

VISUAL IMPACT ASSESSMENT

Jordanville Wind Power Project

Towns of Stark and Warren, Herkimer County, New York

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Date: May 16, 2006

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INTRODUCTION

Environmental Design & Research (EDR) was retained by Jordanville Wind, LLC to prepare a Visual Impact Assessment (VIA) for the proposed Jordanville Wind Power Project (the Project) in the Towns of Stark and Warren, New York. The purpose of this VIA is to: 1) describe the appearance of the visible components of the proposed project, 2) define the visual character of the project study area, 3) inventory and evaluate existing visual resources and viewer groups, 4) evaluate potential project visibility within the study area, 5) identify key views for visual assessment, and 6) assess the visual impacts associated with the proposed action. This VIA was prepared under the direct guidance of a registered landscape architect experienced in the preparation of visual impact assessments. It is also consistent with the policies, procedures, and guidelines contained in established visual impact assessment methodologies (see Literature Cited/References section).

PROJECT DESCRIPTION

Project Site

The proposed project site includes approximately 6,225 acres of leased private land (approximately 77 separate parcels) in the Towns of Stark and Warren in Herkimer County, New York (Figure 1). This area is located on an elevated plateau located approximately 6 miles southeast of the Village of Herkimer, approximately 5 miles southwest of the City of Little Falls, approximated 1 mile west of the Hamlet of Van Hornesville, and approximately 5 miles northeast of the Village of Richfield Springs (as measured to the nearest turbine). The site is bordered by State Route 168 to the north, State Route 80 to the east, U.S. Route 20 to the south, and State Route 28 to the west. The Hamlet of Jordanville is located within this area, and County Route 18 (Jordanville Road) bisects the site in an east-west direction. Land use within the area is dominated by active agriculture, with farms and single-family rural residences generally occurring along the road frontage. Settlement and human activity are concentrated in the small villages and rural hamlets that occur in and around this area.

Proposed Project

For the purpose of this VIA, it is assumed that the proposed project will be a 150-megawatt (MW) wind power facility, consisting of up to 75 2.0-megawatt (MW) wind turbines and associated support facilities. Thirty-seven turbines are proposed for the Town of Stark, and 38 in the Town of Warren. The proposed substation is located off of State Route 168 in the Town of Stark (Figure 2).

The specific components of the project are described below:

Wind Turbines

The type of wind turbine currently anticipated to be used on the project is the 2.0 MW G-87 turbine manufactured by Gamesa-Eolica. Each turbine consists of three major components; a tubular steel tower; a three-bladed rotor; and a nacelle. A description of these components is provided below:

Towers: The tubular steel towers are manufactured in multiple sections and assembled on site. Finished tower height on this project is proposed to be 78 meters (256 feet). The towers have a base diameter of approximately 15 feet and a top diameter of 8 feet and are installed upon a buried concrete foundation. They are painted white and include no exterior ladders of catwalks.

Nacelle: The tower is topped by the nacelle, which is approximately 9 feet wide, by 12 feet high, by 30 feet long, and connects with the rotor hub. The nacelle houses all of the turbine's

mechanical components, including the generator, transformer, gearbox, and power train. It is assumed (based on current Federal Aviation Administration guidelines) that approximately half of the nacelles will be equipped with aviation warning lights, currently anticipated to be synchronized flashing red and operated only at night. For the purposes of this study, it is also assumed that the nacelle will be white in color, and include no lettering, logo, or other exterior marking.

Rotor: The turbine rotor on this project is proposed to be 87 meters (285 feet) in diameter. The rotor consists of three 42-meter (139-foot) long composite blades that are pitched, or rotated along their axis, to operate with the greatest efficiency in varying wind conditions. The blades are white in color, and connect to the nacelle at the rotor hub. The rotor spins at varying speeds, up to 19 revolutions per minute (rpm).

With the rotor blade oriented straight up, each turbine has a maximum height of approximately 400 feet (122 meters). A computer model illustrating the appearance of the proposed turbines is shown in Appendix A.

Electrical System

The project's electrical system includes a system of buried and above-ground 34.5 kilovolt (kV) cables that will collect power from each wind turbine and carry it to a central collection station. Also included is a 230 kV transmission line that will carry power from the collection station to a point of interconnection with the existing National Grid (formally Niagara Mohawk) 230 kV Porter to Rotterdam transmission line. The final component of the electrical system is a substation that transfers the power from the proposed transmission line to the existing line and regional power grid. Each of these components is described below:

Collector System: The individual turbines will be connected to each other and to the collector station by a system of underground electrical cables which will generally run along field edges and project access roads. The collector system will also include an approximately 2 mile long section of above-ground 34.5 kV line that will be built within the right-of-way (ROW) of Travis Road and Bush Road. The line will be carried on treated wood poles that range in height from 30 to 40 feet tall. The total length of 34.5 kV collection line will be approximately 41 miles. The above-ground section of this system will be similar in appearance to existing roadside utility lines (see typical photos in Appendix A). Consequently, it was not evaluated as part of this VIA.

Collection Station: The collection station will be located south of Upper Deck Road, and will be approximately 160 by 105 feet in size. It will be enclosed by chain link fencing and include a control building, electrical transformers, and other equipment (see plan in Appendix A). The collection station will be located approximately 500 feet from Upper Deck Road and will be accessed by a new gravel access road (see site photo in Appendix A). Because the design of this facility is not yet complete, the collection station was not addressed in this study.

230 kV Transmission Line: The 230 kV transmission line will connect the collection station with a proposed substation off of State Route 168. The line will run north approximately 0.8 mile and cross Upper Deck Road and State Route 168. The line will be carried on treated wood H-frame structures (see typical photos in Appendix A). Such structures are fairly common in a rural agricultural landscape. This, along with the limited length of the line, are anticipated to result in only minor visual impact. However, because the design of the transmission line is not yet complete, it was not addressed in this study.

Substation: The substation will be located off of State Route 168 in the Town of Stark, adjacent to the existing National Grid 230 kV transmission line. The substation will include breakers, towers, cable carriers, and related structures. It will be approximately 243 by 215 feet in size, and enclosed within a chain link fence (see plan in Appendix A). The substation will be located approximately 600 feet north of Route 168, and will be accessed by a new gravel service road. Because the design of this facility is not yet complete, it was not addressed in this study.

Meteorological Tower

Two 262-foot (80 meter) tall meteorological towers will be installed to collect wind data and support performance testing of the project. The towers are anticipated to be galvanized lattice steel structures that include wind monitoring instruments and an aviation warning light. Because of their lattice design and narrow profile, these towers generally have limited visibility and visual impact. However, because the design and location of these towers have not yet been determined, they are not addressed in this study.

Service Roads

Approximately 21 miles of new or improved access/service roads will provide construction and maintenance access to the wind turbines. The finished roads will be gravel-surfaced and approximately 16-feet wide. To the extent possible, existing unimproved roads and farm lanes will be upgraded to provide turbine access. Following construction, project access roads will be reduced in size (to approximately 16 feet in width) and receive very limited use. Although included in any simulations where they may be visible (see Viewpoint 39 in Figure 15), these access roads take on the appearance of farm lanes, and generally do not have a significant long-term visual impact. Similarly, temporary or permanent improvements to town roads necessary to accommodate construction vehicles generally do not change the rural character of these roads (see photos in Appendix A). Consequently, the visibility and visual impact of road improvements, on their own, are not evaluated in this study.

The layout of the proposed project components on the site is illustrated in Figure 2.

EXISTING VISUAL CHARACTER

The following section describes the visual character of the project study area. Based on established visual assessment methodology (NYSDEC, not dated) the study area for the project was defined as the area within a 5-mile radius of each of the proposed turbines and includes 174 square miles in Herkimer and Otsego Counties. This study area is illustrated in Figure 3.

Physiographic/Visual Setting

Landform and Vegetation

The visual study area is located along the transition between the Mohawk Valley and Central Appalachian physiographic regions of New York State (Reschke, 1990). The majority of this area is a rolling, elevated plateau that lies between the Mohawk River Valley to the north and drumlin formations at the foothills of the Appalachians to the south. The northern portion of the study area includes a narrow portion of the Mohawk Valley. The valley transitions to a steep north-facing slope with tributaries of the Mohawk River creating a series of narrow north-south oriented valleys along the slope. The central portion of the site is characterized by rolling topography until reaching the east-west oriented drumlins that dominate the southern portion of the study area. Steeper and more

mountainous topography can be seen outside of the study area to the south. Elevations within the study area range from approximately 370 to 1,970 feet above sea level.

Vegetation in the study area is roughly a 70:30 mix of open agricultural fields and deciduous forest (primarily in the form of small woodlots). Open fields include active cropland and pasture, and tend to occur on more level hilltops and gentle slopes within the study area. Forest vegetation is primarily deciduous (northern hardwoods) with some planted conifers (pine and spruce). Mature trees typically occur in hedgerows, woodlots, on steep slopes, and within wooded wetlands that are found in some valley areas. Forests on steep slopes and ridges outside the study area (primarily to the south) form a back drop in some views.

Land Use

Land use within the study area is dominated by agricultural fields, farms, and scattered rural residences. Dairy farming is the primary agricultural activity, and contributes significantly to the bucolic character of the study area. Higher density residential and commercial development is concentrated in the villages and small hamlets that occur along U.S. Route 20, State Routes 80, 167, and 168, and County Route 18. Hamlets within the study area, such as Jordanville, Starkville, and Van Hornesville are relatively small, well defined components of a primarily rural/agricultural landscape. They typically occur in more wooded valley areas which limits the availability of the outward views. Village development occurs outside the study area boundary to the north (the Village of Herkimer) and along the study area boundary to the south (the Village of Richfield Springs). The villages have a much higher concentration of residential and commercial uses, and a well-defined central business district surrounded by residential neighborhoods. Commercial/industrial uses are limited to areas adjacent to the major villages, as well as the Hanson quarry located off of Kingdom Road (County Route 155), and the New York State Thruway (Interstate Route 90), which runs through the northern portion of the study area.

