DOE/EA-2004

DRAFT
ENVIRONMENTAL ASSESSMENT

FOR

THE SENECA NATION
WIND TURBINE PROJECT

CATTARAUGUS TERRITORY
ERIE COUNTY, NEW YORK

Jointly prepared by the
U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
and the
Seneca Nation

AUGUST 2015

ACRONYMS AND ABBREVIATIONS

BGEPA	*Bald and Golden Eagle Protection Act*
BMP	best management practice
BPU	Salamanca BPU
CFR	*Code of Federal Regulations*
CEQ	Council on Environmental Quality
CRIS	New York State Cultural Resources Identification System
dBA	decibel on an A-weighted scale, used to approximate the human ear's response to sound
DNL	Day Night Average Sound Level
DOE	U.S. Department of Energy
EMF	electromagnetic field
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
FR	*Federal Register*
I-90	Interstate 90
MBTA	*Migratory Bird Treaty Act*
National Grid	National Grid Utility Company
NEPA	*National Environmental Policy Act*
NRHP	*National Register of Historic Places*
NY 5	New York State Highway 5
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
OSHA	Occupational Safety and Health Administration
SNI	Seneca Nation
SNIFWD	Seneca Nation Fish and Wildlife Department
SHPO	State Historic Preservation Office
THPO	Tribal Historic Preservation Officer
U.S.C.	*United States Code*
USFWS	U.S. Fish and Wildlife Service

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1 INTRODUCTION

1.1 National Environmental Policy Act and Related Procedures

The National Environmental Policy Act (42 U.S.C. § 4321 et seq.; NEPA), the Council on Environmental Quality (CEQ) NEPA regulations [40 Code of Federal Regulation (CFR) Parts 1500 to 1508], and the U.S. Department of Energy's (DOE's) NEPA implementing regulations (10 CFR Part 1021) require that DOE consider the potential environmental impacts of a Proposed Action before making a decision about federal actions that could have environmental effects. This requirement applies to decisions about whether to provide financial assistance to state and Native American governments as well as private entities.

In compliance with these regulations and DOE's procedures, this *Environmental Assessment for the Seneca Nation Wind Turbine Project* (DOE/EA-2004) (Wind Turbine EA):

- Examines the potential environmental impacts of the Proposed Action and the No-Action Alternative;
- Identifies unavoidable adverse environmental impacts of the Proposed Action;
- Describes the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity;
- Characterizes any irreversible and irretrievable commitments of resources that would be involved should DOE decide to implement its Proposed Action; and
- Analyzes past, present, and reasonably foreseeable actions to evaluate potential cumulative impacts.

This EA provides DOE and other decision-makers with information needed to make an informed decision about the proposed Seneca Nation (SNI) Wind Turbine Project, including an evaluation of the potential direct, indirect, and cumulative impacts of the proposed project during construction, operation and maintenance, and decommissioning. This EA also evaluates the impacts that could occur if DOE were not to provide funding (the No-Action Alternative), in which case DOE assumes SNI would not proceed with the Wind Turbine Project. The provision of financial assistance for the proposed project is conditional upon completion of the NEPA process and a final decision by the DOE.

DOE recognizes the sovereign nature of Native American governments and lands, specifically SNI and the Cattaraugus Territory, in defining and regulating the environmental resources associated with proposed actions on SNI lands. As such, SNI regulatory agencies and processes comprise the main consultation efforts associated with this project and are entirely consistent with other federal regulatory requirements for protection of the environment. Where applicable, federal environmental protection requirements are discussed as points of reference related to SNI regulatory requirements.

1.2 Background

In 2003, SNI and the DOE embarked on the development of a strategic energy plan that would allow SNI to comprehensively address energy-related issues on the SNI lands. SNI defined its vision for energy self-sufficiency and development, quantified its energy needs, and identified renewable and nonrenewable resource opportunities and energy options. As part of this effort, SNI installed meteorological towers to assess the available wind resource potential for wind-generated energy (i.e., a wind turbine) on various areas of land. The installation near Lake Erie revealed a substantial resource for community-scale turbine installation.

SNI is composed of two primary Territories (Cattaraugus and Allegany): The primary goal of this project is to create electrical utility rate cost equivalency between these Territories. Cattaraugus Territory electricity is supplied through National Grid Utility Company (National Grid) and the Allegany Territory is supplied through the Salamanca BPU (BPU). Allegany residents are afforded less expensive electricity rates due to a municipal hydro-allocation received through the BPU. The electricity generated by the wind turbine will reduce rates for Cattaraugus residents and equalize rates between the two Territories.

DOE's Tribal Energy Program under the Office of Energy Efficiency and Renewable Energy Weatherization and Intergovernmental Program promotes energy sufficiency and fosters economic development and employment on Native American lands through the use of renewable energy and energy efficiency technologies. Through competitive grants, the Tribal Energy Program helps Native American Nations develop renewable energy resources and reduce energy consumption. The SNI Wind Turbine Project was competitively selected under the Tribal Energy Program's fiscal year 2013 funding opportunity announcement "Community-Scale Clean Energy Projects in Indian Country" (DE-FOA-0000852).

1.3 Purpose and Need

The adoption of clean energy technologies can help the nation reduce its greenhouse gas emissions, diversify its energy supply, provide cost-competitive electricity to underserved areas, and stimulate economic revitalization of key sectors of the economy. In order for the nation to realize these benefits, deployment of clean energy technologies must be increased. Through the Community-Scale Clean Energy Projects in Indian Country FOA, DOE is providing support for the installation of "community-scale" or "facility-scale" clean energy systems on Indian lands to provide electricity and/or heating and cooling for local use in tribal buildings. The purpose of the Community-Scale Clean Energy Projects is to increase energy security and reduce energy costs while spurring increased renewable and clean energy deployment on Indian lands. A recently completed analysis by the National Renewable Energy Laboratory shows that tribal renewable energy resources comprise approximately 5 percent of all U.S. renewable energy resources, with potential installed capacity of more than 9 million megawatts. The current estimate is that there is only approximately 125 megawatts of renewable energy currently installed on Indian lands.

With regard to energy costs, currently SNI uses approximately10.5 million kilowatt-hours per year in its tribal administrative and government services buildings. SNI currently pays about $1 million dollars annually for electricity service to those buildings. National Grid allows for up to 2 megawatts for net metering of renewable generation. With the proposed deployment of the wind

turbine, the expected credit from National Grid for aggregated net metering is expected to be 8 cents per kilowatt-hour on at least 5 million kilowatt-hours of generation. Therefore, the expected revenue/savings generated from this proposed project is approximately $400,000 per year, which represents at least a 40 percent savings in electric energy costs to SNI and will allow electrical utility rates to be equalized between the two primary SNI Territories.

1.4 Public Involvement and Agency Consultation

1.4.1 SCOPING SUMMARY

The scoping process refers to an early and open process undertaken by a lead agency to determine the scope of issues to be addressed and to identify the significant issues related to the Proposed Action. On January 15, 2015, DOE mailed letters to SNI, state, and federal agencies (listed below) announcing its intent to produce this SNI Wind Turbine EA and to solicit comments on the scope of the EA during the 15-day public comment period. A Notice of Scoping was posted in the January 15, 2015 *Seneca Nation of Indians Newsletter*, and DOE sent a Notice of Scoping postcard on January 15, 2015 to SNI members and residents of the Cattaraugus Territory, directing them to the DOE Golden Field Office Public Reading Room Website (http://energy.gov/eere/golden-reading-room-environmental-assessments) to review the scoping letter. Copies of these public scoping documents are included in Appendix A.

The public scoping comment period closed on February 4, 2015. During the scoping period, DOE received three comment documents from the following entities: U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and a member of the public. The comments received during scoping are also included in Appendix A.

1.4.2 PUBLIC AGENCY COORDINATION

The DOE and/or SNI have contacted the following agencies and organizations regarding the wind turbine project (Agency correspondence can be found in Appendix B):

- SNI Tribal Historic Preservation Officer (THPO)
- SNI Fish and Wildlife Department
- SNI Environmental Protection Department
- U.S. Fish and Wildlife Service (USFWS)
- U.S. Environmental Protection Agency Region 2
- Federal Aviation Administration's (FAA's) Eastern Region Airports Division
- Department of Commerce's National Information Telecommunications Administration's Office of Spectrum Management

Pursuant to Section 106 of the *National Historic Preservation Act of 1966* (16 U.S.C. § 470f; 36 CFR Part 800), DOE provided information to the SNI THPO describing the proposed project and requested input regarding historic or cultural resources in the area that might be affected by the proposed project. Additional information regarding this consultation is provided in Section 3.3.4 of this EA.

Secretarial Order 3206 issued by the Secretaries of the Interior and Commerce addresses American Indian tribal rights, federal-tribal trust responsibilities, and the Endangered Species Act (Secretarial Order 3206, 1997). The Order recognizes the tribal sovereignty over the management of Indian lands and tribal trust resources and tribal conservation and management plans for tribal lands and the conservation of listed species. The SNI Environmental Protection Department (SNIEPD), with support of the SNI Fish and Wildlife Department (SNIFWD), is responsible for the protection of the natural environment on the Seneca territories and the restoration and improvement of environmental quality (https://sni.org/departments/environmental-protection/). In addition, pursuant to Section 7 (a)(2) of the *Endangered Species Act*, DOE submitted a letter to the USFWS initiating consultation on potential endangered, threatened, or species of special concern at or near the project site. On July 24, 2015 the USFWS concurred with DOE's finding of "may affect, but not likely to adversely affect" for the northern long-eared bat (Appendix B). For information regarding the northern long-eared bat and conservation measures, see Sections 3.3.3.1.4, 3.3.3.2.3, and 3.4 of this EA.

In January 2015, SNI filed a "Notice of Proposed Construction or Alteration – Off Airport" with the FAA. The FAA subsequently conducted an aeronautical study of the proposed project and opened a public comment period that closed on May 27, 2015. Based on the aeronautical study and public comments, the FAA issued a "Determination of No Hazard to Air Navigation" for the SNI Wind Turbine Project on June 9, 2015 (Appendix B). Additional information is provided in Section 3.3.6.2.7.

1.4.3 DRAFT ENVIRONMENTAL ASSESSMENT

DOE has published a Notice of Availability of the Draft EA for a 30-day public review from the date of publication. DOE will accept comments on this Draft EA by mail, facsimile, or e-mail. The Draft EA is available for review at the DOE Electronic Public Reading Room at: http://www.energy.gov/node/1143511. Public comments on the NEPA process, proposed action and alternatives, and environmental issues will be accepted until September 16, 2015. Comments may be submitted by letter to the attention of Mr. Casey Strickland, U.S. Department of Energy, Golden Field Office, 15013 Denver West Parkway, Golden, CO 80401, by e-mail to gonepa@ee.doe.gov, or by fax to (240) 562-1640. DOE will consider all comments, to the extent practicable, received by, or that are postmarked by, the close of the comment period in the preparation of the Final EA.

2 PROPOSED ACTION AND ALTERNATIVES

2.1 DOE'S Proposed Action

DOE's Proposed Action is to authorize the expenditure of $1.5 million in federal funding for SNI to design, procure, and install an access road, substation equipment, transmission cables, and up to a 2.0 megawatt wind turbine on SNI-owned sovereign lands in the Cattaraugus Territory, Erie County, New York.

2.2 SNI'S Proposed Project

SNI's proposed project is the construction, operation and maintenance, and eventual decommissioning of a single wind turbine of up to 2.0 megawatts on SNI-owned sovereign land located northeast of Lucky Layne, within the western portion of the Cattaraugus Territory, Erie County, New York. Examples of the type of wind turbine being considered by SNI include the GE 103 1.7 megwatt and the Vestas V100 1.8/2.0 megawatt models. The proposed project includes the construction of a gravel access road, temporary crane pad, turbine foundation, and installation of transmission equipment and cables. The current estimated project cost is $6 million. The project would reduce electrical demands on the existing electricity service provider from the existing SNI administrative buildings and be credited back to the Cattaraugus Territory residents and electricity users. The project would also equalize rates among SNI territories. SNI holds title to five distinct and noncontiguous territories located in western New York, an area of the state where communities primarily are rural in geographic location and are considerable distances from the services and amenities available in urban locales. Once installed, the turbine is anticipated to produce approximately 5,000 megawatt-hours of electrical power annually.

Regardless of which wind turbine model is selected, it would have a maximum rotor diameter of approximately 330 feet and would connect at its hub (midpoint) to an approximately 265-foot-tall tower (maximum). The total maximum height of the wind turbine from the bottom of the tower to the blade tip at its highest point is expected to be approximately 430 feet.

The proposed project would be located on approximately 1.5 acres of SNI-owned sovereign land in the Cattaraugus Territory. The project site lies approximately 630 feet northeast of Lucky Layne Road, is immediately east of New York State Route (NY) 5 and west of existing railroad tracks. Lake Erie is located approximately 1.5 miles west of the project site. In order to minimize potential environmental impacts, best management practices (BMP), as identified in Section 3.4, will be implemented during construction, operation, and maintenance. Figure 2-1 shows the location of the proposed project.

2.2.1 CONSTRUCTION AND INSTALLATION

SNI proposes to install a community wind turbine with a maximum hub height of approximately 265 feet, maximum rotor diameter of approximately 330 feet, and an overall maximum height of approximately 430 feet on the site. The turbine would be constructed on a 15,780 square-foot foundation. The staging area is currently proposed to be 200 feet by 250 feet; the crane pad, 80 feet by 160 feet; and the crane assist area, 60 feet by 30 feet (Figure 2-2). Land clearing would occur on approximately 1.0 acre or less of the overall 1.5-acre site.

Figure 2-1. Location of the Proposed Project

2.2.2 OPERATION AND MAINTENANCE

The wind turbine would be operated and maintained according to standard industry procedures and applicable requirements. All workers associated with turbine maintenance and operation would be properly trained and informed about wind facility safety. Routine maintenance of the turbine would be necessary to maximize performance and identify potential problems or maintenance issues. The turbine would be monitored through the use of a supervisory control and data acquisition system (to be installed) to ensure efficient operations. Any problems would be reported electronically to operation and maintenance personnel, who would perform both routine maintenance and most major repairs. Most servicing would be performed up-tower by a maintenance crew who would not need to use a crane to remove the turbine from the tower. In addition, all roads, pads, and trenched areas would be regularly inspected and maintained to minimize erosion. Under normal operations, cut-in speeds (the minimum wind speed at which the wind turbine will generate usable power) are approximately 7 to 10 miles per hour.

2.2.3 DECOMMISSIONING

The turbine and other infrastructure are expected to have a useful service life of 20 to 25 years. The trend in the wind energy industry has been to "repower" older wind energy projects by upgrading equipment with more efficient turbines, thereby extending a project's useful life beyond 20 years. Upon reaching the expected operational life of the wind turbine, SNI would determine the appropriate course of action. Among them would be retooling the generator and additional parts in an effort to continue its operation until the entire turbine needs to be replaced. At that time, SNI would determine if the turbine would be replaced based on then-current-day technologies.

Activities associated with the decommissioning of the project are expected to be similar to the initial construction. If an upgrade is not considered, the turbine and other infrastructure would be decommissioned through DOE's financial assistance regulations if applicable, and all facilities would be removed to a depth of approximately 3 feet below grade. The surface soil would be restored as close as possible to its original condition. Underground facilities would either be removed or safely secured and left in place. Salvageable items (including fluids) would be sold, reused, or recycled as appropriate; unsalvageable material would be disposed of at authorized sites. Reclamation procedures would be based on site-specific requirements commonly employed at the time the area is to be reclaimed and could include re-grading and adding topsoil to facilitate a return to existing conditions. All decommissioning activities would be performed in accordance with the selected manufacturer's guidelines and a SNI decommissioning plan that incorporates BMPs (see Section 3.4) that are appropriate and applicable at the time of decommissioning.

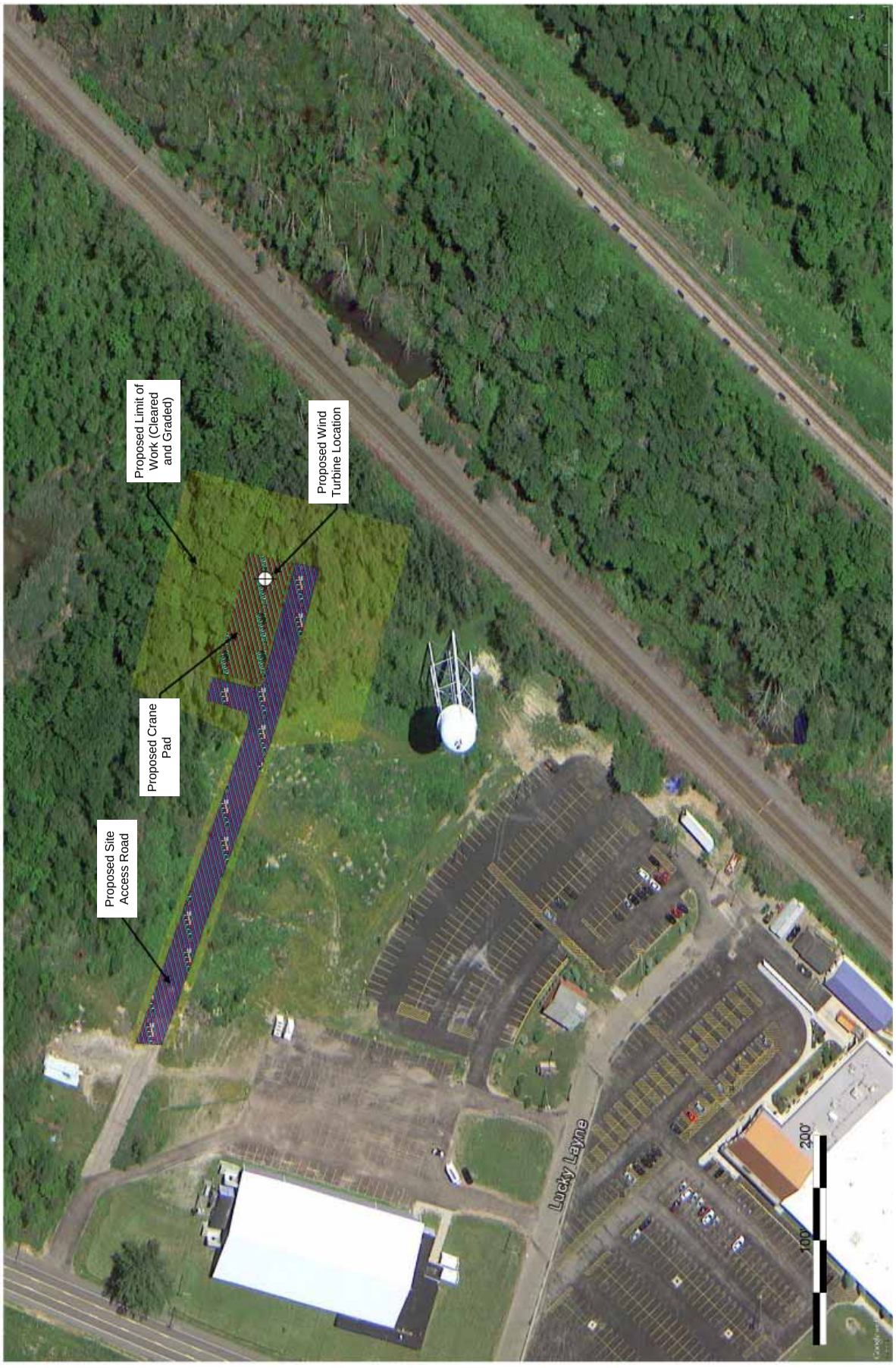

Figure 2-2. Preliminary Site Layout Plan for the Proposed Wind Turbine

2.3 No-Action Alternative

An evaluation of a No-Action Alternative is required under the CEQ regulations at 40 CFR 1502.14(d) and the DOE NEPA implementing regulations at 10 CFR 1021.321(c). Under the No-Action Alternative, DOE would not authorize expenditure of federal funds for the proposed project, and SNI would not design, construct, or operate the Wind Turbine Project. DOE has assumed, for the purposes of comparison in this EA, the project would not proceed without its assistance. If the project proceeded without DOE assistance, the potential impacts essentially would be identical to those under the DOE Proposed Action.

