Draft Environmental Impact Statement for the Hounsfield Wind Farm

Town of Hounsfield
Jefferson County, New York

Lead Agency:
New York State Department of Environmental Conservation
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, New York 12233
Steven Tomasik
518-486-9955

Project Sponsor:
Upstate NY Power Corp
950-A Union Road, Suite 20
West Seneca, NY 14224

Prepared by:
American Consulting Professionals of New York, PLLC
70 Niagara Street, Suite 410
Buffalo, NY 14202

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CONSULTANTS CONTRIBUTING TO THE PREPARATION OF DEIS

American Consulting Professionals of NY 70 Niagara Street, Suite 410 Buffalo, New York 14202 (716) 362-1116 Mark Colmerauer www.acp-ny.com	**ESS Group** 401 Wampanoag Trail, Suite 400 East Providence, Rhode Island 02915 (401) 434-5560 Steve Wood http://www.essgroup.com
URS Corporation 77 Goodell Street Buffalo, New York 14203 (716) 856-5636 Kevin Shanahan www.urscorp.com	**C&S Companies** 499 Col. Eileen Collins Boulevard Syracuse, NY 13212 (315) 455-2000 Bryan Bayer www.cscos.com
Old Bird, Inc. 605 W. State St. Ithaca, New York 14850 (607) 272-1786 William R. Evans www.oldbird.org	**Stantec** 30 Park Drive Topsham, ME 04086 (207) 729-1199 George Kendrick www.stantec.com
Terrestrial Environmental Specialists, Inc. 23 County Route 6, Suite A Phoenix, NY 13135 (315) 695-7228 Don Coogan http://home.alltel.net/tesinc/	**North East Ecological Services** 52 Grandview Road Bow, NH 03304 (603) 228-9308 D. Scott Reynolds, PH.D.
Nixon Peabody LLP 1100 Clinton Square Rochester, NY 14604 (585)263-1000 Robert Burgdorf, Partner http://www.nixonpeabody.com	**Young Summer Ward** Five Palisades Drive Albany NY 12205 (518) 438-9907 Doug Ward, Partner
Panamerican Consultants, Inc. 2390 Clinton Street Buffalo, NY 14227 (716) 821-1650 Frank J. Schieppati www.panamconsultants.com	**Saratoga Associates** 109 South Warren Street, Suite 400 Syracuse, NY 13201 315 288 4286 John Guariglia, RLA www.saratogaassociates.com/

Commonwealth Associates, Inc. 2700 Argyle St. Jackson, MI 49202 (517) 796-6187 J. Fernando Arze-Peredo, P.E. www.cai-engr.com	**Comsearch** 19700 Janelia Farm Boulevard Ashburn, Virginia 20147 (703) 726-5500 Denise Finney, Manager www.comsearch.com

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Acronyms

AST	Aboveground Storage Tank
BCA	Bird Conservation Area
BMP	Best Banagement Practices
CWA	Clean Water Act
CY	Cubic Yards
DANSY	New York State Dormitory Authority
DEIS	Draft Environmental Impact Statement
ECS	Electrical Collection System
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
gpd	Gallons Per Day
gpm	Gallons Per Minute
HDD	Horizontal directional drilling
Hz	Hertz
kWh	Kilowatt Hour
LCM	Landing Craft Mechanized
LOIWMA	Lake Ontario Islands Wildlife Management Area
LWRP	Local Waterfront Revitalization Program
MOA	Memorandum of Agreement
MW	Megawatts
MWh	Megawatt Hours
NEPA	National Environmental Policy Act
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NYSDOS	New York State Department of State
NYDPS	New York Department of Public Service
NYISO	New York Independent System Operator
NYNHP	New York Natural Heritage Program
NYS	New York State
NYSDAM	New York State Department of Agriculture & Markets
NYSDEC	New York State Department of Environmental Conservation
NYSERDA	New York State Energy Research and Development Authority
NYSM	New York State Museum
NWI	National Wetlands Inventory
O&M	Operations and Maintenance
PILOT	Payments in Lieu of Taxes
PBS	Petroleum Bulk Storage
PSC	New York State Public Service Commission
PTC	Production Tax Credit
RGGI	Regional Greenhouse Gas Initiative
RHA	Rivers and Harbors Act of 1899

ROW	Right of Way
RPS	Renewable Portfolio Standards
SEQRA	State Environmental Quality Review Act
SCFWH	Significant Coastal Fish and Wildlife Habitats
SHPO	New York State Historic Preservation Office
S/NRHP	State and National Registers of Historic Places
SPCC	Spill Prevention, Control and Countermeasures
SPDES	State Pollutant Discharge Elimination Standards
SWPPP	Stormwater Pollution Prevention Plan
USACE	United States Army Corp of Engineers
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
V	Volt
VRA	Visual Resource Assessment
WTG	Wind Turbine Generators

Executive Summary

This Draft Environmental Impact Statement (DEIS) has been prepared for the proposed action known as the Hounsfield Wind Farm (the Project). This Executive Summary presents a synopsis of the project description, statement of purpose, need and benefit, summary of impact assessment, summary of mitigation and an overview of other alternatives considered.

Project Description

Introduction

The Project is a utility scale wind farm project located in eastern Lake Ontario, on Galloo Island, in the Town of Hounsfield, Jefferson County, New York. It will be owned and operated by the Upstate New York Power Corp (Upstate Power) of West Seneca, New York. Upstate Power is affiliated with Babcock & Brown Renewable Holdings, Inc and Babcock & Brown International Pty, Ltd. (collectively "Babcock & Brown").

Proposed Action

The Action subject to SEQR involves the permitting/approvals for the construction and operation of the Project, which consists of up to 84 wind turbine generators (WTG), capable of generating up to 252 megawatts (MW) of power at peak capacity, and related support facilities. Key Project elements include construction, maintenance and operation of:

- 84 3.0 MW WTG having a 90 meter rotor diameter and a hub height of 80 meters, for a total maximum height of 125 meters (410 feet) from blade tip to ground.
- 34.5 KV electrical collection system (ECS) connecting all WTG to an on-island electrical substation. The ECS will be both above ground and below ground.
- 17.25 miles of private service roads (up to 38 feet wide).
- One permanent meteorological tower, approximately 80 meters in height.
- Maintenance and operation facilities housed in two buildings of approximately 20,000 square feet each.
- A temporary rock crushing facility and concrete batch plant.
- Permanent and temporary housing facilities for construction, operation and maintenance staff. Permanent residential facilities include two three-story

structures of 12 units each, and a community building housing kitchen and dining facilities, infirmary, laundry and recreational facilities. Temporary housing consists of 4 modular buildings, each having 32 rooms.

- A potable and fire protection lake water intake system.
- A potable water treatment system
- A sewage treatment system.
- An auxiliary power generating system.
- A closed loop geothermal heating and cooling system for permanent residential facilities. The closed loop system will utilize approximately 36 - 400 foot-deep wells located within the residential and support facilities complex.
- A channel slip and offloading/storage area, which together make the offloading facility, to allow for delivery and storage of materials and equipment.
- A helicopter pad.

The Project will have the ability to generate up to 252 megawatts (MW) of power at peak capacity. Assuming the Project will generate electricity at 33-34% of its nameplate capacity throughout the year, it is estimated the Project's average output will be approximate 83.2 MWs (approximately 728,482 MW hours per year). This percentage (or capacity factor) represents a total yearly average output versus nameplate output for the Project.

The Project construction is anticipated to begin in April 2010 and to be complete by the end of October 2012. The three-year construction schedule considers the difficulties associated with working on Galloo Island in the winter months and therefore on-island construction work will only take place between April and November each year. Once complete, the Project will employ approximately 24 full time operation and maintenance employees. Detailed descriptions of key project components, design rationale, construction activities and wind farm operations are presented in Section 1.0 (Project Description).

Off-Island Transmission Facilities

In additional to the on-island Project activities, Upstate Power intends to construct a transmission line to link the Project on Galloo Island with the New York State Power Grid operated by the New York Independent System Operators (NYISO). Although the

Project will generate power in Jefferson County (in the NYISO Mohawk Valley Zone E), due to limitations in transmission capacity Upstate Power will construct the transmission line from the Project site to a new substation in Mexico, NY (in NYISO Central Zone C) where it will interconnect to a 345 kV line transmission trunk line, which has capacity to accept additional power.

