Draft Environmental Impact Statement For The Dutch Hill Wind Power Project

TOWN OF COHOCTON
STEUBEN COUNTY, NEW YORK

Project Sponsor:	Canandaigua Power Partners II, LLC 100 Wells Avenue, Suite 201 Newton, Massachusetts 02459 Contact: Chris Swartley Phone: (617) 964-3340
Lead Agency:	Town of Cohocton Planning Board P.O. Box 327 Cohocton, New York 14826-0327 Contact: Ms. Sandra Riley, Town Clerk Phone: (585) 384-5330
Prepared By:	ESS Group, Inc. 401 Wampanoag Trail, Suite 400 East Providence, Rhode Island 02915 Contact: Steve Wood Phone: (401) 330-1206
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COMMONLY USED ACRONYMS AND ABBREVIATIONS

ºC	Degrees Celsius
ºF	Degrees Fahrenheit
µt	Microtesla
ABR	Alaska Biological Research, Inc.
AC	Alternating Current
ACI	American Concrete Institute
AG-R	Agricultural-Residential
amsl	Above Mean Sea Level
APE	Areas of Potential Effect
APLIC	Avian Power Line Interaction Committee
ARA	Avian Risk Assessment
AusWEA	Australian Wind Energy Association
AWEA	American Wind Energy Association
BBA	Breeding Bird Atlas (New York State)
BBS	North American Breeding Bird Survey
BCM	Bat Conservation & Management, Inc.
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CPP II	Canandaigua Power Partners II, LLC
CRM	Cultural Resource Management
CSI	Construction Standards Institute
cy	Cubic Yards
dB	Decibels
dBA	Decibels, A-rated
dBC	Decibels, C-rated
DEIS	Draft Environmental Impact Statement
DEM	Digital Elevation Model
DPW	Department of Public Works

COMMONLY USED ACRONYMS AND ABBREVIATIONS

EAF	Environmental Assessment Form
EDR	Environmental Design & Research, Landscape Architecture, Environmental Services, Engineering and Surveying, P.C.
EIS	Environmental Impact Statement
EMF	Electric Magnetic Fields
EMS	Emergency Medical Services
EPA	Environmental Protection Agency
ESS	ESS Group, Inc.
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
G	Gauss
GB	General Business
GIS	Geographic Information System
gpm	gallons per minute
GPS	Geographic Positioning System
Hz	Hertz
I	Industrial
IC	Interchange Commercial
IEEE	Institute for Electrical and Electronic Engineers
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt hour
Lbs	Pounds
LDR	Low Density Residential
L_{eq}	Equivalent Energy Sound Level
LMR	Land Mobile Radio
m/s	meters per second
mG	Milliguass

MMT	Million Metric Tons
mph	miles per hour
MSDS	Material Safety Data Sheets
MSL	Mean Sea Level
MW	Megawatts
MWh	Megawatt Hours
NAAQS	National Ambient Air Quality Standards
NEC	National Electric Code
NFPA	National Fire Protection Agency
NHP	Natural Heritage Program (New York State)
NHPA	National Historic Preservation Act of 1966
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxide
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWCC	National Water and Climate Centers
NWI	National Wetlands Inventory
NYAC	New York Archaeological Council
NYCRR	Official Compilation of Codes, Rules, and Regulations of the State of New York
NYISO	New York Independent Services Operator
NYS	New York State
NYSA&M	New York State Department of Agriculture and Markets
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
NYSDPS	New York State Department of Public Service
NYSEG	New York State Electric and Gas
NYSERDA	New York State Energy Research and Development Authority
NYSM	New York State Museum

O&M	Operations and Maintenance
OPRHP	Office of Parks, Recreation & Historic Preservation (New York State)
OS/OW	Oversize/overweight
OSHA	Occupational Safety and Health Administration
Pa	Pascal
PAF	Public Archaeology Facility
PAH	Polynuclear aromatic hydrocarbon
Pb	Lead
PCS	Personal Communication System
PILOT	Payment in Lieu of Tax
PM	Microns in Diameter
PPM	parts per million
PSC	Public Service Commission (New York State)
REPP	Renewable Energy Policy Project
ROW	Right-of-Way
rpm	revolutions per minute
RPS	Renewable Portfolio Standard
RSG	Resource Group, Inc.
SCADA	Supervisory Control and Data Acquisition
SCIDA	Steuben County Industrial Development Agency
SEQRA	State Environmental Quality Review Act
SHPO	State Historic Preservation Office (New York)
SIMS	Safety Information Management System
SO_2	Sulfur Dioxide
SPCC	Spill Prevention, Control, and Countermeasure
SPDES	State Pollutant Discharge Elimination System
SPL	Sound Pressure Level
STP	Shovel test pits

COMMONLY USED ACRONYMS AND ABBREVIATIONS

SWPPP	Stormwater Pollution Prevention Plan
T	Tesla
UPC	UPC Wind Partners, LLC
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey
VIA	Visual Impact Assessment
vpd	Vehicles Per Day
W	watt
WECO	Wind Energy in Cold Climates
WEI	Wind Engineers, Inc.
WMA	Wildlife Management Area

FIRMS INVOLVED IN PREPARATION OF THE DRAFT ENVIROMENTAL IMPACT STATEMENT

ESS Group, Inc. 401 Wampanoag Trail, Suite 400 East Providence, RI 02915 Steve Wood (401) 330-1206	**Canandaigua Power Partners II, LLC** 100 Wells Avenue, Suite 201 Newton, Massachusetts 02459 Chris Swartley (617) 964-3340
Environmental Design & Research, Landscape Architecture, Environmental Services, Engineering and Surveying, P.C. 238 West Division Street Syracuse, New York 13204 John Hecklau (315) 471-0688	**Woodlot Alternatives, Inc.** 30 Park Drive Topsham, Maine 04086 Robert D. Roy (207) 729-1199
Haley & Aldrich of New York 200 Town Centre Drive, Suite 2 Rochester, New York 14623-4264 Robert J. Mahoney (585) 359-9000	**Comsearch** 19700 Janelia Farms Blvd. Ashburn, Virginia 20147 David Flagg (703) 726-5500
Hessler Associates, Inc. 3862 Clifton Manor Place Haymarket, Virginia 20169 David M. Hessler (703) 753-1602	**Public Archaeology Facility** Binghamton University P.O. Box 6000 Binghamton, New York 13902-6000 Samuel M. Kudrle (607) 777-4786
Nixon Peabody, LLP Omni Plaza 30 South Pearl Street Albany, New York 12207 **Richard Cogen** (518) 427-2650	**Wind Engineering, Inc.** 7660 Whitegate Avenue Riverside, California 92506 Arne Nielsen (909) 789-5281
Cushman & Wakefield 200 SW Market Street, Suite 200 Portland, OR 97201-5730 P. Barton DeLacy (503) 279-1795	

1.0 EXECUTIVE SUMMARY

This Draft Environmental Impact Statement (DEIS) is for a proposed action known as the Dutch Hill Wind Power Project (the Project). Provided below is a brief project description, along with summaries of the regulatory process; the Project's purpose, need, and benefit; its potential environmental impacts; and proposed mitigation measures. Alternatives to the Project and its effect on use and conservation of energy are also reviewed.

Project Description

Canandaigua Power Partners II, LLC (CPP II) is proposing to develop a wind-powered generating facility of up to 16 turbines with a maximum rated capacity of approximately 40 megawatts (MW). The Project will generate electric power capable of meeting the electrical needs of up to 17,596[1] homes. In addition to the wind turbines, the Project will involve construction of one meteorological tower, a system of gravel access roads, an electrical collection system, and a 34.5 kilovolt (kV) transmission line to connect with an electrical substation on Lent Hill.

The Project will be developed on leased private land, totaling approximately 2,160 acres, in the Town of Cohocton. It will be constructed in one continuous phase anticipated to commence in the spring of 2007 and finish in December 2007. Once built, the wind turbines and associated components will operate in almost completely automated fashion. The Project will, however, employ approximately 5 operations and maintenance personnel. The wind turbine currently proposed is the Clipper Windpower Technology, Inc. Liberty C-96 (or an equivalent machine), with a minimum cut-in wind speed of approximately 4 meters per second (m/s) [9 miles per hour (mph)] required to generate electricity. This turbine's maximum rotational speed is 15.5 rpm and high-speed shutdown occurs when constant wind velocity exceeds roughly 25 m/s (56 mph). Each wind turbine has a computer control system to control critical functions, monitor wind conditions, and report data.

Regulatory Process

This DEIS has been prepared by ESS Group, Inc. (ESS) of East Providence, Rhode Island. The document is intended to facilitate the environmental review process and provide a basis for informed public comment and decision-making. This process is in accordance with the requirements of New York State's Environmental Quality Review Act (SEQRA). The Town of Cohocton Planning Board is acting as the lead agency under SEQRA.

Various plans and support studies have also been prepared in support of the Project, which provide detailed information on discrete topical areas in furtherance of the SEQRA evaluation. These studies include the following:

[1] Based on 5,974 kWh per household per year. (EIA New York Household Electricity Report, Table NY-1)

- Agricultural Protection Measures
- Groundwater Resources Report
- Cultural Resource Management Report
- Shadow Impact Assessment
- Transportation Study
- Off-Air Television Reception Analysis
- Licensed Microwave Search & Worst Case Fresnel Zone Study
- Spring 2006 Survey of Breeding Birds
- Avian and Bat Risk Assessment
- Visual Impact Assessment
- Environmental Sound Survey and Noise Impact Assessment

Purpose, Need, and Benefit

The purpose of the proposed Project is to create a wind-powered electric-generating facility that will provide a significant source of renewable energy to the New York power grid, in order to:

- Meet regional energy needs in an efficient and environmentally sound manner;
- Provide increased stability to the price volatility of fossil-fuel electricity generation in the region;
- Realize the full potential of the wind resource on the lands under lease;
- Promote the long-term economic viability of agricultural areas in New York State's Finger Lakes Region; and
- Assist New York State in meeting its proposed Renewable Portfolio Standard for the consumption of renewable energy in the State (see below).

The Project would facilitate compliance with the Public Service Commission (PSC) "Order Approving Renewable Portfolio Standard Policy," issued on September 24, 2004. This Order calls for renewable energy used in the state to increase to 25% (from the then level of 19%) by the year 2013. The Project responds to objectives identified in the 2002 New York State Energy Plan and Final Environmental Impact Statement (State Energy Plan) (New York State Energy Planning Board, 2002), and the Preliminary Investigation into Establishing a Renewable Portfolio Standard in New York (NYSERDA, 2003). These objectives include stimulating economic growth, increasing energy diversity, and promoting a cleaner and healthier environment. It is also consistent with Title II of the Energy Policy Act of 2005 (EPAct 2005) to increase the use of renewable energy resources for electric generation. The benefits of the proposed action include positive impacts on socioeconomics (e.g., increased payment-in-lieu of tax [PILOT] revenues to local municipalities and lease revenues to participating landowners), air quality (through reduction of emissions from fossil-fuel-burning power plants), and climate (reduction of greenhouse gases that contribute to global warming).

Summary of Potential Impacts

In accordance with requirements of the SEQRA process, potential impacts arising from the proposed action were evaluated with respect to an array of environmental and cultural resources. The analysis of potential impacts is summarized in Table 1.

Table 1. Summary of Potential Impacts

Environmental Factor	Potential Impacts
Physiography, Geology, and Soils	• Soil disturbance • Soil erosion • Soil compaction • Loss of agricultural land
Water Resources	• Temporary disturbance • Siltation/sedimentation • Stream crossings • Wetland filling
Biological Resources	• Vegetation clearing/disturbance • Incidental wildlife injury and mortality • Loss or alteration of habitat
Climate and Air Quality	• Construction vehicle emissions • Dust during construction • Reduced air pollutants and greenhouse gases
Aesthetic/Visual Resources	• Visual change to the landscape • Visual impact on sensitive sites/viewers • Shadow-flicker impact on adjacent residents
Cultural Resources	• Visual impacts on architectural resources • Disturbance of archaeological resources
Sound	• Construction noise • Operational impacts on adjacent residents
Transportation	• Road wear/damage • Traffic congestion/delays • Road system improvements/upgrades
Socioeconomic	• Host community payment/PILOT • Revenue to participating landowners • Expenditures on goods and services • Tourism • Short-term and long-term employment
Public Safety	• Construction concerns related to large equipment, falling objects, open excavations, electrocution • Possible ice shedding concerns • Project components catching fire

Table 1. Summary of Potential Impacts (continued)

Environmental Factor	Potential Impacts
Communication Facilities	• Temporary interference to communication signals • Degraded reception to off-air television signals
Community Facilities and Services	• Demands on police and emergency services • Relocated utility distribution lines and poles
Land Use and Zoning	• Adverse and beneficial impacts on farming • Changes in community character and land use trends

Project construction may result in permanent conversion of approximately 15 acres of vegetated land within the Project Site to unvegetated/built facilities (access roads, turbines, crane pads, etc.). This total may include approximately 13.5 acres of agricultural land, and 1.5 acres of forest. Permanent wetland impacts are estimated to total approximately 0.17 acres (transmission line poles). Project construction may also result in some level of temporary disturbance and congestion on area roadways.

Project operation is expected to result in some level of avian and bat collision mortality. Based on data from other comparable sites, bird mortality is expected to be in the range of 0-6 birds impacted per turbine per year. The turbines will be visible from a number of locations within the surrounding area, but will also be fully or partially screened from viewers in many locations (e.g., the Village of Cohocton). The turbines will result in a perceived change in land use from some locations, but may actually help keep land in active agricultural use by supplementing farmer's income. Predicted noise and shadow flicker impacts are modest: only four receptors have the potential to experience over 25 hours of shadow flicker annually. The project will comply with the requirements of the windmill local law noise limits. The highest predicted noise level at any residence is 44 A-weighted Decibels (dBA) and occurs at two residences that are on or just inside the 44 dBA contour line. The 50 dBA contour line is confined to participating property owners with the exception of two small areas where there are no houses or farm structures located. In no instances will this sound level be experienced at a neighboring residence. The Project is expected to generate approximately $500,000 per year ($10 million over 20 years) in PILOT revenues to local taxing jurisdictions, while requiring very little in terms of municipal services.

Summary of Mitigation Measures

Various measures will be taken to avoid, minimize and/or mitigate potential environmental impacts. General mitigation measures will include adhering to requirements of various local, state, and federal ordinances and regulations. CPP II will also employ environmental monitors to assure compliance with permit requirements and environmental protection commitments during construction. The proposed Project will result in significant environmental and economic benefits to the area. These benefits also serve to mitigate unavoidable adverse impacts associated with Project construction and operation.

Specific measures designed to mitigate or avoid adverse potential environmental impacts during Project construction or operations include:

- Siting the Project away from population centers and areas of residential development.
- Siting turbines primarily in open field areas to minimize required clearing of mature forest land to the extent practicable.
- Siting turbines and access roads so as to avoid impacts to wetlands and streams.
- Keeping turbines a minimum of 1,500 feet between the tower and the nearest dwellings, areas, or structures customarily used by the public to minimize noise, shadow flicker, and public safety concerns.
- Using existing roads for turbine access whenever possible to minimize disturbance to agricultural land.
- Utilizing construction techniques that minimize disturbance to vegetation, streams, and wetlands.
- Routing the overhead transmission line along existing railroad right of way, and other disturbed areas, to minimize clearing of forested areas and impacts on wetlands.
- Implementing agricultural protection measures to avoid, minimize, or mitigate impacts on agricultural land and farm operations.
- Limiting turbine lighting to the minimum allowed by the Federal Aviation Administration (FAA) to reduce nighttime visual impacts, and following lighting guidelines to reduce the potential for bird collisions.
- Developing and implementing various plans to minimize adverse impacts to air, soil, and water resources, including a dust control plan, sediment and erosion control plan, and Spill Prevention, Control, and Countermeasure (SPCC) plan.
- Entering into a PILOT agreement with the local taxing jurisdictions to provide a significant predictable level of funding for the town, county, and school districts over the first 20 years of the Project's operations.
- Development of an emergency response plan with local first responders.

Alternatives

Alternatives to the proposed Project that were considered and evaluated include no action, alternative project siting, alternative Project Area, alternative project design/layout, alternate project scale and magnitude, and alternative technologies. Analysis of these alternatives revealed that both the size of the Project and the configuration of the turbines as currently proposed are necessary to produce a commercially feasible project that minimizes adverse impacts to the extent practicable. A smaller project would not fully capture the available wind resource and would not generate enough power to be economically viable given the high project development and fixed construction costs, including the expense of connecting to the power grid. A larger facility might theoretically provide more economic return, but it would force location of towers into areas with more marginal wind power resources and greater proximity to residents, steep slopes, and/or forested areas. This would result in more numerous potential adverse environmental impacts than currently anticipated. A larger number of smaller turbines, while perhaps reducing visibility from some areas, would generally worsen the overall visual impact and would increase impacts associated with the more extensive road and interconnect systems required. Alternative technologies (e.g., different sources of generation) eliminate many of the environmental advantages associated with the proposed Project. In summary, the alternatives analysis concluded that the Project as proposed offers the optimum use of resources avoids or minimizes adverse environmental impacts to the maximum extent practicable.

Effects on Use and Conservation of Energy Resources

The proposed Project will have significant, long-term beneficial effects on the use and conservation of energy resources. Energy will be expended during the construction phases of the Project, as well as for the maintenance of the wind turbines and support facilities on-site. However, the operating Project will generate up to 40 MW of nameplate electricity without any fossil-fuel emissions. This greatly exceeds the energy required to construct and operate the Project, and the output is enough to power approximately 17,596 homes in New York State, (on an average annual basis). The Project will add electric generating capacity and will help diversify the state's sources of power generation, helping to stabilize power prices currently subject to the volatility in fossil fuel prices. Over the long term, the Dutch Hill Project will displace some of the state's older, less efficient, and dirtier sources of power, and at a minimum will help to push out the need to build new fossil fuel plants. The principal, overriding benefits of the Project are in conformance with the Federal goals of EPAct 2005 and in accordance with the 2002 State Energy Plan (New York State Energy Planning Board, 2002), namely:

- "Stimulating sustainable economic growth"
- "Increasing energy diversity…including renewable-based energy"
- "Promoting and achieving a cleaner and healthier environment"

2.0 DESCRIPTION OF PROPOSED ACTION

The subject of this DEIS is a proposed action known as the Dutch Hill Wind Power Project (the Project). The Project is described below in terms of its components, location, construction, and operation. The Project's purpose, need, benefit, cost and funding, and the permits and approvals necessary to construct and operate the Project are discussed below, along with a description of the regulatory process and opportunities for public and agency involvement in that process.

2.1 Introduction

CPP II is proposing to develop an approximately 40 MW wind-powered generating facility in the Town of Cohocton, Steuben County New York (Figure 1). The Project is anticipated to include up to 16 wind turbines, each with a generating capacity of 2.5 MW. The turbine array will be located on Dutch Hill north of the Village of Cohocton. Each of the 16 potential turbine sites is located in this area.

Each wind turbine will include a 96-meter (315-foot) diameter, three-bladed rotor mounted on an 80-meter (262-foot) tall tubular steel tower. The project also will include one meteorological tower, a system of gravel access roads, buried gathering lines (electrical interconnect), and a low voltage transmission line that is partially underground and partially overhead that will connect the turbine array to a substation on Lent Hill.

The layout was based on a number of factors, including wind resource optimization, availability of land rights and access routes, landowner preferences, and avoidance and minimization of environmental impacts. All of the potential turbine sites are located a minimum of 520 feet from the existing roads and at least 1,500 feet from nonparticipating neighboring residential structures, unless consent to a lesser distance has been obtained from neighboring land owners, in accordance with the Town of Cohocton Windmill Local Law No. 1 of 2006. Because of landowner decisions and potential unforeseen construction issues, all of the potential turbine locations remain subject to minor adjustments. However, any such adjustments will not change the affected resources, increase environmental impacts, or alter proposed mitigation, as described herein.

The Project is located in northern Steuben County, in the Appalachian Plateau and the Finger Lakes Highlands physiographic regions of New York State, approximately 7 miles south of the Village of Naples, 4 miles east of the Village of Wayland, and 9 miles north of the Village of Avoca (as measured from the closest proposed turbine). Located entirely within the Town of Cohocton, the Project will occur on approximately 2,160 acres of leased land (owned by seven individual landowners) located off of Shultz Hill Road, Fleishman Road, Davis Hollow Road, Dutch Hill Road, Drum Road, Atlanta Back Road, Zeh Road, State Route 371, and Edmond Road. This land is referred to as the Project Site (Figure 2).

The Project Site is a mature, eroded plateau with elevations ranging from approximately 1,300 feet above mean sea level (amsl) in the Cohocton River Valley to approximately 2,012 feet amsl northwest of the intersection of Zeh Road and Davis Hollow Road. The proposed turbine sites are located on Dutch Hill north of the Village of Cohocton. This area is accessed by County and local highways, including Shultz Hill Road, Fleishman Road, Davis Hollow Road, Dutch Hill Road, Drum Road, Atlanta Back Road, Zeh Road, State Route 371, and Edmond Road. It is dominated by open crop fields (primarily hay and corn), with forested areas generally confined to small woodlots and steep slopes that descend to adjacent valley bottoms. The Project Site also includes successional old field, hedgerow, successional shrubland, yards, farms, small wetlands, and ponds. The proposed low voltage transmission line descends from the Dutch Hill ridge above ground on existing New York State Electric and Gas (NYSEG) poles. It will then go belowground at the Atlanta Back Road and remain underground until the Cohocton River. It will continue above ground from this point across the river and railroad tracks. The line will then go back underground and remain underground to the foot of the steep slope leading up Lent Hill where it will go above ground. At the crest of the slope, the line will again go underground until reaching the collector substation. Alternatively, the line on Lent Hill may go above ground for a short distance to cross a small stream and Lent Hill Road.

The Cohocton River Valley is characterized by broad flat agricultural fields and sizeable wetlands associated with the Cohocton River. The valley also includes Interstate Route 390, New York State (NYS) Route 415, and the Erie, Delaware, Lackawanna, and Western railroad. Existing built features within the Project Site boundaries include roads single-family homes, barns, silos, and other agricultural buildings.

2.2 Project Description

The Dutch Hill Wind Power Project will consist of up to 16 wind turbines, approximately 5 miles of access roads, 4.8 miles of underground electrical lines, a 3.6 mile long low voltage (34.5kV) transmission line to a collector substation on Lent Hill and a construction staging area.

The proposed location and spacing of the wind turbines and support facilities was based on a wind resource assessment and review of the site's current land uses and zoning constraints (see Section 3.13, Land Use and Zoning). Factors considered when siting the turbines included the following:

Wind resource assessment: Through the use of modeling software, meteorological data, and topographic data, the wind turbines are sited to optimize exposure to wind from all directions, with emphasis on exposure to the prevailing wind direction in the Project Area.

Sufficient spacing: Siting turbines too close to one another can result in decreased electric production due to the creation of wind turbulence between and among the turbines. Each operating wind turbine creates downwind turbulence in its wake. As the flow proceeds downwind, there is a spreading of the wake and recovery to free-stream wind conditions. The Project turbines are proposed to be sited with enough space between them to minimize wake losses and maximize the capture of wind energy.

Distance from dwellings, areas, or structures customarily used by the public: The turbine locations were selected to maintain a minimum setback of approximately 1,500 feet between the tower and the nearest dwellings, areas, or structures customarily used by the public. This turbine setback complies with the Town of Cohocton Windmill Local Law, and minimizes the visual and sound effects of the turbines.

Distance from Non-participating Land Parcels: The turbine locations have been selected to maintain a minimum setback of 520 feet from the boundary line (and an operating noise not exceeding 50 decibels at the line) of all non-participating local landowners, in accordance with the Town of Cohocton Windmill Local Law.

Distance from roads: The turbine locations were also selected to maintain a minimum setback of at least 520 feet from all rights of way and public ways. Where setbacks may not meet the minimum, consent agreements will be obtained. This setback is in accordance with the wind turbine siting requirements of the Town of Cohocton Windmill Local Law.

The proposed layout of all Project components is illustrated in Figure 3. These components are described individually below.

2.2.1 Wind Turbines

The wind turbines proposed for this Project are the 2.5 MW C-96 manufactured by Clipper Windpower Technology. Additional information regarding these turbines is included in Appendix A. Although CPP II anticipates utilizing Clipper Liberty C-96 wind turbines for the Project, the wind turbine supply market in the United States is currently very tight. Turbine market conditions at the time of Project financing and construction will dictate the ultimate choice of turbines for the Project. CPP II anticipates that any alternate wind turbine that it would select would have characteristics and environmental impacts substantially similar to those discussed in this DEIS. If a turbine with materially different environmental impacts were to be selected in the future, additional environmental impact review may be required.

Each wind turbine consists of three major components; the tower, the nacelle, and the rotor. The height of the tower, or “hub height” (height from foundation to top of tower) will be approximately 262 feet (80 meters). The nacelle sits atop the tower, and the rotor hub is mounted to the nacelle. The total turbine height (i.e., height at the highest blade tip position) will be approximately 420 feet (128 meters). Descriptions of each of the turbine components are provided below.

Tower: The tubular towers used for this Project are conical steel structures manufactured in multiple sections. The towers have a base diameter of approximately 15 feet and a top diameter of approximately 8 feet. Each tower will have an access door, internal lighting, and an internal ladder to access the nacelle. The towers will be painted off-white to make the structure less visually obtrusive. The turbine and related structural systems are or will be designed to withstand wind speeds of up to 133 mph.

Nacelle: The main mechanical components of the wind turbine are housed in the nacelle. These components include the drive train, gearbox, and generator. The nacelle is housed by shell that protects internal machinery from the environment and dampens noise emissions. The housing is designed to allow for adequate ventilation to cool internal machinery, and is approximately 20 feet long, 12.5 feet tall, and 15 feet wide. It is externally equipped with an anemometer and a wind vane that signals wind speed and direction information to an electronic controller. A single, medium intensity aviation warning light will be attached to the top of some of the nacelles, per specifications of the FAA. These lights will be flashing red strobes (L-864) and operated only at night. The nacelle is mounted on a sliding ring that allows it to rotate ("yaw") into the wind to maximize energy capture (see detail in Appendix A).

Rotor: A rotor assembly is mounted to the nacelle to operate upwind of the tower. Each rotor consists of three composite blades approximately 157.5 feet (48 meters) in length [total rotor diameter = 315 feet (96 meters)]. The rotor attaches to the drive train at the front of the nacelle. Hydraulic motors within the rotor hub feather each blade according to wind conditions, which enables the turbine to operate efficiently at varying wind speeds. Also, the rotor can spin at varying speeds to operate more efficiently at lower wind speeds. The wind turbines begin generating energy at wind speeds as low as 4 meters per second (9 mph) and produce full power at wind speeds above approximately 8 meters per second (17.8 miles per hour) with a cut out wind speed of 25 meters per second (56 mph). The maximum rotor speed is approximately 15.5 revolutions per minute (rpm).

2.2.2 Electrical System

The proposed Dutch Hill Project will have an electrical system that consists of several parts. These include 1) a system of buried 34.5 kV shielded and insulated cables that will collect power from each wind turbine, and will carry power from the turbine field to a low voltage (34.5kV) transmission line that will connect with a collector substation on Lent Hill. From Lent Hill, power will be delivered to a point of interconnection with the existing NYSEG 230 kV transmission line on Brown Hill by a 115 kV transmission line. The 115 kV transmission line will interconnect to a 115kV/230kv substation to step voltage up to the NYSEG transmission line voltage. These components are described below.

2.2.3 Collector System

A transformer will raise the voltage of electricity produced by each turbine generator up to the 34.5 kV voltage level of the collection system. From the transformer, cables located inside the tower will join the collector circuit and turbine communication cables (electrical interconnect), which will run underground (generally along Project access roads) and connect the individual turbines to a junction box where they will be tied into the 34.5kV transmission line that will run east to Lent Hill. The proposed low voltage transmission line descends from the Dutch Hill ridge above ground on existing NYSEG poles to Atlanta Back Road. It will then go below ground at Atlanta Back Road and remain underground until the railroad and Cohocton River. It will continue above ground from this point across the river and railroad tracks. The line will then go back underground and remain underground to the foot of the steep slope leading up Lent Hill where it will go above ground. At the crest of the slope, the line will again go underground until reaching the collector substation. Alternatively, the line on Lent Hill may go above ground for a short distance to cross a small stream and road. The location of the proposed collection lines is indicated in Figure 3. The total length of buried cable carrying electricity to the collection station will be approximately 2.5 miles, and approximately 1.1 miles overhead.

2.2.4 Collection Station

The collection station will be located on Lent Hill at the intersection of Rynders Road and McLean Hollow Road. It is the terminus of the 34.5 kV transmission line from the collection system on Dutch Hill, and will transform the voltage of this system from 34.5 kV to 115 kV. The station will be approximately 160 by 105 feet in size and will include 34.5 and 115 kV busses, a transformer, circuit breakers, towers, a control building, and related structures. The collection station will be enclosed by chain link fencing and will be accessed by a new gravel access road. The collection station is part of the Cohocton Wind Power Project, and is addressed in greater detail in the Supplemental Draft Environmental Impact Statement (SDEIS) for that project.

2.2.5 115 kV Transmission Line

A single circuit 115 kV transmission line will connect the collection station on Lent Hill with the proposed substation on Brown Hill. It will cross the Cohocton River Valley and be approximately 3.6 miles in length. The line will be carried on treated wood pole structures that range in height from 50 to 70 feet above ground level, and will have an average span length of 450 feet. Pole heights for the section crossing Interstate Route 390 may be as tall as 100-120 feet. The 115 kV transmission line is part of the Cohocton Wind Power Project, and is addressed in greater detail in the SDEIS.

2.2.6 Substation

The substation will be located off Preston Road on Brown Hill in the Town of Cohocton, adjacent to the NYSEG 230 kV transmission line and is addressed in the Cohocton Wind Power Project SDEIS. The substation will step up voltage from 115 kV and 34.5 kV to 230 kV to allow connection with the existing NYSEG transmission line. The substation will include 34.5, 115, and 230 kV busses, transformers, circuit breakers, towers, control houses, and related structures. It will be approximately 350 by 220 feet in size, and enclosed within a chain link fence. Access will be via a new gravel access road that will be constructed as part of the Cohocton Wind Power Project.

2.2.7 Access Roads

The Project will require the construction of new or improved access roads to provide access to the proposed turbines and collector station/substation sites. The proposed location of Project access roads is shown in Figure 3. The total length of new access road required to service all proposed wind turbine locations is approximately 5 miles. A section of Fleishman Road, approximately 0.2 miles long will also be used. The roads will be gravel-surfaced and typically 16 feet in width (however, for impact calculation purposes a maximum finished width of 20 feet is assumed).

2.2.8 Meteorological Towers

One 80-meter (262.5-foot) tall meteorological tower will be installed between Turbines 12 and 13 to collect wind data and support performance testing of the Project. The tower will be galvanized tubular or lattice steel structures, and will include wind monitoring instruments.

2.2.9 Staging Area

The Project will share the staging area constructed for the neighboring Cohocton Wind Farm Project. The construction staging area will accommodate construction trailers, material storage, and parking for construction workers. The staging area is anticipated to total approximately 5 acres in size, and be located on agricultural land. No fencing or lighting of the staging area is proposed (but could be added if vandalism or similar problems are experienced).

2.2.10 Operations Center and Maintenance Building

The operations center and maintenance building (O&M) will exist at the same location, generally in the Lent Hill area. CPP II will attempt to utilize an existing, unoccupied farmhouse to function as the operations center. The operations center will consist of control rooms, offices, and meeting rooms. The facility will also house the Supervisory Control and Data Acquisition (SCADA) system. CPP II will also construct an approximately 25,000 square foot maintenance building. This structure will have the appearance of a large agricultural building. It will be heated and will be served by a private well and septic system. The structure will house spare turbine components such as blades and generators, and will have a shop for repairs. CPP II will present additional details and a building application for this building as soon as its location and final design are determined. As with the staging area, it is assumed that the building will be built on agricultural land. The O & M building is addressed in greater detail in the Cohocton Wind Power Project Supplemental Draft Environmental Impact Statement.

2.3 Project Purpose, Need and Benefit

The purpose of the proposed Project is to create a wind-powered electrical-generating facility that will provide a significant source of renewable energy to the New York power grid to:

i. Meet regional energy needs in an efficient and environmentally sound manner;

ii. Reduce the price volatility of fossil-fuel electricity generation in the region;

iii. Realize the full potential of the wind resource on the lands under lease;

iv. Promote the long-term economic viability of agricultural areas in New York State's Southern Tier; and

v. Assist New York State in meeting its proposed Renewable Portfolio Standard for the consumption of renewable energy in the State (see below).

The Project will facilitate compliance with Executive Order 111, issued by Governor George Pataki on June 10, 2001, which requires all New York State agencies to purchase 10% of their electricity from renewable energy sources by 2005 and 20% by 2010. The Project also responds to objectives identified in the 2002 State Energy Plan (New York State Energy Planning Board, 2002), and the Preliminary Investigation into Establishing a Renewable Portfolio Standard in New York (NYSERDA, 2003). The 2002 State Energy Plan required that the New York State Energy Research and Development Authority (NYSERDA) examine and report on the feasibility of establishing a renewable portfolio standard (RPS). NYSERDA's preliminary report found that an RPS can be implemented in a manner that is consistent with the wholesale and retail marketplace in New York and that an RPS has the potential to improve energy security and help diversify the state's electricity generation mix. The report also concluded that an RPS would likely spur increased economic development opportunities in the renewable energy industry, including the attraction of renewable technology manufacturers and installers to New York State. In September 2004, The Public Service Commission approved the RPS and identified a renewable energy policy, which calls for an increase in renewable energy used in the State to 25% by the year 2013 (PSC, 2004).

Implementation of the RPS began in 2005. According to the PSC, implementation of the RPS is projected to reduce statewide annual air emissions of nitrogen oxide (NO_x) by 6.8% (approximately 4,000 tons per year), sulfur dioxide (SO_2) by 5.9% (approximately 10,000 tons per year), and carbon dioxide (CO_2) by 7.7% (approximately 4,129,000 tons per year) (PSC, 2004a). In addition, as a result of the RPS, the PSC anticipates that wholesale energy prices are likely to decline by approximately $362 million in wholesale energy cost reductions as New York reduces its reliance upon fossil fuels (PSC, 2004). The Project is also consistent with Table II of EPAct 2005 to increase the use of renewable energy resources for electric generation.

Beyond meeting the goals of the Governor and the RPS, the benefits of the proposed action include positive impacts on socioeconomics (e.g., increased revenues to local municipalities and lease revenues to participating landowners short-term and long-term employment, and purchase of local goods and services), air quality (by off-setting generation from fossil-fuel-burning power plants), and climate (reduction of greenhouse gases that contribute to global warming). By eliminating pollutants and greenhouse gases, the Project will also benefit ecological and water resources as well as human health. Additional information on the socioeconomic and air quality benefits of the proposed Project are included in Sections 3.9 and 3.4, respectively.

2.4 Project Construction

Project construction is anticipated to occur in a single phase. It is scheduled to start in the spring of 2007 and be completed by December 31, 2007. Project construction will be performed in several stages and will include the following main elements and activities:

i. Grading of the staging/field construction office area and substation areas;

ii. Construction of access roads, crane pads and turn-around areas;

iii. Construction of turbine tower foundations;

iv. Installation of the underground electrical collection system;

v. Assemble and erection of the wind turbines;

vi. Construction and installation of the substation; and

vii. Plant commissioning and energization.

Prior to the initiation of construction, various environmental protection and control plans will be developed and shared with the Town. These will include a construction routing plan, road improvement plan, dust control plan, public safety plan, and complaint resolution procedures. These plans and procedures are described in greater detail in Section 3.0 of the DEIS. Actions included in these plans and procedures will be reviewed, coordinated and approved by the Town prior to implementation, to assure that the impacts of Project construction on local residents are avoided, minimized, or mitigated to the extent practicable. The following section describes the major activities that will occur as part of Project construction. Representative photographs of wind power project construction activities are included in Figure 4. Typical construction details are included in Appendix A.

2.4.1 Pre-construction Activities

Before construction commences, a site survey will be performed to stake out the location of the wind turbines, access roads, electrical cables, and substation areas. Once the surveys are complete, a geotechnical investigation will be performed to identify subsurface conditions and allow development of final design specifications for the access roads, foundations, underground trenching, and electrical grounding systems. The geotechnical investigation involves a drill rig obtaining borings (typically to 30-45 feet deep) to identify the subsurface soil and rock types and strength properties. Testing is also done to measure the soil's electrical properties to ensure proper grounding system design. A geotechnical investigation is generally performed at each turbine location, at substation locations, along the access roads, and at the O&M building site.

Using all of the data gathered for the Project (including geotechnical information, environmental conditions, site topography, etc.), CPP II will develop a set of site-specific construction specifications for the various components of the Project. The specifications will comply with applicable codes and construction standards established by various industry practice groups such as:

- American Concrete Institute (ACI)
- Institute for Electrical and Electronic Engineers (IEEE)
- National Electric Code (NEC)
- National Fire Protection Agency (NFPA)
- Construction Standards Institute (CSI)

CPP II will also hire environmental monitors to oversee construction (and post-construction) activities. The environmental monitors will meet with Project contractors and subcontractors prior to the start of construction to assure that they are aware of all environmental protection commitments and permit conditions, and will be in compliance with such commitments and conditions.

2.4.2 Staging Areas

The total area developed as construction staging areas will be approximately 5 acres. This area will be developed by stripping and stockpiling the topsoil and grading and compacting the subsoil. Geotextile fabric and a minimum of 8 inches of gravel will then be installed to create a level working yard. Electric and communication lines will be brought in via overhead service from existing distribution poles to allow connection with construction trailers. At the end of construction, utilities, gravel, and geotextile fabric will be removed and the site will be restored to preconstruction condition. Offsite storage will also be used for components.

2.4.3 Site Preparation

Actual Project construction will be initiated by clearing woody vegetation (as necessary) from tower sites, access roads, and interconnect routes. The work area will be cleared with a chainsaw or brush hog. Trees cleared from the work area will be cut into logs and removed, while limbs and brush will be chipped and spread onsite. For the purposes of this DEIS, it is assumed that a 200 foot radius will be cleared around each tower with a 60-foot by 100-foot area established for a crane pad, a 75 foot-wide corridor will be cleared along access roads, and a 15 foot-wide corridor will be cleared along all underground electric interconnect routes. The 34.5 kV overhead transmission line right-of-way (ROW) will be cleared to a width of about 35 feet, with "danger trees" being removed beyond this width to ensure the reliability of the line.

2.4.4 Access Road Installation

Wherever possible, existing roads and farm drives will be upgraded for use as Project access roads in order to minimize impacts to active agricultural areas and wetland/stream areas. Where an existing road or farm drive is unavailable or unsuitable, new gravel- surfaced access roads will be constructed. Road construction will involve topsoil stripping and grubbing of stumps, as necessary. Stripped topsoil will be stockpiled along the road corridor for use in site restoration. Any grubbed stumps will be removed, chipped or buried. Following removal of topsoil, subsoil will be graded, compacted, and surfaced with 8-12 inches of gravel or crushed stone. A geotextile fabric or grid will be installed beneath the road surface, if necessary, to provide additional support. The typical access road will be 16 feet in width, with occasional wider pull-offs to accommodate passing vehicles. Maximum permanent road width will be 20 feet. Appropriately sized culverts (minimum 12 inch) will be placed in any wetland/stream crossings in accordance with state and federal permit requirements. In other locations culverts may also be used to assure that the roads do not impede cross drainage. Where access roads are adjacent to, or cross, wetlands, streams or drainage ditches/swales, appropriate sediment and erosion control measures (e.g., silt fence) will be installed. During construction, access road installation and use could result in temporary disturbance of a maximum width of 40 feet, with temporary road corner radii of 200 feet. In agricultural areas, topsoil will be stripped and windrowed along the access road to prevent construction vehicles from driving over undisturbed soil and adjacent fields. Once construction is complete, temporarily disturbed areas will be restored (including removal of excess road material, de-compaction, and rock removal in agricultural areas) and returned to their pre-construction contours.

The primary erection crane(s) will move from one tower to another within each group of turbines along a designated crane path. This crane path will follow the 16-foot wide operation and maintenance access road. The crane path will consist of ten foot wide earthen shoulders on either side of the 16-foot wide access road. These shoulders will be native material, graded level.

The only fill material placed within the shoulders will be in those areas where the side slope prevents the grading of the road shoulders to a level surface. The fill will be native soils and will remain in place provide it does not impact the local drainage patterns. The only compaction necessary for these shoulders will be via tracked or wheeled equipment. No vibratory compaction will be necessary. Following the crane passage, the shoulders will be allowed either to re-vegetate or to be returned to crop production. Cranes will only traverse open fields when moving between individual groups of turbines. For open field traffic, a route has been identified that presents minimal side and vertical slope. Limited physical disturbance is likely along the field crossings including grading to create a smooth path that will be performed with a bulldozer or motor grader. The route will be subject to field adjusted in order to minimize the grading necessary or other potential impacts.

Some intersections on roads used by trucks delivering turbine components will require modification to accommodate turns. This will result in approximately 0.5 acres of temporary disturbance and placement of gravel. See Appendix M for additional information. Photos of access road construction are included in Figure 4.

2.4.5 Foundation Construction

Once the roads are complete for a particular group of turbine sites, turbine foundation construction will commence on that completed access road section. Foundation construction occurs in several stages including hole excavation, outer form setting, rebar and bolt cage assembly, casting and finishing of the concrete, removal of the forms, backfilling and compacting, and site restoration. Excavation and foundation construction will be conducted in a manner that will minimize the size and duration of excavated areas required to install foundations.

Initial activity at each tower site will involve stripping and stockpiling topsoil within a 200-foot radius around each tower (maximum area of disturbance = 2.9 acres). Following topsoil removal, backhoes will be used to excavate a foundation hole. In agricultural areas, excavated subsoil and rock will be segregated from stockpiled topsoil. If bedrock is encountered it is anticipated to be ripable, and will be excavated with a backhoe. If the bedrock is not ripable, it will be excavated by pneumatic jacking, hydraulic fracturing, or blasting. Blasting will be utilized only if the other potentially available methods of excavation are not practicable. CPP II anticipates that few, if any, turbine sites will require blasting. If blasting is required, it will be conducted in compliance with a Blasting Plan, and in accordance with all applicable laws and good engineering practices to avoid impacts to sensitive receptors. If blasting is proposed at a tower site, the nearest wells will be identified, and if necessary, pre- and post-blasting inspections of the wells will be conducted. If necessary, dewatering of foundation holes will involve pumping the water to a discharge point, which will include measures/devices to slow water velocities and trap any suspended sediment. Dewatering activities will not result in the direct discharge of water into any streams or wetlands.

The foundation is anticipated to be one of two designs; either a concrete caisson or a spread footer. It is currently anticipated that the spread foot foundation will be used. This foundation type is approximately 10 feet deep, approximately 50-60 feet in diameter, and requires approximately 300 cubic yards (cy) of concrete. Once the foundation concrete is sufficiently cured, the excavation area around and over it is backfilled with the excavated on-site material. The top of the foundation pedestal measures approximately 18 feet in diameter, and typically extends 6 to 8 inches above grade. A caisson footing would be placed in an excavation that measures approximately 18 feet diameter and has a depth of up to approximately 30 feet. A gravel crane pad will be developed at the base of each tower in an area that measures approximately 100 feet by 60 feet.

2.4.6 Buried Cable Installation

As mentioned previously, electrical interconnects will generally follow Project access roads, but will also follow field edges and cut directly across fields in places. The proposed layout of the interconnect system is illustrated in Figure 3. Where buried cable is proposed to cross active agricultural fields, the location of any subsurface drainage (tile) lines will be determined (through consultation with the landowner), if possible, to avoid damaging these lines during cable installation. Direct burial methods via cable plow, rock saw and/or trencher will be used during the installation of underground interconnect lines whenever possible.

Direct burial via a cable plow will involve the installation of bundled cable (electrical and fiber optic bundles) directly into the ground via a “rip” created by the plow blade. The rip disturbs an area approximately 24 inches wide with bundled cable installed to a minimum depth of 36 inches (48” in active agricultural fields) (Figure 4). An area up to 15 feet wide must be cleared of tall-growing woody vegetation and will be disturbed by the tracks of the installation machinery. However, this disturbance does not involve excavation of the soil. Generally, no restoration of the rip is required, as it closes in on itself following installation. Similarly, surface disturbance associated with the passage of machinery is typically minimal. Should surface restoration be required, it will closely follow the installation via a restoration Bobcat or small bulldozer, which will ride over the rip, smoothing the area.

Direct burial via a trencher involves the installation of bundled cable in a similar fashion to cable plow installation. The trencher or rock saw uses a large blade or “saw” to excavate an open trench that is approximately 24-inches wide and has a sidecast area immediately adjacent. Similar to cable plow, this direct burial method installs the cable a minimum of 36 inches deep (48 inches in active agricultural fields) and requires only minor clearing and surface disturbance (up to 15 feet wide for the installation machinery). In active agricultural land, up to two parallel cables can be installed by trenching without the need to strip and segregate topsoil (in accordance with NYS Department of Agriculture and Markets guidance). Sidecast material will be replaced via a Bobcat or small bulldozer. All areas will be returned to pre-construction grades, using the same techniques as described above for cable plow installation. Where three or more cables run parallel through active agricultural fields, the topsoil will be stripped and stockpiled prior to cable installation, and replaced, regraded, and stabilized by seeding and mulching following installation. Any tile lines that are inadvertently cut or damaged during installation of the buried cable will be repaired as part of the restoration effort.

Installation of utility lines via an open trench will be used only in areas where the previously described direct burial methods are not practicable. At this time, no open trench installation is proposed unless conditions at the time of construction make direct burial infeasible. Areas appropriate for open trench installation will be determined at the time of construction and may include areas with unstable slopes, excessive unconsolidated rock, and standing or flowing water. Open trench installation will be performed with a backhoe and will generally result in a disturbed trench 36 inches wide and a minimum of 36 inches deep. The overall temporary footprint of vegetation and soil disturbance may be a maximum of 15 feet due to machinery dimensions and backfill/spoil pile placement during installation. In agricultural areas, all topsoil within the work area will be stripped and segregated from excavated subsoil. Replacement of spoil material will occur immediately after installation of the buried utility. Subgrade soil will be replaced around the cable, and topsoil will be replaced at the surface. Any damaged tile lines will be repaired, and all areas adjacent to the open trench will be restored to original grades and surface condition. Restoration of these areas will be completed through seeding and mulching of all exposed soils.

2.4.7 Wind Turbine Assembly and Erection

Beyond the tower, nacelle and rotor blades, other smaller wind turbine components include hubs, nose cones, cabling, control panels and internal facilities such as lighting, ladders, etc. All turbine components will be delivered to the Project Site on flatbed or specialized transport trucks, and the main components will be off-loaded at the individual turbine sites. Turbine erection is performed in multiple stages including: setting of the electrical bus cabinet and ground control panels on the foundation, erection of the tower (usually in 3-4 sections), erection of the nacelle, assembly and erection of the rotor, connection and termination of the internal cables and inspection and testing of the electrical system prior to energization.

Turbine assembly and erection involves mainly the use of large track mounted cranes, smaller rough terrain cranes, boom trucks and rough terrain fork-lifts for loading and off-loading materials. The tower sections, rotor components, and nacelle for each turbine will then be delivered to each site by flatbed or specialized trucks and unloaded by crane. A large erection crane will set the tower segments on the foundation, place the nacelle on top of the tower, and following ground assembly, place the rotor onto the nacelle (Figure 4).

The erection crane(s) will move from one tower to another along a designated crane path. For the purposes of this DEIS, it is assumed that this path will follow existing public roads and Project access roads. Cranes will only traverse open fields without any permanent roads if conditions allow such movement without creating significant soil disturbance. In such instances, a proof roller will be used to test soil stability and level and compact the soil prior to crane passage. In some places, the crane will be partially disassembled and carried from one tower site to another by a specialized flatbed tractor-trailer. This mode of crane transport will not require a 40-foot-wide travel surface, but could require some additional clearing and grading adjacent to the roads to accommodate the width of the crane tracks (which will extend well beyond the edges of the trailer).

Upon departure of the crane from each tower site, all required site restoration activities will be undertaken. Restoration of crane paths will include removal of all temporary fill/road materials. In agricultural fields, restoration will also include subsoil de-compaction (as necessary) and reestablishing pre-construction contours. Exposed soils at restored tower sites and along roads and crane paths will be stabilized by seeding and/or mulching.

2.4.8 34.5 kV Transmission Line

The 34.5kV transmission line will run from Dutch Hill east to Lent Hill. The proposed low voltage transmission line descends from the Dutch Hill ridge above ground on existing NYSEG poles for approximately 3,360 feet to Atlanta Back Road. It will then go below ground at Atlanta Back Road and remain underground for approximately 2,335 feet until the railroad and Cohocton River. It will continue above ground from this point for approximately 785 feet across the river and railroad tracks. The line will then go back underground and remain underground for approximately 2,625 feet to the foot of the steep slope leading up Lent Hill where it will go above ground for approximately 1,490 feet. At the crest of the slope, the line will again go underground for approximately 1.5 miles until reaching the collector substation. Alternatively, the line on Lent Hill may go above ground for a short distance to cross a small stream and Lent Hill Road. Wooden poles will be approximately 43 to 56.5 feet high and the ROW where the line is above ground will generally be clear cut to a width of (35) feet, with additional "danger trees" being removed as appropriate. The initial above ground section of the line will be installed on existing NYSEG wooden poles and the ROW is already cleared and maintained by NYSEG. For the remaining section of above ground line wooden poles will be delivered from the staging area and will be installed in augured holes, backfilled with gravel, guyed where needed and anchored. It is assumed that no concrete foundations will be required, and that no permanent access roads will be built on the ROW. However, during construction, it is assumed that vehicular activity will disturb a corridor up to 20 feet wide within the ROW (although where the line parallels the railroad, materials delivery and vehicular activity should be largely confined to the existing railroad grade). Miscellaneous hardware (ground rods, line vibration dampers, etc.) will be installed to complete the line construction.

Where the line is below ground, similar construction techniques will be used and cleared areas will be the same as described in Section 2.4.6.

2.4.9 Collection Station and Substation

Collection station and substation construction are being constructed as part of the Cohocton wind Power Project. The 34.5 kV transmission line will interconnect to the 34.5/115 kV collector substation on Lent Hill.

Table 2. Impact Assumptions and Calculations

Project Components	Maximum Area of Vegetation Clearing	Area of Temporary Soil Disturbance	Area of Permanent Soil Disturbance
16 Wind Turbines and 16 Gravel Crane Pads	200' radius per structure (pedestal plus crane pad)	2.9 acres/structure (pedestal plus crane pad)= 46.4 acres	0.2 acre/structure (pedestal plus crane pad) = 3.25 acres (16 turbines)
5 miles of Access Roads	75' wide per linear foot of road	40' wide per linear foot of road * 5 miles = 24.3 acres and 0.5 acres for intersection improvements	20' wide per linear foot of road * 5 miles = 11.6 acres total
4.8 miles of Buried Electrical Interconnect Cable	15' wide per linear foot of cable	15' wide per linear foot of cable * 4.8 miles = 8.7 acres	None
1 Meteorological Tower	1 acre	1 acre	0.1 acre
1 Staging Area	5 acres	5 acres	None
1.1 miles of 34.5 kV Above-ground Transmission Line	15' wide ROW plus per linear foot, danger trees	15' wide per linear foot = 2 acres	0.1 acre
2.5 miles of 34.5 kV Underground Transmission Line	35' wide ROW plus per linear foot, danger trees	15' wide per linear foot = 10.6 acres	None
TOTAL	**---**	**98.5 acres**	**15.05 acres**

2.5 Operations and Maintenance

Operation of the wind turbines and associated components is almost completely automated. However, the Dutch Hill Project is anticipated to employ a staff of approximately two or three O&M staff. For the wind turbines anticipated for the Dutch Hill Project, a minimum wind speed of approximately 9 mph (4 meters/second) is required to initiate generation. High-speed shutdown occurs at around 56 mph (25 meters/second). The turbines are equipped with two fully independent braking systems that allow the rotor to be brought to a halt under all foreseeable conditions. The system consists of aerodynamic braking by the rotor blades and by a separate hydraulic-disc brake system. Both braking systems operate independently, such that if there is a fault with one, the other can still bring the turbine to a halt. Each wind turbine has a computer to control critical functions, monitor wind conditions, and report data back to a SCADA system.