2.4 Alternative Sites Considered but Eliminated from Further Study

SNI evaluated two other sites for the project (herein referred to as Alternative Project Site 1 and Alternative Project Site 2) near the proposed project site on SNI-owned sovereign lands (Figure 2-3). These alternative sites were considered due to their potential to maximize the wind resources, but the proposed site was chosen because environmental screening showed this site to have the lowest potential for impacts and fewest constructability concerns when compared with the other two sites.

Alternative Project Site 1 is located near the intersection of Snows Marina Road and Nation Beach Road in the Cattaraugus Territory, approximately 1.5 miles southwest of the proposed project site. The alternative site is near the outlet of the Cattaraugus Creek and the eastern shore of Lake Erie. The SNI land in this general area includes a public beach (approximately 0.5 mile away), consisting of approximately half a mile of lakefront. There are mature trees approximately 100 yards from the Lake Erie waterline and an unimproved roadway leading to the beach. This site is surrounded by Cattaraugus Creek and the Village of Silver Creek to the south, agricultural fields to the east, Lake Erie to the west, and summer rental cottages to the north. The area presents high wind potential from winds generated by the lake effect. However, this alternative site was constrained by its proximity to the lake and its potential environmental and constructability issues including visual and recreation resources, proximity to known Blanding's Turtle nesting areas, higher potential for bird concentrations due to proximity to water, and lack of electrical system tie-in infrastructure (increases costs).

Alternative Project Site 2 is located farther inland, adjacent (north) to Sulphur Springs Road, approximately 0.75 mile north of the intersection of NY 438 and Sulphur Springs Road, and 5 miles east of Lake Erie. This site is adjacent to an agricultural field to the east and is surrounded on the other sides by mature trees in dense forest. Although wind resources are present at this alternative site, it was considered a lower potential than the other alternative and the proposed site due to the greater distance from the wind coming off Lake Erie. Additionally, constructability issues associated with having to clear more land for construction and lack of access to electrical tie-in infrastructure would incur additional costs for the development of the site.

Figure 2-3. Alternative Sites Eliminated from Further Study

3 AFFECTED ENVIRONMENT AND IMPACTS

This section discusses the existing environmental, social, cultural, and economic conditions in the project area and the potential impacts to these conditions from the Proposed Action. The discussion begins with consequences of the No-Action Alternative, a brief description of environmental resource areas not evaluated for potential impacts, and analysis of those environmental resources that could potentially be impacted from the Proposed Action.

3.1 Environmental Consequence of the No-Action Alternative

Under the No-Action Alternative, DOE would not authorize SNI to use federal funds for its proposed project, and the proposed project would not proceed. There would be no direct, indirect, or cumulative impacts to the environment and resources discussed in this EA. There would continue to be fossil fuel-generated public utility energy pollutant emissions from current and future SNI energy use, and potential benefits from using a renewable energy technology would not be realized. Based upon current energy technology and usage, the continued annual pollutant emissions realized under the No-Action Alternative would equal 3,440,000 pounds of carbon dioxide, 36,821 milligrams of mercury vapor, 64,000 pounds of sulfur dioxide, and 6,800 pounds of nitrogen dioxide.

3.2 Environmental Resources Evaluated and Dismissed from Detailed Analysis

Consistent with NEPA implementing regulations and guidance, DOE focused the analysis in this EA on topics with the greatest potential for environmental impacts [known as the sliding-scale approach (40 CFR 1502.2(b)]. Table 3-1 presents DOE's evaluations of the environmental resource areas on which SNI's proposed project is not expected to have any measurable effects. These resource areas were not carried forward for detailed analysis.

Table 3-1. Resources Not Carried Forward for Detailed Analysis

Resource Area	Not Present	No Potential for Impact	Low Potential for Impact	Considerations
Geology and Soils		X		• Niagara Silt Loam soil classification – non-hydric • Not a U.S. Geological Survey earthquake hazard • 1 to 1.5 acres of site clearing (or less) • BMPs for soil erosion would be implemented
Hazardous Materials/Hazardous Waste			X	• Regulated materials would be stored, used, and disposed of according to applicable regulations • No process waste streams generated during operations
Solid Waste Management		X		• No solid waste would be generated during operations • Waste generated during construction, and decommissioning would be recycled and properly disposed of
Floodplains			X	• The project would be located in a Federal Emergency Management Agency Zone C Area (i.e., minimal flood hazard)

3.3 Environmental Resources Carried Forward for Analysis

This section of the EA analyzes in detail the potential environmental impacts of the Proposed Action on the following resource areas:

- Air Quality and Climate Change
- Aesthetics and Visual Resources
- Biological Resources
- Cultural and Historic Resources
- Wet Areas/Wetlands
- Health and Safety
- Land Use
- Noise
- Socioeconomics and Environmental Justice
- Transportation
- Utilities and Energy
- Intentional Destructive Acts

3.3.1 AIR QUALITY AND CLIMATE CHANGE

The air quality and climate change resource area is concerned with possible impacts on the ambient air quality from the Proposed Action. Also of consideration is the release of any potential pollutants (e.g., greenhouse gases) that could contribute to long-term climate change.

3.3.1.1 Affected Environment

The project site is located within western New York State and characterized by a humid continental climate. The climate in the area is affected by three merging air masses—one from the north providing masses of cold, dry air, and one from the south and southwest transporting warm, humid air from the Gulf of Mexico and adjacent subtropical waters. The third air mass flows inland from the Atlantic Ocean, producing cool, cloudy, and damp weather conditions. Local weather conditions are highly influenced by Lake Erie.

In 2006, U.S. Environmental Protection Agency (EPA) established the National Ambient Air Quality Standards for criteria pollutants. Ambient air levels in the area are characterized by the concentrations of the criteria pollutants including carbon monoxide, sulfur dioxide, particulate matter, nitrogen dioxide, ozone, and lead. No air monitors are located within the Cattaraugus Territory; however, based on the nearest ambient air monitoring station located downwind of the Territory in Buffalo, the Cattaraugus Territory is in attainment for all local criteria pollutants. Further, there are no permitted facilities and/or known point sources of emissions in the Cattaraugus Territory. Thus, the EPA Region 2 has designated the Territory “in attainment” with the National Standards.

On December 18, 2014, the CEQ released revised draft guidance on how federal agencies should consider the effects of greenhouse gas emissions and climate change during NEPA reviews (CEQ 2014). The guidance explains that agencies should consider both the potential effects of a proposed action on climate change, as indicated by its greenhouse gas emissions, and the

implications of climate change for the environmental effects of a proposed action. This EA includes discussion of the potential greenhouse gas impacts of the proposed project.

3.3.1.2 Environmental Impacts

During construction, vegetation clearing, grading for the turbine foundation and extension of the access road, and burial of cable lines would generate small amounts of dust and mobile-source air emissions from diesel-powered construction vehicles and equipment such as skid steer loaders, front end loaders, telehandlers, and crane equipment. Similarly, the hauling of wind turbine components would also temporarily generate mobile-source air emissions. These emissions would occur during a 12-month construction period. Emissions would be minimized to the extent practicable and would incorporate BMPs as presented in Section 3.4.

The project would create a small increase in the amount of land committed to industrial use. However, the operation of the wind turbine would not generate emissions or criteria pollutants nor degrade air quality. The project would displace the use of fossil fuel resources and would result in a source of renewable energy for SNI. During operation and maintenance, the project is expected to generate one vehicle trip per hour, resulting in nominal air emissions. No odors would be produced as part of project operations. As such air emissions from the project would be minimal.

On average, the wind turbine is anticipated to generate approximately 5,000 megawatt-hours annually of electricity, displacing 5,000 megawatt-hours of nuclear and fossil fuel sources of energy that SNI currently receives. Based on the electricity generation mix in New York State, this translates in a reduction of 3.4 million pounds of carbon dioxide, 64,000 pounds of sulfur dioxide, and 6,800 pounds of nitrogen dioxide annually. Over its expected lifetime of 20 to 25 years, the project would result in a reduction of 86 million pounds of carbon dioxide, 1.6 million pounds of sulfur dioxide, and 170,000 pounds of nitrogen dioxide. The project would also result in a reduction of mercury vapor.

3.3.2 AESTHETICS AND VISUAL RESOURCES

This section of the EA discusses the project's potential impacts on aesthetics, including scenic resources, shadows and flicker, and visual resources as regards public and private views.

3.3.2.1 Affected Environment

Visual resources include the physical (natural and manmade) and biological features of the landscape that contribute to the visual character or scenic quality of an area. Scenic quality is a measure of the visual appeal of the landscape, which is subjective and varies among viewers.

The project site is located on flat land bordered by forested lands to the north, commercial/ industrial uses to the south, railroad tracks to the east, and NY 5 to the west. The visual character of the project area is influenced by surface parking, a mix of single-story commercial/industrial structures, and single-story rural residential homes surrounded by forested lands. These physical structures include a 135-foot-tall water tower immediately south of the project site, the Gil Lay Memorial Sports Arena, the SNI Bingo Hall and associated structures, and NY 5 directly west of the project site (Figure 3-1). The surrounding forested lands are characterized by thick stands of

mature trees consisting of hardwoods and shrub vegetation. Other vertical structures in the surrounding region and communities include cell, telecommunication, and water towers.

Views of the project site are primarily accessible to traffic heading north and south on NY 5, patrons of the SNI Bingo Hall, attendees of events at the Gil Lay Memorial Sports Arena, and one single-family residence located west of the project site. Due to the relatively flat topography and forested/undeveloped nature of the surrounding area, views of the project site from areas surrounding the project site are limited. Lake Erie is not visible from the project site.

NY 5, approximately 1,100 feet southwest of the project site, is a part of the Great Lakes Seaway Trail (Figure 3-2), a designated scenic byway by the U.S. Department of Transportation Federal Highway Administration and the New York State Department of Transportation (NYSDOT). The Seaway Trail is a driving trail that was created to encourage regional economic development through tourism. It is administered by the NYSDOT through the Great Lakes Seaway Trail Corridor Management Plan (NYSDOT 2015). The section of NY 5 near the project site is located in Zone 1 (Chautauqua – Erie) of the Seaway Trail. The Seaway Trail generally follows NY 5 north along Lake Erie from the Pennsylvania border to the project site, separating from NY 5 just west of the SNI Bingo Hall, doubling back southwesterly on Old Lake Shore Road, and then resumes northward as it follows the shoreline along Lake Erie. There are two scenic vistas near the project site along this segment of the Seaway Trail: one is from approximately one mile south of the project site, where the Cattaraugus Creek meets NY 5, facing west to the lake; the other is from Old Lake Shore Road approximately one mile southwest of the project site, facing inland to the northeast. As shown in Figure 3-2, the segment of the Seaway Trail near the project site traverses a landscape of commercial, residential, undeveloped natural areas, open space, and agricultural areas. The wind turbine would be visible only to north bound traffic on either Old Lake Shore Drive or NY 5 for a distance of less than a mile because of trees, buildings, and local topography.

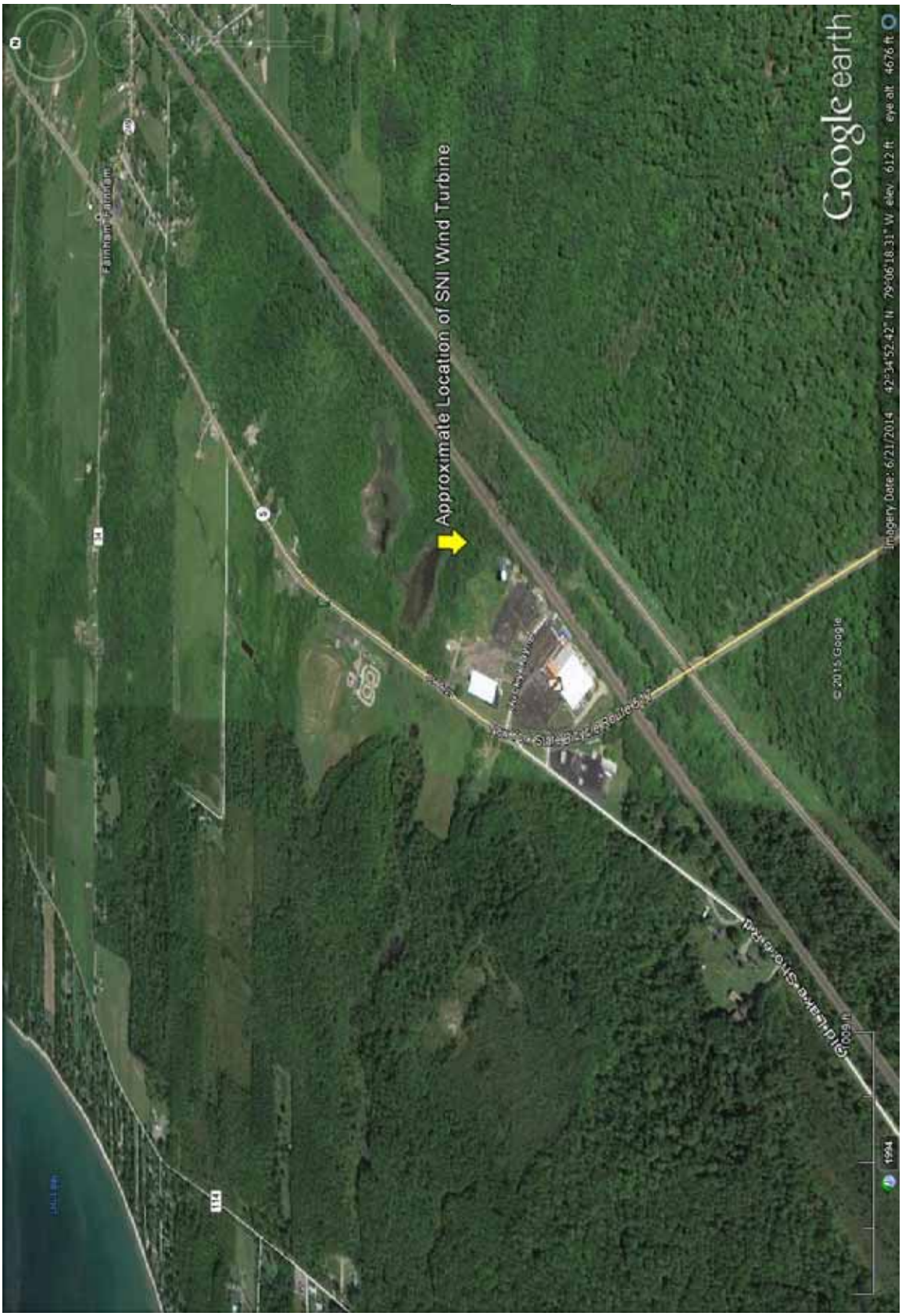

Figure 3-1. Overview of the Project Area Showing the Physical Structures Near the Project Site and the Surrounding Landscape

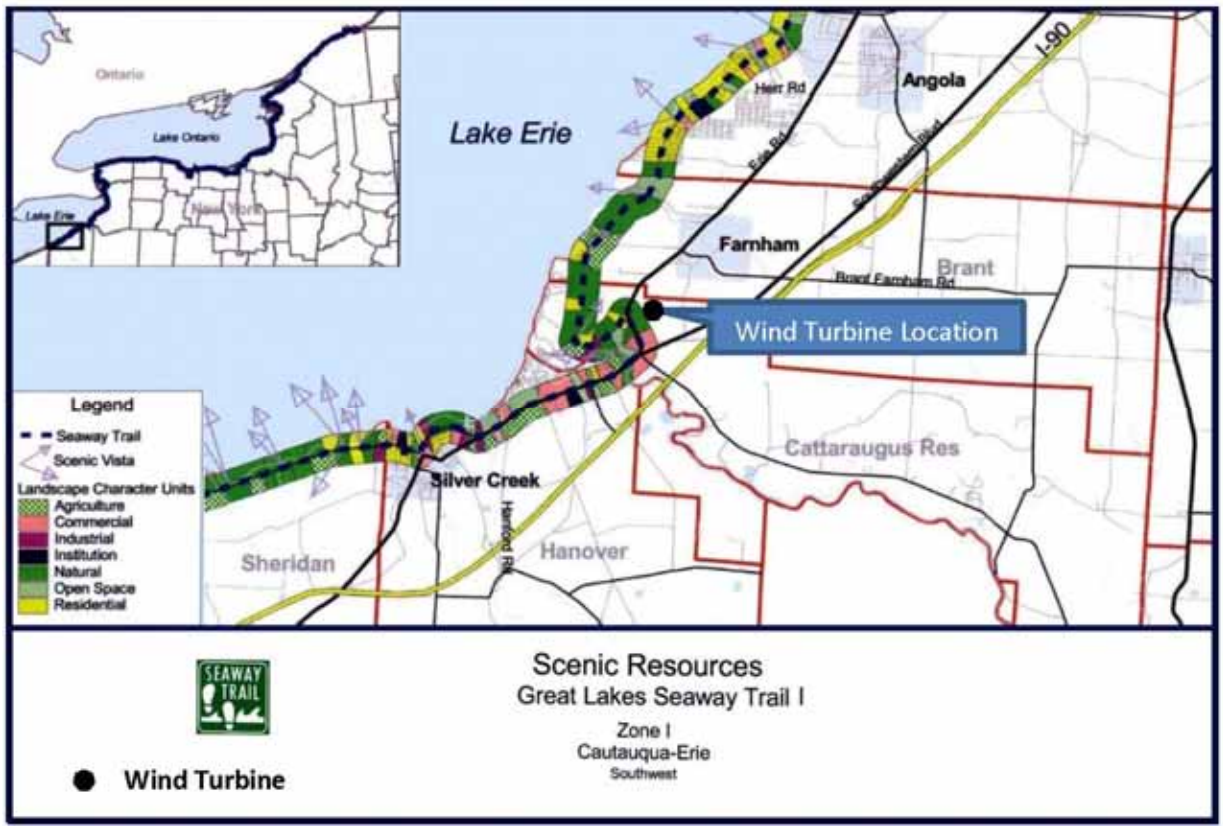

Figure 3-2: Great Lakes Seaway Trail – Scenic Resources (Source: NYSDOT 2015)

The visual character of an area where an operating wind turbine is sited can also be affected by a phenomenon known as shadow flicker. Shadow flicker zones occur when the blades of a wind turbine cast a rapidly moving shadow on a residence or other structure. Shadow flicker zones vary by time of day and by season as the sun angle changes in relation to the wind turbine. Because of the low sun angle at dawn and dusk, shadows can extend over longer distances in the morning and evening.