Water Features

Water features within the visual study area include several water bodies (rivers, lakes, ponds, streams) that are important features of the landscape. The most significant of these occur at, or just outside the northern boundary of the study area, where West Canada Creek joins the Mohawk River/Erie Canal. The 2-mile segment the Mohawk River/Erie Canal that is included within the study area occurs within a relatively narrow valley setting. This river is broad, flat, and typically bordered by trees. It receives significant recreational use in the form of boating and fishing and is part of the Erie Canalway National Heritage Corridor. Several major travel corridors (State Route 5, State Route 5S, and the NYS Thruway), and significant commercial development in (Herkimer and Little Falls) also occur along the Mohawk River/Erie Canal. Canadarago Lake and Otsego Lake are located just outside the southern boundary of the study area. These lakes are major water features in the region, and offer recreational opportunities including swimming, boating, and fishing. Other water features in the study area include Mud Lake, Weaver Lake, Summit Lake, Young Lake, Allen Lake and Shipman Pond. These water bodies are relatively small, but (along with associated wetland areas) are character-defining elements of the southern portion of the study area. Their open water and proximity to public roads often provides for open, water-level views of the surrounding landscape. Streams in the study area are not major components of the landscape due to their relatively small size and/or occurrence within largely wooded valleys and ravines.

Landscape Similarity Zones

Within the visual study area, four distinct landscape similarity zones (LSZ) were defined. These zones are illustrated in Figure 4 and their general landscape character, use, and potential views to the proposed wind power project are described below.

Zone 1. Rural /Agricultural Zone

This landscape similarity zone makes up the vast majority of the visual study area, and is characterized by open agricultural land with widely dispersed farms and rural residences along a network of state, county, and local roads. Active agricultural fields (corn, hay, pasture, etc.), bordered by hedgerows and scattered deciduous woodlots, dominate the landscape. Topography is undulating throughout this zone, but ranges from gently rolling in the central portion of the study area, to steeply sloping hillsides in the north, to rolling drumlins in the south. Views in the rural/agricultural zone are generally open, at times expansive, and include a patchwork of fields, fenced pastures, and woodlots, punctuated by barns and silos. Livestock and working farm equipment are often seen in the fields. Views in this zone also occasionally include communication towers. Due to the elevation of the project site and the abundance of open fields through the study area, foreground (<0.5 mile), mid-ground (0.5-3.5 mile), and background (>3.5 mile) views of the proposed project will be available from many areas within the rural/agricultural zone. However, strong hill top and ridge features limit views of distant background features in many locations.

Zone 2. Village/Hamlet Zone

This zone includes the larger hamlets and villages in the study area. This zone is characterized by moderate to high-density residential and limited commercial development. Vegetation and landform contribute to visual character in some of the hamlets (e.g., Van Hornesville), but within the majority of this zone, buildings (typically 1-2 stories tall) and other man-made features dominate the landscape. These features can be highly variable in their size, architectural style, and arrangement. However, buildings tend to be traditional in architectural style and arranged in an organized pattern that generally focus views along the streets and block views of distant features. The villages and hamlets within this zone have a classic small town feel and convey a sense of permanence and history. In some areas, such as Jordanville and Van Hornesville, trees and adjacent slopes also help to enclose and screen views within this zone. However, in other hamlets, outward views to the greater landscape are available. Examples of this zone include the Village of Richfield Springs and the Hamlets of Jordanville, Starkville, and Van Hornesville. Views of the proposed project will likely be limited from this zone due to the valley setting of most of the hamlets and villages, and the screening provided by adjacent topography and/or vegetation. However, views are likely to be available from the edges of this zone, where housing and vegetation density decrease and topographic elevation increases.

Zone 3. Forestland Zone

Forestland is a relatively minor Landscape Similarity Zone within the visual study area. It is characterized by the dominance of mature forest vegetation (primarily deciduous tree species), and occurs primarily as relatively small woodlots and blocks of trees scattered throughout the visual study area. Views in the forestland zone are typically limited due to the screening provided by overstory trees. Views are generally restricted to areas where small clearings and road cuts provide breaks in the tree canopy. Where long distance views are available, they are typically at the edges of woodlots, more uni-directional, and/or framed by trees. Land use in this zone includes forest management, low-density residential, and recreational use (hunting, etc.). Prime examples of this zone include the Ohisa and Otsquago State Forests.

Zone 4. Water/Waterfront Zone

This landscape similarity zone includes areas of open water, and shorelines within the study area. These sites include the Mohawk River/Erie Canal System, Mud Lake, Weaver Lake, Summit Lake, Young Lake, Allen Lake, and Shipman Pond. Several of these water bodies have public access

areas for water-based recreational activities including boating and fishing. The character-defining component of this landscape similarity zone is the presence of open water as a dominant foreground element in the view. The open water also provides opportunities for unobstructed views of midground and background features of the surrounding landscape. The recreational use these water bodies receive (and in the case of the Erie Canal, its historic significance) makes sensitivity to visual quality and visual changes in this zone generally high. However, views of the proposed project will generally be limited from these areas due to their valley location, the screening provided by surrounding hills and trees, and/or their distance from the project. It should be noted that the location of the Mohawk River/Erie Canal in a narrow portion of the Mohawk River Valley will preclude views to the proposed project from these waterbodies.

Viewer/User Groups

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

Local Residents

Local residents live and work within the study area. They generally view the landscape from their yards, homes, local roads and/or places of business. Residents are concentrated in the villages and hamlets, but occur throughout the visual study area. Except when involved in local travel, residents are likely to be stationary, and have frequent or prolonged views of certain landscape features. 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, and may be tempered by the aesthetic character/setting of their neighborhoods or work place. For example, residents with a view of existing commercial facilities may be less sensitive to landscape changes than those with a view of open farmland. It is assumed, however, that all local residents are familiar with the local landscape and may be very sensitive to changes in particular views that are important to them.

Through Travelers/Commuters

Through-travelers and commuters view the landscape from ground-level viewpoints while in a motor vehicle on their way to work or other destinations. These viewers will be concentrated on the major highways that traverse the study area including Interstate Route 90 (NYS Thruway), U.S. Route 20, and State Route 5S, 28, 80, 167 and 168. Commuters and through travelers are typically moving, have a relatively narrow field of view and are destination oriented. They tend to 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 toward landscape features than will drivers, and accordingly, may have greater perception of changes in the visual environment than drivers.

Recreational Users and Tourists

Recreational users and tourists include local residents and out-of-town visitors involved in cultural and recreational activities at parks, athletic fields, and historic sites, as well as in undeveloped natural settings such as forests, fields and water bodies. These viewers are concentrated in the recreational facilities/cultural sites located within and adjacent to the visual study area, including Otsego Lake, Canadarago Lake, the Mohawk River/Erie Canal, and parks and historic sites associated with these water bodies. They may view the landscape from area highways while on their way to these destinations, or from the sites themselves. This group includes, snowmobilers, bicyclists, hikers, joggers, recreational boaters, hunters, fishermen and those involved in more passive recreational activities (e.g., picnicking, sight seeing, or walking). Visual quality may or may not be an important part of the recreational experience for these viewers. However, for some,

scenery will be a very important part of their recreational experience, and recreational users and tourists will often have continuous views of landscape features over relatively long periods of time. Passive recreational activities generally do not require as much concentration as more active recreational activities, and therefore tend to be more focused on the enjoyment of scenery. Those engaged in passive activities have the opportunity to concentrate on views and observe the surrounding area for a prolonged period of time, and may be particularly sensitive to visual change. Most recreational viewers and tourists will only view the surrounding landscape from ground-level or water-level vantage points.

Visually Sensitive Resources

The area within and adjacent to the visual study area includes several sites that the New York State Department of Environmental Conservation (NYSDEC) Visual Policy (DEP-00-2) considers scenic resources of statewide significance (NYSDEC, 2000 – See Appendix B). These include the following:

Sites listed on the National or State Register of Historic Places

The visual study area includes a total of 10 sites or districts that are currently listed on the National Register of Historic Places (NYSOPRHP Website; Heaton, 2005). These include the following:

1. Holy Trinity Russian Orthodox Monastery – Robinson Road, Warren
2. Church of the Good Shepard – State Route 167 and Earl Street, Cullen
3. Jordanville Public Library – Main Street, Jordanville
4. Zoller-Fraiser Round Barn – Fords Bush Road, Newville
5. East Main Street Historic District – Richfield Springs
6. Church Street Historic District – Richfield Springs
7. West Main Street Historic District – Richfield Springs
8. Sunnyside – 72 East Main Street, Richfield Springs
9. U.S. Post Office – 12 East Main Street, Richfield Springs
10. Glimmerglass Historic District - Springfield

The study area also includes several sites that are considered eligible for listing on the State and National Register, including, Mohawk Dam 14 and Erie Canal Lock 18 (on the Erie Canal), the Owen D. Young School in Van Hornesville, several buildings in the Hamlet of Starkville, and several structures in the Hamlet of Jordanville (Heaton, 2005). The area within a mile outside the study area boundaries (i.e., within 6 miles of the project), includes the following additional Register-listed sites:

1. East Springfield Union School – East Lake Road, East Springfield Vicinity, (Otsego County)
2. Windfall Dutch Barn –Clinton and Ripple Roads, Salt Springville, (Montgomery County)
3. Fort Herkimer Church – State Route 5S, East Herkimer
4. Herkimer Home – South bank of Mohawk River on County Route 5S, Little Falls
5. Hyde Hall Covered Bridge – Glimmerglass State Park, East Lake Road, Springfield

Numerous additional Register-listed sites occur beyond 6 miles, primarily along the Mohawk River/Erie Canal, in the Villages of Herkimer and Ilion and the City of Little Falls. The Lindesay Patent Rural Historic District is just over 6 miles from the nearest proposed turbine.