Operations and maintenance staff will be on duty during core operating hours (eight hours a day, five days per week) with weekend shifts and extended hours as required. In the event of turbine or facility outages, the SCADA system will send alarm messages to on-call technicians via pager or cell phone to notify them of the outage. The Project will have an on-call local technician who can respond quickly in the event of an emergency. The wind turbines selected for the Dutch Hill Project have been chosen in part for their high functional reliability. Each wind turbine manufacturer studies and reports on the frequency of operation problems and malfunctions that arise when the turbines are generating electricity. Data on the turbines' reliability is summarized by the manufacturer in the turbine's availability rating, which estimates the percentage of time that the turbine will function. Wind turbines at other UPC Wind projects have an availability rating of 98.5%. More detailed specifications on the wind turbines being proposed for the Project are included in Appendix A.

Each wind turbine will receive scheduled preventive maintenance inspections during the first year of operation and twice a year in subsequent years. Given the high availability rating of the turbines, CPP II estimates that, once operational, individual wind turbines will require maintenance and repair calls an average of three to six times per year in addition to their scheduled inspections. In certain circumstances, heavy maintenance equipment, such as a lifting crane, may need to be brought in to repair turbine problems (such as nacelle component replacement).

UPC Wind has a proven track record in operating commercial scale wind farms. This should provide assurance that Project maintenance and repair work will be completed quickly and with as little impact to the surrounding community and landowners as possible.

The Dutch Hill Wind Power Project is expected to be generating power about 70% of the time, with an average annual capacity of approximately 30%, which is comparable to other commercial wind farms in New York State. Total net generation delivered to NYSEG's high-voltage grid is expected to be 105,120 megawatt hours (MWh), which is the average annual consumption of approximately 17,596[2] homes. (By way of comparison, the 2000 census indicated a total of 46,132 housing units within Steuben County).

2.6 Decommissioning

Prior to the start of construction, a financial instrument will be in place to ensure that sufficient funds are available for removal of the wind turbines and associated equipment at the end of the Project's operational life. Megawatt-scale wind turbine generators typically have a life expectancy of 20-25 years. The current trend in the wind energy industry has been to replace or "re-power" older wind energy projects by upgrading older equipment with turbines that are more efficient. However, if not upgraded, or if the turbines are non-operational for more than one year, they will be decommissioned, in accordance with the Town of Cohocton Windmill Local Law. Decommissioning

[2] Based on 5,974 kWh per household per year. (EIA New York Household Electricity Report, Table NY-1)

would consist of the following elements: all turbines, including the blades, nacelles and towers will be disassembled, and transported off site for reclamation and sale. The transformers will also be transported off-site for reuse or reclamation. The overhead transmission line will be removed and reclaimed, and the poles will be cut off at grade. All underground infrastructure at depths less than 36 inches below grade will be removed. All underground infrastructure at depths greater than 36 inches below finished grade (including the subsurface collection conductors, and foundations) will be abandoned in place. Areas where subsurface components are removed will be graded to match adjacent contours, stabilized with an appropriate seed mix, and allowed to re-vegetate naturally. All road materials will be allowed to remain in place.

Under the interconnection rules of the New York Independent Services Operators (NYISO), the Project sub-station reverts to the ownership of the transmission owner and thus CPP II does not have the authority to plan for the decommissioning of the substation.

2.7 Project Cost and Funding

The costs of developing and permitting the Project have been provided by its sponsors. UPC Wind is currently developing approximately 2,500 MW of wind power in the U.S. (primarily in the Northeast, on the West Coast, and Hawaii). UPC Wind has also developed 30 operating wind power projects in Europe. The Dutch Hill Project will be funded as a commercial, for-profit enterprise with the expected $85 million capital cost supplied by private lenders and investors. CPP II intends to own and operate the Project.

2.8 Permits and Approvals Required

Implementation of the Project will require certain permits and/or approvals from local, state, and federal agencies. The permits and approvals that are expected to be required are listed in Table 3.

Table 3. Permits and Approvals for the Dutch Hill Wind Power Project

Agency	Description of Permit or Approval Required
Towns	
Town of Cohocton Planning Board	Issuance of Special Use Permit and Site Plan Approval. Acceptance of DEIS, FEIS, and issuance of findings (as Lead Agency under SEQRA).
Town of Cohocton Departments (Public Works, Codes, etc.)	Issuance of building permits. Review and approval of highway work permits.
Steuben County	
Department of Public Works	Highway work permits.
Steuben County Planning Board	Approval pursuant to General Municipal Law 239-m.
Steuben County Industrial Development Agency	PILOT Agreement
New York State	

Agency	Description of Permit or Approval Required
Department of Environmental Conservation	Article 24 Permit for disturbances to state jurisdictional wetlands. Article 15 Permit for disturbance of protected streams. SPDES General Permit. Section 401 Water Quality Certification. Issuance of SEQRA findings.
Department of Transportation	Special Use Permit for oversize/overweight vehicles. Highway work permit. Use and occupancy permit.
Department of Agriculture & Markets	Review Notice of Intent for work in an Ag. District.
Federal	
U.S. Army Corps of Engineers	Section 404 Nationwide Permit for placement of fill in federal jurisdictional wetlands/waters of the U.S. NEPA compliance.
Federal Aviation Administration	Approval of Obstruction Lighting Plan

2.9 Public and Agency Involvement

Extensive agency interaction and public outreach has preceded the formal submittal of this DEIS. CPP II held numerous informational sessions, meetings, and discussions with the Town of Cohocton regarding the Project since April 2006. Several meetings have been held with the Town Board and Town Planning Board. In addition, CPP II met with the Steuben County Industrial Development Agency (SCIDA). The first meetings with local residents were also held in April 2006. Two public information sessions regarding the Project were held in April 2006 and October 2006.

CPP II has also had several meetings with participating landowners and Project neighbors, and articles in local newspapers have also covered the Project. A website (www.dutchhillwind.com) has been set up to facilitate the sharing of information throughout project development and construction. The DEIS will be posted to this website to facilitate public review and comment on the document.

2.9.1 SEQRA Process

In October 2006, a Full Environmental Assessment Form (EAF) (Appendix B) addressing the proposed wind power Project was submitted by CPP II to the Town of Cohocton Planning Board pursuant to SEQRA. The formal submittal of the EAF initiated the SEQRA process for the subject action. Also in October of 2006, a solicitation of Lead Agency status was forwarded to involved SEQRA agencies by the Cohocton Planning Board, along with a copy of the EAF document. In November 2006, it is expected that the Cohocton Planning Board will formally assume the role of Lead Agency, and, in that role, will issue a positive declaration, requiring the preparation of this DEIS.

This document has been prepared to comply with the requirements of SEQRA (6 NYCRR Part 617). The purpose of the DEIS is to assess the environmental impacts associated with construction of the Project. The SEQRA process for the Project will include the following actions:

- DEIS accepted by lead agency (Cohocton Planning Board);
- File notice of completion of DEIS and notice of public hearing and comment period;
- Public hearing on DEIS (must be held at least 14 days after public notice is published);
- Public comment period on the DEIS;
- Preparation and acceptance of Final Environmental Impact Statement (FEIS), including response to comments;
- Notice of completion of FEIS;
- 10-day public consideration period;
- SEQRA Findings Statement issued by Planning Board as Lead Agency, completing the SEQRA process; and
- Involved agencies issue Findings Statements.

2.9.2 Agency and Public Review

Opportunities for detailed agency and public review will be provided throughout the SEQRA process, as well as in conjunction with the review of applications for the permits and approvals needed for the Project. With respect to the completion of the SEQRA process, the DEIS will be available for public review and agency comment as outlined above. In addition to a public comment period (during which time written comments will be accepted), a duly noticed public hearing concerning the DEIS will be organized and held, in accordance with SEQRA requirements.

This DEIS, along with a copy of the public notice, will be distributed for review and comment to the public and to all of the parties identified in Table 4.

Table 4. Involved and Interested Agencies and Public DEIS Repositories

Cohocton	
Town of Cohocton Planning Board Post Office Box 327 Cohocton, New York 14826	Town of Cohocton Highway Department Post Office Box 327 Cohocton, New York 14826
Cohocton Town Clerk Post Office Box 327 Cohocton, New York 14826	Town of Cohocton Public Library 15 South Main Street Cohocton, New York 14826
Neighboring Towns & Villages	
Town of Wayland Attn: Larry Graham, Town Supervisor 17 North Main Street Wayland, NY 14572	Town of Avoca Attn: Town Supervisor 3 Chase Street Avoca, NY 14809

Village of Naples Attn: M. Sherwood, Mayor 160 South Main Naples, New York 14512	Town of Howard Attn: Donald Evia, Town Supervisor 3725 Mill Road Avoca, New York 14809
Steuben County	
Steuben Co. Industrial Development Agency Attention: Mr. James Sherron Executive Director 7234 Route 54 Bath, New York 14810-0393	Steuben County Planning Department 3 East Pulteney Square Bath, New York 14810
Steuben County Highway Department 3 East Pulteney Square Bath, New York 14810	
New York State	
NYS Dept. of Environmental Conservation Attn: Mr. Steve Tomasik 625 Broadway Albany, New York 12233-1011	NYS Department of Public Service Three Empire State Plaza Albany, New York 12223-1350
NYS Dept. of Environmental Conservation Region 8 Attn: Regional Permit Administrator 6274 East Avon-Lima Road Avon, New York 14414	NYS Department of Transportation 50 Wolf Road 6^{th} Floor Albany, New York 12232
NYS Department of Agriculture and Markets 10 b Airline Drive Albany, New York 12235	NYS Energy Research and Development Authority Corporate Plaza West 286 Washington Ave. Ext. Albany, New York 12203-6399
NYS Department of Transportation Region 6 107 Broadway Hornell, New York 14843	NYS Office of Parks, Recreation and Historic Preservation Field Services Unit Peebles Island Waterford, New York 12118
Federal Government	
Federal Highway Administration 400 Seventh Street, SW Washington, DC 20590	U.S. Army Corps of Engineers Attn: Diane Kozlowski 1776 Niagara Street Buffalo, New York 14207-3199

3.0 ENVIRONMENTAL SETTING, POTENTIAL IMPACTS, AND PROPOSED MITIGATION

3.1 Geology, Soils, and Topography

3.1.1 Existing Conditions

Information presented in this section regarding topography, geology, and soils was obtained from onsite observations, field hydrogeologic investigations conducted by Haley and Aldrich of New York (Appendix C), and existing published sources, including the Steuben County Soil Survey (U.S. Department of Agriculture [USDA], 1978), U.S. Geological Survey (USGS) topographic mapping, New York State surficial geology mapping (NYS Museum/NYS Geological Survey, 1999a), and statewide bedrock geology mapping (NYS Museum/NYS Geological Survey, 1999b).

3.1.1.1 Topography

The Project Site is located within the Southern New York Section of the Appalachian Uplands physiographic province of New York State. Topography in the area is consistent with that of a mature, eroded plateau (Figure 2). It is characterized by rolling uplands and flat-topped hills, which are dissected by steep ravines and the broad valley of the Cohocton River.

The proposed wind turbines are sited atop Dutch Hill, a well-defined roughly triangular-shaped plateau bounded on the north, east and south by the Cohocton River Valley, and on the west by Black Creek Hollow. Ground surface elevations across the Project Site range from approximately 1,300 feet amsl in the Cohocton River Valley to approximately 2,012 feet amsl atop Dutch Hill. Slopes are generally in the range of 3-20%, but in some ravine areas nearly vertical slopes can be found.

3.1.1.2 Bedrock Geology

The sedimentary bedrock within the Project Site is composed of sandstone, shale and siltstone rocks of Upper Devonian Age. A map of the bedrock geology in the vicinity of the Project Site is included on Figure 5 of the groundwater resources report in Appendix C. Major bedrock formations in the Project Site include 1) the Wiscoy Formation of the Java Group (mapped across the Dutch Hill and Lent Hill plateaus), 2) the Nunda formation of the West Falls Group, (mapped across the slopes of these two plateaus) and 3) the West Hill and Gardeau Formations (also of the West Falls Group), that are mapped across the Cohocton River Valley.

Depth to bedrock in the Project Site is variable, with some exposed bedrock observed throughout the area, especially on the northern and eastern slopes of Dutch Hill. Bedrock may also be exposed on steep slopes and within ravine areas (Appendix C). These areas were avoided to the extent possible in the siting of the proposed wind turbines, access roads and interconnects. However, shallow or exposed bedrock may be encountered, especially at the northern and northeastern turbine sites in the array and along a portion of the powerline corridor east of Route 371 (Appendix C, Figure 4).

3.1.1.3 Surficial Geology

Unconsolidated surficial geologic deposits at the Project Site are largely the result of the advance and retreat of the last continental glaciers, which receded from this area approximately 12,000 to 10,000 years ago. The Project Site is immediately south of the Valley Heads moraine, a complex of ice-terminus glacial deposits at the southern extent of several Finger Lake valleys in Central New York State (Appendix C).

Surface geological materials within the Project Site include glacial till, kame deposits, and more recent alluvial and swamp deposits associated with the Cohocton River. A map delineating the extent of these deposits is provided as Figure 4 in Appendix C. Glacial till is mapped across the top of the Dutch Hill plateau. Till typically contains a poorly sorted mix of clay, silt, sand, gravel and boulders, deposited beneath advancing or stalled glaciers. Because the deposits were often pressed beneath glacial ice, they are generally dense and drain poorly.

Kame deposits are mapped along the eastern flank of Dutch Hill. These sediments were deposited by meltwater during glacial retreat, often between an ice margin and a pre-existing topographic high, such as Dutch Hill. Kame deposits contain sand, gravel, and boulders (the finer-grained sediments were washed away by meltwater). Unconsolidated kame deposits are generally well-drained, and are often mined for road aggregate.

In the Cohocton River Valley, more recent swamp deposits and alluvium are found along the valley floor.

3.1.1.4 Soils

The Steuben County Soil Survey has mapped general soil associations and soil types throughout the county (USDA, 1978). The Project Site is shown overlain on soil survey maps (Figure 5). Soils are variable, but the majority of the area is characterized by deep silt loams and gravelly loams that formed in glacial till or kame deposits, respectively. Three soil associations are mapped within the overall Project Site; these are listed in Table 5, together with general characteristics identified by USDA that are pertinent to construction of the Project.

Table 5. Soil Associations within the Project Site

Soil Association	Main Characteristics
Lordstown – Arnot: found on steep and very steep hillsides along the Cohocton River Valley	• Well drained • Moderately deep and shallow soils overlying hard sandstone bedrock
Bath – Lordstown: upland soils found on gently sloping and sloping hilltops.	• Well drained • Deep soils with a fragipan and moderately deep soils overlying hard sandstone bedrock

Soil Association	Main Characteristics
Howard - Chenango – Middlebury: found in nearly level and gently sloping valleys	• Somewhat excessively drained to somewhat poorly drained • Deep soils formed in outwash in valleys or formed in recent alluvium on floodplains

Approximately 28 soils types were identified within the overall Project Site. Soil types are categorized within soil series, which are groups of area soils similar in origin, chemical, and physical properties for land use purposes (Natural Resources Conservation Service (NRCS), 2006a). The Bath, Howard, Lordstown, and Mardin are the predominant soil series within the overall Project Site. These are listed on Table 6, together with general characteristics identified by USDA that are pertinent to construction of the Project.

Table 6. Dominant Soil Series within the Project Site

Soil Series	Main Characteristics
Bath Series	• Well drained • Formed in glacial till derived mainly from sandstone and siltstone • Gently sloping to steep • Very firm, brittle fragipan • Depth to bedrock is greater than 60 inches • Erosion hazard is slight to moderate • Equipment limitation is slight to severe
Howard Series	• Well drained to somewhat excessively drained • Formed in glacial outwash derived from limestone, sandstone, and shale • Nearly level to steep • Depth to bedrock is greater than 60 inches • Erosion hazard is slight • Equipment limitation is slight to moderate
Lordstown Series	• Well drained • Formed in glacial till • Depth to bedrock ranges from 10 to 40 inches • Erosion hazard is slight • Equipment limitation is slight to moderate
Mardin Series	• Moderately well drained • Formed in glacial till derived mainly from sandstone and shale • Well expressed fragipan • Depth to bedrock is greater than 60 inches • Erosion hazard is slight • Equipment limitation is slight to moderate

There are no designated state soils, farmland soils of statewide significance, additional local importance and unique importance identified in the overall Project Area, based upon information in the NRCS web site (NRCS, 2006b) cross referenced with the 2006 New York Agricultural Land Classifications for Steuben County on the New York State Department of Agriculture and Markets (NYSA&M) (NYSA&M, 2006).

The Project Site does contain significant tracts of prime farmland soils (if drained, irrigated or otherwise managed, as noted), according to the New York State Department of Agriculture and Markets (see above citation). In descending order by predominance, Table 7 lists soils within the overall Project Area that are identified as prime farmland soils.

Table 7. Prime Farmland Soils within the Project Area

Soil	Soil ID	Soil Group	Designation	Where found
Bath channery silt loam (12 to 20% slopes)	BaC	5	Prime farmland if drained	Uplands
Bath channery silt loam (3 to 12% slopes)	BaB	4	Prime farmland if irrigated	Uplands
Mardin channery silt loam (8 to 15% slopes)	MdC	6	Prime farmland if irrigated and drained	Uplands
Howard gravelly loam undulating	HoB	4	Prime farmland if irrigated	Valleys
Mardin channery silt loam (2 to 8% slopes)	MdB	4	Prime farmland if irrigated	Uplands
Howard gravelly loam (0 to 3% slopes)	HoA	2	Prime farmland if drained	Valleys

The Steuben County Soil Survey has classified the erosion hazard for each soil type as slight, moderate, or severe. The majority of the Project Site has a slight erosion hazard (USDA, 1978). However, some soils with a moderate erosion hazard classification occur within the Project Site, including Bath soils (steep, map unit BBE), Lordstown-Arnot association (very steep, map unit LRF), and Volusia channery silt loam (15-20% slopes, map unit VoD). These soils occur almost exclusively in ravine areas. Soil drainage characteristics are variable but outside of the Cohocton River Valley are predominantly well drained.

3.1.2 Potential Impacts

3.1.2.1 Construction

Project components have been sited to avoid or minimize either temporary or permanent impacts to topography, geology and soils. Construction on steep slopes (i.e., in excess of 15%) primarily occurs along the overhead transmission line route, as it traverses the walls bordering the Cohocton River Valley.

The Project is not anticipated to result in any significant impacts to geology, but because depth to bedrock in the Project Site is variable, it is possible that some turbine foundations will be set into bedrock. If bedrock is encountered, it is anticipated to be ripable, and will be excavated with backhoe. If the bedrock is not ripable, it will be excavated by pneumatic jacking or hydraulic fracturing. Blasting is not anticipated to be necessary. If blasting is required for some foundations, given the proposed turbines' distance from adjacent development (each turbine is at least 1,500 feet from the nearest residence), there should be no significant blasting-related impacts on wells, foundations, etc. Only temporary, minor impacts to topography and geology are expected as a result of construction activities. For example, some cut and fill or addition of fill will be required at some turbine sites and along some access roads. However, the impact to overall topography will be minor, and generally the land surface will be restored to previous grade following construction.

The primary impact to the physical features of the Project Site will be the disturbance of soils during installation of turbines and foundations, underground 34.5 kV cable, and access roads. Based on the assumptions outlined in Section 2.0, these activities will temporarily disturb approximately 98.5 acres of ground. The majority of this disturbance is associated with access road construction and the clearing around the turbines. The actual impact of this work will be significantly less than these calculations indicate, due to the proposed use/upgrade of existing farm lanes to access most turbines sites. Construction of a temporary staging area will disturb approximately 5.0 acres of soil and the construction of the meteorological tower, will temporally disturb approximately 1.0 acre of soil. Construction of the 34.5 kV transmission line could temporarily result in approximately 12.6 acres of soil disturbance where the line is underground or where poles are installed. Crane paths on this Project are anticipated to follow access roads and existing town roads, and thus will not add to the acreage of soil disturbance. Soil disturbance from all anticipated construction activities will total approximately 98.5 acres. Of this total, approximately 15.05 acres will be converted to built facilities (roads, crane pads, and structures), while the remaining area will be restored and stabilized following completion of construction.

Soils at the proposed access road and turbine locations generally do not present significant engineering or development constraints. However, correspondence with Jeffrey Parker of the Steuben County Soil and Water Conservation District revealed a concern regarding potential soil drainage impacts (Appendix B). Soils in the area typically have a fragipan layer, which inhibits vertical infiltration of water, resulting in predominantly lateral subsurface drainage.

Therefore, existing flow patterns can be disrupted/impeded by construction activities. Where subsurface drainage follows construction trench-lines, this disruption can create wet areas. Where access roads divert drainage to existing roadways, the disruption can create excess run-off to town and county road systems. Parker stated that previous access road construction in the area has caused excessive road ditch erosion or culvert over-topping due to increased runoff.

Additionally, earth moving and general soil disturbance will increase the potential for wind/water erosion and sedimentation into surface waters. There will be some impacts to soils that are classified as moderately erodable by the Steuben Soil Survey along the overhead 34.5 kV transmission line across the Cohocton River Valley, although such soils have generally been avoided. Construction activity also has the potential to impact soil in agricultural fields through rutting, mixing of topsoil and subsoil, and soil compaction, including some soils classified as prime farmland soils (if managed) by the NYSDA&M.

The area of disturbance calculations presented above assume that significant soil disturbance will occur in all areas in which construction occurs. This assumption is very conservative. Actual disturbance will be highly variable based on the specific construction activity, the construction techniques employed, and soil/weather conditions at the time of construction. For instance, in many locations installation of the buried electrical interconnects will involve relatively minor soil disturbance, restricted to a 2-3 foot wide trench when utilizing a rock saw or cable plow. However, because use of a backhoe and soil segregation cannot be precluded, a 15-foot-wide corridor of disturbance is assumed along all interconnect routes.

3.1.2.2 Operation

As mentioned previously, the Project will result in permanent conversion of approximately 15.05 acres of land into built facilities (0.2 acres of crane pad and foundation at each tower site (3.25 total acres for 16 turbines), 0.1 acre pad at the meteorological tower, and 11.6 acres of 20-foot-wide (maximum) permanent access roads, and 0.1 acres of underground transmission lines). Beyond occasional soil disturbance associated with Project maintenance and repair, the impacts of Project operation on physiology, geography, and soils are expected to be minimal.

3.1.3 Proposed Mitigation

Impacts to physiography or geology have been largely avoided by siting Project components so as to avoid major disturbances to steep slopes, sensitive soils, and bedrock. Nevertheless, geotechnical investigations will be conducted before construction to verify depth to bedrock and to perform a pre-construction evaluation of site-specific surficial and bedrock/geology. In the event that blasting is employed for tower foundations, mitigation measures will include the development of a blasting plan that limits offsite impacts. This plan will address blast size, timing, and sequencing to focus force within the area of excavation. All necessary blasting will receive oversight by an environmental monitor. In addition, pre-notification signs and warnings to affected landowners, use of best management practices, and compliance with applicable permit requirements will be instituted as mitigation measures.

Additional potential impacts associated with soil disturbance (erosion, sedimentation, compaction) have been minimized by siting turbines in relatively level locations and using existing roads for turbine access wherever possible. Impacts to soils will be further minimized by the following means:

- In areas where steep slopes are traversed by transmission lines, the lines will be run overhead as opposed to underground to reduce soil disturbance in erosion-prone areas.
- Low permeability breakers will be installed along buried electrical interconnect trench-lines to inhibit the migration of subsurface water.
- Public road ditches and other locations where runoff is concentrated will be armored with rip-rap to dissipate the energy of flowing water and to hold the soils in place.
- In areas where fragipan soils inhibit vertical drainage, efforts will be made to minimize alteration of existing drainage patterns and avoid excess runoff onto existing roads and agricultural lands, in accordance with NYSA&M Agricultural Protection Guidelines (Appendix D).
- Prior to commencing construction activities, erosion control devices will be installed between the work areas and downslope surface waters or wetlands, to reduce the risk of soil erosion and siltation.
- During construction activities, hay bales, silt fence, or other appropriate erosion control measures will be placed as needed around disturbed areas and stockpiled soils.
- Following construction, all temporarily disturbed areas will be stabilized and restored.

Impacts to soil resources will be minimized by adherence to "best management practices" that are designed to avoid or control erosion and sedimentation, stabilize disturbed areas, and prevent the potential for spills of fuels or lubricants. In general, erosion and sedimentation impacts during construction will be minimized by the implementation of an erosion and sedimentation control plan developed as part of the State Pollutant Discharge Elimination System (SPDES) General Permit for the Project.

Mitigation measures to protect and restore agricultural soils will be undertaken during and after construction. These will include full restoration of temporarily disturbed agricultural land in accordance with New York State Agriculture & Markets Agricultural Protection Guidelines (Appendix D). For example, topsoil will not be stripped and cranes will not cross fields during saturated conditions when such actions would damage agricultural soils. Existing access roads will be used for access to farmland to the extent practicable. However, for any required new access roads, topsoil in the work area will be stripped and stockpiled outside the area of disturbance, but on the property from which it was removed. All vehicular movements and construction activity will be restricted to areas where topsoil has been removed. Approximately 75 acres of temporarily disturbed soils will be restored following construction, almost exclusively in agricultural land. Restored areas will include tower sites, road edges, crane paths, temporary roads, and staging areas. The restoration process will generally involve the following sequence of activities:

1. Removal of gravel or other temporary fill;
2. Decompaction of compacted subsoils using a deep ripper;
3. Disking and removal of stones from decompacted subsoil;
4. Spreading of stockpiled topsoil over decompacted subsoil, and re-spreading of topsoil so as to reestablish pre-construction contours to the extent practicable;
5. Disking and removal of stones from re-spread topsoil; and
6. Seeding and mulching topsoil. Seed selection in agricultural fields will be based on guidance provided by the landowner and the NYSA&M.

Additional detail regarding proposed agricultural soil protection measures is included in Appendix D.

Soil impacts during construction will also be minimized by providing the contractor and all subcontractors copies of the final construction documentation and plans, which will contain all applicable soil protection erosion control and soil restoration measures. One or more pre-construction meetings will be held with the contractor and a representative of the NYSA&M, and, during construction, the environmental monitors will assure compliance with the construction plans and soil protection measures described above and included in Appendix D.

3.2 Water Resources

3.2.1 Existing Conditions

3.2.1.1 Surface Waters and Hydrology

The Project Site is located entirely within the Cohocton River watershed and includes the headwaters of several unnamed perennial and intermittent streams, some small ponds, and the Cohocton River. Streams in the area are highly variable, ranging from dry washes to moderate/steep gradient headwater streams along Dutch Hill, Drumm, Davis Hollow, Shultz Hill, and Zeh Roads, to the meandering Cohocton River, which is characteristic of a midreach stream (see Reschke, 1990 for community descriptions). With the exception of the Cohocton River, all of these streams are less than 10 feet wide, and most are characterized by a gravel/cobble substrate with little or no aquatic vegetation. Water depths are typically 2 to 8 inches and the streams have well-defined and abrupt banks. The Cohocton River occurs in broad, nearly flat-bottomed valley with portions mapped by FEMA as a 100-year floodplain. In the area where the Cohocton River is crossed by the Project transmission line, it is approximately 20-30 feet wide and 2-3 feet deep with a gentle to moderate gradient and a cobble, gravel, and silt substrate. The river has well-defined banks, and is bordered by a corridor of state protected wetlands along its west bank and a steep railroad embankment along its east bank. Refer to Figure 6 for the location of surface waters in the Project vicinity.

The Cohocton River within the Project Site is protected by Article 15 of the Environmental Conservation Law (Protection of Waters), and is classified as a C(t) trout stream. Specific locations of protected streams within and adjacent to the Project Site are indicated on Figure 4 of Appendix E (Wetland Delineation Report).

A variety of wetland communities were observed within the Project Site ranging from small isolated depressions in agricultural fields to wooded riparian wetlands along the Cohocton River Valley. The eastern slope of the Cohocton Valley (along the transmission line route) includes numerous groundwater seeps, and a few farm ponds are also found within the Project Site. Typically, these ponds are excavated or diked, and are less than one acre in size. Shorelines are well-defined and water depths are typically 3 feet or more.

Sources of wetland hydrology on the plateau areas within the Project Site include precipitation and surface water runoff during rainfall or snowmelt events. In the valleys, groundwater discharges/inflow and/or periodic flooding from nearby surface water bodies supplement these sources.

3.2.1.2 Wetlands

Wetlands within the Project Site have been examined through review of existing mapping, aerial photography interpretation, field reconnaissance, and on-site wetland inventory. The results of this data collection effort are described below.

3.2.1.2.1 Existing Information

Review of New York State Department of Environmental Conservation (NYSDEC) freshwater wetlands mapping indicates that there are a number of wetlands located in the Cohocton River Valley within and adjacent to the Project Site that are regulated under Article 24 of the Environmental Conservation Law. The state-regulated wetlands are identified in Figure 7. State-regulated wetland NA-6 is associated with the Cohocton River, and is designated as a Class I wetland by the NYSDEC and is the only State-regulated wetland that occurs within the Project Site. While this wetland totals 459.2 acres in size, less than two acres occur within the Project Site.

Review of National Wetland Inventory (NWI) mapping indicates that there are four federally-mapped wetlands located within the Project Site. The federally mapped wetlands are identified in Figure 8, and cumulatively total 1.3 acres. Three of the federally-mapped wetlands are located in the western portion of the Cohocton River Valley, and the fourth is located adjacent to Wise Road. One of these wetlands is an unconsolidated bottom impoundment, or a farm pond (PUBHh), and the other three are emergent impoundments (PEM1Eh and PEM1Fh). Additionally, significant tracts of NWI wetlands occur adjacent to the Project Site in the Cohocton River Valley.

Review of the New York portion of the National Hydric Soil List indicates that the Project Site contains areas of hydric soils, as determined by the United States Department of Agriculture (USDA) NRCS (NRCS, 2005). Hydric soils are poorly drained, and their presence is also indicative of the likely occurrence of wetlands. Hydric soils found in the Project Site include the following soil series: Chippewa; Fluvaquents and Ochrepts; Palms; Red Hook and Volusia [potentially hydric in New York State (NRCS, 2006a)]; and Wayland.

3.2.1.2.2 Field Review and Wetland Community Types

Wetlands and streams within or adjacent to the Project Site were identified during field surveys conducted by Environmental Design & Research, Landscape Architecture, Environmental Services, Engineering and Surveying, P.C. (EDR) during the fall of 2005 and spring and summer of 2006.

EDR performed field surveys only on those wetlands that are adjacent to or may be impacted by proposed project components (including the turbines, turbine workspaces, access roads, transmission line, and buried electrical interconnect) and along the portions of public roads that may be subject to improvements (i.e., increased turning radius). In general, an area within 200 feet of all turbines, and 100 feet of all roads, interconnects, and other project components, as identified and delineated. The determination of wetland boundaries was made by EDR personnel according to the three-parameter methodology described in the USACE Wetland Delineation Manual (hereafter referred to as the 1987 Manual) (Environmental Laboratory, 1987). Attention was also given to the identification of potential hydrologic connections between wetlands areas that could influence their jurisdictional status. The data collected for each of the wetlands delineated by EDR personnel on the Project Site included vegetation, hydrology indicators, and soils characteristics.

EDR personnel delineated a total of 22 wetlands/waters within the Project Site. These included 11 wetlands, 9 streams/drainages, and 3 farm ponds. Where a river or stream occurred within a delineated wetland, the open water channel was not separately delineated. The location of these wetlands is indicated in Figure 10A. Information pertaining to individual on-site wetlands is summarized in Table 8.

Table 8. Delineated Wetlands and Streams

Wetland/ Stream ID	Community Type[1]	Federal Jurisdiction (Yes/No/ Undetermined)[2]	State Jurisdiction (Yes/No)[3]	Potential Impact (Yes/No)[4]
DHA	WM	No	No	No
DHB	WM	No	No	Yes
DHC	WM/ditch	Undetermined	No	Yes
DHD	FO/SS/River	Yes	Yes	No
DHE	WM/SS/FO	Yes	No	No
DHF	WM/dry drainage	Undetermined	No	No
DHG	WM/SS/Seep	Undetermined	No	Yes
DHH	FO/WM/SS/Seep	Undetermined	No	No
DHI	SS/WM	Undetermined	No	No
DHJ	WM	Undetermined	No	No
DHK	Intermittent Stream	Yes	No	No
DHL	SS/WM/Stream	Yes	No	Yes
DHM	WM/FO	Yes	No	Yes
DHN	Pond with EM edge	Yes	No	No
DHO	FO/Seep	Undetermined	No	Yes
DHP	FO/seep	Undetermined	No	Yes
DHQ	FO/Seep	Undetermined	No	Yes
DHR	Stream with WM edge; SS/WM	Yes	No	Yes
DHRA	Stream	Yes	No	Yes
DHS	Pond, WM/EM edge	Yes	No	Yes
DHT	Intermittent Stream	Yes	No	Yes
DHY	FO/SS/EM/Stream	Yes	Yes	Yes
DHZ	Pond, SS/EM edge	No	No	No

[1] Wetland community types are represented by the following abbreviations: "EM" = Emergent, "FO" = Forested, "SS" = Scrub-shrub, "WM" = Wet meadow.
[2] Based on existing mapping and visual observation of hydrologic connectivity in the field. Final jurisdictional determination to be made by USACE.
[3] Based on existing NYSDEC mapping of freshwater wetlands and/or protected streams.
[4] Based on preliminary assessment of impact avoidability.

The on-site delineation effort revealed that wetlands within the turbine array on Dutch Hill are very limited, and generally consist of isolated depressions and swales. The most significant wetlands within the Project Site occur along the proposed transmission line route through the Cohocton River Valley (Figure 10A). Descriptions of each of the wetland types found on the plateau areas where turbines are proposed, and through the valley where the transmission line is routed are set forth in Sections 3.2.1.2.2.1 and 3.2.1.2.2.2, respectively.

3.2.1.2.2.1 Wind Turbine Site

The elevated plateau areas where the turbines, access roads, and buried interconnect are proposed are generally well drained and include relatively few wetlands. No state or federally mapped wetlands are indicated in this area. Three wetlands were delineated in the Generating Site and share similar characteristics as described below.

Isolated Depressions and Swales – In several locations on Dutch Hill small depressional wetlands have formed in low spots that collect run-off. Wetlands DHA and DHB are both small depressional wetlands in upland agricultural settings, as in Wetland DHT. Similarly, wetland characteristics have developed in some of the man-made drainage swales that have been created between sloping agricultural fields to capture and divert surface water run-off, as in Wetland DHC. Dominant species in these depressions and drainages generally include sedges (*Carex sp*.), rushes (*Juncus sp*.), reed canary grass (*Phalaris arundinacea*), and willows (*Salix sp*.). Wetland DHB is a representative example of a depressional wetland. It is located in a dairy cow pasture off of Fleishman Road, south of Turbine 4. This wet meadow is dominated by reed canary grass and sedges, with a scattering of soft rush (*Juncus effuses*) also present (Appendix E, Wetland Delineation Report - Photo 2, Appendix C). The soil is a hydric silt loam as evidenced by the low chroma matrix color (10YR 5/2) and moderately abundant high chroma mottles (10YR 5/6 and 10YR 5/8) in the B horizon. Primary indicators of hydrology include saturated soils at the surface with free water at a depth of three to four inches, and drainage patterns in the wetland. Wetlands DHA and DHC have marginal wetland characteristics and may not hold water long enough during the growing season to be true wetlands.

Although these wetlands offer relatively little in terms of wildlife habitat and floodwater abatement due to their small size and lack of habitat diversity, they play a role in the protection of downstream water quality by physically filtering sediment and absorbing nutrients out of water running off of agricultural fields. In terms of jurisdictional status, the depressional wetlands generally appear isolated and unlikely to fall under federal jurisdiction whereas the drainage swales typically are hydrologically connected to navigable waters and therefore may be considered jurisdictional by the USACE.

3.2.1.2.2.2 Transmission Line Route

The majority of wetlands and streams, and certainly the largest/most significant of these resources, occur in the valley and slope areas along the proposed transmission line route. These include the Cohocton River and associated riparian wetlands, a forested wetland/hillside seepage complex, stream channels, and farm ponds, which are described below.

Cohocton River/Wetlands – Wetlands delineated along the Cohocton River are primarily forested/scrub-shrub communities with some emergent/wet meadow components. The largest and most diverse of these is north of the currently proposed transmission line route, on Town park property. The route for the proposed transmission line was moved from this area to the south where wetlands are restricted to a relatively narrow band along the west shore of the Cohocton River. Common vegetative species encountered in the wetlands along the Cohocton River include red maple, green ash, ironwood, silky dogwood, speckled alder, reed canary grass, and spotted jewelweed. These wetlands are characterized by periodic inundation/saturation (due to river flooding, surface runoff, and seasonal high groundwater) and deep alluvial soils. They correspond with the mapped NYSDEC wetland (NA-6) described previously, and are some of the largest/most significant wetlands in the Project Site. Delineated wetlands in this area include DHE, DHD, and DHY. Wetlands DHD and DHY include segments of the Cohocton River and Wetland DHE surrounds a tributary stream to the Cohocton River. As mentioned previously, the transmission line route was shifted to the south in this area, and now only crosses DHY and the Cohocton River. At the proposed crossing location, the Cohocton River is a 20-30 foot wide, gentle to moderate gradient stream with a substrate that includes cobbles, gravel, and silt (Appendix E, Wetland Delineation Report - Photos 23 and 24, Appendix C). The river is characterized by numerous meanders/oxbows, and is typically lined by wetlands and agricultural fields throughout the valley. The Cohocton River is classified as a protected C(t) trout stream by the NYSDEC. The proposed crossing location is at the southern end of Wetland DHY (Figure 10A, Sheet 4). This wetland is dominated by green ash in the overstory as well as the midstory, with jewelweed common in the herbaceous layer (Appendix E, Wetland Delineation Report - Photo 21, Appendix C). The soils in Wetland DHY are a silt loam displaying hydric characteristics through a low chroma matrix color (10YR 5/2) with common high chorma mottles (10YR 5/6) in the B horizon. At the time of delineation, soils were saturated at a depth of three to four inches with free water at a depth of nine to ten inches.

The Cohocton River/wetland complex is potentially the most significant wetland delineated within the Project Site in terms of its size, as well as the wetland functions and values it provides. Due to its large size and structural diversity this wetland provides habitat to a variety of plant and animal species, as well as making significant contributions to water quality improvement through nutrient cycling and sediment filtration. Being located within the floodplain of the Cohocton River, this wetland complex also contributes to floodwater abatement and groundwater recharge/discharge. This wetland complex is mapped on both the NWI map and the NYS Freshwater Wetland Map (Wetland NA-6), and therefore falls under the jurisdiction of the NYSDEC and the USACE.

<u>Forested Wetland/Hillside Seepage Complex</u> – The valley wall that transitions between the broad Cohocton River Valley and the Lent Hill uplands supports a forested/scrub-shrub wetland complex that is fed largely by groundwater seeps. This complex includes Wetlands DHH, DHI, DHJ, DHG, DHQ, DHO, and DHP. The transmission line route, as currently proposed, had been shifted south to avoid the bulk of these wetlands. Groundwater seepage from discharge points within upland deciduous forest on the rocky slope, feed Wetlands DHG, DHH, and DHQ which occur on steep slopes and sloping benches on the valley wall. In places, water from these wetlands consolidates into narrow discharge channels and flows down the valley wall via steep gradient intermittent streams (approximately one to two feet wide and one to four inches deep) into Wetlands DHO and DHP at the toe of the slope. The overhead transmission line route ascends the valley wall in the vicinity of these drainages, and crosses wetlands DHO and DHG. Wetland DHO is a forested community dominated by

black willow, green ash, and spotted jewelweed (Appendix E, Wetland Delineation Report - Photo 15, Appendix C). Portions of Wetlands DHG and DHQ have been logged in recent years, and in such places are characterized by wet meadow communities of spotted jewelweed, reed canary grass, and late goldenrod intermixed with red maple and green ash saplings (Appendix E, Wetland Delineation Report - Photos 7 and 17, Appendix C). Elsewhere, these wetlands are a mix of forest, shrub, and herbaceous species including American elm, silky dogwood, hawthorn, willows, jewelweed, Joe Pye weed, and reed canary grass. Soils in this area are typically gravelly and relatively shallow.

The primary wetland functions provided by this complex include groundwater discharge/recharge, wildlife habitat (including brook salamander in the seep channels), and water quality improvement. The jurisdictional status of these wetlands is questionable, as a “significant nexus” to navigable waters was not observed. Field observations suggest that the groundwater released via seeps descends to the valley floor where it infiltrates back into the ground.

Intermittent Headwater Streams – Also found along the slopes of the Cohocton Valley are intermittent headwater streams, including Streams DHF and DHK. Both of these channels were dry at the time data was collected (June 23, 2006), but displayed evidence of periodic heavy flows. The channels had well defined banks, with a moderate to gentle gradient and gravel substrate. Vegetation was lacking from Stream DHK, while Stream DHF had approximately 70% vegetative cover consisting of spotted jewelweed and late goldenrod (Appendix E, Wetland Delineation Report - Photos 6 and 11, Appendix C). The impenetrable substrate of these two drainages precluded the collection of soil samples.

Typically, the primary function/value of intermittent headwaters is to convey snowmelt, storm water runoff, and groundwater seeps (in the case of Stream DHK) from upland areas to larger streams and rivers in the valleys. However, both of these streams terminate in agricultural fields indicating that the seasonal water they carry may be limited in volume or frequency of flow and/or infiltrates through the gravelly soils of the valley into the groundwater.

Perennial Stream Channels – Three perennial headwater streams were delineated near the intersection of Kirkwood-Lent Hill Road and Edmond Road, along the proposed overhead transmission line route on Lent Hill. These include Streams DHL, DHM, and DHR and are characterized by narrow (one to three feet wide) channels and rock/gravel substrate. They are typically gentle to moderate gradient streams that have shallow (one to six inch deep) flowing water. Streams DHL and DHM run parallel to each other, separated by the abandoned Edmond Road, until DHM crosses the road and feeds into DHL. Stream DHM has a wet meadow fringe dominated by spotted jewelweed and sensitive fern, while the banks of Stream DHL have a silky dogwood shrub component in addition to an herbaceous layer of spotted jewelweed, late goldenrod, and sedges (Appendix E, Wetland Delineation Report - Photos 13 and 12, Appendix C). Stream DHR is located along Kirkwood-Lent Hill Road. Its banks are well defined, but lined by hydrophytic vegetation including silky dogwood and late goldenrod with minor components of cattail, reed canary grass, and spearmint (Appendix E, Wetland Delineation Report - Photo 18, Appendix C). A fourth stream channel (DHRA) was delineated along Davis Hollow Road in the western portion of the Project Site. This stream is approximately two to four feet wide with a depth of one to two inches of flowing water. This stream has a moderate flow and gradient and a rocky substrate (Appendix E, Wetland Delineation Report - Photo 19, Appendix C).

The delineated stream channels appear to display a "significant nexus" to downstream, and ultimately, navigable waters and are therefore are likely to fall under federal jurisdiction. These streams provide habitat to fish, amphibians and other wildlife in addition to maintaining surface water flows. The water quality of streams directly impacts that of water bodies further down stream.

<u>Farm Ponds/Emergent Marsh</u> – Three old farm ponds/emergent marshes were delineated along the proposed overhead transmission line route, including Wetlands DHN, DHS, and DHZ. Wetland DHZ is located in an agricultural field in the Cohocton River Valley, between the river and Atlanta Back Road. Vegetation is structurally diverse and includes black willow trees, willow and silky dogwood shrubs, and a variety of herbaceous species including spotted jewelweed, sedges, cattail, and sensitive fern. Wetlands DHN and DHS are located on Lent Hill adjacent to Kirkwood-Lent Hill Road and Stream DHR. Both of these ponds have an emergent wetland fringe, although the plant communities are very different. Wetland DHS is dominated by late goldenrod, narrow leaf meadowsweet, and cottonwood seedlings while Wetland DHN is dominated by cattail and reed canary grass (Appendix E, Wetland Delineation Report - Photos 20 and 14, Appendix C).

The farm ponds within the Project Site likely provide habitat and breeding grounds for waterfowl and amphibians. These wetlands also make a small contribution to nutrient cycling, stormwater detention, and groundwater recharge but these functions are negligible due to the small size of these wetlands. Wetland DHS is reportedly a source of drinking water for livestock at a farm located on Edmond Road. Wetlands DHZ and DHS appear to be isolated and are not anticipated to fall under federal jurisdiction. However, Wetland DHN is hydrologically connected to Stream DHR and therefore is likely to be considered jurisdictional by U.S. Army Corps of Engineers (USACE).

3.2.1.3 Groundwater

Haley & Aldrich of New York conducted a study of groundwater resources within the Project Area (Appendix C). This study identified three water bearing units within the area, the most significant being the valley fill aquifer (Figure 11). The valley fill deposits underlying the Cohocton River and the lower reaches of several unnamed tributaries to these water courses have collectively been designated a Primary Aquifer as defined by NYSDEC regulations. This designation indicates that the aquifer yields enough groundwater to be used as a municipal water supply, which is the case for the Village of Cohocton and the Hamlets of North

Cohocton and Atlanta. Although the quality of the water in this aquifer is generally good, the Environmental Protection Agency's (EPA) Safe Drinking Water Information System has a record of nitrate health-based violations for the Village of Cohocton and the North Cohocton water district (EPA, 2006B). Haley & Aldrich report high salt content at significant depths in the valley fill due to contact with halite subcroppings as well as the presence of sulfates and iron in some areas, particularly in darker shale units. Municipal well data indicate yields from this aquifer in the range of 200-300 gallons per minute (gpm). Haley & Aldrich describe this aquifer as very prolific and subject to significant ongoing recharge across most of the study area. Additionally, this valley fill aquifer is continuous with the valley fill aquifer in Wayland Township, which has been designated a Critical Environmental Area by the Town of Wayland because it is a primary source of drinking water. As shown in Figure 11, none of the proposed turbine sites are located over the area designated as a Primary Aquifer. A portion of the transmission line route traverses over the area so designated.

Other water bearing units identified by Haley & Aldrich are hill slopes and upland area soil deposits and bedrock. Hill slopes and upland area soil deposits are not considered significant water-bearing units but may be sufficient for domestic use in some areas. The bedrock aquifer is expected to be the source of water for the majority of the drilled wells on hill slopes and in the upland portions of the Project Site. Groundwater flow and yield within the bedrock is generally controlled by fractures in the rock. Rock formations that typify the Project Site generally have low permeability and therefore low yields. Refer to Appendix C for further information on groundwater resources within the Project Area.

3.2.2 Potential Impacts

3.2.2.1 Construction

3.2.2.1.1 Surface Waters and Wetlands

Due to the general lack of wetlands and surface water resources within the Project Site, construction-related impacts are anticipated to be very minor. To avoid or minimize the impacts on streams and wetlands, Project design was guided by the following siting criteria:

- Large built components of the Project, including staging areas, wind turbines, the collector station, and the substation, will be located in upland areas and will completely avoid wetlands.
- Wetland impacts due to access road crossings will be avoided by routing around wetlands and utilizing existing farm lanes.
- Buried electric interconnect lines will be routed to avoid crossing wetlands and streams whenever possible. Where necessary, narrow and/or previously disturbed crossing locations will be utilized.

- To minimize impacts to wetlands in the Cohocton River Valley, the transmission line will be installed above ground, along the Erie, Delaware, Lackawanna, and Western ROW.

- Wetlands that could be impacted during construction were inventoried by EDR during the fall of 2005 and the spring and summer of 2006 (Figure 10A). Unavoidable wetland impacts anticipated to occur in these areas during construction of the Project will be limited to the crossing of the Cohocton River and associated wetlands by the proposed overhead transmission line. Although final design of the line is not yet complete, the route is proposed to utilize previously disturbed areas. The Cohocton River will be spanned, and will not be disturbed during construction. The proposed alignment will cross approximately 377 linear feet of delineated wetlands (Figure 10B). However, construction impacts will be limited to selective tree clearing within the 35-foot wide ROW and placement of treated wood poles (by auguring). For the purposes of this DEIS, it is assumed that a 20-foot wide corridor of disturbance will occur within the wetland during Project construction.

During construction, direct impact to wetlands/streams is anticipated to total no more than 0.17 acres. This impact will be limited to minor and temporary vegetation and soil disturbance associated with clearing of vegetation and the placement of transmission poles in the wetland. Indirect impacts such as sedimentation/siltation and incidental spills are also possible. Permanent impacts will be limited to placement of transmission poles in wetlands and regulated adjacent areas, which will require an Article 24 permit from the NYSDEC and a Section 404 permit from the USACE. The construction of turbines, access roads, and the possible upgrade of local public roads, are not anticipated to result in either temporary or permanent impacts to wetlands and streams.

3.2.2.1.2 Groundwater

The project will include the following constructed elements, as shown on Figure 3:

- Construction of up to approximately 16 wind turbines as shown on Figure 3. The structures will consist of a single tower constructed on a concrete foundation. The foundations will be either a spread footing, octagonal in plan, up to 55 ft in lateral dimension and constructed up to approximately 10 feet below existing grade; otherwise, they will be a cylindrical caisson foundation 18 feet. in diameter, extending up to 30 feet below existing grade. The type of foundation constructed will be dependent on the subsurface conditions (soil type, depth to bedrock, type and quality of bedrock, etc) and other factors.

- Construction of gravel access roads connecting each turbine to existing roads. To the extent possible, the connector roads will utilize existing farm roads.

- Installation of power lines connecting the various elements of the project (Figure 3). The turbines will be connected via underground 34.5 kV cables. These cables will terminate in a collection structure near the south-central portion of the Project Area.

- From the collection structure, an above-grade power line will be installed on poles that will traverse the eastern slope of Dutch Hill, cross the Cohocton River and State Route 371, traverse the western slope of the Lent Hill area and continue to a connection point on Lent Hill with the transmission line for the Cohocton Wind Farm Project.

Haley & Aldrich conducted an assessment of the potential impacts the Project could have on groundwater resources. As stated in their report: "The proposed construction elements of the project do not appear to present significant potential impacts to groundwater resources in the vicinity of the project." However, they did identify four potential impacts to groundwater and assessed the potential for each impact based on site-specific resources and construction plans. Potentially-negative impacts to groundwater include:

- Localized lowering of the water table, thereby impacting yield of nearby water supply wells;

- Modification to surface runoff or stream-flow, thereby affecting groundwater recharge characteristics;

- Degradation in groundwater chemical quality; and

- Impacts to groundwater recharge areas (wetlands).

Installation of turbine foundations has the greatest potential for impacts to groundwater. If blasting is necessary, it can generate ground vibration, fracture bedrock, and impact groundwater levels. However, based on the depth and extent of excavation proposed, and the distance of the excavations from local wells, these risks are considered minimal and unlikely to have an affect on surrounding residences. Groundwater that infiltrates into the excavation may require removal by pumping, which could have an effect on the elevation of the water table. However, this water will be pumped to the surface and allowed to infiltrate back into the aquifer with negligible loss of volume due to evaporation. Therefore, any effect will be very localized and temporary. Additionally, installation of the concrete foundations may cause a temporary, localized increase in groundwater pH during the curing process. This effect will not extend beyond the immediate area of the foundation and will not adversely affect ground water quality.

In addition to impacts to groundwater due to turbine foundation installation, minor impacts could result from other Project activities. Construction of the 5 miles of new access roads will result in minor increase in storm water runoff that otherwise would have infiltrated into the ground at the road locations. Buried transmission lines may facilitate groundwater migration along trench backfill in areas of shallow groundwater. However, this volume of water should not be sufficient to have an impact at any distance from the trench. Overhead transmission lines will generally have no effect on groundwater, except perhaps in wetlands in the Cohocton River Valley. In these areas of shallow groundwater, the preservative-treated wooden poles may be installed below the water table. Under these circumstances, there will be a localized loss of polynuclear aromatic hydrocarbon (PAH) compounds to the soils immediately surrounding the poles. However, these compounds are not readily dissolved into groundwater and would not be present in quantities that could adversely affect human health or the environment.