Rapidly moving shadows or flickering shadows can create an unpleasant indoor environment for those nearby and may be considered a nuisance when cast upon receptors including residences, schools, or hospitals. Shadow flicker effects can be affected by several factors including the distance between a wind turbine and a receptor, the location of trees, obstructions such as buildings, the topography of the area, and weather characteristics such as wind speed/direction, and cloud cover. Based on National Climatic Data Center estimates, areas near the project site receive on average 48 percent daily total sunshine (based on the nearest monitoring station at the Dunkirk Airport). Within western New York, a substantial amount of this sunshine occurs during the months of June to October. The nearest potential receptor is a residential home approximately 1,000 feet to the southwest of the project site.

3.3.2.2 Environmental Impacts

3.3.2.2.1 Visual Resources

Visual impacts occur if an intrusion or noticeable contrast affects the visual character or scenic quality of a landscape. The compatibility of introduced features within established views, together with the public's attitudes and visual perspectives, determine the subjective importance of the visual impact.

The maximum wind turbine height for the proposed project would be approximately 430 feet or approximately three times taller than the adjacent water tower (approximately 135 feet tall) and the surrounding single-story structures in the area. However, visibility of the wind turbine would depend on several factors, including the time of day, the time of year, weather conditions, and the location and proximity of the viewer.

The wind turbine would be located approximately 1,000 feet from the Great Lakes Seaway Trail and would be adjacent to existing commercial/industrial uses. Photographs of view sheds were taken at locations surrounding the project site (Figure 3-3) and were visually rendered with a simulated wind turbine of appropriate scale to assess the potential visual effects to viewers living or travelling in the area. Photographs illustrating simulated view sheds are provided in Appendix C. The position or location of the wind turbine is shown (red outlines) on the photographs in Appendix C to show the relative position to the view point even if the wind turbine would not be visible.

The wind turbine would be partially visible from the nearest residence located approximately 1,000 feet southwest of the project site (Location 1 in Figure 3-3) on the west of side of NY 5 (Figure 3-4 and Appendix C, Figure C-1). Although the upper part of the wind turbine, including the rotor swept area, would be visible above the Gil Lay Memorial Sports Arena from NY 5 in front of the residence, trees located between NY 5 and the house would obscure the view of the turbine blades and upper tower (Figure 3-4). The wind turbine would be slightly more visible from the residence during the late fall through winter when leaves are absent from trees.

The Great Lakes Seaway Trail, a designated scenic byway, connects with NY 5 south of the SNI Bingo Hall (Location 2 in Figure 3-3). The wind turbine would be partially visible through the trees during the winter and mostly obscured when trees were in full foliage to vehicles traveling northward near this location (Appendix C, Figure C-2). The wind turbine also would be largely obscured from a residence located there. The wind turbine would not be visible until travelers on the scenic byway were near the intersection of NY 5 and Old Lake Shore Road, when the view shed also would include the commercial area (e.g., gas station, SNI Bingo Hall, and Gil Lay Memorial Sports Arena), power lines, parking lot light poles, and the water tower. In the immediate area surrounding the project site, the wind turbine would be visually compatible with the existing commercial/light industrial uses nearby. As such, views of the project site from the adjacent roads would not result in adverse visual effects.

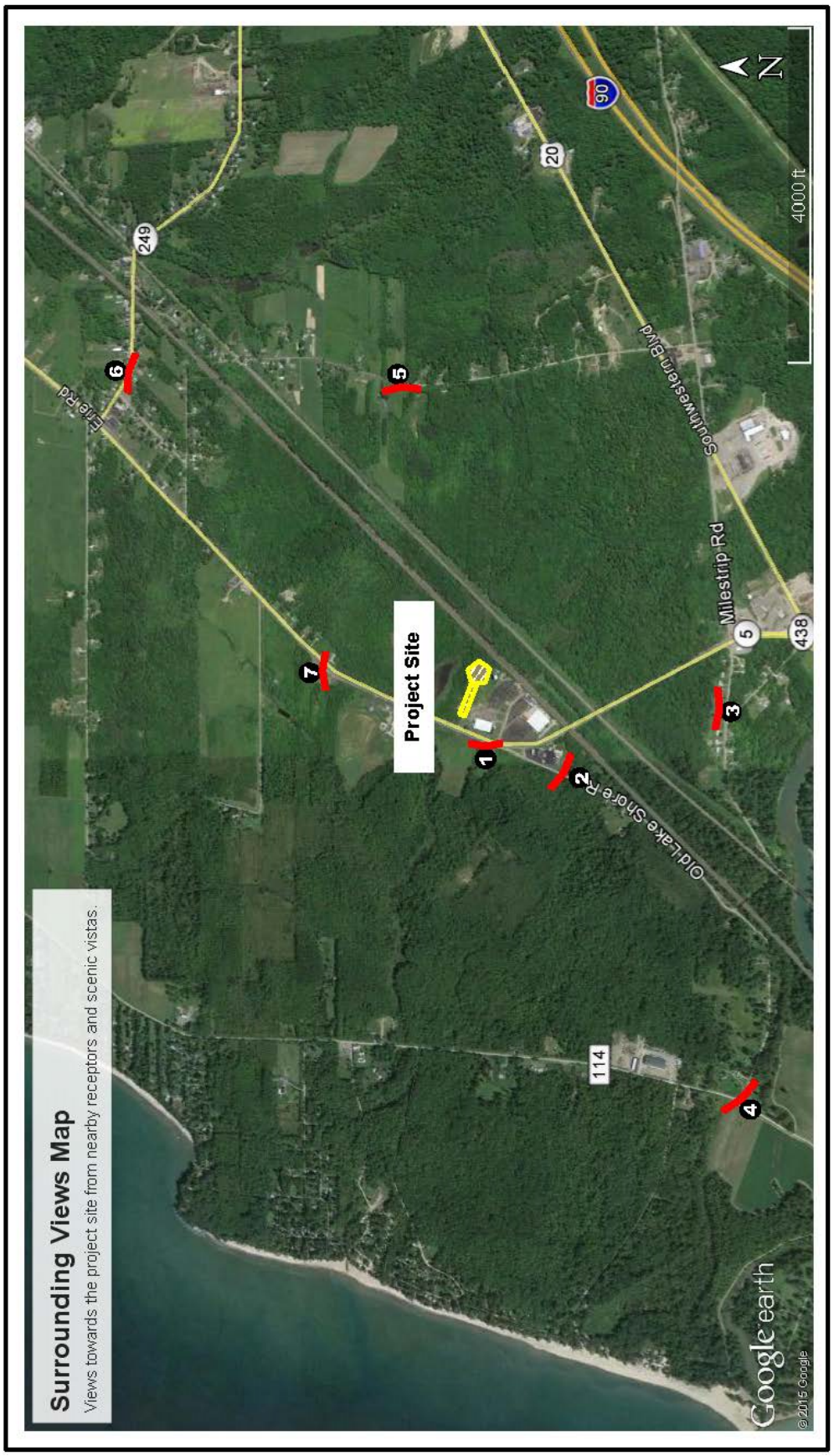

Figure 3-3. Locations within Approximately 2 Miles of the Project Site Used to Evaluate Impacts on Visual Resources Using Visual Renderings of the Wind Turbine

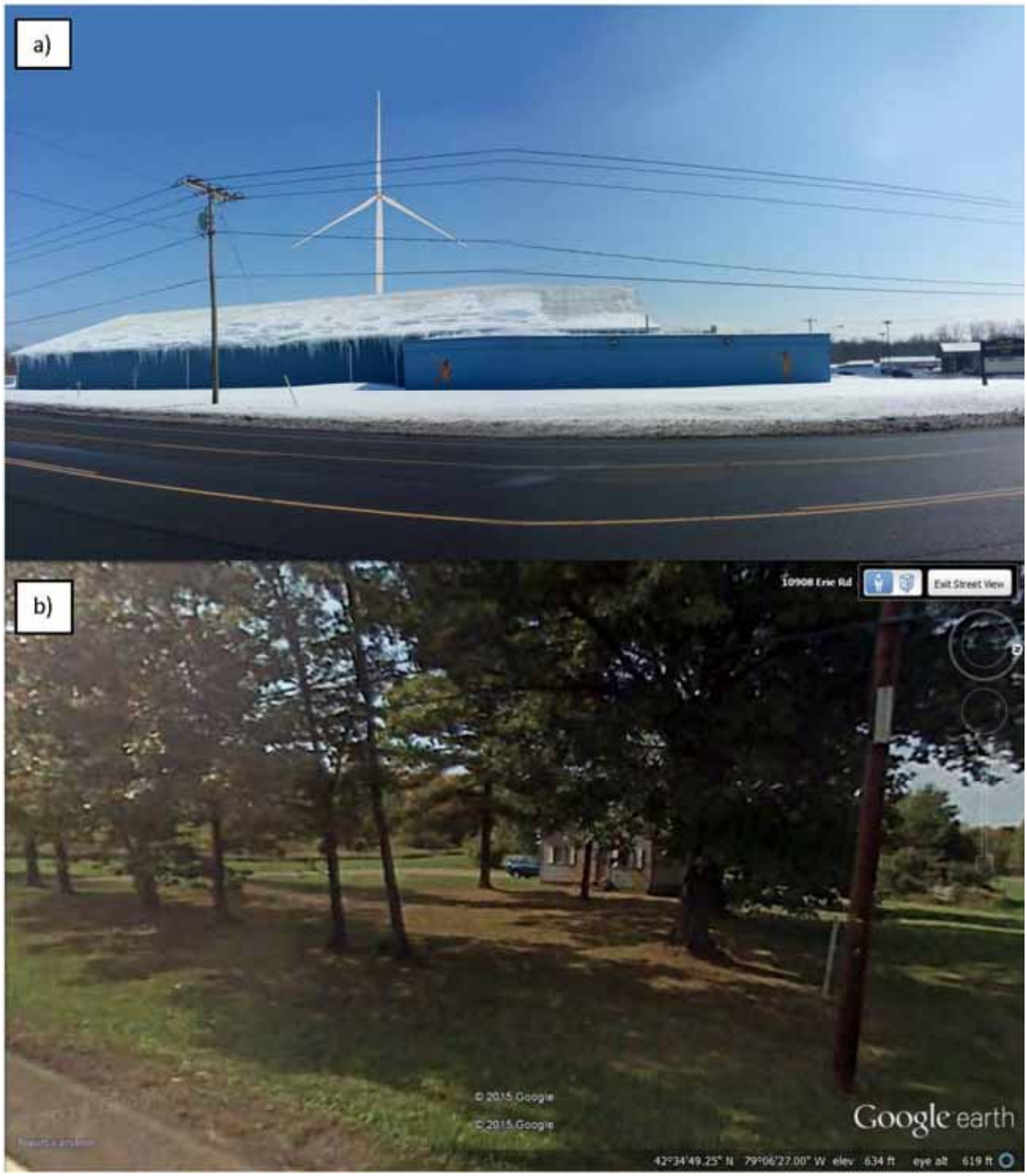

Figure 3-4. View from the residence near the Project Site showing (a) the partial obstruction of the wind turbine by the Gil Lay Memorial Sports Arena as viewed from NY 5 adjacent to the residence looking toward the proposed location of the wind turbine and (b) the view of the vegetation shielding the house.

Locations 3 through 7 in Figure 3-3 represent locations within approximately 1.5 miles of the wind turbine from residential areas and along NY 5. As expected, the wind turbine would be obscured from view at most locations because of the topography, trees, and in some cases small hills (e.g., Location 4 from the scenic byway) (Appendix C, Figures C-3 through C-6). The wind turbine would be partially visible to vehicles traveling southward on NY 5 toward the project site during the winter (Location 7 in Figure 3-3) but would be mostly obscured when trees were in full foliage (Appendix C, Figure C-7).

The project may also be visible from private residential and other areas located in slightly higher topographic positions at further distances. Surface elevations at some locations within five miles of the project site reach up to 900 feet above sea level. Photographs were taken from several locations within a five-mile radius of the project site, including private residential homes to the north, south, east, and west of the project site (Figure 3-5).

From a location approximately 3.5 miles southwest of the project site along Hanover Road near Highway 20 (Location A in Figure 3-5), the wind turbine would be visible on the horizon but would appear relatively small (Appendix C, Figure C-8). The wind turbine would not be visible in the view shed to the southeast from Evangola State Park (Location B in Figure 3-5) because of trees and a small hill southeast of the park (Appendix C, Figure C-9). From the other three locations evaluated, the wind turbine would be partially visible and small in the view shed (Location C in Figure 3-5) or obscured from view by trees and topography (Locations D and E in Figure 3-5) (Appendix C, Figures C-10 through C-12).

While the wind turbine would be a dominant vertical feature on the landscape (within 2 miles) because of its height, the visual impacts would be reduced by other existing, vertical structures in the area such as the adjacent water tower, parking lot lighting, and power lines. The forested landscape along most of the primary and secondary roads combined with the flat topography and occasional small hills would obscure and reduce turbine visibility. In addition, the wind turbine would only be visible to people travelling in vehicles in the vicinity for very short periods of time while they transit the area. Visual effects are expected to be negligible within a five-mile radius of the project site. Based on an assessment of views and visual simulations created with the proposed wind turbine, DOE does not anticipate that the project would adversely affect the visual character or scenic quality of the surrounding area.

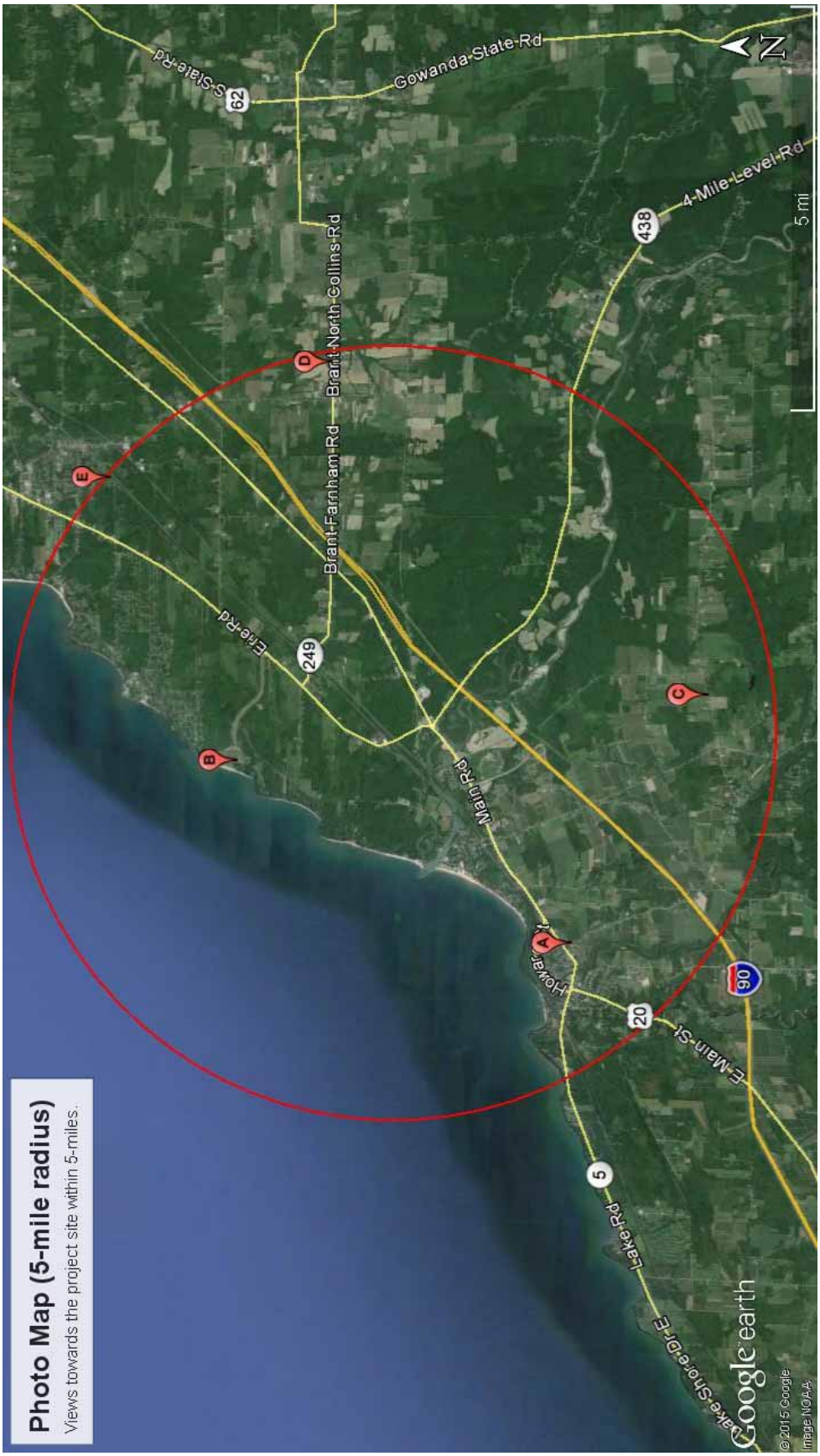

Figure 3-5. Locations Used to Evaluate Impacts on Visual Resources to Private Residences and Evangola State Park within an Approximate 5-Mile Radius around the Project Site

3.3.2.2.2 Shadow Flicker

Shadow flicker may pose an annoyance or a nuisance particularly to receptors such as residents in the area. Generally accepted wind industry guidelines recommend a 10-rotor-diameter distance from the nearest receptor for negligible shadow flicker impacts and fewer than 30 hours per year for acceptable shadow flicker exposure.