The construction of the approximately 50.6-mile transmission line (approximately 2.6 miles on island, 9 miles under Lake Ontario, and 39.0 miles across the mainland), together with interconnection facilities (substations) and other related facilities are subject to the review jurisdiction of the New York State Public Service Commission (PSC) under Public Service Law Article VII. As such, it is a Type II action under SEQRA (6 NYCRR §617.5(c) (35)) and therefore not subject to SEQRA review (6 NYCRR §617.5(a)) and the transmission line is not included within the "Project" subject to this DEIS. The impacts from the transmission line however, are presented in Section 6.0 (Cumulative Impacts).

Purpose, Need and Benefit

The purpose of the Hounsfield Wind Farm Project is to develop a wind powered system to generate electricity from a clean renewable source and to sell that power to the power grid in the New York State energy market.

Project benefits include:

- The project will advance the goals of the State's Renewable Portfolio Standard (RPS) Policy, which calls for New York State to increase its use of renewable energy to 25% by 2013, as well as the recent announcement in NYS Governor Patterson's January 7, 2009 announcement that: "By 2015, New York will meet 45 percent of its electricity needs through improved energy efficiency and clean renewable energy."
- The Project takes advantage of one of New York's most productive sources of clean, renewable energy and therefore is fully consistent with the NYS Energy policy.
- At the federal level, the Project's goal to provide electricity to the public using wind, a clean, renewable resource, supports the federal government's policy as articulated in 42 U.S.C. 9201 to "hasten the widespread utilization of [wind energy] systems," .

- According to the 2001 Energy Information Administration (EIA) annual data, the average northeastern household uses approximately 7.8 MW hours per year. Therefore, the Project is anticipated to provide enough electricity to power the equivalent of approximately 93,400 households.
- At 252 MW nameplate capacity, over a 20-year period, the Project could reduce emissions (by displacing the average mix of fossil fuel generated power) by:
    - 13.8 billion pounds of CO2
    - 49.9 million pounds of SO2, and
    - 18.5 million pounds of NOx.
- While the Project is not anticipated to directly lead to a shut down of a fossil fuel burning power plant, the Project lessens the demand for development of additional fossil-fuel burning power plants to meet the anticipated future energy demands of the State.
- Clean, renewable sources of energy produced domestically also reduce this nation's need for foreign oil, reducing its dependency on foreign nations to meet this demand, and thereby enhancing national security.
- Direct local economic benefit from the creation of approximately 200 construction jobs and up to 24 permanent jobs.
- Indirect or economic benefit from increased demand for support services, such as equipment, food, fuel and transportation services needed to sustain the housing and support facilities on Galloo Island.
- Payments in lieu of taxes (PILOT) payments are anticipated to value $8,000 per MW. At 252 MW, total PILOT payments are anticipated to be approximately $2.02 million and are expected to be split between the Town of Hounsfield, Jefferson County, and the Sackets Harbor Central School District. After the term of the PILOT agreement expires, the Project will be taxed at its full assessed value.

Permits and Approvals

Permits and approvals at the federal, state and local levels are anticipated from the following agencies prior to the construction and operation of the project:

AGENCY	PERMIT / APPROVAL
Federal Aviation Administration	Notice of Construction or Alteration pursuant to 49 USC 44718
United States Army Corps of Engineers	Joint Application for Nationwide Permit for Alternation to Wetlands pursuant to 33 USC 1251
United States Army Corps of Engineers	National Environmental Policy Act determination pursuant to 42 USC 4321
Advisory Council on Historic Preservation	Consultation under Section 106 of the National Historic Preservation Act

US Fish and Wildlife Service	Consultation under Section 7 of the Endangered Species Act
New York State Department of Environmental Conservation	Findings for the State Environmental Quality Review Act pursuant to 6 NYCRR Part 617
New York State Department of Environmental Conservation	Joint Application for Water Quality Certification pursuant to 33 USC 1341
New York State Department of Environmental Conservation	Joint Application for Wetlands Permit pursuant to ECL Article 24
New York State Department of Environmental Conservation	Joint Application for Protection of Water Permit pursuant to ECL Article 15
New York State Department of Environmental Conservation	Joint Application for Potable Water Supply pursuant to ECL Article 15
New York State Department of Environmental Conservation	SPDES General Permit No. GP-0-08-001 for Stormwater Discharges from Construction Activities, pursuant to ECL Article 17
New York State Department of Environmental Conservation	Review and approval of Stormwater Pollution Prevention Plan pursuant to ECL Article 17
New York State Department of Environmental Conservation	SPDES Permit for Discharge of Treated Wastewater pursuant to ECL Article 17
New York State Department of Environmental Conservation	Registration for Petroleum Bulk Storage pursuant to 6 NYCRR Part 614
New York State Department of State	Consultation for Coastal Zone Consistency Review pursuant to 16 USC 1451
New York State Department of Health	Ministerial approvals for transient housing, infirmary, food service, sewage treatment plant.
New York State Office of Parks, Recreation and Historic Preservation, State Historic Preservation Office	Consultation required pursuant to PRHPL 14.09
Public Service Commission*	Certificate of Public Convenience and Necessity pursuant to Section 68 of the PSL and determination under Article VII of the PSL
Town of Hounsfield Planning Board	Site Plan Review pursuant to Hounsfield Zoning law Area Variance pursuant to Hounsfield Zoning law Building Permits pursuant to Hounsfield Town law.
Jefferson County Planning Board	Zoning Referral and recommendation pursuant to Gen. Mun. Law 239-m
Jefferson County IDA	Financing/leasing and PILOT Agreement
Sacket's Harbor Central School District	Approval of PILOT Agreement
Potential	
New York State Department of Environmental Conservation	Incidental Take Permit pursuant to ECL Article 11(Potential)

*Environmental assessment for transmission line (submission pursuant to Article VII of the PSL) is addressed outside this DEIS.

Resource Characterization, Impact Assessment and Mitigation

Through the public scoping process, assessment areas were identified for evaluation in the DEIS. Each potentially affected resource was first characterized, and then potential impacts were evaluated and described (quantified where appropriate), and mitigation

measures were proposed. The significant potential adverse impacts and proposed mitigation(s) are identified and briefly described below.

Impacts to Topography, Geology and Soils

Potential impacts to topography, soils and bedrock, which are anticipated in both the construction and operational phases of the project, include:

- Limited, temporary impacts to soils will result from the clearing, excavation and filling activities associated with establishing crane pads, foundations and ECS.
- Impacts to bedrock are anticipated from blasting during construction.

No significant permanent impacts to surface topography or soils are anticipated from the construction or during the operation and management of the project.

Topography, Geology and Soils Mitigation

Impacts to topography and soils will be mitigated by:

- Avoiding wetland disturbance where practicable;
- Obtaining required wetland disturbance permits;
- Minimizing disturbance of agricultural fields;
- Re-using topsoil on site; and
- Implementing the requirements of the Project's Conceptual Storm Water Pollution Prevention Plan (SWPPP).
- Impacts on topography and soils as a result of blasting will be minimized by utilizing a blasting contractor certified to operate in New York State and complying with all applicable Federal and State requirements.

Land and Land Use Impacts

The permanent impacts to the land are associated with the permanent conversion of land (approximately 162 acres) from its existing use (primarily vacant land and residential-estate) to new wind farm facilities. In addition, as part of the mitigation plan for wetland impacts, approximately 0.27 acres of vacant uplands will be permanently converted to wetland.

Outside the land permanently converted for Project use, there will be approximately 154 acres temporarily impacted for construction staging areas, laydown areas at the WTG and for the concrete bath plant.

Because the predominant land use on Galloo Island is vacant or otherwise unoccupied, the permanent conversion of approximately 162 acres of the 1,966 acre uninhabited island (8.2%) does not represent a significant adverse impact to existing land use.

Land and Land Use Mitigation

Approximately 154 acres of temporary impacts to land will be mitigated by restoring the sites to pre-construction conditions to the extent practicable.

Impacts to Agricultural Resources

The Project will result in the following impacts to the existing agricultural land on Galloo Island:

- Temporary impacts resulting from construction activities in the agricultural area may include erosion, topsoil mixing, and soil compaction.
- The Project will result in the permanent loss of approximately 14 acres of agricultural resources.

Agricultural Resources Mitigation

Proposed mitigation measures for agricultural impacts include:

- Implementation of the Sediment and Erosion Control Plan;
- Segregation and marking topsoil stockpile areas; and
- Soil decompaction prior to topsoil restoration.