State Parks: NONE IN THE STUDY AREA

Two state park facilities occur outside the southern boundary of the visual study area in Otsego County (NYSOPRHP Website). These parks and the recreational facilities/opportunities they provide are listed below.

1. Glimmerglass State Park – Located on Otsego Lake, southwest of the Hamlet of Springfield Center, and 8 miles north of the Village of Cooperstown. The park is approximately 6 miles from the nearest proposed turbine. Glimmerglass State Park provides picnic, beach, and boat launch facilities, as well as campsites and showers. The park offers opportunities for hiking, fishing, biking, and winter activities such as cross-country skiing, snowshoeing, snowmobiling, and ice fishing. Park attendance in 2005 was 95,250 (C. Sutliff, pers. comm.).
2. Canadarago Boat Marine Park – Located approximately 8 miles from the nearest proposed turbine, 3 miles south of the Village of Richfield Springs off of State Route 28. This facility provides a boat launch and parking for boaters and fishermen using Canadarago Lake.

Urban Cultural Parks: NONE IN THE STUDY AREA

State Forest Preserve:

The project study area includes two areas of state Forest Preserve land (NYSDEC Website). These include the following:

1. Ohisa State Forest – Town of Stark. Approximately 689-acre forest near the Hamlet of Starkville off Route 168. The forest offers opportunities for various informal recreation activities including hunting, photography, and nature study.
2. Otsquago State Forest – Town of Stark. Approximately 408-acre forest near the Hamlet of Starkville off Route 80. The forest includes no developed recreational facilities, but offers opportunities for hunting, photography, and nature study.

National Wildlife Refuges: NONE IN THE STUDY AREA

State Wildlife Management Areas: NONE IN THE STUDY AREA

The Plantation Island Wildlife Management Area (WMA) occurs outside the visual study area to the north (just over 5 miles from the nearest proposed turbine). This WMA includes 300-acres 2.5 miles east of the Village of Mohawk on State Route 5. Plantation Island is a unique natural area located between the Barge Canal and Mohawk River (accessed by Canal Lock 18). Numerous recreational opportunities are available in the WMA's wetlands and forested Mohawk River flood plains; including trapping, fishing, and hunting.

National Natural Landmarks: NONE IN THE STUDY AREA

National Park System Lands:

The only National Park Service lands within or adjacent to the visual study area is the Erie Canal National Heritage Corridor. This corridor is a National Park Service partnership with 230 communities along the 524-mile canal way that was established to protect and promote the NYS Canal System as a recreational resource for boaters and tourists. Approximately 2 miles of the Erie Canal National Heritage Corridor occurs within the northern portion of the visual study area.

Wild, Scenic and Recreational Rivers: NONE IN THE STUDY AREA

Designated Scenic Roads/Byways: NONE IN THE STUDY AREA

Although not yet listed as a designated scenic byway, State Route 20 (8 miles of which bisect the southern portion of the visual study area) has been recommended to receive such designation (The Saratoga Associates, 2004). In addition, two designated scenic byways occur just outside the northern boundary of the visual study area (NYSDOT website). These include the following:

1. Revolutionary Trail Scenic Byway – A portion of this 158-mile east-west corridor along Route 5 (the original Mohawk Turnpike) occurs just outside the northern boundary of the visual study area. This scenic byway connects Lake Ontario to Albany and links Revolutionary War historic sites along its route. The nearest of these is the General Herkimer State Historic site in Little Falls, approximately 5 miles from the nearest proposed turbine.
2. Southern Adirondack Trail Scenic Byway – This 112-mile corridor is also located outside the northern boundary of the study area and connects Herkimer and Little Falls along the Erie Canal to southern Adirondack hamlets along State Routes 8, 28, 29, 167, and 169. This scenic byway links a variety of historic recreational and scenic sites within the Adirondack foothills.

Designated Scenic Sites/Overlooks: NONE IN THE STUDY AREA

State or Federal Designated Trails: NONE IN THE STUDY AREA

Although there are currently no designated trails within the visual study area, potential development of an 8-mile Canalway Trail extension between the Towns of Ilion and Little Falls is being considered by the New York Canal Corporation. This section of Canalway Trail would help create more than 60-miles of contiguous trail along the canal in the Herkimer and Montgomery Counties. The trail would begin at the existing Miller Mile trail segment in the City of Little Falls and follow the abandoned West Shore Railroad. The trail would then follow the Canal right-of-way to the Fort Herkimer Church in German Flatts. The project will start up again in the Village of Mohawk at the Route 28 Bridge and run parallel with Route 5S and the Erie Canal to the Town of Ilion Marina. Approximately 2 miles of this trail would occur within the visual study area.

Adirondack Park Lands and Scenic Vistas: NONE IN THE STUDY AREA

State Nature and Historic Preserve Areas: NONE IN THE STUDY AREA

Palisades Park Land: NONE IN THE STUDY AREA

Bond Act Properties (Exceptional Scenic Beauty, Open Space): NONE IN THE STUDY AREA

Beyond the scenic resources of statewide significance listed above, the visual study area also includes areas that are regionally or locally significant/sensitive. These include local parks and recreation facilities, public open space, population centers, and heavily used transportation corridors. The most significant of these are listed below:

Local Scenic Viewsheds:

Although not officially designated as scenic overlooks/vistas, the Town of Stark Planning Reference Guide (Bronner and Lewis, 2000) identifies 10 scenic views in the Town of Stark. These views were identified by local participants in a photo survey and occur on Sickler Road, PusKarenko Road, Cemetery Road, Mead Road, Wiltse Hill Road, Gros Road, Wagner Hill Road, Mussmaker Road, Cramers Corners Road, and Travis Road. Most of these views are oriented toward the Mohawk Valley to the north and east.

State Land:

Along with the previously-mentioned state park and Forest Preserve lands, the only other state land within or adjacent to the study area is the Van Hornesville State Fish Hatchery in the Town of Danube. Located near the Hamlet of Van Hornesville off State Route 80, the hatchery is open to the public, and includes facilities for the raising and stocking of trout.

Recreational Areas:

Beyond the facilities listed previously, the study area includes several additional areas that receive recreational use. These include the following:

- Mohawk River – Towns of Little Falls and German Flats
- Mud Lake – Town of Warren
- Weaver Lake – Town of Warren
- Youngs Lake – Town of Warren
- Cary Park – Village of Richfield Springs
- Allen Lake – Village of Richfield Springs
- Shipman Pond – Hamlet of Springfield Four Corners (Otsego County).
- Summit Lake – Hamlet of Springfield Four Corners
- Otsego Golf Club – Route 80, Springfield Center
- KOA Campground – McShane Road, Richfield Springs

Areas of Intensive Land Use:

Several municipalities and areas of settlement within and adjacent to the visual study area are considered visually sensitive due to the concentration of residential development or the type/intensity of land use they receive. These include the following:

- Village of Mohawk
- Village of Herkimer
- Hamlet of Columbia Center
- Hamlet of Jordanville
- Hamlet of Van Hornesville
- Hamlet of Starkville
- Hamlet of Warren
- Village of Richfield Springs
- Hamlet of East Springfield
- Hamlet of Springfield Center
- Hicks Cemetery – Town of Warren
- Lakeview Cemetery – Town of Richfield
- Otsego Lake
- Canadarago Lake

Transportation Corridors:

The visual study area includes several highways that could be considered visually sensitive due to the number of drivers that travel these roads on a daily basis. According to the New York State Department of Transportation (NYSDOT) website, 2004 traffic counts indicate the following average annual daily traffic on these roads:

- Interstate Route 90, from Interchange 30, State Route 28 to Interchange 29A, State Route 169 averaged 51,300 vehicles per day.
- State Route 5, from State Route 28 in the Town of Herkimer to the City of Little Falls Line, averaged 77,100 vehicles per day.
- State Route 5S, from State Route 28 in the Town of Herkimer to State Route 167, averaged 45,800 vehicles per day.
- U.S. Route 20, from State Route 167 in the Village of Richfield Springs to the Otsego-Herkimer County Line, through the Town of Warren to the Herkimer-Otsego County Line, to County Route 31 in the Hamlet of East Springfield, averaged 18,450 vehicles per day.
- State Route 28, from the Town of Herkimer Line to the Herkimer-Otsego County Line, to U.S. Route 20 in the Village of Richfield Springs, averaged 13,100 vehicles per day.
- State Route 80, from the Montgomery-Herkimer County Line through the Hamlets of Starkville and Van Hornesville, to the Herkimer-Otsego County Line, to State Route 20 in the Hamlet of Springfield Center, averaged 4,270 vehicles per day.
- State Route 167, from the City of Little Falls Line through the Hamlet of Jordanville, to the Herkimer-Otsego County Line, to U.S. Route 20 in the Village of Richfield Springs averaged 45,780 vehicles per day.
- State Route 168, from the intersection of State Route 28 in the Village of Mohawk through the Hamlets of Paines Hollow and Starkville, to the intersection of State Route 80, averaged 3,200 vehicles per day.
- County Route 18, from the intersection of State Route 28 in the Hamlet of Orendorf Corners, through the Hamlets of Jordanville and Crains Corners, to the intersection of State Route 80, is also a well traveled local road, but daily traffic count data were not available.