The wind turbine is proposed to be set back approximately 1,000 feet from the nearest residence. This would be less than the industry-recommended 3,300-foot setback for a 330-foot rotor diameter. However, the windows on the nearest residential receptor are obstructed from the wind turbine by trees. The worst case scenario would occur in the late spring and summer when the sun rises east-northeast of the turbine and when the wind is blowing from the west-southwest (i.e., predominate wind direction). Any shadow flicker would be cast toward the residence in the morning hours. However, the windows of the residence facing the project site are obstructed by trees in full foliage surrounding the perimeter of the property during this time of year. The Gil Lay Memorial Sports Arena is also located between the residence and proposed turbine site and would obscure the sun and the lower portion of the rotor swept area for about one hour after sunrise. Any shadow flicker cast upon the residence by the wind turbine would be shielded from view partially by the sports arena shortly after sunrise when shadows are longest and then by the tree foliage as the sun rises. By about 10:00 AM during the summer, the sun is positioned where any shadow flicker would be cast to the north of the residence. During the summer, western New York averages about 40 percent cloudy days which would further reduce potential shadow flicker effects (Vermette et al. 2013).

During the winter season, the canopy cover of the surrounding trees (foliage) thins out during leaf fall; however, this would occur concurrent with the diminishing amount of sunlight received during the winter months (November to May) with about 60 to 80 percent cloudy days, and the more southeasterly direction of sun rise would direct shadows to the northwest in the morning hours, away from the residence. Potential shadow flicker effects during the summer (i.e., worst case scenario) on the one residential receptor would be limited to approximately three to four hours during the morning hours, but would be obscured by the tree foliage surrounding the residence and further reduced by the number of cloudy days in western New York. Therefore, DOE expects that shadow flicker impacts to the nearest residential receptor would be minimal.

The next closest residence is located approximately 1,500 feet to the southwest of the project site. However, this residence is outside the possible shadow flicker range because of its geographic location in relation to the wind turbine and possible sun angles. The property is also surrounded by a thick stand of mature trees surrounding the perimeter of that property. At distances beyond 3,300 feet, consistent with acceptable industry standards, it is anticipated that shadow flicker impacts to other receptors would be negligible. The sports arena does not have windows facing the turbine and would not be affected. The adjacent bingo hall is located south of the wind turbine in a position where shadow flicker could not occur because of sun angles.

Shadow flicker impacts could occur to those travelers passing along the project site on NY 5 due to the highway's proximity to the wind turbine. However, the duration of shadow flicker impacts to these travelers would be limited to the time it takes to pass the project area. Therefore, impacts

to travelers in the project area would be minimal. Additional shadow flicker effects are discussed in Section 3.3.6.2.4.

3.3.3 BIOLOGICAL RESOURCES

This section addresses potential impacts from the proposed action to plants and animals and their required habitats during all, or some, life history stages, including endangered, threatened, and species of concern.

3.3.3.1 Affected Environment

3.3.3.1.1 Vegetation

The project site is currently undeveloped, consisting of some previously cleared land, grasses, shrub vegetation, and forested woodland. The two dominant forest types present in the project area include successional northern hardwoods and successional southern hardwoods (Edinger et al. 2014; Stantec 2010). Successional northern hardwoods are generally characterized by the presence of hardwood species including aspen (*Populus spp.*), birch (*Betula spp.*), and cherry (*Prunus spp*). Successional southern hardwoods are typically a hardwood or mixed forest that occurs on sites that have been cleared or disturbed in the past. Common species include American elm (*Ulmus americana*), slippery elm (*U. rubra*), white ash (*Fraxinus americana*), red maple (*Acer rubrum*), box elder (*A. negundo*), silver maple (*A. saccharinum*), sassafras (*Sassafras albidum*), gray birch (*Betula populifolia*), hawthorn (*Crataegus spp.*), eastern red cedar (*Juniperus virginiana*), and choke-cherry (*Prunus virginiana*) (Edinger et al. 2014).

The vegetation surrounding the project site is a mixture of hardwood forests, grasslands, and wet areas. The land area immediately south of the project site is mostly commercial development (buildings and parking lots). The newly installed access road to the project site would cross a previously disturbed area with grasses and successional shrubs. Hardwood forest occurs immediately to the north and northwest of the project site, with a wet area approximately 100 feet north of the edge of the proposed cleared area for construction.

There is one federally listed endangered plant species and five federally listed threatened plant species found in New York State (Table 3-2). None is located within or near the project area.

Table 3-2. List of Federally Endangered or Threatened Plant Species in New York State

Common Name (*Genus species*)	Federal Status
Northern wild monk's-hood (*Aconitum noveboracense*)	T
Sandplain gerardia (*Agalinis acuta*)	E
Seabeach amaranth (*Amaranthus pumilus*)	T
Hart's-tongue fern (*Asplenium scolopendrium* var. *americanum*)	T
Leedy's roseroot (*Sedum integrifolium* ssp. *leedyi*)	T
Houghton's goldenrod (*Solidago houghtonii*)	T

The existing access road to the commercial/industrial buildings would be extended eastwardly, and a temporary crane pad and a turbine foundation would be constructed for the project. Direct impacts to existing vegetation and the construction of impermeable surfaces would be about 1.5 acres during and after construction. Indirect impacts to vegetation adjacent to the construction

zone may occur from vegetation removal and/or land grading, but are expected to be minimal due to implementation of construction BMPs (see Section 3.4).

3.3.3.1.2 Wildlife and Endangered, Threatened, and Special Concern Species

Because the project site is relatively small (1 acre), clearing of vegetation for construction of the single wind turbine should have minor impacts to common wildlife species (e.g., deer, rodents, rabbits). Of most concern would be wider ranging species such as birds and bats that could be harmed by interaction with the wind turbine (e.g., collisions or barotrauma) and any wildlife species classified as threatened or endangered. Therefore, the description of the wildlife resource and evaluation of potential impacts in this EA focuses on birds, bats, and threatened or endangered species.

3.3.3.1.3 Migratory Birds

Most birds are protected under the federal *Migratory Bird Treaty Act* (16 U.S.C. §§ 703–712; MBTA), which prohibits the taking of migratory birds without a valid permit, and the *Bald and Golden Eagle Protection Act* (16 U.S.C. § 668–668c; BGEPA), which further protects golden eagles (*Aquila chrysaetos*) and bald eagles (*Haliaeetus leucocephalus*) from a take without a valid permit. DOE must comply with these federal regulations. The golden eagle is considered extirpated from New York and therefore no longer a species of conservation concern, and in 2007 the bald eagle was federally delisted. Bald eagles are known to occur in the region, primarily to the southeast of the project site, along the Cattaraugus River. According to the SNI Fish and Wildlife Department (SNIFWD), no bald eagles nest in the vicinity of the project (see SNIFWD letter in Appendix B of this EA). The nearest known bald eagle nest is approximately 3.5 miles southeast of the project along the Cattaraugus River. Table 3-3 lists the bird species of conservation concern under the federal MBTA and BGEPA in the vicinity of the project site that could be potentially affected.

Table 3-3. Migratory Birds of Conservation Concern

Species Name (*Scientific Name*)	Seasonal Occurrence
American bittern (*Botaurus lentiginosus*)	Breeding
Bald eagle (*Haliaeetus leucocephalus*)	Year Round
Black-billed Cuckoo (*Coccyzus erythropthalmus*)	Breeding
Black-crowned Night-Heron (*Nycticorax nycticorax*)	Breeding
Blue-winged Warbler (*Vermivora pinus*)	Breeding
Canada Warbler (*Wilsonia canadensis*)	Breeding
Common tern (*Sterna hirundo*)	Breeding
Golden-Winged Warbler (*Vermivora chrysoptera*)	Breeding
Least Bittern (*Ixobrychus exilis*)	Breeding
Pied-billed Grebe (*Podilymbus podiceps*)	Breeding
Prairie Warbler (*Dendroica discolor*)	Breeding
Red-headed Woodpecker (*Melanerpes erythrocephalus*)	Breeding
Short-eared Owl (*Asio flammeus*)	Wintering
Upland Sandpiper (*Bartramia longicauda*)	Breeding
Wood Thrush (*Hylocichla mustelina)*	Breeding

Source: http://www.fws.gov/migratorybirds/regulationspolicies/mbta/mbtandx.html (accessed December 2014).

In addition to the protected bird species of conservation concern, other migratory bird species occur (at least seasonally) in the region surrounding the project site. A total of 76 species of birds was documented during breeding bird surveys conducted between 2000 and 2005 in the vicinity of the project area (Table 3-4). The project area is found in Breeding Bird Atlas Block 1572D. These species have not been confirmed on the project site but comprise the regional avifauna that could occur in the vicinity. Three state-listed avian species of special concern (osprey, sharp-shinned hawk, and red-headed woodpecker) have been documented during breeding bird surveys in the project region.

Table 3-4. List of Species Breeding in Atlas Block 1572D, 2000–2005[a]

Common Name	Scientific Name	Behavior Code	Date	NY Category
Canada Goose	*Branta Canadensis*	P2	5/13/2001	Game Species
Mallard	*Anas platyrhynchos*	FL	6/20/2000	Game Species
Hooded Merganser	*Lophodytes cucullatus*	FL	7/30/2002	Game Species
Wild Turkey	*Meleagris gallopavo*	X1	6/20/2000	Game Species
Great Blue Heron	*Ardea Herodias*	X1	7/15/2001	Protected
Green Heron	*Butorides virescens*	X1	6/20/2000	Protected
Turkey Vulture	*Cathartes aura*	X1	6/20/2000	Protected
Osprey	*Pandion haliaetus*	X1	6/16/2001	Protected-Special Concern
Sharp-shinned Hawk	*Accipiter striatus*	X1	5/20/2000	Protected-Special Concern
Red-tailed Hawk	*Buteo jamaicensis*	FL	7/4/2003	Protected
Killdeer	*Charadrius vociferus*	FL	6/23/2002	Protected
Rock Pigeon	*Columba livia*	P2	6/4/2000	Unprotected
Mourning Dove	*Zenaida macroura*	FL	8/8/2001	Protected
Ruby-throated Hummingbird	*Archilochus colubris*	NY	8/16/2001	Protected
Belted Kingfisher	*Megaceryle alcyon*	FY	6/24/2001	Protected
Red-headed Woodpecker	*Melanerpes erythrocephalus*	FY	7/14/2001	Protected-Special Concern
Red-bellied Woodpecker	*Melanerpes carolinus*	X1	6/17/2001	Protected
Yellow-bellied Sapsucker	*Sphyrapicus varius*	X1	7/29/2003	Protected
Downy Woodpecker	*Picoides pubescens*	P2	5/13/2001	Protected
Hairy Woodpecker	*Picoides villosus*	X1	7/29/2003	Protected
Northern Flicker	*Colaptes auratus*	X1	6/6/2001	Protected
Eastern Wood-Pewee	*Contopus virens*	FY	7/13/2002	Protected
Willow Flycatcher	*Empidonax traillii*	S2	6/20/2000	Protected
Least Flycatcher	*Empidonax minimus*	X1	6/4/2000	Protected
Great Crested Flycatcher	*Myiarchus crinitus*	N2	//2000	Protected
Eastern Kingbird	*Tyrannus tyrannus*	T2	6/20/2000	Protected
Yellow-throated Vireo	*Vireo flavifrons*	X1	5/28/2001	Protected
Warbling Vireo	*Vireo gilvus*	FY	6/20/2000	Protected
Red-eyed Vireo	*Vireo olivaceus*	FY	7/27/2002	Protected
Blue Jay	*Cyanocitta cristata*	FY	6/20/2000	Protected
American Crow	*Corvus brachyrhynchos*	S2	6/20/2000	Game Species
Purple Martin	*Progne subis*	ON	6/20/2000	Protected
Tree Swallow	*Tachycineta bicolor*	ON	6/20/2000	Protected
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	NY	6/24/2001	Protected
Bank Swallow	*Riparia riparia*	ON	7/5/2002	Protected
arn Swallow	*Hirundo rustica*	S2	6/20/2000	Protected

Table 3-4. List of Species Breeding in Atlas Block 1572D, 2000–2005[a] (continued)

Common Name	Scientific Name	Behavior Code	Date	NY Category
Black-capped Chickadee	*Poecile atricapillus*	FY	6/20/2000	Protected
Tufted Titmouse	*Baeolophus bicolor*	P2	7/12/2003	Protected
White-breasted Nuthatch	*Sitta carolinensis*	FY	6/24/2001	Protected
Carolina Wren	*Thryothorus ludovicianus*	DD	6/30/2001	Protected
House Wren	*Troglodytes aedon*	B2	7/6/2002	Protected
Blue-gray Gnatcatcher	*Polioptila caerulea*	ON	5/28/2001	Protected
Eastern Bluebird	*Sialia sialis*	ON	6/20/2000	Protected
Veery	*Catharus fuscescens*	FY	7/7/2002	Protected
Wood Thrush	*Hylocichla mustelina*	S2	6/20/2000	Protected
American Robin	*Turdus migratorius*	FL	6/20/2000	Protected
Gray Catbird	*Dumetella carolinensis*	FY	6/20/2000	Protected
European Starling	*Sturnus vulgaris*	ON	6/20/2000	Unprotected
Cedar Waxwing	*Bombycilla cedrorum*	FY	7/20/2002	Protected
Yellow Warbler	*Dendroica petechial*	S2	6/4/2000	Protected
Yellow-rumped Warbler	*Dendroica coronate*	X1	7/6/2001	Protected
Pine Warbler	*Dendroica pinus*	T2	5/28/2001	Protected
American Redstart	*Setophaga ruticilla*	FY	6/17/2001	Protected
Ovenbird	*Seiurus aurocapilla*	X1	5/20/2000	Protected
Northern Waterthrush	*Seiurus noveboracensis*	X1	7/7/2001	Protected
Common Yellowthroat	*Geothlypis trichas*	S2	6/20/2000	Protected
Hooded Warbler	*Wilsonia citrine*	S2	6/20/2000	Protected
Eastern Towhee	*Pipilo erythrophthalmus*	S2	6/20/2000	Protected
Chipping Sparrow	*Spizella passerine*	FY	7/25/2002	Protected
Field Sparrow	*Spizella pusilla*	S2	6/20/2000	Protected
Song Sparrow	*Melospiza melodia*	FY	6/20/2000	Protected
Swamp Sparrow	*Melospiza georgiana*	X1	5/20/2000	Protected
Scarlet Tanager	*Piranga olivacea*	T2	6/28/2001	Protected
Northern Cardinal	*Cardinalis cardinalis*	P2	6/20/2000	Protected
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	FY	6/30/2001	Protected
Indigo Bunting	*Passerina cyanea*	X1	6/20/2000	Protected
Bobolink	*Dolichonyx oryzivorus*	P2	6/4/2000	Protected
Red-winged Blackbird	*Agelaius phoeniceus*	FL	5/20/2000	Protected
Eastern Meadowlark	*Sturnella magna*	FY	6/20/2000	Protected
Common Grackle	*Quiscalus quiscula*	NE	5/20/2000	Protected
Brown-headed Cowbird	*Molothrus ater*	FL	6/20/2000	Protected
Baltimore Oriole	*Icterus galbula*	NY	6/20/2000	Protected
Purple Finch	*Carpodacus purpureus*	P2	7/19/2003	Protected
House Finch	*Carpodacus mexicanus*	B2	6/30/2002	Protected
American Goldfinch	*Spinus tristis*	S2	6/20/2000	Protected
House Sparrow	*Passer domesticus*	X1	6/20/2000	Unprotected

Source: http://www.dec.ny.gov/cfmx/extapps/bba/index.cfm?RequestTimeout=250 (accessed February 17, 2015).

a. There is no more recent data available from the Breeding Bird Atlas.

3.3.3.1.4 Bats

Eight species of bats potentially occur in the vicinity of the project site based on their known geographical range (Stantec 2010; Wilson and Ruff 1999) (Table 3-5). A ninth species, the Indiana bat (*Myotis sodalis*), occurs in New York State but not in vicinity of the project site. Many of these species use caves for winter hibernation. Cave hibernacula do not occur in the

immediate area surrounding the project site (Stantec 2010). Summer roosting and maternity sites typically include larger trees, particularly those that have loose bark or crevices. Some bat species will also use manmade structures (e.g., houses, barns, and storage sheds) that provide crevices, openings, or overhangs that can serve as roost sites. Four of the eight species (eastern small-footed bat, eastern red bat, silvered-haired bat, and hoary bat) are listed as "Species of Greatest Conservation Need" under New York's Comprehensive Wildlife Conservation Strategy Plan (NYSDEC 2005).

Table 3-5. Bat Species that Could Occur in the Vicinity of the Project Site

Common Name	Scientific Name	Status
Eastern small-footed Myotis	*Myotis leibii*	New York species of greatest conservation need
Northern long-eared bat	*Myotis septentrionalis*	Federally threatened
Little brown bat	*Myotis lucifugus*	
Eastern red bat	*Lasiurus borealis*	New York species of greatest conservation need
Hoary bat	*Lasiurus cinereus*	New York species of greatest conservation need
Silvered-haired bat	*Lasionycteris noctivagans*	New York species of greatest conservation need
Tricolored bat	*Perimyotis subflavus*	
Big brown bat	*Eptesicus fuscus*	

3.3.3.1.5 Endangered and Threatened Wildlife Species

Information regarding the potential occurrence of federally listed species was obtained from the USFWS Endangered Species Website searching under Erie County, NY (http://www.fws.gov/endangered/). The *Endangered Species Act* (16 U.S.C. §§ 1531–1543) covers federally listed endangered and/or threatened species and critical habitat under 50 CFR Part 17.