A final potential impact to groundwater is the introduction of pollutants to groundwater from the discharge of petroleum or other chemicals during construction. Such discharges could occur in the form of minor leaks from fuel and hydraulic systems, as well as more substantial spills that could occur during refueling or due to mechanical failures and other accidents.

Given the location of the majority of the proposed project components, and the practices to be followed during construction, none of the potential impacts listed above will have a significant impact on the valley fill aquifer.

3.2.2.2 Operation

3.2.2.2.1 Surface Waters and Wetlands

Operation and maintenance of the constructed facility is not anticipated to have significant adverse impacts to wetlands, streams, or ponds within the Project Site. The only predictable operational impact is periodic vegetation management (i.e., tall tree removal) along the transmission line ROW where it crosses wetlands in the Cohocton River Valley. However, this activity will not result in the loss of wetland acreage, and because these wetlands are primarily scrub-shrub and emergent communities, will not result in permanent wetland conversion (i.e., from a forested to non-forested community). Minor and isolated incidences of wetland/stream impact could also occur in association with infrequent events such as repair of buried electrical interconnects, access road washouts, or accidental fuel/chemical spills.

The proposed Project will not result in wide-scale conversion of land to built/impervious surfaces. Tower bases, crane pads, access roads, and the substation in total will add approximately 15 acres of impervious surface to the 2,160-acre Project Site (i.e., conversion of less than 1%). Consequently, no significant changes to the rate or volume of stormwater runoff are anticipated. However, installation of permanent Project components could result in localized changes to runoff/drainage patterns.

3.2.2.2.2 Groundwater

Any impacts to groundwater will occur during construction only. Over the long term, addition of small areas of impervious surface to the Project Site in the form of permanent access roads, crane pads, substations, and the O&M building will have a minimal effect on groundwater recharge. Turbine foundations and utility poles installed below the water table and migration of groundwater along buried interconnect trenches could have a minor effects on groundwater flow paths, and a continued risk of chemical spills exists during operation. However, as stated by Haley and Aldrich: "Wind farm projects typically do not have demonstrable impacts to groundwater resources. They do not utilize groundwater for generating energy. They do not require the use or storage of fuels or other chemicals for operation, thus the potential release of such materials and resulting negative impacts to groundwater quality are not an issue."

3.2.3 Proposed Mitigation

The information collected during the onsite delineations will be included in the Joint Application for Permit that will be submitted to the NYSDEC and the USACE. Because permanent wetland and stream impacts (beyond placement of poles) are not anticipated, no compensatory wetland mitigation project is proposed. However, if wetland mitigation is required by the agencies, a mitigation plan will be developed in consultation with the NYSDEC and USACE during the wetland permitting process.

No mitigation for indirect or temporary impacts to wetlands or streams is proposed, given the fact that these impacts will not result in any loss of wetland acreage. However, temporary impacts to wetlands/streams will be minimized during construction as discussed below:

The direct impacts to wetlands and streams will be minimized by utilizing existing or narrow crossing locations and previously disturbed areas whenever possible. Special crossing techniques, equipment restrictions, herbicide use restrictions, and erosion and sedimentation control measures will also be utilized to reduce impacts to water quality, surface water hydrology, and aquatic organisms. In addition, clearing of vegetation in wetland areas will be kept to an absolute minimum.

Where crossings of surface waters and wetlands are required, the Applicant will employ the Best Management Practices associated with particular, applicable streamside and wetland activities, as recommended by the NYSDEC and the USACE, and required by the issued wetland/waters permits. Specific mitigation measures for protecting wetlands and surface water resources will include the following:

- No Equipment Access Areas. Wetlands, streams, waterbodies will be designated “No Equipment Access,” thus prohibiting the use of motorized equipment in these areas.
- Restricted Activities Area. A buffer zone of 100 feet, referred to as “Restricted Activities Area”, will be established where Project construction traverses streams, wetland and other bodies of water. Restrictions will include:
    - No deposition of slash within or adjacent to a waterbody;
    - No accumulation of construction debris within the area;

- o Herbicide restrictions within 100 feet of a stream or wetland (or as required per manufacturer's instructions);
- o No degradation of stream banks;
- o No equipment washing or refueling within the area; and
- o No storage of any petroleum or chemical material.

- Access Through Wetlands - When crossing wetlands, routing around edges, utilizing disturbed areas, and crossing the narrowest portion of the wetland will be the preferred crossing options. Wherever feasible, low impact crossing methods will be used such as timber mats or similar materials.
- Sediment and Siltation Control – A soil erosion and sedimentation control plan will be developed and implemented as part of the SPDES General Permit for the Project. To protect surface waters, wetlands, groundwater and stormwater quality, silt fence, hay bales, and temporary siltation basins will be installed and maintained throughout Project development. The location of these features will be indicated on construction drawings and reviewed by the contractor and environmental monitor prior to construction. The environmental monitor will also inspect these features to assure that they function properly throughout the period of construction, and until completion of all restoration work (final grading and seeding).

To enhance compliance with proposed mitigation measures during construction, CPP II will provide the construction contractor with copies of applicable NYSDEC (Article 24 and Section 401 Water Quality Certification) and USACE permits (Section 404) and site specific plans detailing construction methodologies, sediment and erosion control plans, and required natural resource protection measures. The on-site environmental monitor will ensure compliance with resource protection plans and permit conditions. Wetlands temporarily disturbed during construction will be restored to their original grade. This will allow wetland areas to redevelop naturally following construction.

Any increase in stormwater runoff will be negligible, as Project construction will result in limited addition of impervious surface. Nevertheless, specific means of avoiding or minimizing stormwater-related adverse impacts during construction and operation of the Project include adhering to a detailed soil erosion and sedimentation control plan, as described previously. Additionally, a SPCC Plan that outlines procedures to be implemented to prevent the release of hazardous substances into the environment will be developed and implemented. This plan will not allow refueling of construction equipment within 100 feet of any stream or wetland, and all contractors will be required to keep materials on hand to control and contain a petroleum spill. These materials will include a shovel, tank patch kit, and oil-absorbent materials. Any spills will be reported in accordance with NYSDEC regulations. Contractors will be responsible for ensuring responsible action on the part of construction personnel.

If blasting is necessary for construction of any wind turbine foundations, blasting will be done in compliance with a blasting plan designed with appropriate charge weights and delays to localize bedrock fracturing to the proposed foundation area, minimizing the already unlikely chance of impacting water levels in residential wells. However, as stated in Section 2.0, CPP II does not currently expect that blasting will be required.

Long-term vegetative management on the transmission line ROW within wetlands will be accomplished in a manner that does not require the use of vehicular equipment or the application of herbicides.

3.3 Biological Resources

3.3.1 Existing Conditions

3.3.1.1 Vegetation

Plant species and communities found within the Project Area were identified and characterized during field surveys conducted by EDR during the summer and fall of 2006. A total of 138 plant species were documented within the project area during these field surveys. A list of these species (including scientific names) is included in Appendix F. All of the plant species identified during the course of field surveys are common to the region and the state.

3.3.1.1.1 Ecological Communities

Inventoried wetlands within the Project Site have been quantified and described separately (Section 3.2.1.2). All of the major plant communities found within the Project Site are common to New York State. Within the Project Site, agricultural land and forestland are the dominant community types on the higher elevation ridges and steep-sloped hillsides. Agricultural land, along with disturbed/developed areas, successional communities (successional shrubland and old field), open water, and wetland communities, also occur along the 34.5 kV transmission line component of the Project in the lower elevations of the Cohocton River Valley. Brief descriptions of these ecological community types, as classified and described in *Ecological Communities of New York State* (Reschke, 1990), are provided below. *Agricultural Land* constitutes the largest community throughout the Project Site, with approximately 1,325 acres (61.3%) of the land in row crops, field crops, or pastureland. Corn and hay (alfalfa, clover, and grasses) are the primary agricultural crops on site. Hayfields are typically rotated into (and out of) row crop production (typically corn), and less often into pastureland. Consequently, the percentage in each agricultural type is constantly changing. Pastureland is used for the grazing of livestock and is typically characterized by mixed grasses and broad-leafed herbaceous species, including clovers, cow vetch, plantains, and dandelion.

Forestland totals approximately 745 acres (34.5%) of the Project Site. Hardwood forests within the Project Site resemble the Appalachian oak-hickory forest, beech-maple mesic forest, and the hemlock-northern hardwood communities described by Reschke (1990). Forests typically occur on steep valley walls, in ravines, and within woodlots of various sizes. Overstory tree species vary based on the orientation of the slope, but dominant or co-dominant species in most locations include northern red oak, white ash, basswood, sugar maple, and red maple. On north-facing slopes and in narrow wooded ravines Eastern hemlock and white pine are often the dominant or co-dominant tree species, along with red maple, yellow birch, black cherry, Scotch pine, American beech and sugar maple. The forest understory ranges from sparse to very dense, with common species including saplings of the overstory trees, along with honeysuckle, striped maple, low bush blueberry, wild grape, white wood aster, Canada goldenrod, May apple, brambles, and ferns such as bracken fern and wood fern.

Successional Shrubland is a relatively minor community within the Project Site, occurring on only approximately 35 acres (1.6%). Shrubland occurs primarily in association with old field communities on reverting agricultural fields and along the periphery of active agricultural areas. Shrublands also occur in poorly drained areas and areas disturbed by logging, where young trees and shrubs are also intermixed with overstory trees. Herbaceous species similar to those found in successional old fields also occur in this community. However, shrub species such as honeysuckle, buckthorn, raspberry, multiflora rose, gray dogwood, hawthorn, and wild grape dominate this community. Shrub-dominated wetlands (interspersed with some upland successional shrubland) occur along the Cohocton River and in seep areas on the eastern wall of the Cohocton Valley. These wetlands were described in Section 3.2, and are dominated by species such as silky dogwood, speckled alder, pussy willow, and Eastern cottonwood.

Successional Old Field constitutes approximately 30 acres (1.4%) of the Project Site, and is defined by Reschke (1990) as "a meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development), and then abandoned." This ecological community is fairly uncommon within the Project Site, occurring primarily along field edges or in fallow/abandoned agricultural fields. Species found in these areas include typical old-field grasses such as orchard grass, timothy, and perennial rye. Broad-leaved herbaceous species found in old fields include goldenrods, clovers, milkweed, thistles, asters, Queen Anne's lace, and burdock. Shrubs (including honeysuckle, raspberry, gray dogwood, and brambles) and saplings from adjacent forestland, are also typically components of this community, but represent less than 50% of total vegetative cover.

Shallow emergent marsh and open water communities account for approximately 1 acre, (<0.1%) of the Project Site. Other than the Cohocton River, these communities are essentially farm ponds with a fringe of emergent vegetation. They were described in Section 3.2, and are characterized by open water bordered by herbaceous wetland species such as broad-leaf and narrow-leaf cattail, common reed, reed canary grass, sedges, spotted jewelweed, and green bulrush. These areas provide habitat for fish and various wetland/aquatic wildlife species, including salamanders, painted turtle, bullfrog, great blue heron, mallard, muskrat, and raccoon.

The Project Site also includes approximately 24 acres (1.1%) of Disturbed/Developed land. This community is a combination of several "cultural communities" defined by Reschke (1990), and is characterized by the presence of buildings, paved areas, and lawns. It includes residential yards, farms, storage yards, and roads.

3.3.1.1.2 Significant Natural Communities/Rare Plant Species

Written requests for information regarding listed threatened and endangered species were sent to the United States Fish and Wildlife Service (USFWS) and the NYS Natural Heritage Program (NHP) on April 18, 2006. According to the NHP, their database indicates that no state-listed threatened or endangered plants, or significant/unique natural communities are known to exist within the vicinity of the Project area. Refer to Appendix B for the NHP response letter. To date, no response to the written request for information has been received from the USFWS.

Supplemental field surveys were conducted by EDR during the summer and fall of 2006 looking specifically for the presence of rare flora, fauna and unique natural communities. Seeps on the eastern wall of the Cohocton Valley and other wetland areas were examined closely, as these areas represented the most likely habitat for rare plants within the Project Site. However, no listed threatened or endangered plant species were documented in these areas, and the field surveys confirmed that common ecological communities dominate the Project Site. No unique or significant natural communities were observed on the Project Site, and other than the seeps mentioned above, typical indicators or possible rare plant occurrence (e.g., rich woodlands, limestone outcrops, fens, etc.) were not observed.

3.3.1.2 Fish and Wildlife

Wildlife resources within the Project Area were identified through analysis of existing data sources, such as the North American Breeding Bird Survey (BBS), the New York State Breeding Bird Atlas (BBA) and the New York State Amphibian and Reptile (Herp) Atlas, along with on-site field surveys conducted by EDR ecologists in the summer and fall of 2006. This information was supplemented by site-specific avian and bat studies conducted by Woodlot Alternatives, Inc. (Appendix G).

Based on the data sources listed above, it is estimated that over 200 different species could potentially be found within the Project area at some time during the year. These species of wildlife, including scientific names, are listed in a species list included in Appendix F. More specific information regarding birds, mammals, herpetofauna (reptiles and amphibians), state and federally listed threatened and endangered species, and wildlife habitat within the Project Site is presented below.

3.3.1.2.1 Birds

To determine the type and number of bird species present within the Project Area, existing data sources were consulted and on-site field surveys were conducted. Sources of information included the following:

- NYS Breeding Bird Atlas;
- USGS Breeding Bird Survey;
- Onsite spring breeding bird survey conducted by Woodlot during Spring 2006 (Appendix G);
- On-site raptor migration surveys conducted by Woodlot during 2004 and 2005 (Appendix G);
- A radar survey conducted by Woodlot during the fall of 2006 (Appendix G);
- Radar data from migration studies conducted in the Town of Prattsburgh during 2004 (Mabee, et al., 2005);
- Raptor migration and radar survey data from studies conducted by Woodlot in Prattsburgh during 2004 and 2005 (Woodlot, 2005a and b);
- On-site observations by EDR ecologists during the summer and fall of 2006; and
- Based on the results of these investigations, it appears as if approximately 151 avian species could use the Project Site at some time throughout a given year (Appendix G). Details on the site's avian community are presented below:

Breeding Birds

The BBS, which is directed by the USGS, is a long-term avian monitoring program that tracks the status and distribution of North American avian populations. There are four BBS survey routes within approximately 20 miles of the Project Site (Sauer, 2005). BBS survey data from 1966 to 2004 were analyzed by Woodlot to determine likely breeding birds within the Project Area. BBS survey data documented between 99 and 118 species of bird likely breeding in the vicinity of the Project Site. The most commonly observed species included European starling (*Sturnus vulgaris*), red-winged blackbird (*Agelaius phoeniceus*), American robin (*Turdus migratorius*), common grackle (*Quiscalus quiscula*), American crow (*Corvus brachyrhynchos*), song sparrow (*Melospiza melodia*), house sparrow (*Passer domesticus*), barn swallow (*Hirundo rustica*), American goldfinch (*Carduelis tristis*), and yellow warbler (*Dendroica petechia*). State-listed species observed during these surveys included northern harrier (*Circus cyaneus*) (threatened), Cooper's hawk (*Accipiter cooperii*) (special concern), sharp-shinned hawk (*Accipiter striatus*) (special concern), horned lark (*Eremophila alpestris*) (special concern), Henslow's sparrow (*Ammodramus henslowii*) (threatened), grasshopper sparrow (*Ammodramus savannarum*) (special concern), and vesper sparrow (*Pooecetes gramineus*) (special concern). Of these only northern harrier was observed on site (during EDR's fall field surveys). The species data reflect the habitat conditions within the Cohocton area, which include agricultural fields, early successional shrubland, and young forest.

The BBA is a comprehensive, statewide survey that indicates the distribution of breeding birds throughout the State. BBA survey blocks, 2971C, which cover much of the Dutch Hill Project Site, was analyzed by Woodlot. This block totaled 98 species, of which, 50 were confirmed as breeding birds, five were recorded as probable breeding birds, and 43 were recorded as possible breeding birds (Appendix G). The species composition indicated by the BBA is very similar to that indicated by the BBS, with the majority of the species being typical of the agricultural and mixed agricultural/forest habitat that dominates the Project Area. Listed species documented in the area by the BBA included Cooper's hawk and horned lark.

During 2006, Woodlot Alternatives, Inc. (Woodlot) conducted field surveys of breeding birds at the Dutch Hill Site. The overall goal of the investigation was to document the relative abundance and species richness of breeding birds in the area.

The survey included two 2-day point count surveys in June 2006 to count the number of individuals of each species located at a series of survey points. All birds seen or heard at each of the 15 survey points during three-minute periods timed between 5:30 and 9:30 a.m. were documented. During the two survey periods, 27 breeding bird species were observed at the 15 points. Species richness at individual survey points ranged from three to 11 species. Species richness was greater in field-woodland edge habitats (23 species) than in field habitats (16 species).

The most abundant species after averaging across all survey points and habitat types were the savannah sparrow (2.60 individual/survey point), bobolink (2.57), red-winged blackbird (0.93), European starling (0.85), song sparrow (0.63), and American robin (0.30).

Different groups of species were observed to be local to specified habitat types. Within field habitats, the most abundant species were bobolink (3.00 individuals/survey point), savannah sparrow (2.50), red-winged blackbird (1.00), song sparrow (0.55), American crow (0.32), and American robin (0.32). Within field-woodland edge habitat, the most abundant species were savannah sparrow (2.88 individuals/survey point), bobolink (1.38), song sparrow (0.88), red-winged blackbird (0.75), common yellow throat (0.50), chipping sparrow (0.50), tree swallow (0.50), and American goldfinch (0.50).

The surveys confirmed incidental observations made during the course of other field investigations (such as raptor surveys conducted in the late spring) indicate that the common species are similar to those documented by BBS and BBA data. The onsite surveys also confirmed that one New York state-listed species of special concern, the horned lark, breeding within the Project Site. In addition, a sharp-shinned hawk (a species of special concern) was observed flying low over the point count observational area on two separate occasions, hunting along the field edges.

Migrating Raptors

Diurnal raptor migration surveys in the Dutch Hill Project Site were conducted by Woodlot during the fall of 2004 and the spring and fall of 2005. Surveys were typically conducted from approximately 9:00 am to 3:00 pm each day. All raptors observed were recorded and attempts were made to distinguish between migrating and resident birds. In addition, concurrent raptor surveys were conducted during the fall of 2004 and the spring of 2005 at another proposed wind power site in the Town of Prattsburgh, approximately three miles to the east.

These surveys identified from 8 to 15 different migrating raptor species, the most common of which were turkey vultures and red-tailed hawks. At both sites, the majority of raptors observed were flying below the rotor-swept area of the proposed turbines (<125m, or 410 feet). According to the Woodlot report, the total number of raptors observed (and the observation rates) are very low compared to those seen at other sites in the region, which include observation rates 3 to 15 times greater then those reported at the Dutch Hill site (Woodlot, 2006a).

Migrating Songbirds

Woodlot conducted three nights (May 10 through 12) of on-site nocturnal radar surveys during the spring of 2005 to characterize songbird migration, referred to as the Cohocton effort. This data set was intended to supplement and verify radar data being collected concurrently at a site in Prattsburgh, located approximately 6 miles to the northeast. The Prattsburgh survey was being conducted over the entire spring season (20 nights of radar), and the Cohocton effort was essentially designed to verify that data obtained from Prattsburgh would apply to Cohocton and Dutch Hill. Identical radar systems and identical sampling methods (horizontal and vertical radar antenna orientation) were used at both sites. In addition, the results of a second (30 night) radar study in Prattsburgh (Mabee *et al*., 2005) were also available for comparison.

Results of these surveys revealed that nightly mean passage rates at Cohocton varied from 133 targets/kilometer/hour (t/km/hr) to 773 t/km/hr, with an overall mean of 371 t/km/hr, while passage rates at Prattsburgh were slightly lower, varying from 70 to 621 t/km/hr with an overall nightly mean of 292 t/km/hr (Woodlot, 2006a). Mean flight height of targets at Cohocton ranged from 518 m (1,699 feet) to 745 m (2,444 feet), and were considerably higher than those seen at Prattsburgh. The percent of targets flying below 125 m (i.e., the height of the proposed turbines) varied from 4-20%, with a three-night mean of 12%. Mean flight direction at both sites was to the northeast. These results indicate that nighttime migration characteristics at the two sites are very similar. Data from both sites show high flight heights relative to the proposed turbines and natural landscape features as well as uniform movement across the radar display. This indicates that migration over the Project Sites is likely to occur as a broad front movement and that landscape features are not causing night-migrating birds to concentrate at any specific locations in the Project Sites.

Woodlot Alternatives conducted 21 nights of radar survey on Dutch Hill between August 12 and October11, 2006. Although the analysis of this data has not been completed, a Technical Memorandum is included in Appendix G. The memorandum also provides a summary list of available radar survey results at wind project sites between 1994 and 2006. Nightly passage rates ranged from 88 targets/kilometer/hour (t/km/h) on September 30, to 1,158 t/km/h on September 21 with a seasonal mean of 535 t/km/h. A typical fall migration direction for the northeast of to the southwest was observed.

The mean seasonal flight height of night migrants was 358 ± 15 meters above the radar site with a mean nightly flight height ranging from 263 ± 12 m to 494 ± 31m. Nightly percentage of targets flying below the approximate turbine height of 125 m ranged from less than 1 to 27 percent with a seasonal average of 11 percent. This data is very similar to the data collected at the Cohocton and Prattsburgh sites in 2004 and 2005.

Radar survey results from a fall 2004 study conducted by Alaska Biological Research, Inc. (ABR) at one of the proposed wind power developments in Prattsburgh (Mabee *et al.,* 2005) are similar to those obtained by Woodlot at Cohocton and the other Prattsburgh project (Woodlot, 2005a). The similarity in results again indicates that nighttime bird migration over the Project Site is likely to be broad front, with similar movement patterns over the broad geographic scale of west-central New York. More importantly, this similarity indicates that the data collected for these nearby projects are representative of migration over the Dutch Hill study area.

The results presented above are of sites in proximity to each other and indicate that nighttime bird migration over the two locations is likely to be similar. When compared to other Northeastern studies using similar methods, these results fall within the range of the other studies (Table 9).

Table 9. Summary of Passage Rates from Other Radar Studies

Year	Location	Passage Rate (t/km/hr)	Reference
Fall			
1994	Western Maine	551	ND&T, 1995a
1994	Copenhagen, NY	341	Cooper *et al*., 1995
1994	Martinsburg, NY	661	Cooper *et al*., 1995
1998	Harrisburg, NY	336	Cooper and Mabee, 1999
1998	Wethersfield, NY	466	Cooper and Mabee, 1999
2003	Chautauqua, NY	235	Cooper *et al*., 2004a
2003	Mt. Storm, WV	241	Cooper *et al*., 2004b
2004	Prattsburgh, NY	200	Mabee *et al*., 2005
2004	Prattsburgh, NY	193	Woodlot, 2005a
Spring			
1994	Western Maine	99	ND&T, 1995b
1994	Carthage, NY	159	Cooper *et al.,* 2004c
1999	Weathersfield, NY	41	Cooper *et al.,* 2004c
2003	Chautauqua, NY	395	Cooper *et al.,* 2004c
2005	Cohocton, NY*	371	This report
2005	Prattsburgh, NY	277	Woodlot, 2006a

* This study was calculated with only three nights of radar sampling.

Waterbirds

Waterfowl and wading birds are not well represented in the BBS or BBA data collected within or adjacent to the Project Site. The Project Site is not located adjacent to any large bodies of water (including large marshes and rivers) that would be expected to attract high numbers of migrating waterbirds. The nearest large water bodies are Keuka Lake and Canandaigua Lake (located approximately 12 miles to the east and 7 miles to the north, respectively), which NYSDEC correspondence indicates are winter concentration areas for waterfowl (Seoane, 2006). While available literature, such as Drennan's *Where to Find Birds in New York State* (1981), does not reference significant waterbird migration through this region, Bellrose (1976) suggests that there are minor migration corridors for ducks and Canada geese through Central New York. However, these corridors are approximately 60 to 70 miles wide, which suggests rather broad front migration of ducks and Canada geese through the area. NHP data indicates the occurrence of a great blue heron rookery off of Salmon Creek Road in the Town of Wheler, but this site is well outside the Project Site. It should also be noted that, during the fall migration, large numbers of Canada geese forage in harvested corn fields, which are common within the Project Site.

3.3.1.2.2 Mammals

Due to a lack of existing data regarding mammals within the Project Site, the occurrence of mammalian species was documented entirely through on-site field surveys and evaluation of available habitat. This effort suggests that up to 39 species of mammal could occur in this area. Ecological surveys conducted by EDR during 2006 resulted in the observation of eleven species of mammals on the Project site. These species included whitetail deer, eastern cottontail, eastern chipmunk, coyote, red fox, raccoon, opossum, woodchuck, gray squirrel, red squirrel, muskrat, and beaver. Species not observed, but likely to occur in the area, include striped skunk, mink, weasels, and a variety of small mammals (mice and shrews). All of the observed species are common and widely distributed throughout New York State.

Bat Activity

To characterize and document bat activity within the Project Site, Woodlot conducted acoustic bat surveys using Anabat II detectors, which record bat vocalizations. These surveys were conducted at the Cohocton site during the fall of 2004 and the spring and fall of 2005, and included one night of mobile (active) Anabat survey and a total of 105 nights of stationary (passive) Anabat survey. (See Appendix G)

A total of 484 bat call sequences were recorded during the three seasons of survey. Of the 191 bat call sequences recorded during the fall 2005 survey (the longest survey season), 149 (78%) were identified to species, or to the genus *Myotis*. Calls within *Myotis* were not identified to species, due to similarity of calls between species and the lack of a reference database (Robbins and Britzke, 1999). However, all of the *Myotis* call sequences recorded at the Dutch Hill site most closely resembled those of the little brown bat (*Myotis lucifugus*). In addition to myotids, big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), and silver-haired bat (*Lasionycteris noctivagans*), were also recorded, and big brown bats and myotids were the most common bats detected.

A bat survey was conducted at the Dutch Hill site between August 12 and October 11, 2006. Bat detectors we deployed at the meteorological tower site at the northern end of Dutch Hill. Detectors were located at two heights, 10m and 25m. A total of 103 bat call sequences were recorded during the survey period, 57 at the high detector and 46 at the low. Detection rates varied from 0.79 call sequences to 0.86 per detector night. Surveys conducted at Cohocton and Prattsburgh had detection rates of 0.28 to 2.8 call sequences per detector-night. Overall, the detection rates and species composition at Dutch Hill was generally similar to those documented at the nearby Cohocton and Prattsburgh projects in 2004 and 2005.

Summer 2004 bat surveys were conducted by Bat Conservation and Management, Inc. (BCM) at one of the proposed wind power sites in Prattsburgh (BCM, 2004). Mist netting was conducted at five sites in the area of that proposed project in early July and late August of

2004. Detector surveys were also conducted at each of the five sites. A total of 101 bats were documented during the mist-netting surveys. Little brown bats were the most abundant species netted, accounting for 75% of the collected animals. This was followed by the northern long-eared bat (*Myotis septentrionalis*) (15%), big brown bat (6%), eastern red bat (2), and hoary and silver-haired bats (1% each). The detector surveys documented 2,209 bat calls. Big brown bats accounted for the greatest percentage of calls recorded (47%), followed closely by little brown bats (42%). Other species recorded included northern long-eared bats, eastern red bats, hoary bats, silver-haired bats, and eastern pipistrelles (*Pipistrellus subflavus*). No rare species of bats were documented during the field surveys.

3.3.1.2.3 Reptiles and Amphibians

Reptile and amphibian presence within the Project Area was determined through field survey and review of the New York State Amphibian and Reptile Atlas. The Atlas Project was a ten-year survey (1990 through 1999) designed to document the geographic distribution of the state's herpetofauna. Atlas data was collected and organized according to USGS 7.5-minute quadrangles (NYSDEC, 2006b). Based on this data, along with documented species ranges and existing habitat conditions, it is estimated that over 34 reptile and amphibian species could occur in the area. Refer to the Appendix F for a listing of the reptile and amphibian species. A total of nine species were observed on site during field surveys. These species included eastern garter snake, red-backed salamander, bullfrog, painted turtle, American toad, and common snapping turtle. All of species observed on the Project Site are common and widely distributed throughout New York State.

3.3.1.2.4 Fish

Ponds and streams within and adjacent to the Project Site likely support both warm water and cold water fish populations (some native and some stocked). The only state-classified trout stream on the Project Site is the Cohocton River. Fish survey data for the Cohocton River were obtained from the Region 8 office of the NYSDEC. This data, obtained from electro-shocking surveys conducted in July 2000 and July 2001, documented the presence of 36 different fish species in the Cohocton River in the Towns of Avoca, Cohocton, Naples, Wayland, and Hawkinsville. The most common species include sculpins, brown trout, cutlip minnow, eastern blacknose dace, long nose dace, Johnny darter, and white sucker. All of the fish species documented in these surveys have been added to the species list included in Appendix F. Ponds and streams within the Project Site are located on private property and lack any provisions for public access (i.e., public fishing easement). However, the Cohocton River is a significant fishery resource and is well used by area trout fishermen.

3.3.1.2.5 Wildlife Habitat

As previously described, the Project Site includes a variety of ecological community types. The value of these communities to various wildlife species is summarized below.

Agricultural, Successional Old Field, and Wet Meadow Habitats

These grass/forbs dominated areas provide preferred foraging and nesting habitat for open country bird species such as bobolink, eastern meadowlark, northern harrier, and chipping sparrow. The vegetation in these areas provides forage in the form of seeds and foliage, which is utilized by sparrows, finches, small mammals (mice, shrews, etc.), woodchucks, whitetail deer, and eastern cottontail. Birds of prey, such as the red-tail hawk, and mammalian predators, such as red fox and eastern coyote, also use open fields as hunting areas.

Successional Shrubland and Scrub-Shrub Wetland Habitats

Shrub-dominated habitats (both wetland and upland) provide nesting and escape cover for a variety of wildlife species. Various songbirds, such as gray catbird, American goldfinch, indigo bunting, and yellow warbler, require low brushy vegetation for nesting and escape cover. Whitetail deer and eastern cottontail are also typically found in brushy edge habitat. In addition, many of the shrub species found in these areas produce berries that are a food source for birds and mammals such as raccoon, striped skunk, and opossum.

Forest Habitat

Larger areas of contiguous woodland that occur on the slopes of the Cohocton River Valley likely provide habitat for forest wildlife species such as wood thrush, veery, eastern wood pewee, red-eyed vireo, black-capped chickadee, great crested flycatcher, and various woodpecker species. Mammals found in these areas include gray squirrel, eastern chipmunk, and whitetail deer. Smaller areas of forest are typically found as woodlots adjacent to active agricultural fields. These areas provide some of the same habitat for birds and mammals as larger forested plots, but typically lack the size or seclusion required by forest interior species.

Emergent Marsh and Open Water Habitats

Emergent marsh and open water habitats in the Project Area are used as a source of food, water, and/or cover by many of the upland species mentioned previously. Most of these water bodies support fish and a diversity of insects and aquatic invertebrates. They are preferred foraging areas for aerial insectivores, including songbirds and bats. In addition, these areas provide habitat for various wetland/aquatic wildlife species, including great blue heron, mallard, painted turtle, bullfrog, mink, muskrat, and raccoon.

3.3.1.2.6 Threatened and Endangered Species

Correspondence from the NHP, field surveys, and existing data sources, including the NYS Herp Atlas, BBS, and BBA were consulted to assess the potential for occurrence of state- and/or federally listed threatened and endangered wildlife species on the Project Site.

Written requests for listed species documentation were sent to the USFWS and the NHP on April 18, 2006. According to a letter dated May 2, 2006 from the NHP, one state and federal-listed threatened species, the bald eagle (*Haliaeetus leucocephalus*), is known to occur in the vicinity of the Project Site. Three nest locations for the bald eagle have been noted at the southern end of Canandaigua Lake, approximately 12-15 miles north of the northern Project boundary, and nine nest locations have been noted on the southwest side of Hemlock Lake, approximately 25 miles west of the eastern Project boundary (Appendix B). However, none of the on-site surveys or existing data sources have documented this species on or in the vicinity of the Project Site. The letter also indicated that clay-colored sparrow (*Spizella pallida*) and great blue heron (*Ardea herodias*), both state-protected species, also have been documented within 10 miles of the Project Site. To date, no response to the written request for information has been received from the USFWS.

According to the data obtained from the NYS Herp Atlas, there are no state or federally-listed reptile or amphibian species documented within the Project area. Field surveys also failed to reveal the presence of any listed reptile or amphibian species on the Dutch Hill Site. However, Jefferson salamander, a state-listed species of special concern was observed on the Cohocton Wind Farm site (Brown Hill area) approximately 5 miles from Dutch Hill. This species lives in mature forest habitat and breeds in vernal pools in the spring. It most likely occurs on the wooded valley walls that line ravines and the Cohocton River Valley. No other listed reptile and amphibian species have been documented in the area, and on-site habitat conditions do not suggest that such species are likely to occur.

BBS survey data indicate that two state-listed threatened species (northern harrier, Henslow's sparrow) and five state-listed special concern species (Cooper's Hawk, sharp-shinned hawk, horned lark, grasshopper sparrow, and vesper sparrow) have been recorded in the general area of the Project Site. According to the BBA data, nine state-listed species (all special concern) have been documented on BBA blocks within, or immediately adjacent to, the Project Site. These species are Cooper's hawk, northern goshawk, sharp-shinned hawk, grasshopper sparrow, red-shouldered hawk (*Buteo lineatus*), common nighthawk (*Chordeiles minor*), horned lark (*Eremophila alpestris*), osprey (*Pandion haliaetus*), and vesper sparrow.

The presence of state- and/or federally-listed threatened and endangered species was also assessed during site-specific avian and bat studies conducted by Woodlot. Five listed species were observed during the three raptor surveys conducted on-site. These included peregrine falcon (*Falco peregrinus*) (state-listed endangered), northern harrier (state-listed threatened), sharp-shinned hawk, Cooper's hawk, and red-shouldered hawk (all state-listed special concern). Woodlot indicated that most of the observed individuals appeared to be migrants rather than residents of the Project Area. A summary of listed bird species documented in the area is presented in, below.

Table 10. Documented State-listed Species in the Vicinity of the Project Area[1]

Common Name	Scientific Name	NYS Legal Status
Red-Shouldered Hawk*	*Buteo lineatus*	Special Concern
Northern Harrier*	*Circus cyaneus*	Threatened
Peregrine Falcon*	*Falco peregrinus*	Endangered
Cooper's Hawk*	*Accipiter cooperii*	Special Concern
Sharp-shinned Hawk*	*Accipiter striatus*	Special Concern
Grasshopper Sparrow	*Ammodramus savannarum*	Special Concern
Horned Lark	*Eremophila alpestris*	Special Concern
Osprey	*Pandion haliaetus*	Special Concern
Vesper Sparrow	*Pooecetes gramineus*	Special Concern
Northern Goshawk	*Accipiter getilis*	Special Concern
Common Nighthawk	*Chordeiles minor*	Special Concern
Bald Eagle	*Haliaeetus leucocephalus*	Threatened
Henslow's Sparrow	*Ammodramus henslowii*	Threatened

[1]Source: BBA, BBS, Agency Correspondence, and On-site Surveys.
*Observed on site in 2005

Bat Activity

Although not mentioned in agency correspondence regarding the Project, the NYSDEC and the USFWS have expressed concerns regarding potential impacts to Indiana bat (*Myotis sodalis*) from wind power projects. The Indiana bat is a state- and federally-listed Endangered species. Approximately 42,000 Indiana bats reside within New York State and the population appears to be growing (Hicks, 2006). These bats winter (hibernate) in 10 known locations (caves and mines) throughout the state. They emerge in the spring and disperse on average up to 30 miles to their summer range. The nearest wintering cave (hibernacula) used by Indiana bats is located approximately 80 miles northeast of the Project Site, in Onondaga County.

The NYSDEC NHP report from May 2, 2006 noted the occurrence of eastern small-footed myotis (*Myotis leibii*), a state species of special concern, within a 40-mile buffer of the Project Site. However, this species has not been found in field surveys of the Project Site conducted by Woodlot.

Bat surveys (acoustic monitoring and mist netting) conducted by Woodlot and Bat Conservation Management in both Cohocton and Prattsburgh, did not reveal the presence of Indiana bat or any other listed bat species (Woodlot, 2006a).

3.3.2 Potential Impacts

3.3.2.1 Construction

3.3.2.1.1 Vegetation

Project construction will result in temporary and permanent impacts to vegetation within the Project Site. However, no plant species occurring in the Project Site will be extirpated or significantly reduced in abundance as a result of construction activities.

Construction-related impacts to vegetation include cutting/clearing, removal of stumps and root systems, and increased exposure/disturbance of soil. Along with direct loss of and damage to vegetation, these impacts can result in a loss of wildlife food and cover, increased soil erosion and sedimentation, and a disruption of normal nutrient cycling. Impacts to vegetation will result from site preparation (clearing), earth-moving, and excavation/backfilling activities associated with construction/installation of access roads, foundations, buried electrical lines, and sections of overhead transmission line. Based on the area of impact assumptions described in Section 2.4 (Project Construction), these activities will result in disturbance to approximately 100.5 acres of agricultural land, 0.5 acre of successional old-field, 0.5 acre of successional shrubland, and 13 acres of forest on the Dutch Hill Site. Impacts to agricultural land are likely to be somewhat smaller than these disturbance calculations would indicate, due to the proposed use of existing farm lanes for most turbine access roads. As indicated in Table 11, the majority of the calculated impacts will be temporary, and native vegetation (or agricultural crops) will be allowed to regenerate following restoration of areas disturbed during construction. Construction-related impacts to wetlands were previously discussed in Section 3.2.2.1.1.

Table 11. Approximate Area Impacts to Vegetative Communities

Community[1]	Total Disturbance (Acres)	Temporary Disturbance (Acres)	Permanent Loss (Acres)
Agricultural Land	100.5	87.0	13.5
Successional Old Field	0.5	0.5	0
Successional Shrubland	0.5	0.5	0
Forest	13.0	11.5	1.5
Disturbed/Developed	0.5	0.5	0
TOTAL	**115**	**100**	**15**

[1]Excludes wetland and open water communities.

3.3.2.1.2 Fish and Wildlife

In general, construction-related impacts to wildlife will be minimal as a result of siting Project components away from sensitive habitat such as streams, wetlands, and mature forest. Construction-related impacts to wildlife are anticipated to be limited to incidental injury and mortality due to construction activity and vehicular movement, construction-related silt and sedimentation impacts on aquatic organisms, habitat disturbance/loss associated with clearing and earth-moving activities, and displacement of wildlife due to increased noise and human activities. Each of these potential impacts is described below.

Incidental injury and mortality should be limited to sedentary/slow-moving species such as small mammals, reptiles and amphibians, which are unable to move out of the area being disturbed by construction. If construction occurs during the nesting season, wildlife subject to mortality could also include the eggs and young offspring of nesting birds, as well as immature mammalian species that are not yet fully mobile. More mobile species and mature individuals should be able to vacate areas that are being disturbed.

Earth-moving activities associated with Project construction have the potential to cause siltation and sedimentation impacts down slope of the area of disturbance. Although most Project components have been sited in elevated uplands well away from wetlands and streams, soil disturbance along the proposed underground/overhead transmission line could adversely affect water quality and aquatic habitat of some wetlands and streams along this route. However, such impacts will be minimized by spanning the Cohocton River and traversing the seeps and wetlands on the eastern wall of the Cohocton Valley with segments of overhead line.

The majority of the Project occurs in or adjacent to agricultural land, which in general provides habitat for only a limited number of wildlife species. In addition, these areas are already subject to periodic disturbance in the form of mowing, plowing, harvesting, etc. However, hayfields and pastureland do provide habitat for open country/grassland avian species (such as red-winged blackbird, American robin, and savannah sparrow), and will be disturbed by Project construction. Successional old-field, shrubland, and forestland will experience less construction-related disturbance, but approximately 13 acres of forest and 1 acre of successional communities will be directly impacted by Project construction. Impact to these communities occur primarily along the proposed transmission line route. Impacts to forestland along this line are being reduced by collocating the line within an existing NYSEG ROW on the western wall of the Cohocton Valley.

Some wildlife displacement will also occur due to increased noise and human activity as a result of Project construction. The significance of this impact will vary by species and the seasonal timing of construction activities. However, the species most likely to be disturbed/displaced by Project construction include grassland bird species such as bobolink, eastern meadowlark, red-winged blackbird, and savannah sparrow.

None of the construction-related impacts described above will be significant enough to affect local populations of any resident or migratory wildlife species.

3.3.2.1.3 Threatened and Endangered Species

No rare plant species or unique natural communities are known to occur within the Project Site. Therefore, impacts to state or federally listed threatened and endangered plant species are not anticipated.

According to written correspondence received from the NYSDEC, bald eagles are known to nest approximately 15 miles north of the Project Site at the southern end of Canandaigua Lake (as requested by NHP personnel, the exact location of bald eagle nests are not provided). This species has not been observed on the Project Site during site surveys, nor does suitable habitat for bald eagles exist within or adjacent to the Project Site. Therefore, this species is not expected to be impacted or disturbed by Project construction activities.

BBA and BBS data indicate that several listed grassland bird species could occur within the Project Site, including northern harrier, grasshopper sparrow, horned lark, vesper sparrow, and Henslow's sparrow. Additionally, the NYSDEC Natural Heritage Program Database indicates that the state-protected clay-colored sparrow has historically nested near the Project Site. Because the proposed Project will occur in or adjacent to some grassland habitat, construction-related impacts to these species are possible. Disturbance/displacement, habitat loss, and/or mortality impacts to eggs or young of these species could occur. However, the grassland habitat that is being directly or indirectly impacted by Project construction is already subject to regular disturbance due to mowing and rotational planting. Consequently, it is less than ideal habitat for grassland birds. In this type of habitat setting, Project-related impacts will be minor.

The NHP also indicated an old record (from 1981) of a state-protected great blue heron nesting colony on a hillside over five miles from the Project Site. This colony, if still present, is unlikely to be affected by Project construction because it is located on the eastern side of Wagner Hill, well over five miles southeast of the Project Site. Although not likely, additional colonies may be impacted by construction if they exist, and if they are within 0.5 miles of an active work zone. Typical impacts during the breeding season are nest abandonment and colony splintering (Butler, 1992).

At least one species of waterfowl (redhead) is known to have wintered in large numbers on Canandaigua Lake, which is approximately seven miles northeast of the Project Site. Over 30% of the New York state wintering population of this species may utilize this area. However, these waterfowl are unlikely to be directly impacted by Project construction because there is not substantial area of suitable wintering habitat within or adjacent to the Project Site.

Listed raptors documented or observed within the Project area include one state-listed endangered species (peregrine falcon), one state-listed threatened species (northern harrier), and three state-listed species of special concern (red-shouldered hawk, sharp-shinned hawk, and Cooper's hawk). Although NHP data indicates that bald eagles occur within 15 miles of the site, no federally listed species were documented on the Project Site, and based on existing habitat conditions, are not considered likely to occur. Based upon observations made during the on-site raptor surveys, Woodlot determined that it is likely all of the listed raptors observed were migrants. The Project area lacks the cliff habitat required by peregrine falcons and the large riparian forests preferred by red-shouldered hawks. Although ospreys could use the Cohocton River for foraging, in the vicinity of the proposed transmission line crossing, the river is narrow and lacks the large open water characteristics preferred by this species. As mentioned previously, Project construction will impact the open country/grassland habitat that could be used by northern harrier, and therefore disturbance/displacement, habitat loss, and/or mortality impacts to this species could occur. Clearing of some forestland along the transmission line could have similar effects on forest-nesting species such as Cooper's hawk and sharp-shinned hawk. However, given the relatively small area of habitat that is being directly or indirectly impacted by Project construction, any impacts to these species, will be minor and largely temporary.

Although no listed reptiles and amphibians were observed on site, the presence of Jefferson salamander in the area suggests that this state-listed special concern species could be impacted by clearing of the transmission line ROW through forested habitat. This activity could result in incidental injury or mortality to salamanders, and will convert the habitat to an early successional community, which is generally not preferred by this species. However, the amount of forest habitat being affected is relatively small, and if fallen logs and rocks are left in place, the habitat still may be used by Jefferson salamander to some extent. In addition, no vernal pools or other wetlands, which represent critical breeding habitat for this species, will be disturbed by Project construction.

The only mammal of special concern found near the Project Site is a bat (eastern small-footed myotis). However, the NYSDEC Natural Heritage Program report documents its presence more than 20 miles west of the boundaries of the Project Site (near the town of Portage). Furthermore, this species was not found during the field studies by Woodlot. This species utilizes both forested and cleared land for part of its life cycle and shows a habitat preference for hilly or mountainous areas. These habitats do occur within the Project Area; however, in light of the small area that would be directly or indirectly affected by this Project, impacts to this species would likely be inconsequential and primarily temporary.

3.3.2.2 Operation

3.3.2.2.1 Vegetation

As indicated in Table 11, Project construction will result in permanent conversion of 15 acres of vegetated land to unvegetated/built facilities (access roads, turbines, crane pads, etc.)

within the Project Site. This total will include approximately 13.5 acres of agricultural land, and 1.5 acres of forest. Permanent impacts to wetlands were previously discussed in Section 3.2.2.1.1. It should be noted that for vegetation, permanent impact includes both conversion of natural communities to built facilities, and conversion of one vegetative community to another (e.g., forest to successional shrubland or old field). This latter type of conversion will occur within forested turbine workspaces and within a 35-foot-wide permanent ROW where the overhead transmission line crosses forested areas. These activities will result in a total of 6.5 acres of forestland being converted to successional communities for the duration of Project operation. Other than minor disturbance associated with routine maintenance and occasional repair activities, other disturbance to plants and vegetative communities are not anticipated as a result of Project operation.

3.3.2.2.2 Wildlife

As with construction-related impacts, operational impacts to wildlife are expected to be limited to minor loss of habitat, possible forest fragmentation, wildlife displacement due to the presence of the wind turbines, and some avian and bat mortality as a result of collisions with the wind turbines. Each of these potential impacts is described below.

Habitat Loss

A total of approximately 15 acres of wildlife habitat will be permanently lost from the Project Site (i.e., converted to built facilities). As mentioned in the previous section, the majority of this loss (approximately 13.5 acres) will occur in agricultural lands, which have limited wildlife habitat value. In addition, approximately 6.5 acres of forest will be maintained as a successional community (old field, shrubland, or saplings) for the life of the Project. However, the cumulative habitat loss/conversion resulting from Project development is not significant.

Forest Fragmentation

As mentioned in the discussion of construction-related impacts, the proposed Project will result in permanent loss or conversion of approximately 8.0 acres of forest habitat. The forested habitat being impacted by the Project includes woodlots that will be cleared to accommodate 6 turbines, as well as a band of forest along the eastern wall of the Cohocton River Valley, that will be crossed by the transmission line. All of the impacted forest at turbine sites is located on the edge of woodlots, adjacent to agricultural fields. Along the proposed transmission line route, the forest on the eastern wall of the valley has been disturbed by previous logging activity, resulting in a broken canopy and the presence of skid trails. Thus it is questionable as to whether forest interior conditions exist in any of the areas that will be impacted by the Project. This being the case, fragmentation impacts on forest interior species should be limited.

Disturbance/Displacement

While wildlife will likely become habituated to the presence of wind turbines within a few years, the rate (and degree) of habituation, is currently unknown because long-term studies have not been conducted. Forest and forest edge birds should not be significantly disturbed because these species are familiar with tall features (i.e., trees) in their habitat. However, evidence indicates that some grassland species do not respond favorably to the presence of tall structures in their habitat. Studies conducted at the Buffalo Ridge wind power project in southwest Minnesota and the Foote Creek Rim Project in Wyoming, revealed that grassland nesting birds are found in reduced numbers as the proximity to wind turbines increases (Johnson *et. al.*, 2000; Leddy *et. al.*, 1999). Assuming similar behavior by grassland species within the Project Site, the completed Dutch Hill Project may result in a reduced number of grassland species in open fields that contain wind turbines.

The potential impacts of the Project on Canada geese (*Branta Canadensis*) that may forage in harvested corn fields on site should not be significant. Kerlinger (2005) indicates that Canada geese often habituate rapidly to man-made structures, and that geese have been observed foraging in fields that contain operating wind turbines at the Fenner Wind Power Project in Madison County, New York. This observation is also supported by a study conducted by the Iowa Cooperative Fish and Wildlife Research Unit at the Top of Iowa Wind Farm located in Worth County, Iowa. Due to its proximity to three state-owned Wildlife Management Area's (WMA), the Top of Iowa Wind Farm experiences very high use by waterfowl (over 1.5 million duck and goose use days per year). Observations at that site revealed that the wind turbines did not affect the use of the fields by Canada geese or other species of waterfowl. In addition, over the two-year course of the study, no turbine-related waterfowl or shorebird mortality was documented (Koford *et. al.*, 2005). Based on these study results, and observations at other wind power projects, the proposed Dutch Hill Project is not anticipated to have a significant, long-term displacement or mortality effect on foraging Canada geese.

Landowners are also often concerned over the potential displacement effect of wind turbines on game species such as whitetail deer and wild turkey. While habituation to the presence of the turbines may not be immediate, species such as whitetail deer and wild turkey generally adapt quickly to the presence of man-made features in their habitat (as evidenced by the abundance of these species in suburban settings). Significant displacement of game species from a wind power site has not been reported, and the primary landowner at the existing Madison Wind Power Project in Madison County, New York, has indicated that he has not detected any apparent decline in game species on his property Brandi Lee Schafran (Stone, 2005).

Collision

Collision with man-made structures has been documented as a potentially significant source of songbird mortality (Erickson *et. al.*, 2001). According to the Avian Risk Assessment (ARA) prepared by Woodlot (Appendix G), an estimated 28,000 to 33,000 birds were killed at about 15,000 wind turbines in the United States in 2001 (Erickson *et al.*, 2001). Fatalities ranged from zero to about 6 birds per turbine per year, yielding an average of 2.2 birds per turbine per year. Studies from the Eastern United States generally reveal slightly higher fatality levels than those observed farther west. A study conducted in 2003 at the Mountaineer Wind Energy Center in West Virginia found an average mortality rate of about four birds per turbine per year (Kerns and Kerlinger, 2004). As mentioned previously, a study at the Top of Iowa Wind Power Project site revealed no fatalities to Canada Geese or other waterfowl (Koford *et al.*, 2005). Fewer than 1.5 birds per turbine per year were found to be killed at that site.

As these study results illustrate, bird collisions are relatively infrequent events at wind farms. No federally-listed endangered or threatened species have been recorded, and only occasional raptor, waterfowl, or shorebird fatalities have been documented. In the Midwestern and Eastern United States, night migrating songbirds have accounted for a majority of the fatalities at wind turbines. In general, the documented level of fatalities has not been large in comparison with the source populations of these species, and minor when compared to other potential sources of avian mortality (Erickson *et al*, 2001).

Although collision risk is likely to be low, data on avian migration at the Project Site were collected to determine if site-specific migration characteristics might suggest an elevated level of risk relative to other sites. As indicated in Table 12's radar data collected at the Dutch Hill site are similar to data from other sites in the northeast in terms of passage rates, flight altitudes, and flight directions. Perhaps most important, in terms of the potential for collision impacts, is the flight altitude of migratory birds. Data from radar studies at proposed and existing wind power Project Sites across the eastern United States consistently show mean flight altitudes well above the height of the proposed wind turbines. Radar data from northeastern sites typically show mean songbird flight altitudes in the range of 1,200 to 2,000 feet with between 1% and 13% flying below the 125-meter (410 foot) altitude. Data collected at the Dutch Hill site are consistent with these observations.