Water Resources

<u>Impacts to Surface Waters</u>

Potential impacts to surface waters from Project activities (upland and in-water) will include:

- Impacts associated with discharges of eroded materials and stormwater to the stream and surface waters during construction and operation;
- Impacts from the construction of the docking facility and barges used to transport equipment and materials;
- Impacts from water and sewage treatment;
- Need for maintenance dredging at the offloading facility;
- Navigational impacts during construction, operation and decommissioning;

- Water quality impacts associated with boating activities for the maintenance and inspection of project facilities;
- Use of herbicides to control invasive plant species;
- Impacts from releases of regulated materials to streams and surface waters; and
- Use of lake water intake for drinking, fire protection, dust control, and the concrete batch plant operation.

Surface Waters Mitigations

Mitigation measures for potential negative impacts on surface waters include:

- adherence to all general and special conditions of the SPDES and Water Intake permits to minimize impacts during construction and operation;
- construction of wetland crossings by roads with a pervious stone fill; and
- storage of fuels, oils and other chemicals in accordance with the procedures in the SWPPP, and the Spill Prevention, Control and Countermeasures Plan (SPCC).

Impacts on Sediment

There will be no impact on the sediments in the two water bodies on Galloo Island.

Each of the water-based components will have short term impacts during their construction.

- Blasting and excavation for the navigational entrance channel will not cause resuspension of sediment or turbidity due to the lack of sediment.
- The temporary groin will not result in accretion of littoral drift materials due to the nature of the bottom substrate at the site (very little sediment present).
- Due to the nature of the sediment and lake bottom, the proposed offshore floating breakwater will have no effect on sediment transport and deposition.
- It is possible that over an extended time, minor quantities of sediment may accumulate in the submerged slip channel and approach. This may require dredging to occur in order to maintain the full capacity of the channel.

Sediment – Mitigations

- Implementation of the required Stormwater Pollution Prevention Plan will reduce the possibility of impacts from construction activities anywhere on the island.
- In water blasting work will be limited to avoid sensitive fish spawning dates.
- No project construction will occur in sensitive fish habitat.
- If feasible, directional boring of the water intake and treated waste water discharge will be used.

Wetlands Impacts

After conducting wetlands delineations, the Project layout was adjusted to first avoid and then minimize impacts to wetlands. The preferred alternative described in this DEIS does not place any WTG in wetland areas. The Project has avoided wetland impacts to the greatest extent practicable. The primary impact of the Project on wetlands includes:

- The loss of 0.098 acres of wetland from fill for road construction; and
- The loss of 0.69 acres from ECS.

Wetlands Mitigation

Wetland mitigation for the Project includes:

- Measures taken during construction to avoid or minimize impacts.
- Measures to restore disturbed areas as close as practicable to pre-construction condition.
- Compensation for the unavoidable loss of about 0.79 total acres of wetland habitat is anticipated to be approximately 0.27 acres.
- Crossings of wetlands by service roads and ECS have been designed, wherever possible, to transect the wetlands at the narrowest possible points or at the peripheral edges in order to minimize habitat loss and impacts on wetland hydrology.
- Road crossing will have base layers of large stone to ensure a permeable media that allows proper movement of water between sections of wetland separated by the roads. and
- Wetland mitigation will also include taking all measures to prevent and reduce the impact of soil erosion during project construction and containment of various materials to protect wetlands and waterways during construction and operations.

Ground Water Impacts

Generally, impacts to groundwater due to the construction and operation of the Project are not anticipated.

Ground Water Mitigations (Protections)

- Groundwater impacts associated with the storage of petroleum are not anticipated, however, in the event of a spill, potential impacts will be minimized by the implementation of a SPCC Project Plan.
- Groundwater pumped from excavations will be handled in accordance with NYS SPDES requirements under general permit GP-0-08-001.

- Long term mitigation of potential impact to ground water will occur by operating the Project under the specifications outlined in its SWPPP and SPCC Plan.

Wildlife and Habitat

Impacts to Flora and Fauna

Impacts to vegetation, wildlife habitat, and wildlife populations will result primarily from construction of individual turbine sites, staging areas, the electrical collection system, the substation, concrete batch plant, service roadways, and buildings. Impacts include:

- Approximately 154 acres of various habitat types will be temporarily affected during construction.
- Permanent impacts to flora from the Project will be approximately 162 acres.
- Operational phase impacts from the Project could include bird and bat collisions and minor disturbances to wildlife during maintenance activities.

Flora and Fauna Mitigation

- Mitigation to reduce the impact to flora and fauna include:
- avoiding wetland areas to the extent practicable;
- restoration of areas temporarily disturbed during construction;
- implementation of the Invasive Species Control Plan;
- implementation of the SWPPP; and
- avoiding the use of pesticides and herbicides to control vegetation except invasive plants in accordance with the Invasive Species Control Plan.

Impacts to Rare, Threatened and Endangered Species

Two sources of impact to rare, threatened and endangered species include: habitat disturbances and losses due to construction of structures and roads, and collision fatalities. Potential impacts include:

- As a result of the loss of approximately 63.95 acres of the open field and 13.96 acres of agricultural habitat, minor impacts may occur for species that utilize those habitats, such as the Northern Harrier (state-threatened), the Upland Sandpiper (state-threatened) and short-eared owl (state endangered).
- Minor impacts could occur for the Cooper's Hawk from the disturbance of approximately 75.98 acres of deciduous forested habitat and 4.81 acres of mixed forested habitat.
- Collision risks and fatalities of avian species, including threatened and endangered species, are addressed in the avian section (2.5.3) of this DEIS.

- Disturbances to vegetation cover types in which the state listed threatened species, the troublesome sedge, may be found.
- Significant losses of state threatened plants are not expected as a result of the project.

Mitigation for Rare, Threatened and Endangered Species (other than Avian Species, which is discussed below)

- Since troublesome sedge was quite prolific and found in various habitats throughout the island, the loss of some plants at a particular worksite would not adversely affect population levels on the island, and no mitigation is required.
- Based on the analysis provided in the studies conducted in support of this EIS, there will be no substantial impact to rare, threatened and endangered species (other than avian species),and thus no additional mitigation is proposed.

Impacts to Avian Species

The main risks to avian species associated with the Projects are the loss of habitat from construction of project components and collisions with WTG. Summaries of avian studies conducted to date for the Project and assessment of collision risks and fatalities of avian species are addressed in detail in Section 2.5.3. A brief summary list of avian impacts includes:

- Displacement of resident/breeding birds can occur because of the loss of habitat or due to disturbances that occur during nesting periods.
- Some displacement of ground nesting birds from the vicinity of the turbine sites may occur, and this could possibly reduce population sizes of several species. Any nesting disturbances would be localized in nature and no substantial effects on population levels of the predominant avian species or avian diversity are anticipated.
- Habitat related impacts to waterfowl will be low.
- Based on pre-construction avian studies at Galloo Island, bird studies at other regional wind farm projects and bird migration dynamics documented or theorized for the northeastern Lake Ontario region, the following specific avian trends are likely for the Project:
- Varying levels of collision fatalities might occur to: of Ring-billed Gulls, Double-crested Cormorants and Caspian Terns making foraging flights over Gallo Island.
- Waterfowl collision fatalities would likely occur, but in small numbers because of the relatively little waterfowl activity in the RSZ over Galloo Island.
- Rough-legged Hawk and Bald Eagle collision risk during winter may occur. However, it should be noted that to date no Bald Eagles have been impacted by

Wind Projects and there is no study or data regarding avoidance or evasive behavior regarding this species.

- Nocturnal and diurnal migrating passerines would likely have lower collision fatalities per MW at the Project than the Wolfe Island Wind Farm and other wind projects in the eastern coastal zone of Lake Ontario.
- While the Project would likely have fewer nocturnal and diurnal migrant passerines flying in the RSZ during the day than coastal and inland wind projects sites, there may be a higher collision risk per individual at the Project due to migrants repeatedly traversing the island, especially in the mornings.
- There are no grounds to expect that the Project would cause anything but very low collision mortality for the breeding birds on Galloo Island.