The locations of visually sensitive resources within the visual study area are illustrated in Figure 5.

VISUAL IMPACT ASSESSMENT METHODOLOGY

The Visual Impact Assessment (VIA) procedures used for this study are consistent with methodologies developed by the U.S. Department of the Interior, Bureau of Land Management (1980), U.S. Department of Agriculture, National Forest Service (1974), the U.S. Department of Transportation, Federal Highway Administration (1981), U.S. Army Corps of Engineers (Smardon, et al., 1988) and the NYS Department of Environmental Conservation (not dated). The specific techniques used to assess potential project visibility and visual impacts are described in the following section.

Project Visibility

An analysis of project visibility was undertaken to identify those locations within the study area where there is potential for the proposed wind turbines to be visible. This analysis included identifying potentially visible areas on viewshed maps, preparing technical cross sections, and verifying visibility in the field. The methodology employed for each of these assessment techniques is described below.

Viewshed Analysis

Topographic viewshed maps for the study area were prepared using USGS digital elevation model (DEM) data (7.5-minute series) and the ArcView Spatial Analyst® computer program. Two 5-mile radius topographic viewsheds were mapped, one to illustrate “worst case” daytime visibility (based on a maximum blade tip height of 400 feet above existing grade) and the other to illustrate potential visibility of turbine lights (based on a nacelle height of 262 feet above existing grade). The viewshed analysis was also run using an 8-mile radius to evaluate potential project visibility at sensitive sites outside the study area boundary (e.g., Glimmerglass State Park, Canadarago Lake, historic sites in the Mohawk Valley, and the Lindesay Patent). The viewshed analyses were based upon the location of all turbines, as indicated in the proposed project layout (Figure 2).

The ArcView program defines the viewshed (using topography only) by reading every cell of the DEM data and assigning a value based upon visibility from observation points throughout the study area. The resulting topographic viewshed maps define the maximum area from which any turbine within the completed project could potentially be seen within the study area during both daytime and nighttime hours (ignoring the screening effects of existing vegetation and structures). Because the screening provided by vegetation and structures is not considered in this analysis, the topographic viewsheds represent a "worst case" assessment of potential project visibility.

To illustrate the potential screening effect of forest vegetation, a vegetative viewshed analysis was also performed. The vegetative viewshed was prepared in the same manner as the topographic viewshed, except that a base vegetation layer was created using USGS National Land Cover Data (2000) and assigning an elevation value (40 feet) to various forest cover types (Deciduous, Evergreen and Mixed Forest). This layer was then added to the digital elevation model to produce a base layer for the viewshed analysis, as described above (using the blade tip height as input data). Once the viewshed analysis was completed, the areas covered by the forest vegetation layer were designated as "not visible" on the resulting data layer.

It is worth noting that because characteristics of the proposed turbines that influence visibility (color, narrow profile, distance from viewer, etc.) are not taken into consideration in the viewshed analyses, being within the viewshed does not necessarily equate to actual project visibility.

Cross Section Analysis

To illustrate the screening effect of vegetation within the study area, five representative line-of-sight cross sections (each approximately 6-miles long) were cut through (and in some cases beyond) the study area. Cross section locations were chosen so as to include visually sensitive areas (e.g., hamlets, villages, recreational sites, and water bodies) and various roads and local landmarks. The cross sections are based on forest vegetation and topography as mapped on the 7.5-minute USGS quadrangle maps and digital aerial photographs. For the purposes of this analysis, a uniform 40-foot tree height was assumed. A 10 fold vertical exaggeration was used to increase the accuracy of the analysis.

Field Review

Potential visibility of the proposed project was evaluated in the field on November 3, 2005. Existing tall structures within the project area (communication towers, transmission structures, silos, etc.) were used to provide locational and scale reference for verification of potential turbine visibility, and the development of subsequent photo renderings of the project. The exercise involved a field crew driving public roads and visiting public vantage points within the 5-mile radius (174 square mile) study area to document points from which the turbines were likely to be visible. To document

potential visibility and screening, photos and field notes were obtained from 57 representative viewpoints within the study area. An additional 12 photos were also taken from outside the study area, in and around the Village of Richfield Springs and the Hamlet of Springfield Center. All photos were obtained using Nikon (D100 and D70) or Canon (350D and 20D) digital SLR cameras. All cameras utilized a focal length between 28 and 35 mm (equivalent to between 45 and 55 mm on a standard 35 mm camera). This focal length most closely approximates normal human eyesight relative to scale. Photos were typically taken by a photographer standing on the shoulder of a public roadway. This perspective includes more than is generally visible to drivers and passengers in automobiles, but is similar to the views that will be available to local residents and users of outdoor recreational sties/facilities in the area. Viewpoint and reference point locations were determined using hand-held global positioning system (GPS) units and high-resolution aerial photographs (digital ortho quarter quadrangles). The time and location of each photo were documented on all electronic equipment (cameras, GPS units, etc.) and noted on field maps and data sheets (see Appendix C and D).

It should be noted that EDR also visited the proposed project site on May 11, 2005 to obtain photos for use in the development of preliminary photo renderings of the project. Views from an additional 16 viewpoints within and adjacent to the study area were documented during this field investigation (bringing the total number of documented viewpoints to 85). Follow-up site visits were also conducted in April 2006 to obtain additional photos from Jordanville Road (County Route 18) and the Holy Trinity Russian Orthodox Monastery.

Project Visual Impact

Beyond evaluating potential project visibility, the VIA also examined the visual impact of the proposed wind power facilities on the aesthetic resources and viewers within the visual study area. This assessment involved creating computer models of the proposed turbine and turbine layout, selecting representative viewpoints within the study area, and preparing computer-assisted simulations or photo renderings of the proposed project. These images were then evaluated by an in-house panel of landscape architects to determine the type and extent of visual impact likely to result from project construction. Details of the visual impact assessment procedures are described below.

Viewpoint Selection

From the photo documentation conducted during field verification, EDR selected a total of 11 viewpoints for development of simulations/photo renderings. These viewpoints were selected to illustrate typical views of the proposed project that will be available to representative viewer/user groups, from the major landscape similarity zones and sensitive sites within the study area. The selected viewpoints also include a variety of viewer distances and lighting conditions to illustrate the range of visual change that will occur with the project in place. Because photos were obtained during both the spring and the late fall, views with and without the screening effect of tree foliage were also selected. It is worth noting that no viewpoints that required viewing turbines through tree branches were selected and that in most views the presence or absence of tree foliage had little effect on project visibility. The location of the selected viewpoints is indicated in Figure 9. Locational details and the reasons for selection of each viewpoint are described below:

- Viewpoint 12 - View from State Route 167 near the intersection of County Route 136, looking southwest. Typical view of the rural/agricultural LSZ in the study area, where turbines will be visible at midground distances.

- Viewpoint 15 - View from Cramers Corners Road, adjacent to the Ohisa State Forest, looking southwest. "Worst case" view from Forest Preserve land. Also representative

of the rural/agricultural LSZ in the western portion of the study area.

- Viewpoint 25 - View from State Route 80, south of the Hamlet of Van Hornesville, looking northwest. Nearest open view in the vicinity of Van Hornesville, and a typical view of the rural agricultural LSZ.
- Viewpoint 27 - View from Summit Hill Road (Otsego County) looking northwest. Typical background view of the project within the rural/agricultural LSZ.
- Viewpoint 34 - View from U.S. Route 20 near the intersection of Ostrander Road in the Hamlet of Warren, looking northeast. Background view of the project from a heavily traveled road, and representative of the water/waterfront LSZ.
- Viewpoint 39 - View from County Route 18 at the intersection of County Route 116 looking northwest. Typical foreground view of the project within the rural agriculture LSZ.
- Viewpoint 43 - View from State Route 167 near the Holy Trinity Russian Orthodox Monastery, looking northwest. A visually sensitive site that will have open foreground views of the project. Viewpoint 43-A shows the most open view available from the grounds of the monastery.
- Viewpoint 46 - View from County Route 117 near Hick's Cemetery looking northwest. Foreground view of the project within the rural/agriculture LSZ and from a visually sensitive site.
- Viewpoint 70 - View from County Route 18 near the Hamlet of Jordanville, looking east. Typical open view from the periphery of a hamlet in the study area.
- Viewpoint 71 - View from County Route 18 near the intersection of County Route 117, looking southeast. Typical midground view of the project from the rural/agriculture LSZ.
- Viewpoint 72 - View from County Route 18, south of the intersection of County Route 203, looking northeast. Typical foreground view of the project within the rural/agricultural LSZ in the study area.

To illustrate the potential cumulative impact of the project (i.e., those instances where turbines are visible in multiple directions from a given viewpoint), a 360° panorama simulation was also prepared from Jordanville Road (County Route 18). This simulation shows the full extent of the currently available view from this location, and how this view would change when turbines are added to views toward the west, northeast, and southeast.

Simulations/Photo Renderings

To show anticipated visual changes associated with the proposed project, high-resolution computer-enhanced image processing was used to create realistic simulations or photo renderings of the completed project from each of the viewpoints described above (including Viewpoint 43-A and the panorama view). The simulations and photographic renderings were developed by constructing a three-dimensional computer model using 3D Studio Max 5.0® software, based on turbine specifications and survey coordinates of the proposed facilities provided by the project developer. For the purposes of this analysis, it was assumed that all new turbines would be Gamesa G-87

machines. The simulation methodology is outlined in Figure 6, and the computer model used in this VIA is shown in Appendix A.