Table 12. Summary of Results from Radar Studies Conducted in the Eastern United States Since 2000

Site	Season	Topography/Elevation	Targets/Km/Hr	Mean Altitude of Flight (AGL)	Percent Targets <100-125m	Mean Flight Direction
Chautauqua, NY	Fall	Hilltop/Ridge	238	532 m (2,366 ft)	4% below 125m	199°
	Spring	Hilltop/Ridge	395	528 m (1,830 ft)	4% below 125 m	29°
Flat Rock, Tug Hill Plateau, NY	Fall	Hilltop/Ridge	158	415 m (1,362 ft)	8% below 125m	184°
Prattsburgh, NY	Fall	Hilltop/Plateau	200	365 m (1,198 ft)	9% below 125 m	177°
Jordanville, NY	Fall	Hilltop/Ridge	380	440 m (1,444 ft)	6% below 125 m	208°
	Spring	Hilltop/Ridge	409	317 m (1,217 ft)	21% below 125 m	40°
Jack Mountain, WV[1]	Fall	Straight Ridge	229	583 m (1,912 ft)	8% below 125 m	175°
Mt. Storm, WV	Fall	Straight Ridge	241	410 m (1,245 ft)	13% below 125 m	184°
Martindale, PA[1]	Fall	Disjunct Ridge	187	448 m (1,469 ft)	~8% below 125 m	188°
Casselman, PA[1]	Fall	Disjunct Ridge	174	436 m (1,430 ft)	~8% below 125 m	219°
Dans Mountain, MD[1]	Fall	Straight Ridge	188	542 m (1,778 ft)	~7% below 125 m	193°

Site	Season	Topography/Elevation	Targets/Km/Hr	Mean Altitude of Flight (AGL)	Percent Targets <100-125m	Mean Flight Direction
Searsburg, VT[1]	Fall	Mountaintop	178	503 m (1,659 ft)	1% below 100 m	194-223°
	Fall	Mountaintop	178	624 m (2,047 ft)	5% below 100 m	194-223°
Sheffield, VT	Fall	Mountaintop	114	566 (1,857 ft)	1% below 125 m	200°
Average[2]			207	1,630 ft	7.4 (8.1)	

[1] Data from draft reports in preparation by, and with permission from: Alaska Biological Research, Inc. Woodlot Alternatives, Atlantic Renewable Energy, PPM Energy, St. Francis University/McLean Energy Partners.
[2] Average excludes those percentages that are reported below 100 meters (Searsburg, VT).
Sources: Chautauqua, NY (Cooper, 2004a), Mt. Storm, WV (Cooper, 2004b), Prattsburgh, NY (Mabee et al., 2005), Jordanville, NY (Woodlot, 2005a).

Because there currently is no predictive model available to quantify expected avian collision mortality as a result of wind power project operation, risk assessments must be based on pre-construction indices and indicators of risk (e.g., breeding bird survey and radar data) at the proposed Project Site, along with empirical data from operating projects (e.g., avian mortality surveys). Because pre-construction surveys at the Dutch Hill site revealed no indicators of elevated risk (e.g., abundance of rare species, unusually high numbers, unusually low flight altitude, habitat that would act as an ecological magnet), it appears that avian collision mortality rates at the site should be similar to the relatively low rates seen at other eastern sites (i.e., 0 to 6 fatalities per turbine per year). Even if as many as 6 birds per turbine per year are killed (i.e., the high end of what has been observed at other projects), total annual collision mortality for a 41 turbine project would be approximately 246 birds. Although this number may appear large, as the radar data indicate, it is a tiny fraction of the population that migrates through the area, and is not considered a biologically significant impact.

With the exception of the Altamont Pass project in California, documented raptor fatalities at wind power projects are virtually non-existent. In fact, just more than ten raptor fatalities have been documented from all the mortality studies conducted outside of California (Roy, 2006). In addition, studies conducted at operating wind power projects that are near concentrated hawk migration corridors indicate that raptors rarely collide with wind turbines (Kerns and Kerlinger, 2004). Based on the results of published collision mortality studies and the results of on-site raptor migration surveys, Project operation is not expected to result in significant collision mortality to migrating raptors. On-site surveys determined that raptor passage rates were low, and that migration occurred across a broad front (Woodlot, 2006a). The species most likely to be impacted are those that forage in open country, as opposed to migrating raptors that pass through the site or general area.

The northern harrier (threatened) forages and probably nests on the Project Site, as was evident from BBA data, and on-site observations. These birds are at some risk of collision with turbines, although documented fatalities involving northern harriers at wind power facilities are relatively rare. The foraging flight of these birds is generally below the rotor-swept height, but their aerial displays ("sky dancing") during the nesting season may put them at rotor height and at increased risk of collision.

Findings from the Mountaineer Wind Facility in West Virginia and the Meyersdale Wind Facility in Pennsylvania have heightened concerns regarding collision risk to migratory bat populations. While few studies have been conducted to document bat mortality at operating wind power sites, Johnson and Strickland (2004) documented bat mortality rates of 46.2 fatalities per turbine per year at wind projects sited along forested ridgelines in the Appalachians. This differs from the much lower rates (ranging from 0.07 to 2.32 fatalities per turbine per year) documented at more open midwest and western sites (Erickson *et al.,* 2002).

Estimates of the number of bats that may collide with wind turbines at the Dutch Hill Wind Power Project can be derived by multiplying reported mortality rates by the number of proposed turbines, which results in estimates of 2.9 to 95 bat fatalities per year if fatality rates similar to western and mid-western projects occur and 1,894 bat fatalities per year if fatality rates are similar to rates found at facilities along forested ridgelines of the central Appalachians.

This range appropriately estimates the potential high and low ends of the range of potential bat mortality that may arise from operation of the Project. However, as stated in the Project ARA, the site characteristics of the Dutch Hill Wind Power Project are not identical to the site characteristics of either the low mortality mid-western and western sites, or the higher mortality Appalachian ridge sites. The Project will be located in an agricultural landscape, with the turbines placed in fields on rolling hills. These characteristics are similar to those of western and mid-western facilities. However, the Project Site is located atop a plateau that is separated from other plateaus by steep-sided, narrow valleys. It is also located in the eastern United States where bat populations in general may be higher than western and mid-western areas due to the prevalence of forested habitat. These characteristics are similar to those of the eastern facilities have been investigated.

Given that the characteristics of the Dutch Hill site lie in between the characteristics of the sites of the other projects that have been investigated for bat collision mortality, it is likely that the bat collision mortality for the proposed Project will lie within the range bracketed by the observed mortality at those other projects (Woodlot, 2006a).

3.3.2.2.3 Threatened and Endangered Species

As previously mentioned, no threatened or endangered plant species (or unique natural communities) are known to occur in the Project Site. Therefore, operational impacts to rare vegetation or rare communities are not expected.

NHP correspondence reported that nesting bald eagles have been documented approximately 12 to 15 miles north of the Project. However, due to the lack of any sizeable open water habitat within the Project Area, and the design/spacing of the proposed turbines, and because this species is not known to be susceptible to wind turbine collisions, the operating Project poses very little risk to bald eagles (Woodlot, 2006a).

Operational impacts to listed grassland bird species, such as northern harrier and horned-lark, could include occasional collision mortality and disturbance/displacement of nesting individuals. Although the grassland habitat on site is less than ideal, horned lark were documented in the on-site breeding bird survey and harriers likely use the area for foraging. Of the listed grassland species documented within the Project area, only horned lark is considered susceptible to significant collision risk. This is due to the aerial courtship displays performed by males of this species. Regularly flying in circles at 100-200 feet (30-60 m) above the ground would put these species at risk of colliding with turbine rotors (Kerlinger, 2006). In addition, because grassland birds have evolved in a habitat that lacks large overhead structures (i.e., trees), it is possible that the presence of wind turbines in open fields could have a disturbance/displacement effect on listed grassland species.

As mentioned previously, the NYSDEC and the USFWS have expressed concerns regarding potential impacts to Indiana bats as a result of wind power projects in New York State. This concern has resulted primarily from sizeable bat kills that have occurred at wind power projects in recent years at the Mountaineer site in West Virginia and the Meyersdale site in Pennsylvania (although no Indiana bats (*Myotis sodalis*) are known to have been killed at these sites). Specific to this Project, correspondence received from the USFWS and the NYSDEC did not indicate any concern over the Project's potential to impact Indiana bat. Regardless, an analysis of potential impact to Indiana bat is provided below.

The nearest wintering cave (hibernaculum) used by Indiana bats is located approximately 80 miles northeast of the Project Site, in Onondaga County. While the proposed Project Site is within the dispersal distance of Indiana bats, Project-related impacts on this species are not considered likely for a variety of reasons, including:

1. Acoustic monitoring and mist netting surveys in the area did not document any Indiana bats.

2. The Project Site is not in an area designated by regulatory agencies as critical habitat for Indiana bats.

3. Bats utilizing the Onondaga County hibernaculum are likely to be widely dispersed once they leave the cave. NYSDEC telemetry studies also indicate that most Indiana bats in New York breed within 30 miles of their hibernacula (Hicks, 2006). Thus, relatively few individuals are likely to occur in the vicinity of the proposed Project.

4. There are no physiographic landscape features (e.g., abrupt ridge lines or water courses) that might direct or concentrate bats migrating to and from the Onondaga County hibernaculum toward the Project Site.

5. High winds and low temperatures make the Project site less likely to receive use by Indiana bats, when compared to warmer, less exposed valley and lake plain areas located closer to the hibernaculum. Based on the results of previous NYSDEC studies of Indiana bats elsewhere in the state, it is reasonable to expect that Indiana bats (especially reproductive females) will remain within suitable habitat at lower elevation (e.g., large valley and lake plain areas west of the hibernaculum on the Lake Ontario plain). Results of 2005 and 2006 telemetry studies conducted by the NYSDEC and the USFWS at the Glen Park Indiana bat hibernacula revealed that none of the bats traveled further than 30 miles from the cave.

6. The majority of documented turbine-related bat mortality has involved three species of migratory tree bat (hoary bat, red bat, and silver-haired bat). An Indiana bat fatality has never been documented at any wind power Project Site in the United States, even those in proximity to Indiana bat hibernacula and summer maternity roosts, and where sizable numbers of other bat species have been killed.

Based on all of the information presented above, the Project is not expected to result in any impacts to the Indiana bat.

3.3.3 Proposed Mitigation

The development of wind power projects can legitimately be considered a form of mitigation or avoidance of impacts on ecological resources, in that power generated from the wind can satisfy demand that would otherwise utilize power generated by other means. All electric generating facilities impact ecological resources (fish, wildlife, natural communities). However, as indicated in below, environmental impacts on ecological resources that result from more traditional power generating facilities (fossil fuel, hydroelectric, nuclear) are much more significant than the impacts caused by wind power projects.

Table 13. Environmental Impacts of Electricity Sources

Impact	Wind	Hydro	Nuclear	Coal	Natural Gas
Global Warming Pollution	None	None	None	Yes	Yes
Air Pollution	None	None	None	Yes	Limited
Mercury	None	None	None	Yes	None
Mining/Extraction	None	None	Yes	Yes	Yes
Waste	None	None	Yes	Yes	None
Habitat Impacts	Limited	Yes	Limited	Yes	Yes

Source: (AWEA, Undated)

These impacts include a larger project footprint, which results in direct habitat loss; the use of surface waters for generation and/or thermal regulation, which results in thermal discharge, fish entrainment, and impingement; the extraction and transportation of raw materials, which results in habitat disturbance and air pollution; waste disposal, which increases the effective footprint of a project and presents pollution/contamination concerns; air pollution, which results in acid precipitation and the subsequent affects on ecological resources; and/or continued contribution to global warming, which is perhaps the greatest potential impact to ecological (and human/cultural) resources worldwide.

3.3.3.1 Vegetation

Mitigation of impacts to vegetation has been accomplished primarily through careful site planning. Large areas of forest and wetland areas are being avoided to the extent practicable. Collocation of the transmission line on an existing NYSEG ROW on the western wall of the Cohocton Valley eliminates the need for forest clearing in this area. The proposed location of the Cohocton River crossing is in an area where associated riparian wetlands are narrow and impacts will be limited. Consequently, impacts to the most ecologically significant communities within the Project Site are being minimized to the extent practicable. Project access roads will be sited on existing farm lanes in most locations, and areas of disturbance will be confined to the smallest area possible. In addition, a comprehensive sediment and erosion control plan will be developed and implemented to protect adjacent undisturbed vegetation and other ecological resources.

Mitigation measures to avoid or minimize impacts to vegetation will also include delineating sensitive areas (such as wetlands) where no disturbance or vehicular activities are allowed, educating the construction workforce on respecting and adhering to the physical boundaries of off-limit areas, complying with guidance provided by environmental monitors, employing best management practices during construction, and maintaining a clean work area within the designated construction sites. Following construction activities, temporarily disturbed areas will be seeded (and stabilized with mulch and/or straw if necessary) to reestablish vegetative cover in these areas. Outside of active agricultural fields, native species will be allowed to re-vegetate these areas.

3.3.3.2 Fish and Wildlife

As previously discussed, construction-related impacts to fish and wildlife should be limited to incidental injury and mortality due to construction activity and vehicular movement, construction-related silt and sedimentation impacts on aquatic organisms, habitat disturbance/loss associated with clearing and earth moving activities, and displacement due to increased noise and human activities. Mitigation of impacts related to construction activity will be accomplished through careful site design (e.g., utilizing existing roads, avoiding sensitive habitat, and minimizing disturbance to the extent practicable), adherence to designated construction limits, and avoidance of off-limit sensitive areas.

To avoid and minimize impacts to aquatic resources resulting from construction-related siltation and sedimentation, an approved sediment and erosion control plan and Storm Water Pollution Prevention Plan (SWPPP) will be implemented. The sediment and erosion control plan and SWPP were previously described in Section 3.2 (Water Resources). Proper implementation of these plans will assure compliance with NYSDEC State Pollutant SPDES regulations and New York State Water Quality Standards. In addition, a SPCC Plan will be developed and implemented to minimize the potential for unintended releases of petroleum and other hazardous chemicals during Project construction and operation.

Impacts related to permanent habitat loss and forest fragmentation along the transmission line have been minimized, as described previously. In addition, cleared forested land along Project access roads and at the periphery of turbine sites will be allowed to grow back and reestablish forest habitat in these areas.

The Project has been designed to minimize bird and bat collision mortality. The turbines will be placed much further apart than in older wind farms where avian mortality has been documented, such as those in northern California. They will also be mounted on tubular towers (rather than lattice), which prevent perching by birds. In an effort to reduce avian and bat impacts, all electrical lines between the turbines will be buried and any the above-ground segments of the 34.5 kV transmission line will follow Avian Power Line Interaction Committee (APLIC) guidelines for insulation and spacing. Lighting of the turbines (and other infrastructure) will be minimized to the extent allowed by the FAA and follow specific design guidelines to reduce collision risk (e.g., using flashing lights with the longest permissible off cycle).

Despite the fact that significant impacts to birds and bats are not anticipated, a post-construction avian and bat fatality monitoring program will be implemented in consultation with the NYSDEC and USFWS. Although this study will not directly mitigate Project-specific impacts, it will help to advance understanding of avian and bat collision impacts. The purpose of the on-site, post-construction monitoring program will be to determine if avian and/or bat collision fatalities are occurring as a result of Project operation, and if so, the rate of mortality. This data can then be correlated with pre-construction data, and ultimately this information can help to develop models that will more precisely predict the impact of future wind power projects. The protocols and study design will follow established/accepted procedures for monitoring collision mortality at wind power facilities and other tall structures. These methods include searches under turbines, coupled with analysis of carcass removal rates (scavenging) and searcher efficiency rates. In addition, new procedures may be implemented based on the findings of ongoing monitoring studies at other wind power facilities.

3.3.3.3 Threatened and Endangered Species

To avoid impacting listed threatened and endangered bird species, a pre-construction breeding bird survey will be undertaken. This survey will focus on areas of habitat where listed threatened or endangered species could be nesting. If such species are nesting within or adjacent to proposed areas of disturbance, these areas will be avoided until after the nesting season, to the extent practicable. If the pre-construction breeding bird survey indicates the presence of listed grassland bird species, the Project developer will also undertake a post-construction habitat displacement study to ascertain whether, and to what extent, the operating turbines are disturbing/displacing nesting grassland birds. Although this study will not directly mitigate Project-specific impacts, it will serve to provide post-construction data that can be correlated with pre-construction data, and ultimately used to develop predictive models for use in the siting of future wind power projects.

3.4 Climate and Air Quality

3.4.1 Existing Conditions

3.4.1.1 Climatic Conditions

The NRCS maintains and monitors National Water and Climate Centers (NWCC) in numerous locations throughout the United States. Available data from Steuben County and the adjacent Livingston and Ontario counties were examined for their relevance to the Project site. Only NWCCs that collect both temperature and precipitation data were considered. The Project site is located approximately between the two closest NWCCs located in Dansville and Bath, New York, approximately 11 miles west and 15 miles southeast of the Project site, respectively.

The Dansville NWCC is located at an elevation of 660 ft above Mean Sea Level (MSL). The Bath NWCC data sheet from NRCS does not list an elevation, so for the sake of this analysis it was assumed to be located at Bath's elevation of approximately 1,100 ft MSL (ePodunk, 2006). Since the Project site is located at an elevation of approximately 1,900 to 2,000 ft MSL, the Bath data is considered more representative of the Project site.

The Bath NWCC substation has collected temperature and precipitation data since 1953. Based upon the compiled 30-year (1971-2000) averages, the average daily maximum temperature in Bath is 57.0 degrees Fahrenheit (°F), and the average daily minimum is 34.2 °F. Historically, January is the coldest month with an average daily temperature of 22.7 °F, and July is the warmest with an average daily temperature of 67.9 °F.

The 30-year annual average precipitation recorded in Bath is 31.9 inches. June is historically the wettest month of the year, with an average monthly precipitation of 3.92 inches, and February is the driest, with an average monthly precipitation of 1.61 inches. The 30-year average snowfall recorded in Bath is 46.0 inches annually. January and February are historically the snowiest months of the year with monthly averages of 11.3 inches and 10.2 inches, respectively (NRCS, Undated).

Since in general higher elevations receive more moisture, it is likely that the Project site receives more precipitation than was recorded at Bath. This effect is caused by the cooling of moist air as it is forced to higher elevations to pass over ridges. Cooler air has less capacity to hold moisture, so water vapor condenses and precipitates out (Matteson, 2005). Table 14 shows that at Bath's higher elevation, temperatures are indeed lower and precipitation is higher, illustrating that the described effect is operative in this region. A linear extrapolation has been performed to estimate the conditions that may be present at the higher elevation of the Project site. A linear extrapolation is not unreasonable, since the dry adiabatic lapse rate (the change in dry air temperature with respect to altitude) is a constant (Sutton, 1953). At the same time, since the air is not dry and condensation is assumed, the relationship may not be perfect. However, the extrapolated values should be more representative of the Project site than are the Bath data.

Table 14. Estimation of Climatic Conditions at Project Site

Parameter	Dansville	Bath	Site
	Data	Data	Calculated
Elevation (ft MSL)	660	1,100	1,900
Estimated Distance from Site	11 miles west	15 miles southeast	--
Avg. Daily Max Temp	58.5° F	57.0° F	54° F
Avg. Daily Min Temp	37.1° F	34.2° F	29° F
Coldest Month	January	January	January
Avg. Daily Temp.	24.4° F	22.7° F	20° F
Warmest Month	July	July	July
Avg. Daily Temp.	70.4° F	67.9° F	63° F
Avg. Annual Precipitation (inches)	31.52	31.90	32.6
Wettest Month	June	June	June
Avg. Monthly Precipitation (inches)	3.75	3.92	4.2
Driest Month	February	February	February
Avg. Monthly Precipitation (inches)	1.33	1.61	2.1
Avg. Annual Snowfall (inches)	44.1	46.0	49

3.4.2 Air Quality

Air quality data for New York State are published annually by the NYSDEC's Division of Air Resources. The most recent summary of air quality data available for the state is the *2005 Annual New York State Air Quality Report - Ambient Air Monitoring System* (NYSDEC, 2006A). Included in this report are the most recent ambient air quality data through 2005, as well as long-term air quality trends derived from data that have been collected and compiled from numerous state and private (e.g., industrial, utility) monitoring stations across the state. These trends are assessed by NYSDEC region. The Project site is located in NYSDEC Region 8. Most of the air quality monitoring stations for Region 8 occur in the metropolitan Rochester area, where sources of pollution and air quality concerns are most significant. The other Region 8 monitoring stations are located in Elmira, Pinnacle, and Williamson. During the most recent year for which data were available (2005), all of the Region 8 monitoring stations were within the acceptable levels established by the National Ambient Air Quality Standards (NAAQS) for all tested parameters: sulfur dioxide, inhalable particulate matter less than 2.5 microns in diameter (PM) ($PM_{2.5}$), carbon monoxide, and ozone.

The Project site is located immediately downwind of NYSDEC Region 9, therefore, air quality data for that region were also examined. It was found that monitoring stations in Region 9 are mostly located in the urbanized portions of the Niagara Frontier or along the shores of Lake Erie, so they are no more representative of the Project site than are the monitoring stations located within Region 8. The lakeshore monitoring stations are arrayed to measure ambient concentrations in the prevailing winds as they enter New York State from Canada and the American Upper Midwest.

During the most recent year for which data were available (2005), the Region 9 monitoring stations located in Middleport, Amherst, and Dunkirk slightly exceeded the NAAQS for ozone for the 8-hour averaging period. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 parts per million (ppm) (EPA, 2006c). The results for the three listed stations were 0.086, 0.086, and 0.089, respectively.

All of the Region 9 monitoring stations were within the acceptable levels established by the NAAQS for the following tested parameters: SO_2, inhalable particulates (PM_{10} and $PM_{2.5}$), carbon monoxide (CO), and NO_x. Where some inhalable particulate data was not yet available for 2005, the 2004 report was checked and compliance was also indicated.

The *EPA Green Book* (EPA, 2006a) lists Currently Designated Nonattainment Areas for All Criteria Pollutants by county for the entire United States. As of its last update on March 3, 2006, Steuben County is designated as in attainment of the NAAQS for all criteria pollutants monitored (CO, nitrogen dioxide (NO_2), ozone, lead (Pb), PM_{10}, $PM_{2.5}$, and sulfur dioxide). However, Livingston and Ontario Counties, located immediately north of the Site, are listed as being non-attainment for 8-hour ozone.

One of the largest air emission sources in the vicinity of the proposed Project is the AES Greenridge coal and biomass co-fired power plant in Dresden, Yates County, approximately 25 miles northeast of the Project site. This power plant is ranked among the top six facilities in New York State for total air releases by the Environmental Protection Agency as of 2002, the latest year for which data are available (Scorecard, 2006). Additionally, NYSDEC listed this plant in the top ten facilities releasing mercury in New York in 2000 (NYSDEC, Undated A). However, no local air monitoring data for mercury are available to further characterize air quality in the vicinity of the proposed Project.

3.4.3 Potential Impacts

3.4.3.1 Construction

During the site preparation and construction phases of the Project, minor temporary adverse impacts to air quality could result from the operation of construction equipment and vehicles. Such impacts could occur as a result of emissions from engine exhaust and from the generation of fugitive dust during earth moving activities and travel on unpaved roads. Dust could cause annoyance and impact property at certain yards and residences that are adjacent to unpaved town roads or Project access roads. These impacts are anticipated to be short-term and localized and will be avoided or corrected quickly, as discussed below.

3.4.3.2 Operation

The operation of this Project is anticipated to have a positive impact on air quality by producing 105,120 MWh of electricity per year with zero emissions. Power delivered to the grid from the proposed Project would directly off-set the generation of energy at existing convention power plants.

The region is subject to emissions transported from fossil-fuel burning sources. Resource Systems Group, Inc. (RSG) conducted a study for the Flat Rock Wind Power Project (now known as Maple Ridge Wind Power Project) in Lewis County, NY, to assess the effects of that project in reducing air emissions (RSG, 2003). The analysis projected potential reductions in contaminants resulting from that project's power generation. Since both projects are located in the central portion of New York State (approximately 140 miles apart), the emission factors determined by RSG based on the regional average fuel mix are considered representative for the proposed Project and are presented in Table 15, along with estimated emission reductions that would result from the proposed Project.

Table 15. Estimated Annual Emissions Reductions That Would Result from the Proposed Project

Compound	Emission Factor [pounds (lbs) / MWh] [1]	Total Annual Reductions (tons/year) [2]
Nitrogen oxides	1.363	72
Sulfur dioxide	1.765	93
Carbon dioxide	1,274	66,960
Particulate matter less than 10 microns in diameter	0.041	2.2
Volatile organic compounds	0.035	1.8
Mercury	2 E-06	0.0001 (0.21 lbs/yr)

1 Emission factors based on the regional average fuel mix.
2 Assumes 105,120 MWh of electrical power generated by the Project during an average year based on a 30% capacity factor

The Project would have a beneficial impact on air quality by producing up to 40 MW of electricity without any emissions to the atmosphere. The annual production of wind power by the Project would reduce carbon dioxide emissions, which contribute to global warming, by an amount equivalent to removing about 11,000 to 12,000 cars from the road (calculated using EPA's Greenhouse Gas Calculator (EPA, 2001).

The operation of the proposed Project is not anticipated to have any measurable effect on climate. A recent preliminary modeling study conducted by Roy, *et al* (2004) suggests that a large scale wind turbine installation (10,000 turbines) in the Great Plains region (Oklahoma) may have a slight summertime warming effect (a mean of 0.7 degrees Celsius (°C) during the 15-day period in July 1995 modeled) and drying effect on the local climate by creating turbulence that brings warmer, drier air down to the ground.

During the environmental review process for a wind farm in Chautauqua County, NY, a study group analyzed the Roy, *et al* (2004) study with respect to local conditions to determine its applicability to impacts of wind turbines on vineyard microclimates (DeGaetano, *et al*, 2004). The specific concern addressed was whether the 31-34 proposed wind turbines with rotor diameters of 240 feet would cause local ground-level cooling, which has the potential to damage grape vines during the coldest days. The study group concluded that results of the Roy, *et al* (2004) study did not apply to the Chautauqua County project due to the much smaller number of turbines in the proposed installation, and the generally wetter climate in New York State. Additional analysis by the study group concluded that the wind turbines would likely not cause any ground-level cooling, but might have a slight, unquantified ground-level warming effect within one-half mile of the turbines. The final conclusion of DeGaetano, *et al* (2004) was that the Microclimate Study Group did not believe the proposed Project would have "a significant impact (adverse or beneficial) on local microclimatic conditions and grape production." Based on DeGaetano, *et al* (2004) it is therefore concluded that the operation of the proposed Dutch Hill Project will also not have any discernible effect on climate.

3.4.4 Proposed Mitigation

Project operation has the potential to reduce current emissions from existing power plants or delay increased use of fossil fuels. In 2004, the United States obtained approximately 71% of its electricity from fossil fuels, and 50% from coal, the fossil fuel with the highest carbon dioxide content per unit of electricity produced (USEIA, 2005). A detailed analysis by the Department of Energy's Pacific Northwest Laboratory in 1991 estimated the energy potential of the United States wind resource at 10.8 trillion kilowatt-hours (kWh) annually, or more than three times total U.S. electricity consumption in 1996 (Elliot *et. al.*, 1991; USDOE, 1997). Every 10,000 MW of wind power generation installed can reduce carbon dioxide emissions by approximately 33 million metric tons (MMT) annually if it replaces coal-fired generating capacity, or 21 MMT if it replaces generation from the United States average fuel mix (San Martin, 1989). The NYS Department of Public Service (NYSDPS) has estimated that achievement of the State's RPS goal will reduce in-State emissions of NO_x by approximately 4,000 tons per year, emissions of SO_2 by approximately 10,000 tons per year, and emissions of CO_2 by approximately 4,129,000 tons per year (NYSDPS, 2004).

Thus, by contributing to this effort, the proposed Project would have a long-term beneficial impact on climate and air quality. This benefit can be viewed as mitigation for other environmental impacts associated with the Project. Since transmission losses generally increase linearly with the distance electricity is transmitted, all else being equal, displaced power generation is more likely to be located closer to the Project site than further away, providing additional local air quality benefit.

Except for minor, short-term impacts from construction vehicles, the proposed Project would have no adverse impacts on air quality. The following mitigation measures for construction-related air emissions and dust are proposed and will be standard operating policy for the Project construction contractors:

- All vehicles used during construction will comply with applicable federal and state air quality regulations;
- Operational measures, such as limiting engine idling time and shutting down equipment when not in use, will be implemented;

- The site environmental monitor will identify any dust problems during construction and report them to the construction manager and the contractor;
- Active dust suppression will be implemented on unpaved construction access roads, parking areas, and staging areas, using water-based dust suppression materials in compliance with state and local regulations. In more severe cases, temporary paving (e.g. oil and stone) may be used to stabilize dusty road surfaces in certain locations;
- Traffic speeds on unpaved access roads will be kept to 25 mph to minimize generation of dust;
- Carpooling among construction workers will be encouraged to minimize construction-related traffic and associated emissions;
- The extent of exposed or disturbed areas on the Project site at any one time will be minimized;
- Disturbed areas will be re-planted or graveled to reduce windblown dust; and
- Erosion control measures will be implemented to limit silt deposit to roadways.
- The Project will implement a Complaint Resolution Procedure to establish an efficient process by which to report and resolve any construction (or operational) related impacts.

3.5 Aesthetic/Visual Resources

3.5.1 Existing Conditions

Based on established visual assessment methodology (NYSDEC, Undated B) the visual study area for the Project was defined as the area within a 5-mile radius of each of the proposed turbines. This area includes 88 square miles in Steuben County, 11 square miles in Livingston County, 10.6 square miles in Ontario County. However, to address agency concerns regarding visibility beyond 5 miles, sensitive site mapping and viewshed analysis were extended to a 10-mile radius. This visual study area (5 and 10 mile radius) is illustrated in Figure 12. Existing visual and aesthetic resources within the visual study area were identified as part of a Visual Impact Assessment (VIA) conducted by EDR (Appendix H). The VIA included review of existing data and field reconnaissance to identify landscape similarity zones, viewer groups, and sensitive visual resources within the area. These existing visual/aesthetic components of the study area are described below.

3.5.1.1 Landscape Similarity Zones

Land use within the study area is dominated by undeveloped land (agricultural and wooded), farms, and scattered rural residences. Dairy farming is the primary agricultural activity. Higher density residential and commercial development is concentrated in the villages and small hamlets that occur along State Routes 21, 371, and 415, including the Villages of

Cohocton and Wayland and the hamlets of Atlanta, North Cohocton, and Wallace. Within this area, four distinct landscape similarity zones were defined. The general landscape character of these zones is described below:

Zone 1. Upland Agricultural Zone

This landscape similarity zone occurs on hilltops and elevated ridges within the visual study area, and is characterized by open agricultural land with widely dispersed farms and rural residences along a network of county and local roads. Active agricultural fields (corn, hay, soybeans, small grains, and potatoes), dominate the landscape. Topography ranges from undulating ridge tops in the northern and central portions of the study area, to more gently rolling terrain in the southern portions, west of the Cohocton River Valley. The ridges are oriented in a generally northeast-southwest direction with roads, streams, and lines-of-sight following a similar orientation. To the south of the study area (Towns of Dansville and Avoca) the topography has an elevated rolling character with less intense ravine formations. Views in the upland agricultural zone are generally open, at times expansive. These views typically include open fields in the foreground, often backed or bordered by lines of trees that define the edges of the steep ridge slopes. Views across valleys to other hilltops are available from many locations. These views include widely scattered homes, barns and silos, with working farm equipment often seen in the fields. Interstate Route 390 traverses this zone to the southwest of the Project site. Due to the elevation of this zone, the abundance of open fields, and the proposed location of turbines exclusively within this zone, mid-ground (0.5-3.5 miles), and background (>3.5 miles) views of the proposed project will be available from many areas within the upland agricultural zone. Foreground views (i.e., <0.5 mile) will be limited due to the limited public access to Dutch Hill and the very few residences located in that area.

Zone 2. Valley Agricultural Zone

This zone includes the Cohocton River Valley as well as the Naples and Springwater Valleys, north of the 5-mile radius study area. It is characterized by large, flat to gently rolling, crop fields and extensive wooded wetlands with farms, residences, and rural businesses located along the road frontage. This zone includes significant portions of State Routes 415, 21, and 371. These roads generally parallel the orientation of the major valleys and offer open views of the valley floor and surrounding hills. The Cohocton River runs through the majority of this area and is characterized by a gentle gradient, numerous oxbows and extensive shoreline wetlands. The river banks are lined with mature trees and understory brush in most places, so views to and from the river are generally limited to locations where roads run adjacent to or cross the channel. The dominant activity in this area is farming and local travel along Route 415, 21, and 371. The Cohocton River is used for fishing, but views of the proposed project will generally be limited from the river due to its shoreline vegetation. Because of the abundance of open farm land, where views of the project are available from this zone, they will often be open, unobscured views that are observed from a lower elevation than the

Project Site. Therefore, the proposed facilities will be viewed along the ridge that defines the horizon in most views.

Zone 3. Village/Hamlet Zone

This landscape similarity zone includes the villages and hamlets in the study area. It is characterized by moderate to high-density residential and limited commercial development. Vegetation and landform may contribute to visual character in this zone, but buildings (typically 1-3 stories tall) and other man-made features dominate the landscape. These features can be highly variable in their size and architectural style. However, they are typically arranged along an organized street pattern that tends to screen outward views and focus views along the main streets and crossroads. In most areas, street and yard trees also help to enclose and screen views within this zone. Examples of this zone within the study area include the Villages of Cohocton and Wayland, and the Hamlets of Atlanta and North Cohocton. Views of some turbines will be available from this zone, although complete views of the turbines or views of the full extent of the project are generally limited due to the screening provided by buildings and adjacent forested slopes. Open, views are most likely to be available from the edges of the village/hamlet zone, where housing and vegetation density decrease, and along street corridors that are oriented toward the Project Site.

Zone 4. Forestland Zone

This zone is characterized by the dominance of forest vegetation (native deciduous/mixed forest and mature conifer plantations) and generally steep topography. The forestland zone occurs throughout the visual study area, primarily in the steep valleys and wooded ravines, which line the Cohocton River Valley and occur between the dissected upland ridges. Small streams and local roads often run through these valleys. Also included in this zone are some large woodlots that occur either on the ridge tops or within the river valley. Views within this zone are generally restricted to areas where small clearings and road cuts provide breaks in the tree canopy. Where long distance views are occasionally available, they are typically of short duration, limited distance, and/or tightly framed by trees and adjacent slopes. Land use in this zone includes, low-density residential and recreational use (hunting, fishing, etc.). Examples of this zone include areas along local roads such as Avery Hollow Road, Shults Hill Road, and Potter Hill Road. These forested areas are typically private lands with limited public access. However, forested public lands, such as the High Tor Wildlife Management Area (outside the 5-mile radius study area to the northeast) would also be included within this zone.

These landscape similarity zones are illustrated in Figure 4 in Appendix H.

3.5.1.2 Viewer/User Groups

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

Local Residents

Local residents include those who live and work within the visual study area. They generally view the landscape from their yards, homes, local roads, and places of employment. Except when involved in local travel, residents are likely to be stationary, and have frequent or prolonged views of the landscape. Local residents may view the landscape from ground level or elevated viewpoints (typically upper floors/stories of homes). Residents' sensitivity to visual quality is variable, and may be tempered by the aesthetic character/setting of their neighborhood or work place. For example, residents with a view of existing commercial and industrial facilities may be less sensitive to landscape changes than those with a view of open farmland. It is assumed, however, that all residents are familiar with the local landscape and may be very sensitive to changes in particular views that are important to them.

Through Travelers/Commuters

Commuters and travelers passing through the area view the landscape from motor vehicles on their way to work or other destinations. Commuters and through travelers are typically moving, have a relatively narrow field of view, and are destination oriented. Drivers on major roads in the area (Interstate Route 390, State Routes 21, 371, and 415) will generally be focused on the road and traffic conditions, but do have the opportunity to observe roadside scenery. Passengers in moving vehicles will have greater opportunities for prolonged off-road views than will drivers, and accordingly, may have greater perception of changes in the visual environment. Because most of the major roads in the study area traverse open valley areas, views to adjacent slopes and ridge tops are available in most locations. However, these landscape features also serve to block more distant views from these roads.

Tourists/Recreational Users

Tourists and vacationers come to the area for the purpose of experiencing its cultural, scenic, or recreational resources. These viewers include sight-seers and visitors to area lakes and wineries. They may view the landscape on their way to a destination or from the destination itself. Some, such as weekend and seasonal home owners, may spend extended time in the area. Tourists' and vacationers' sensitivity to visual quality and landscape character will be variable (depending on their reason for visiting the area), although this group is generally considered to have relatively high sensitivity to aesthetic quality and landscape character. Recreational users include local and seasonal residents involved in outdoor recreational activities at parks and recreational facilities, and in undeveloped natural settings such as forests, fields, and water bodies. This group includes those involved in competitive sports, snowmobilers, bicyclists, joggers, recreational boaters, hunters, fishermen, and those involved in more passive recreational activities (e.g., picnicking or walking). Visual quality/scenery may or may not be an important part of the recreational experience for these viewers. However, recreational users will often have continuous views of landscape features over relatively long periods of time. Passive recreational activities generally do not require as much concentration as more active recreational activities, and tend to be more focused on the enjoyment of scenery. Those engaged in passive activities, therefore have the opportunity to observe the surrounding area for a prolonged period of time and may be particularly sensitive to visual change. Tourists and recreational users will be concentrated outside the 5 mile visual study area, in and around the Village of Naples and Canandaigua Lake. However, these viewers will also traverse the area while traveling the major roads. Most of these viewers will only view the surrounding landscape from ground-level or water-level vantage points.

3.5.1.3 Visually Sensitive Resources

The 5-mile radius visual study area includes several sites that the NYSDEC Visual Policy (DEP-00-2) considers scenic resources of statewide significance (NYSDEC, 2000). The area between 5 and 10 miles from the Project Site includes additional scenic resources. These resources are described in the following section, and their location is indicated in Figure 12.

3.5.1.3.1 Sites listed on the National or State Register of Historic Places

The expanded visual study area includes a total of seven sites that are currently listed on the State and National Register of Historic Places (OPRHP, 2006). These sites include the following:

5-mile Visual Study Area:

- Larrowe House – South Main Street (State Route 415), Cohocton

10-mile Visual Study Area:

- Ephraim Cleveland House – 201 North Main Street, Naples
- Dansville Library – 200 Main Street, Dansville
- Morgan Hook and Ladder Company – 18-20 Mill Street, Naples
- Naples Memorial Town Hall – intersection of North Main (State Route 21) and Monier Streets, Naples
- Pioneer Farm – South of Dansville on NY 36, Dansville
- U.S. Post Office – 100 Main Street, Dansville

The Phase 1B Archaeological/Architectural Reconnaissance Survey conducted for the Project (Kudrle and Carrington-Carter, 2006) also indicated that 62 structures/sites within the 5-mile radius visual study area may be eligible for listing on the State and National Register. The majority of these are located in and around the Villages of Cohocton, and Wayland, and the Hamlet of Atlanta. The 10-mile study area also includes a site that has been determined eligible for listing on the State and National Register; the Clara Barton House (American Red

Cross Ch. 1) in Dansville. Sections 3.6.1.5 and 3.6.1.6 present the Phase 1B Survey in more detail.

3.5.1.3.2 State Parks

Two state park facilities occur within the 10-mile visual study area (OPRHP, 2006). These parks and the recreational facilities/opportunities they provide are listed below.

1. Stony Brook State Park – Located approximately 9.5-miles from the nearest proposed turbine. The 577 acre park is located approximately 1.5 miles south of the Village of Dansville and provides opportunities for hiking, picnicking, swimming, camping, cross county skiing, and hunting.

2. Harriet Hollister Spencer State Recreation Area – This 679-acre park is located in the northern portion of the study area approximately 9.5-miles from the nearest The Phase 1B proposed turbine. Activities in the recreation area include hiking, biking, picnicking, cross-country skiing, and hunting.

3.5.1.3.3 Urban Cultural Parks

There are no urban cultural parks in the study area.

3.5.1.3.4 State Forest Preserve

There are no state forest preserves in the study area.

3.5.1.3.5 National Wildlife Refuges

There are no national wildlife refuges in the study area.

3.5.1.3.6 State Wildlife Management Areas

High Tor Fish and Wildlife Management Area - This 6,100-acre wildlife management area (WMA) is located in Ontario and Yates County on State Route 245 within the 10-mile visual study area. The WMA consists of three individual parcels, the largest of which occurs entirely within the 5-10 mile ring surround the Project. This 3,400-acre parcel, east of the Village of Naples, is predominately steep wooded terrain. A portion of the second parcel, which is primarily wetland and borders the south end of Canandaigua Lake, also occurs within 10 miles of the Project. The third parcel is located east of the southern end of Canandaigua Lake. Known as South Hill, this portion of the WMA is entirely outside the 10 mile radius study area. Hunting, fishing, trapping, hiking, cross-country skiing, boating, and camping (by permit) are allowed in the WMA.

3.5.1.3.7 National Natural Landmarks

There are no national natural landmarks in the study area.

3.5.1.3.8 National Park System Lands

There are no national park system lands in the study area.

3.5.1.3.9 Wild, Scenic, and Recreational Rivers

There are no wild, scenic, and recreational rivers in the study area.

3.5.1.3.10 Designated Scenic Areas of Statewide Significance

There are no designated, scenic areas of statewide significance in the study area.

3.5.1.3.11 Designated Scenic Sites/Overlooks

One scenic overlook is occurs along the north-bound lanes of Interstate Route 390, near Flint Road in the Town of Cohocton within the 5-mile visual study area. The site includes parking and picnicking facilities, and provides expansive views of the Cohocton River Valley and the wooded hills that surround it. The primary view is to the north, toward the Village of Cohocton and Dutch Hill.

3.5.1.3.12 State or Federal Designated Trails

The nearest designated trail is a spur of the Finger Lakes Trail, known as the Bristol Hills Trail, which is within the 10-mile visual study area. This trail runs north from the Village of Prattsburgh to Italy Hill State Forest, then west to the High Tor WMA, and then northwest through Naples to the Ontario County Park west of the Village of Bristol Springs. At its closest point, a spur leading to the Bristol Hills Trail is located approximately 5.5 miles from the nearest proposed turbine.

3.5.1.3.13 Adirondack Park Lands and Scenic Vistas

There are no Adirondack Park lands and scenic vistas in the study area.

3.5.1.3.14 State Nature and Historic Preserve Areas

There are no state nature and historic preserve areas in the study area.

3.5.1.3.15 Palisades Park Land

There is no Palisades Park land in the study area.

3.5.1.3.16 Bond Act Properties (Exceptional Scenic Beauty, Open Space)

Memorial Town Hall (Old Town Hall), along with being listed on the State and National Register of Historic Places, is also a 1986 Environmental Quality Bond Act property. It is located within the 10-mile visual study area in the Village of Naples, at the intersection of North Main and Monier Streets.

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

Recreational Areas

The study area includes several areas that offer opportunities for local recreation, including fishing, boating, swimming, and/or field sports. These include the following:

5-mile Visual Study Area:

- Atlanta/North Cohocton Community Park – County Route 39, Cohocton
- Cohocton River – Adjacent to State Routes 21, 371, and 415, Wayland and Cohocton
- Lawrence Parks Recreation Area – Atlanta Back Road, Cohocton
- Loon Lake – Cohocton Loon-Lake Road (County Route 121), Wayland
- Pine Hill ATV Park – Pine Hill Road, Cohocton
- Tumble Hill Campground – 10551 Atlanta Back Road, Cohocton
- Victory Park – Pine Street, Village of Wayland

10-mile Visual Study Area:

- Hill & Valley Riders Snowmobile Trails
- Holiday Hill Campground – 7818 Marvin Hill Road, Springwater
- Hunt Hollow Ski Resort – 7532 Hunt Hollow Road, Naples
- Loucks Pond – Bauter Road, Avoca
- Reservoir Creek Golf Course – Cohocton Street, Naples
- Smith Pond – Smith Pond Road, Avoca
- Widmers Wine Cellar – 1 Lake Niagara Lane, Naples

The most significant regional recreational resource is Canandaigua Lake, which lies just outside the 10-mile visual study area to the north (approximately 10.5 miles from the nearest proposed turbine). The lake is a popular destination for fishermen and boaters and includes seasonal/vacation homes along its shorelines. Several vineyards/wineries that are popular tourist destination also occur along Canandaigua Lake.

Areas of Intensive Land Use

Several communities within the study area are considered visually sensitive due to the concentration of residential development in these areas and intensity of land use they receive. These include the following:

5-mile Visual Study Area:

- Hamlet of Atlanta
- Hamlet of North Cohocton
- Village of Cohocton
- Village of Wayland

10-mile Visual Study Area:

- Hamlet of Wallace
- Village of Avoca
- Village of Dansville
- Village of Naples

Transportation Corridors

The visual study area includes several highways that could be considered visually sensitive due to the number of drivers that travel these roads on a daily basis. According to NYSDOT, 2005 traffic counts indicate the following average annual daily traffic on these roads (NYSDOT, 2005):

5-mile Visual Study Area:

- Interstate Route 390, from Exit 3 (State Routes 15 and 21) in the Town of Wayland to Exit (State Route 415) in the Town of Avoca, averaged 9,920 to 12, 600 vehicles per day.
- State Route 21, from the junction of State Route 53 in the Village of Naples, through the Ontario-Steuben County Line, Hamlet of North Cohocton, to the State Route 415 Junction at the Wayland Town Line, averaged 2,970 to 5,630 vehicles per day.
- State Route 21, from the State Route 415 junction at the Wayland Town Line, to the Hamlet of Haskinville, averaged 2,060 to 6,930 vehicles per day.

- State Route 371, from the junction of State Route 21 in the Hamlet of North Cohocton, to the junction of State Route 415 in the Village of Cohocton, averaged 1,730 vehicles per day.
- State Route 415, from the junction of State Routes 15 and 21 in the Town of Wayland, through the Village of Cohocton and Hamlet of Wallace, to County Route 6 in the Hamlet of Bloomerville, averaged 1,460 to 5,290 vehicles per day.

10-mile Visual Study Area:

- Interstate Highway 86/State Route 17, from Exit 34 (Hornell) to Exit 35 (Howard) averaged 6,880 to 7,320 vehicles per day.
- State Route 53, from the south side of the Village of Naples, through the Ontario-Steuben County Line, Hamlet of Ingleside, to the junction of County Route 7 in the Town of Prattsburgh, averaged 1,140 to 1,940 vehicles per day.
- State Route 63, from the Livingston County Line to the Village of Wayland, averaged 4,350 to 5,200 vehicles per day.
- State Route 15 from the junction with Route 415 to the Village of Wayland, averaged 5,140 to 5,410 vehicles per day.

The locations of visually sensitive resources within the visual study area are illustrated in Figure 12, and in large-scale viewshed maps included as Appendix H.

3.5.2 Potential Impacts

3.5.2.1 Construction

Visual impacts during construction will include the addition of construction material and working construction vehicles and equipment to the local roads and landscape. Construction activity will also result in visible site disturbance, such as tree clearing, earth moving, soil stockpiling, and road building, all of which will alter the character of the landscape, at least on a temporary basis. Dust generated by the movement of construction vehicles and sediment-laden storm water run-off could also potentially have an adverse impact on aesthetic resources. However, all of these activities will be relatively short term (i.e., generally restricted to the construction season), and at any one site, will generally occur on only a few days during the course of Project construction. Once construction activity ceases and site restoration activities are complete, construction-related visual impacts will no longer occur.

3.5.2.2 Operation

Impacts to visual resources resulting from Project operation were evaluated primarily through the VIA prepared by EDR (Appendix H).

The VIA procedures utilized on this Project were based on visual impact assessment methodologies developed and/or accepted by various state and federal agencies. Potential Project visibility was evaluated using viewshed mapping, line-of-sight cross-section analysis, and field verification (ballooning). Visual impact was evaluated by preparing computer-assisted visual simulations of the Project from representative/sensitive viewpoints from throughout the 5-mile radius study area. The Project's visual impact on the landscape was evaluated by an in-house panel of registered landscape architects with experience in visual impact assessment.

3.5.2.3 Viewshed Analysis

Topographic viewshed maps for the study area were prepared using USGS digital elevation model (DEM) data (7.5-minute series) and ESRI ArcView® software with the Spatial Analyst extension. Two 10-mile radius topographic viewsheds were mapped, one to illustrate "worst case" daytime visibility (based on a maximum blade tip height of 420 feet above existing grade) and the other to illustrate potential visibility of turbine lights (based on a nacelle height of 262 feet above existing grade). To illustrate the potential screening effect of forest vegetation, a 10-mile radius vegetative viewshed analysis was performed. The viewshed analyses were based upon the location of all turbines, as indicated in the proposed project layout (Figure 3).

Potential turbine visibility, as indicated by the viewshed analyses, is illustrated in Figure 7 of Appendix H, and is summarized in Table 1 of Appendix H. As indicated by the blade tip analysis, potential project visibility is indicated in approximately 85% of the 5-mile study area and 38% of the 10-mile study area. Potentially visible areas are concentrated in the ridge top terrain in the central portion of the study area, but include slopes facing the Project throughout the study area. Concentrated areas of potential visibility are indicated in a north south band west of the Village of Wayland and on the hills (and the Naples Valley) outside of the Village of Naples. Most of the visually sensitive sites in the study area fall within the topographic viewshed, including the villages of Cohocton, Wayland, and Naples, the hamlets of North Cohocton and Atlanta, the scenic overlook on Route 390, and most of the sites listed Historic Register, and heavily-traveled state highways. Only those areas that are in deep valleys or on the backside of hills will be fully screened from view by topography alone. These include the Village of Dansville, Route 17/86, most of Route 321 south of Wayland, most of Route 15 north of Wayland, Stony Brook State Park, Loon Lake, Springwater Valley, and most of the creeks within the study area.

As indicated by the turbine count analysis (Appendix H, Figure 7, Sheet 2) in most areas where potential visibility is indicated, views to multiple turbines could be available. The largest number of turbines will be visible from hilltops and elevated slopes, while the smallest number will be visible from valley areas. These valley areas include the majority of visually sensitive sites, suggesting that most views from such sites will include relatively few turbines.

Areas of potential nighttime visibility (Appendix H, Figure 7, Sheet 3) cover approximately 72% of the 5-mile radius study area and 33% of the 10-mile radius study area, and are indicated in roughly the same location indicated by the blade tip analysis. However, factoring vegetation into the analysis significantly decreases potential project visibility (Appendix H, Figure 7, Sheet 4). As indicated in Table 1 of Appendix H, the vegetation viewshed covers only 28% of the 5-mile radius study area, and 13% of the 10-mile radius study area. These areas are largely restricted to open agricultural fields on hilltops and valley floors.

3.5.2.3.1 Cross-section Analysis

To further illustrate the screening effect of vegetation and structures within the study area, three representative line-of-sight cross-sections (ranging from 10.5 to 15-miles long) were cut through the study area. Cross-section locations were chosen so as to include visually sensitive areas (i.e. villages, historic sites, and major roads) and cover the various landscape similarity zones occurring within the 5-mile radius study area. The cross-sections are based on forest vegetation and topography as mapped on the 7.5-minute USGS quadrangle maps and digital aerial photographs. For the purposes of this analysis, a uniform 40-foot tree height was assumed. A 10-fold vertical exaggeration was used to increase the accuracy of the analysis and facilitate reader interpretation.

Cross-section analysis (Appendix H, Figure 8) suggests that the Project will be visible from between 33% and 43% of the area along the selected lines of sight. The analysis also indicates that various visually sensitive sites are likely to have at least partial views of the Project. The cross-sections suggest that views of the turbines are likely to be available from sites in the various village and hamlets, as well as from most local roads. Forested hillsides, the Cohocton River, various creeks in ravines, and roads that parallel these streams are indicated as being screened. The results of the cross-section analysis are summarized in Appendix H, Table 2.

3.5.2.3.2 Field Verification

Actual visibility of the proposed project was evaluated in the field on April 11, 2006. Two 15-foot by 6-foot helium-filled balloons were tethered at the approximate location of proposed Turbines 3 and 15 and raised to a height of approximately 400 feet above the existing grade, thus slightly lower than the maximum finished elevation of the turbine blade tip when oriented straight up (i.e., at the 12 o'clock position). The purpose of this exercise was to provide a locational and scale reference to verify visibility of the Dutch Hill turbines and to obtain photographs for subsequent use in the development of visual simulations. Clear skies and sunshine, resulted in good visibility throughout most of the day. Calm winds resulted in relatively stationary balloon heights throughout the day. Photos for use in development of the transmission line simulation were obtained on October 9, 2006.