Mitigation for Avian Species

Measures that can reduce impacts on avian species have been incorporated into the preliminary design of the Project. These include:

- Use of free-standing tower steel monopole structures for the WTG and permanent meteorological tower (rather than lattice or guyed towers);
- Paint WTG in white, off-white or a pale color to be readily visible to migrating birds; and
- Design a lighting scheme to minimize attraction to migrating birds to the extent allowed by FAA standards.
- In additional to design considerations other avian mitigation measures may include:
    - Reintroduce fox to the island and allow coyote to repopulate Galloo Island to reduce the size of the vole population maxima and lead to lower winter raptor numbers.
    - Elimination of agricultural operations at the north end of Galloo Island to reduce or eliminate foraging areas for Canada Geese and migratory shorebirds.
    - Culling the artificially high deer population on Galloo Island. This will lead to fewer dead deer and reduced flight activity of Bald Eagles in the island's interior for feeding on carcasses.
    - Participation in nontoxic control programs to curtail pale swallow-wort, Canadian thistle and other introduced plant species that out compete native plant species to preserve natural avian and plant species diversity, and
    - Minimize permanent lighting on Galloo Island to only that necessary. Any required lighting should be shielded and pointed in the downward direction.

Impacts to Bat Species

Impacts to bats can occur during construction and operation of wind farms from habitat loss or degradation, habitat fragmentation, construction disturbances and collision with WTG. Impacts to resident bats from habitat disturbances are expected to be low in the Project area.

- Based on the pre-construction monitoring and risk assessment prepared by NEES, it is possible that a small population of migratory tree bats could be at risk of collision with WTG.

Mitigation for Bat Species

Measures that can reduce the impact on bats have been included in the design of the project.

- Reduced number of WTG, has reduced the impact on bat habitat and potential collision.
- Lowered impact to the largest forested tracts has reduced forest fragmentation.
- Use of free standing permanent meteorological tower, and
- Use of buried ECS to the extent practicable.

Impacts Fish and Aquatic Species

Impacts to fish and other aquatic biota will occur during construction, operation and maintenance activities associated with the Project, include:

- Approximately 0.82 acres of habitat will be impacted by the construction of the slip channel and construction of the offloading slip will create new aquatic habitat from upland areas (approximately 0.46 acres of water at a depth of 14 feet below low water datum).
- Use of underwater explosives to construct the entrance channel will affect aquatic organisms, especially fish.
- Additional temporary impacts may occur from the construction of water intakes, when sidecasting of excavated material temporarily changes the habitat adjacent to the trenches.
- During the operation and maintenance phase, the water supply intake volume and velocity will be low and entrainment of aquatic organisms will be minimal.

Mitigation to Fish and Aquatic Species

Mitigation to avoid and reduce impacts to fish and aquatic species have been incorporated into the Project design.

- Minimized the amount of fill used in for the temporary unloading facility.
- Once the groin is removed, the effected lake bottom will be returned to preconstruction contours.
- Mitigation during excavation of the entrance channel will consist of procedures listed in the Blasting Plan that minimize blasting impacts along with timing of the activity to avoid significant fish migration and spawning periods.
- Use of blasting methods that essentially involves "confined blasting" will reduce mortality of fish from shock waves.

Impacts to Visual Resources

Following the NYSDEC policy for assessing and mitigating visual impact, a visual resource assessment (VRA) was conducted to identify potential visual and aesthetic impacts resulting from the Project. Impacts were identified and assessed in both qualitatively and quantitatively by the use of techniques such as viewshed mapping (for a conservative 15 mile radius), identification of visually sensitive resources, and determining the degree of project visibility. The following impacts to visual resources are anticipated:

- Only visual resources on Galloo and nearby islands and Lake Ontario itself offer views of the Project from the foreground or middle ground. Other resources are more than 5.6 miles from Galloo Island.
- Simple visibility of the proposed wind farm from any resource of statewide significance does not result in detrimental effect on the perceived beauty of the place or structure.
- The Project will not cause the diminishment of public enjoyment and appreciation of an inventoried resource.

Visual Resources Mitigation

Possible mitigation measures have been identified to reduce visibility of the project or otherwise alter the project's visual effect. Key mitigative actions include:

- WTG will not be used for commercial advertising, or include conspicuous lettering or corporate logos identifying the Project owner or equipment manufacturer.
- The color of the blades, nacelle, and tower will be a neutral off-white.
- Where specifications permit, non-specular paint will be used on all outside surfaces to minimize reflected glare.

- Aviation obstruction lighting will be proposed at the lowest intensity allowed by FAA requirements and atop the nacelle on only approximately 23 of the 84 turbines.
- No additional mitigation measures are necessary as the Project does not result in detrimental effect on the perceived beauty of an inventoried resource; nor will the Project cause the diminishment of public enjoyment and appreciation of an inventoried resource, or impair the character or quality of such a place.

Impacts to Archeological Resources

Field work for the Phase IB Archaeological Survey Investigation has been complete and an "end of field letter" has been prepared.

The Phase IB testing did not result in the identification of any significant archaeological finds.

Mitigation for Archeological Resources

- If during construction a previously unknown significant archaeological resource is discovered, all work at that site will cease until a representative from SHPO and a cultural resources company can be consulted.
- All areas identified in the Phase IB study as containing significant archeological resources will be avoided.

Impacts to Historic Resources

Potential impact to the Galloo Island Lighthouse and the other six structures on Galloo Island greater than 50 years old will be limited to visual impacts. The historic architectural significance of the lighthouse will not be adversely affected by the visual impact.

Mitigation for Historic Resources

In order to mitigate the impact to the historic Galloo Island Lighthouse, WTG will be painted off-white and have a neutral, low reflectivity finish.

Socioeconomic Impact

- No <u>adverse</u> socioeconomic impacts are anticipated from the Project
- No adverse impacts are anticipated for the Sackets Harbor Central School District as the Project is not expected to increase school enrollment above current levels as a result of the project.
- Temporary impacts during construction will not permanently impact recreational use of this portion of Lake Ontario.

- There is no additional need for increased fire or emergency medical services due to the construction and operation of the Project; therefore, no significant adverse impact is anticipated.
- Due to the remote location of the Project, no impact to tourism or tourism-related employment on the mainland is anticipated.
- Positive impacts to the local economy are anticipated from employment of approximately 200 employees required during construction, and up to 24 full time employees.
- A positive impact will result from $2.02 in payments in lieu of tax (PILOT) revenue anticipated to be split between the Town of Hounsfield, Jefferson County, and the Sackets Harbor Central School District.

Socioeconomic Mitigations

No mitigation measures are necessary.

Public Safety

Impacts on Fire Response

- Because there are no residential or commercial uses on the island there are no potential impacts to the public in the event of a fire onsite.
- Fire could result in the need for an evacuation of onsite personnel by either helicopter or boat.

Mitigation for Fire Response

- An Emergency Response Plan for the island will be implemented which will outline on site equipment and the procedures for fire suppression, medical and weather emergency evacuation as well as other critical areas.

Impacts on Aircraft Routes

- The WTG are outside of the Federal Aviation Administration (FAA) restricted area for public airports, and will have no impact on operation of public or private airports in the region.
- It is unlikely that the Project will have any impacts on FAA's long range radar and therefore, there is no need to consider limiting turbine heights on Galloo Island.
- WTGs may pose a risk to local small aircraft that fly over the lake and from time to time fly near or over Galloo Island.

Mitigations for Aircraft

- To reduce potential air navigation impacts to small, low altitude aircraft, the WTG will be lit according to recommended FAA standards for wind farms.

Impacts to Shipping Security

Adhering to the existing security measures in place for the St. Lawrence Seaway and the Port of Oswego, and it is not anticipated that international shipping of project equipment will result in any significant concerns and therefore, no additional mitigation measures are necessary.

Impacts to Substation Site Security

Given the remote nature of the island and the security measures that will be in place, there are no impacts to public safety associated with substation site security and therefore, no additional mitigation measures are necessary.

Impacts from Lightning

Due to the height of the turbines, there is a potential for lightning strikes.

Lightning Mitigation

The effects of lightning strikes are mitigated by turbine design. Each blade is grounded to minimize impacts from lightning and no additional mitigation measures are required.

Impacts from Microwave Beam Interference

No microwave paths were identified within the vicinity of Galloo Island; therefore, the Project will not affect microwave transmissions and therefore, no mitigation is required.

Impacts from Blasting

Based on the nature of the rock and its proximity to the surface, blasting will be required in most places where subsurface structures are required (WTG foundations and slip channel).

- Since the bedrock already contains significant joint systems that facilitate bedrock groundwater flow to the lake, blasting within the bedrock would have minimal additional impact to groundwater flow.
- Property damage that could occur would be minimized by the fact that the predominantly undeveloped island is owned and controlled by the developer.
- Impacts from blasting to the aquatic environment are not anticipated to be significant and are discussed in Section 2.5.6 Fish and Aquatic Species.