The next step in this process involved utilizing aerial photographs and GPS data collected in the field to create an AutoCAD 2004® drawing. The two dimensional AutoCAD data was then imported into 3D Studio Max, and three-dimensional components (cameras, modeled turbines, etc.) were added. These data were superimposed over photographs from each of the viewpoints, and minor camera changes (height, roll, precise lens setting) made to align all known reference points within the view. Photos with several identifiable reference points (roads, buildings, etc.) allowed the development of simulations. Those that lacked these features (i.e., where camera alignment was based primarily on topography and vegetation) are referred to as photo renderings. This process ensures that project elements are 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 turbines will be accurate and true in their relationship to other landscape elements in the photo.

At this point, a “wire frame” model of the facility and known reference points is shown on each of the photographs. The proposed exterior color/finish of the turbines was then added to the model and the appropriate sun angle was simulated based on the specific date, time and location (latitude and longitude) at which each photo was taken. This information allows the computer to accurately illustrate highlights, shading and shadows for each individual turbine shown in the view. All simulations show the turbines with rotors oriented toward the northwest, which is generally the prevailing wind direction in the area. The effects of distance (hazing, bluing, loss of detail) were not added to any of the simulations or photo renderings. To illustrate the motion of the turning rotor, animation was also added to the Viewpoint 39 simulation (see digital images in Appendix E).

Panel Evaluation

An in-house panel of three landscape architects was asked to rate the proposed project in terms of its contrast with existing components of the landscape. Each of the panel members have experience in visual impact assessment and have visited operating wind power projects in New York State. Digital color prints (11 x 17-inch) of the before and after photos from the 11 representative viewpoints were evaluated by the panel. Using a rating form developed by EDR, the project's contrast with existing vegetation, landform, land use, water resources, and user activity was then rated on a scale of 1 (completely compatible) to 5 (strong contrast). For each viewpoint, these scores were added and averaged to provide an overall contrast rating. Each panel member's overall score for each viewpoint was then added and averaged to get a final composite rating for each viewpoint. In addition, rating panel comments on each viewpoint, the panorama simulation, and on nighttime photos from the Fenner (New York) Wind Power Project, were used to evaluate the project's overall visual impact.

VISUAL IMPACT ASSESSMENT RESULTS

Project Visibility

Topographic viewshed analysis (Figure 7, Sheet 1 of 4) indicates that the proposed project has the potential to be visible in approximately 78% of the study area, disregarding the screening effect of vegetation and structures. Potential visibility is most heavily concentrated in the central portion of the study area and diminishes at the periphery, especially to the north and the southwest. Visually sensitive sites indicated as having potential views of the project include several Register-listed historic sites (the Jordanville Public Library, Church of the Good Shepard, Zoller-Fraiser Round Barn, and sites/districts in Richfield Springs), the Holy Trinity Russian Orthodox Monastery, Ohisa and Otsquago State Forests, the Village of Richfield Springs, the Hamlets of Jordanville, Starkville,

and Warren, Mud Lake, Weaver Lake, and portions of U.S. Route 20, NYS Routes 80, 167, and 168, and County Route 18. In most areas where potential visibility is indicated, the topographic viewshed analysis suggests that views to multiple turbines could be available (see Figure 7, Sheet 2 of 4). In approximately 25% of the 5-mile radius study area, 1-20 turbines are potentially visible. These sites are concentrated in the lower valley areas and along the plateau that occurs north/northeast of the project area. From 21 to 40 turbines are potentially visible in 18% of the study area (primarily in mid-slope areas), while 41 to 61 turbines are potentially visible in 17% of the area, and 61 to 75 turbines are potential visible in 18% of the area. Sites with potential views of the most turbines are concentrated in the central portion of the study area and on higher elevation hilltops and slopes oriented toward the project. Views from valley bottoms, ravines, and the backsides of hills (22% of the visual study area) are indicated as being fully screened by topography. Visually sensitive sites within the study area indicated as being fully screened from view by topography alone include the Mohawk River/Erie Canal, the New York State Thruway, Youngs Lake, Shipman Pond, and the Hamlets of Van Hornesville, Columbia Center, and Springfield Center. Areas of potential nighttime visibility cover approximately 73% of the study area, and generally occur in the same areas where potential daytime visibility is indicated.

Review of the 8 mile topographic viewshed map indicates that potential project visibility decreases significantly outside of the 5 mile radius visual study area. Within the 5 to 8 mile ring the proposed project has the potential to be visible in approximately 51% of the area. Significant valley and hillside areas in this ring are fully screened from view, including the Mohawk Valley, Cherry Valley, and Ilion Gorge. The 8 mile viewshed analysis also indicates that most visually sensitive resources in this area will be fully screened by topography alone, including Glimmerglass State Park, the majority of the Lindesay Patent Historic District, and the majority of individual Register-listed historic sites. The majority of the Glimmerglass Historic District, Otsego Lake, Canadarago Lake, portions of the Villages of Mohawk, Herkimer and Ilion, and portions of the City of Little Falls are indicated as having potential project visibility.

Factoring vegetation into the viewshed analysis significantly reduces potential project visibility (Figure 7, Sheet 4 of 4). Within the 5-mile radius study area, vegetation, in combination with topography, will serve to screen the project from approximately 66% of the area (i.e., potential visibility is indicated in 34% of the area). Visibility will essentially be restricted to open agricultural areas, which are concentrated in the central portion of the study area. The vegetation viewshed analysis indicates that most sensitive sites within the study area, including the Ohisa and Otsquago State Forests and historic sites/districts in the Village of Richfield Springs will be screened from view. Within the 5-8 mile ring, the vegetation viewshed indicates very little potential visibility to the south and west, with the exception of Canadarago Lake and Otsego Lake. Potential project visibility within this ring is concentrated on open, high elevation sites to the north and east. Register-listed historic sites in this ring, including the Hyde Hall Covered Bridge, East Springfield Union School, Baker Octagon Barn, Windfall Dutch Barn, and Indian Castle Church, are indicated as being screened from view. Only some of the sites in the Villages of Herkimer, Ilion and Mohawk and the City of Little Falls are indicated as being potentially visible in the outer ring of the vegetation viewshed.

Areas of actual visibility are anticipated to be much more limited than indicated by the viewshed analyses, due to the slender profile of the turbines (especially the blades, which make up the top 139 feet of the turbine), their light color, and screening provided by structures, which are not considered in the viewshed analyses.

Cross section analysis (Figure 8) revealed that along selected lines of sight, vegetation and structures will significantly decrease potential project visibility, when compared to the results of the viewshed analysis. All of the sections indicate that woodlots and wooded slopes effectively screen certain hamlets, such as Springfield Center, and sections of area roadways, including Routes 20, 80, and 167. Buildings screen ground-level views from villages and hamlets such as Jordanville and

Richfield Springs (sections A-A' and B-B'). In regard to visually sensitive sites, the sections suggest that views of the turbines are likely to be available from portions of the Hamlet of Jordanville, portions of Otsego Lake, portions of the Glimmerglass Historic District, many of the heavily used roads in the area, and the upper floors of some homes in the villages and hamlets. The sections indicate that views from other sensitive sites, such as Ohisa State Forest, and historic sites/districts in the Mohawk River Valley, the Village of Richfield Springs, the Hamlets of Springfield Center and Van Hornesville are likely to be screened from view.

Field review indicated that screening provided by buildings and trees in various locations within the study area is more extensive and effective than assumed in the previous analyses (e.g., vegetation is more extensive than indicated on the USGS maps, and often taller than 40 feet in height). The result is that certain sites/areas where "potential" visibility was indicated by viewshed mapping, such as area lakes and ponds, Register-listed historic sites, and significant portions of State highways are likely to be well screened from views of the proposed project. Field review confirmed that views from the Mohawk Valley (including the Herkimer Home historic sites, Erie Canal, and Revolutionary Trail Scenic Byway) are completely screened by steep wooded hills. Views from the NYS Thruway are also blocked by these hills, as well as roadside rock cuts. Field review also confirmed that ground-level views within villages and hamlets were typically blocked by buildings and street/yard trees (see photos in Appendix C). Views from seven of the 10 scenic vistas identified in the Town of Stark Planning Reference Guide (Bonner and Lewis, 2000 p. 83) will also not be impacted by the proposed project (vistas A, B, and H will be affected). In the rural/agricultural portions of the study area, hedgerows and trees not indicated on the USGS maps blocked/interrupted views in many areas (see photos in Appendix D). However, field review confirmed that from many county and local roads, especially those in elevated, agricultural areas, significant portions of the project will be visible, often from foreground distances (<0.5 mile) and in multiple directions. Field review also confirmed project visibility from several locations at and near the Holy Trinity Russian Orthodox Monastery.

Analysis of Existing and Proposed Views

To illustrate anticipated visual changes associated with the proposed project, simulations and photographic renderings of the completed facilities from each of the 13 viewpoints indicated in Figure 9 were used to evaluate project visibility and appearance. Rating panel review of these images, along with photos of the existing view, allowed for comparison of the aesthetic character of each view with and without the proposed project in place. Results of this evaluation are presented below. Digital images of the simulations, including an animation from Viewpoint 39 showing the turbine rotors in motion, are included in Appendix E (see attached CD).

Viewpoint 12 (Figure 10)

Existing View

This viewpoint is from State Route 167 near the intersection of County Route 136, looking southwest. This viewpoint is approximately 1.6 miles from the nearest proposed turbine that would be visible in the view. It is located on a rolling plateau that occurs between the Mohawk Valley and to the north and the elevated project area to the south. The mix of open fields and forest, interspersed with widely scattered farms and rural residences, is typical of the rural/agricultural LSZ. The view is open and expansive, and dominated by the green and brown colors and fine texture of the existing vegetation. Foreground conifers block views into a midground valley. Hedgerows and woodlots in the view frame the agricultural fields and create strong horizontal lines in the landscape. This is reinforced by the strong horizontal ridgeline that blocks distant views to the background. Vertical features are primarily man-made objects, including a roadside monument, silos, and a

communication tower on the ridge. However, a repeating pattern of vertical lines is also seen in the tree trunks that are viewed against the sky on the ridgeline.