While the balloons were in the sky, field crews drove public roads and visited public vantage points within the 5-mile radius (108 square mile) study area to document points from which the balloons could or could not be seen. Photos were taken from 173 representative viewpoints within the study area. All photos were obtained using Nikon (D70 and D100) or Canon (350D and 20D) digital SLR cameras. All cameras utilized a focal length between 28 and 35 mm (equivalent to between 45 and 55 mm on a standard 35 mm camera). This focal length most closely approximates normal human eyesight relative to scale. Viewpoint locations were determined using hand-held GPS units and high resolution aerial photographs (digital ortho-quarter quadrangles). The time and location of each photo were documented on all electronic equipment (cameras, GPS units, etc.) and noted on field maps and data sheets (see Appendices D and E of Appendix H).

Field review indicated that actual project visibility, (as indicated by visibility of the helium-filled balloons raised at two proposed turbine sites) is likely to be more limited than suggested by viewshed mapping and cross section analysis. This is due to the fact that screening provided by buildings and trees within the study area is more extensive and effective than assumed in the previous analyses (e.g., vegetation is more extensive than indicated on the USGS maps, and often taller than 40 feet in height). The result is that certain sites/areas where "potential" visibility was indicated by viewshed mapping and cross section analysis, were actually well screened from views of the proposed project. Field review confirmed a lack of visibility from areas that were heavily forested, and areas in low valleys. The balloons could not be seen from the Village of Wayland, where ground-level views were typically blocked by buildings and street/yard trees. However, they could be seen from outskirts of Wayland as well as from certain locations in the Village of Cohocton and the Hamlets of Atlanta and north Cohocton In the rural/agricultural portions of the study area, hedgerows and trees not indicated on the USGS maps also blocked/interrupted views of the balloons in many areas. Views were available from several sensitive sites, including Route 390, the scenic overlook on Route 390, and Lawrence Park Recreation Area. However, the balloons could not be seen from Loon Lake, the Village of Wayland, or the Village of Naples.

Independent of the ballooning exercise conducted by EDR, the Project cultural resource consultants identified numerous additional structures within the visual study area that could be eligible for listing on the NRHP, some of which could have views of the proposed Project. Potential Project visibility from these sites will be evaluated after the SHPO has determined which of these structures are eligible for listing on the National Register (Section 3.6).

3.5.2.3.3 Visual Simulations

From the photo documentation conducted during field verification, EDR selected a total of 14 viewpoints for development of visual simulations. These viewpoints were selected to illustrate typical views of the proposed project that will be available to representative viewer/user groups, from the major landscape similarity zones and sensitive sites within the study area. The selected viewpoints also include a variety of viewer distances and lighting conditions to illustrate the range of visual change that will occur with the project in place. Location of the selected viewpoints is indicated in Appendix H, Figure 9. Locational details and the criteria for selection of each simulation viewpoint are described below:

Viewpoint 1	-	View from State Route 371, north of Atlanta-East Wayland Road, looking southwest. Typical view from a major road in the valley agricultural LSZ in the central portion of the study area. The viewpoint is approximately 1.3 miles from the nearest turbine that would be visible in the view.
Viewpoint 36	-	View from State Highway 21 between Cemetery Road and Atlanta-North Cohocton Road near a small cemetery, looking southwest. Typical view of the valley agricultural LSZ from a major road in the central portion of the study area. The viewpoint is approximately 1.2 miles from the nearest turbine that would be visible in the view.
Viewpoint 49	-	View from Pardee Hollow Road, looking southeast. Typical view of the forestland/upland agricultural LSZ in the northern portion of the study area. The viewpoint is approximately 3.7 miles from the nearest turbine that would be visible in the view.
Viewpoint 60	-	View from State Route 21, between Eelpot Road and Pine Hill Road, looking southwest. Typical view of valley agricultural LSZ in the northeast portion of the study area. The viewpoint is approximately 2.5 miles from the nearest turbine that would be visible in the view.
Viewpoint 71	-	View from West Hollow Road, south of Freid Hill Road, looking southwest. Typical view of forestland LSZ and the most open view available in the vicinity of the Village of Naples. Also provides opportunity for cumulative view of the Dutch Hill and Cohocton Wind Farms. The viewpoint is approximately 6.4 miles from the nearest turbine that would be visible in the view.
Viewpoint 75	-	View from the scenic overlook on Route 390 (north bound), looking north. Typical view of the valley agricultural LSZ from a heavily-used sensitive site. The viewpoint is approximately 2.6 miles from the nearest turbine that would be visible in the view.
Viewpoint 98	-	View from southbound lane of Route 390, near Warren Hill Road, looking east-northeast. Typical view of the upland agricultural LSZ from the most heavily used road in the study area. The viewpoint is approximately 1.6 miles from the nearest turbine that would be visible in the view.
Viewpoint 111	-	View from the intersection of Church Street and Route 415, looking north. An open view of the project site from within the village/hamlet LSZ. The viewpoint is approximately 0.9 miles from the nearest turbine that would be visible in the view.
Viewpoint 116	-	View from Park Avenue in the Village of Cohocton, looking north-northwest. Typical open view from the village/hamlet LSZ. The

viewpoint is approximately 1.3 miles from the nearest turbine that would be visible in the view.

Viewpoint 131 - View from Erie Street, between Atlanta-East Wayland Road and Boggs Street, in the hamlet of Atlanta looking southwest. Typical open view of the village/hamlet LSZ. The viewpoint is approximately 0.6 miles from the nearest turbine that would be visible in the view.

Viewpoint 155 - View from Ward Road, looking northeast towards Loon Lake. Typical view of the upland agricultural LSZ in the southwestern portion of the study area. The viewpoint is approximately 4.8 miles from the nearest turbine that would be visible in the view.

Viewpoint 158 - View from Emo Road, looking northeast towards State Route 21. Open, panoramic view from the upland agricultural LSZ just outside the southwestern portion of the study area. The viewpoint is approximately 5.3 miles from the nearest turbine that would be visible in the view.

Viewpoint 195 - View from Kirkwood-Lent Hill Road looking west. Typical view of the upland agricultural LSZ that offers opportunity to see turbines from both the Dutch Hill and Cohocton Wind Farms. This viewpoint is approximately 3.4 miles from the nearest Dutch Hill turbines and 0.5 mile from the nearest Cohocton turbines that will be visible in this view.

Viewpoint 222 - View from State Route 371 looking east toward the proposed 34.5 kV transmission line route. This viewpoint will offer the closest, most direct view of the proposed ROW clearing and above-ground line segment.

To show anticipated visual changes associated with the proposed project, high-resolution computer-enhanced image processing was used to create realistic photographic simulations of the completed turbines from each of the 14 selected viewpoints. In addition, the appearance of the most significant overhead segment of the 34.5 kV line was simulated from Viewpoint 172. The photographic simulations were developed by constructing a three-dimensional computer model in 3D StudioMax® based on turbine and transmission line specifications and survey coordinates facilities provided by the project developer. For the purposes of this analysis, it was assumed that all new turbines would be Clipper C-96 machines and that transmission line structures would be single wood poles with a cross arm. Simulation methodology and accuracy is outlined in Figure 13, which also outlines the computer models used in this VIA.

Simulations from each of the 14 viewpoints listed above are shown in Appendix H. These simulations of the proposed Project indicate that the Project will result in a change to the existing visual setting/landscape. However, the visibility and visual impact of the wind turbines will be highly variable based on distance, weather conditions, sun angle, the extent of visual screening, viewer sensitivity, and/or existing land use characteristics. The greatest impact occurs when the turbines are close to the viewer (i.e., less than 0.5 mile), which heightens the Project's contrast with the landscape in color, line, texture, form, and especially scale. In such views, the turbines become focal points, and begin to alter the perceived land use in the view. More distant views (i.e., over 2.0 miles), and those that occur in a working agricultural setting generally have more limited visual impact. These factors tend to decrease turbine visibility and/or contrast with the landscape.

3.5.2.3.4 Visual Impact Evaluation

A panel of three landscape architects (two in-house at EDR, and one independent) was asked to rate the proposed Project in terms of its contrast with existing components of the landscape. Digital color prints (11 x 17-inch) of the before and after photos from each selected viewpoint were evaluated by the panel. Using a rating form developed by EDR, the Project's contrast with existing vegetation, landform, land use, water resources, and user activity was then rated on a scale of 1 (completely compatible) to 5 (strong contrast). For each viewpoint, these scores were added and averaged to provide an overall contrast rating.

This evaluation revealed that the individual contrast ratings for the 12 selected turbine viewpoints ranged from 1.0 (completely compatible) to 4.25 (high visual contrast). Composite scores (i.e., the average of individual rating panel members) ranged from 1.0 to 3.25, and nine viewpoints (75%) received scores of less than the mid-point of 3.0 on the scale of 1 to 5. Scores in this range generally indicate a low to moderate level of visual contrast. The lowest contrast ratings (under 2.0) were received by Viewpoints 49, 71, 111, 116, and 155. Simulations from these viewpoints were characterized by more distant views (over 3.5 miles), limited turbine visibility due to screening, or an abundance of man-made elements in the view. All of these conditions tend to decrease turbine visibility and/or contrast with the existing landscape.

Based upon review of nighttime photos/observations of existing wind power projects, the panel felt that the red flashing lights have the potential to create a significant nighttime effect. The potential significance of this impact depends on how many turbines are visible, what other sources of lighting are present in the view, the extent of screening provided by structures and trees, and nighttime viewer activity/sensitivity. However, it was felt that night lighting could be distracting and have an adverse impact on rural residents that currently experience dark nighttime skies. It should be noted that nighttime visibility/visual impact may be reduced on this Project due to 1) new FAA guidelines that result in fewer aviation warning lights than required on earlier projects, 2) the steep ridge slopes that largely screen portions of the Project from many valley locations, and 3) the concentration of residences in villages, hamlets, and along highways where existing lights already compromise dark skies and compete for the viewer's attention. Panel members also felt that new FAA guidelines requiring the synchronization of flashing lights would help to reduce adverse visual impact.

3.5.2.3.5 Assessment of Shadow Flicker

In addition to the Visual Impact Assessment (VIA) prepared by EDR, a separate assessment of the phenomenon known as "shadow flicker" was conducted by Wind Engineers, Inc. (WEI) (Appendix I). Shadow flicker is the alternating change in light intensity or shadows created by the moving turbine blades when back-lit by the sun. These flickering shadows can cause an annoyance when cast on nearby or residences, however, due to the turbines' low blade pass frequency, shadow flicker is not anticipated to have any adverse health effects (e.g., trigger epileptic seizures). Although setback distances for turbines (1,500 feet from adjacent residences) will significantly reduce shadow flicker impacts to potential receptors, some limited impact will occur.

To calculate potential shadow flicker impacts, WEI used the following data to evaluate potential impacts related to shadow flicker:

- Turbine locations (coordinates),
- Shadow flicker receptor (residence) locations (coordinates),
- USGS 1:24,000 topographic and USGS DEM (height contours),
- Turbine rotor diameter,
- Turbine hub height,
- Joint wind speed and direction frequency distribution, and
- Sunshine hours (long term monthly reference data).

The model calculated shadow-flicker time at each assessed receptor location and the amount of shadow-flicker time (hours/year) everywhere surrounding the project (on an iso-line plot).

WEI's modeling indicated that of 126 potential receptors within 1,500 m (4,920 feet), 90 will experience no effect, and only four could experience over 25 hours of shadow flicker throughout a year (typically around sunrise or sunset). WEI indicates that this number is significantly lower than that calculated for other wind power projects in New York and throughout the United States. They also note that these model results do not reflect many of the local conditions at the receptor site that could further reduce shadow flicker, such as trees and neighboring structures. This model also assumes that the turbine rotor is always turning, the receptor always has a window facing the direction of the sun, and that the receptor dwelling is occupied at all hours when shadow flicker may occur (i.e., at sunrise and sunset). These are highly conservative assumptions, and as such, the analysis over-predicts potential impacts. In reality, site-specific factors such as terrain, trees, buildings, and window location could significantly reduce impacts from shadow flicker. In addition, many of the modeled shadow flicker hours are expected to be of very low intensity, due to the distance of the proposed turbines from the affected receptors.

3.5.3 Mitigation

Construction-related visual impacts will be avoided, minimized, and mitigated through 1) careful site planning/Project layout, 2) development and implementation of various construction plans, and 3) a comprehensive site restoration process following completion of construction.

The proposed Project layout was developed so as to minimize the need for tree clearing and new road construction. The majority of the proposed turbines and other Project components have been sited in open fields (agricultural and successional). Mature forest and wetland communities have been avoided to the extent practicable, thus minimizing the need to clear existing vegetation. Existing farm lanes will be upgraded for use as turbine access roads wherever possible, while buried interconnect lines will follow access roads and field edges to minimize required clearing. Where clearing of undisturbed forest is unavoidable, such sites are typically well removed from adjacent roads and residences and therefore will not result in a significant adverse visual impact.

During construction, visual impacts associated with working construction equipment will be minimized through adherence to a construction routing and sequencing plan that minimizes impacts on local roads and residences. A dust control plan and a sediment and erosion control plan will be developed and implemented to minimize off-site visual impacts associated with construction activities. As described in the impacts discussion, any unavoidable construction-related visual impacts will be short term.

Following completion of construction, site restoration activities will occur. These will include removal of access road material from Project access roads (i.e., going from 30+ feet to 16 feet in width), restoration of agricultural fields (including soil decompaction, rock removal, and topsoil spreading), and stabilizing/re-vegetating disturbed sites through seeding and mulching. These actions will assure that, as much as possible, the site is returned to its preconstruction condition.

Mitigation options for the operating Project are limited, given the nature of the Project and its siting criteria (tall structures on high elevation sites). However, in accordance with NYSDEC Program Policy (NYSDEC, 2000), various mitigation measures were considered. These included the following:

- Screening: Due do the height of individual turbines and the geographic extent of the proposed Project, screening with earthen berms, fences, or planted vegetation will generally not be effective in reducing Project visibility or visual impact. However, if adequate natural screening of the proposed substation site is not preserved, a planting plan will be developed and implemented to minimize visibility and visual impact associated with this component of the Project.

- Relocation: Because of the extent of the Project, the number of individual turbines, and the large number of viewpoints from which the Project can be seen, turbine relocation will generally not significantly alter the visual impact of a wind power Project.

- Camouflage: The white or off-white color of wind turbines generally minimizes contrast with the sky under most conditions. Consequently, this color will be utilized on the Dutch Hill Project. The size and movement of the turbines prevents more extensive camouflage from being a viable mitigation alternative (i.e., they cannot be made to look like anything else).

- Low Profile: A significant reduction in turbine height is not possible without significantly decreasing power generation. To off-set this decrease, additional turbines would be necessary. There is not adequate land under lease to accommodate a significant number of additional turbines, and a higher number of shorter turbines would not necessarily decrease Project visual impact. In fact, several studies have concluded that people tend to prefer fewer larger turbines to a greater number of smaller ones. The visual impact of the electrical collection system is being minimized by placing the lines underground rather than on overhead poles.

- Downsizing: Reducing the number of turbines could reduce visual impact from certain viewpoints, but from most locations within the study area, unless this reduction was drastic, the visual impact of the Project would change only marginally. Even a modest reduction in turbine number would render the Project economically infeasible.

- Alternate Technologies: Alternate technologies for power generation would have different, and perhaps more significant, visual impacts than wind power. Alternative utility-scale wind power technologies, that would significantly reduce visual impacts, do not currently exist.

- Nonspecular Materials: Non-reflective paints and finishes will be used on the wind turbines and nonspecular conductor will be used on the overhead transmission line to minimize reflected glare. Galvanized substation components will rapidly weather to a non-reflective gray color.

- Lighting: Turbine lighting will be kept to the minimum allowable by the FAA. FAA guidelines (FAA, 2005) do not require daytime lighting, and allow nighttime lighting of perimeter turbines only, at a maximum spacing of 0.5 mile. Medium or low intensity pulsing red lights will be used at night, rather than white or red strobes, or steady burning red lights. Lighting at the substation will be kept to a minimum, and turned on only as needed, either by switch or motion detector.

- Maintenance: The turbines and turbine sites will be maintained to ensure that they are clean, attractive, and operating efficiently. Research and anecdotal reports indicate that viewers find wind turbines more appealing when they are operational and the rotors are turning. In addition, CPP II will establish a decommissioning fund to ensure that all visible above-ground components will be removed if the Project goes out of service for more than one year and is not repowered or redeveloped.

- Offsets: Correction of an existing aesthetic problem within the viewshed is a viable mitigation strategy for projects that result in significant adverse visual impact. However, results of this

VIA do not suggest that such mitigation measures are warranted for the Dutch Hill Wind Power Project.

In addition to the mitigation measures above, additional measures that may reduce or mitigate the Project's visual impact include the following:

- Compliance with required set-backs from roads and residences.
- The turbines will have uniform design, speed, height, and rotor diameter.
- Towers will include no exterior ladders or catwalks.
- The Project operations and maintenance building (although not yet designed) will reflect the vernacular architecture of the area (i.e., resemble an agricultural structure).
- New road construction will be minimized by utilizing existing town roads, woods roads, and farm lanes whenever possible.
- Prohibit placement of advertising devices on the turbines
- Provide a parking/viewing location, with an informational kiosk, to enhance public understanding and appreciation of the Project.

3.6 Archaeological Resources and Historic Architectural Structures

The Public Archaeology Facility (PAF) at Binghamton University in New York conducted Phase 1A and Phase 1B archaeological surveys and an architectural assessment of the Project Area and vicinity. The studies were undertaken to assess the potential impacts of the Project on archaeological and historic architectural resources within the Project's Areas of Potential Effect (APEs) for ground disturbance, noise, and visual effects.

Methodology and results of PAF's studies are detailed in the following two cultural resource management reports, which are included in Appendix J, and are summarized in the sections below:

- *Phase 1A Archaeological Sensitivity Assessment: Dutch Hill Wind Power Project, Town of Cohocton, Steuben County, New York*, dated February 2006 (Kudrle, 2006); and
- *Phase 1B Archaeological/Architectural Reconnaissance: Dutch Hill Wind Power Project, Town of Cohocton, Steuben County, New York*, dated October 2006 (Kudrle and Carrington-Carter, 2006).

The studies were conducted in compliance with the New York Archaeological Council (NYAC) *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State* (NYAC, 1994) and the New York State Historic Preservation Office's (SHPO's) *Guidelines for Wind Farm Development Cultural Resources Work* issued in January 2006. The studies were also conducted to assist in compliance with Section with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended. The reports were submitted to SHPO by letter dated November 17, 2006 (see Appendix J) and are currently under review.

3.6.1 Existing Conditions

This section describes the environmental setting, prehistoric (pre-European contact) and historic cultural contexts, and known archaeological sites and historic structures in the Project vicinity, based upon background research and a general area reconnaissance (see Sections 3.6.1.1 through 3.6.1.3).

The background research included review of available Cultural Resource Management (CRM) reports, the files and historic maps at the New York State Museum (NYSM) and the OPRHP, which contains the SHPO, the National Register of Historic Places (National Register) database, aerial photographs, and PAF files. A walkover/drive-over of the Project Area was done to document areas of previous ground disturbance and slopes greater than 15% and identify potential aboveground historic structures. The research, coupled with the reconnaissance, was used to predict the archaeological sensitivity of the Project Area to contain previously unidentified archaeological sites (see Sections 3.6.1.2 and 3.6.1.3) and develop potential strategies for Phase 1B archaeological field testing. A total of 21 potential turbine locations were inspected; six (noted as locations A through F) have been dropped from the proposed layout. Proposed access roads, underground cables (most within the footprints of existing or proposed access roads), and an electrical interconnect corridor trending easterly to a proposed substation atop Lent Hill were also inspected. The substation is part of the Cohocton Wind Power Project.

Based upon the findings of the Phase 1A (see Section 3.6.1.4), a Phase 1B archaeological field investigation (Kudrle and Carrington-Carter, 2006) of the APE for Project ground disturbance was recommended, and has been conducted (see Sections 3.6.1.5 and 3.6.1.6). The Phase 1B included subsurface testing of representative landforms within the APE for physical disturbance (i.e. during construction) to determine the presence or absence of previously unknown archaeological sites. An architectural field assessment was also conducted to identify aboveground structures greater than 50 years old that may be both eligible for listing in the National Register and within the Project's visual APE (see Section 3.6.1.7).

3.6.1.1 Environmental Setting

PAF's field observations during the walkover/drive-over identified no aboveground historic structures or artifact scatters in the Project Area. Current settlement in the vicinity is limited primarily to farmsteads, post-1950 mobile homes, and seasonal cottages. Proposed turbine locations were examined and found to be relatively flat and located in existing agricultural fields or undisturbed lightly wooded areas. The proposed access roads will connect each turbine location to the main roads, as well as to adjacent turbines. All new roads will be gravel placed atop existing grade with a total width of approximately 7.5 m (25 feet). Many of the proposed access roads will follow the footprint of an existing farm road. Most interconnection cables will be located within proposed access roads, with small sections crossing relatively undisturbed landforms. The cables will be laid in trenches to a depth of 1.2 m (4 feet), with trench widths varying from 1-2 m (3.5 to 6.5 feet).

An interconnect will transmit electricity from Dutch Hill to a proposed substation east of the Cohocton River. The interconnect will be installed underground across the valley floor just north of the Village of Cohocton, as well as atop Lent Hill into the substation (which is part of the Cohocton Wind Project). The interconnect will be aboveground across the river and up the steep side of Lent Hill. No cultural resources were found by PAF along this corridor.

3.6.1.2 Prehistoric Context and Sensitivity

PAF's research indicates two distinct patterns of prehistoric lifeways in the region. The first and oldest was the highly mobile pre-agricultural hunter/gatherer of the Paleo-Indian to Early-Middle Archaic periods. The second was marked by the advent of early agricultural practices, together with hunting and gathering, which led to larger, more sedentary populations in the Late Woodland to the Contact periods.

Six previously identified prehistoric sites with unknown affiliations are documented in NYSM/OPRHP files to date in the Cohocton region, in Yates, Ontario and Steuben Counties. These range from reported small lithic scatters to village settlements, often proximal to wetland or surface water resources. None of the sites has been determined eligible for listing or is listed on the National Register, and none are located within the Project Area.

PAF assigned a high-potential prehistoric sensitivity for previously unidentified small seasonal camps and processing stations that may be located on knolls within the Project's APE and near the headwaters of upland creeks and streams. A low-potential prehistoric sensitivity for large occupation sites was assigned throughout the remaining Project Area. A Phase 1B field investigation was recommended to determine the presence or absence of prehistoric sites.

3.6.1.3 Historic Context and Sensitivity

PAF's research indicates historic settlement of the regional area started during the late 18th century. Available historic maps for the Cohocton area date from 1857 to 1903, and show the population centered within the communities of Cohocton, North Cohocton, and Atlanta. Agriculture was and continues to be the primary economic activity within and around the Project Area.

Individual farmsteads are shown on the historic maps, scattered along the growing road system. Three historic sites have been documented to date in Steuben County (one site) and Yates County (two sites). These are 19th century foundations and associated middens. None of the sites has been determined eligible for listing or is listed on the National Register, and none are located within or near the Project Area. Historic cultural features on the maps reviewed by PAF were limited to the Erie-Lackawanna railroad tracks, which parallel NY Route 415 into the Village of Cohocton and are still in use today.

PAF overlaid historic maps (particularly the accurate early 20th century USGS maps) onto the Project Area maps. One map documented structure (MDS) was indicated, termed MDS 1, that may have been located in the vicinity of a plowed agricultural field near the proposed access road leading from Turbine 8 north of Davis Hollow Road. The structure appears to have been a farm/residence dating from at least 1857 to 1903. Structural remains are no longer visible. This area was further assessed during the Phase 1B and a historic archaeological site was identified that may be associated with this former structure (see Section 3.6.1.6).

Apart from the area of MDS 1, PAF assigned a low potential sensitivity for previously unidentified historic archaeological sites within the remaining Project APE, based upon the relative lack of MDSs and the location of the APE outside of population centers (specifically the Village of Cohocton).

3.6.1.4 Findings of Phase 1A Archaeological Assessment

The Phase 1A (Kudrle, 2006) identified no known archaeological sites or existing aboveground historic structures within the Project Area. One former structure (MDS 3) was indicated on historic maps ranging from 1857 to 1903 in what is now the Project Area. Ground surface observations during the Phase 1A walkover at a total of 21 potential turbine locations (including the 16 currently proposed) and associated access roads found no foundations or artifact scatters within the Project Area. PAF recommended that a Phase 1B field investigation be conducted within the APE for surface ground disturbance (the construction area) to determine the presence or absence of previously unidentified archaeological resources that could be affected by construction and/or operation of the Project.

3.6.1.5 Phase 1B Archaeological Field Survey Methodology

Phase 1B reconnaissance field testing of the Project Area was conducted by PAF in 2006 (Kudrle and Carrington-Carter, 2006). The survey was designed to comply with updated OPRHP CRM guidelines for wind farms released in January 2006. The Phase 1B design strategy was submitted by PAF to OPRHP for review and was approved on May 2, 2006 (Appendix J). The design strategy included systematic surface surveys (of recently plowed fields) and/or the strategic placement of close-interval shovel test pits (STPs) to sample representative landform types within the Project Area, targeting those types considered favorable for archaeological sites. PAF designed the close-interval sampling strategy (at 5-m spacing rather than the typical 15-m spacing, with the exception of the valley floor along the interconnect crossing the Cohocton River) to focus on knolls within the Project Area, to increase the probability of finding the small lithic scatters most commonly encountered within those upland contexts.

Landforms within the Project Area were first categorized based on Robert Funk's 1993 study (as cited in the Phase 1B in Appendix J) that assigned prehistoric archaeological site sensitivities to types of landforms found within the eastern Upper Susquehanna drainage area. Two types of landforms in the Project Area were identified by PAF to be sensitive: 1) summit knolls/ridges with no associated streams, and 2) summit knolls overlooking stream headwaters. The shortest linear distance to any natural water source was also the primary variable used for landform classification.

After landform variation and sensitivity was defined for the Project Area, a testing strategy was designed to sample at least 70% of each landform type within the Project Area's APE for physical disturbance. PAF's strategy included a combination of subsurface STPs for unplowed areas, and systematic surface surveys of recently plowed agricultural fields.

The total acres of APE for physical disturbance was tallied for each type of Project component, then multiplied by 16 (the average number of STPs per acre using the typical 15-meter spacing interval) to obtain the total number of STPs required to adequately test the area, according to OPRHP guidelines. The number of STPs was reduced based upon the estimated acreage of recently plowed agricultural fields suitable for surface survey (estimated at approximately 50% of the APE). The STPs for the remaining APE were then allocated to test representative landform types using close-interval, 5-meter spacing. Turbine pads were tested using an 8 by 8-foot grid of STPs spaced for 5-meter intervals (testing 15% of each turbine's 2.9-acre APE). Approximately 20% of the lengths of access road segments and 12% of the lengths of buried cable corridors were tested using the close-interval spacing, with STPs placed based upon estimated proximity to water and micro-topography.

A total of 832 STPs at 5 m intervals, 50 STPs at 15 m intervals (valley floor) were excavated and 9 systematic surveys were completed within the APE for physical disturbance. All headwater turbine locations and 80% of non-headwaters turbine locations were surveyed. All STPs penetrated intact soil horizons, marked by shallow brown to dark brown rocky silt loam A-horizons, to an average depth of approximately 25 cm (10 inches). Subsoil layers appeared as a light brown to yellowish-brown very rocky silt loam. Average STP total depth was 38 cm (15 inches).

All artifact locations were flagged, numbered, and recorded using a hand-held GPS. Second systematic surface surveys were completed at each isolated prehistoric surface find location. Artifacts were collected and bagged, then processed, examined, catalogued, and are now temporarily curated (according to state and federal guidelines) at PAF's laboratory at Binghamton University. STP soil records and artifact catalogues are included in Appendices II and III of the Phase 1B report in Appendix J.

3.6.1.6 Phase 1B Archaeological Field Survey Findings

Two archaeological sites were identified during the Phase 1B survey within the Project's APE for physical disturbance. One, a prehistoric site, was named the Dutch Hill 1 Site. The second, a historic site, was named the Davis Hollow Road Site. Both are described below.

3.6.1.6.1 Prehistoric Site

Two prehistoric artifacts were recovered during the project field survey. Prehistoric artifacts were found at one of the 11 headwater (<550 meters to water) turbine locations (Turbine

C). The site was designated as the Dutch Hill 1 Site; Turbine C has been dropped from the Project layout to avoid this archaeological site. No prehistoric artifacts were identified at non-headwater (>550 meters to water) turbine locations.

Dutch Hill 1 Site (SUBi-2618) at Turbine C

One Onondaga chert stemmed projectile point and one biface fragment were recovered from the surface of a plowed field within the impact area for Turbine C (now omitted). No additional prehistoric artifacts were found during a second surface survey. The site occupies one of the numerous knolls on Dutch Hill, overlooking the headwaters of several small upland tributaries of the Cohocton River. PAF described the artifact characteristics as “somewhat similar” to the Late Archaic (1800 B.C.) cultural context and indicated the site may have been a small camp or processing station (Phase 1B pp. ii and 90).

The Project has been redesigned to avoid this archaeological site. Prior to construction in this area (specifically of nearby Turbine 11), PAF recommends installation of temporary fencing around the site limits (as delineated by the archaeologist), to minimize accidental impacts during construction. In addition, if impacts from the staging of heavy machinery and equipment are likely during construction, a Phase 2 site examination was recommended. This field study would consist of three to four test units and additional plowing and surface survey to determine National Register status of the Dutch Hill 1 Site.

An OPRHP Prehistoric Site Inventory Form has been prepared for this site and is included in Appendix V of PAF’s Phase 1B report in Appendix J.

3.6.1.6.2 Historic Site

Three isolated historic finds and one historic archaeological site (designated as the Davis Hollow Road Site) were found during field testing.

Davis Hollow Road Site (SUBI-2619) along Access Road to Turbine 8

This historic site consists of a low density of 19th and 20th century sheet midden deposits likely associated with a possible former residential structure (see Section 3.6.1.3) atop Dutch Hill. No aboveground structural remains are visible in the site area, but historic maps (1857-1903) for Steuben County place several structures in the vicinity of the concentration of historic artifacts. Names associated with the closest structure are “G. Dance” on the 1857 map and “J. Synther" on the 1873 map. No structures are shown within the immediate area on the 1942 USGS quad map, indicating that the structure may have been demolished prior to 1942.

The site is located within a plowed field. A total of 81 historic artifacts were found at this site during systematic surface survey within an approximate 320-m (3443-foot) square area on the western edge of an existing farm road. Though site limits are preliminary, it likely extends further west and outside of the Project’s APE. No artifacts were found within the 60-

foot-wide area east of the existing farm road that was subject to surface inspection by the archaeologists.

The artifacts recovered include a variety of decorated and diagnostic ceramics, functional vessels and food remains. The mean ceramic date for the assemblage was estimated at approximately 1863. PAF determined that the site may contain high research potential to address questions pertaining to the daily lives of rural families in the Town of Cohocton, and regards the site as potentially eligible for the National Register. PAF recommended further archaeological work if the site will be impacted by the Project. This work would likely consist of a Phase 2 site examination of four to six test units and deed/census research.

The proposed access road to Turbine 8 will be located to the east of the farm road to avoid the Davis Hollow Road Site. Ground disturbance will be a minimum of 25 feet east of the eastern edge of the existing farm road in the vicinity of the site, as recommended by PAF. Temporary visible fencing will be placed along this buffer to avoid impacts during construction of the access road. The known limits of the site within and to the west of the existing farm road will also be delineated with temporary visible fencing to avoid inadvertent impacts during construction.

An OPRHP Historic Site Inventory Form has been prepared for this site and is included in Appendix V of PAF's Phase 1B report in Appendix J.

Because both the prehistoric and historic archaeological sites have been avoided by Project redesign, no further testing is required.

3.6.1.7 Architectural Reconnaissance Survey of Aboveground Structures

An architectural reconnaissance survey was conducted for the Dutch Hill Wind Project. The purpose of the survey was to locate and identify aboveground historic structures that are 1) listed on the National Register, 2) have been previously determined eligible for listing by SHPO, or 3) are recommended as eligible for listing by an architectural historian and that could be visually affected by the Project.

The visual study area was defined as a 5-mile radius out from the outermost turbines, in accordance with the NYS OPRHP's guidelines for wind farms. To delineate the visual study area, a 5-mile radius was drawn around the northernmost, southernmost, easternmost and westernmost turbine locations in the Project Area. The visual study area comprises portions of six towns (Cohocton, Naples, Prattsburg, Avoca, Wayland, and Wheeler) in four counties (Ontario, Yates, Livingston, and Steuben). Two villages (Cohocton and Wayland) and two hamlets (North Cohocton and Atlanta) were located within the visual study area, as were miles of rural roads and agricultural lands.

National Register-listed, eligible, and previously documented properties in NYSM/OPRHP files within the visual study area were compiled during background research. A vehicular reconnaissance survey along public roads within the visual study area was then conducted town by town to visually examine the exterior of these properties, as well as all buildings and structures greater than 50 years old (one of a number of criteria for National Register eligibility). Roads clearly marked as private roads were not investigated, and long private driveways were also eliminated, as traditionally farmhouses in New York State were constructed near roads. Many of the town roads were unpaved, and some were seasonally maintained. In a few instances, roads that appeared on a current road map had actually been abandoned and came to a dead end, often with the collapsed remains of a former house at the road's end.

The buildings greater than 50 years old were located and evaluated using the National Register Criteria (cited in Section VI of the Phase 1B report in Appendix J). Those that were potentially eligible for listing in the National Register were photographed and documented from publicly accessible areas.

Only one structure in the visual study area is listed on the National Register: The Larrowe House (NR89002088) in the Village of Cohocton. A total of 62 structures/properties were identified as potentially eligible for listing on the National Register, in the opinion of the architectural historian. All structures were deemed potentially National Register eligible under Criteria C of the National Register criteria (National Park Service, 1990):

> "Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction."

National Register eligibility Criteria A, B, and D do not apply to the 62 structures/properties identified. However, eligibility Criteria A, B, and D include the following (National Park Service, 1990):

- Criteria A: Structures/properties which are associated with events that have made a significant contribution to the broad patterns of our history.
- Criteria B: Structures/properties which are associated with the lives of significant persons in or past.
- Criteria D: Structures/properties that have yielded or may be likely to yield, information important in history or prehistory.

At least partial visibility of a Project turbine is possible for at least 52 of the 62 structures/properties, based upon regional topography only. Additional screening may be afforded by intervening vegetation and structures. Note that potential Project visibility from any of these structures has not yet been determined, and that SHPO recommends eligibility to the National Register (which makes the inclusion decision).

A number of properties in the Villages of Cohocton and Wayland, and a few in the hamlets, were identified as potentially eligible for listing on the National Register. At least one working farm (and possibly three or four) was found that was considered potentially eligible. Based upon architectural significance, few other eligible properties were found in the Project's visual study area. PAF's Phase 1B report in Appendix J) summarizes each of the 62 structures/properties and potential Project visibility (Table 8), provides photographs and descriptions (Section 6.15), and mapped locations (Appendix IV). A summary of findings by Town is presented below.

Town of Cohocton

The entire Town of Cohocton is in the visual study area. The town includes the Village of Cohocton and the hamlets of North Cohocton and Atlanta, west of Dutch Hill. The Larrowe House, also known as the Cohocton Town and Village Hall, is the only building listed in the National Register in the town. PAF found several additional buildings that may be individually eligible and may be within the viewshed of the proposed turbines at Dutch Hill.

Town of Naples

The southwest corner of the Town of Naples is within the visual study area, and was found to contain one structure that may be National Register-eligible. There are three National Register-listed structures in the town, all within the Village of Naples, outside the visual study area. These are 1) the Cleveland Ephraim House at 201 North Main Street; 2) the Morgan Hook and Ladder Company at 18-20 Mill Street; and 3) the Naples Memorial Town Hall at the junction of North Main and Monier Streets.

Town of Prattsburg

The western half of the Town of Prattsburg falls within the visual study area. There are no properties currently listed on the National Register in the town. Two structures were found that are potentially eligible within the visual study area in Prattsburg.

Town of Wheeler

The extreme northwest portion of the town is in the visual study area. There are currently no properties listed on the National Register in Wheeler. No potentially eligible structures/properties were found within the visual study area in Wheeler.

Town of Avoca

The western half of the Town of Avoca is within the visual study area. There are no National Register-listed properties in the town. No potentially eligible properties were identified within the viewshed by the architectural historian.

Town of Wayland

The eastern half of the Town of Wayland and most of the Village of Wayland is within the visual study area. There are no National Register-listed properties in the town. Approximately 20 properties in the village and four in the town were identified as potentially eligible.

3.6.2 Potential Impacts

Potential impacts of wind projects to prehistoric and historic archaeological resources and historic aboveground structures include physical disturbance or destruction. These are limited to the APE for ground disturbance (i.e. the construction area).

Potential impacts specific to aboveground historic structures also include noise and visual impacts during project construction and/or operation. Potential noise and visual impacts have separate APEs; these will be determined from results of noise and visual studies conducted for the Project.

3.6.2.1 Construction

3.6.2.1.1 Archaeological Resources

The Phase 1B field investigation identified two archaeological sites (one prehistoric and one historic) within the Project's APE for ground disturbance. The prehistoric archaeological site presently comprises two stone artifacts found within a plowed field in the proposed impact area for the now omitted Turbine C. The site was named the Dutch Hill 1 Site (SUBi-2618) and may be indicative of a prehistoric camp or tool processing location.

A total of 81 artifacts presently comprise the Davis Hollow Road Site (SUBi-2619), a historic archaeological site, located solely on the west side of an existing farm road that is proposed for access to Turbine 8. Historic maps indicate a possible residence in the vicinity although no structural remains were found during the Phase 1B.

The Project has been designed to avoid both archaeological sites. Turbine C has been omitted, thus avoiding impacts to the prehistoric archaeological site.

The proposed access road to Turbine 8 will be located to the east of the farm road to avoid the historic Davis Hollow Road Site. As recommended by PAF, ground disturbance will occur a minimum of 25 feet east of the eastern edge of the existing farm road in the vicinity of the archaeological site. Temporary visible fencing will demarcate the limit of work to avoid impacts to the site during construction of the access road. The known limits of the site will also be delineated with temporary visible fencing to avoid inadvertent impacts during construction.

Because both archaeological sites have been avoided, no further testing is required.

3.6.2.1.2 Historic Aboveground Structures

No historic aboveground structures were identified within the Project's APE for physical disturbance (i.e. the construction envelope).

The architectural survey documented 62 potentially National Register-eligible historic structures/properties within a 5-mile perimeter of the outermost turbines (the visual study area). The Larrowe House in the Village of Cohocton was the only National Register-listed structure within the visual study area.

Turbine and/or blade visibility is possible for at least 52 of the 62 structures/properties, based upon regional topography only. PAF recommended that photographic visual simulations be prepared from selected locations, to assess whether the setting of the structure/property would be affected by the visual introduction of the Project into the existing landscape. PAF recommended simulations in the Villages of Cohocton and Wayland, and the hamlets of North Cohocton and Atlanta.

If one or more aboveground historic structures are found to be within the viewshed of the Project and to have actual views of the Project, the structure will be assessed for significance in consultation with the SHPO. If the permanent introduction of Project elements into the visual setting of a significant historic structure is determined by the SHPO to cause an adverse impact (i.e. alter characteristics of the resource that contributed to its eligibility to the National Register), then efforts will be made to avoid, minimize, or mitigate those impacts, in consultation with the SHPO.

If results of the noise study indicate Project noise during construction and/or operation may potentially physically damage a historic structure or alter its setting, that structure will be assessed for significance in consultation with the SHPO. If the structure is found to be significant, efforts will be made to avoid, minimize, or mitigate noise impacts to that historic architectural structure.

3.6.2.2 Operation

Potential impacts to archaeological resources occur primarily during project construction, and are described in Section 3.6.2.1.1.

Potential impacts to historic structures during operation include noise and visual impacts and are addressed in Section 3.6.2.1.2.

3.6.3 Proposed Mitigation

3.6.3.1 Archaeological Resources

The two archaeological sites identified during the Phase 1B field survey have been avoided by Project redesign.

The prehistoric Dutch Hill 1 site (SUBi-2618), defined by the discovery of two stone artifacts within the APE of Turbine C, has been avoided by omission of the turbine from the layout. Accidental impacts to the site during construction will be avoided by the placement of temporary visible fencing around the known limits of the site, as recommended by the Project archaeologists.

The second archaeological site, the Davis Hollow Road Site (SUBi-2619), is a small historic scatter found within a portion and to the west of an existing farm road that was planned for use as an access road for the Project. No artifacts were found on the east side of the farm road. To avoid disturbance of the site, the proposed access road has been located a minimum of 25 feet to the east of the existing farm road in the vicinity of the site,. Temporary construction fencing will demarcate the work limits in the vicinity of the site, and will also be placed around the site's perimeter to avoid inadvertent disturbance during Project construction, as recommended by the Project archaeologists.

Potential impacts to unidentified archaeological resources that may be discovered during Project construction will be avoided, minimized, or mitigated by adherence to protocols in a *Plan for Unanticipated Historic Properties and Human Remains*, which will be prepared as a compliance filing for the Project and will be submitted to OPRHP for review. The plan will also be included in environmental compliance documentation provided to construction personnel.

Field compliance with these mitigation measures will be overseen by an environmental inspector on-Site during Project construction.

3.6.3.2 Historic Aboveground Structures

If noise impacts from operation and/or the permanent introduction of Project elements into the visual setting of a significant historic structure are determined by the SHPO to cause an adverse effect (i.e. alter characteristics of the resource that contributed to its eligibility to the National Register), then efforts will be made to avoid, minimize, or mitigate those impacts, in consultation with the SHPO.

3.7 Sound

Hessler Associates, Inc. was retained by the Applicant to evaluate potential noise effects from the operation of the proposed Project on sensitive receptors in the vicinity of the proposed Project Area. The Project as presently configured will consist of approximately 16 Model C-96 wind turbine generators manufactured by Clipper Windpower Technology, Inc., each with a nominal output of 2.5 MW. The C-96 wind turbines will be installed on 80 meter tall towers. As is the case with most turbines in the 2.5 MW class, the C-96 is not yet widely used in commercial operation. A prototype of this turbine has been constructed for testing and refinement and preliminary sound power level information is available for this machine. The measurements from this wind turbine have been used in the modeling assessment. It is anticipated that the final noise level of the production model will be lower than the prototype which did not include certain noise abatement features. The full report titled Environmental Sound Survey and Noise Impact Assessment, Dutch Hill Wind Power Project is contained in Appendix K.

3.7.1 Existing Conditions

For most wind power projects, the sound produced during construction and operation can be a concern to local residents. Certain activities inherently produce sound levels or sound characteristics that have the potential to create noise (i.e., unwanted sound). Some properties of sound that can be measured include:

Frequency: Frequency is the rate at which the source produces sound waves, i.e. complete cycles of high and low pressure regions. In other words, frequency is the number of times per second that a vibrating body completes one cycle of motion. The unit for frequency is the hertz (Hz = 1 cycle per second). Low pitched or bass sounds have low frequencies. High-pitched or treble sounds have high frequencies. The sensitivity of the human ear to sound depends on the frequency or pitch of the sound. People hear some frequencies better than others.

Sound Pressure: Sound pressure level (SPL) is the amount of air pressure fluctuation a sound source creates. We "hear" or perceive sound pressure as loudness. Sound pressure is usually expressed in units called pascals (Pa). The common sounds we hear have sound pressure over a very wide range (0.00002 Pa - 20 Pa). It is difficult to work with such a broad range of sound pressures. To overcome this difficulty a unit of decibel (dB) is used which compresses the scale of numbers into a manageable range. SPL can be statistically summarized as the residual, or L90, sound level. The L90 is the sound level exceeded during 90% of a measurement interval. It excludes sporadic, short-duration sound events, thereby characterizing the more quiet lulls between such events. It is this consistently present "background" level that forms a conservative basis for evaluating the audibility of a new sound source.

Sound Power

The sound power is the sound energy transferred per second from the sound source to the air. A sound source has a given, constant sound power that does not change if the source is placed in a different environment. Sound power is expressed in units called watts (W). An average whisper generates a sound power of 0.0000001 watts, a truck horn 0.1 W, and a turbo jet engine 100,000 W. Like sound pressure, sound power (in W) is usually expressed as sound power levels in dB. Sound measurement readings can be adjusted to correspond to human hearing with an "A-weighting filter" which de-emphasizes low frequencies or pitches that are outside the normal range of human hearing. Decibels measured using this filter are A-weighted and are called dB(A).

Time Distribution

Sound can be continuous, variable, intermittent or impulsive depending on how it changes over time. Continuous sound remains constant and stable over a given time period.

3.7.1.1 Background Sound Level Survey

A background sound level survey was conducted to determine what minimum environmental sound levels are consistently present at the nearest potentially sensitive receptors. A number of statistical sound levels were measured in consecutive one-hour intervals over the entire 15 day survey. Of these, the average and residual levels are the most meaningful. The equivalent energy sound level (L_{eq}), is the average sound level over each measurement interval. While useful and informative, this measure needs to be viewed with some caution when the survey objective is to quantify the mean minimum background level - it can be, and often is, influenced by noise events that are relatively loud in magnitude but short in duration, such as a car passing close by the monitoring position. Such an event can significantly elevate the average level and yield a result that may be unrepresentative of the quieter times during the sample.

In order to avoid this, the statistical sound level (L_{90}) is commonly used to quantify background sound levels. The L_{90} is exceeded during 90% of the measurement interval and filters out sporadic, short-duration noise events thereby capturing the quiet periods between such events. It is this consistently present "background" level that forms a conservative basis for evaluating the audibility of a new source. If the source does not exceed the background sound level by more than approximately 3 to 5 dBA, the source typically will not be perceived as a noise nuisance and may not be audible at all.

An additional factor that is important in establishing the minimum background sound level is the natural sound generated by wind. Wind turbines only operate and produce noise when the wind exceeds a minimum cut-in speed of about 4 m/s measured at a reference elevation of ten meters. Turbine sound levels increase with wind speed up to about 8 m/s when the sound produced reaches a maximum and no longer increases with wind speed. Therefore, at moderate to high speeds when turbine noise is most significant, the level of natural masking noise is normally also relatively high due to tree or grass rustling which reduces the ability to perceive noise from the turbines.

3.7.1.2 Site Description and Sound Level Measurement

The Project Area on Dutch Hill is a discrete ridge running north to south, rising from approximately 300 to 600 feet above the surrounding valley. The turbines are proposed along the crest of the ridge which is a fairly flat and plateau like with steep contours on the north, south and east and a gradual slope on the western side. The top of the ridge is sparsely populated with approximately 6 homes/farms located on the northern end. All other residences that might be affected are located at the base of the ridge or in the lower elevations of the western slope. The village of Atlanta is located at the base of the northern end of the ridge approximately 1,600 feet from the nearest turbine and 600 feet vertically below the turbine base.

Three locations were chosen to measure background sound levels and were designated North, South, and Central and are shown in Appendix K, Figure 2.2.1.

The survey was carried out from April 11 to April 26, 2006 using long term environmental sound level data recording equipment that captured hourly data on a 24 hour per day basis. A Rion Model NL-32 ANSI type 1 and NL-06 and NL-32 ANSI Type 2 A-weighted sound level meters were used to conduct the measurements. Microphones were fitted with appropriate windscreens and measurements were taken one to two meters above ground level. All equipment was field-calibrated at the beginning, and again at the end, of the survey.

The weather conditions during the survey were generally clear with several periods of light rain. The specific periods of precipitation and other meteorology are tabulated in the report provided in Appendix K.

The wind speed at the site was measured at a meteorology tower ("Cohocton 6") at the northern end of the Project Area. Appendix K shows the hourly average wind speeds measured at an elevation of 48.5 meters above ground level and the calculated average wind speed[3] at the standard normalization height of ten meters.

3.7.1.3 Background Measurement Results

Hourly L_{90} sound levels were plotted for the entire 15-day survey period. Although the three locations are miles apart, data reveals that the sound levels are very similar and follow the same overall trends, which are clearly influenced by wind speeds.

The general trend at all the monitoring stations is that sound levels closely parallel wind speed. Areas such as this are said to be "macro-ambient", meaning that the sound level at any specific point can be inferred with good accuracy from levels measured elsewhere within the same macro-ambient environment. The wind speed range of interest with respect to wind turbine noise is from the cut-in speed of 4 m/s at 10 meters[4], when the turbines just begin to operate, up to about 8 m/s at 10 meters when the noise levels off at a constant, maximum value after increasing from zero. The measured wind speed data[5] presents a trend of increasing background sound levels with wind speed as shown in Table 17 below.

Analysis indicates the background ambient sound level is 34 dBA for the cut-in speed of the turbines (4 m/s), and 39 dBA when the turbines would reach maximum power (8 m/s) and when noise levels would reach their maximum value. Beyond this, wind speed background noise would continue to increase while turbine noise would remain constant.

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[3] Per International Electrotechnical Committee Standard 61400.
[4] Because surface roughness varies from place to place, measurements of wind turbine sound power levels and concurrent wind speeds carried out in accordance with International Electrotechnical Committee Standard 61400-II (Ref I) are normalized and reported at a reference height of ten meters.
[5] See Figure 2.7.1 in Appendix K.

3.7.2 Potential Operational Impacts

Virtually everything that has moving parts will make some sound, including wind turbines. Table 16 lists examples of common sound levels using typical dB(A) levels.

Table 16. Common Sources of Sound and Associated Typical Sound Levels (dBA)

Source/Activity	Indicative sound level (dBA)
Threshold of hearing	0
Rural night-time background	20-40
Quiet bedroom	35
Wind farm at 350m	35-45
Car at 40mph at 100m	55
Busy general office	60
Truck at 30mph at 100m	65
Pneumatic drill at 7m	95
Jet aircraft at 250m	105
Threshold of pain	140

Source: The Scottish Office, Environment Department, Planning Advice Note, PAN 45, Annex A: Wind Power, A.27. Renewable Energy Technologies, August 1994. Cited in "Noise from Wind Turbines," British Wind Energy Association, http://www.britishwindenergy.co.uk/ref/noise.html .

The potential sound-related impacts resulting from the construction and operation of wind turbines are described below.

3.7.2.1 Turbine Noise Level

The sound power level produced by the commercial version of the C-96 wind turbine is not definitively known at this time as this model is still under development. Preliminary sound power levels have been taken for an operating prototype of the C-96 with a slightly smaller rotor diameter of 93 meters. The sound power level spectrum of measurements made in May and June 2006 have been used in the modeling

Sound *power* level is based on the measured sound pressure level at a given point and the effective radiating surface, or wave front area at that point. Knowledge of the sound power level allows the sound *pressure* level of the source, the quantity perceived by the ear and measured with instruments, to be determined at any point. Table 17 shows the octave band sound power level spectrum and overall A-weighted power level used in the modeling.

Table 17. Preliminary Clipper C-96 Sound Power Levels versus Wind Speed

Octave Band Center Frequency	31.5	63	125	250	500	1k	2k	4k	8k	dBA
Sound Power Level dB re: 1 pW	114.5	110.2	108.8	105.8	105.0	99.3	90.7	85.1	68.3	104.7

This A-weighted sound power level is considered conservative because several noise abatement features or improvements had not been implemented at the time of testing. These abatement features will address several minor tones in the measured frequency spectrum. Annex A to Appendix K provides a letter from Clipper addressing the source of these tones and the nature of the noise abatement features.

In general 104.7 dBA is below the average for a wind turbine of this size and megawatt class. Elimination of the tonal components will further reduce the overall A-weighted sound power level.

There is currently no information available on the relationship of wind speed and sound levels of the turbine. The reported sound power levels are for a wind speed of 8 m/s which is the typical wind speed at which wind turbines of this type produce peak sound levels. Based on information from other similar turbines, lower wind speeds result in reduced sound levels down to cut in speed of 3 to 4 m/s. At this point, turbines sound levels are typically about 5 dBA lower than at the maximum operating wind speed.

3.7.2.2 Assessment Criteria

To determine if any adverse environmental impacts might result, two criteria exist for the comparison of the predicted noise from the Project. The first criterion is the local regulatory noise limit, and the second is the noise assessment guidelines published by NYSDEC.