Blasting Mitigations

- Employing mitigations in the submerged blast zones will significantly reduce aquatic species impacts. These mitigations include:
- The Blasting Plan will adhere to all applicable regulations pertaining to blasting, including NYSDOL explosive handling regulations (12 NYCRR Part 39) and NYSDEC blasting/mining regulations.
- Blasting activities will be scheduled to avoid dates when there are high numbers of fish spawning and using the area for a nursery.
- The work will be located, to the extent practicable, outside of significant spawning and nursery areas.
- Employing the use of air bubble curtains.
- Employing "confined blasting" techniques.

Impacts from Abandonment and Decommissioning

In the unlikely scenario the Project is an abandoned, potential impacts related to the following may result:

- aesthetics,
- erosion and sedimentation,
- public safety, and
- navigation.

Abandonment and Decommissioning Mitigations

A Decommissioning Plan has been prepared and would be put in place in order to mitigate adverse impacts from abandonment. Key elements of the Decommissioning Plan include:

- Removal of the WTG and towers, removal of each of the tower pad transformers, and removal of foundations/pedestals to a minimum depth of 36" below grade or to bedrock, whichever is less.
- A bond or fund will be established to ensure that sufficient funds are available to decommission and restore the Project site.

Mandated FAA Lighting

- FAA requirement that the WTG be marked and lighted in accordance with the FAA standards will create a nighttime visual impact.
- FAA requirements that the helicopter pad meet FAA lighting requirements helipad will create a nighttime visual impact.

Mitigations to Mandated FAA Lighting

- Designing a lighting plan at the lowest intensity allowed by FAA requirements, and
- Only install lighting atop 23 of the 84 turbines.

Impacts to Air Resources

The WTGs themselves will not generate any air emissions, however, as with any typical construction project; the construction equipment will generate temporary emissions of various pollutants. Potential impacts include:

- The temporary operation of construction equipment will not result in emissions exceeding the nonattainment New Source Review (NSR) and Prevention of Significant Deterioration (PSD) thresholds.
- Operation of two 350 kw-hr diesel powered generators will not exceed emissions thresholds for VOCs, NOx, SO2, PM, Co, and lead, and as such, no pre-construction permit is required.

Mitigations for Air Resources

- Although operation of two generators at full capacity would not require an air permit, emissions will be reduced by the use of emission control equipment on the generators,

Alternative Summary

In addition to the Project, or Preferred Alternative, Upstate Power assessed five additional alternatives. Key impacts from each alternative were assessed and are summarized in the table and narrative below:

Alternative (turbine @ height)	**Number of WTG - MW**	**Total Impact** **Temporary / Permanent**	**Disturbance Acres per MW** **a. Total land** **b. Forest land** **c. Wetland**	**PILOT (annual payments)**
Preferred Alternative (3.0 MW @ 419')	84 - 252 MW	154 acres 162 acres	a. 0.64 acres/MW b. 0.32 acres/MW c. 0.003 acres/MW	$2.02 million
No Action (no turbines)	0 – 0 MW	0 acres	a. 0.0 acres/MW b. 0.0 acres/MW c. 0.0 acres/MW	$0
Maximum Turbine Build-out (3.0 MW @ 419')	98 – 294 MW	167 acres 169 acres	a. 0.57 acres/MW b. 0.28 acres/MW c. 0.088 acres/MW	$2.35 million
Fewer Turbines (3.0 MW @ 419')	51 – 153 MW	112 acres 124 acres	a. 0.80 acres/MW b. 0.31 acres/MW c. 0.003 acres/MW	$1.22 million
No Impact from	8 – 24 MW	10 acres	a. 1.0 acre/MW	$192,000

Project Layout (3.0 MW @ 419')		24 acres	b. 0.04 acres/MW c. 0.0 acres/MW	
Lower Turbine Height (1.5 MW @ 339')	84 -126 MW	154 acres 162 acres	a. 1.28 acres/MW b. 0.64 acres/MW c. 0.006 acres/MW	$1.01 million

Preferred Alternative: The layout that was selected based on the maximum MW production, with minimal impacts on wetlands, flora and fauna. A comparison of the impacts from each of the six alternatives indicates that the layout that most effectively minimizes the impacts to wetlands and other sensitive habitat while attaining the maximum benefit from the wind resources on the island has been determined to be the 84 - 3.0 MW turbine layout.

"No Action" (Alternative 1): The "No Action" alternative assumes the proposed Project area would continue to be underutilized as a seasonal residence, forest, and active agricultural land and the wind farm would not be constructed on Galloo Island. Based upon the loss of socioeconomic benefits and loss of environmental benefits (air quality and renewable energy); and given the temporary and relatively minor nature of anticipated impacts of the proposed Project, the "No Action" alternative is not a viable alternative.

Maximum Turbine Build-out (Alternative 2): The layout for this alternative places the maximum number of turbines to achieve the maximum possible output for the wind resources on the island. This layout was assessed for the impact to wetlands and other potential environmental concerns. This alternative results in the greatest total amount of wetland impacts (26 acres) of all alternatives. The net increase in MW capacity, and PILOT revenues, does not justify the related increase in impacts to wetland and forest land for Alternative 2.

Fewer Turbines (Alternative 3): The layout focuses on using the Preferred Alternative and reducing the number of turbines based on further minimizing the permanent impact to the wooded areas on the island. The net decrease in MW capacity vs. the acreage of permanently disturbed land per MW produced and the decrease in PILOT revenues does not justify Alternative 3 as a viable alternative.

No Impact from Project (Alternative 4): The layout focuses on a project designed to avoid all impacts to wetlands, sensitive habitat and forested areas. The net decrease in MW capacity vs. the acreage of permanently disturbed land per MW produced and the decrease in PILOT revenues would not justify this as a viable alternative. In addition, due to the necessary ECS and roads, it is not possible to construct any layout at the Project site without some impacts to wetlands and forested land.

Lower Turbine Height (Alternative 5): Impacts from lower turbines were assessed with special attention to impacts on visual resources, habitat/wetlands; economics; efficient use of wind resource; and impact of renewable energy to the public. This is not a viable alternative as the amount of disturbance per MW generated will increase, while the PILOT payment versus the acreage of disturbance would decrease.

Coastal Zone Consistency

Upstate Power has certified, pursuant to the Coastal Zone Assessment, that the Project complies with New York State's approved Coastal Management Program. A complete summary of the Project Sponsor's determination of consistency with the applicable policies set forth in the State Coastal Management Program is included in the DEIS.

Cumulative Impacts

Cumulative Impacts to Avian and Bat Populations

The cumulative impact assessment identified the avian and bat species that may experience displacement or collision risk due to the construction and operation of the Hounsfield Wind Farm and five other wind power projects (Cape Vincent Wind Farm, St. Lawrence Wind Farm, Horse Creek Wind Farm, Wolfe Island Wind Farm and Roaring Brook Wind Farm).

In total, nine (9) species of raptors, eleven (11) species of breeding birds, three (3) species of waterbirds and three (3) species of bats may be impacted. A comparison between wind farms of the relative level of impact (none, low, medium or large) to each species is presented in a tabular format in the body of the DEIS.

A summary of the results of the cumulative assessment of avian and bat impacts, suggest that overall, significance of cumulative environmental change is generally considered minimal. However, impacts of medium significance are expected on avian and bat resources. The wind farms may combine to influence avian behavior. Further, incidental mortality of avian and bat species may increase, but is viewed as a lesser significance.

Like any other wind project in New York, the Hounsfield project would have some impacts associated with collision risk and habitat alteration on avian and bat species. However, the project's location within New York State's highest wind resource (excluding Atlantic Ocean sites) enables the project to utilize wind more efficiently than any other existing or proposed project in the region. Moreover, in terms of towers per MW, the project makes the most compact use of wind in comparison to any the other wind farms considered in the Cumulative Impact Assessment.

Cumulative Impact on Visual Resources

Cumulative visual impacts were considered from the perspective of the Seaway Trail Scenic Byway (Route 3) in the Town of Henderson, New York. Other wind farms in the vicinity of the Project that may contribute to the cumulative visual impact in the region include: the existing Maple Ridge Wind Farm (Towns of Lowville, Martinsburg, Harrisburg, and Watson in Lewis County) and the proposed Roaring Brook Wind Farm (in the Town of Martinsburg).

No cumulative visual impacts are expected from the three projects as their viewsheds do not overlap.

Cumulative Impacts from Project and Transmission Line

The DEIS presents a summary of the cumulative impact assessment conducted for the Project in combination with the associated single circuit 230kV electric transmission line to be constructed 50.6 miles between the Project site on Galloo Island to a substation in the Town of Mexico, Oswego County, New York where the line will connect to the regional power grid.