Proposed Project

With the proposed project in place, numerous turbines are visible on the background ridge. The turbines introduce strong new vertical elements to the view, and break the skyline. While rural character remains dominant, the turbines become strong focal points in the view. This is particularly true for the tightly clustered turbines on the left hand side of the view. However, their rhythmic spacing reflects the rolling character of the landform, and their color under these lighting conditions does not contrast strongly with the vegetation. Due to their distance from the viewers, the turbines' perceived scale contrast is modest, but their size tends to compress or reduce the scale of the view.

Viewpoint 15 (Figure 11)

Existing View

This viewpoint is from Cramers Corners Road adjacent to the Ohisa State Forest. This viewpoint is approximately 1.0 mile from the nearest proposed turbine that would be visible in the view. It is very close to Scenic View I identified in the Town of Stark Planning Reference Guide, but is oriented to the southwest instead of the north (the primary view to the Mohawk Valley). It is representative of open views that may be available at the edge of the state forest/forestland LSZ (as opposed to the well-screened views typical of the forest interior). The view features a curving gravel road in the foreground that carries the viewer's eye into a wooded valley in the midground. Foreground trees on either side of the road extend into the sky and create a sense of enclosure. An open background ridge creates a strong horizon line and blocks views of more distant background features. The character of the view is strongly rural/remote, with the road and a distant building being the only visible man-made features. The dark color of the land contrasts strongly with the overcast white sky.

Proposed Project

With the proposed project in place, two turbines are visible on the background ridge. The turbines break the skyline and appear large in size. Their vertical line contrasts with the strong horizontal ridge, and their modern, utilitarian form contrast with the remote, undeveloped character of the view. For these reasons the turbines may not be perceived positively by visitors to the state forest. However, impact is limited by the small number of turbines that are visible and their white color, which blends well with the sky. The overall rural character and strong horizontal ridgeline remain dominant features of the landscape.

Viewpoint 25 (Figure 12)

Existing View

This viewpoint is from State Route 80, south of the Hamlet of Van Hornesville, looking northwest. This viewpoint is approximately 1.3 miles from the nearest turbine that would be visible in the view. Although views of the project will not be available from Van Hornesville due to its location in a narrow valley, open, elevated views such as this are available from the roads that lead into the hamlet. As is typical in the area, open agricultural fields and rolling topography define the view. The character is strongly rural but the landscape has a managed, working feel. The strong green and brown color of the land contrast with the light blue and white of the sky, and a strong ridgeline defines the horizon and blocks background views. Man-made features include a barn and silo, overhead electric lines, and glimpses of a road in the foreground and background. The silo and utility poles create vertical

lines in landscape otherwise dominated by strong horizontal lines associated with field edges and the background ridge. The electric lines and roads angle and descend into the midground valley, reinforcing the undulating landform. This pattern is reflected in some of the field edges that angle into the valley and adds complexity to the view.

Proposed Project

With the project in place, several turbines can be seen rising above the background ridge. Some are almost fully exposed, while other (more distant) machines are significantly screened by trees on the ridge. At this distance, the turbines do not feel out of scale with their surroundings. Their vertical line and form are compatible with the overhead utility lines, and their white color minimizes contrast with the light sky. The spacing between the turbines makes them feel organized and spatially compatible with the patchwork of agricultural fields. Overall, the turbines feel appropriate in this working agricultural landscape, and in the opinion of one rating panel member, add interest to the view.

Viewpoint 27 (Figure 13)

Existing View

This viewpoint is from Summit Hill Road in Otsego County, looking northwest. This viewpoint is 3.8 miles from the nearest turbine that would be visible in this view. It is a classic rural landscape dominated by farms, fields, and livestock along a narrow country road. The light-colored farm structures are the dominant features in the view. The foreground is relatively level and open, allowing for expansive views to rolling wooded hills in the background. The undulating character of the land is reinforced by the road, which drops out of sight into a small midground valley. The horizon, field edges, and a line of built features (including round bales, a trailer, and farm buildings) create strong horizontal lines in the landscape. Vertical elements include midground silos, utility poles, and isolated trees.

Proposed Project

With the proposed project in place, numerous turbines can be seen on the wooded background ridge. They are fairly evenly spaced and follow the undulating horizontal line of the landform. At this distance, scale contrast is minimized, and the turbine's white color is compatible with the light-colored sky and built features in the view. The lightness of the turbines on the horizon and their slender form reduce their visual prominence. The rural character of the view is maintained, and the farm structures remain the dominant features (focal points) in the view. However, nighttime visibility may be significant due to the number of lighted turbines potentially visible from this vantage point.

Viewpoint 34 (Figure 14)

Existing View

This viewpoint is from U.S. Route 20 near the intersection of Ostrander Road in the Hamlet of Warren, looking northeast across Weaver Lake. It is 3.7 miles from the nearest turbine that would be visible in the view. Proximity to open water makes this a distinctive view along Route 20, and provides open, unobstructed visibility to wooded hills in the background. The water and associated marsh vegetation are the dominant, character-defining features in the view. They are flat in form and their interspersed creates several strong horizontal lines of blue and brown color in the foreground and midground. The tree line at the back edge of the marsh and the undulating horizon line further reinforce these strong horizontal lines. While the majority of the landscape appears

pristine and remote, a farm and open fields on the right hand side add a working agricultural component to the view.

Proposed Project

With the project in place, several turbines can be seen protruding above the background ridge. Some of these are largely exposed, while others are almost completely screened. Most of these turbines would be completely screened by background trees from the lower elevation of the water surface, and thus would not be seen by boaters on the lake. The turbines appear as distant features in the landscape, and as such, their scale contrast is minimal. Their white color, slender profile, and wide spacing, minimize contrast with the sky. Any contrast with land use is mitigated by the presence of the farm, which adds a working agricultural component to this view. The lake and marsh remain the strongly dominant features in the view.

Viewpoint 39 (Figure 15)

Existing View

This viewpoint is from the intersection of County Route 18 and State Route 116, looking northwest. This viewpoint is approximately 0.7 mile from the nearest turbine that would be visible in the view. This view is typical of those available within the project area. An open, recently harvested agricultural field dominates the foreground, while additional rolling fields, separated by hedgerows, extend to a background ridge. The alternating green and brown color of the vegetation and the harvest pattern of the field are the dominant features of the view. The flat to gently rolling ridge is topped by woodlots and hedgerows that block distant views. A curving road rises out of a small valley in the midground and crests background ridge. Overhead utility lines, a house, barn, and communication tower occur along the road. The communication tower is prominent against the sky, and appears out of place with its multiple microwave dishes. Consequently it tends to draw the viewer's eye and comprises the visual quality of the landscape.

Proposed Project

With the proposed project in place the character of the view is significantly changed. Turbines straddle both sides of the background ridge and extent across the entire view. Turbines beyond the ridge are screened to varying degree by the ridge, with some almost fully exposed and others showing only blade tips. Their form is in contrast with the landscape, and at this distance, the turbines appear large and out of scale with their surroundings. Their presence reduces the rolling character of the landform, and the open feel of the view. Lighting conditions illustrated in this photo create areas of bright white and strong shadow on the turbines, which contrast with the dull blue-gray sky. Even though the view maintains a rural character, the turbines now dominate the view and become more significant focal points than the communication tower.

Viewpoint 43 (Figure 16)

Existing View

This viewpoint is from State Route 167 near the Holy Trinity Russian Orthodox Monastery, looking northwest. This viewpoint is approximately 0.7 mile from the nearest turbine that would be visible in this view. An unharvested cornfield dominates the foreground view. The field has a distinct color and texture, and the sideways orientation of the leaves on the cornstalks imply movement in the wind. The foreground field gives way to a line of coniferous trees and buildings, including the Eastern Orthodox Church with its multiple gold leaf onion domes. The other buildings are a combination of agricultural and institutional structures that include a mix of architectural styles,

colors, and materials. The line of buildings and trees enclose the foreground view and completely screen any midground and background views. The buildings and open sky are the dominant features in this view. Outward views from the grounds of the monastery were generally well screened by trees and buildings. The most open view toward the project (indicated as Viewpoint 43-A) is included on Sheet 2 of Figure 16.

Proposed Project

With the proposed project in place, the upper portions of two turbines are visible above the line of trees and buildings. The turbines do not appear out of scale with the existing structures, and their form, texture, and color do not contrast significantly with most of the built features in this view. However, the turbines' modern form does contrast with the ornate architecture of the church, and suggests a landuse that is not compatible with a religious institution. Because they are only partially visible, the turbines feel awkward and compete with the church for viewer attention. As indicated in the simulation from Viewpoint 43-A, the turbines will appear larger and be less screened from open viewpoints within the monastery compound itself. However, Viewpoint, 43-A does not display the visual tension between the built form of the Monastery and the proposed turbines (as was the case in Viewpoint 43), and the foreground vegetation and upright nature of the utility poles and trees minimize the line, form, and scale contrast of the turbines. Although scale contrast is apparent in Viewpoint 43-A, the rhythm of the turbines along the ridgeline, their reduced height as they move into the background, and their light color, generally serve to minimize contrast with the landscape.