One species, the northern long-eared bat (*Myotis septentrionalis*), that occurs in Erie County has recently been listed as threatened by the USFWS (Table 3-6) (80 FR 17974, April 2, 2015). The northern long-eared bat hibernates in caves or mine shafts during the winter. During summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Males and non-reproductive females may also roost in cooler places, like caves and mines. It has also been found, rarely, roosting in structures like barns and sheds. Northern long-eared bats forage at dusk by flying through the understory of forested hillsides and ridges, feeding on moths, flies, leafhoppers, caddisflies, and beetles, which they catch while in flight using echolocation. The bats also feed by gleaning motionless insects from vegetation and water surfaces.

Table 3-6. Erie County, New York, Federally Endangered Species List

Group	Common Name (*scientific name*)	Population	Status	Recovery Plan Name	Recovery Plan Stage
Mammals	Northern long-eared bat (*Myotis septentrionalis*)	N/A	Threatened	N/A	N/A

Source: http://ecos.fws.gov/tess_public/reports/species-by-current-range-county?fips=36029 (accessed April 2015).

There are no critical habitat areas designated by the USFWS for any federally endangered or threatened species in Erie County. There are also no nearby National Wildlife Refuges.

The State of New York maintains a list of species identified as endangered, threatened or of special concern under the State of New York *Endangered Species Act* (6 NYCRR Part 182). The federally listed species found in New York also appear on the New York state list, with additional species included. Table 3-7 presents all the state-listed endangered and threatened species of fauna in Erie County (marine species and those not found in Erie, or an adjoining county were not included). State-level species of special concern are not included.

Table 3-7. New York State Endangered or Threatened Species List in Erie County

Group	Common Name	Scientific Name	Status
Mollusc	Clubshell	*Pleurobema clava*	E
	Rayed Bean	*Villosa fabalis*	E
	Brook Floater	*Alasmidonta varicosa*	T
	Wavy-rayed Lampmussel	*Lampsilis fasciola*	T
	Green Floater	*Lasmigona subviridis*	T
Insects	Tomah Mayfly	*Siphlonisca aerodromia*	E
	Hessel's Hairstreak	*Callophrys hesseli*	E
	Regal Fritillary	*Speyeria idalia*	E
	Persius Duskywing	*Erynnis persius*	E
	Grizzled Skipper	*Pyrgus centaureae wyandot*	E
	Arogos Skipper	*Atrytone arogos arogos*	E
	Bog Buckmoth	*Hemileuca species 1*	E
	Pine Pinion Moth	*Lithophane lepida lepida*	E
	Pine Barrens Bluet	*Enallagma recurvatum*	T
	Scarlet Bluet	*Enallagma pictum*	T
	Little Bluet	*Enallagma minisculum*	T
	Frosted Elfin	*Callophrys irus*	T
Fish	Pugnose Shiner	*Notropis anogenus*	E
	Round Whitefish	*Prosopium cylindraceum*	E
	Bluebreast Darter	*Etheostoma camurum*	E
	Deepwater Sculpin	*Myoxocephalus thompsoni*	E
	Lake Sturgeon	*Acipenser fulvescens*	T
	Mooneye	*Hiodon tergisus*	T
	Gravel Chub	*Erimystax x-punctata*	T
	Banded Sunfish	*Enneacanthus obesus*	T
	Longear Sunfish	*Lepomis megalotis*	T
	Longhead Darter	*Percina macrocephala*	T
	Eastern Sand Darter	*Ammocrypta pellucida*	T
	Swamp Darter	*Etheostoma fusiforme*	T
	Spotted Darter	*Etheostoma maculatum*	T
Reptile	Queen Snake	*Regina septemvittata*	E
	Fence Lizard	*Sceloporus undulatus*	T
	Timber Rattlesnake	*Crotalus horridus*	T
	Blanding’s Turtle	*Emydoidea blandingii*	T
Birds	Black Tern	*Chlidonias niger*	E
	Short-eared Owl	*Asio flammeus*	E
	Loggerhead Shrike	*Lanius ludovicianus*	E
	Pied-billed Grebe	*Podilymbus podiceps*	T
	Least Bittern	*Ixobrychus exilis*	T
	Bald Eagle	*Haliaeetus leucocephalus*	T
	Northern Harrier	*Circus cyaneus*	T

Table 3-7. New York State Endangered or Threatened Species List in Erie County (continued)

Group	Common Name	Scientific Name	Status
Birds (cont)	King Rail	*Rallus elegans*	T
	Upland Sandpiper	*Bartramia longicauda*	T
	Common Tern	*Sterna hirundo*	T
	Least Tern	*Sterna antillarum*	T
	Sedge Wren	*Cistothorus platensis*	T
	Henslow's Sparrow	*Ammodramus henslowii*	T
Mammals	Northern Long-Eared Bat	*Myotis septentrionalis*	T

Source: http://www.dec.ny.gov/animals/7494.html (accessed April 2015).

3.3.3.2 Environmental Impacts

The SNIFWD monitors wildlife on SNI-owned lands. No wildlife species federally or state-listed as endangered, threatened, or of special concern are known to occur near the project site (see SNIFWD letter in Appendix B of this EA). As a sovereign governmental entity, the SNI has the inherent authority to manage and control the natural resources on their land, including the conservation of listed species (Secretarial Order 3206, 1997). Although SNI lands are not subject to the controls and restrictions in federal public land laws, the SNI has committed to implementing BMPs for biological resources to avoid, reduce, and monitor potential impacts (Section 3.4). Because of the small disturbance footprint of the project and its location adjacent to a developed commercial property (buildings and parking lots), impacts to vegetation and common wildlife species (e.g., rodents, deer, and rabbits) are expected to be minor. Birds and bats that range for a wider distance are more likely to be impacted from turbine collisions or barotrauma.

3.3.3.2.1 Vegetation

Potential impacts to vegetation would be limited to a relatively small area to be cleared of vegetation to support construction of the wind turbine. This area is expected to be about 1.0 acre. The access road would affect grassland and successional shrubs on the SNI commercial property adjacent to the wind turbine. The construction of the wind turbine would require clearing and removal of a small area (about 1.0 acre) of northern hardwood forests. A wet area occurs approximately 100 feet north of the edge of the proposed construction work area. This wet area would not be affected and would remain forested and undisturbed. The construction contractor would install erosion-control fences or structures (e.g., straw bales or wattles) as needed to prevent sediment runoff. Following completion of construction, the contractor would reseed work areas surrounding the wind turbine with an herbaceous or low shrub cover to stabilize the soil and prevent sedimentation. During construction, invasive weedy plants could potentially grow and propagate in the exposed mineral soil. The relatively short construction time required to install a single wind turbine and the timely reseeding of disturbed sites would minimize establishment of unwanted plant species.

3.3.3.2.2 Birds

It is unlikely that impacts to birds (e.g., loss of nests and eggs or collisions with the wind turbine blades or tower) will occur during clearing of vegetation on the construction site and/or during turbine operation. Adult birds can avoid vegetation clearing activity by flying away. However,

nests, eggs, and fledglings could be at risk if located within the footprint of the construction site. The project is not expected to affect any endangered or threatened species due to the small size of the forested area to be cleared (about 1.0 acre). Impacts to nesting birds would be avoided by clearing vegetation from October 1 to March 31 (see Section 3.3.3.3).

Estimating or predicting the potential number of bird mortalities from a wind turbine, whether an individual tower or a wind farm complex, is difficult and can vary based on surrounding regional characteristics (e.g., topography, habitats, local aggregation of birds, and location relative to migration pathways). Post-construction mortality monitoring at the Noble Bliss Windpark approximately 36 miles to the east and the nearest wind farm with available data to the project site indicated about 1-4 bird mortalities per turbine per year (Jain et al. 2009). September, during fall migration, was the month of greatest mortality at the Noble Bliss Windpark. Although mortality risk comparisons between sites should be made cautiously because of differences in landscape features and habitats, the Seneca Nation Wind Turbine Project is a single turbine and would likely cause no more than a similar small number of bird mortalities. The project site is located adjacent to an area that is unlikely to attract and create aggregations of birds. The site is near an active railroad and roads, and is adjacent to SNI recreational and commercial property with large parking lots. That is, there is existing human activity in the area, which presents an unlikely environment for bird aggregation.

There is little evidence that birds are attracted to wind turbines. Exceptions may be at night with certain types of lights and during inclement weather. Lighting, such as FAA-recommended steady red lights, has been shown to attract night-migrating birds and is associated with increased bird mortality at towers.

Spring and fall migration periods are potentially the highest-risk times of bird mortalities simply because of greater numbers of birds flying in the region. In addition, many species use areas along the Lake Erie shoreline as stopover locations during migration. However, the project site is approximately 1.5 miles from Lake Erie and 13 miles northeast of Dunkirk Harbor along Lake Erie, an area known for a large number of migratory birds. Grodsky and Drake (2011) found most bird fatalities from Wisconsin wind turbines were nocturnally migrating passerines (songbirds), which are abundant in most ecosystems and could be a potential source of mortality. This is consistent with a review of studies of avian collisions with wind turbines (Erickson et al. 2001), and the mortality data from the Noble Bliss Windpark (Jain et al. 2009). In contrast, other bird impacts are rare, including waterfowl, shorebirds, and raptors (Erickson et al. 2001). The average migratory flight height in the spring and fall estimated from radar studies (conducted between 2005 and 2008) in New York was between 950 and 2,100 feet, which are significantly above the rotor swept area (Stantec 2010).

Bald eagles (*Haliaeetus leucocephalus*) are known to nest to the southeast (along the Cattaraugus River) and southwest of the project site (Stantec 2010). The nearest point of the Cattaraugus River is about 0.75 miles south of the project site, and the nearest bald eagle nest occurs approximately 3.5 miles southeast along the Cattaraugus River. The bald eagle has not been reported in the Breeding Bird Atlas Survey Block (1572D) in which the project occurs (Stantec 2010). The project site is outside the riparian corridor of the Cattaraugus River and does not contain habitat that would attract bald eagles. Human activity (roads, railroad, and commercial businesses) adjacent to the wind turbine should minimize eagle use of the area. The primary risk

would be collision mortalities to eagles migrating or flying through the area. However, because of the lack of habitat that would attract eagles to the site, human activity nearby, and only a single turbine, mortality of eagles is not expected.

The SNI would conduct a three year post-construction avian and bat mortality monitoring program during the spring, summer, and fall seasons. Appendix D contains an annotated outline of the mortality monitoring plan; the detailed plan requires final information on the searchable area and visibility classes of vegetation below the wind turbine tower, which will not be available until construction is nearly complete. Therefore, detailed search protocols cannot be finalized. Mortality monitoring would identify whether any avian mortality issues exist and during what time of year. The wind turbine will initially be operated at a cut-in speed of 15.4 miles per hour (6.9 meters per second) between dusk and dawn from April 1 to September 30 (see Section 3.3.3.2.3). Turbine tower lighting will be synchronized red lights per FAA requirements (see Section 3.3.6.2.7), which will also minimize attracting birds. Overall impacts to avian species are expected to be minimal. The MBTA prohibits taking, killing, possessing, transporting, or importing migratory birds, their eggs, parts, and nests, except when specifically authorized by the U.S. Department of the Interior. Although "take" is not authorized under the MBTA, the USFWS recognizes that some migratory birds may be taken during wind turbine operation even when all reasonable measures to avoid a take have been implemented (see Section 3.4).

3.3.3.2.3 Bats and Threatened or Endangered Species

There is a higher potential for mortality to bats than birds from wind turbines (Baerwald et al. 2008). The northern long-eared bat (*Myotis septentrionalis*), which was recently listed as a federally threatened species, has been known to occur in the region surrounding the project site. During summer, these bats opportunistically roost singly or in colonies underneath tree bark and in cavities or crevices of both living and dead mature trees. Males and non-reproductive females may also roost in caves and mines. Suitable summer and roosting habitat does exist for this species in a wider region from the project site in western New York. To avoid any potential impacts from vegetation clearing, the SNI would clear vegetation on the project site during the non-roosting season from October 1 through March 31 (See Section 3.4).

Northern long-eared bat winter hibernacula are small cracks and crevices in large caves and mines with large passages and entrances, constant temperatures, and high humidity with no air currents. There is no known suitable hibernacula habitat in the immediate project area. The nearest known northern long-eared bat hibernacula are about 45 and 55 miles from the project site (USFWS 2015). Caves are important not only for winter hibernation but also for bat swarming behavior in the fall when mating occurs. The area surrounding caves used for swarming are areas of high bat activity in the late summer and fall. In the absence of caves near the project site, concentrations of bats are unlikely to occur and most bats that may occur in the vicinity would likely have left by October 1.

The Indiana bat is federally and state-listed as endangered, but is not found in any of the five western counties of New York state. Additionally, the eastern small-footed bat (*Myotis leibii*) is a New York state-listed species of special concern, but also not found within or near the project area (Erdle 2001).

Direct take to bats occurs from barotrauma near, or direct collision with, turbine components (usually rotor blades). Potential bat mortality primarily occurs during fall migration of migratory or tree-dwelling bats, especially during times of low wind speeds. Tree-dwelling bats are found in the hardwood forested ridges prevalent in the northeastern United States, including this part of New York (Ellison 2012). Bats can also coincidentally collide with wind turbines while foraging for insects. Minimizing night lighting in the vicinity of the wind turbine also may reduce insects that are attracted to the lights, which in turn would be less likely to attract foraging bats.

Wind turbines cause bat mortality more frequently during times of low wind speeds, particularly in the two hours immediately after sunset, and almost exclusively affect common bat species, such as the silver-haired bat (*Lasionycteris noctivagans*), eastern red bat (*Lasiurus borealis*), and hoary bat (*L. cinereus*) (Baerwald et al. 2008). Wind turbines frequently operate at cut-in speeds of approximately 7 to 10 miles per hour (3 to 4 meters per second). Baerwald et al. (2009) reported a 60 percent reduction in bat mortality by increasing the cut-in speed to 12.3 miles per hour (5.5 meters per second). Arnett et al. (2011) in an experimental test found a 44 to 93 percent reduction in bat mortality using turbine cut-in speeds of 11.2 and 14.5 miles per hour (5.0 and 6.5 meters per second) compared to standard cut-in speeds but reported no difference in bat mortality between the two higher cut-in speeds tested. To avoid the potential for bat mortality, the SNI wind turbine would be operated with a cut-in speed of 15.4 miles per hour (6.9 meters per second) between dusk to dawn from April 1 through September 30 during avian and bat migration and the bat summer roosting season (see Section 3.4). Mortality monitoring would be conducted at the project site by the SNI Fish and Wildlife Department for three years during the spring, summer, and fall seasons (Appendix D). The 15.4 miles per hour cut-in speed will be re-evaluated based on post construction monitoring data and other relevant information compiled by SNI.

Because of the small forested area that would be cleared, the potential loss of bat habitat, whether for foraging or summer roosting, would be expected to be negligible. Mortality monitoring at the Noble Bliss Windpark approximately 36 miles east of the project site and the nearest wind farm with available monitoring data reported 8 to 15 bat mortalities per turbine per year (Jain et al. 2009). Other mortality monitoring efforts in New York report comparable numbers (Stantec 2010). No mortality of northern long-eared bats was reported at Noble Bliss Windpark. The reported bat mortality included six species, the little brown bat (39.2 percent), hoary bat (32.4 percent), silver-haired bat (17.6 percent) eastern red bat (8.1 percent), big brown bat (1.4 percent), and eastern pipistrelle (1.4 percent) across the 22 turbine towers surveyed. Although mortality risk comparisons between sites should be made cautiously because of differences in landscape features and habitats, the SNI Wind Turbine Project is a single turbine and is likely to cause at most a small number of bat mortalities. Any bat mortalities would likely be species similar to those reported at Noble Bliss Windpark, none of which are federally listed (Jain et al. 2009). DOE believes that any potential mortality of a northern long-eared bat is extremely unlikely to occur because of project construction and operating procedures. Therefore, DOE concludes that the project "may affect, but is not likely to adversely affect the species."

3.3.4 CULTURAL AND HISTORIC RESOURCES

Cultural resources in the vicinity of the proposed wind turbine consist of evidence of past SNI occupation of the area including archaeological resources, important cultural sites for religious

practices, and natural resources associated with the land, water, plants, and animals. The people of SNI today live and work on the same lands that Seneca people have inhabited for more than 1,000 years. SNI supports its own people, consisting of approximately 8,000 members, and benefits surrounding communities with a variety of cultural, educational, and economic efforts.

Historic resources in the area consist of buildings, structures, places, and districts that are either listed or eligible for listing on the *National Register of Historic Places* (NRHP). The historic context and peoples' experiences associated with important historic resources can sometimes be affected by the addition of a modern technological component to the visual landscape of an area.

3.3.4.1 Affected Environment

The Seneca were the largest of six Native American nations that comprised the Iroquois Confederacy, or Six Nations, a democratic government that pre-dates the United States Constitution. The historical Seneca occupied territory throughout the Finger Lakes area in central New York and in the Genesee Valley in western New York, living in longhouses on the riversides. The villages were well fortified with wooden stake fences, just one of the many industrious undertakings. The people relied heavily on agriculture for food, growing the "Three Sisters": corn, beans, and squash. In addition to raising crops, the early Seneca were subsistence hunters and fishers. The Seneca were also highly skilled at warfare, and were considered fierce adversaries. But the Seneca were also renowned for their sophisticated skills at diplomacy and oratory and their willingness to unite with the other original five nations to form the Iroquois Confederacy of Nations.

The New York State Cultural Resources Identification System (CRIS) lists an archaeological site in the Cattaraugus Territory located within approximately one mile of the proposed project site that is eligible for listing on the NRHP. CRIS identifies historic structures in the vicinity that are listed or eligible for listing on the NRHP and include numerous residential and other buildings in the Village of Silver Creek near the shore of Lake Erie, approximately 3.5 miles southwest of the proposed wind turbine location. In addition, CRIS identifies eight buildings and structures listed on the NRHP that are associated with the SNI administrative office location approximately six miles southeast of the project site.

3.3.4.2 Environmental Impacts

The proposed wind turbine site and any activities associated with construction or operation, including transportation of project components, would not cause any impacts to the NRHP-eligible archaeological site in the area due to the distance between the project and archaeological sites. On April 6, 2015, SNI THPO staff conducted an onsite preconstruction survey to evaluate the proposed site for the presence of archaeological or historic resources. Pursuant to Section 106 of the *National Historic Preservation Act*, the THPO declared a finding of "no effect" to cultural resources from the Wind Turbine Project. The potential historic context and experiences associated with the resources located in the Village of Silver Creek and in the area of the SNI offices would not be affected by the proposed wind turbine due to the general inability to see the turbine structure because of large distances involved and terrain and vegetation obstructions. BMPs for cultural and historic resources are presented in Section 3.4.