Local Regulatory Noise Limits

The Town of Cohocton Windmill Local Law (Appendix L) limits noise from any wind energy conversion system to a maximum of 50 dBA "at the boundaries of all abutting parcels that are owned by persons other than the owner of the parcel on which the turbine is located." The local law also requires preparation of a noise impact analysis demonstrating that windmill-only noise at existing residences on non-project parcels does not exceed 45 dBA. A restriction on tonal noise is specified for pure tones defined as when a one third octave band noise level exceeds the arithmetic average of the two adjacent one third octave band levels by a designated exceedance measure, as listed in Table 18.

Table 18. Restrictions on Tonal Noise

Octave Band Range	Exceedance
31.5 – 125 Hz	15 dB
160 – 400 Hz	8 dB
500 – 8000 Hz	5dB

There are no other state or federal noise regulations that apply to the Project.

NYSDEC Noise Assessment Guidelines

NYSDEC has published a guidance document titled *Policy Assessing and Mitigating Noise Impacts* (2001), which provides a methodology for evaluating potential community impacts from any new noise source. The policy uses a two-level approach to evaluating the cumulative noise increase. A First Level Noise Impact Evaluation is carried out to model noise from the future project in an extremely simple and conservative manner considering only the reduction in sound level with distance. This analysis identifies the area defined by the 6-dBA cumulative increase contour line that needs to be looked at in greater detail to see if any sensitive receptors are present.

If any residences or other potentially sensitive receptors are identified as being within the area of potential concern (6 dBA), a Second Level Noise Impact Evaluation noise modeling study is carried out considering all normal sound propagation loss mechanisms (in addition to pure distance losses).

3.7.2.3 Noise Modeling

Using these sound power levels, several worst-case, maximum noise level contour plots for the site were calculated using the Cadna A, ver. 3.5 noise modeling program developed by DataKustik, GmbH (Munich). This software allows the Project and its surroundings to be realistically modeled in three dimensions. Each turbine is represented as a point noise source at a height of 80 meters above the local ground surface (design hub height).

A conservative ground absorption coefficient of 0.5 has been assumed in the modeling (except for the First Level analysis which only considers distance) since all of the intervening ground between the turbines and potentially sensitive receptors consists of open farm fields or pasture land with a few wooded areas. Ground absorption ranges from 0 for water or hard concrete surfaces to 1 for absorptive surfaces such as farm fields, dirt, or sand. Consequently, a higher ground absorption coefficient between 0.7 and 0.9 could be used but would be less conservative. Also, any attenuation that might result from wooded areas has been completely neglected in all calculations.

The noise level from each turbine was assumed conservatively to be the downwind sound level in all directions simultaneously. This approach yielded a contour plot that shows the maximum possible sound level at any given point and sometimes shows levels that cannot possibly occur, such as between two or more adjacent turbines, since the wind would have to be blowing in two opposing directions at the same time.

The model also allows for certain atmospheric conditions that are likely to occur from time to time that may favor the propagation of sound relative to the "standard day" default conditions (10°C and 70% relative humidity). An example is thermal conditions in the atmosphere where air close to the ground cools faster than the air aloft, causing sound waves that might otherwise travel upwards to diffract downwards allowing distant sounds to be heard when they normally would not be.

3.7.2.4 Modeling Results

Plot 1 in Appendix K shows the Project sound level contours calculated in accordance with the First Level Noise Impact Evaluation outlined in the NYSDEC guidance document. The condition shown is for an omnidirectional 8 m/s wind, which is associated with the maximum turbine sound power level. As described above in the analysis of the background survey data, a residual background sound level of 39 dBA can be expected during such a wind condition. Given this background level, the NYSDEC 6 dBA cumulative increase threshold for project noise would be 45 dBA. (Also, note that the ambient background sound level of 30 dBA plus a project sound level of 44 dBA, would yield a total of 45 dBA). Therefore, the 45 dBA sound contour defines the area of concern that potentially might be impacted.

The results of the NYSDEC Level 1 Analysis is shown on Plot 1 in Appendix K. Contour lines which represent only project noise are drawn out to 44 dBA which is the theoretical point at which a 6 dBA cumulative sound level increase would occur. This first level is a screening tool to see if additional, more detailed analysis is required. This plot shows there are about 7 homes, mostly along Dutch Hill Road that are inside the 44 dBA contour.

Plot 2 in Appendix K shows the results from the second level assessment. Any residence outside of the 44 dBA contour line is unlikely to clearly hear or notice any noise from the Project. There are two homes (labeled A and B) that are on or just inside the 44 dBA line. For the predicted sound level to have a chance of occurring at these three locations, the following conditions would be required.

- The wind would need to blow out of the east which is opposite of the prevailing wind,
- Wind speed would need to be 8 m/s at 10 meters above ground level, and
- The ground surface would need to be partially reflective (such as ice covered or frozen),
- A background sound level of 39 dBA with the observer standing outside

In summary, the model prediction indicates that project noise might be audible at up to two houses but that the circumstance for this to occur rarely happens. Therefore, no significant adverse impact is expected at any home in the Project Area due to project noise.

3.7.2.5 Compliance with the Town of Cohocton Noise Ordinance

The Town of Cohocton's Noise Ordinance limits noise from the Project to 50 dBA at the property line of any parcels belonging to non-participating land owners. Plot 3 in Appendix K shows the 50 dBA contour line. As shown on the plot, the 50 dBA contour line will be confined to participating property owners with the exception of two small areas near turbine 14 and 16. Also, there are no house or farm structures near the areas with predicted sound levels in excess of 50 dBA.

The local law also requires preparation of a noise impact analysis demonstrating that windmill-only noise at existing residences on non-project parcels does not exceed 45 dBA. Plot 2 shows that the maximum predicted sound level at any residence is 44 dBA so compliance is also anticipated with the local ordinance provision limiting project noise to 45 dBA outside of non-participating residences.

Finally, with respect to the limits on tonal noise in the ordinance, as discussed previously, the C-96 sound power level does exhibit some tonal components. The manufacture is planning actions to significantly reduce or eliminate theses tones for the commercial version of the wind turbine. Table 19 describes the tonal components and compares them to the ordinance.

Table 19. Clipper C-96 Tonal Components

Tonal Frequency	1/3 Octave Band Sound Power Level of Tone and Two Adjacent Bands, dB re 1 pW	Exceedance of Tone Above Average of Adjacent Bands, dB	Cohocton Ordinance Limit, dB (As Observed at a Property Line or Residence)
160	103.0	2.2	8
	105.0		
	102.6		
400	100.3	4.3	8
	103.6		
	98.3		
800	93.2	1.4	5
	96.3		
	95.6		

Table 19 shows that the tonal peaks are in compliance with the Ordinance and will improve further with the anticipated mitigation actions by the manufacturer.

3.7.2.6 Low Frequency Noise

Concerns about low frequency sound are commonly expressed for proposed wind turbine farms. Modern wind turbines of the type proposed by this project do not generate low frequency noise to any significant extent. Early wind turbines with the rotor blades down wind of the support tower were prone to periodic noise as the blade based the wake of the tower. This has been eliminated by the upwind design of current wind turbines.

Low frequency noise can produce perceptible vibrations or rattle windows if the magnitude is sufficient. Threshold levels of between 70 and 80 C-rated decibels (dBC) have been reported as necessary for the onset of vibration.[6] The maximum predicted C-Weighted sound level downwind at the receptor with the highest A-weighted sound level (see Plot 2) is 59 dBC, which is well below the threshold where vibration would start.

3.7.3 Potential Construction Impacts

Construction of wind power projects requires the operation of heavy equipment and construction vehicles for various activities including the following typical activities:

- Right of Way Clearing;
- Construction of Access Roads;
- Foundation Construction;
- Wind Turbine Structure Erection;
- Underground Electric Collector Cable Installation; and
- Site Cleanup and Restoration.

Construction noise is produced primarily by diesel engines that power construction equipment and by impact noise from rock drills, jackhammers, and compactors. Generally, engine noise will dominate the noise produced by diesel and gasoline engine-powered equipment, and functional mufflers will be maintained on all applicable machinery.

Appendix K presents some estimates of noise levels at other distances from typical construction equipment. As a general rule, not all equipment listed will be employed during each phase of construction, and the equipment is typically operated intermittently during a work shift.

[6] ANSI Standard B133.8 Gas Turbine Installation Sound Emissions (Ref 2) citing 75 to 80 dBC and Hessler reporting 70 dBC.

Table 20. Typical Construction Equipment Sound Level

Equipment Description	Typical Sound Level at 50 ft., dBA	Est. Maximum Total Level at 50 ft. per Phase, dBA*	Max. Sound Level at a Distance of 1,500 ft., dBA	Distance Until Sound Level Decreases to 42 dBA, ft.
Road Construction and Electrical Line Trenching				
Dozer, 250-700 hp	88	92	58	4,800
Front End Loader, 300-750 hp	88			
Grader, 13-16 ft. blade	85			
Excavator	86			
Foundation Work, Concrete Pouring				
Piling Auger	88	88	54	3,660
Concrete Pump, 150 cu yd/hr	84			
Material and Subassembly Delivery				
Off Hwy Hauler, 115 ton	90	90	56	4,200
Flatbed Truck	87			
Erection				
Mobile Crane, 75 ton	85	85	51	3,000

*Not all vehicles are likely to be in simultaneous operation. Maximum level represents the highest level realistically possible at any given time.

Noise from the construction-related phases including clearing, foundations, structure erection, and collector cable installation, are expected to be temporary, and therefore the effect on potential receptors is not anticipated to be significant. The temporary noise will constitute an unavoidable impact at some but not all of the homes in the Project Area. This impact would be similar to that experienced by road repair or paving that might typically occur on Town roads. The values in

Table 20 indicate that, depending on the particular activity, sounds from construction equipment are likely to be insignificant at distances of more than 3,400-5,500 feet. There are only four or five houses within 3,400 feet of any turbine location. During construction in any one location, most houses will be further than 5,500 feet, and therefore should be largely or completely unaffected by construction sound. However, sound levels ranging from 56 to 61 dBA might temporarily occur over several days at one of the nearest residences on Dutch Hill Road. Such levels would generally be unacceptable if they were occurring on a permanent basis or outside of normal daytime working hours. However, as a temporary, daytime occurrence, construction sound of this magnitude may well go unnoticed by many in the Project Area.

Sound from the very small amount of daily vehicular traffic to and from the construction site should be negligible in magnitude relative to normal traffic levels, and temporary in duration at any given location.

3.7.4 Proposed Mitigation

3.7.4.1 Turbine Operation

It is a well established fact for a new broadband, atonal noise source, such as a wind turbine, that a cumulative increase in the total sound level of about 5 dBA or 6 dBA at a given point of interest is required before the new sound begins clearly to be perceptible or noticeable to most people. Cumulative increases of between 3 dBA and 5 dBA are generally regarded as negligible or hardly audible and an increase less than this are not audible.

Noise measurements at the site demonstrated that the Project Area is uniform in magnitude and sound levels over the entire site area are dominated by wind induced noises and uniformly dependent on the speed of the wind. At an 8 m/s wind speed, measured at the standard reference height of 10m above ground level, the clipper C-96 wind turbine produces the maximum amount of noise. At this wind speed the mean background residual (L_{90}) sound level was found to be 39 dBA under leaf off conditions in April, meaning that such a sound level is consistently present and available to mask potential turbine sound. Experience with surveys during other times of the year indicates that a significantly higher background level could be expected under windy conditions in the spring and summer due to leaf rustle. Although specific analysis of potential noise impacts during low wind conditions could not be conducted for the C-96 prototype wind turbine, experience has shown and it is expected that for this Project when the background level is diminished turbine noise levels will drop in parallel with the level of masking noise so that any incremental increase or impact would not be any different for a low wind situation than it is during an 8 m/s wind when the turbines generate maximum sound levels.

In general, two residences are on or just inside the 44 dBA contour where the audibility of the wind turbines is expected to be minimal and intermittent, but because of modeling conservatism and seasonal considerations the probability is low of a significant adverse impact due to noise alone. Continuous audibility seems unlikely given the conservative assumptions inherent in the model. The modeling study also demonstrates that the local (Towns of Cohocton) law limits[7] will not be exceeded.

Mitigation of the turbine noise has been accomplished through the design of the turbine and through the incorporation of setback distances from receptors during the siting of the turbine. Although residential sound impacts that remain are anticipated to be minor, additional mitigation measures will include the implementation of a complaint resolution procedure to assure that any complaints regarding construction or operational sound are adequately investigated and resolved.

3.7.4.2 Construction

Construction-related noise will be a temporary short-term impact, and therefore the effect on potential receptors and community is not anticipated to be significant. In many locations construction noise will not be louder than typical normal noise associated with farm equipment or vehicular traffic. Mitigation measurers will include BMPs for noise abatement such as insuring all engines have mufflers in good condition, minimizing idling of equipment, and limiting hours of construction. Landowners also will be notified of certain construction noise in advance, such as blasting activity should it be necessary. A procedure for addressing any complaints received from residents regarding construction noise is outlined in the Complaint Resolution Plan (Appendix K).

3.8 Transportation

The Project Site is served by an existing network of interstate, state, county, and local highways. Roads range from four lane divided highways (Interstate Route 390) to seasonally maintained, dirt/gravel roads. The primary transportation corridor through the Project Area is Interstate 390. Other major routes through the area include NYS Routes 21, 371, and 415.

Route 390 runs in a generally southeast to northwest orientation through the Project Area from Bath to Wayland, and then northerly towards Geneseo and Rochester. It is classified as a Rural Principal Arterial Interstate and has an annual average daily traffic volume of 10,960 vehicles per day (vpd) between Exits 1 & 2 and 9,910 vpd between Exits 2 & 3 (NYSDOT, 2004).

NYS Route 21 connects the Village of Wayland with the Hamlet of North Cohocton. It is classified as a Rural Minor Arterial and carries approximately 3,370 vpd (NYSDOT, 2004).

NYS Route 415 runs parallel to Interstate Route 390, and provides access to 390 at Exit 1 southeast of Avoca, Exit 2 west of Cohocton, and Exit 3 south of Wayland. It is classified as a Rural Major Collector and carries between 1,300 vpd and 4,760 vpd depending on the location throughout the

[7] The Town of Cohocton windmill local law limits noise from any wind energy conversion system to a maximum of 50 dBA "at the boundaries of all abutting parcels that are owned by persons other than the owner of the parcel on which the turbine is located." The local law also requires preparation of a noise impact analysis demonstrating that windmill-only noise at existing residences on non-project parcels does not exceed 45 dBA.

Project Area (NYSDOT, 2004). NYS Route 371 connects North Cohocton to the Village of Cohocton, and is classified as a Rural Major Collector. It carries approximately 1,920 vpd (NYSDOT, 2004). Table 21 lists the roads within the Project Area, the towns in which they occur, and the ownership/jurisdiction of each road.

Table 21. Road System in Project Area

Roadway	Location	Ownership/ Jurisdiction
Interstate Route 390	Towns of Cohocton, Avoca & Wayland	State
State Route 415	Towns of Cohocton, Avoca & Wayland, Village of Cohocton	State
State Route 21	Town of Cohocton, and Wayland	State
State Route 371	Town & Village of Cohocton	State
Michigan Hollow Road	Town of Avoca	Town
Jones Road	Town of Cohocton	Town
Marks Road	Town of Cohocton	Town
County Route 121	Town & Village of Cohocton	County
Davis Hollow Road	Town of Cohocton	Town
Shults Hill Road	Town of Cohocton	Town
Dutch Hill Road	Town of Cohocton	Town
County Route 36	Town of Cohocton	County
Atlanta Back Road	Town of Cohocton	Town
McKay Street	Town of Cohocton	Town

3.8.1 Existing Conditions

A roadway inventory conducted by ESS Group, Inc. examined roadway width, roadway surface and condition, drainage structures, overhead electrical and telephone wires, and roadway geometry along all state, county, and local roads that could be used during Project construction. Refer to Appendix B of the Transportation Assessment Report (Appendix M) for the Roadway Inventory.

The most recent three-year accident summary for Interstate 390 and State Route 415 was obtained from the New York State Department of Transportation (NYSDOT) Safety Information Management System (SIMS) database. The SIMS accident data review confirmed that traffic safety along these trucking routes is very good during the hours of 7:00 AM and 5:00 PM. These will most likely be the hours of operations dictated in the NYSDOT Special Hauling Permit.

To determine if there are any existing traffic capacity or congestion problems, ESS Group reviewed the latest NYSDOT Highway Sufficiency Ratings data for I-390, SR 121, and SR 415. According to the data reviewed for these trucking routes, there is adequate lane width capacity to accommodate the proposed construction vehicle traffic generated by this Project. In addition to reviewing the NYSDOT highway capacity data, ESS Group conducted its own highway safety inspection (5/04/06 and 8/15/06) of all State, County, and Town roads in the Project Area and determined that in general, the Project Area experiences light traffic volumes and that there are no existing traffic capacity or congestion problems. It should be noted that during the May 5, 2006 highway safety inspection, sections of I-390 were being resurfaced and bridges were being repaired, but the completion date of this highway construction project is November 30, 2006, long before this route will be used for special hauling.

The majority of the roads within the Project Area are asphalt-surfaced, with widths in the range of 22-38 feet wide. Portions of the Project Area roadways are surfaced with gravel (Davis Hollow Road Ext., Marks Road, and Shultz Road) and are 16-18 feet in width. Most roadways are in fair to good condition and are capable of accommodating construction traffic.

ESS Group also conducted an on-site bridges and culvert inventory. This inventory identified 31 bridges (24 bridges on I-390) and 31 culverts (2 culverts on I-390) along roadways within the study area. Twelve (12) of the culverts had cover of 12" or less over the top of the structure and may require improvements prior to use by construction vehicles. All of the bridges along the proposed routes will require a complete safety review by the NYSDOT Bridges and Structures Division prior to granting any Special Hauling Permits for the Project.

3.8.2 Potential Impacts

Temporary traffic impacts are anticipated as a result of short-term construction activities related to transporting construction materials, equipment and wind turbine components to the Project Area. These temporary impacts can be generally described as stress to the roadway infrastructure resulting from the repeated use of public roads as construction haul roads.

3.8.2.1 Construction

Although roads within and adjacent to the Project Area are operating well under capacity, some temporary impacts to roadway network infrastructure in and around the Project Area will result from the movement of vehicles involved in Project construction. These vehicles and their role in the Project are described below. The exact construction vehicles have not yet been determined, however, estimates of the truck dimensions, gross vehicles weights, and approximate number of truck trips are provided below:

- Access Road Construction: Gravel trucks with capacity of approximately 10 cy per truck and an estimated gross weight of 75,000 lbs. Estimated gravel truck trips (one way) per mile of access road built: 540.

- Wind Turbine Foundations (Concrete): Concrete trucks for construction of tower foundations with capacity of approximately 10 cy per truck and an estimated gross weight of 96,000 lbs. Estimated concrete truck trips (one way) per turbine: 35-45.

- Wind Turbine Foundations (Steel Reinforcement): Flatbed trucks for construction of tower foundations with capacity of approximately 25,000 lbs of steel. Estimated steel transport truck trips per turbine: 4-5.

- 400-Ton Crane: Mobilization of one 400-ton erection crane requires approximately seven low bed trailers prior to on-site crane assembly.

- Wind Turbine Components: Low bed trailers (up to approximately 14 axles) for transporting turbine components (tower sections, blades, nacelles, hubs); these trucks may have gross weights up to 276,000 lbs, with lengths (from front of cabin to end of trailer) up to 170 feet, widths to 14 feet, and heights to 15 feet 6 inches. Estimated transport truck trips (one way) per turbine: 9.

- Construction Support Vehicles: Pickup trucks for equipment and tools; trucks and cars for transporting construction workers (one way): 10-15 total.

3.8.2.1.1 Overhead Wires

ESS Group also surveyed overhead electrical and telephone wire heights as part of its roadway inventory. Truck Route D1 (Appendix M, Map 3) was free of any low hanging overhead wires. An overhead electrical or telephone wire was classified as "low" if it was less than 16' above the crown of the road beneath. Along Truck Route D2 (Appendix M, Map 3) there were three low overhead wires found. Two of the wires measured 14'-2" above the road (SR 415, Avoca, mile 2.3), and the third overhead wire measured 15'-4" above the road (SR 415, Avoca, mile 2.6). Prior to using this route for wind turbine deliveries, the utility company responsible for maintaining electric and telephone service in the area will have to raise the wires to 16' in height or greater.

The Project delivery and construction routes have not yet been finalized, however, it is likely that turbine components will arrive at the Project Site from Interstate 390 ***northbound*** via Exit 2 ***or*** Interstate 390 ***southbound*** via Exit 1 due to bridge height restrictions at Exits 2 and 3. If the deliveries use the I-390 ***northbound*** truck route (Appendix M, Map 1, Truck Route D1), then they will be exiting at Exit 2 (Cohocton), then proceeding east on CR 121 (Loon Lake Road) to the traffic light at SR 415; then turn left on SR 415 North; then right on Davis Hollow Road to either Davis Hollow Rd. (Extension) or Dutch Hill Road.

If the deliveries use the I-390 ***southbound*** truck route (Appendix M, Map 1, Truck Route D2, then they will be exiting at Exit 1 (Avoca) to avoid bridge height restrictions at Exits 2 (14'-3") and 3 (14'-4"). From Exit 1 (southbound off-ramp), it is necessary to turn right onto Michigan Hollow Road; then right on SR 415 North through the hamlet of Wallace; then left onto Jones Road. Jones Road turns into Marks Road then back to Jones Road again. At the end of Jones Road, turn right on CR 121 (Loon Lake Road). Here the truck route joins up with Truck Route D1 described above.

Once beyond Exits 1 or 2, the local roadway network would also require improvements in the form of turning radius improvements (150-foot radius to accommodate delivery vehicle length), bridge, pipe, or culvert upgrades (to accommodate the weight of the delivery vehicles and other construction traffic), and/or general roadway widening (to a minimum of 16-feet to accommodate delivery and construction vehicles and/or to maintain two-way traffic). The extent and location of these improvements will vary depending on the route selected to access the Project Site. Refer to Appendix A of the Transportation Assessment Report (Appendix M) for intersection improvements and details for specific intersections along Truck Routes D1 and D2.

Prior to construction, a transportation routing plan and final roadway improvement plan will be developed and provided to state, county, and local Highway Department officials. These plans will identify proposed travel routes, existing highway limitations, planned work schedules, required road and intersection widening, utility re-locations, and bridge reinforcement. Based on the results of the ESS Transportation Assessment Report, no roadways should present grade constraints for construction traffic. Oversize construction vehicles could also cause minor delays on Project Area roadways, but these are unlikely to be significant given the relatively low traffic volume through the area.

As mentioned above, the bridge and culvert inventory conducted by ESS Group documented the location of 31 bridges and 31 culverts along roads within the Project Area that could accommodate construction traffic. This inventory indicates that at least 12 of these structures may require improvement to accommodate safe passage of construction vehicles. Typical improvements may include:

- Placement of additional cover over structures,
- Reinforcing structures with bracing,
- Use of bridge jumpers to clear structures,
- Replacement of structure prior to construction,
- Replacement of structure during or after construction if damaged by construction activities, and
- Re-route construction traffic to avoid structures.

The required improvements will be defined when the final transportation routing plan is developed. An engineering and improvement plan will be developed in coordination with state, county, and local highway departments, and undertaken by the Project developer/contractor (at no expense to these departments) prior to the arrival of oversize/overweight vehicles onsite. In addition, these road improvement activities may create additional Project-related impacts (i.e. wetlands, drainage, grading, etc.) that will be addressed in detail during the final Project design, and reviewed during all Project permitting subsequent to this DEIS (i.e., SPDES General Permit, USACE/NYSDEC wetland permits, highway work permits).

3.8.2.2 Operation

Routine Project operation and maintenance will not generate a significant volume of traffic, or involve the use of oversized/heavy weight vehicles on a regular basis. Thus, following the completion of construction and road restoration/repair, on-going traffic and transportation impacts are not anticipated. Should repair work require the use of over-sized or heavy vehicles, some damage to the roads could occur on a very occasional basis.

3.8.3 Proposed Mitigation

Prior to construction, the applicant and/or contractor will obtain all necessary permits from the town and county highway departments and the NYSDOT, for activities including new access points, improving existing roadways, crossing highways with buried electrical interconnects, and operating oversized vehicles on the highways. The final transportation routing plan will be provided to the Town of Cohocton and Steuben County, and will specify the local, county, and state roads to be used as haul routes (both within and outside of the Project Site) by construction/transportation vehicles.

As part of the final routing plan, a road improvement plan will be prepared that defines various upgrades that may be required to accommodate construction vehicles, including shoring up bridge abutments, adding steel plates or gravel to road surfaces, widening roadways, reconfiguring intersection geometry to accommodate the turning radius of large construction vehicles, and identifying the bridges, pipes, and culverts that will not accommodate the construction related traffic. These improvements will be made at the applicants' expense prior to the arrival of oversized/overweight vehicles.

The road improvement plan will also be designed to avoid/minimize safety issues associated with the use of the approved haul routes, which will confine the heavy truck travel to a few select roads. Delivery/haul routes may change during the design and construction preparation process; however, the municipalities will be notified of the changes throughout the continued development of the Project. Additionally, design plans will be completed for all public road improvements, and will be made available to the affected local towns (and jurisdiction having responsibility for the affected roads) for review prior to the initiation construction activities.

Prior to construction, the Applicant will video document the existing roadways to verify pre-construction roadway conditions. Upon completion of the construction activities, the Applicant will, at a minimum, return all roadways to their pre-construction conditions (and video document) at no cost to the affected jurisdiction.

The following mitigation techniques will be utilized to avoid or minimize transportation-related impacts and/or to provide long-term improvement to the local road system:

<u>Insufficient roadway width</u>

- Widening roadway to accommodate construction vehicles.
- Rerouting construction traffic to wider roadways.
- Insufficient cover over drainage structures
- Adding cover over structures.
- Reinforcing structures with bracing.
- Using bridge jumpers to clear structures.
- Replacing structure prior to construction.
- Replacing structure during or after construction if damaged by construction activities.
- Rerouting construction traffic to avoid structures.

<u>Poor structure condition</u>

- Replacing structure prior to construction.
- Replacing structure during or after construction if damaged by construction activities.
- Using bridge jumpers to clear structures.
- Rerouting construction traffic to avoid structures.

<u>Inadequate bridge capacity</u>

- Using bridge jumpers to clear bridge.
- Replacing bridge components that provide insufficient capacity.
- Reinforcing bridge with additional longitudinal or lateral support beams.
- Rerouting construction traffic to avoid structures.

Insufficient Roadway Geometry

- Constructing appropriate turning radii at intersections where construction traffic is anticipated[8].
- Rerouting construction traffic to avoid insufficient roadway geometry.
- Profile adjustments to roadways with insufficient vertical geometry.
- Use of public roads by heavy equipment or oversized vehicles during Project operation and maintenance will be coordinated with state, county, and local Highway Department officials. Any damage to the roads will be repaired at the Project operator's expense.

3.9 Socioeconomics

To understand the effects this Project will have on socioeconomic conditions within the Town of Cohocton and the surrounding communities, it is important to understand the current state of the economy in the area. Thus, this section presents specific information regarding the labor force, including population and housing; the economy, in particular employment rates and opportunities; and municipal budgets and taxes, including the local school budgets and taxes. The potential impacts of the Dutch Hill Wind Power Project on these existing socioeconomic conditions, during both construction and operation, are then evaluated.

3.9.1 Existing Conditions

Existing population and housing, employment and income, and municipal budgets and taxes in the Town of Cohocton are described below.

3.9.1.1 Population and Housing Characteristics

According to U.S. Census Bureau data from 1980-2000, the Town of Cohocton has experienced a modest 6% increase in population over the last 20 years (U.S. Census Bureau, 2000). However, between 2000 and 2004, the estimated resident population decreased by approximately 1% (New York State Data Center, 2002). This trend is similar to Steuben County as a whole, which has experienced a slight population decline over the last 20 years. However, this county-wide trend is expected to slightly improve over the next five years (U.S. Census Bureau, 2000; STCRPDB, 2006).

In 2000, the number of total housing units in the Town of Cohocton was 1,144. Of those, approximately 85% (or 972) were occupied and 15% (or 172) were vacant (100 units were vacant due to seasonal, recreational or occasional use). Not only is housing available but home ownership in the Town of Cohocton is strong, as indicated by the percentage of owner-occupied housing units. Approximately 83.6% of the housing units were owner-occupied and 16.4% were renter-occupied (U.S. Census Bureau, 2000).

[8] Approximately 0.5 acres o land will be temporarily modified by adding gravel/fill to allow truck turning movements.

Likewise, home ownership in Steuben County is strong, at approximately 73%. The percentage of ownership reflects the affordability of housing in the area. As the population has slightly declined it can be rationally concluded that the availability of housing remains strong.

Currently, housing values in the Town of Cohocton are moderate to low, when compared to average values in Steuben County and New York State. The median housing value in the town is $50,600, whereas in the county the median value is $66,200. This compares to a statewide median value of $147,630. However, housing values in the Town of Cohocton have steadily increased over the past five years, and this trend is expected to continue (STCRPDB, 2006).

3.9.1.2 Economy and Employment

According to the 2000 Census, the largest industry in Steuben County is manufacturing, with 23.4% of all workers employed in this sector. The second largest industry is health care, and the third is retail. Some of the major employers in Steuben County include Corning Incorporated, Dresser-Rand, and the Gunlocke Company. However, the average annual number of non-agricultural workers employed in Steuben County has been decreasing since 2001 (STCRPDB, 2006) and some of the major employers in the county have incurred layoffs. As an example, in 2005 Alstom Inc., a major employer in the Town of Hornell, laid off approximately 160 employees. In addition to a reduction in the number of existing jobs, only a few new employment opportunities have materialized in recent years (STCRPDB, 2006; New York State Department of Labor, 2004). The 2004 unemployment rate for Steuben County was 5.3%.

With respect to the agricultural industry in the county, in 2003 there were a total of 1,490 farms (totaling 372,800 acres) and the agricultural industry represented approximately 3.5% of total employment in the county. This represents a 55% decrease in number of farms since 1959, when the county had over 2,700 working farms, accounting for a significant percentage of the total employment. The decline in number of farms continues. In 2004 there were 1,450 farms in the county. The Town of Cohocton had 284 parcels in agricultural use, with an approximate total assessed value of $29,108,613 (USDA, 2004; NYSORPS, 2004).

3.9.1.3 Municipal Budgets and Taxes

Municipalities (towns, villages, and counties) and school districts are responsible for providing specific services and facilities to those who live and work within their boundaries. Municipalities and school districts incur costs when providing these facilities and services, and to pay these costs, collect revenues by levying taxes. Tax revenues in the Project Area accrue from both sales taxes and real property taxes. The taxing jurisdictions in the Project Area include Steuben County, the Town of Cohocton, and three school districts (Avoca

Central School District, Wayland-Cohocton Central School District, and Naples Central School District).Table 22 summarizes the total 2004 property tax levy for these jurisdictions.

Table 22. 2004 Real Property Tax Levy per Taxing Jurisdiction

Taxing Jurisdiction	2004 Real Property Tax Levy
Town of Cohocton	$668,000
Steuben County	$30,627,506
Naples Central School District	$7,340,913
Avoca Central School District	$1,945,033
Wayland-Cohocton CSD	$4,435,923

(Source: NYSORPS, 2004; NYS Office of the State Comptroller, 2004)

The property tax rates for the Town of Cohocton are based on $1,000 of assessed valuation. For the fiscal year 2004, real property taxes for the Town of Cohocton were $668,000. In the Town of Cohocton, the highest percentage of land use (55% of total parcels) is classified as residential. Agriculture and vacant land are both approximately 16-17% of total land use. The percentage of vacant land has steadily increased over the last few years and has surpassed agriculture as the second highest percentage of land use. This distribution of broad land use categories is similar to that seen throughout Steuben County (NYSORPS, 2004). Type of land use contributes to the assessed value of property, and thus influences the total real property tax levy for the town and county. The total assessed value of the land use classifications for the Town of Cohocton is summarized in Table 23, below.

Table 23. Assessed Value of Property in the Town of Cohocton by Land Use Classification, 2004

Type of Land Use	Town of Cohocton	
	Assessed Value	Percent of Total Parcels[1]
Residential	$28,994,813	52.5%
Commercial	$3,162,800	2.5%
Industrial	$544,514	0.3%
Recreation and Entertainment	$179,000	0.2%
Community Service	$2,432,400	1.3%
Agricultural	$10,092,825	18.8%
Vacant Land	$1,664,631	20.8%
Public Serve Properties	$5,572,712	3.1%
Public Parks, Wild, Forested and Conservation Properties	$43,825	0.5%
Total	**$50,667,5720**	**100%**

Source: NYSORPS, 2004
[1] 2005 Steuben County Real Property Tax Service Agency

The current sales tax rate for the County is 8% (4% local tax plus 4% state tax), which represents a reduction from a rate of 8.25% in 2003 (NYS Department of Taxation and Finance, 2005). In 2004, total sales tax revenue for the County was $22,154,454, and for the Town of Cohocton was $211,615 (NYS Office of the State Comptroller, 2004).

Table 24 summarizes municipal budgets for 2004 at the town and county levels. Table 25 summarizes the 2004 budgets for the Naples, Avoca, and Wayland-Cohocton Central School Districts.

Table 24. 2004 Town and County Budgets

Taxing Jurisdiction	Total Revenue	Total Expenditures
Town of Cohocton	$1,369,442	$1,448,481
Steuben County	$139,592,269	$147,646,220

(Source: New York State Office of the State Comptroller, 2004)

Table 25. 2004 School District Budgets

District	Revenue (total)	Expenditure (total)	Indebtedness
Naples CSD	$12,781,625	$12,803,887	$5,075,045
Avoca CSD	$8,983,170	$8,877,887	$6,850,000
Wayland-Cohocton CSD	$24,581,508	$24,767,097	$22,345,600

(Source: New York State Office of the State Comptroller, 2004)

The town, county and school districts face the yearly challenge of meeting their service obligations, or expenditures, through the collection of sales and/or real property taxes. As with most taxing jurisdictions in upstate New York, loss of, or lack of, commercial and industrial tax base, in combination with rising labor and material costs, make it increasingly difficult to meet their budgets without significantly raising taxes.

3.9.2 Potential Impacts

The Project will have both direct and indirect positive economic effects on the town, county, and school districts, as well as the individual landowners participating in the Project. These effects will commence during construction and continue throughout the operating life of the Project. In the short term, benefits will include additional employment and expenditures associated with construction of the Project. In the long term, the operating Project will generate significant additional revenue through a PILOT agreement, purchases of goods and services, and lease payments to participating landowners. The Project will also provide full-time employment for a limited number of individuals and likely result in some increased visitation to the Project Area by tourists interested in wind power. All of these results could have a beneficial effect on local businesses. The overall socioeconomic impact of Project construction and operation is discussed in greater detail below.

3.9.2.1 Construction

3.9.2.1.1 Population and Housing

As mentioned above, the Town of Cohocton experienced a modest, 6% population growth rate from 1980 to 2000 with a slight decline from 2000 to 2004. This population trend will likely continue regardless of whether the proposed Project is built. The Project will not generate construction employment at a level that would significantly increase population in either the Town or county. Even though employment during the construction period will be significant (on the order of approximately 38 full-time jobs), this employment is relatively short term, and is not expected to result in workers permanently relocating to the area. For the duration of construction (approximately nine months) there could be a temporary increase in local population and demand for temporary housing by out-of-town workers. However, this demand will be relatively modest, and can easily be accommodated by the available housing in Cohocton and the surrounding communities. Beyond this relatively minor (and positive) short-term impact, Project construction will have no significant impact on population and housing.

3.9.2.1.2 Economy and Employment

Saratoga Associates was retained to conduct an economic analysis of the project. (See Economic Analysis in Appendix N) This analysis was conducted using the RIMS II model. It is anticipated that construction of the proposed Project will employ a total work force of approximately 38 construction workers over a 7.5 month period. It is anticipated that the majority of this employment will be drawn from the Southern Tier and Finger Lakes labor markets, which, in light of the size of the labor force and the number of unemployed, can easily supply the required work force. Local employment will primarily benefit those in the construction trades, including equipment operators, truck drivers, laborers, and electricians. Project construction will also require workers with specialized skills, such as crane operators, turbine assemblers, specialized excavators, and high voltage electrical workers. It is anticipated that the majority of these workers will be imported from outside the area and will remain only for the duration of construction.

Based on the results of the RIMS II analysis the proposed project represents approximately $85 million in investment. The construction phase will have an indirect and induced impact of approximately 333 jobs, bringing the total economic impact of construction to approximately 371 jobs. The $85 million in original construction investment will generate an indirect and induced output of approximately $119.72 million, bringing the total impact on output at approximately $204.72 million. Household earnings for 38 construction jobs over a 7.5 month period are estimated at $1.093 million. These earnings will have a spin-off effect of approximately $0.397 million in earnings, bringing the total impact range of the construction to $1.487 million in earnings. (See the Economic Analysis in Appendix N)

In addition to the jobs created during construction and the wages paid to the work force, this Project is expected to have an indirect impact on the local economy through the purchase of goods and services (including $2-3 million in locally-sourced construction material), which will support local businesses and perhaps result in the creation of some additional new jobs.

3.9.2.1.3 Municipal Budgets and Taxes

During construction, the Project will not impact municipal budgets and taxes. Temporary construction workers will not create significant demand for municipal or school district services or facilities. These workers will also not generate significant revenue through payment of property taxes. The Project will result in impacts to the local road system (see discussion of transportation impacts in Section 3.8.2). This has the potential to affect local highway department expenditures/budgets. However, as will be discussed in the mitigation section, the cost of construction-related road repairs/improvements will be borne by the Project developer.

3.9.2.2 Operation

3.9.2.2.1 Population and Housing

Approximately five full-time jobs will be created once the Project is fully operational. These employees are expected to reside locally, which could translate into purchase of a few homes and addition of a few families to Cohocton and the surrounding communities. Although this represents a positive economic impact, long-term employment associated with the Project is not large enough to have a significant impact on local population or housing characteristics.

Local residents often express concern over the potential for local property values to depreciate as a result of a proposed wind power project. This issue has come up during the siting and review of other wind power projects in New York and throughout the United States. In order to address this concern, the Renewable Energy Policy Project (REPP) conducted a quantitative study in 2003. REPP assembled a database of real estate transactions adjacent to every wind power project in the United States (10 MW or greater) that became operational between 1998 and 2001 (a total of 10 projects, including the Madison and Fenner projects in Madison County, New York). For this study, data was gathered within 5 miles of the wind projects, as this was determined to be the potential area of visual impact (viewshed). For each of the 10 projects, similar data was also gathered for a comparable community that was located outside of the project viewshed (comparable communities were based on interviews with local assessors as well as analysis of U.S. Census Bureau demographic data). The goal of the data collection was to obtain real estate transaction records for a time period covering roughly six years (three years pre-construction and three years post-construction). The data was then analyzed in three different ways: Case 1 examined the price changes in the viewshed and the comparable community for the entire period of the study; Case 2 examined how property values changed in the viewshed before and after the project became operational; and Case 3 examined how property values changed in the viewshed and the comparable community after the project became operational.

The results of these analyses showed no negative effect on property value from existing wind farms. Of the 10 projects examined in the Case 1 analysis, property value actually increased faster within the wind power project viewshed in eight of the 10 projects. The Case 2 analysis revealed that the property values also increased faster after the wind farms became operational in nine of the 10 projects examined. In the Case 3 analysis, property values increased faster in the wind power project viewshed than in the comparable community in nine of the 10 projects. More specifically (and perhaps most relevant to the proposed Dutch Hill Wind Power Project) is the fact that these positive results apply to the Madison Wind Power Project and the Fenner Wind Power Project in New York State. The results from the Madison and Fenner analysis revealed a generally positive affect on property value. In five of the six case studies (Case 1, 2, and 3 analyses for both projects), the monthly average sales price grew faster or declined slower in the viewshed communities than in the comparable communities outside the project viewshed. The REPP study therefore concluded that there is no evidence that the presence of the Madison and Fenner wind farms had a significant negative effect on residential property values in Madison County, New York (Sterzinger *et al*, 2003).

A recent study of real property transactions in the vicinity of the Fenner Wind Project in Madison County conducted by Den Hoen of Bard College (2006) as part of his master degree thesis evaluated whether views within 5 miles of the turbines had effected transaction values of homes that had sold. Data was collected from assessor records for a period before and after the project. Data was ground truthed by inspecting each property sold after January 1, 2001 to rate and grade the relative view of the turbines from the house. Hoen concluded that "…of 280 home sales within 5 miles of the Fenner windfarm…failed to uncover any statistically significant relationship between either proximity to or visibility of the windfarm and the sale price of homes."

To address local concerns about possible real estate value depression, the firm of Cushman & Wakefield was retained to conduct an assessment of local property value impacts. The technical memorandum addressing these potential impacts is presented in Appendix N. Cushman & Wakefield undertook a number of data collection tasks described below.

- Review of topographical overlays and maps were reviewed for the project area
- Field inspection of similar rural areas in neighboring Wyoming County
- Visits to inspect properties on and around Dutch Hill and the Fenner (Madison County, NY), Maple Ridge (Lewis County, NY), Wethersfield (Wyoming County, NY) and Searsburg (Bennington County, VT) wind power projects
- Review of demographic and sales files for the above referenced areas

- Experience from wind projects in Kittas County, Oregon and
- Current literature review of relevant information

As a result of the above site visits and information, Cushman & Wakefield reported the following general findings:

- The most sensitive properties in the project area are residential,
- The Dutch Hill Wind Project may yield net economic benefits that could result in a demand for housing and an increase in property value over time, and
- Dairy farms and vacant agricultural land are unlikely to be affected since the value of these properties lie in the relative productivity of the soil and the age and functional utility of the farm and related dairy structures.

Cushman & Wakefield concluded that the project should have negligible impact on property values and that property values are more likely affected by local economy as opposed to viewshed changes. They found that the project should have no impact upon future sales or value of developed properties under prevailing conditions.

Given the results of the REPP and Hoen studies and the similarity of the Madison County sites to Dutch Hill, it is reasonable to conclude that the proposed Project will not have an adverse impact on local property value. This is supported by the findings of Cushman & Wakefield assessment.

3.9.2.2.2 Economy and Employment

Total direct earnings consisting of direct wages and leases paid to landlords are estimated at $487,000 annually. The Dutch Hill Wind Farms wages for five workers is estimated at $265,000. Land leases are projected to be approximately $213,000, comprising 2.5% of annual gross receipt (output) per year.

The five jobs generated by operating the wind farm will result in a spin-off of approximately 16 jobs, bringing the total impact of operations to 21 jobs. These full-time jobs in turn create more jobs in other sectors of the economy through expenditures derived from household wages. Total earnings from wages and leases to landlords are projected to have an indirect and induced impact of approximately $100,000 per year, bringing the total economic impact on earnings at approximately $577,000 per year. Revenues are projected to generate approximately an additional $10.463 million in output, bringing the total economic impact on output to approximately $18.963 million per year. (See the Economic Analysis in Appendix N)

Additionally, expected lease payments in the range of $213,000 per year, will be provided to local landowners participating in the Project. These lease payments are a direct financial benefit to all participating landowners and will enhance the ability of those in the agricultural industry to continue farming. Lease payments from the wind power project can have the effect of preserving a rural life style and protecting family farms from being taken over by large-scale commercial farming operations (Cary, 2005). Local lease payments will also enhance the ability of participating landowners to purchase additional goods and services. To the extent that these purchases are made locally, they will have a broader positive effect on the local economy.

With respect to tourism in the region, it is worth noting that other wind power projects in New York have resulted in a significant increase in visitation from tourists interested in the projects. This has certainly resulted in increased local expenditures for goods and services, but these have not been quantified, and are probably fairly modest. It should also be acknowledged that this effect is likely to diminish as wind power projects become more common in the state and their novelty decreases.

Despite concerns expressed by some area residents, there is no evidence to indicate that the presence of wind turbines will have a negative impact on tourism. A 2002 study conducted in the Argyll Region of Scotland, involving interviews with over 300 tourists, found that 91% said the presence of wind farms in the area would not influence their decision about whether to return to the area (MORI Scotland, 2002). Almost half (48%) of the tourists interviewed were visiting the area because of the 'beautiful scenery and views'. Of those who had actually seen wind farms, 55% indicated that their effect was "generally or completely positive", 32% were ambivalent, and 8% felt that the wind farms had a negative effect. Similar positive effects have been reported from various wind farm locations in Australia. According to the Australian Wind Energy Association (AusWEA), initial concerns that wind turbines would negatively impact tourism in that country, have proven unfounded (AusWEA, 2003). Similarly, a recent survey of visitors, to Vermont's Northeast Kingdom found that 95% would not be deterred from further visits by the existence of a proposed wind farm (Institute for Integrated Rural Tourism, 2003). This is also evident in the resort community of Palm Springs, California, where there are over 3,500 wind turbines. Tours of this wind farm regularly draw 10,000 to 12,000 curious tourists every year (AWEA, 2005).

3.9.2.2.3 Municipal Budgets and Taxes

As a new land use, the Project will positively impact the municipal budgets of all of the involved jurisdictions. Studies of the impact of wind power projects on property values have indicated that these projects typically do not have an adverse effect on assessed property value (REPP, 2003). Therefore, the Project should not negatively affect the total amount of real property taxes levied by the local taxing jurisdictions or the budgets of these jurisdictions. According to the Town of Fenner (NY) Supervisor, Russell Cary, the wind farm in his town has required the town to purchase additional road maintenance equipment to service roads that have been improved or are more heavily traveled as a result of the project (Cary, 2005). However, the improved roads are a benefit to the community, and represent the only significant municipal service required by the project. The Dutch Hill Wind Power Project will place similar, limited demand on municipal (and school district) services.

The Project will more than off-set any impact on municipal budgets and taxes through additional revenue provided in the form of a PILOT agreement. The details of the PILOT agreement are described in Section 3.9.3.2.3 below.

3.9.3 Mitigation

3.9.3.1 Construction

As described in the Impacts discussion, construction of the proposed Project will not have a significant impact on local population and housing, and will have a short-term beneficial impact on the local economy and employment. Consequently, no mitigation is necessary to address these impacts. The only potential adverse impact to municipal budgets and taxes is the impact of Project construction on local roads, and the need to repair or upgrade these roads to accommodate construction vehicles/activity. To mitigate this impact, construction-related damage or improvements to state, county, or Town roads will be the responsibility of the Project developer, and will be undertaken at no expense to the town or county (see additional detail in the discussion of transportation mitigation in Section 3.8.3).

3.9.3.2 Operation

3.9.3.2.1 Population and Housing

As discussed in Section 3.9.2.1, the operating Project is not anticipated to adversely affect population or housing availability in the Town of Cohocton or the surrounding area. Nor is it expected to have a depressing effect on local property values. Consequently, mitigation measures to address population and housing impacts are not necessary.

Property owners within the viewshed of proposed wind power projects are often concerned about the possibility that these projects could at some point be abandoned, and that the derelict facilities will have a depressing effect on local property values. To address this concern, the Project developer will establish a decommissioning fund. This fund will assure that the proposed wind power facility will be dismantled and removed in the event that it is not completed, proves economically unviable, or reaches the end of its operational life span. Prior to the start of construction the Project developer will submit evidence of the mechanisms that are in place to ensure the removal of each wind turbine in the event it is not in active service for one year or more.

3.9.3.2.2 Economy and Employment

As described previously, the operating Project's potential impact on the local economy and employment will be positive, in that additional jobs will be created and additional local expenditures made (lease payments to participating landowners, as well as local purchase of goods and services). However, the number of permanent jobs created is not large enough to create a financial burden on the town, county or school districts by requiring provision of additional services and/or facilities. Thus, mitigation measures to address either loss of jobs or increased demand for municipal services are not necessary.

3.9.3.2.3 Municipal Budgets and Taxes

Because operation of the proposed Project will not create a significant demand for municipal or school district services and facilities, it will have no adverse impact on municipal or school budgets. Dutch Hill Power Project plans to enter into a PILOT agreement with the Steuben County Industrial Development Agency as well as other host payments. Dutch Hill Power Project anticipates that the PILOT agreement will have a term of 20 years. Although the specific terms of the PILOT agreement have not been negotiated, the PILOT and other host payments would average approximately $500,000 per year. Further, over an assumed 20-year duration of the PILOT agreement, the local jurisdictions would receive total payments in the range of $10 million. Dutch Hill Power Project anticipates that the annual PILOT payments would be distributed between the Town of Cohocton, the County of Steuben, and the local school districts. The percentage sharing of the payments has not yet, however, been negotiated. After the PILOT expires, the facility will be taxed at its assessed value.

The PILOT and other host payments will increase the revenues of the local taxing jurisdictions, and will represent a significant portion of their total tax levy. Further, the PILOT payments will more than off-set any minor increases in community service costs that may be associated with long-term operation and maintenance of the Project (e.g., small number of additional school children, slightly increased road maintenance costs).

Because the wind farm facility will generate a predictable source of additional revenue for all of the affected municipalities and school districts over the next 20+ years, the Project will positively impact municipal and school district revenues. This will enhance the type and level of services these jurisdictions provide to local residents for the duration of the Project's operational life.

3.10 Public Safety

This section addresses the potential impacts of the Project on public safety.

3.10.1 Background Information

Public safety concerns associated with the construction of a wind power project are fairly standard construction-related concerns. These include the potential for injuries to workers and the general public from 1) the movement of construction vehicles, equipment and materials, 2) falling overhead objects, 3) falls into open excavations, and 4) electrocution. These types of incidents are well understood, and do not require extensive background information.

Public safety concerns associated with the operation of a wind power project are somewhat more unique, and are the focus of this section.

In many ways, wind energy facilities are safer than other forms of energy production since combustible fuel source and fuel storage are not required. In addition, use and/or generation of toxic or hazardous materials are minor when compared to other types of generating facilities.

However, wind turbines are generally more accessible to the public, and risks to public health and safety can be associated with these facilities. Examples of such safety concerns include ice shedding, tower collapse, blade throw, stray voltage, fire in the nacelle, and lighting strikes. Each of these concerns is discussed individually below.

3.10.1.1 Ice Shedding

Ice shedding and ice throw refer to the phenomena that can occur when ice accumulates on rotor blades and subsequently breaks free and falls to the ground. Although a potential safety concern, there has been no reported injury caused by ice being "thrown" from an operating wind turbine (NYSERDA, 2003). However, ice shedding does occur, and could represent a potential safety concern.

Icing in the Dutch Hill area would generally result from freezing rain events forming a "glaze" ice (as opposed to "rime" icing that occurs at high elevations). Under such conditions, either the anemometer on the top of the nacelle would freeze, which would in turn signal for the wind turbine to shut down, or the ice buildup would register as an imbalance in the weights of the blades, which would also cause the turbine would shut down.

Field observations and studies of ice shedding indicate that most ice shedding occurs as air temperatures rise and the ice on the rotor blades begins to thaw. Therefore, the tendency is for ice fragments to drop off the rotors and land near the base of the turbine (Morgan *et al*, 1998). Ice can potentially be "thrown" when ice begins to melt and stationary turbine blades begin to rotate again (although usually turbines do not restart until the ice has largely melted and fallen straight down near the base). Several observational studies and mathematical models examining this phenomenon have calculated how far ice can potentially be thrown from a moving rotor blade before hitting the ground (Morgan and Bossanyi, 1996). The distance traveled by a piece of ice depends on a number of factors, including the position of the blade when the ice breaks off, the location of the ice on the blade when it breaks off, the rotational speed of the blade, the shape of the ice that is shed (e.g., spherical, flat, smooth), and the prevailing wind speed. Data gathered at existing wind farms have documented ice fragments on the ground from 50 to 328 feet from the base of the tower (<33 to 197 feet blade diameter). These fragments were in the range of 0.2 to 2.2 pounds in mass (Morgan *et al*, 1998). The risk of ice landing at a specific location is found to drop dramatically as the distance from the turbine increases. European studies have identified a safety threshold of 200-250 meters (660-820 feet) from any turbine, beyond which there is no significant risk from falling ice fragments (Morgan and Bossanyi, 1996).