Viewpoint 46 (Figure 17)

Existing View

This viewpoint is from County Route 117 near Hicks Cemetery, looking northwest. This viewpoint is approximately 0.4 mile from the nearest turbine that would be visible in the view. Centrally located within the project area, this view includes rolling fields, woodlots, and hedgerows interspersed with houses and agricultural buildings. The hedgerows define multiple agricultural fields and the overall character is strongly rural. The view is open, but interrupted by sparse roadside trees and an overhead utility line. The angled road edge, utility line, and hedgerows carry the viewer's eye toward the structures in the left hand side of the view. However, the undulating landform is the dominant, character-defining feature of the view.

Proposed Project

With the project in place, one turbine occurs behind a foreground knoll and five others can be seen along the background ridge. Although they break the skyline, the more distant turbines appear in scale with their surroundings and echo the vertical pattern of the row of coniferous trees on the ridge crest. These conifers, as well as the roadside trees also partially screen these turbines. The closer turbine appears very large, and contrasts in form, texture, and scale with its surroundings. However, this contrast is lessened by its light color and partial screening provided by trees on the foreground knoll which settles the turbine in the view. The turbine's vertical line is also consistent with the roadside trees and utility pole, which reduce its scale contrast. The spacing of the turbines reduces their dominance in the landscape, and the view maintains its strong rural character. Although they change the character of the landscape somewhat, the turbines do not appear overly distracting or incompatible with the existing setting of the historic cemetery.

Viewpoint 70 (Figure 18)

Existing View

This viewpoint is from Jordanville Road (County Route 18) near the Hamlet of Jordanville, looking east. This viewpoint is 2.2 miles from the nearest turbine that would be visible in the view. Route 18 is the main east west thoroughfare through the project area. While visibility is limited in Jordanville itself, (located in the wooded midground valley) this viewpoint illustrates the type of open, expansive views that are available once one travels outside the hamlet into the surrounding countryside. In this classic rural view, open fields, woodlots, and scattered farms and homes stretch across the landscape. Elevated, open fields and the road dominate the foreground, while a band of trees and structures in a valley (Jordanville) dominate the midground. The roadway and adjacent utility lines draw the viewer's eye to a well-tended farm complex. The background is a patchwork of open fields and woodlots. The background ridge creates a strong horizontal line, but man-made features such as utility poles, silos, and communication towers add vertical elements to the landscape (some of which break the skyline).

Proposed Project

With the proposed project in place numerous turbines straddle the background ridge. Some of these are fully exposed, and some are significantly screened by the ridge. The number and density of turbines and the lack of any foreground screening result in a significant scale contrast. The turbines stretch across the full field of view and punctuate the skyline at various heights. However, their variable height reflects the undulating topography, and their contrast with the sky is limited due to their slender profile and light color. Their vertical line is also consistent with the utility lines. Although the turbines are distant, their broad expanse alters the rural character of the view. The foreground fields and the central farm complex remain the dominant elements, but the turbines have become focal points that attract the viewer's attention. Nighttime impacts could also be significant from viewpoints such as this, due to the number of unscreened turbines present in the view.

Viewpoint 71 (Figure 19)

Existing View

This viewpoint is from County Route 18 near the intersection of County Route 117, looking southeast. This viewpoint is 0.6 mile from the nearest turbine that would be visible in the view. This view is from the center of the project area, and is typical of the rolling rural landscape that borders Jordanville Road. In this expansive, open view, the road is a dominant foreground feature, along with adjacent agricultural fields. The road illustrates the rolling character of the foreground before disappearing into a midground valley. This drop-off is also indicated by a hedgerow that backs up the adjacent fields. Rolling hills that include areas dominated by open fields and hedgerows, as well as those dominated by deciduous forest, rise up out of the valley in the background. The background ridge, while undulating in places, is strongly horizontal. It is backed by a more distant ridgeline with more mountainous landform on the far right side of the view. An overhead utility line, and distant rooftops and silos, constitute the other significant man-made features in the view.

Proposed Project

With the proposed project in place, seven turbines are added to the view. These turbines appear to be in three separate groupings that roughly approximate to foreground, midground, and background distances. The spacing and separation of the turbines organizes the project and reflects the rolling lay of the land and the field and hedgerow pattern of the vegetation. Although the contrast in scale is significant, the turbines are fairly compatible in line, color, and form with other elements in the

landscape. The rural character of the landscape remains dominant and in the opinion of one rating panel member, the turbines add an element of interest to the view.

Viewpoint 72 (Figure 20)

Existing View

This viewpoint is from County Route 18 south of the County Route 203 intersection, looking northeast. This viewpoint is 0.3 mile from the nearest turbine that would be visible in the view. This medium scale view focuses on the foreground landscape, which includes the road edge, an open field, hedgerow and barn, backed by a wooded hill. The hill helps contain the view and blocks any views to midground or background features. The rich green color of the vegetation contrasts with the gray color of the road and the blue sky. The fields smooth texture contrasts with the rougher texture of the trees and brush on the hillside.

Proposed Project

With the proposed project in place, two turbines rise immediately behind the wooded hill. The base of both towers are significantly screened, which reduces scale impact and settles the turbines in the landscape. However, the turbines still appear very large and out of scale with their surroundings. This impact is limited by the small number of turbines present in the view and their light color, which minimizes contrast with the sky. The lack of visible background features makes this contrast more striking. However, the rural agricultural character of the landscape remains dominant and the turbines add visual interest to the view.

Panorama Simulation (Figure 21)

Many open, elevated sites within the visual study area will offer expansive views in multiple directions. This 360° panorama view from Jordanville Road is representative of this condition. The level landform, field edges, and tree lines all serve to create strong horizontal lines in the landscape, and the lack of foreground trees provide unobscured visibility in multiple directions. With the proposed project in place, views will be available in several directions. The open, rural character of the view is altered by the addition of the proposed turbines, and their contrast with the existing landform and vegetation in line, form, and scale, is significant. The view becomes more enclosed and the turbines begin to feel as if they are surrounding the viewer. However, in the opinion of one rating panel member, the varying heights of the turbines and their layering effect provides some consistency with the landform throughout the view.

Visual Impact Assessment Rating

An in-house panel of three registered landscape architects (LA) evaluated the visual impact of the proposed project, as described in the Methodology section of this report. Utilizing 11 x 17-inch digital color prints of 11 selected representative viewpoints, the rating panel members evaluated the before and after views, assigning each view quantitative visual contrast ratings on a scale of 1 (completely compatible) to 5 (strong contrast). Each panel member's ratings were averaged to get an overall score for each viewpoint, and these scores were then compiled to obtain a composite average for each viewpoint. Copies of the completed rating forms are included in Appendix F, and the results of this process are summarized in Table 1.

Table 1. Visual Contrast Rating

Viewpoint #	Individual Overall Scores ¹			Composite Score
	LA 1	LA 2	LA 3	
VP 12	3.50	2.75	2.38	2.88
VP 15	1.00	2.25	5.00	2.75
VP 25	1.00	2.25	2.25	1.83
VP 27	1.00	2.00	1.63	1.54
VP 34	1.00	2.00	1.30	1.43
VP 39	3.75	3.25	3.13	3.38
VP 43	1.75	2.00	4.00	2.58
VP 46	1.50	2.25	2.50	2.08
VP 70	3.25	2.75	4.25	3.42
VP 71	1.88	2.25	2.88	2.33
VP 72	3.13	2.75	1.63	2.50
Average	2.10	2.41	2.81	2.43

¹On a scale of 1 (completely compatible) to 5 (strong visual contrast).

As this table indicates, individual contrast ratings were highly variable, ranging from 1.0 (completely compatible) to 5.0 (strong visual contrast). Composite scores (i.e., the average of rating panel member's scores) ranged from 1.43 to 3.42, with nine of the 11 viewpoints (82%) having a composite score below the midpoint of 3.0 on the scale of 1 to 5. Scores in this range generally indicate a low to moderate level of visual contrast. The lowest contrast ratings (under 2.0) were received by Viewpoints 25, 27, and 34. Simulations/photo renderings from these viewpoints were characterized by turbines at midground and background distances set in a rural landscape. In Viewpoints 25 and 27, the turbines appear compatible with the working agricultural setting. In Viewpoint 34, distance and significant screening by trees reduces project visibility and visual impact. These conditions tend to decrease visual impact and/or contrast with the existing landscape.

The highest composite contrast ratings were received by Viewpoints 39 and 70. These were the only viewpoints that received composite ratings above the midpoint on the 1 to 5 scale. In the case of Viewpoint 39, impact related primarily to the turbines' proximity to the viewer, which heightened their contrast with the landscape, in terms of line, color, and especially scale. For Viewpoint 70, the impact related more to the expansiveness of the view and the large number of proposed turbines that will be visible. The number of turbines alters the perceived land use/rural character, and the lack of screening accentuates the turbines' scale contrast with the surrounding landscape.

It is interesting to note that Viewpoint 15 elicited very different reactions from individual rating panel members. This is reflected in the range of individual scores seen in Table 1 (1.0 to 5.0). In their comments on this photo rendering, one panel member indicated that addition of the turbines created strong contrast with all elements of the landscape and adversely affected views from the State Forest. However, the other panel members indicated relatively little impact, and felt that the rural character of the view remained intact. This variability was also seen (but to a lesser extent) with Viewpoint 43, where one panel member felt that the project presented strong contrast with land use and viewer activity at the Holy Trinity Monastery and degraded views to and from this site. The other panel members, while noting contrast in form and scale, felt the turbines appeared no more out of place, or less interesting, in this setting than the monastery itself. These comments largely reflect individual variability in perception/acceptance of the turbines. A generally positive viewer reaction to wind turbines, with some strong individual variability (based on viewer preference and/or landscape setting), has been observed by EDR on the currently operating projects in New York State (Madison, Fenner, and Maple Ridge). Similar results have been documented in public opinion surveys regarding constructed wind power projects in other locations (Bishop and Proctor, 1994; Gipe,

2003). Based on rating panel results, this reaction will likely also be seen on the Jordanville Wind Power Project.