The cumulative impact analysis evaluates the same impact categories for the transmission line as were evaluated for the Project. The combined impacts are comprehensively summarized in a table presented in Section 6.2. The summary of cumulative impacts shows the simple additive effect from constructing and operating the Hounsfield Wind Farm with the construction and operation of the Upstate Power Transmission Line is minimal, primarily because they do not overlap geographically.

Potential cumulative impacts resulting from the construction and operation of the Hounsfield Wind Farm and the Upstate Power transmission line are limited to temporary impacts to navigation and fish and aquatic species and permanent impacts to Caspian Tern and Upland Sandpiper, both threatened avian species in New York State. Permanent impacts may also be felt within the socioeconomic environment. Temporary impacts to navigation are minimal and will be further minimized through USCG notification to boaters. Consultation with the NYSDEC and USFWS, as well as limiting in water construction during spawning periods, will minimize temporary impacts to fish and aquatic species.

Section 6.2 presents a table that comprehensively presents the impacts from both projects as well as their additive effect.

1.0 Project Description

Introduction

This Draft Environmental Impact Statement (DEIS) has been prepared for the proposed action known as the Hounsfield Wind Farm (the Project). The DEIS has been prepared in accordance with the State Environmental Quality Review Act (SEQRA) Environmental Conservation Law (ECL § 8-0101 et seq,; 6 NYCRR Part 617).

The Project is a utility scale wind farm project located on Galloo Island (Project Site), in the Town of Hounsfield, Jefferson County, New York and is depicted in Figure 1-1.1 – Project Location. The Project is proposed by the Upstate NY Power Corp (Upstate Power) of West Seneca, New York.

Proposed Action

The Action involves the permitting/approvals and physical activities related to the construction and operation of the Project, which consists of up to 84 wind turbine generators (WTG), capable of generating up to 252 megawatts (MW) of power at peak capacity, and related support facilities. Specifically the key Project elements include:

- Construction and operation of up to 84 WTG. The proposed WTG will be a 3.0 MW generator with a 90 meter blade rotor diameter and a hub height of 80 meters, for a total maximum height of 125 meters (410 feet) from blade tip to ground.
- Installation and operation of associated 34.5 KV electrical collection system (ECS) connecting all WTG to an on-island electrical substation. The ECS will be both above ground and below ground.
- Construction of 17.25 miles of private service roads (up to 38 feet wide) between each WTG.
- Construction of one permanent meteorological tower, approximately 80 meters in height.
- Construction of operation and maintenance facilities.
- Construction of a temporary rock crushing facility and concrete batch plant.
- Construction of permanent and temporary housing facilities for construction, operation and maintenance staff. Permanent residential facilities include two three-story structures of 12 units each, and a community building housing kitchen

and dining facilities, infirmary, laundry and recreational facilities. Temporary housing consists of 4 modular buildings, each having 32 rooms.

- Construction of a potable and fire protection lake water intake system.
- Construction of a potable water treatment system.
- Construction of a sewage treatment system.
- Construction of an auxiliary power generating system.
- Construction of a closed loop geothermal heating and cooling system for permanent residential facilities. The closed loop system will utilize approximately 36 - 400 foot-deep wells located within the residential and support facilities complex.
- Construction of a channel slip and offloading/storage area, which together make the offloading facility, to allow for delivery and storage of materials and equipment.
- Construction of a helicopter pad.

Off-Island Transmission Facilities

In addition to the activities associated with the Project identified above, the transmission of the electricity will require construction and operation of an approximately 50.6-mile transmission line (approximately 2.6 miles on island, 9 miles under Lake Ontario, and 39.0 miles across the mainland), together with interconnection facilities (substations) and other related facilities, linking Galloo Island with the New York State power grid. The construction and operation of the 50.6-mile transmission line is subject to the review jurisdiction of the New York State Public Service Commission (PSC) under Public Service Law Article VII. As such it is a Type II action under SEQRA (6 NYCRR §617.5(c) (35)) and therefore not subject to SEQRA review (6 NYCRR §617.5(a)) and is not included within the "Project" that is subject to this DEIS. The impacts from the transmission line however, are presented in Section 6.0 (Cumulative Impacts).

1.1 Project Purpose, Needs and Benefits

Project Purpose

The purpose of the Hounsfield Wind Farm Project is to develop a wind powered system to generate electricity from a clean renewable source. The energy produced will be sold to the power grid in the New York State energy market.

Sponsors' Goals, Capabilities and Experience Developing Wind Energy Projects

The Project sponsor, Upstate Power, is a corporation formed under New York's Transportations Corporations Law. Its mission is to develop utility scale energy projects for distribution of low cost energy to the public in the New York State energy market using clean, renewable resources such as wind. This particular Project intends to maximize the energy production from this unique wind resource and other unique characteristics of Galloo Island in order to deliver clean, renewable, low cost electricity to the utility grid, and provide economic benefits to the local economy.

Upstate Power is affiliated with Babcock & Brown Renewable Holdings, Inc and Babcock & Brown International Pty, Ltd. (collectively "Babcock & Brown"). Babcock & Brown is a world leader in wind powered renewable energy projects, with 80 operating wind projects worldwide, 20 of which are in the U.S. It also currently has five new wind energy projects under construction in the U.S., and an additional 25 in various stages of development in the U.S. Babcock & Brown was founded in San Francisco in 1977 and now operates from 33 offices around the world with more than 1,500 employees worldwide.

Upstate Power has the professional expertise and financial support to successfully plan, license and develop the Project. Upstate Power has assembled a team of consultant professionals in the various technical fields (wetlands, visual, avian, engineering) necessary to complete the design and permitting tasks.

Expected Electric Power Generation

It is anticipated that in the full operations phase, the Project will have the ability to generate up to 252 MW of power at peak capacity. Specifically, the Project will use 84, 3.0 MW WTG. Projects in good wind resource areas typically generate electricity at 35% of its nameplate capacity throughout the year. This percentage (or capacity factor) represents a yearly average of total output versus nameplate output for the Project. Based on one year of wind data, it is assumed that the Project will operate at 33-34% capacity factor. A preliminary estimate yields an average project output of approximately 83.2 MWs and would generate approximately 728,482 MW hours per year.

Project Need

Impacts of Project on Market

The wind market in the United States is experiencing strong growth. According to the U.S. Department of Energy, as referenced in their Annual Report on U.S. Wind Power Installation, Cost, and Performance Trends: 2007, U.S. wind power capacity increased by 46% in 2007 from the previous year. The same report states that the State of New York is among the top-twenty states in terms of annual capacity growth, increasing nearly 15% from 2006 to 2007.

The Project is one of approximately 21 wind power projects currently operating or under development in New York State (AWEA, November 2008). According to the New York Independent System Operator (NYISO), New York is third among the states in wind capacity under construction (Tierney, 2008). As of June 30, 2008, only Texas and Iowa had more wind capacity under construction. At that time, New York State had 706.8 MW of operating wind power, with 588.5 MW under construction and approximately 3,113 MW of capacity proposed in the state. Combined, existing, under construction and proposed wind capacity equals approximately 4,409 MW based on the NYISO interconnection queue. As of October 2008, there were a total of 72 wind plants in the NYISO interconnection queue (Gonzales, 2008).

Wind projects support fuel diversity in New York's power market, since most other new generating capacity added in the past decade and currently proposed is from power plants that use natural gas – a fossil fuel whose price has tripled since 2000 (Tierney 2008). The price of wind remains the same over the same period: zero cents per kilowatt hour (kWh). Maintaining and improving fuel diversity in New York will likely to lead to less volatile electric prices, improved reliability and positive environmental impacts (Tierney, 2008).

According to NYISO forecasts for the winter 2008-2009, there is a total available supply of 40,375 MW which can meet the anticipated peak winter demand of 25,293 MW, an increase of 272 MW over 2007-2008 (NYISO website: www.nyiso.com). At 33,809 MW, the peak demand for the summer 2008 was 1,640 MW (5.1%) higher than the summer 2007 (NYISO website: www.nyiso.com). If the project were on-line in 2008, its

average output of 88 MW would have provided approximately 0.26% of the state's peak demand for the summer 2008 from a clean renewable source. Since the long-term demand trend is increasing, the Project will not replace existing fossil fuel capacity, but rather offset the demand for future fossil fuel generated power. If future demand increases are not be satisfied with clean renewable energy, they will be satisfied with fossil fuels. The Project provides an opportunity to provide future capacity from a clean renewable source. While the Project provides significant benefit by helping move closer towards meeting the State's renewable energy goals, it is not so large that it will negatively affect the wholesale prices in the competitive power market.