3.3.5 WET AREAS/WETLANDS

The SNI manages natural resources on its lands and understands the importance of wet areas in the landscape (i.e., sites that are seasonally wet as indicated by water, vegetation, and hydric soils). Wet areas, whether temporary or permanent, absorb and hold runoff water, reducing the risk of flooding and often contain high biodiversity and therefore have high ecological value. DOE recognizes the sovereign nature of Native American governments and lands in defining and regulating wet area boundaries. Project discussions with the SNI Environmental Protection Department indicate there are no SNI-regulated wet areas on the project site. SNI's management of wet areas is consistent with Executive Order 11990, "Protection of Wetlands," which requires each federal agency to avoid adversely impacting wetlands wherever possible, to minimize wetlands destruction and to preserve the values of wetlands. DOE regulations at 10 CFR Part 1022, "Compliance with Floodplain and Wetland Environmental Review Requirements," implement these Executive Orders. Title 10 CFR 1022.2(b) states that whenever possible, DOE shall accommodate requirements of the Executive Order through the applicable NEPA procedures.

3.3.5.1 Affected Environment

Using aerial imagery and reviews of USFWS maps and U.S. Department of Agriculture soil survey data, wet areas were identified in the vicinity of the project site. The nearest wet areas are north of the turbine location (about 200 feet) and east (opposite side of the railroad) of the project site (Figure 3-6). The USFWS also noted, in scoping comments (see Appendix B), the presence of a wet area approximately 200 feet from the proposed turbine location, which is consistent with identified wet areas in Figure 3-6. No part of the project site is in a wet area. Soils on the project site are classified as Niagara silt loam, 0 to 3 percent slopes, which is predominantly non-hydric. Soils located more than 200 feet to the north and east of the proposed turbine location are classified as Canandaigua silt loam, which is characterized as a hydric soil. These data are consistent with the wet areas identified north and east of the project.

Using the nomenclature of the National Wetland Inventory, the wet areas north and east of the project site would be designated freshwater forested/shrub wet areas or a palustrine, forested, broadleaved-deciduous wet area that is seasonally flooded or saturated. Approximately 100 feet of undisturbed forest and understory vegetation would remain between the cleared work area around the proposed wind turbine location and the wet areas to the north and east. The railroad bed also provides an additional berm between the project site and wet areas to the east.

3.3.5.2 Environmental Impacts

Based on data reviewed for the project site and consultation with SNI, the Proposed Action would not impact any wet areas. A geotechnical survey would be conducted to determine soil stability conditions prior to site clearing, excavation, or grading for the project. An undisturbed strip of forest and understory vegetation would remain between the construction work area and the nearest wet areas. Implementation of BMPs for erosion control and revegetation would ensure that no indirect impacts would occur to any nearby offsite wet areas.

Figure 3-6. Location of Wet Areas in the Vicinity of the Project Site

3.3.6 HEALTH AND SAFETY

This EA addresses health and safety concerns for workers and members of the public from incidents during construction, operation, and maintenance potentially occurring from personal accidents; tower failure and component mishaps; shadow flicker, glint, and glare; severe weather; electromagnetic fields; and transportation. BMPs for health and safety are presented in Section 3.4.

3.3.6.1 Affected Environment

Worker safety in construction and industrial settings is regulated by the Occupational Safety and Health Administration (OSHA). SNI has indicated that its safety standards for construction, operation, and maintenance of the wind turbine mirror applicable OSHA standards (e.g., 29 CFR Parts 1910 and 1926, "Occupational Safety and Health Standards" and "Safety and Health Regulations for Construction,"). These standards are designed to protect workers from potential construction and industrial accidents, as well as to minimize exposure to workplace hazards (e.g., noise and chemicals). The safety of construction workers would be the responsibility of the contractors hired to construct and install project components.

Workers have the potential to be injured or killed during construction, operation, and maintenance of wind turbines through industrial accidents such as falls, being caught or struck by moving parts, equipment fires, dropping or collapsing equipment, severe weather, ice build-up on turbine blades, and electrical fields and mishaps. Such accidents are uncommon and are avoidable through implementation of proper safety practices and equipment maintenance. Members of the public conducting routine activities in the vicinity of the proposed turbine location may also be affected by construction, operation, and accident scenarios associated with the turbine.

SNI operates a gaming enterprise (the SNI Bingo Hall) approximately 800 feet southwest of the proposed turbine location. In addition, two parking lots are located approximately 350 feet south and 470 feet west of the turbine site, respectively. The Gil Lay Memorial Sports Arena building is located approximately 700 feet west and a decommissioned 135-foot water tower is located approximately 200 feet south of the turbine location. The distance between the water tower and the proposed turbine location, the height of the turbine hub (approximately 265 feet), and the 165-foot radius of the rotor sweep would provide adequate operating clearance between the structures. The nearest residential property is approximately 1,000 feet west of the site.

A potential nuisance effect of operating wind turbines is shadow flicker and blade glint and glare. These terms refer to the phenomenon that occurs when the moving blades of wind turbines cast moving shadows (shadow flicker) or reflections (blade glint or glare) that cause a flickering effect. When the sun is in such a position in relation to the blades, and the shadow or reflection falls across occupied buildings, the light passing through windows can disturb the occupants. This can be viewed by observers as either brief change in brightness in an indoor environment or by moving shadows on the ground in an outdoor environment. The type of turbine, landscape features, latitude, weather, and wind energy generation facility layout are all factors that would impact shadow flicker and blade glint and glare (Fortin et al. 2013). Additional descriptions of shadow flicker are discussed with regard to visual resources in Section 3.3.2.2.2.

Transportation infrastructure, including roads, airports, and rail lines, in the area could be affected by accidents associated with operation of the turbine if located within close proximity of project components. The nearest airport (Dunkirk Airport) is approximately 10 miles southwest of the proposed site. CSX Railroad Company operates a freight rail line located approximately 200 feet southeast of the site. The closest road (NY 5) is approximately 800 feet northwest of the site.

3.3.6.2 Environmental Impacts

A health and safety plan would be prepared to address potential hazards associated with construction and operation (See Section 3.4). The plan would be revised as needed for different phases of the project and would include by reference any contractor health and safety plans for specific job tasks. The health and safety plan would include a communication plan for contacting various emergency response organizations (e.g., fire, law enforcement, and rescue) and potentially affected parties such as the railroad, local commercial businesses, community buildings, and nearby residences.

3.3.6.2.1 Construction Health and Safety

Construction activities pose various health and safety risks to workers, and possibly members of the public in some situations, which are considered typical for construction projects involving electrical components, working at height, and operating heavy machinery. The following potential risks could be associated with the proposed project:

- Falls from working at height,
- Crush injuries in excavation work,
- Slips and trips,
- Cuts and scrapes from sharp tools or construction materials or debris,
- Receiving injuries from hand tools and/or rotating machinery,
- Electrocution,
- Being struck by falling objects,
- Manually lifting heavy loads,
- Bad working positions, possibly in confined spaces,
- Being struck or crushed by a workplace vehicle,
- Inhalation of dust,
- Handling of rough materials,
- Exposure to dangerous substances (chemical and biological), and
- Hearing damage from loud noises.

3.3.6.2.2 Operation and Maintenance Health and Safety

During operation and maintenance, potential health and safety impacts to workers would be similar to those described during the construction phase. Electrocution remains a safety concern during operation and maintenance activities that occur near electrical equipment. Potential injuries or fatalities to workers could also occur from falls from heights, equipment and vehicle accidents, and other operational and maintenance activities. Because day-to-day activities with

regard to operating equipment and vehicles would be less during operational activities than during construction, the frequency of accidents that could affect members of the public would also be significantly less.

Because no fuel is used in operating a wind turbine, there would be no process waste streams generated during operation of the wind turbine that could cause health and safety concerns. Some lubricants are used in wind turbines, including gearbox oil, hydraulic fluid, and gear grease, that require periodic replacement. These lubricants would be managed in accordance with applicable regulations.

3.3.6.2.3 Tower Collapse and Blade Throw

Two possible but very unlikely accidents that could occur are collapse of the turbine tower and breakage (and throwing) of one or more turbine blades. Debris falling from these unlikely occurrences would be limited to a calculated fall zone around the base of the turbine. For a structural collapse, the fall zone would be about 430 feet away from its base (i.e., the maximum blade height of the turbine). In addition to the unlikely occurrence of a structural failure, accident consequences and safety risks would be further reduced because the nearest parking lot would be on the edge of the fall zone. The adjacent rail line would be within the fall zone of the highly unlikely event of a tower collapse; however, the line does not carry passengers and trains pass by only intermittently. Communication with the railroad operator as identified in the health and safety plan would make any accident events known in a timely manner.

Blade throw (i.e., a whole blade or fragments of the blade being thrown from a failed turbine rotor) could occur from extremely high winds, excessive rotor speed, electrical system failure, or manufacturing or installation defects. Although there are limited probability statistics on blade failures, estimates range from 10^{-2} to 10^{-5} failures per turbine per year (Larwood 2005). A blade throw analysis completed for a wind turbine with a blade height of 426 feet determined a maximum blade throw of 565 feet (Epsilon 2010). Although portions of the parking lots southwest of the turbine tower are within this zone, winds blow predominantly from the southwest quadrant (180° to 270°), which would orient the rotating blades 90° from those directions (270° to 360°). Any highly unlikely blade throw that might occur from these scenarios would be away from the parking lot and human structures, further reducing any potential risk to human safety or property. In addition, the risk is reduced even further when potential receptors are mobile, such as walking individuals or moving vehicles. Additionally, for the reasons mentioned in the previous paragraph, any potential impacts to the nearby rail line from a blade throw incident would be minimized.

3.3.6.2.4 Shadow Flicker and Blade Glint and Glare

Shadow flicker and blade glint and glare would not be an issue during cloudy periods or when the turbine is not operating. While there have been studies that have found that shadow flicker may result in the potential for epileptic seizures for those suffering from photosensitive epilepsy (Fortin et al. 2013), the American Wind Energy Association has refuted that finding, noting that "shadow flicker from wind turbines occurs much more slowly than the 'light strobing' associated with seizures" (AWEA 2010). Harding et al. (2008) reported that flickers with a frequency greater than 3 hertz, i.e., a light flashing at a rate of more than 3 times per second, could

potentially induce photosensitive seizures. The American Epilepsy Foundation reports that lights flashing in the range of 5 to 30 hertz are most likely to trigger seizures (Epilepsy Foundation 2013). A wind turbine with three blades would have to make a full revolution every second (or 60 revolutions per minute) to reach a frequency of 1 hertz; however, the size of the turbine likely to be used for the proposed project would operate at approximately 15 revolutions per minute or 0.3 hertz.

The nearest potential receptor to the proposed site is a residence approximately 1,000 feet to the southwest. As discussed in Section 3.3.2.2.2, potential affects from shadow flicker would be limited to about 3 to 4 hours during the early morning in the late spring and summer. However, any effects from flicker, glint, and glare would be obstructed by tree foliage surrounding the home (see Figure 3-3 above) and further ameliorated by cloudy days that occur on average 40 percent of the time in the summer. Workers in the commercial and community facilities near the wind turbine would not be affected as the facilities either lack windows (i.e., sports arena) or are located (bingo hall) in a direction from the turbine where shadow flicker would not occur and neither facility contains permanent residents. Therefore, DOE does not expect the wind turbine project to result in adverse effects from shadow flicker, glint, or glare.

3.3.6.2.5 Severe Weather

Severe weather (e.g., extremely high winds, tornadoes, ice storms, and lightning) in the vicinity of a wind turbine could cause structural accidents and, consequently, damage or loss of equipment and worker and public health and safety impacts. However, automatic turbine braking and shutdown occurs when extremely high winds are detected that are beyond the operating parameters for the equipment.

Another potential source of severe weather accidents is ice shedding. Ice can form on wind turbines under conditions of low temperatures, precipitation, and heavy fog. Ice shedding, or ice throw, refers to the phenomenon that can occur when ice accumulates on rotor blades and subsequently breaks free or melts and falls to the ground. Ice buildup on blades generally results in an imbalance of the rotor and detectable vibration that would automatically shut down the turbine. In most cases, ice falls within a distance from the turbine equal to the tower height and very seldom does the distance exceed twice the total turbine height (MDEP 2012). However, impacts from ice shedding are highly unlikely; the potential would depend on several factors including the orientation of the turbine and rotating blades. Although portions of the parking lots southwest of the turbine tower are within a potential ice-shedding range, given the predominate wind direction and orientation of the rotating blades (as discussed in Section 3.3.6.2.3), any ice shedding that might occur would be away from the parking lot and human structures, further reducing any potential risk to human safety or property. In addition, the risk is reduced even further when potential receptors are mobile, such as walking individuals or moving vehicles. For the reasons mentioned in Section 3.3.6.2.3, any potential impacts to the nearby rail line from an ice-shedding incident would be minimized.

Although highly unlikely, based on the above analysis, ice throw could impact an adjacent parking lot and associated parked vehicles and individuals who are present, the decommissioned water tower, the rail line, and, to a lesser extent because of the lack of prevailing winds, other adjacent structures and facilities. Although a potential safety concern, it is important to note that

the highly unlikely scenario of impacts from ice throw is further minimized for potential receptors that are mobile, such as moving vehicles and people who may be walking in the area.

Lightning strikes can cause extensive damage to the turbine blades, controllers, and power electronics (McNiff 2002). However, this damage can be reduced by protection from tall nearby communication towers, integral blade protection in the form of conductors, bonding to minimize arcing, good turbine grounding, controller cable and controller shielding, and transient voltage surge suppression. The amount of lightning damage is a factor of the lightning activity in the area, the height and prominence of the turbine, the terrain, and the lightning protection system in place. New York State is considered to have a "moderate" occurrence of lightning, with 3.8 strikes occurring per square mile each year (NYC-OEM 2015).

3.3.6.2.6 Electromagnetic Fields

The term electromagnetic field (EMF) refers to electric and magnetic fields that are present around any electrical device. Electric fields arise from the voltage or electrical charges, and magnetic fields arise from the flow of electricity or current that travels along transmission lines, collector lines, substation transformers, house wiring, and electrical appliances. The intensity of the electric field is related to the voltage of the line, and the intensity of the magnetic field is related to the current flow through the conductors (wire). EMF can occur indoors and outdoors. While the general consensus is that electric fields pose no risk to humans, the question of whether exposure to magnetic fields potentially can cause biological responses or even health effects continues to be the subject of research and debate. However, wind turbines are not considered a significant source of EMF exposure since emissions levels around wind turbines are low (OCMOH 2010).

3.3.6.2.7 Transportation Infrastructure

Normal operation and maintenance of the wind turbine are not expected to cause impacts to physical components of Erie Road (NY 5) or associated vehicle operations. Aircraft operations associated with Dunkirk Airport, 10 miles away, would not be impacted by the wind turbine, and other aircraft operations in the immediate vicinity would not result in health and safety impacts to project equipment, aircraft, or personnel if proper flight patterns, terrain, and structure clearances are followed by pilots. In January 2015, SNI filed a "Notice of Proposed Construction or Alteration – Off Airport" with the FAA. The FAA subsequently conducted an aeronautical study of the proposed project and opened a public comment period that closed on May 27, 2015. Based on the aeronautical study and public comments, the FAA issued a "Determination of No Hazard to Air Navigation" for the SNI Wind Turbine Project on June 9, 2015. As a condition of this Determination, the wind turbine must be painted white and marked with synchronized red lights in accordance with FAA Advisory Circular 70/7460-1K Change 2 (FAA 2007). The rail line located southeast of the proposed site would not be affected by normal operation and maintenance activities of the project because the rail line is located approximately 200 feet away, the radius of the blade sweep is approximately 165 feet, and the turbine and rotating blades would operate at a much higher altitude than railroad operations.

3.3.7 LAND USE

Land has value, in that it serves various uses and purposes. Land uses range from undeveloped areas that serve as wildlife habitat and recreation to highly developed areas that serve as commercial, industrial, and residential areas. This section considers potential impacts on land uses, such as alteration of current or future land use, from the proposed wind turbine.

3.3.7.1 Affected Environment

The project site is located on SNI-owned sovereign lands in the Cattaraugus Territory. The potential development of the site as proposed has been approved by the SNI Council.

The project site is currently undeveloped with some shrub vegetation and uncleared forest land and adjacent to surface parking, a 135-foot-tall water tower, and an existing commercial lot comprising the SNI Bingo Hall (and associated structures) and the Gil Lay Memorial Sports Arena, with access via Lucky Layne Road (Figure 3-7). East of the project site is an existing railroad corridor owned by CSX Railroad Company. To the north and northeast are additional wooded lands. Immediately west of the project site is NY 5. Other uses in the area include a single residence on the west side of the NY 5 and additional wooded lands. There are additional commercial/retail uses (the Catt-Rez Enterprises Gas Station and Tobacco Shop) and a residence approximately 1,500 feet southwest of the project site. A seasonal golf driving range is located approximately 1,500 feet northwest of the site. The remainder of the surrounding area is predominately rural residential surrounded by forested lands and agricultural uses.

3.3.7.2 Environmental Impacts

The project would convert approximately 1.0 acre of uncleared, undeveloped forest land to a commercial/industrial use for an access road, transmission cables, and construction of the temporary crane pad, wind turbine foundation, and interconnection facilities. Approximately 0.5 acre of the 1 acre of cleared forest land would remain as commercial/industrial use during wind turbine operation. Another 0.5 acre of previously disturbed land with grasses and successional shrubs would remain as an access road to the wind turbine site.

The erection of the wind turbine would result in a significantly taller structure (265-foot hub height and 430-foot blade-extended height) in the project area. The wind turbine would be adjacent to an existing commercial area with other vertical structures, such as the 135-foot water tower and parking lot light poles. The presence of the turbine is not expected to affect (i.e., alter or prohibit) existing surrounding land uses or adversely affect future land uses. However, future development (i.e., land use decisions) in the immediate area (e.g., 1,000-foot distance) would have to consider the presence of the wind turbine and potential impacts to safety and health. The proposed project is not expected to cause a growth change in the permanent population of the area that would cause a corresponding change in land use in the surrounding area such as an increase in residential development. DOE does not expect adverse impacts to land use from the wind turbine.