AWS Truewind to conduct a study for UPC of the potential for icing and ice sheding at the proposed Sheffield Vermont Wind Energy Project. (See Appendix O) The study describes the principal mechanisms of ice removal from wind turbines following an icing event: melting, shedding and sublimation. The ice removal mechanism for any given icing event will vary with weather conditions and turbine operation. Experience indicates that for the large majority of icing event, ice will be removed by melting and gravitational shedding due to partial melting. Ice will fall ff the tower and blades directly to the ground below. Only in rare cases is there the potential for ice to be thrown a significant distance because 1) Ice is rarely heavy enough to be thrown, 2) Icing will decrease the aerodynamic properties of the blades causing them to become inefficient airfoils and reducing the ability to operate and may cause the turbine to shut down, 3) ice is deposited in thin layers and is usually brittle and easily shattered.

Should an ice throw occur, the risk of a person being struck and injured by ice thrown from an operating turbine depends on a number of factors:

- The point where the ice lands (function of wind speed, direction, rotor speed, blade position etc.);
- Mass, shape, and speed of the ice fragment;
- Structural integrity of the fragment; and
- Probability of the person being at the point of landfall.

AWS refers to a study of ice shedding and human strike probability prepared by Garrad Hassan and Partners, Ltd. in conjunction with the Finnish Meteorological Institute and Deutches Windenergie as part of a research effort of wind energy in cold climates (WECO) (Morgan *et al*, 1998). This study is included in Appendix O. The Garrad study confirms the mechanisms described for ice shedding and ice throw. Field observations indicated ice shedding consists of dropping of rather than being thrown. For moderate icing locations Garrad concluded the maximum distance (worst case) for ice to be thrown was 350 meters (1,150 feet). They concluded that if a person was always present in the proximity of a wind turbine during icing conditions and the wind turbine had no controls to prevent ice throw, the risk of a person being struck is estimated at greater than one in one million. This is less than the risk of being struck by lightning.

There are a number of control technologies that can be used in modern wind turbines that reduce the risk of ice throw. AWS concluded based on the Garrad study and its own knowledge, that when such technologies are used, the probability of ice fragments falling a significant distance from a turbine becomes essentially insignificant

3.10.1.2 Tower Collapse/Blade Throw

Another potential public safety concern is the possibility of a wind turbine tower collapsing or a rotor blade dropping or being thrown from the nacelle. These are extremely rare occurrences, but such incidents do occur (a tower collapse at the Weatherford Wind Power Project in Oklahoma occurred in May, 2005), and are potentially dangerous for project personnel, as well as the general public. The reasons for a turbine collapse or blade throw vary depending on conditions and tower type. Past occurrences of these incidents have generally been the result of design defects during manufacturing, poor maintenance, wind gusts that exceed the maximum design load of the turbine structure, or lightning strikes

(AWEA, 2006). Most instances of blade throw and turbine collapse were reported during the early years of the wind industry. Technological improvements and mandatory safety standards during turbine design, manufacturing, and installation have largely eliminated such occurrences.

3.10.1.3 Stray Voltage

Stray voltage is a phenomenon that has been studied and debated since at least the 1960's. It is an effect that is primarily a concern of farmers whose livestock can receive electrical shocks. Stray voltage can be defined as a "low level of neutral-to-earth electrical current that occurs between two points on a grounded electrical system" (Wisconsin Rural Energy Management Council, 2000). In a farm setting, stray voltage typically originates from low levels of Alternating Current (AC) voltage on the grounded conductors of a farm wiring system. These voltages are termed "stray voltage" when they are large enough to form a circuit when a person or an animal simultaneously touches two objects which are part of an electrical system.

The occurrence of stray voltage may result from a damaged or poorly connected wiring system, corrosion on either end of the wires, or weak/damaged insulation materials on the "hot" wire. Livestock may encounter stray voltage in their everyday activities when they contact two surfaces with voltage differences, resulting in a small electrical current flowing through the animal and creating a shock. In a barn, stray voltage may occur at watering systems, dairy stanchions, animal pens, or even the metal siding on the building. Dairy barns are particularly prone to the occurrences of stray voltage since they contain all the necessary components, including: concrete or dirt floors that are likely to be wet, metal confinement structures and water systems, metal rebar in the concrete floor, and metal walls with moisture condensed on the surfaces.

Wind power projects and other electrical facilities can create stray voltage to varying degrees, based on factors such as operating voltage, geometry, shielding, rock/soil electrical resistively, and proximity. Stray voltage from such facilities usually only occurs if the system is poorly grounded and located in proximity ungrounded or poorly grounded metal objects (fences, buildings, etc.).

3.10.1.4 Fire

Wind turbines, due to their height, physical dimensions, and complexity, have the potential to present response difficulties to local fire departments. Although the turbines contain relatively few flammable components, the presence of electrical generating equipment and electrical cables, along with various oils (lubricating, cooling and hydraulic) does create the potential for fire within the tower or the nacelle. This, in combination with the elevated location of the nacelle and the enclosed space of the tower interior makes response to a fire difficult.

Other Project components create the potential for a fire or medical emergency due to the storage and use of diesel fuels, lubricating oils, and hydraulic fluids. Storage and use of these substances may occur at the substation, in electrical transmission structures, staging area(s), and the O&M building/facility. Due to the accessibility of these areas, response to an emergency should not pose difficulty to local fire and emergency personnel. However, the presence of potentially hazardous materials, as well as high voltage electrical equipment at the substation could present potential safety risks to local responders.

3.10.1.5 Lightning Strikes

Due to their height and metal/carbon components, wind turbines are susceptible to lightning strikes. Statistics on lightning strikes to wind turbines are not readily available, but it is reported that lightning causes four to eight faults per 100 turbine-years in northern Europe, and up to 14 faults in southern Germany (Korsgaard and Mortensen, 2006). Most lightning strikes hit the rotor, and their effect is highly variable, ranging from minor surface damage to complete blade failure. All modern wind turbines include lighting protection systems which generally prevent catastrophic blade failure.

3.10.1.6 Electric and Magnetic Fields

Electric power transmission lines create electric and magnetic fields (EMFs) because they carry electric currents at high voltages. Electric charges push and pull on other charges and, therefore, each electric charge generates an *electric field* that exerts a force on nearby charges. The movement of electric charges is called electric current and is measured in *amperes* (amps). Current measures the "flow" of electricity, which is analogous to the flow of water in a plumbing system. The moving charges in an electric current produce a *magnetic field* which exerts force on the other moving charges. Magnetic fields are measured in *gauss* (G) or *tesla* (T) (1 T = 10,000 G). Smaller fields are measured in *milligauss* (1 mG = 0.001 G) or *microtesla* (1µT = one-millionth of a tesla). Milligauss is the unit most often used to measure the strength of magnetic fields in electric transmission lines.

EMF decrease in size as the distance form the source (the electric charges or currents) increases. For an electric transmission line, EMF levels are highest next to the transmission lines and directly under an overhead line, and decrease as the distance from the transmission corridor increases. Electric fields are attenuated by objects such as trees and walls of structures, and are completely shielded by materials such as metal, the earth, or the surface of the body. Therefore, underground electric transmission lines do not produce electric fields at the ground surface. Magnetic fields, however, are not shielded by most materials.

Humans are exposed to a wide variety of natural and man-made EMF both in the outdoor environment and in homes, schools, and businesses. The EMF produced by electric transmission lines are well within the range of EMF exposures from such other sources. Numerous public health review groups, including the National Institute of Environmental Health Sciences, the National Institutes of Health, and the U.S. Department of Energy, have examined the public's exposure to EMFs produced by power lines. The consistent overall conclusion of these groups is that available data do not support a cause and effect relationship between exposure to environmental levels of EMF and elevated risk of disease.

3.10.2 Potential Impacts

3.10.2.1 Construction

As mentioned in the background information section, public safety concerns associated with Project construction include 1) the movement of large construction vehicles, equipment and materials, 2) falling overhead objects, 3) falls into open excavations, and 4) electrocution. These issues are most relevant to construction personnel who will be working in close proximity to construction equipment and materials, and will be exposed to construction related hazards on a daily basis. The risk of construction-related injury for such personnel will be minimized through regular safety training and use of appropriate safety equipment.

The general public could also be exposed to construction-related hazards due to the passage of large construction equipment on area roads and unauthorized access to the work site (on foot, by motor vehicle, all-terrain vehicle, or snowmobile). The latter could result in collision with stockpiled materials (soil, rebar, turbine/tower components), as well as falls into open excavations. Because construction activities will occur primarily on private land, and be well removed from adjacent roads and residences, exposure of the general public to construction-related risks/hazard is expected to be very limited.

3.10.2.2 Operation

3.10.2.2.1 Ice Shedding

As stated previously, while turbine icing may occur at times, ice accumulation on the rotor blades will either cause an imbalance or freeze the control anemometer, both of which would result in turbine shut-down. As the ice begins to thaw, it will typically drop straight to the ground. As the blades begin to rotate, any ice that remains attached to the blades could be thrown some distance from the tower. Such a throw will usually result in the ice breaking into small pieces and falling within 300 feet of the tower base. European studies have identified a safety threshold of 200-250 meters (660-820 feet), beyond which there is no significant risk from falling ice fragments (i.e., the risk is equivalent to being hit by lighting) (Morgan and Bossayani, 1996) and studies by Garrad Hassan previously cited have reported a worst case distance of 350 meter (1,150 feet). The minimum setback distance of 520 feet from roads and property lines included in the Town of Cohocton ordinance, and a minimum distance of 1,500 feet between the proposed turbines and adjacent residences, should adequately protect nearby residents and motorists from falling ice of any significant size. In addition, unauthorized public access to the site will be limited by installing gates at the entrance of access roads, and/or posting signs to alert the public and maintenance workers of potential ice shedding risks. Based upon the results of studies/field observations at other wind power projects, the Dutch Hill Project's siting criteria, modern turbine control systems and the proposed control of public access to the turbine sites, it is not anticipated that the Project will result in any measurable risks to the health or safety of the general public due to ice shedding.

3.10.2.2.2 Tower Collapse/Blade Throw

Modern utility-scale turbines are certified according to international engineering standards. These include ratings for withstanding different levels of hurricane-strength winds and other criteria (AWEA, 2006). The engineering standards of the wind turbines proposed for this Project are of the highest level and meet all federal, state, and local codes. In the design phase, state and local laws require that licensed professional engineers review and approve the structural elements of the turbines. Design and construction of the Project will comply with construction standards established by various industry practice groups. State of the art braking systems, pitch controls, sensors, and speed controls on wind turbines have greatly reduced the risk of tower collapse and blade throw. As mentioned in Section 2.6, the wind turbines proposed for the Dutch Hill Project will be equipped with two fully independent braking systems that allow the rotor to be brought to a halt under all foreseeable conditions. In addition, the turbines will automatically shut down at wind speeds over 55 mph. They will also cease operation if significant vibrations or rotor blade stress is sensed by the turbines' blade monitoring system. For all of these reasons, the risk of catastrophic tower collapse or blade failure is minimal.

3.10.2.2.3 Stray Voltage

Stray voltage is preventable with proper electrical installation and grounding practices. The Project's electrical collection cable will be covered with a grounding sheath, and physically and electrically isolated from all of the buildings in and adjacent to the Project Site. Additionally, the wind farm's electrical collection lines will be located 36 to 48 inches below ground, which will prevent incidental contact and protect the system's insulation materials from sustaining any damage. The only potential for stray voltage would be if metal objects (underground pipelines, metal fences, etc.) run continuously for long distances in close proximity and parallel to the power lines. Proper siting, grounding, installation, and maintenance practices will assure that the Dutch Hill Wind Power Project does not cause or contribute to stray voltage in the area.

3.10.2.2.4 Fire

All turbines and electrical equipment will be inspected by the utilities (for grid and system safety) prior to being brought on-line. This, along with implementation of built-in safety systems, minimizes the chance of fire occurring in the turbines or electrical stations. However, fire at these facilities could result from a lighting strike, short circuit or mechanical failure/malfunction. Any of these occurrences at a turbine would be sensed by the SCADA system and reported to the Project control center. Under these conditions, the turbines would automatically shut down and/or Project maintenance personnel would respond as appropriate.

In the event that a wind turbine catches fire, typically, it is allowed to burn itself out while maintenance and fire personnel maintain a safety area around the turbine and protect against the potential for spot ground fires that might start due to sparks or falling material. Power to the section of the Project with the turbine fire is also disconnected. An effective method for extinguishing a turbine fire from the ground does not exist, and the events generally do not last long enough to warrant attempts to extinguish the fire from the air (NYSERDA, 2003). However, since the public typically does not have access to the private land on which the turbines are located, risk to public safety during a fire event would be minimal.

The Dutch Hill project will tie into a collector substation to be located on Lent Hill. Transformers at this substation will have a secondary oil containment system beneath the transformers will be filled with stone, so that if there was an oil spill, the fluid level in the containment basin would not be above the rock surface, preventing an oil pool fire. In addition, the circuit breakers would trip in the event of a transformer failure, thus isolating the substation from the transmission system, and allowing the local fire department to extinguish any fire.

Generally, any emergency/fire situations at a wind turbine site or substation that are beyond the capabilities of the local service providers will be the responsibility of the Project owner/operator. Construction and maintenance personnel will be trained and have the equipment to deal with emergency situations that may occur at a wind turbine site (e.g., tower rescue, confined spaces, high voltage, etc.). Consequently, such an incident would generally not expose local emergency service providers or the general public to any public health or safety risk.

3.10.2.2.5 Lightning Strikes

Lightning protection systems were first added to rotor blades in the mid 1990s, and are now a standard component of modern turbines (Korsgaard and Mortensen, 2006). These systems rely on lightning receptors and diverter strips in the blades that provide a path for the lightning strike to follow to the grounded tower. Clipper C-96 turbine blade tips are equipped with lightning receptors that carry current from lightning to the ground. The turbines' blade monitoring system provides documentation of all critical lightning events. If a problem is detected, the turbine will shut down automatically, or at a minimum, be inspected to assure that damage has not occurred.

3.10.2.2.6 Electric and Magnetic Fields

EMFs will be generated by the operation of various Project components, including the turbine generator, electrical collection lines, transformers, and the low voltage (34.5kV) transmission line. However, the strength of EMF's produced by all of these components will not be significant at any receptor location. The height of the turbine generator (over 250 feet) above the ground; the location of electrical collection cables 3-4 feet underground; the 35-foot width of the transmission line ROW; and the location of turbine step-up transformers, should adequately separate these components from any human receptors.

3.10.3 Proposed Mitigation

3.10.3.1 Construction

Contractors will comply with Occupational Safety and Health Administration (OSHA) regulations, in addition to state worker safety regulations, regarding electricity, structural climbing, and other hazards, during construction of the wind farm. To minimize safety risks to construction personnel, workers will be required to adhere to a safety compliance program protocol, which will be prepared by CPP II (or their representative) prior to construction. The safety compliance program will address appropriate health and safety related issues including:

- personal protective equipment such as hardhats, safety glasses, orange vest, and steel-toed boots);
- job safety meetings and attendance requirements;
- fall prevention;
- construction equipment operation;
- maintenance and protection of traffic;
- hand and power tool use;
- open hole and excavation area safety;
- parking;
- general first aid;
- petroleum and hazardous material storage, use, containment and spill prevention;
- posting of health and safety requirements;
- visitors to the job site;
- local emergency resources and contact information; and
- incident reporting requirements.

As mentioned in Section 3.8, a transportation routing plan will be developed to assure that construction vehicles avoid areas where public safety could be a concern (schools, clusters of homes, etc.). To minimize safety risks to the general public, over-sized vehicles will be accompanied by an escort vehicle and/or flagman to assure safe passage of vehicles on public roads. Because construction activity will occur on private land, the general public should not be on the construction site. After hours, vehicular access to such sites may be blocked by parked equipment, and temporary construction fencing or other visible barrier will be placed around excavations that remain open during off hours. In addition, material safety data sheets (MSDS) for potentially hazardous construction materials will be provided to local fire and emergency service personnel. The contractor will also coordinate with these entities to assure that they are aware of where various construction activities are occurring, and avoid potential conflicts between construction activity and the provision of emergency services (e.g., road blockages, etc.).

Should an injury occur on site, the following actions will be taken:

- The site Construction Manager(s), the O&M Manager, or designee, will be notified of the injury(ies).
- A qualified first aid attendant will administer first aid until medical assistance arrives.
- The site Construction Manager(s), the O&M Manager, or designee, will notify the emergency response system (911).
- All key supervisors will be paged or called and advised of the injury.
- For off-site assistance, the Construction Manager(s), the O&M Manager, or designee, will meet the emergency responders at a prearranged gate and direct them to the location of the emergency.
- Should an employee become injured and require emergency off-site medical transportation, they will be accompanied by a Project representative to give pertinent information needed.

Inspections

Safety, environmental protection, and QA/QC inspections of the major facilities and equipment will also assure that the Project is constructed in a manner that minimizes risks to the public and project personnel. These inspections will typically include, but not be limited to, the following operations, checks, and reviews:

Safety inspections will include:

- Review of safety procedures;
- Observation of, and attendance at, safety training for supervisors and field staff (tail-gate meetings);
- Review of construction safety techniques and implementation; and

- Verification of safety incident reports and statistical data.

Equipment inspections will be conducted for all components including:

- Wind Turbine Generators and Towers,
- Concrete/Structural,
- Electrical Collection System and,
- Turbine Transformers.

3.10.3.2 Operation

3.10.3.2.1 Ice Shedding

As stated previously, compliance with required set-backs, turbine controls and measures to control public access (gates, warning signs, etc.) should minimize any public safety risk associated with ice shedding. CPP II will also meet with local landowners and snowmobile clubs to explain the risks of ice shedding and proper safety precautions. Additionally, icing of the sensors on the wind turbines will result in automatic turbine shut-down.

3.10.3.2.2 Tower Collapse/Blade Throw

In regard to tower or blade failure, a fall zone set-back from roads and property lines equivalent to the maximum turbine height (i.e., base of tower to tip blade), plus a safety factor is generally considered adequate for public safety purposes. In those rare instances where towers or blades have failed, the failure typically results in components crumpling or falling straight down to the ground. It would be very unusual for the tower to break off at the base and fall over. Fall zone set-backs from roads, utility lines, and property lines have been established to provide for a safety zone in the rare case of a failure. The minimum 500 foot setbacks included in the Town of Cohocton's ordinance, should assure that even a "worst case" tower failure would not endanger adjacent properties, roadways or utilities. Members of the public do not typically have access to the private lands on which the turbines are located, and as stated above, gates, signage, and public education/outreach efforts will be used to discourage unauthorized access. These actions should further reduce any risk due to a turbine collapse or blade throw.

3.10.3.2.3 Stray Voltage

Stray voltage will be prevented through proper design and grounding of the Project's electrical system. Any reported stray voltage problems will be addressed through the Project's Complaint Resolution Procedure.

3.10.3.2.4 Fire

An employee safety manual will be incorporated into the overall operating and maintenance policies and procedures for the Project. Included in the manual will be specific requirements for a fire prevention program. In addition, a Fire Protection and Emergency Response Plan will be developed in consultation with the fire department(s) that have jurisdiction over the proposed wind power Project Site. This plan will include the following components:

- Training of all operating personnel and procedures review in conjunction with local fire and safety officials;
- Regular inspection of transformer oil condition at each wind turbine step-up transformer;
- Regular inspection of all substation components;
- Regular inspection of fire extinguishers at all facility locations where they are installed;
- All Project vehicles will be equipped with fire fighting equipment (fire extinguishers and shovels) as well as communications equipment for contacting the appropriate emergency response teams;
- The MSDS for all hazardous materials on the Project site will be on file in the construction trailers (during construction) and the O&M building (during operation), and provided to local fire departments and emergency service providers; and

The facility Safety Coordinator shall notify the local fire department of any situation or incident where there is any question about fire safety, and will invite an officer of the fire department to visit the workplace and answer any questions to help implement a safe operating plan

Development and implementation of this plan will assure that Project construction and operation will not have a significant adverse impact on public safety, or the personnel and equipment of local emergency service providers.

3.10.3.2.5 Lightning Strikes

The wind turbines' lightning protection system, and the fire/emergency response plan described previously provide adequate protection for lightning strikes and therefore no additional measures to mitigate the effects of lightning strikes are proposed.

3.10.3.2.6 Electric and Magnetic Fields

Because no significant impacts from EMFs are expected, no mitigation is required. Electric field strength interim standards were established in the PSC's Opinion No. 78-13, and the magnetic field strength interim standards established in the PSC's Interim Policy Statement on Magnetic Fields, issued September 11, 1990. These standards do not apply to the Dutch

Hill project. However, to mitigate the potential effects of EMF from the Project to the maximum extent practicable, CPP II will voluntarily adhere to the Opinion No. 78-13 establishing an electric field strength interim standard of 1.6 kV/m for Article VII electric transmission lines, at the edge of the right-of-way, one meter above ground level, with the line at the rated voltage. The Interim Policy establishes a magnetic field strength interim standard of 200 mG, measured at one meter above grade, at the edge of the right-of-way, at the point of lowest conductor sag. The measurement is based on the expected circuit phase currents being equal to the winter-normal conductor rating.

3.11 Community Facilities and Services

Community facilities and services provided to the Project Area include public utilities, police and fire protection services, emergency medical services (EMS), health care facilities, education facilities, waste disposal, and recreational facilities. The level of services provided to the Project Area was determined through telephone communications with State, County, Town, and School District personnel, including the State Police Department, County Sheriff's Department, County Emergency Services Coordinator, local volunteer fire department, and administrative personnel at the Avoca, Naples, and Wayland-Cohocton Central School Districts.

3.11.1 Existing Conditions

Public Utilities and Infrastructure

Public utilities and infrastructure in the Project Area include various overhead and underground facilities. Above-ground components include electric distribution and telephone lines along most of the public roads within the Project Site. Cable television lines and communications towers, including radio broadcast antennas and cellular phone communications towers, also occur in and around the Project Site. Underground utilities include telephone and cable television lines, and natural gas transmission lines.

Police Protection

The New York State Police, Steuben County Sheriff's Department and Town of Cohocton Police Department have jurisdiction within and around the Project Site. The Town of Cohocton is the primary provider of police services, while the Steuben County Sheriff's Department and New York State Police provide secondary police service to the area. The Town of Cohocton Police Department, located in the Town Hall on South Main Street in the Village of Cohocton, has two police officers and one patrol car. Each officer works part-time approximately 20 hours per week, for a total of 40 hours of police service. The hours of service provided vary from week to week. The Steuben County 911 Emergency Center dispatches all police and fire calls. If neither of the Town police officers are on duty when a call is received, then either the County Sheriff's office or the State Police are dispatched (Adams, 2006).

The Steuben County Sheriff's Department is located on Rumsey Street Extension in Bath, New York. The department provides 24-hour coverage seven days per week with approximately 19 road patrol deputies. The number of patrol cars deployed per shift varies between two to seven for the entire county (Tweddell, 2006).

New York State Police, Troop E, serves the Project Area and operates out of the main station located in Bath, New York as well as their satellite station located in Wayland, New York. The Bath station has 18 troopers, five investigators, two sergeants, and approximately eight patrol cars. There are 14 troopers, two investigators, and two sergeants assigned to the Wayland station, with five patrol cars. The State Police provide police services 24 hours per day, seven days per week. Typically, the State Police provide one patrol car, each with one officer during the day, and two officers during the night shift (from 12:00 a.m. to 5:00 a.m.) (Cleveland, 2006).

Fire Protection and Emergency Response

The Cohocton Volunteer Fire Department provides fire protection and emergency response service to the Project Area. The Cohocton Volunteer Fire Department has a firehouse on Maple Avenue in the Village of Cohocton. It provides fire and emergency services to the village and all of the Town of Cohocton, except for the north central portion. Its 30 active volunteers (including six Emergency Medical Technicians) respond to approximately 86 calls annually. The Fire Department's equipment includes one pumper with pumping capacity of 1,250 gallons per minute and a 1,000 gallon water tank, one pumper with pumping capacity of 1,000 gallons per minute and a 1,000 gallon water tank, one tanker with a 1,800 gallon water tank, one rescue truck, and an ambulance equipped to provide basic life support emergency services (Gilman, 2006).

The North Cohocton Volunteer Fire Department is a neighboring department that services the north central portion of the Town of Cohocton. These two fire departments provide mutual aide when dispatched from the Steuben County 911 Emergency Center.

Health Care Facilities

There are three hospitals in Steuben County and one hospital in Livingston County that provide health care services to residents of Steuben County. Guthrie Corning Hospital on Denison Parkway East in Corning is located approximately 30 miles from the Project Site. The hospital is an affiliate of the Guthrie Health Care System, which is a regional system of hospitals, nursing homes, and home-care-service providers, serving the Southern Tier of New York and northern Pennsylvania. Guthrie Corning provides primary care, general acute care, and specialty services in the Corning-Elmira metropolitan area. There are approximately 123 physicians on staff who provide a full complement of medical and surgical services. The hospital provides 99 beds for the following patient needs; intensive care (8 beds), maternity (8 beds), medical-surgical (78 beds), and pediatric patients (5 beds) (NYS Department of Health, 2006).

The Ira Davenport Memorial Hospital is a 66-bed acute care hospital located on New York State Route 54 in Bath, approximately 10.8 miles from the Project Site. There are approximately 69 physicians on staff who provide medical services including surgical care, cardiac rehabilitation, physical therapy, primary care, respiratory therapy, and pediatric care in addition to other medical services. Additional urgent, primary and dental health care services are provided by the Davenport and Taylor Health Center located on West Morris Street in downtown Bath (NYS Department of Health, 2006).

Saint James Mercy Hospital is located on Canisteo Street in Hornell and is approximately 10.5 miles from the Project Site. This hospital is an affiliate of the Catholic Health East health care system. St. James Mercy Hospital provides primary care, general acute care, and specialty services to residents in the northwestern portion of the county. There are approximately 48 physicians on staff, and 157 beds for coronary care (7 beds), intensive care (7 beds), maternity (10 beds), medical-surgical (85 beds), pediatric (10 beds) and psychiatric/mental patients (38 beds) (NYS Department of Health, 2006).

Nicholas H. Hoynes Memorial Hospital is a comprehensive acute medical care facility located on Clara Barton Street in Dansville, Livingston County, approximately 13 miles from the Project Site. The hospital is a 72-bed facility with approximately 38 physicians on the active medical staff. Nicholas H. Hoynes Memorial Hospital provides comprehensive acute medical care, offering a full compliment of surgical services, a birthing center, inpatient medical care, telemetry monitoring, intensive care, emergency services, laboratory services, diagnostic imaging, and physical and occupational therapy (NYS Department of Health, 2006).

Educational Facilities

There are three public school districts that provide educational services to residents within and adjacent to the Project Site. However, no public schools or school district facilities are located within the Project Site. The Wayland-Cohocton Central School District includes two schools. The Cohocton Central School, which houses students in pre-kindergarten through twelfth grade (1,642 student population), is located on New York State Route 63 in Wayland, which is approximately 4.0 miles from the Project Site. The other school, Cohocton Elementary School (225 student population), is located on Park Avenue in the Village of Cohocton, which is approximately 1.0 mile from the Project Site.

The Avoca Central School District has one school building for the entire student population from grades pre-kindergarten through twelfth grade (612 student population). The school is located on Oliver Street in Avoca, approximately 8.0 miles from the Project Site.

The Naples Central School District has two schools. Naples High School (480 student population) is located on North Main Street in the Village of Naples and is approximately 7.0 miles from the Project Site. The Naples Elementary School (517 student population) is located on Academy Street in the Village of Naples, approximately 7.0 miles from the Project Site. A private school, St. Joseph School-Wayland, which includes grades pre-kindergarten through sixth grade (87 student population), is located on Fremont Street in the Village of Wayland and is approximately 4.0 miles from the Project Site.

Solid Waste Disposal

Solid waste produced by residents of the Town of Cohocton is brought by the individual residents or contractors to a transfer station in the Town of Wayland, located approximately eight miles northwest of the Project Site. Steuben County then transports the waste from the transfer station to the Bath Sanitary Landfill, located on Turnpike Road in Bath, New York approximately 20 miles southeast of the Project Site (Orcutt, 2006). This landfill accepts multiple types of solid wastes, including those from residential, commercial, industrial, and construction practices (NYSDEC, Undated A).

Parks and Recreation

The study area includes several areas that offer opportunities for local recreation, including fishing, boating, swimming, and/or field sports. These include the following:

- Pine Hill ATV Park – Pine Hill Road, Cohocton,
- Reservoir Creek Golf Course – Cohocton Street, Naples,
- Cohocton River – Adjacent to State Route 21, 371, and 415, Wayland and Cohocton,
- Atlanta/North Cohocton Community Park – County Route 39, Cohocton,
- Loon Lake – Cohocton Loon-Lake Road (County Route 121), Wayland, and
- Smith Pond – Smith Pond Road, Avoca.

The most significant regional recreational resource is Canandaigua Lake, which occurs approximately 7.2 miles north of the nearest proposed turbine. The lake is a popular destination for fishermen and boaters and includes seasonal/vacation homes along its shorelines. Several vineyards/wineries that are popular tourist destination also occur along Canandaigua Lake. The High Tor WMA, located approximately 3.5 miles to the north of the Project, provides a variety of outdoor recreational opportunities, including hunting, trapping, fishing, hiking, bird watching, cross-country skiing, and snowmobiling.

3.11.2 Potential Impacts

3.11.2.1 Construction

During construction, the Project will result in no significant increase in the demand for utilities such as telephone, natural gas, electric, water, sanitary sewer, etc. The Project may require the relocation of some overhead utility lines to allow the passage or accommodate the turning movements of large trucks. Buried utilities could also be subject to disturbance/damage due to construction activity. NYSEG owns the majority of the local overhead distribution poles and lines that could be affected.

The police, fire, and emergency response departments have adequate personnel and equipment to respond to basic emergency needs during construction of the Project. However, during construction, access to some area roadways may be temporarily blocked due to the presence of large construction and delivery vehicles. In addition, damage to the roadways caused by oversized/heavy equipment has the potential to reduce the response time of emergency personnel. This is not anticipated to be a significant problem due to the small number of residents within the Project Site, the general availability of alternate access routes, and correspondence and coordination that will occur between construction managers and local police and fire departments. The construction site could also experience vandalism/trespass problems that would require involvement of local police. However, based on experience with other wind power projects in New York, this is not anticipated to be a significant impact.

Project construction will generate some solid waste, primarily plastic, wood, cardboard and metal packing/packaging materials, construction scrap, and general refuse. This material will be collected from turbine sites and other Project work areas, and disposed of in dumpsters located at the construction staging area(s). A private contractor will empty the dumpsters on an as-needed basis, and dispose of the refuse at a licensed solid waste disposal facility.

During construction, the Project will not adversely impact the local school districts, beyond the possible delay of school bus pick-ups and drop-offs at homes within the Project Area due to construction traffic/activity. Temporary construction workers will not create significant demand for school district services or facilities. These workers will also not generate a significant demand on local recreational facilities or other community services/facilities.

3.11.2.2 Operation

Once in operation, the Project will not result in any significant impacts to local utilities. Facility operation and maintenance will require energy use, but this impact will be minor because the amount of required electricity and fuel is small, and local fuel suppliers and utilities have sufficient capacity available to serve the Project’s needs. As a result, no improvements to the existing energy supply system will be necessary. In addition, the Dutch Hill Project will generate up to 40 MW of electric power and will advance the State's goal of having 25% of the state’s power provided by renewable sources by 2013.

No significant problems that would require response by local police, fire, and emergency service personnel are anticipated to result from Project operation. The wind turbines are located at least 520 feet from property lines and public roads, and 1,500 feet from residences. This is well outside of any area that could be affected in the unlikely event of a tower fall or catastrophic blade failure. Although, operation of the proposed Project could result in accidents that result in personal injury and/or property damage, their occurrence is relatively unlikely, and well within the response capabilities of local emergency service providers. Local providers have experience in responding to fire and accidents in rural locations, including off-road areas used by hikers, all-terrain vehicles, and snowmobilers. This topic is discussed in detail in Section 3.10.

As described in Section 3.10, local fire departments do not have the specialized equipment necessary to respond to a fire in one of the turbines. Generally, any emergency/fire situations at a wind turbine site or substation will be the responsibility of the Project owner/operator. Operations and maintenance personnel will be trained and equipped to deal with emergency situations that may occur at the Project Site (e.g., tower rescue, working in confined spaces, high voltage, etc.), and will coordinate such efforts with the local departments.

During Project operation, very little solid waste will be generated. Any that is, will be placed in containers or dumpsters at the O&M facility and hauled away on a regular basis (e.g., weekly) by a private contractor. The waste will be disposed of at a licensed solid waste disposal facility.

The Project is not anticipated to result in a significant increase in the demand for educational services/facilities. While the operating Project will require up to two or three full-time employees, existing educational facilities/staff within the school districts are adequate to accommodate the potential addition of two or three families.

3.11.3 Mitigation

The impacts to community services resulting from the proposed Project are not of the type or magnitude to require mitigation. In fact, development of the proposed Project will have minimal impact on population, and place little demand on community services. At the same time, the Project will provide significant income and tax revenue to the Town, county, and school districts. This income will more than offset any incurred costs, and will assist with the financing of community services that benefit all residents of the towns and county.

To mitigate any potential concerns regarding Project construction, CPP II will meet with the local emergency service personnel (fire, police, and EMS) to review the planned construction process. During this meeting, unique construction equipment/material, construction traffic routing, and construction scheduling/phasing will be discussed. Prior to construction, CPP II will implement a coordinated emergency response plan, which will be developed in consultation with local emergency service personnel.

Ongoing communication between CPP II and Town police, fire, and emergency services officials will help assure adequate levels of public safety throughout Project operation. As discussed in Section 3.10, CPP II representatives will meet with fire, police and other emergency responders to develop safety plans that address emergency response procedures/responsibilities during Project operation.

Because the solid waste impacts of the Project will be so small, and because the Project will utilize existing permitted disposal facilities, the Project will not create any conflict with the county's solid waste management plan.

3.12 Communication Facilities

To evaluate the potential for the Project to impact existing telecommunication signals, Comsearch was contracted to conduct a Microwave Systems Studies, an AM and FM Broadcast Stations Analysis, a review of the communication systems on the tower on Dutch Hill and an Off-Air Television Reception Analysis (Appendix P).

3.12.1 Existing Conditions

3.12.1.1 Microwave Analysis

Microwave telecommunication systems are wireless point-to-point links that communicate between two sites (antennas) and require clear line-of-sight conditions between each antenna. Comsearch identified two microwave paths that intersect the Project Site (Figure 1) in the Licensed Microwave Search and Worst Caste Fresnel Zone Study in Appendix P).

3.12.1.2 AM and FM Broadcast Stations Analysis

The analysis of AM and FM broadcast stations identified all AM and FM stations within 10-miles of the proposed Project. Comsearch identified two AM and seven FM stations licensed within 10 miles of the proposed wind energy facility (Appendix P). Both of the AM stations appear to be the same station (Call Sign WDNY); however, they transmit different power levels, 0.88 and 1.00 Tx-ERP-kWatts. The distance to the nearest proposed wind turbine from the AM stations was 9.1 miles. Six of the seven FM stations in the area are low-power stations, which are designed for coverage over less than one mile. The distance to the nearest proposed wind turbine from the FM stations was 0.1 mile. Five of the FM stations are located 6.9 miles from the proposed Project Site; and the seventh FM Station is located 8.8 miles from the proposed Project Site.

3.12.1.3 Off-Air Television Analysis

The television reception analysis identified all of the off-air television stations within a 100-mile radius of the proposed Project. Off-air television stations transmit broadcast signals from terrestrially located facilities that can be received directly by a television receiver or house-mounted antenna. The results of the study indicate that there are 246 off-air television stations within 100 miles of the Project Site (Appendix P).

3.12.1.4 Cellular, PCS, and LMR Systems

No formal study of cellular, personal communication system (PCS), or land mobile radio (LMR) coverage/use in the area was conducted. However, the area does have some cell phone coverage, and LMR is used by state, county, and local agencies and departments (police, fire, etc.) for vehicle-to-vehicle communications. Communication towers on Dutch Hill were reviewed and it is anticipated that no problems to the operation of the cellular systems are expected because these systems are designed to operate effectively in the presence of large structures and their cell layouts are adaptable to modification to improve coverage, if necessary.

3.12.2 Potential Impacts

3.12.2.1 Construction

Temporary communication interference as a result of Project construction may occur. Cranes used during construction activities (and the individual turbine components being raised by the cranes) can cause temporary obstruction of microwave links as well as some degradation to television and radio signals (Polisky, 2006). However, because individual turbines have been sited to avoid interference with microwave paths that cross the Project, the potential for microwave interference by equipment assembling and erecting these turbines should be minimal. Any impact on television or radio reception caused by construction equipment would be temporary, as turbine assembly and erection at each turbine site is typically completed within 1-3 days.

3.12.2.2 Operation

3.12.2.2.1 Microwave Communication Systems

To assure an uninterrupted line of communications, a microwave link should be clear, not only along the axis between the center point of each antenna, but also within a mathematical distance around the center axis known as the Fresnel Zone. A Worse Case Fresnel Zone (WCFZ) was calculated for the microwave path identified within the Project Site. The WCFZ calculation only includes a horizontal analysis for the microwave path (i.e., its width). An analysis of the vertical limits of the Fresnel Zone, to determine if it is actually above or below the proposed height of the proposed turbines, was also conducted. Based upon the horizontal analysis, one of the turbines (identified as Turbine 14 in Appendix P) is proposed for location in close proximity to two microwave paths that cross the Project Site (Appendix P, Figure 3). The initial analysis indicated the Fresnel zone from these two microwave paths may be interfered by Turbine 14. Therefore a detailed analysis was performed which indicated that Turbine 14 would not interfere with the microwave paths (Appendix P). In addtion, the telecommunications tower on Dutch Hill was examined to determine the type of equipment present and if any interference wi this equipment would occur due to operation of the wind turbines. The location of this communication tower was field verified and Comsearch concluded that there would be no interference with telecommunications associated with this tower (Appendix P).

3.12.2.3 AM and FM Broadcast Stations Analysis

Comsearch examined the coverage of the identified two AM and seven FM broadcast stations within a 10-mile radius of the Project Site and the potential for degraded reception or interference as a result of the Project. Comsearch indicated that an AM station with a non-directive antenna has to be located at a distance equal or greater than 0.62 miles and with a directive antenna located at a distance equal or greater than 1.86 miles to insure that the radio coverage will not be altered by the presence of tower structures, such as wind turbines. Since the separation distance to the AM antenna is 9.1 miles, no degraded reception or interference to the AM radio coverage in the area is expected (Appendix P).

For two reasons, FM broadcast signals are minimally affected by wind turbines. Signal modulation is frequency modulated (FM) and the wind turbines have the affect of varying the amplitude of the signal which will produce distortion to an amplitude modulated signal, but not to a FM signal. Additionally, when factored with other causes of degraded reception, such as being out of range and broadcast signal fading, the listener would most likely not detect changes to audio coverage or distorted signals. Therefore, the FM broadcast is expected to remain minimally affected, and it is anticipated that the listening audience will detect negligible changes in the FM broadcast signal (Appendix P).

3.12.2.3.1 Television Systems

Comsearch examined the coverage of the identified off-air television stations within a 100-mile radius of the Project Site and the potential for degraded television reception as a result of the Project. The Comsearch report indicated that off-air stations located within 40 miles of the Project Site are most likely to provide serviceable coverage for local residents. Of the 260 stations (American and Canadian-owned) initially identified, 39 stations are located within the 40-mile range, and only 19 of the 39 stations were licensed and operational at the time of the Comsearch analysis (April 2006). Twenty of 39 stations listed are either in their license application or construction phase, but are not yet operational. Of the 19 licensed and operational stations, only two are full power and full service stations, Channel 48 [WYDC] out of Corning and Channel 51 [WPXJ] out of Batavia. Sixteen of the 19 licensed and operational stations are low-power stations or translators with limited coverage. According to the Comsearch study the proposed Project will not affect stations with these characteristics. The last of the 19 stations, Channel 50 [WYDC] out of Corning, is the Digital Signal Broadcast of WYDC, and is operating under a special transmit authority granted by the FCC.

Because off-air coverage to this area only includes two full service stations, 16 low power or limited coverage stations, and one digital signal broadcast, it does not appear that the off-air television stations are the primary mode of delivering television service to the local communities. Cable TV service and/or direct satellite broadcast are probably the dominant delivery mode of TV service to Project Site's surrounding communities. Therefore, the Project is not likely to result in significant impacts to television reception in the area.

3.12.2.3.2 Cellular, PCS and LMR Systems

Telephone mobile communications in the cellular and PCS frequency bands will not be significantly affected by the presence of the wind turbines. This is because the blockage caused by wind turbines is not destructive to the propagation of signals in these frequency bands. In addition, these systems are designed so that if the signal from (or to) a mobile unit cannot reach one cell, it will be able to reach one or more other cells in the network. Therefore, local obstacles are not normally a problem for these systems, whether they are installed in urban areas near large structures and buildings, or in a rural area near a wind energy facility. Similarly, the frequencies of LMR repeaters are generally unaffected by the presence of wind turbines. Very little, if any, change in the coverage of the repeaters will occur when the wind turbines are installed (Polisky, 2006). The communication tower on the site was also reviewed to determine the type of the telecom equipment present and any potential interference that may occur. The evaluation indicated that there would not be any interference from the wind turbines based on the presence of the microwave, three cellular structures, or the low-powered FM radio station (Appendix P).

3.12.3 Proposed Mitigation

3.12.3.1 Construction

If disruptions to existing communication systems occur as a result of Project construction, they will be temporary, and will only occur during the erection of specific turbines. Because turbine installation/crane activity will occur at different locations and at different times during the construction period, any degradation or disruption to existing communications will not represent a constant interference to a give television/radio reception area or microwave signal (Polisky, 2006). In addition, turbine erection will be performed as efficiently as possible (under favorable conditions, one turbine can be erected in one day). Therefore mitigation is not warranted.

3.12.3.2 Operation

3.12.3.2.1 Microwave Communication Systems

The proposed turbines are not located in the path of the three microwave paths that crosses the Project Site. Therefore, the proposed Project will not result in any interference to existing microwave telecommunication systems. One turbine, Turbine 14, is located in close proximity to two identified microwave paths but detailed analysis indicated it would not cause any interference.

3.12.3.3 AM and FM Broadcast Stations Analysis

The Comsearch report does not recommend any mitigation for impacts to AM and FM broadcast signals as it appears AM and FM broadcast signals will not be distorted or degraded.

3.12.3.3.1 Television Systems

If Project operation results in any impacts to existing off-air television coverage, the developer/operator will address and resolve each individual problem as necessary. Mitigation actions could include adjusting existing receiving antennas, upgrading an antenna, or providing cable or satellite systems to the affected households. In addition, the FCC's mandate to transition all off-air television broadcasts from analog signals to digital signals by February 2009 will eliminate any turbine-related contrast variation (shimmering), thus reducing the potential for television signal interference from wind turbines (Polisky, 2006).

3.12.3.3.2 Cellular, PCS and LMR Systems

The results of the telecommunications analysis did not indicate any interference with these systems. If a cellular or PCS company were to claim that their coverage had been comprised by the presence of the proposed Project, coverage could be restored by installing an additional cell or an additional sector antenna on an existing cell fro the affected area. Utility, meteorology, and/or the turbine towers within the Project Site could serve as the structure platforms for the additional cellular or PCS bas station or sector antennas. Similarly, if there is a reported change in LMR coverage in the area, it can be easily corrected by repositioning or adding repeaters that operate with the LMR mobile systems. This could be accomplished by adding or positioning the repeaters at locations within the Project Area. Repeater antennas could also be installed on utility, meteorological or turbine towers within the Project Site, if needed.

3.13 Land Use and Zoning

Land use and zoning in the Project Area was determined through review of local town codes, tax parcel maps, aerial photographs, and field review. Land use and zoning are discussed in terms of regional land use patterns, Project Site land use and zoning, agricultural districts, and future land use.

3.13.1 Existing Conditions

3.13.1.1 Regional Land Use Patterns

The Town of Cohocton is located in northern Steuben County. Steuben County is in the southern portion of the Finger Lakes region of New York State, and borders Yates County to the north and the state of Pennsylvania to the south. The southern part of Keuka Lake dips into northeastern Steuben County, and Canandaigua Lake is located approximately 6 miles north of the county line. The county is characterized by dissected plateaus/ridges, with active and reverting agricultural land and small woodlots occurring on the ridge tops, and forestland on the ridge slopes and in the narrow valleys. Broad valleys are associated with the Cohocton, Canisteo, and Tioga Rivers. These valleys are dominated by agricultural land and wetlands, but also include major transportation corridors and all of the larger villages and cities in the county. Residential land use is concentrated in and around cities, villages, and small hamlets, but occurs throughout the county along the network of state, county, and local roads. Pockets of commercial and industrial development are also scattered along the major transportation corridors. The majority of the population, as well as most commercial and industrial land uses, are located in and around the Cities of Corning and Hornell. Over the past few decades there has been a significant loss of farmland to new commercial and residential development. Most of this loss has occurred near larger villages and cities such as Corning, Hornell and Erwin. The largest state recreational lands in the county are Erwin State Wildlife Management Area and Pinnacle State Park, located in the southern portion of the county, and Stony Brook State Park in the northwestern portion of the county.

Land use patterns within the Town of Cohocton are similar to those of the larger region and county. The town is predominantly rural, with the majority of land being either active agricultural fields or undeveloped forestland. Approximately 16% of the tax map parcels in the town are classified as agricultural, 17% as vacant land, and 55% as residential. Residential and commercial land uses are primarily located in the valleys and are concentrated in and around the Village of Cohocton, the Hamlets of Atlanta and North Cohocton, and along major roads such as NYS Route 371, 21, and 415. There are numerous rural homes and farms scattered throughout the ridgetop and valley portions of the town.

3.13.1.2 Project Site Land Use and Zoning

The Project Site is dominated by open crop fields (primarily hay and corn), with forested areas generally confined to small woodlots and steep slopes that descend to adjacent valley bottoms. The site also includes successional old field, successional shrubland, yards, farms, small wetlands, and ponds. Existing built features within the site boundaries include roads, single-family homes, barns, silos, and other agricultural buildings.

The Town of Cohocton zoning ordinance regulates land use throughout the town. The Town of Cohocton Zoning Law (1990; amended by L.L. No. 1-1992; amended by L.L. No. 1-2002) regulates and restricts "the location, construction, alteration, occupancy and use of structures and the use of land in the Town of Cohocton" (Town Zoning Law, §100). The Town Zoning Law identifies the following five zoning districts: Agricultural-Residential (AG-R); Low Density Residential (LDR); General Business (GB); Interchange Commercial (IC); and Industrial (I). The proposed Project Site is entirely within the AG-R district (Figure 14). Principal permitted uses within the AG-R district include agricultural uses and structures, single and two-family dwellings, seasonal homes, churches and similar places of worship, municipal parks and playgrounds, libraries, day nurseries, kindergartens, nursing homes, historical museums, monuments, and markers.

The Town of Cohocton also has a Windmill Local Law (Town of Cohocton, 2006) governing wind energy facilities. This local law provides the Town of Cohocton with the authority to approve or deny applications for Residential and/or Commercial Windmills, as well as Industrial (utility-scale) Windmills, through a special use permit process. A copy of the Windmill Local Law is included in Appendix P. A special use permit, if approved, would allow for the construction, maintenance and operation of a utility-scale wind energy facility within the AG-R zoning district, without the need to obtain a use, area, or height variance.

Table 26 summarizes certain of the requirements of the Windmill Local Law that are applicable to a wind-powered electric generating facility in the Town of Cohocton.

Table 26. Local Wind Power Facility Requirements and Approvals

Requirements	Approvals
• Wind energy facilities are allowed in the Town, pursuant to the approval of a special use permit by the Planning Board. • Guidelines for industrial wind energy facilities include: - Setback for each wind turbine tower from adjacent property lines, rights-of-way, easements, public ways, power lines, other generation units (turbines) or areas/structures customarily used by the public shall be 100 ft. plus the maximum structure height. * - Minimum setback from adjacent residences and public structures shall be 1,500 ft. - Noise level limits applicable at abutting property boundaries. - All guy wires or cables shall be marked with high-visibility orange or yellow sleeves from the ground to a point 10 feet above ground. - 50 foot setback from any property line for any anchor point for guy wires or cables - Landscaping/building and grounds maintenance requirements - Maximum height limit: 500 feet	Approval of special use permit from Planning Board.

*The Planning Board may reduce setback requirement during special permit review under specific conditions as stated in the Windmill Local Law.

3.13.1.3 Agricultural Districts

The 2002 Census of Agriculture reported that 1,450 working farms occupied 370,400 acres in Steuben County, or 41.9% of the land in the county (USDA, 2002). Of that total, 177,644 acres were classified as harvested cropland and 63,388 acres as pastureland (USDA, 2002). According to the U.S. Census Bureau, 1.4% of the Steuben County population (603 residents) listed farming, fishing or forestry as their occupation (2000). Similarly, 25 residents within the Town of Cohocton (2.2%) listed farming, fishing or forestry as their primary occupation (U.S. Census Bureau, 2000). The number of commercial wineries in the county has increased over the years.

Steuben County has 23 separate agricultural districts. One district (District 5) occurs within the Project Site (Figure 15). Approximately 876.4 acres (46.4%) of the Project Site are included within this district. The Project Site includes nine working farms, the majority of which are dairy farms.

3.13.1.4 Future Land Use

Other than the proposed Project, (and other proposed wind power projects) future land use patterns in Steuben County and the Town of Cohocton are anticipated to remain largely unchanged for the foreseeable future. The Southern Tier Regional Planning and Development Board (STCRPDB) continues to promote agriculture, manufacturing, and tourism as growth opportunities in the region (STCRPD, 2006). However, land use within the area is anticipated to undergo some degree of change as farms are sold and agricultural land goes out of production.

3.13.2 Potential Impacts

The Project will be compatible with the agricultural land use that dominates the Project Site. However, there will be temporary, construction-related impacts, as well as permanent impacts (operation related) on land use within the Project Site and the larger community. Anticipated land use and zoning impacts are described below.

3.13.2.1 Construction

Construction-related disturbance to agricultural land will total approximately 100.5 acres, of which 87 acres will be temporarily impacted and 13.5 acres will be permanently impacted. Along with this direct impact to agricultural land, movement of equipment and material could result in damage to growing crops, fences and gates, and subsurface drainage systems (tile lines), as well as temporary disruption of farming practices (e.g., temporary blockage of farmers' access to fields). However, wind turbines and associated facilities have been located so as to minimize loss of active agricultural land and interference with agricultural operations, and Project construction will be in compliance with NYSA&M Agricultural Protection Guidelines.

Construction activities could have a similar temporary impact of forest management/timber harvest activities. Movement of equipment and materials could temporarily block or damage forest access roads. Timber harvest activities may also need to be curtailed/rescheduled in certain areas to avoid interfering with Project construction. Construction will result in impacts to approximately 13 acres of forestland, of which 11.5 acres will be temporarily impacted and 1.5 acres will be permanently impacted. However, it is anticipated that marketable timber will be salvaged and stockpiled for use/removal by the landowner. Improvements to existing roads to accommodate construction activity will ultimately enhance access to these properties for future forest management activities.

Construction-related impacts to residential land use will include sound, traffic, dust, and visual impacts. All of these issues are address in detail elsewhere in this DEIS. Construction activity will be in compliance with requirements of the Windmill Local Law and zoning regulations in Cohocton. No variances or waivers from the requirements of these local laws are anticipated.

3.13.2.2 Operation

The Project as proposed is consistent with existing zoning/wind energy facilities regulations and land use patterns within the Town of Cohocton. The Project will occur entirely on private land in areas dominated by active and reverting agricultural land and undeveloped forestland. Project components will be sited in accordance with local setback requirements and no public lands or recreational facilities will be impacted. Therefore, impacts to residential, commercial, and recreational land use will be minimized. The operating Project will be compatible with agricultural land use, which dominates the Project Site, and may serve to help keep land in agricultural use. The presence of wind turbines may also limit or prevent the conversion of agricultural and forest land to seasonal or permanent residential use.