State and Federal Policies on Wind Energy

The Project is consistent with New York State and United States federal government policies regarding wind energy as described below.

The New York State Energy Plan and Final Environmental Impact Statement (Energy Plan) provides statewide policy guidance for energy-related decisions by government and private participants within the State (NYSERDA, 2002). The Energy Plan states, *"A benefit of greater energy diversity . . . is greater energy security in the form of reduced risk of energy supply disruption and price volatility. Moreover, a balanced portfolio of energy resources, including renewable energy resources, provides greater service reliability."*

The State of New York has demonstrated a commitment to producing and promoting clean, renewable sources of energy such as wind power. New York's renewable energy policy (Renewable Portfolio Standard – PSC Case 03-E-0188) requires 25% of the State's energy to come from renewable sources such as wind by the year 2013. New York State Energy Research and Development Authority's (NYSERDA) preliminary report found that a Renewable Portfolio Standard (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 stated the expectation that an RPS would spur increased

economic development opportunities in the renewables industry, including the attraction of renewable technology manufacturers and installers.

In August 2007 NYSERDA released the *New York State Renewable Portfolio Standard Performance Report* for the program period ending in March 2007. According to the report, two competitive solicitations conducted through the first quarter of 2007 have resulted in contracts for NYSERDA to provide production incentives for up to 2,775,564 megawatt hours (MWh) per year from 837 MW (nameplate capacity) of new renewable energy. This combined contract quantity of 2,775,564 MWh per year puts New York at 78% of the 2008 RPS (Main Tier) target, and 28% of the 2013 target. Approval of the Project will add an additional 252 MW or 728,482 MWh per year (another 20.5% towards meeting the 2008 target).

NYSDEC in recent testimony before the New York Department of Public Service (NYDPS) on January 11, 2008 (Jared Snyder, Assistant Commissioner Air Resources, Climate Change and Energy) and in Briefs filed before NYDPS on April 11, 2008 underscored the salience that government should give to advancing these policies in decision-making:

Excerpts from January 11, 2008 Testimony

Wind energy is a key component of a clean energy future for New York. New York is responsible for about 1% of the world's carbon emissions." (pg. 4).

Fighting climate change is without question the most substantial environmental challenge facing this State, this nation and the world today. Governor Spitzer and Commissioner Grannis have made the fight against climate change a top priority. . . . development of wind energy is vital to the reduction of greenhouse gases. For each 100 MW of electricity generated from fossil fuels that is displaced by wind power, approximately 500,000 to one million tons of carbon dioxide are avoided annually, depending on whether that power would otherwise by generated by natural gas or coal." (pg. 4-5).

The expansion of wind power has multiple environmental and public health benefits (pg. 5)

Excerpts from April 11, 2008 Brief

Fighting climate change is the substantial environmental challenge facing New York State. (pg. 2).

Wind energy is vital to the reduction of greenhouse gases." (pg. 2).

A dramatic increase in wind energy capacity is a necessary component of a strategy to reduce dependency on, and the use of fossil fuels.(pg. 2).

The expansion of wind power has multiple environmental and public health benefits by reducing the amount of pollutants that lead to levels of illness and death from respiratory and heart disease, and hopefully, reducing in the long term, displacing electric generation that relies on fossil fuels. (pg. 2).

As New York State Department of Environmental Conservation (NYSDEC) Assistant Commissioner Jared Snyder observed, decisions on wind projects cannot proceed in a vacuum. Rather Agency decision-makers must take into account the many policies that have been put in place that favor wind development and will heavily depend on wind energy production in order to achieve critical State and Federal goals. For example, in March 2008, Governor David A. Paterson issued Executive Order 2 directing the creation of a State Energy Plan stating that "...the development, implementation, and periodic review of a sensible comprehensive energy plan will enable the State to determine its future energy needs and facilitate a deliberate, efficient, and cost-effective means of meeting those needs." The goal of the planning process is to map the State's energy future by showing how the State can ensure adequate supplies of power, reduce demand through new technologies and energy efficiency, preserve the environment, reduce dependence on imported gas and oil, stimulate economic growth, and preserve the individual welfare of New York citizens and energy users. Based on the recently issued Draft Scope, methods of addressing climate change through the development of renewable energy sources will be an important component of the next State Energy Plan.

The Governor's Order directing the issuance of a new State Energy Plan was issued shortly after the Report by the Renewable Energy Task Force to, at that time, Lt.

Governor Patterson. The Task Force Report states that "Renewable energy and energy efficiency provide immediate alternatives to transition away from this dependence on fossil fuels, with numerous environmental, economic and societal benefits to our citizens." Specifically, the Task Force recommended that the State develop a strategy "to reap the benefits of New York's Wind Energy Potential." The Task Force recognized that "New York has the most wind energy development potential in the northeast and mid-Atlantic region. The more than 5,000 MW of wind energy that has applied for interconnection to the grid shows the industry's interest in and commitment to New York, and the State should support project development and interconnection efforts."

In his State of the State Address given on January 7, 2009, Governor Patterson announced that: "By 2015, New York will meet 45 percent of its electricity needs through improved energy efficiency and clean renewable energy." Additional benefits of the "45 by 15" program described by the governor included: "This effort will help rebuild our economy, meet our energy needs, and protect our environment. Improving energy efficiency at schools, hospitals, and local governments will allow us to cut costs and hopefully cut taxes in the future". Realizing the "45 by 15" goal is estimated to create approximately 50,000 new jobs. (Patterson, 2009).

Other New York State policies favoring the development of renewable energy include:

- Executive Order 101 issued by Governor Pataki on June 30, 2001 and continued by Governor Elliot Spitzer on January 1, 2007 and by Governor David Patterson on March 20, 2008- requires all New York State agencies to purchase 20% of their electricity from renewable energy sources by 2010.
- Regional Greenhouse Gas Initiative (RGGI)- The Regional Greenhouse Gas Initiative, or RGGI, is a regional agreement to reduce greenhouse gas emissions from power plants. Under the RGGI agreement, the governors of 10 Northeastern and Mid-Atlantic States, including New York, have committed to cap the amount of carbon dioxide (or CO_2, the principal greenhouse gas) that power plants are allowed to emit. State regulations will hold the allowed level constant through 2014, and then gradually reduce it. By 2019, the cap will be 10 percent lower than it initially was, and emissions are estimated to be 16 percent lower than they would be if the power plants had continued emitting on a business-as-usual basis. The RGGI states have negotiated a regional CO_2 budget of approximately 188 million tons, and have apportioned it among themselves. New York's initial CO_2 budget will be approximately 64.3 million tons (before the 10 percent reduction is made). In order to administer the program in New York, NYSDEC will establish

New York's CO2 Budget Trading Program through a new rule (6 NYCRR Part 242) and revisions to an existing rule (6 NYCRR Part 200, General Provisions).

- NYSDEC's Office of Climate Change- In order to coordinate the involvement of the NYSDEC in the implementation of efforts to address climate change and promote renewable energy development, the Governor created the NYSDEC's Office of Climate Change. The Climate Change Office was created to help governments and institutions respond effectively to climate change, through reduced emissions and adaptations to unavoidable warming.
- New York State Dormitory Authority (DANSY)- DASNY launched an aggressive program to promote sustainability and green building. The efforts of DASNY and other State agency partners is to 'green' New York State building and development.
- PSC's Long Range Energy Resources Plan

Maximizing the energy production benefits from one of New York's most productive sources of clean, renewable energy, (the wind resource in the Galloo Island area) as proposed by the Project Sponsor in this application, is an important step for advancing these critical policy goals. The Project will provide a significant renewable power source to New York State (NYS) and therefore is fully consistent with the NYS Energy policy previously discussed.

At the federal level, the Energy Policy Act of 2005 included an extension of a Federal Production Tax Credit (PTC) providing tax credits for electricity generation with wind turbines and other renewables. In October 2008, the PTC was renewed by Congress until December 31, 2009. Also, the Federal Energy Regulatory Commission (FERC) has begun to put in place policy changes to facilitate the interconnection of new wind plants. Federal initiatives promoting cleaner sources of power generation also include the Advanced Energy Initiative announced in the President's January 2006 State of the Union Address – a 22% increase in energy research in zero-emission technologies such as clean coal, solar and wind power.