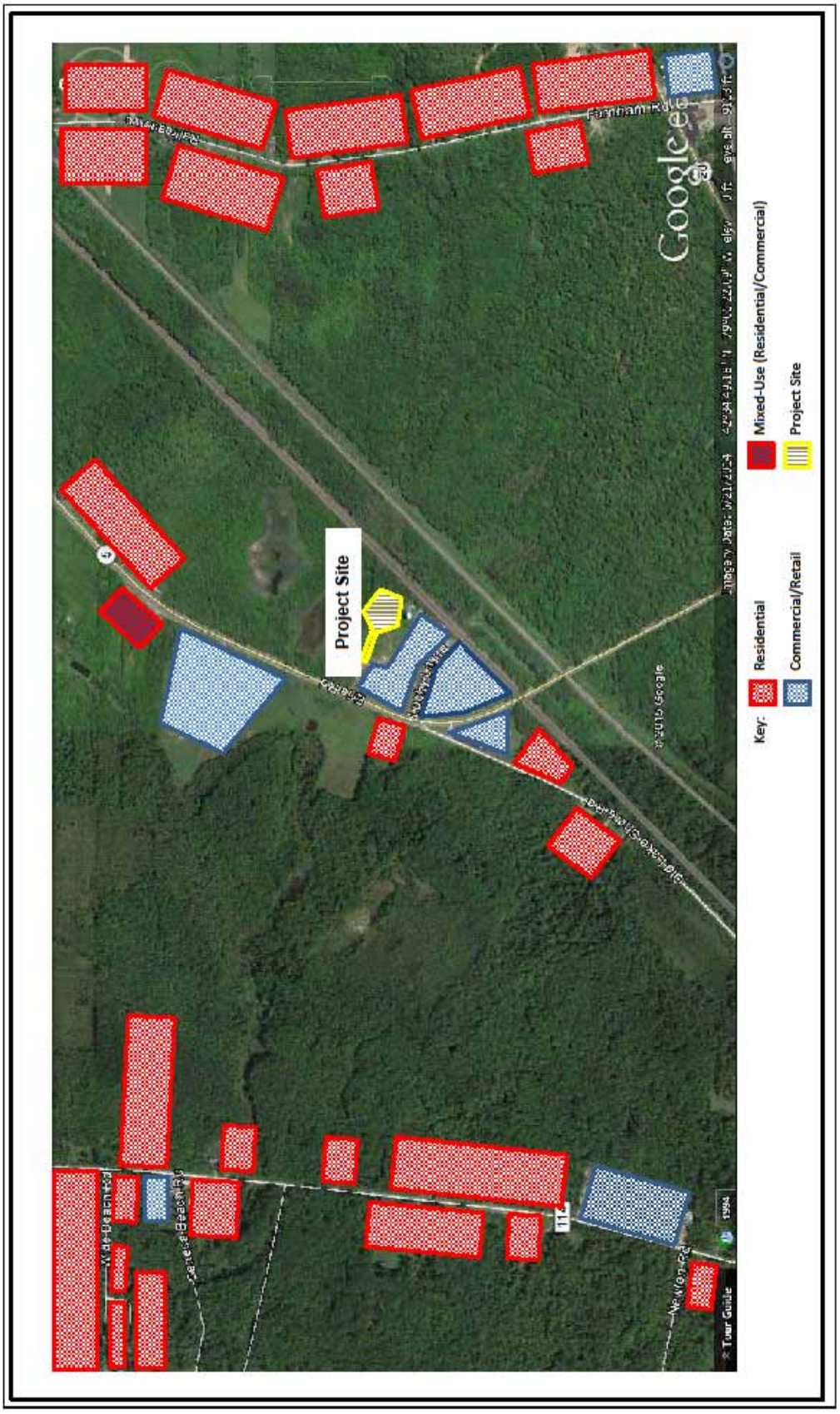

Figure 3-7. Land Uses Surrounding the Project Site

3.3.8 NOISE

Noise is any unwanted, undesirable sound. It has the potential to interfere with communication, damage hearing, and, in many cases, it is viewed as an annoyance. Noise can occur at different levels and frequencies, depending on the type of source and the distance away from the listener.

The standard unit of measure for sound pressure levels is the decibel. A decibel is a unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the measured pressure to the reference pressure, which is 20 micropascals. Typically, environmental and occupational sound pressure levels are measured in decibels on an A-weighted scale (dBA). The A-weighted scale deemphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear [i.e., using the A-weighting filter adjusts certain frequency ranges (those that humans detect poorly)] (Colby et al. 2009)]. Table 3-8 lists common outdoor and indoor sound sources and associated A-weighted noise levels.

Table 3-8. Typical Sound Pressure Levels Measured in the Environment and Industry

Noise Source at a Given Distance	A-Weighted Sound Level in Decibels (dBA)	Qualitative Description
Carrier deck jet operation	140	
	130	Pain Threshold
Jet take-off (200 feet)	120	
Auto horn (3 feet)	110	Maximum Vocal Effort
Jet take-off (1000 feet) Shout (0.5 feet)	100	
N.Y. subway station Heavy truck (50 feet)	90	Very Annoying Hearing Damage (8-hr. continuous exposure)
Pneumatic drill (50 feet)	80	Annoying
Freight train (50 feet) Freeway traffic (50 feet)	70 – 80	
	70	Intrusive (telephone use difficult)
Air conditioning unit (20 feet)	60	
Light auto traffic (50 feet)	50	Quiet
Living room Bedroom	40	
Library Soft Whisper (5 feet)	30	Very Quiet
Broadcasting/Recording Studio	20	
	10	Just Audible

Source: Colby et al. 2009.

The EPA identifies noise levels necessary to protect public health and welfare against hearing loss, annoyance, and activity interference in its document, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (EPA 1974). These noise levels are provided in terms of "24-hour exposure" levels or of an average of acoustic energy over periods of time such as 8 hours or 24 hours, and over long periods of time such as years. A cumulative 24-hour measure of noise accounts for the moment-to-moment fluctuations in A-weighted decibel levels because it combines all sound sources

during 24 hours. For example, occasional higher noise levels would be consistent with a 24-hour energy average of 70 dBA, as long as a sufficient amount of relative quiet is experienced for the remaining period of time.

A 24-hour exposure level of 70 dBA is indicated by EPA as the level of environmental noise at which any measurable hearing loss over a lifetime may be prevented. Levels of 55 dBA outdoors and 45 dBA indoors are defined as preventing activity interference and annoyance to human receptors. Spoken conversation and other daily activities such as sleeping, working, and recreating, occur at these levels. In noise-sensitive areas such as where people sleep, EPA modified these latter criteria by making them Day Night Average Sound Level (DNL) values. The DNL values represent energy averages over a 24-hour period, but a 10-decibel penalty is added to sounds that occur during the 9 hours between 10 p.m. and 7 a.m. Accordingly, in residential areas, for example, EPA's guidelines for sound levels to avoid activity interference and annoyance are DNL levels of 55 dBA outdoors and 45 dBA indoors. These levels of noise are those at which spoken conversation and other daily activities, such as sleeping, working and recreation, can readily occur. Table 3-8 shows common indoor and outdoor sound sources and typical associated sound levels. It is always important to list the distance to the source as well as the level.

The EPA has an existing design goal of a DNL less than or equal to 65 dBA and a future design goal DNL of 55 dBA for exterior sound levels (EPA 1977). The EPA guidelines and design goals are useful tools for assessing a project's noise impacts. SNI does not have noise regulations enforced for the Cattaraugus Territory. However, SNI does consider operating noise levels that exceed ambient noise levels outside of structures.

3.3.8.1 Affected Environment

The area surrounding the project site is primarily rural residential with some commercial/retail, industrial, and agricultural uses interspersed. Ambient noise sources surrounding the project area primarily result from traffic on NY 5 and Interstate 90 (I-90). Intermittent sources of noise in the area include trains passing by on the rail line approximately 200 feet northeast of the project site. Minimal intermittent noise from aircraft occurs from the Dunkirk Airport, approximately 10 miles southwest of the project site.

Six representative potential noise-sensitive receptors were identified within a one-mile radius around the project site (Figure 3-8). Noise sensitive receptors are considered facilities or locations where a state of quietness is a basis for use, or where excessive noise interferes with normal use of a particular facility or location. Noise sensitive receptors include schools, hospitals, churches, libraries, homes, and parks. Some species of wildlife may also be sensitive to noise.

As shown in Figure 3-8, the nearest residential receptor is a single-family residence located approximately 1,000 feet west of the project site. Other identified noise receptors include single-family residences approximately 1,500 feet southwest of the project site on Old Lakeshore Road, single-family residences approximately 2,700 feet southwest of the project site on Milestrip Road, single-family residences approximately 3,900 feet southeast of the project site near the intersection of Milestrip Road and Southwestern Boulevard, single-family residences

approximately 3,600 feet east of the project site on Railroad Avenue, and a seasonal golf driving range located approximately 1,500 feet northwest of the project site off NY 5.

In order to evaluate the existing ambient noise levels, noise measurements were taken at the six noise-sensitive receptor locations shown in Figure 3-8. Noise measurements were taken before sunrise with little to no traffic and during the lunch hour (which was considered a period of high traffic) during the weekday, using an EXTECH Instruments Model 407764 Datalogging Sound Level Meter with wind shielding. Table 3-9 lists the ambient sound pressure level measurements at the six identified noise-sensitive receptor locations. Snow cover on the ground during the month of February 2015, when the measurements were taken, ranged from 1 to 2 feet in most locations, with intermittent wind gusts up to 19 to 30 miles per hour. Note that although single measurements only provide a snapshot of the noise environment, the results are comparable to commonly accepted sound levels for noise sources.

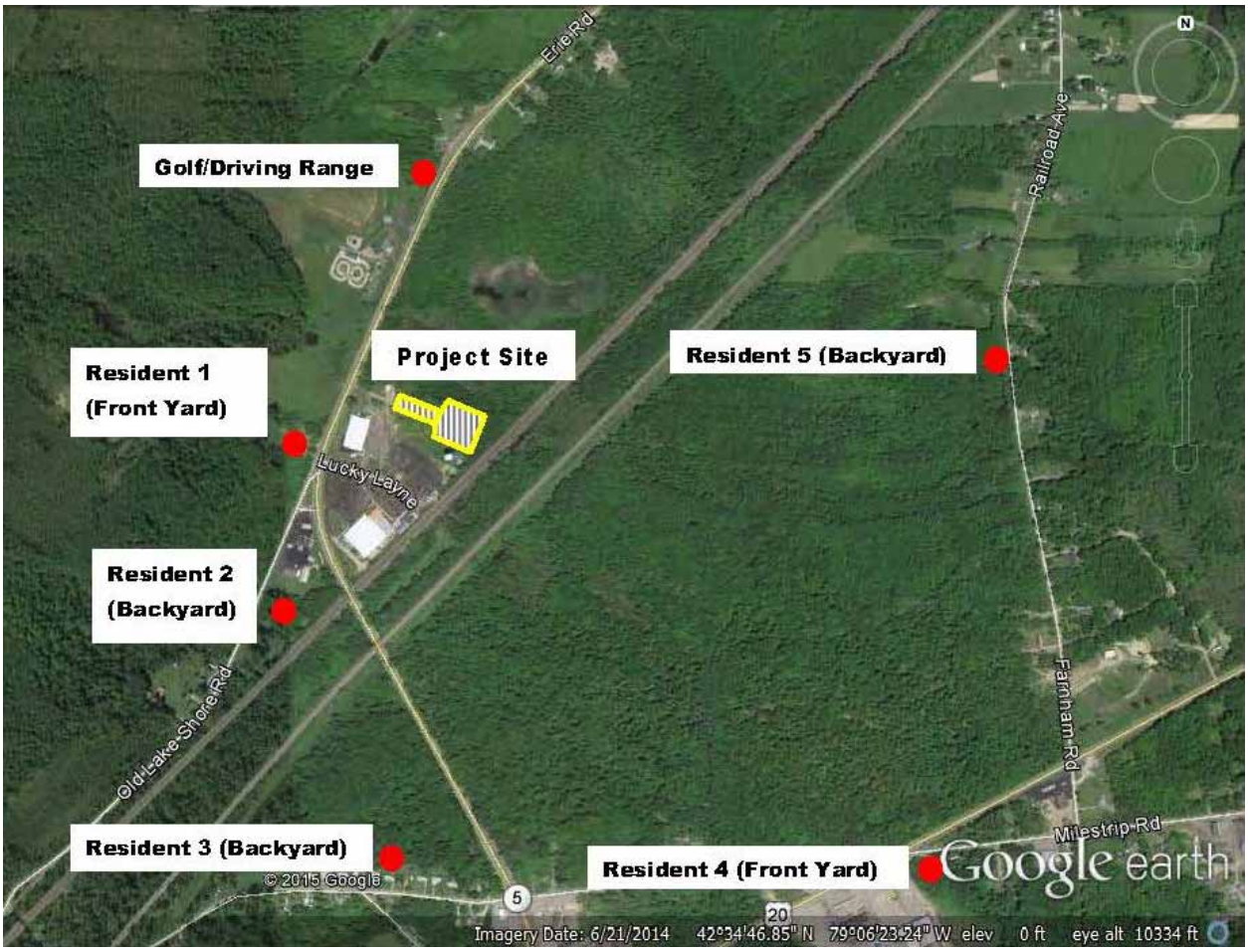

Figure 3-8. Potential Noise-Sensitive Receptors in Project Area

Table 3-9. Ambient Noise Sound Pressure Level Measurements

Location	AM		PM	
	Min (dBA)	Max (dBA)	Min (dBA)	Max (dBA)
Resident 1 - 111112 Route 5	40.7	57.2	48.4	62
Resident 2 -11696 Old Lakeshore Road	37	51.3	41.7	47
Resident 3 - 332 Milestrip Ext	37.9	47	44.3	52.4
Resident 4 - 535 Milestrip Rd.	48.5	71.5	51.2	77.2
Resident 5 - 11090 Farnham Rd.	40	60	46.6	54
Golf/Driving Range - 10862 Route 5 (seasonal)	49.9	53.6	40.8	48.1

3.3.8.2 Environmental Impacts

During construction, the project would require clearing, grading, and excavation of land, generating noise from construction equipment during daytime hours over a 12-month period. Given that the project site is within 1,000 feet from a noise-sensitive receptor and a major arterial highway (NY 5), construction noise likely would increase ambient noise levels. However, construction noise sources would be temporary, and thus would not result in sustained adverse impacts to nearby sensitive receptors.

Sound generated by wind turbines are either mechanical or aerodynamic in nature, resulting from components in the nacelle (mechanical) or, more commonly, from blade movement/flow of air over the blades (aerodynamic), heard as a "whooshing" sound. These types of sounds have been reduced over the years with improvements in wind turbine designs and technologies (e.g., the thickness of the trailing edges of the blades, upwind vs. downwind designs, and improved insulation for gearboxes). The aerodynamic noise has a frequency range approximately between 500 hertz and 1,000 hertz and tends to be less noticeable by humans when compared with sound from road traffic, trains, aircraft, and industrial activities. Sound levels also vary depending on the distance and the environmental conditions present in an area, including wind direction, atmospheric conditions, wind speed, vegetation cover, topography, and background sound levels.

Sound pressure levels from point sources diminish at a rate of approximately 6 dBA per doubling of distance from the source. Based on manufacturer specifications representative of the wind turbine SNI would install, the maximum noise levels that can be expected at the location of the wind turbine range from 105 dBA to 107 dBA (107 dBA without low noise trailing edge technology), which would be inaudible at distances sufficiently far from the turbine (see Table 3-10).

Table 3-10. Estimated Noise from a GE 103 1.7 Megawatt Turbine per Doubling of Distance

Distance (feet)	1	2	4	8	16	32	64	128	256	512	1,024	2,048	4,096
Sound Pressure Level (dBA)	107	101	95	89	83	77	71	65	59	53	47	41	35

The nearest noise-sensitive receptor (Resident 1) is located approximately 1,000 feet west of the project site. Given the rate of attenuation shown above and distance from the site, the estimated sound levels would be between 47 dBA and 53 dBA (consistent with ambient sound level measurements at this receptor location) when wind speeds exceed 17.9 miles per hour and may be even lower depending on the turbine selected. This range of sound is similar to sound levels in a living room or from light automobile traffic within 50 feet of a receptor, or qualitatively described as quiet. Additionally, sound from the turbine would be attenuated by the sports arena structure and trees before it reached the residence, and any sound would be masked by the traffic sound from NY 5 adjacent to the residence. The stated sound levels would be even lower; i.e., below 47 dBA, at single-family residences farther away (i.e., Residents 2 through 5). Finally, noise levels can be lower depending on slower wind speeds and other environmental conditions, including snow levels during the winter season, which cause a muffling effect.

Given the estimated sound levels of the turbine from 47 dBA to 53 dBA at the nearest noise-sensitive receptor, and based on existing ambient noise levels measured in the area during the morning and nighttime hours (shown in Table 3-9 above), DOE expects that noise impacts from operation of the proposed turbine to nearby sensitive noise receptors would be minimal or imperceptible.

3.3.9 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Executive Order 12898, "Environmental Justice," directs federal agencies to identify and address "disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Potential for impacts to socioeconomic and environmental justice factors include evaluating such parameters as employment statistics, public services, and other economic factors in an area being considered for a proposed action.

3.3.9.1 Affected Environment

Based on U.S. Census data gathered for the year 2013, the racial makeup of the SNI Cattaraugus Territory is approximately 76 percent Native American, compared with 0.7 percent Native American in Erie County, and 1.0 percent Native American in New York State as a whole. The remainder of the population of the Cattaraugus Territory is 3.5 percent white and other minority populations. Socioeconomic conditions in the SNI Cattaraugus Territory fall below New York State conditions and local surrounding counties. The median household income for a household in the SNI Cattaraugus Territory on average during 2013 was $36,719, compared with $50,653 in Erie County, $58,693 in the New York (non-metro) area, and $58,003 in New York State as a whole. Unemployment rates also were higher in the SNI Cattaraugus Territory compared to Erie County and New York State (New York Department of Labor 2014; Census Bureau 2015).

3.3.9.2 Environmental Impacts

No substantive negative impacts to the socioeconomics of the area are expected. However, there would be a short-term economic benefit and a minor long-term economic benefit to the area.

During construction, the proposed project would generate 25 short-term jobs (approximately 12 months in duration). Depending on the skill set available in the area, this would have the

potential for construction workers to move into the area or result in the creation of jobs for SNI residents, thus boosting local economic activities. The project would not eliminate jobs in the SNI Cattaraugus Territory or for SNI members. Furthermore, DOE does not anticipate that construction would result in the creation or displacement of housing/residences or businesses in the area. Indirect effects would benefit the local economy, including temporary housing and services for in-migrating construction workers and businesses that would support turbine maintenance and supply chain manufacturing.