Mixed reaction by the rating panel was also seen on the panorama simulation (Figure 21). While two panel members found the visual impact of this simulation to be significant, the third indicated the rural character of the view was only "minimally altered". The condition illustrated by this simulation, where numerous turbines are visible in multiple directions, generally elicits the most negative reaction from viewers. The feeling of being surrounded, in combination with foreground viewer distance, probably represents a worst case visual impact in terms of the project's contrast with the existing landscape. However, even in this instance the indication of limited adverse visual impact by one panel member indicates that this situation will not always be viewed as a negative.

The panel's review of the simulations, along with nighttime photos from the Fenner Wind Power Project (Figure 22), indicate that there will be nighttime visual impact from certain viewpoints. Although not as significant as white lights would be, the contrast of the red aviation warning lights with the night sky is strong in most dark, rural settings. Viewer attention is drawn by the flashing of the lights, and any positive reaction wind turbine engender (due to their graceful form, association with clean energy, etc.) is minimized at night. While perhaps not disturbing (or even strongly perceptible) from roads and other public viewpoints, turbine lighting may be perceived negatively by area residents who view these lights from their homes and yards.

CONCLUSIONS

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

1. Viewshed, mapping, cross section analysis, and field verification indicate that the project will be visible from many roads and residences with the area, especially those in elevated, open agricultural settings within the project area (e.g., along County Route 18). Areas generally screened by vegetation, structures, and/or topography include the Mohawk River corridor, valley areas around Springfield, Center and East Springfield, the backsides of hills, narrow valleys and gorges, and the interior portions of hamlets and villages. Almost all of the sensitive resources between 5 and 8 miles from the turbines will be screened from view, except Otsego Lake and Canadarago Lake. Significant visual effects of wind power projects are generally concentrated within 3.5 miles (6 kilometers) of the project site. (Eyre, 1995). EDR's observations on existing wind power projects (Madison, Fenner, and Maple Ridge Wind Power Projects) indicate that under favorable conditions, views of the wind turbines will be available from certain viewpoints well over 10 miles from the project site. However, visual impact at these distances is typically minimal.
2. Some visually sensitive resources and areas of intense land use will be impacted by the project. These include the Holy Trinity Russian Orthodox Monastery, portions of several hamlets (primarily the outskirts and upper stories of some buildings), and several heavily traveled roadways that traverse the study area (e.g., State Route 167 and County Route 18). At other sites, including most of the Register-listed historic sites/districts, the Hamlet of Van Hornesville, the Village of Richfield Springs, Ohisa State Forest, Glimmerglass State Park, the Erie Canal, the Military Trail Scenic Byway, Otsego Lake, and other area waterbodies, the project will either not be visible, will be significantly screened by foreground vegetation and structures, or will be distant enough that visual impacts should be insignificant.
3. Photo renderings and simulations of the proposed project and EDR's experience with existing wind power project in New York, indicate that the visibility and visual impact of the wind turbines will be highly variable, based on landscape setting, extent of natural screening, presence of other man-made features in the view, viewer sensitivity, and distance of the viewer from the

project. Views where numerous turbines are visible at foreground distances (as illustrated in the panorama simulation in Figure 21) probably represent the worst case project visual impact.

4. Evaluation by the in-house panel of landscape architects indicated that the project's overall contrast with the visual/aesthetic character of the area will generally be low to moderate. However, based on the panel's scoring and comments, this may not be the case where the turbines are in close proximity to the viewer, extend across a broad expanse of landscape, can be seen in multiple directions, or appear out of character with existing land use. Based on the panel's evaluation, and public reaction to existing wind power projects, public reaction to the proposed project is likely to be generally positive, but highly variable based on the viewer's proximity to the turbines, activities in which they are engaged, and personal attitude of the viewer regarding wind power. As Stanton (1996) notes, although a wind power project is a man-made facility, what it represents "may be seen as a positive addition" to the landscape.
5. Based upon nighttime photos/observations of existing wind power projects, the panel felt that the red flashing lights on the proposed turbines have the potential to create a significant nighttime effect. The significance of this impact depends on how many turbines are visible, what other sources of lighting are present in the view, the extent of screening provided by buildings and trees, and nighttime viewer activity/sensitivity. However, it was felt that night lighting could be distracting and have a significant adverse impact on rural residents that currently experience dark nighttime skies. It should be noted that nighttime visibility/visual impact would be reduced on this project due to 1) new FAA guidelines that result in fewer aviation warning lights than required on earlier projects and 2) the concentration of residences in villages, hamlets, and along highways where existing lights already compromise dark skies and compete for the viewer's attention. The panel members also felt that the new FAA guidelines requiring synchronization of flashing lights would likely reduce visual impact.
6. Mitigation options are limited, given the nature of the project and its siting criteria (high elevation, open fields). However, in accordance with DEC Program Policy, (NYSDEC, 2000) various mitigation measures were considered. These included the following:
 - A. Screening. Due to the height of individual turbines and the geographic extent of the proposed project, screening with earthen berms, fences, or planted vegetation will not be effective in reducing project visibility or visual impact. However, if adequate natural screening of the proposed substation site is lacking, a planting plan should be developed and implemented to minimize visibility and visual impact associated with this component of the project.
 - B. Relocation. Again, because of the extent of the project, the number of individual turbines, and the large number of viewpoints from which the project can be seen, turbine relocation will generally not significantly alter visual impact of a wind power project.
 - C. Camouflage. The white or off-white color of wind turbines generally blends well with the sky under most conditions. Consequently it is recommended that this color be utilized on the Jordanville project. The size and movement of the turbines prevents more extensive camouflage from being a viable mitigation alternative (i.e., they cannot be made to look like anything else). Neilson (1996) notes that efforts to camouflage or hide wind farms generally fail, while Stanton (1996) feels that such efforts are inappropriate. She believes that wind turbine siting "is about honestly portraying a form in direct relation to its function and our culture; by compromising this relationship, a negative image of attempted camouflage can occur."

- D. **Low Profile.** A significant reduction in turbine height is not possible without significantly decreasing power generation. To off-set this decrease, additional turbines would be necessary. There is not adequate land under lease to accommodate additional turbines, and a higher number of shorter turbines would not necessarily decrease project visual impact. In fact, several studies have concluded that people tend to prefer fewer larger turbines to a greater number of smaller ones (Thayer and Freeman, 1987; van de Wardt and Staats, 1988). The visual impact of the electrical collection system is being minimized by placing the lines underground rather than on overhead poles.
- E. **Downsizing.** Reducing the number of turbines could reduce visual impact from certain viewpoints, but from most locations within the study area, unless this reduction were drastic, the visual impact of the project would change only marginally.
- F. **Alternate Technologies.** Alternate technologies for power generation would have different, and perhaps more significant, visual impacts than wind power. Alternative utility-scale wind power technologies, that would significantly reduce visual impacts, do not currently exist.
- G. **Nonspecular Materials.** Non reflective (matte) paints and finishes will be used on the wind turbines. Galvanized substation components will rapidly weather to a non-reflective gray color. Overhead transmission lines will utilize wood pole structures similar to those typically seen in rural agricultural landscapes.
- H. **Lighting.** Turbine lighting will be kept to the minimum allowable by the FAA. New FAA guidelines (FAA, 2005) do not require daytime lighting, and allow nighttime lighting of perimeter turbines only at a maximum of 0.5 mile spacing. Medium or low intensity pulsing red lights should be used at night, rather than white or red strobes or steady burning red lights. Upwardly directed lighting fixtures should be utilized to minimize nighttime visual impacts on nearby residents. Lighting at support facilities, such as the substation, should be kept to a minimum, and should be turned on only as needed, either by switch or motion detector.
- I. **Maintenance.** The turbines and turbine sites will be maintained to ensure that they are clean, attractive, and operating efficiently. Research and antidotal reports indicate that viewers find wind turbines more appealing when the rotors are turning (Stanton, 1996). In addition, the project developer will establish a decommissioning fund to ensure that if the project goes out of service and is not repowered/redeveloped, all visible above-ground components will be removed.
- J. **Offsets.** Correction of an existing aesthetic within the viewshed is a viable mitigation strategy for wind power projects that result in significant adverse visual impact. However, results of this VIA do not suggest that such mitigation measures are warranted for the Jordanville Wind Power Project.

In addition to the mitigation measures described above, other measures that will reduce or mitigate visual impact have been incorporated into the project design. These include the following:

- New road construction will be minimized by utilizing existing farm lanes whenever possible. Access road width will be narrowed at the completion of construction to maintain the appearance of farm lanes.
- Improvements to public roads requiring the removal of trees will be minimized to the extent practicable.

- Compliance with all required set-backs from roads and residences.
- All turbines will have uniform design, speed, color, height and rotor diameter.
- Towers will include no exterior ladders or catwalks.
- The project operations and maintenance building (although not yet designed) will reflect the vernacular architecture of the area (i.e., resemble an agricultural structure).
- Prohibiting the placement of any advertising devices on the turbines.
- Providing a parking/viewing location, with an informational kiosk to enhance public understanding and appreciation of the project. Stanton (1996) believes that accessibility to a wind farm can positively affect how the public perceives the project.

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Figures

Appendix A

Wind Power Project Components

Appendix B

NYSDEC Visual Policy

Appendix C

Photo Log – See Enclosed CD

Appendix D

Field Notes – See Enclosed CD

Appendix E

Digital Simulations – See Enclosed CD

Appendix F

Visual Impact Assessment Rating Forms – See Enclosed CD