Only very minor changes in land use within the Project Site are anticipated as a result of Project implementation. The 16 turbine sites, and other ancillary facilities together represent a maximum conversion of approximately 15 acres of land from agricultural land and forestland to developed land use. Very little residential land will be directly impacted by the Project, and these impacts will be confined to the properties of participating landowners, and largely temporary in nature (construction activity). Other than occasional maintenance and repair activities that could have impacts similar to those described in the 'Construction' discussion, operation of the wind power Project should not directly interfere with existing land use.

However, as noted in the Visual Impact Assessment prepared for the Project (Appendix H), the Project may result in a perceived change in land use in some areas of the town (and some portions of surrounding towns). As discussed in Section 3.5, the visibility and visual impact of the wind turbines will be highly variable based upon distance, weather conditions, sun angle, the extent of visual screening, viewer sensitivity and/or existing land uses. The visual impact evaluation indicated a low to moderate level of visual contrast.

3.13.3 Proposed Mitigation

The Project is generally consistent with existing zoning and is compatible with the agricultural land use that dominates the Project Site. However, the Project will impact agricultural activities (at least temporarily) and may result in a change in perceived land use in some areas.

To minimize and/or mitigate impacts to active agricultural land and farming operations, project siting, and construction will fully comply with NYSA&M, agricultural protection guidelines. A Notice of Intent to Undertake an Action within an Agricultural District will be filed with the

NYSDA&M and the Steuben County Agriculture, Industry and Planning Committee. Proposed agricultural protection measures have been prepared in accordance with NYSA&M guidelines, and are included as Appendix D. These mitigation measures include:

- Limiting permanent road widths to a maximum of 20 feet or less, and, where possible, following hedgerows and field edges to minimize loss of agricultural land.
- Having roads that must cross agricultural fields stay on ridge tops and other high ground to minimize cut and fill as well as potential drainage problems.
- Avoiding disturbance of surface and subsurface drainage features (ditches, diversions, tile lines, etc.).
- Prohibiting vehicular access to turbine sites until topsoil has been stripped and permanent access roads have been constructed.
- Constructing roads only in a location and manner approved by the environmental monitor.
- Prohibiting stripping of topsoil or passage of cranes across agricultural fields during saturated conditions when such actions would damage agricultural soils.
- Avoiding blockage of surface water drainage due to road installation or stockpiled topsoil.
- Maintaining access roads throughout construction so as to allow continued use/crossing by farmers and farm machinery.
- Temporarily fencing open excavation areas in active pastureland to protect livestock.
- Disposing of excess concrete off-site (unless otherwise approved by the environmental monitor and the landowner). Under no circumstances shall excess concrete be buried or left on the surface in active agricultural areas.
- Washing of concrete trucks outside of active agricultural areas in locations approved by the environmental monitor.
- Restricting erection cranes to designated access roads, crane paths, and work pads at the structure sites for all set-up, erection, and breakdown activities.
- Stabilizing restored agricultural areas with seed and/or mulch.
- Removing and disposing of all construction debris off-site at the completion of restoration.

Mitigation measures that will be undertaken to reduce the impact of the wind energy facilities on land use and zoning include appropriate design and full compliance with the local windmill laws. These include:

- Placing all turbines a minimum of 1,500 feet from neighboring residences, and 520 feet from all public roads.
- Locating electrical collection (interconnect) lines underground.

- Lighting towers only to the extent necessary to comply with FAA requirements. Lighting for the substation and other ground level facilities will be kept to a minimum and generally operated by switch or motion detector.
- Not affixing television, radio or other communication antennas or advertising signs to the towers or any other Project structures.
- Utilizing tubular towers and finishing structures with a single, non-reflective matte finish color.
- Installing turbines in locations where proximity to existing fixed broadcast, retransmission, or reception antenna for radio, television, or wireless phone or other personal communications systems will not interfere with signal transmission or reception.
- Designing all Project components in a way that minimizes the impacts of land clearing and the loss of open space.
- Locating Project components so as to minimize impacts on state and federal jurisdictional wetlands.
- Managing storm water run-off and erosion control in a manner consistent with all applicable state and federal laws and regulations.
- Removing all solid waste, hazardous materials and construction debris from the site and managing its disposal in a manner consistent with all appropriate rules and regulations.
- Generally limiting construction to daylight hours (typically 7:00 a.m. to 5:00 p.m.), except for certain activities that have to occur outside these hours due to wind or temperature constraints.

These actions will assure that adverse impacts on land use and zoning are minimized or mitigated to the extent practicable.

4.0 UNAVOIDABLE ADVERSE IMPACTS

The proposed Project will result in significant long-term economic benefit to participating landowners as well as to the Town of Cohocton, the local school districts, and Steuben County. When fully operational, the Project will provide up to 40 MW of electric power generation with no emissions of pollutants or greenhouse gases to the atmosphere. The development of the site is consistent with surrounding land uses and will help maintain the area in agricultural use.

Despite the positive effects anticipated as a result of the Project, its construction and operation will necessarily result in certain unavoidable adverse impacts to the environment. The majority of the adverse environmental impacts associated with the Project will be temporary, and will result from construction activities. Site preparation (e.g., clearing, grading), improvement of local roads, and the installation of roads, turbines, interconnects, staging areas, and the meteorological tower will have short-term and localized adverse impacts on the soil, water, agricultural and ecological resources of the site. This construction will also have short-term impacts on the local transportation system, air quality, and noise levels. These impacts will largely result from the movement and operation of construction equipment and vehicles, which will occur during the one-year development of the Project. The level of impact to each of these resources has been described in other sections of the DEIS and will generally be localized and/or of short duration.

Long-term unavoidable impacts associated with operation and maintenance of the Project include turbine visibility from many locations within the town. While the presence of the turbines will result in a change in perceived land use from some viewpoints, their overall contrast with the landscape is low to moderate in most locations. The Project also may function to keep land within the Project Site in agricultural use, thus protecting open space and existing land use patterns. Project development may also result in an increased level of sound at some receptor locations (residences) within the study area, a minor loss of agricultural and forest land, wildlife habitat changes, and some level of avian and/or bat mortality associated with bird/bat collisions with the turbines. As described in Section 3.0, these impacts are not considered significant.

Although adverse environmental impacts may occur, they will be minimized through the use of various general and site-specific avoidance and mitigation measures. With the incorporation of these mitigation measures, the Project is expected to result in positive, long-term overall impacts that will offset the adverse effects that cannot otherwise be avoided.

The following subsections summarize general mitigation and avoidance measures that have been incorporated into the Project design, and specific mitigation and avoidance measures proposed to minimize adverse impacts to specific resources.

4.1 General Avoidance and Mitigation Measures

General mitigation measures include compliance with the conditions of various local, state, and federal ordinances and regulations that govern Project development, as well as the inherent characteristics of the Project. The primary government review/approval processes that apply to the Project include:

- SEQRA,
- NYSDOT and Steuben County Department of Public Works (DPW) highway regulations,
- Federal Clean Water Act regulations (Section 404 individual permit, 401 water quality certification),
- Town of Cohocton building and zoning regulations,
- Town of Cohocton Local Windmill Law,
- NYSDEC water resources regulations (Article 24, Article 15, Section 401 water quality certification),
- NYSDEC SPDES regulations (stormwater management),
- OSHA regulations (standard conditions for safe work practices during construction), and

- NYS Agricultural Districts law.

SEQRA regulations require environmental review of proposed development projects so that potential adverse impacts and public concerns can be identified prior to project implementation and avoided or mitigated, to the extent practicable. This DEIS was prepared in accordance with these regulations, and provides a primary means by which the potential costs and benefits of the Project are described and weighed in a public forum. Compliance with SEQRA regulations will assure that public and agency comments are solicited and appropriately addressed, Project alternatives are evaluated, and potential adverse impacts are identified and mitigated to the extent practicable. Response to comments and preparation of a FEIS will provide the information necessary for lead agency and other involved agencies to draw conclusions (Findings Statement) regarding the Project's overall environmental impacts and impose conditions on its approval, if necessary.

Compliance with the other various federal, state, and local regulations governing the construction and design of the proposed Project also will serve to minimize adverse impacts. Construction activities and building designs will be in compliance with state and local building codes and federal OSHA guidelines to protect the safety of workers and the public. State permitting required by the NYSDEC will serve to protect water resources, while state and county highway permitting will assure that safety, congestion, and damage to highways in the area is avoided or minimized. Compliance with town ordinances that require building and highway permits will further serve to minimize impacts of the Project. The Town's Windmill Local Law contains protective requirements for the siting and regulation of wind energy facilities that are consistent with (or exceed) the requirements found in other local wind power ordinances in New York State.

Along with regulatory compliance, the Project has been designed in accordance with various siting criteria, guidelines, and design standards that serve to avoid or minimize adverse environmental impacts. These include:

- Siting the Project away from population centers and areas of residential development;
- Siting turbines in compliance with all local set-back requirements to minimize noise, shadow flicker, and public safety concerns;
- Following NYSA&M Agricultural Protection Guidelines;
- Utilizing existing disturbed areas for stream and wetland crossings;
- Siting turbines primarily in open field areas to minimize forest clearing and potential impacts to bats;
- Using existing farm roads for turbine access whenever possible, to minimize impact to soil, ecological, and agricultural resources;
- Designing the overhead transmission line in accordance with APLIC guidelines to minimize impacts on birds;
- Project design, engineering, and construction will be in compliance with various codes and industry standards to assure safety and reliability;

- Limiting turbine lighting to the minimum allowed by the FAA to reduce nighttime visual impacts, and following lighting guidelines to reduce the potential for bird collisions;
- Construction procedures will follow Best Management Practices for sediment and erosion control; and
- Turbines will include grounding and automatic shutdown/braking capabilities to minimize public safety concerns.

4.2 Specific Mitigation Measures

Project development and operation will also include specific measures to mitigate potential impacts to specific resources. These were described in detail in Section 3.0, but generally include the following:

- Developing and implementing a complaint resolution procedure to address landowner concerns throughout Project construction and operation.
- Developing and implementing various plans to minimize adverse impacts to air, soil, and water resources, including a dust control plan, sediment and erosion control plan, and SPCC plan.
- Undertaking a pre-construction breeding bird survey to avoid impacting any nesting listed species during construction.
- Video documentation of existing road conditions, development of a road improvement plan, and undertaking public road improvement/repair at no cost to the town or county.
- Post-construction avian and bat monitoring studies to document Project impacts on birds and bats.
- A historic resource mitigation program to be developed in consultation with the SHPO.
- Entering into a PILOT agreement with the local taxing jurisdictions to provide a significant predictable level of funding for the town, county, and school districts over the first 20 years of Project operation.
- Development of an emergency response plan with local first responders.

The proposed complaint resolution process referenced in the DEIS will be developed and implemented prior to construction. It is anticipated to include the following:

- Prior to construction, CPP II will communicate to neighboring residents, the Town of Cohocton and permitting agencies the contact name and address of the Project Community Relations representative and the Construction Manager (and, prior to the end of construction, the Operations Manager). CPP II will also publish a community 1-800 telephone number.
- Complaints by neighboring residents, or others, may be made through the following channels:
    1. By calling the local or 1-800 number and speaking directly with construction and operations personnel;
    2. By writing to UPC at its local address or at its principal place of business; or

3. By making the complaint in person at CPP II's construction trailer or operations building.

- In the event that the Town receives complaints directly about unanticipated effects of Project construction or operations, the Town shall notify CPP II within 5 days in writing of the details of such complaint.
- A log will be kept locally of the name and contact details of the complainant and the actions taken to resolve the complaint. This log will be available to the Town Board for inspection upon request.
- In the event that CPP II receives complaints, CPP II will promptly investigate such complaints. A report of each investigation shall be made available to the Town Board. In the event that the investigation determines that the complaint has identified a problem attributable to the construction, operation or maintenance of the Dutch Hill Wind Farm, CPP II will promptly work directly with the complainant and, in appropriate circumstances, the Town to resolve the identified problem. In the event that the identified problem is not resolved, or that a plan to resolve the problem is not under development within 30 days of the determination that a problem exists, the complainant may refer the matter to the Town Board. In such event the Town Board may by majority vote determine that no further measures are necessary or may require CPP II and complainant to proceed with non-binding mediation with a mutually acceptable mediator. CPP II will make every reasonable effort to resolve the complaint.

4.3 Environmental Compliance and Monitoring Program

In addition to the mitigation measures described above, CPP II will develop an environmental compliance program and employ environmental monitors to oversee compliance with environmental commitments and permit requirements. The environmental compliance program will include the following components:

- Planning – Prior to the start of construction, the environmental monitors will review all environmental permits and, based upon the conditions/requirements of the permits, prepare an environmental management document that will be utilized for the duration of the Project. This document will outline environmental requirements for construction and restoration included in Project permits and approvals.
- Training – The environmental monitors will hold environmental training sessions that will be mandatory for all contractors and subcontractors. The purpose of the training sessions will be to explain the environmental compliance program in detail prior to the start of construction.
- Preconstruction Coordination – Prior to construction, the contractor(s) and the environmental monitors will conduct a walkover of areas to be affected by construction activities. This walkover will identify landowner restrictions, sensitive resources, limits of clearing, proposed stream or wetland crossings, and layout of sediment and erosion control features. The limits of work areas, especially in sensitive resource areas, will be defined by flagging, staking or fencing prior to construction, as needed.

- Construction and Restoration Inspection – The monitoring program will include the inspection of construction work sites by the environmental monitor. The monitor will be present during construction at environmentally sensitive locations, will keep a log of daily construction activities, and will issue periodic/regular reporting and compliance audits. Additionally, the monitor will work with the contractors to create a punch list of areas for restoration in accordance with issued permits. Following construction, CPP II or an environmental monitor will maintain a monitoring presence for two years following completion of site restoration (in accordance with NYSA&M requirements) to evaluate areas disturbed during construction and assure that agricultural and ecological functions and values are restored and maintained over the long term.

5.0 ALTERNATIVES ANALYSIS

The following alternatives to the proposed action are described and evaluated: no action, alternative Project Site, alternative project design/layout, alternate project size, and alternative technologies. These alternatives offer a potential range and scope of development for comparative analysis and consideration.

5.1 No Action

The no action alternative assumes that the Project Site would continue to exist as active agricultural land, residential property and vacant land. This no action alternative would not affect current zoning, ambient noise conditions, traffic or public road conditions, television/communication systems, and would maintain community character, economic and energy-generating conditions as they currently exist.

Under this alternative, no wind turbines or infrastructure (e.g., roads, interconnects, and substations) would be developed on the site. Consequently, none of the environmental impacts associated with Project construction and operation would occur. In addition, no economic benefits would accrue to the area. These unrealized economic benefits would include income from construction jobs, lease payments to the landowners, annual PILOT payments to the affected towns and school boards. Annual revenues to the Town of Cohocton and the area school districts are anticipated to average in excess of $500,000 per year for the first 20 years of Project operation, declining thereafter based on depreciation. Under the no action alternative, multiplier effects from these economic benefits would also not be realized. In addition, to the extent that the Project helps supplement farm income and keeps land in active agricultural use, the no action alternative could have an adverse impact on land use and grassland bird habitat. If family farms go out of business, the land maybe incorporated into larger corporate farming operations, converted to residential use, or allowed to revert to successional communities. All of these possibilities would result in a change to the Town's existing character and available wildlife habitat.

Furthermore, the benefits of installing 40 MW of clean, renewable electric energy to the power grid would be lost, and reliance on fossil-fuel-fired generators, which contribute to emissions of sulfur dioxide (a precursor of acid rain), nitrogen oxide (a smog precursor), and carbon dioxide (a greenhouse gas) would continue. Given the short-term nature of anticipated construction impacts and the generally minor long-term impacts of Project operation, as compared to the significant economic benefits that the Project would generate the no action alternative, which is not considered a preferred alternative.

5.2 Alternative Project Area

Under 6 NYCRR § 617.9(b)(5)(v)(g), site alternatives addressed in an Environmental Impact Statement (EIS) may be limited to parcels owned by, or under option to, a private project sponsor. CPP II does not own, or have under option, any parcels other than the ones that constitute the Project Site. Therefore, there is no requirement to evaluate any alternative Project Areas. Nonetheless, this section provides background information on CPP II's selection of the Project Site to facilitate understanding of the criteria that CPP II employed.

The selection of wind turbine locations is constrained by several factors which are essential for the Project to operate in a technically and economically viable manner. These factors include the following:

- adequate wind resource;
- adequate access to the bulk power transmission system, from the standpoints of proximity and ability of the system to accommodate the interconnection and accept and transmit the power from the Project;
- contiguous areas of available land;
- compatible land use;
- willing land lease participants and host communities;
- limited sensitive ecological resources; and
- limited population/residential development.

UPC Wind began a search for appropriate Project Sites within the Southern Tier of New York that had these characteristics in September 2002. The analysis of potential sites concluded that many other locations in the region presented significant constraints on wind power development, including, incompatible land uses, lack of contiguous land, proximity to population centers, a lack of adequate wind resource, or unsuitable transmission facilities (either too far to connect or in need of major system upgrades).

UPC Wind selected the proposed Dutch Hill site because of the quality of the wind resource, the ease of access to the site, relatively low population density, positive feed-back from landowners and town officials, and the relative lack of sensitive resources. These factors combined to make the proposed site desirable from the standpoint of wind power development. Based upon the result of the site evaluations performed in the region, other potential locations do not have the same combination of desirable features.

5.3 Alternative Project Design/Layout

CPP II's ability to develop a significantly different project layout within the Project Site is constrained by the need to maintain required set-backs and adequate separation of turbines, and to limit environmental impacts. Keeping the turbines on high-elevation sites with adequate wind, staying 520 feet from roads and property lines, and 1,500 feet from the nearest dwellings, areas, or structures customarily used by the public, leaves very little room for modification of the Project layout. In addition, the turbines must have adequate separation to avoid energy loss associated with wake effects. They, and other Project components, also must be sited so as to minimize loss of active agricultural land and/or interference with agricultural operations. Avoidance of wetlands, streams, forested areas, and steep slopes further reduces available siting alternatives. Proposed turbine siting also needs to be sensitive to landowner agreements/considerations. All of these factors have guided the location of potential turbine sites, and limit the ability to significantly change the proposed configuration.

The layout of 16 potential turbine sites as proposed results in a carefully achieved balance of energy production and environmental protection. By identifying 16 potential turbine sites, CPP II has bracketed the potentially feasible layout alternatives within the Project Site. Relocation of any of the turbines to a site other than one of the identified 16 potential sites would have a ripple effect, in that the location of other turbines would have to be reexamined and possibly changed to maintain an efficient/workable Project design. Therefore, reduction of environmental impacts in one location could result in increased impact in another location and/or reduced power generation. In the case of visual impact, removal or relocation of one or two individual turbines from a 16-turbine array is unlikely to result in a significant change in Project visibility and visual impact from most locations.

The final turbine sites will be selected based on input and guidance received from landowners and Project cultural resource, noise, and ecological consultants, as well as agency personnel (e.g., NYSDA&M) to assure that adverse impacts have been reduced to the extent practicable.

In addition to evaluating turbine siting alternatives, alternate means of connecting with the existing NYSEG 230 kV line were evaluated. Different voltage levels for the transmission line (34.5, 115, and 230 kV) were considered, as well as different routes, and the alternative or placing the line underground. An analysis of potential transmission line voltages was undertaken to assure that the line would be appropriately sized to accommodate expected generation from the proposed Project, while minimizing line losses of electricity. This analysis determined that connecting the Dutch Hill project to the collector substation on Lent Hill was preferable to constructing a separate substation and high voltage transmission line to the NYSEG 230kV line. Given the length of the transmission line to Lent Hill (3.6 miles), the size of the generating project, and electrical losses, a 34.5 kV line would be the most appropriately sized transmission facility and the most efficient and environmentally preferred tie-in would be to the collection station on Lent Hill. In addition, crossings of steep slopes, wetlands, and the Cohocton River were unavoidable along any transmission line route across the Cohocton River Valley. An underground line, while reducing visual impacts, would likely result in more disturbance to these sensitive resources than would an overhead facility; therefore, an overhead line is proposed for installation through environmentally sensitive areas.

As far as the proposed route is concerned, the transmission line route proposed avoids the Village of Cohocton and other areas of concentrated settlement. Public roads are also being avoided to the extent practicable in an attempt to minimize disturbance/interference with yards, homes, street tress, and utility lines. The proposed route largely follows field edges and crosses open land (farm fields, successional old field/shrubland, scrub-shrub wetland, and the Cohocton River), where required tree clearing will be limited. On the valley walls, where forest clearing is unavoidable, alternative routing that would reduce the extent of clearing were not considered acceptable by the involved landowners (because CPP II does not have the right of Eminent Domain, any proposed route must be agreed to by the affected landowners). The proposed alignment uses an existing electric utility ROW and underground to the maximum extent practicable except where crossing a wetland adjacent to the Cohocton River, the Cohocton River, and the steep slopes up Lent Hill. Consequently, the proposed transmission line route is considered the best feasible route available to the Applicant.

The wind industry is generally moving toward the use of larger wind turbine generators, since they are generally more cost-effective (i.e., have a more favorable ratio of the rotor-swept area to generator size). Use of smaller turbines would not significantly reduce environmental impacts. If installed at the same density, the number of tower sites, length of access road, and length of electric interconnect would not be reduced. Thus, impacts would be roughly equal, while potential power generation would be significantly reduced because of smaller wind turbine capacity. To maintain an equivalent level of power generation, more of the smaller turbines would be required. This would increase temporary and permanent disturbance to soils, vegetation, and agricultural resources as the number of towers and the length of required access road and interconnect increases. Potential operational impacts (e.g., noise, avian mortality) would also likely increase with a larger number of smaller machines. In terms of visibility and visual impact, while smaller turbines might be marginally less visible, they would still be very tall structures and their higher density/greater number could actually increase the Project's visual impact. For example, to achieve 40 MW of total nameplate capacity with a 660 kW (kilowatt) generator (the smallest of the currently available turbines for commercial wind farms), about 60 wind turbines would be required. Several studies have concluded that people tend to prefer fewer larger turbines to a greater number of smaller ones (Thayer and Freeman, 1987; van de Wardt and Staats, 1998). Also, given the local set-back requirements and other siting constraints described previously, it is questionable whether a significantly larger number of smaller turbines could be accommodated within the Project Site.

The Project Site, as with most places in New York State, has positive wind shear, which means that the average wind velocity increases along with the height of the wind turbine tower. Eighty-meter towers are the highest towers now commercially available; use of a smaller tower would substantially increase the cost of energy from the facility. As mentioned previously, use of lower towers (e.g., 65 to 70 meters) would not reduce impact associated with road and interconnect construction, and would only marginally reduce visual impact.

The Project is using tubular steel towers instead of lattice, permanent access roads widths will be the minimum necessary to maintain the Project, and all on-site electrical interconnects will be placed underground. These actions will minimize visual impacts associated with the Project.

Consequently, CPP II believes that alternative project designs are likely to result in equal or greater adverse environmental impacts, while yielding lower electrical output. They are therefore considered less desirable than the proposed design.

5.4 Alternative Project Size

As discussed in the previous section, project components of alternative size and number were considered. A project of significantly more, or fewer, turbines would pose challenges to the technical or economic feasibility of the Project. If the proposed number of turbines were significantly reduced, the maximum benefit of the available wind resource would not be realized. If the turbine number was even moderately reduced, the Project would cease to be economically viable due to the high fixed cost of interconnection with the power grid. As with environmental impacts, economic benefits would also be reduced proportionately with a smaller project. Fewer landowners would participate in the Project, and therefore, fewer landowners would realize direct economic benefits. In addition, PILOT payments to the county and Town (which are typically developed on a per-MW, or per-turbine basis), as well as construction expenditures, would be greatly reduced.

As mentioned previously, various siting constraints dictate the size and layout of a wind power project. These constraints make a significantly larger number of turbines within the Project Site highly unlikely. A larger project would result in location of wind turbine towers in areas that do not have ideal wind resources, and would also require installation of more turbines in areas with more sensitive resources and/or higher population density. Although a larger facility would theoretically have more economic value, the greater environmental impacts would not justify the marginally increased power generation potential of the Project.

5.5 Alternative Technologies

The turbines proposed for the Project will utilize the latest in wind power generation technology to enhance Project efficiency and safety and minimize impacts such as noise and bird collisions. Alternative power generation technologies, such as fossil-fuel and biomass combustion, would pose more significant adverse environmental impacts, particularly on air quality but also on land use, aesthetics, and water resources. Most fossil fuel-fired generating facilities would require significant amounts of water to operate, the use of which may pose impacts to surface water or groundwater resources as well as fish and other aquatic organisms. Nuclear power plants have not been constructed in the U.S. for over 25 years, due primarily to public opposition, high cost, and concerns over the safe storage and disposal of nuclear waste and also require large quantities of water for cooling and other purposes. These plants also present potential public safety and security/terrorism concerns. Conventional power plants also would not advance the RPS goal of generating 25% of the state's power by 2013.

In regard to other renewable sources of generation, hydroelectric plants have significant impacts on terrestrial and aquatic ecological resources, land use, and aesthetics. They can also only be developed in places with appropriate water volumes and topographic conditions (which do not exist in the Project Site). Other renewable energy technologies, such as solar power and hydrogen, are still either cost-prohibitive or in development. Aside from cost constraints, utility-scale solar power is not feasible in an area such as Western New York, where available sunshine is limited. Currently, wind is the only renewable energy source that can help meet energy needs in a technologically and economically efficient manner. It can also do this without the emission of greenhouse gases and other environmental impacts that some alternative power generation technologies would create.

5.6 Alternative Construction Phasing

CPP II proposes to construct the Project in a single phase during a single construction season. Single phase construction will result in a more efficient construction process, with a shorter duration of construction-related impacts, than a multiple phase construction approach, and will allow resources, such as soils, wildlife, and vegetation, that are temporarily impacted by construction, to begin to recover and/or habituate sooner. In contrast, a multiple phase construction process would result in a longer period of construction disturbance, and would be less economically efficient for both CPP II and the local beneficiaries of the direct and indirect economic benefits of the Project.

6.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The proposed Project will require the irreversible and irretrievable commitment of certain human, material, environmental, and financial resources, as described below. For the most part, the commitments of these resources will be offset by the benefits that will result from implementation of the Project.

Human and financial resources have already been expended by CPP II, the State of New York (i.e., various state agencies), Steuben County and the Town of Cohocton for the planning and review of the Project. The expenditure of funds and human resources will continue to be required throughout the permitting and construction phases of the Project (e.g., for environmental reviews and permitting, site plan approval, building and construction inspections).

The Project also represents a commitment of land for the life of the Project. Specifically, the approximately 15 acres of land to be developed for wind turbines, access roads, and electrical connections will not be available for alternative purposes for the life of the Project. However, because the turbines/towers could be removed, and the land reclaimed for alternative uses at some future date, the commitment of this land to the Project may be neither irreversible nor irretrievable.

Various types of construction materials and building supplies will be committed to the Project. The use of these materials, such as gravel, concrete, steel, etc., will represent a long-term commitment of these resources, which will not be available for other projects.

Energy resources also will be irretrievably committed to the Project, during both the construction and operation of the Project. Fuel, lubricants, and electricity will be required during site preparation and turbine construction activities for the operation of various types of construction equipment and vehicles, and for the transportation of workers and materials to the Project Site. However, the energy resources utilized to construct and operate the Project will be minor compared to the energy generated by the Project and made available to the people of New York State.

7.0 GROWTH INDUCING IMPACTS

Certain proposed actions covered under the SEQRA process have the potential to trigger further development by either attracting a significant local population, inviting commercial or industrial growth, or by inducing the development of similar projects adjacent to the built facility. The proposed Project does not require a work force greater than approximately six employees, and therefore will not lead to significant growth in local population or housing. Although it will support the local economy through the purchase of goods and services, the type and level of expenditures are not of the sort that would generate significant growth of businesses that serve the proposed facility. Therefore, secondary/indirect impacts resulting in local growth are not anticipated to occur as a result of the proposed action.

The Dutch Hill Wind Power Project is proposed, in part, because of the presence of existing resources and facilities that allow the Project to be economically viable. Specifically, the availability of adequate wind and the presence of an existing transmission line allows for generation and transmission of the Project's electric output to the state power grid. The occurrence of these resources/facilities might suggest that other wind power projects could be proposed on adjacent lands. However, this would be the case with or without the proposed Project. Its presence alone will not encourage the development of additional wind power projects in the area. In fact, because existing transmission facilities have limited additional capacity, the Project may make future projects more difficult to develop if such development could only be accommodated by upgrading the existing transmission line. If this were the case, such upgrades would likely make future projects less economically viable. In addition, landowner willingness and environmental sensitivity play a significant role in the location of wind power projects. As currently proposed, the Project maximizes the land resource of willing landowners within the Dutch Hill portion of the Town of Cohocton, while maintaining environmental sensitivity. Any, additional wind power development in this portion of the Town is likely to be limited due to set-back constraints, more significant environmental impacts, and lack of landowner participation.

8.0 CUMULATIVE IMPACTS

SEQRA requires a discussion of cumulative impacts where such impacts are "applicable and significant." 6 NYCRR § 616.9(b)(5)(iii)(a). Cumulative impacts are two or more individual environmental effects which, when taken together, are significant or which compound or increase other environmental effects. The individual effects may be effects resulting from a single project or from separate projects.

Where individual effects of the Project may interact with other effects of the Project, such potential cumulative impacts have been addressed in Section 3.0 above.

This section addresses the potential cumulative impacts that may arise from interactions between the impacts of the Project and the impacts of other projects. In general, cumulative impact analysis of external projects is required where the external projects have been specifically identified and either are part of a single plan or program, or there is a sufficient nexus of common or interactive impacts to warrant assessing such impacts together. The subsections below discuss whether there are identified projects for which cumulative impact analysis is required, and assess the extent to which the impacts of such projects will be cumulative with the impacts of the Dutch Hill Wind Power Project.

8.1 Existing and Approved Projects

There are currently no operating or approved utility-scale wind power projects in Steuben County. The nearest existing project is the Wethersfield Wind Farm, a 10 turbine, 6.6 MW wind energy facility located in the town of Wethersfield in Wyoming County. The Wethersfield facility is located approximately 40 miles from the Project Site, and therefore does not have an impact on the Project Site or the surrounding area within and near the Town of Cohocton.

CPP II is not aware of any other existing or approved projects within the Town or surrounding area that do, or if constructed, would have environmental effects that would interact with those of the Project.

8.2 Proposed or Future Projects

Across Steuben County and New York State, several additional wind-powered generating facilities are in the project planning and development phases. The review and approval status of these projects is highly variable, ranging from preliminary site investigations to those with completed system reliability impact studies (requirement of NYISO), detailed project plans, and landowner agreements. The NYISO reviews projects in three main phases: submittal of an interconnection request, preparation of a feasibility study, and completion of a system reliability impact study. This review process separates projects, initially by feasibility to connect to the New York power grid via a selected transmission facility. Proposed projects in any phase of project review by the NYISO are listed on a comprehensive queue listing maintained on the NYISO website (http://www.nyiso.com). It is reasonable to assume, that wind power projects with in-progress system reliability impact studies and with upcoming proposed operation dates may be considered 'proposed' or 'future' projects for the purposes of cumulative impact analysis.

In Steuben County, eight additional projects are considered proposed projects that may fall into this category (NYISO, 2006). These include the following:

- Ecogen Prattsburgh/Italy Valley Wind Farm (79.5 MW);
- Prattsburgh Wind Park [WindFarm Prattsburgh] (75 MW) proposed by UPC Wind Management, LLC and Global Winds Harvest, Inc.;
- Hartsville Wind Farm (50 MW) proposed by Airtricity Developments, LLC;
- Canisteo Hills Windfarm (149 MW) proposed by Invenergy NY, LLC;
- Canandaigua [Cohocton Wind] (85 MW) proposed by UPC Wind Management, LLC;

- Howard Wind Project (102.3 MW) proposed by Everpower Global;
- Paragon I Wind Generation (100 MW) (formerly Pine Hill) proposed by Clipper Windpower Development Corporation, Inc.; and
- Paragon II Wind Generation (150 MW) (formerly Pine Hill II) proposed by Clipper Windpower Development Corporation, Inc.

Because the precise location of these proposed facilities is not available in any materials submitted to NYISO, CPP II is not able to identify the actual locations of most of these projects, and therefore, is not able to provide a detailed cumulative impact analysis. Steuben County Industrial Development Authority serves as the lead agency for each of the proposed facilities. CPP II also contacted the Steuben County Industrial Development Authority, which advised that they are not in possession of materials which identify location or layout of the other projects in any greater detail. The exceptions are the Ecogen Prattsburgh/Italy Valley Wind Farm, which has been the subject of a Final Generic EIS issued by SCIDA, the WindFarm Prattsburgh Project (proposed by an affiliate of CPP II and Global Winds Harvest), and Canandaigua (Cohocton) project, which is also being proposed by an affiliate of CPP II. Further, it is important to note that the assumption that one or more of the proposed Steuben County projects would complete the NYISO review, complete SEQRA review, complete state, federal, and local permitting, receive funding, *and* be constructed is also speculative. Any, or all of the proposed projects in Steuben County may not be approved and/or constructed, and therefore would not contribute to cumulative impacts associated with the construction and operation of the Dutch Hill Wind Power Project.

Nonetheless, for purposes of this DEIS, CPP II assumes that all of the proposed projects will be approved and constructed, and provides the analysis which follows of potential cumulative impacts to the extent ascertainable. In most cases, only limited information about the other projects is available, so only a limited analysis is possible.

8.2.1 Ecogen and Global Winds Harvest Prattsburgh Projects

The Ecogen Prattsburgh/Italy Wind Farm and the WindFarm Prattsburgh Project are proposed to be constructed in close proximity to each other in the Towns of Italy (Yates County) and Prattsburgh (Steuben County). As measured to the nearest turbine, these projects are located approximately 6 miles east of the Dutch Hill Wind Power Project. Due to the distance to these projects, they will not create cumulative construction impacts with the Project. With respect to operational impacts, the two projects will not create cumulative noise and shadow flicker impacts with the Project. Cumulative impacts arising from simultaneous operation of the three projects are anticipated to be limited to visual and avian impacts. However, due to the distance between the Dutch Hill Project and the other two projects such impacts are not anticipated to be significant. If the two Prattsburgh area projects are visible from the same vantage points as the Project, they will typically be background features in any foreground or midground view that includes the Dutch Hill turbines. A cumulative viewshed is presented in the VIA, Figure 7 - Sheets 5 and 6. Based on topography alone, it appears that cumulative views of the Dutch Hill, Cohocton Wind and WindFarm Prattsburg projects will be limited to ridge tops and slopes. Views from the valleys will be limited to one or two of the projects.

Based on information presented in the WindFarm Prattsburg DEIS if up to 6 birds per year per turbine may be expected to be killed, total mortality could be expected to be as high as 264 birds. Applying the same number of bird fatalities per turbine to the Dutch Hill Project would add 96 birds per year for a total of 360. Adding the potential mortality from the 50 turbines at Ecogen would increase this total number to 660. This is a small fraction of the population that migrates or resides in the area and would not be biologically significant.

Cumulative bat impacts may be expected to occur but it is not possible to predict based on preconstruction information.

The Final Generic EIS prepared with respect to the Ecogen project analyzed the cumulative impacts that could arise between it and the Global Winds Harvest project.

8.2.2 Cohocton Wind Project

Canandaigua Power Partners, LLC, has filed an interconnection request with the NYISO with respect to the Cohocton Wind Farm, a proposed up to 36 turbine 90 MW wind energy project and has filed a DEIS with the Town of Cohocton. A DEIS was also filed with the lead agency for this project on March 31, 2006. The current layout of Cohocton Wind is for up to 36, 2.5 MW wind turbines to be located on Pine, Lent, and Brown Hills northeast of the Town of Cohocton. The Cohocton site is located directly east of the proposed Dutch Hill Wind Power Project, across the Cohocton River Valley. This site is approximately 1.5 miles from the nearest turbine included in the Dutch Hill Wind Project. It is located directly northeast of the Village of Cohocton. The proposed Project Site is consistent with that of a mature, eroded plateau characterized by rolling uplands and flat-topped hills with elevations ranging from 1,300 feet in the Cohocton River Valley to approximately 2,012 feet amsl atop Dutch Hill. The Cohocton Wind site is primarily a mix of dissected plateaus and valleys with elevations ranging from 680 to 2,385 amsl.

Many of the cumulative impacts will be the simple additive effect of the projects (i.e. each will disturb a certain amount of ground surface, wetlands, or stream crossings). Also, each will provide a certain economic benefit to the host community. These additive impacts can be quantified by simply tallying the total impacts quantified found in each project's DEIS. Certain other cumulative impacts may not simply be additive and therefore need a certain level of further analysis as described below.

It is important to reiterate that the Dutch Hill project is not a second phase of the Cohocton Wind Farm. Rather, the two are entirely separate projects. As stated in the DEIS, the Dutch Hill project will be owned and operated by a separate project company, on a separate site, with a separate electrical interconnection. Construction and operation of the Project is not dependent upon the development or operation of the Dutch Hill Project, and the two projects will not be functionally dependent upon each other. Review of the Cohocton Wind Farm Project pursuant to

SEQRA, and subsequent issuance of the permits necessary to construct and operate the Project, will not commit any reviewing agency to approve the Dutch Hill project. To the contrary, the Dutch Hill project will be separately reviewed. To assure that all environmental impacts are fully and appropriately reviewed, the Dutch Hill DEIS will include a full cumulative impact assessment of the interactions between the two projects.

Due to the distance between the Dutch Hill and Cohocton sites, cumulative noise and shadow flicker impacts are not anticipated. However, based on the proposed number and location of Dutch Hill turbines, transportation, avian, visual, and socioeconomic impacts are likely.

8.2.2.1 Transportation

Given the number of large over size/overweight (OS/OW) transport vehicle trips required to deliver turbine components for the Dutch Hill and Cohocton Wind Projects, it is reasonable to assume that there may be a cumulative effect on transportation and traffic within the Town of Cohocton. It is not anticipated that there will be significant cumulative effects on local transportation routes due to the fact that the projects are separated by over a mile and the local roads used for the Cohocton Project are separate and distinct from those used by Dutch Hill. Additionally, preliminary turbine component delivery routes were selected to avoid major population areas such as business and residential areas in the Village of Cohocton. In the event that both the Cohocton and Dutch Hill Wind Projects are constructed in the same time frame, it is necessary to identify which travel routes may be common to evaluate the cumulative impacts the two projects may impose on the existing highway infrastructure.

The transportation assessment reports prepared for the Dutch Hill and Cohocton Wind Projects indicate the same southbound and northbound routes in Cohocton and Avoca, NY may be used to deliver wind turbine components to the two project sites, as described below.

- Southbound Truck Route: Potential areas of cumulative traffic impact traveling southbound would be confined primarily to traffic on a) Interstate 390 Southbound, b) a short stretch of Michigan Hollow Road between I-390 and SR 415, and c) SR 415 from Michigan Hollow Road to Newcomb Hollow Road. Each section of this route is described below. If the Dutch Hill Wind Project is constructed on the same schedule as the Cohocton Wind Power Project, the number of truck trips required to deliver turbine equipment along these sections of road would increase from 144 trucks needed for Dutch Hill to a total of 468 trips (324 trips for Cohocton). There would also be an equal number of returning trucks. The 468 total truck trips would be spread throughout the duration of the construction phase and would not occur at one time.

- I-390 Southbound: This section of the route is approximately 15.5 miles in length. The number of truck trips along this route would increase by 324 trips spaced throughout the construction period if construction of the Dutch Hill Wind Project occurs on the same construction schedule as the Cohocton Wind Power Project. The additional impact to the interstate highway infrastructure is expected to very low because the interstate highway system is designed and constructed to handle heavy volume and heavy loads.

- Michigan Hollow Road: This section is very short (0.3 miles) and connects I-390 to SR 415. This section is also designed and constructed to the same high standards as the interstate system. The total of 468 truck trips spaced throughout the duration of construction using this road to make deliveries to the Dutch Hill and Cohocton projects would have very little if any impact to the roadway infrastructure.

- State Route 415 North (SR 415): This section of the route is approximately 8.6 miles in length. This route follows the Cohocton River through the hamlet of Wallace into the Village of Cohocton. There is ample pavement width to handle the additional 324 truck trips anticipated by simultaneous construction of the Dutch Hill and Cohocton Projects. As previously stated, the additional 324 truck trips would be spread throughout the duration of the construction phase and would not occur at one time. Therefore, the cumulative impact to the roadway infrastructure is expected to be very low. Though this route leads to the Village of Cohocton, it is important to note that all wind turbine transport vehicles will be exiting SR 415 before reaching the Village and will be traveling along designated by-pass roads to avoid using local roads in the Village. Therefore local congestions and damage to road infrastructure within the Village is not anticipated.

- Village By-Pass Routes: In the Town of Cohocton, both wind projects share a portion of SR 415 northbound between Wentworth Road and Newcomb Hollow Road for approximately 2.5 miles before turning onto designated By-Pass routes to avoid the Village community. For the Cohocton project, the designated By-Pass route is Newcomb Hollow Road. Newcomb Hollow Road has direct access to the Lent Hill area where the majority of the wind turbine sites are located. For the Dutch Hill project, the designated By-Pass route is Jones Road. Jones Road has access to Loon Lake Road (CR 121) which in turn has direct access to SR 415 (west of Cohocton Village) and Davis Hollow Road where the Dutch Hill project is proposed. These By-Pass routes were specifically identified and evaluated as the best routes around the Cohocton Village so as to not create "bottlenecks" on Maple Avenue, Wilcox Street, Hill Street, North and South Main Streets.

- Northbound Truck Route: Potential areas of cumulative traffic impact traveling northbound would be confined primarily to traffic on Interstate 390 Northbound from Exit 1 to Exit 2 for a distance of approximately 11 miles. Both wind projects may be required to travel this route to make deliveries to different wind turbine sites. Deliveries for Dutch Hill will likely use Exit 2 from I-390 North while deliveries for Cohocton will likely use Exit 3 from I-390 North. The number of truck trips along this route is increased by 324 trips to a total of 468 trips throughout the duration of construction, if construction of the Dutch Hill Wind Project occurs on the same construction schedule as the Cohocton Wind Power Project. The additional impact to the interstate highway infrastructure is expected to very low because the interstate highway system is designed and constructed to handle heavy volume and heavy loads.

8.2.2.2 Avian Impacts

Using the assumptions presented previously regarding potential worst case per-turbine avian mortality, the Dutch Hill and Cohocton Projects together could include up to 52 turbines, which would result in up to 312 bird collision fatalities annually assuming 6 birds per turbine per year. Adding this to the two Prattsburg project would result in a total of 876. However, this cumulative impact is still a small fraction of the bird population that resides in or migrates through the area and would not be biologically significant.

The fatality rates of bats documented at some mid-Appalachian wind power facilities do provide credible cause of concern regarding the potential cumulative impact of wind power developments on bat populations. However, considerable variability in documented fatality rates for bats has been observed across the country and across the landscapes on which wind energy developments have been constructed. As mentioned previously, based on current available data, there is no way to accurately predict bat mortality at a specific wind power sites based on preconstruction data, let alone multiple sites.

8.2.2.3 Visual

Construction of the Dutch Hill Wind Project and Cohocton Wind Project in proximity to one another does have the potential to create cumulative visual impacts. The cumulative viewshed analysis of the proposed Dutch Hill and Cohocton Wind projects is presented in Figure 7 of Appendix H. Due to the screening effect of topography and vegetation, it is expected that views will be limited to ridge tops. Areas within the Cohocton River Valley and Naples Valley have potential views of the two projects.

To evaluate potential cumulative visual impact of the Cohocton and Dutch Hill Projects, the VIA (Appendix H) included preparation of a visual simulation from Viewpoint 195 at Kirkland – Lent Hill Road in the town of Cohocton looking west (Appendix H, Figure 23). This viewpoint is approximately 3.4 miles from the nearest Dutch Hill turbine that would be visible in this view, and about 0.5 mile from the nearest Cohocton Wind Farm turbine that would be visible in this view. The Dutch Hill turbines can be seen on the background ridge, while several turbines in the proposed Cohocton Project are visible in the foreground. Rolling agricultural fields, hedgerows, and woodlots in the foreground and mid ground partially screen nearby agricultural structures. The view is typical of the upland agricultural landscape similarity zone and has strong horizontal lines and rural character. It is likely that from more distant viewpoints, the visual impact of the two projects will be greater than one due to the large number of visible turbines and their potential to span across a broad expanse of the view.

8.2.2.4 Air Quality

There is not any anticipated cumulative impact to air quality during construction of the Project due to the distance between the projects. There will be a cumulative positive impact from the operation of the Project which will result in the avoidance of the following emissions to the air.

Table 27. Estimated Emissions Reductions Resulting from the Projects

Compound	Emission Factor (lbs/MW-hr)	Total Annual Reductions (tons/year) [1]		
		Cohocton	Dutch Hill	Total
Nitrogen oxides	1.363	161	72	233
Sulfur dioxide	1.765	209	93	301
Carbon dioxide	1,274	150,660	66,960	217,625
Particulate matter less than 10 microns in diameter	0.041	4.8	2.2	7.0
Volatile Organic compounds	0.035	4.1	1.8	6.0
Mercury	2 E-06	0.0002 (0.47 lbs/yr)	0.0001 (0.21 lbs/yr)	0.0003 (0.68 lbs/yr)

[1] Assumes during an average year that 341,640 MWhrs of electrical power will be generated by the two projects (assuming a 30% capacity factor), 236,520 MWhrs by Cohocton and 105,120 MWhrs by Dutch Hill.

8.2.2.5 Noise

The operational noise of the Dutch Hill Wind and adjacent Cohocton Wind Project were evaluated to determine the magnitude of any cumulative effects. The Cohocton turbines are located generally to the east of the Dutch Hill Wind Project area with the closest turbine being approximately 1.5 miles away.

Additional noise modeling was conducted to evaluate any potential noise impacts on residents in the area due to the cumulative noise of both projects. The most current coordinates for the Dutch Hill turbines and the Cohocton Wind turbines were used in the model. Appendix K, Plot 3 shows the sound levels out to the 45-dBA “threshold” for both projects. The Cohocton Wind Project is proposing to use the same turbine as Dutch Hill Wind Project that is the Clipper Liberty C96 on 80-meter towers.

Since the nearest wind turbine is approximately 1.5 miles away, the noise from the two projects will not be additive and therefore there will be no cumulative increase in noise at any receptor on Dutch Hill. The sound level from the Cohocton Wind Project will be 25 dBA or less when the wind turbines are operating at their maximum noise point. This is well below the natural background level of 39 dBA meaning that noise from the Cohocton Wind Project would be inaudible on Dutch Hill (Appendix K).

8.2.2.6 Socioeconomics Update

In regard to cumulative economic impacts, the Economic Impact Analysis prepared for the Dutch Hill Project (Appendix N) also evaluated the potential impact of both the Cohocton and Dutch Hill Projects. This study reported that approximately $245 million in investment would be needed to construct the Cohocton and Dutch Hill Wind Farms, and that construction of both facilities would generate approximately 101 full time construction-related jobs for a 7.4 month period. Wages resulting from these jobs are estimated at approximately $4.14 million. The construction of the two wind farms will collectively have a spin-off of approximately 886 jobs, bringing the projected total economic impact of construction to 987 jobs. Earnings derived from construction wages will have a spin-off projected at approximately $1.054 million, bringing the total estimated economic impact from household wages to $3.958 million. The $245 million in total construction investment will generate indirect and induced impacts of approximately $345 million, brining the total economic impact to over $590 million for the two wind farm facilities.

Once in operation, the Cohocton and Dutch Hill Wind Farms will have a combined generation maximum capacity of up to 125 MW of power. Both wind farms will need the services of one Operations Manager, one Quality Control Engineer, one Bookkeeper/Secretary and four Wind Technicians. Staff time utilization will be divided at 70% utilization for the Cohocton Wind Farm and 30% utilization for the Dutch Hill Wind Farm.

Total direct earnings comprising of direct wages and leases paid to landlords for both sites are estimated at $768,000 annually. Wages for the Cohocton and Dutch Hill Wind Farms are estimated at $355,000 per year for a staff of seven. Leases are collectively projected at approximately $625,000, comprising 2.5% of annual gross receipt (output) per year. The seven jobs generated by operating the wind farm facilities will result in a spin-off of approximately 22 jobs, bringing the total impact of combined project operation to 29 jobs. These full-time jobs create other jobs in other sectors of the economy through expenditures derived from household wages. Earnings are projected to have an indirect and induced impact of approximately $161,000 annually, bringing the total economic impact on earnings to approximately $928,000 per year. Revenues are projected to generate approximately an additional $30.773 million in output, bringing the total economic impact on gross sales and receipts (output) to approximately $55.773 million per year.

8.2.3 Other Steuben County Wind Energy Projects

It is reasonable to assume, based upon the limited information provided by the interconnection queue, that all of the proposed Project Sites for the remaining five wind energy projects proposed in Steuben County are located approximately 3 to 30 miles from the Project Site. Given that, cumulative impacts to area residences from noise or shadow flicker are unlikely, as the turbines would not overlap or be interspersed with proposed Dutch Hill turbines (i.e. be located within 1,200 feet of each other). However, potential cumulative impacts could include construction-related impacts to area roads and bridges. This would only occur if two or more projects were constructed simultaneously and if they used the same construction delivery routes. Should this situation arise, any cumulative impacts would be temporary and short-term in nature. Upon issuance of approvals of individual projects, coordination of transportation routes would be undertaken by the involved project developers to assure that the duration and extent of impact is minimized and that road repair/restoration work is accomplished at the appropriate time, and at not cost to the affect jurisdictions.

The most likely cumulative impact resulting from the construction of multiple proposed wind power projects within the County would be the effects on visual/aesthetic resources and community character. The cumulative impact of multiple projects will be highly variable depending upon the number of turbines visible, their proximity to the viewer, the landscape setting and the viewer's attitude toward wind power. If multiple projects were visible from a particular viewpoint, the typical scenario would have portions of one project being visible in the foreground while another is visible in the background. Although a project may be visible from many miles away, its visual impact diminishes significantly at distances over 3.5 miles (Eyre, 1995). In addition, long distance views across Steuben County are highly variable and often screened by valley topography and forest vegetation. Consequently, visibility of multiple projects (if they are ultimately built) would generally be restricted to elevated, open (agricultural) areas, where residential density is generally lower (as opposed to villages and hamlets which are often located in valley setting and have limited outward views to the landscape due to the presence of building and trees).

9.0 EFFECTS ON USE AND CONSERVATION OF ENERGY RESOURCES

The proposed Project will have significant, long-term beneficial effects on the use and conservation of energy resources. The operating Project will generate up to 40 MW of electricity without any fossil-fuel emissions. Assuming that the average house in Western New York uses approximately 500 kilowatt hours of electric power per month, and assuming the Project actually generates approximately 30% of its nameplate generating capacity, this is enough power to support approximately 16,000 homes in New York State (on an average annual basis). The Project will add to and diversify the state's sources of power generation, accommodate growing power demand through the use of a renewable resource (wind) and over the long term may displace some of the state's older, less efficient, and dirtier sources of power.

It will also facilitate compliance with the PSC "Order Approving Renewable Portfolio Standard Policy," issued on the 24th of September 2004. This Order calls for an increase in renewable energy used in the state to increase to 25% (from the then level of 19%) by the year 2013. The principal benefits of the Project are in accordance with the 2002 State Energy Plan (NYSEPB, 2002), namely:

- "Stimulating sustainable economic growth;"

- "Increasing energy diversity…including renewable-based energy;" and
- "Promoting and achieving a cleaner and healthier environment."

In response to statements by wind power opponents that such projects will not address global warning and our dependence of fossil fuels, Charles Kamanoff, in a recent article in the on-line publication Orion (Kamanoff, 2006) offers the following response:

> "This notion is mistaken. It is true that since wind is variable, individual wind turbines can't be counted on to produce on demand, so the power grid can't necessarily retire fossil fuel generators at the same rate as it takes on windmills. The coal- and oil-fired generators will still need to be there, waiting for a windless day. But when the wind blows, those generators can spin down. That's how the grid works: it allocates electrons. Supply more electrons from one source, and other sources can supply fewer. And since system operators program the grid to draw from the lowest-cost generators first, and wind power's "fuel", moving air, is free, wind-generated electrons are given priority. It follows that more electrons from wind power mean proportionately fewer from fossil fuel burning."

10.0 REFERENCES

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