During operations, the proposed project is anticipated to create 3 full-time-equivalent jobs, as minimal manpower is generally required for the operation and maintenance of one wind turbine; nonetheless, the project would have minor potential to result in additional employment opportunities for SNI residents and boosting local economic activities. There would be no expected population increase resulting from the proposed project that would result in housing demands and public service demands that could not be met by existing resources in the area.

Consistent with SNI's goals, the project would equalize rates between the SNI Cattaraugus Territory and Allegany Territory, resulting in an approximately 40 percent cost savings to SNI. The cost savings would be distributed to SNI Cattaraugus Territory residents, providing not only economic benefits, but also a social justice benefit for resident members (currently, Allegany residents pay 5 to 6 cents per kilowatt-hour, while Cattaraugus residents pay approximately 12 to 14 cents per kilowatt-hour). Therefore, the proposed project would not adversely affect the socioeconomic condition for the SNI members; long-term benefits of the electricity rate cost equivalency would be considered a beneficial impact.

The temporary jobs brought into the relatively low-income community would represent a small benefit to the area's economy. Therefore, the net impact of the proposed project would not result in disproportionately high and adverse impacts on minority and low-income populations.

3.3.10 TRANSPORTATION

Transportation includes those systems used to move people and goods and services. This EA addresses the local and regional roadways and railroads, both of which are important to the region's economy.

3.3.10.1 Affected Environment

The project site is approximately 600 feet northeast of Lucky Layne Road. Ingress and egress to the project site is currently available via Lucky Layne Road and through the SNI Bingo Hall parking lot or through an incomplete access road north of and parallel to Lucky Layne Road off NY 5 (see Figure 2-2 above).

The main highways in the project area include I-90, NY 5, and U.S. Route 20. These highways generally run parallel to the Lake Erie shoreline in a northeasterly-to-southwesterly direction. NY 438 runs in an easterly-to-westerly direction along the entire length of the SNI Cattaraugus Territory and connects with NY Route 62 in the city of Gowanda to the east and U.S. Route 20 in the western part of the Territory.

The latest available average annual daily traffic counts (i.e., the number of vehicles expected to travel on the road segment on any given day based on an annual average) for the local roadway and highway network were obtained using the NYSDOT GIS Traffic Data Viewer and are shown in Figure 3-9. The average annual daily traffic count near the project site along NY 5 is approximately 7,000 vehicles.

Figure 3-9. NYSDOT Average Daily Traffic Counts, 2012 (Source: NYSDOT, Traffic Data Viewer, http://gis.dot.ny.gov/tdv/; accessed March 12, 2015)

Other types of transportation in the area include the CSX railroad, approximately 200 feet east of the project site. CSX uses this railway for transport of freight including consumer products, automobiles, food and agriculture products, coal and chemicals. There are no passenger trains that utilize this railway. The nearest public airport identified is the Dunkirk Airport located in the City of Dunkirk approximately 10 miles southwest of the project site.

3.3.10.2 Environmental Impacts

The project would create up to 25 short-term jobs (approximately 12 months in duration) that would add light-duty truck traffic to the area during the selection, evaluation, and construction of the project. The project also would require the transport and delivery of wind turbine components and materials. A single turbine can require up to eight hauls (one nacelle, one hub, three blades, and three tower sections), and up to 60 hauls for the transport of a large-capacity crane. Up to 93 construction-related traffic trips to and from the project site could occur over the

12-month construction period. However, the project site is accessible from major highways and would only require a short distance on other roads to the project site. Nonetheless, this may require a short-term alteration of existing traffic patterns, and local highways and roadways may be temporarily affected during the transport of equipment and materials.

It is anticipated that the turbine manufacturer would provide transport as part of its supply agreement, assuming responsibility for any damage to the local roadway upon which the turbine equipment is hauled, damage to personal property along the route, or injury to persons from the transport of the turbine equipment. The turbine manufacturer would develop transportation plans that would identify the routes, taking into account turning radius and overhead obstructions such as overpasses and power lines. Plans would also specify any coordination with local and regional governments, law enforcement, and emergency response agencies. I-90, approximately 1 mile east of the project site, would be the primary route for hauling equipment and materials to the site. Secondary roads from I-90 would be selected based on more detailed planning.

Based on the anticipated vehicle transport routes and average daily traffic count results, the addition of up to 93 construction-related trips to average daily traffic flow during a 12-month construction period would have a negligible impact to existing traffic. Drivers on affected roads may be inconvenienced temporarily; however, impacts would be minimized to the extent practicable, including avoiding peak hours, nights, weekends, and holidays. BMPs to minimize impacts during turbine transport are presented in Section 3.4.

During operations, the project would require 3 full-time-equivalent jobs and several vehicle trips per day for operation and maintenance purposes. These vehicle trips would represent a negligible increase in traffic above present levels and would be handled sufficiently by the existing road network. Therefore, the project would not adversely impact the surrounding local roadways and network, and traffic- and transportation-related impacts would be negligible.

3.3.11 UTILITIES AND ENERGY

This section of the EA discusses the utility infrastructure, including electrical power transmission, and associated potential impacts from the Proposed Action. BMPs for utilities and energy are presented in Section 3.4.

The wind turbine would connect to the National Grid system via net metering, which allows utility customers to offset some or all of their energy use with self-produced renewable energy, such as the proposed wind turbine. SNI would generate a credit through aggregated net metering that will provide rate cost equivalency and savings to SNI residents on the Cattaraugus Territory approximately equal to residents on the Allegany Territory. This credit will be administered through Seneca Energy, which is the newly established SNI utility organization.

3.3.11.1 Affected Environment

Electricity for SNI's administration, judicial, public safety, and small commercial needs are currently provided by National Grid. No electricity service is currently available for the project site; however, two connections to National Grid's electrical infrastructure are available close to the project site; one along Lucky Layne Road and the other at the Gil Lay Memorial Sports Arena building.

Existing electricity usage rates for SNI were gathered from National Grid's online account service tool. As shown in Table 3-11, the usage rates for SNI's administration buildings totaled 10 million kilowatt-hours in 2012.

Table 3-11. SNI Electricity Usage Data, 2012

Rate Class	# of Accounts	Usage kWh
SC1	13	110,920
SC2	15	51,443
SC2-D	16	1,377,426
SC3	4	8,997,728
Total	48	10,537,517

Source: National Grid self-service web tool (https://www1.nationalgridus.com/StateLandingNY; accessed March 1, 2015).

3.3.11.2 Environmental Impacts

The wind turbine would connect to the National Grid system, and would require the creation or extension of the energy transmission or supply system. As mentioned above, the project site is in close proximity to existing electrical infrastructure owned and operated by National Grid; therefore, impacts associated with connecting new electricity service would be minimal.

The project would require securing a remote net metering agreement with National Grid prior to construction of electrical cable lines to the project site for interconnection, pending completion of the investigation and subsequent design of the potential interconnection service points and input and review by National Grid. Further, a coordinated electric system interconnection review by the utility provider would occur prior to any modifications or updates to the grid, as necessary. SNI would be responsible for any modification to the electrical grid and would coordinate the scheduling of such modification with National Grid.

The installation of the wind turbine is not anticipated to generate an increase in electricity use. Instead, the project would generate electricity that would service SNI, including administrative, judicial, public safety, and small commercial needs. Economically, the generation credit derived from the aggregated net metering and credited against the commercial accounts of SNI would reduce SNI electricity costs by more than one-third. Pending final turbine selection, it is anticipated that the project would generate up to 5,000 megawatt-hours of energy annually, which would offset SNI's 10,000 megawatt-hours of existing energy usage, which currently consists of fossil fuel- and nuclear-based energy.

3.3.12 INTENTIONAL DESTRUCTIVE ACTS

Intentional destructive acts are acts of sabotage or terrorism but could also include mischievous acts of vandalism to, or theft of, project components.

3.3.12.1 Affected Environment

Installation and operation of the proposed wind turbine would not involve the transport, storage, or use of radioactive, explosive, or toxic materials, nor is the project a component of a major energy project that serves a large population base. Thus, it is highly unlikely to be viewed as a

potential target by saboteurs or terrorists. There are no sources of information regarding acts of terrorism or vandalism specific to wind turbines. However, there is anecdotal evidence that this should be a concern to wind energy generation developers. An investigation into a recent turbine collapse in the United Kingdom revealed that bolts were missing from the turbine base. Though the turbine collapsed during a high wind event, it is speculated that it could be the result of an intentional act of sabotage (Collins 2013).

Equipment theft is very costly and a growing concern to construction projects. According to the National Insurance Crime Bureau, in 2012, close to $300 million was lost nationwide to the theft of construction equipment (NICB 2013). A 2008 industry research study commissioned by LoJack Corporation and the National Insurance Crime Bureau showed that 71 percent of equipment owners have experienced the theft of equipment in the previous year (LoJack 2012). According to LoJack, the types of equipment most frequently stolen are light utility work trucks and trailers, loaders, skid steers, and generators/air compressors/welders.

3.3.12.2 Environmental Impacts

The most likely related impacts to wind turbines are theft and vandalism, including gunfire, objects thrown at the turbine structure, graffiti, and theft of equipment, tools, or materials. Although these types of impacts are considered unlikely, if they do occur, they pose lower safety risks to individuals but could cause temporary disruptions to electrical service. Wind turbines generally are designed and constructed to minimize the potential for their destruction, damage, or displacement. BMPs to help minimize impacts from intentional destructive acts are presented in Section 3.4.

3.4 Best Management Practices

SNI, as a sovereign entity, has authority to manage their lands in accordance with tribal goals and objectives. SNI would conduct each phase of the Wind Turbine Project in compliance with applicable laws, regulations, permits, and procedural requirements related to construction, operation and maintenance, and decommissioning activities. SNI would develop and implement BMPs to avoid or minimize potential environmental impacts of the proposed project in a cost-effective manner while meeting the project objectives. BMPs can include schedules of activities, prohibitions of practices, maintenance procedures, monitoring, operating procedures and practices, control measures, environmental restoration, and communications. The SNIEPD is responsible for regulating and permitting environmental issues within the territories of the Seneca Nation. The SNIEPD would develop a review and approval process for each phase of the project to ensure that required BMPs are implemented as appropriate for construction, operation, and decommissioning.

The following BMPs have been identified for the Wind Turbine Project for applicable environmental resource areas. SNI has made the commitment to follow the BMPs in this section that were identified during the development of the SNI Wind Turbine Project and the preparation of this EA. These commitments would be incorporated and binding through the DOE financial assistance award. The BMPs are not necessarily being implemented to decrease the level of impact below significant (i.e., the impacts may have been less than significant with or without

the measures) but to further reduce the likelihood of impacts and to ensure the project is carried out in an environmentally responsible manner.

Air Quality and Climate Change

- Maintain construction equipment in good operating condition to minimize emissions.
- Use dust control measures (e.g., watering roads) to reduce fugitive emissions.

Biological Resources

- Restore disturbed sites not needed for wind turbine operations with native species.
- Perform vegetation clearing of the project site between October 1 – March 31 to avoid potential impacts to roosting bats and nesting migratory birds.
- Prepare an avian and bat mortality monitoring plan and conduct mortality monitoring for 3 years (3 seasons: spring, summer, and fall) in coordination with SNIFWD to assess potential impacts. The monitoring program may be adjusted based on acquired data.
- The wind turbine cut-in speed between dusk and dawn from April 1 – September 30 (during avian and bat migration and bat roosting) would be set at 15.4 miles per hour (6.9 meters per second) to avoid potential impacts to bats and birds. (This restriction may be re-evaluated once further data has been compiled by SNI.)
- Employ only red strobe-like or flashing lights, not steady burning lights, to meet FAA requirements for visibility lighting of the wind turbine to avoid attracting birds or bats and insect prey.
- To the extent practical, minimize lighting in the surrounding area and use downward directed and motion sensitive lights.
- Use erosion control fences or barriers during construction to minimize run off of sediment.

Cultural and Historic Resources

- Maintain compliance with THPO requirements for protection of cultural and historic resources.
- Conduct cultural resources monitoring during construction activities.
- Conduct staff and contractor training regarding cultural resources and potential stop-work authority if resources are found during construction.

Health and Safety

- Prepare and adhere to a health and safety plan for the identified activities associated with construction and operation.
- Use applicable lighting and signage on and surrounding project equipment that will identify potential hazards to workers, members of the public, and aircraft in the area.
- Implement ice buildup mitigation procedures, including modification of operating parameters and deicing turbine features consistent with manufacturer recommendations.
- Identify and implement site security features and procedures to protect against unauthorized access and impacts to project assets.

Transportation

- Develop a transportation plan for the transport of the crane and the wind turbine components.
- Schedule transportation when local and tourist traffic is minimal.
- Coordinate shipments with local law enforcement and emergency services.

Utilities and Energy

- Coordinate with local utility provider regarding wind turbine electrical power generation, transmission, customer distribution, usage, and rate structure.

Intentional Destructive Acts

- Identify and implement site security features and procedures to protect against unauthorized access and impacts to project assets.
- Implement countermeasures such as regular inspections, security patrols, fencing, signs, and/or video cameras to deter or prevent theft, vandalism, and unauthorized access.

Decommissioning

- Prepare a decommissioning plan that incorporates manufacturer's guidelines and BMPs from this section that are appropriate and applicable at the time of decommissioning and any additional BMPs specific to decommissioning activities.

3.5 Unavoidable Adverse Impacts

The Proposed Action would have unavoidable adverse impacts. Temporary unavoidable adverse impacts would include loss of approximately 1.0 acre of forest during construction and installation of the wind turbine, a minimal increase in noise during construction, and traffic delays during transport of turbine components and construction equipment to the project site.

Long-term unavoidable adverse impacts would include loss of approximately one-quarter acre of forest and one-half acre of grassland that would be occupied by the wind turbine and access road, respectively; introduction of a dominant vertical element to the visual character of the affected environment; and possible annoyance of some nearby residents from shadow flicker during certain times of the year. Some take of individual birds and bats may occur during wind turbine operation even when all reasonable measures to avoid a take have been implemented. Such take is generally considered unavoidable. However, there is no reason to believe that any threatened or endangered species would be taken.

3.6 Relationship Between Short-Term Use of Environment and Maintenance and Enhancement of Long-Term Productivity

Short-term use of the environment occurs during the life of the project, whereas long-term productivity refers to the time period after the project has been decommissioned, the equipment removed, and the land reclaimed and stabilized. Current use of the site is undeveloped SNI-owned sovereign forest land and grassland adjacent to the SNI Bingo Hall and Gil Lay Memorial Sports Arena. The short-term use of the site for the wind turbine project would not affect the long-term productivity of the area for either forest and grassland wildlife habitat or other SNI purposes. When operation of the wind turbine was no longer practicable, it would be decommissioned, removed, and vegetation would be reclaimed on the site or the site could be used for other purposes.

3.7 Irreversible and Irretrievable Commitment of Resources

An irreversible or irretrievable commitment of resources can be defined as the loss of future options. Irreversible effects result primarily from consumption or destruction of a specific resource that cannot be replaced within a reasonable timeframe, such as fossil fuels or soils. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action, such as the destruction of a cultural site or extinction of an endangered species.

Labor, energy, and materials would be committed for construction and installation of the wind turbine. These resources would not be recovered. Construction would make permanent use of building materials. The construction materials, except to the extent they can be recycled, would be irretrievably committed. Fossil fuels would be irreversibly lost through the use of gasoline- and diesel-powered construction equipment.

4 CUMULATIVE IMPACTS

Cumulative impacts are those potential environmental impacts that result "from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7). Cumulative impacts are discussed for those resource areas where cumulative impacts could occur even if considered relatively minor.

4.1 Other Projects

The Proposed Action would add one additional wind turbine in Erie County to the existing 14 wind turbines at the 35 megawatt Steel Winds I & II facility in Lackawanna, New York, located 20 miles to the north, near the city of Buffalo. Approximately 300 wind turbines (approximately 440 megawatts of generation capacity) are located 35 to 45 miles east of the project site in Wyoming County. An estimated 70 wind turbines with a generation capacity of 126 megawatts are planned for development in Chautauqua County, approximately 15 miles southeast of the project site. Information on existing and planned wind energy facilities was obtained from the NYSDEC renewable energy website, http://www.dec.ny.gov/energy/48089.html.

The SNI Wind Turbine Project is near the SNI Bingo Hall and Gil Lay Memorial Sports Arena. Additional developments on SNI sovereign lands in the vicinity could include industrial or business parks and possibly greenhouses.

4.2 Potential Cumulative Impacts

4.2.1 AESTHETICS AND VISUAL RESOURCES

The Proposed Action would introduce a dominant vertical component to the landscape surrounding the project site. The project would not be cumulative with other existing or reasonably foreseeable wind turbines (i.e., wind farms) in the region because those structures range from 15 to 45 miles from the project site. The Proposed Action could have a small cumulative impact on the visual landscape with respect to other existing or reasonably foreseeable vertical landscape components such as water towers, cell towers, and electrical transmission towers.

4.2.2 BIOLOGICAL RESOURCES

The Proposed Action would impact native plant species only in a small area. Depending on where other reasonable and foreseeable industrial or commercial developments are located (i.e., previously disturbed or undisturbed sites), the project could have no cumulative effect or a small cumulative effect on native plants species. Other existing and planned wind energy projects in the western New York region are spread across several counties. Any mortality of migratory birds and bats, even when all reasonable measures to avoid a take have been implemented, during operation of the single wind turbine would be a small cumulative effect relative to other wind energy projects.

4.2.3 NOISE

The Proposed Action would create noise levels similar to existing outdoor levels and could have a small cumulative effect on noise levels from other reasonably foreseeable development projects in the immediate vicinity of the project site.

4.2.4 SOCIOECONOMICS

The Proposed Action would create an estimated three new long-term jobs and also potentially decrease electrical rates in the Cattaraugus Territory by 40 percent, providing economic benefit to SNI residents. The project could have a beneficial cumulative effect on economic conditions with other reasonable and foreseeable development projects in the Cattaraugus Territory that provide job opportunities.

4.2.5 UTILITIES AND ENERGY

The Proposed Action would not increase energy use and would partially replace electrical power currently purchased from the electrical grid. The proposed project would require a net metering connection to the existing electrical grid. Therefore, the project would have a small (relative to other regional wind energy projects) cumulative effect on the amount of renewable energy supplied to the regional electrical grid.

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