The Project's goal to provide electricity to the public using wind, a clean, renewable resource, supports the federal government's policy as articulated in 42 U.S.C. 9201 to "hasten the widespread utilization of [wind energy] systems".

According to the 2001 Energy Information Administration annual data, the average northeastern household uses approximately 7.8 MW hours per year. Therefore, the Project is anticipated to provide enough electricity to power the equivalent of approximately 93,400 households. The Federal Government is likewise developing initiatives in this regard confirming the importance of renewable energy sources to addressing issues of global climate change and energy independence.[1] Steps to advance these policies are becoming increasingly critical as the State and the Country grapple with the ever-mounting threats of global warming (eg. The United States Environmental Protection Agency (USEPA) has dedicated a significant portion of their website to issues regarding global climate change, http://www.epa.gov/climatechange/index.html), and decreasing energy supplies and the significant threats that these events pose to the economy and the public health safety and welfare.

New York State Power Grid and Wholesale Operations

The Project will interconnect to the New York State Power Grid operated by the NYISO. Power generated by the Project will be transmitted to the grid by the new 230kV electric transmission line from Galloo Island to the new substation in Mexico, NY where the line will interconnect to the power grid. The NYISO is responsible for the operation of New York State's bulk power system and for the electric energy markets. New York's wholesale energy markets were established coincident with the establishment of the NYISO in 1999. The NYISO is charged with two overriding responsibilities: First, maintain the safe and reliable operation of New York's bulk power system; and second, operate fair, nondiscriminatory and effective wholesale electric markets.

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[1] In addition to the Production Tax Credit, other Legislative actions have been taken to address climate change. For example, in March 2007, the House of Representatives voted 269-150 to form a new Select Committee on Energy Independence and Global Warming, chaired by Rep. Edward Markey (D-MA), with Rep. James Sensenbrenner (R-WI) as the ranking member. On December 5th, 2007 the Senate Environment and Public Work Committee voted 11-8 to favorably report S.2191, the Lieberman-Warner Climate Security Act. This is the first GHG cap-and-trade bill that has ever been voted out of a Congressional committee. Additionally, in 2002, President Bush announced a new climate change strategy for the United States. The Bush Climate Change Plan sets a voluntary "greenhouse gas intensity" target for the nation, expands existing programs encouraging companies to voluntarily report and reduce their greenhouse gas emissions, and proposes increased federal funding for climate change science and technology development. Finally, the concern regarding greenhouse gases was reflected in a recent decision by the Supreme Court whereby the Court determined that EPA was empowered to regulate greenhouse gases under the Clean Air Act. (See Massachusetts v. U.S. EPA, April 2, 2007).

The New York wholesale electricity market is divided into eleven pricing or load zones. These load areas were initially developed by the New York Power Pool after the 1965 Northeast blackout as part of a process of identifying critical bulk power system transmission interfaces. Subsequently, these load zones were utilized to define pricing zones for the wholesale electricity market (NYSDPS, 2005).

The Project will supply electricity to the regional power community known as "NYISO Central Zone C," which includes Oswego County (and all or portions of several other counties). The Project must sell into the NYISO Central Zone C, at the prices derived through the regulations promulgated by the NYISO. Pricing in the central and western regions of New York (Zones A-E) have relatively homogeneous prices and can be defined as one super zone called West NY, while the balance of the zones can be defined as East NY. Pricing is not homogeneous within the eastern zones. As a result of the distribution within New York of load (demand is higher in the east) and capacity (higher in the west), power flows and therefore, sales are primarily west to east and then southeast or predominantly from the northwest to the southeast into the highly congested urban zones of New York City and Long Island. All power must cross the physical interface between each zone to reach the southeast where demand is generally higher than capacity. Historic trends in load (demand) growth and capacity additions have only increase the importance of the transmission system in maintaining system reliability (NYSDPS, 2005). The Project enters the power grid in a zone with adequate capacity to accept the additional capacity without limiting other producers' ability to add power to the grid. The NYISO falls under the jurisdiction of the New York State Public Service Commission and is regulated as an "electric corporation". Expansion of the bulk transmission system is also subject to the review jurisdiction of the PSC under Public Service Law Article VII.

Emissions Reductions from Fossil Fuel Offset

The global community's increased and urgent focus on clean and renewable sources of energy is largely due to the negative environmental effects of burning fossil fuels. The growing consensus among scientists is that the burning of fossil fuels and the associated release of carbon dioxide and other greenhouse gases stoke global climate change,

intensify droughts in some parts of the world, floods and storms in others, and add to the deterioration of air quality and alteration of animal species' habitats among other negative health and environmental consequences. As a result, and as reflected by the policy initiatives mentioned above, there is heightened public policy attention on wind energy, which produces no harmful air emissions, no greenhouse gases, and does not consume nor pollute water sources.

According to information provided in the NYSERDA "Wind Energy Tool Kit" a per kilowatt reduction in emissions can be calculated for the use of new wind power instead of fossil fuel-fired power generation (NYSERDA website: http://www.powernaturally.org/Programs/Wind/largewindfaqs.pdf). NYSERDA calculated the emissions displaced by the operation of a 1 MW WTG turbine over a typical turbine life span of 20 years as follows

Assuming that a 1 MW turbine operates at a 35% capacity factor over its 20-year life span, the turbine would produce 3,066 MWh/year or a total of 61,320 MWh in 20 years. Using the average fuel mix in New York State for coal, natural gas, and oil for the year ending 2002 to quantify emissions, 0.892 pounds of carbon dioxide (CO_2), 0.003 pounds of sulfur dioxide (SO_2), and 0.0012 pounds of nitrogen oxides (NOx) were produced for 1 kWh of electricity.

Therefore, in one year a 1 MW turbine displaces:

- 2,734,872 pounds of CO_2,
- 9,918 pounds of SO_2, and
- 3,679 pounds of NOx

Over the 20-year life of the turbine, the amount of pollution displaced is:

- 55 million pounds of CO_2,
- 198,360 pounds of SO_2, and
- 73,580 pounds of NOx.

Based on the calculations above, at 252 MW nameplate capacity, over a 20-year period, the Project could reduce emissions (by displacing the average mix of fossil fuel generated power) by:

- 13.8 billion pounds of CO_2.
- 49.9 million pounds of SO_2, and
- 18.5 million pounds of NOx.

Clean, renewable sources of energy produced domestically also reduce this nation's need for foreign oil, reducing its dependency on foreign nations to meet this demand, and thereby enhancing national security.

While the Project is not anticipated to directly lead to a shut down of a fossil fuel burning power plant, the Project will supply needed new energy to the NYS Market without requiring the need for additional fossil fuel generation. In other words, the construction and operation of this Project, and other renewable energy projects, lessens the need for the siting and development of fossil-fuel burning power plants to meet the anticipated future energy demands of the State.

Displacement of Other Renewable Energy Projects

The Project is not anticipated to replace other renewable power generation sources. As noted in the *New York State Renewable Portfolio Standard Performance Report* for the program period ending in March 2007 the development of wind power and other renewable energy sources is not meeting the yearly RPS energy targets. Therefore, approval of the Project will not displace other proposed renewable energy projects in terms of generating capacity.

In terms of transmission capacity, while other wind energy projects generate or are proposing to generate power within Jefferson County, within the NYISO Mohawk Valley Zone E, which has transmission limitations, the Project sponsor proposes to construct a transmission line from the Project site on Galloo Island to a new substation in Mexico, NY where it will interconnect to a 345 kV line transmission trunk line in NYISO Central Zone C, which has capacity to accept additional power. By interconnecting to the grid in

a zone with excess transmission capacity, the Project will not displace other renewable energy projects in either Zone E or Zone C.

Furthermore, due to its remote location, the Project will not compete for land or wind resources with other wind projects.

Expected Economic Benefits from Project

The development of renewable energy services in upstate New York serves an important potential economic boom for the region. As recognized by many commentators, capitalizing on the assets associated with, among other things, a substantial wind resource, to grow upstate's "green economy" and create so-called green-collar jobs is an investment with potential to pay dividends for generations to come. (See "Upstate is Green with Assets", http://timesunion.com/AspStories/story.asp?storyID=681463&category=OPINION&newsdate= last reviewed on 4/17/2008).

With regard to revitalizing the economy of upstate New York, the Governor has recognized that wind project development can have a substantial impact and multiplier effect for the upstate region of the State. For example as recognized by the State Task Force Report:

- Increasing wind power development produces significant local economic benefits. Permanent jobs are created and host communities realize other economic benefits in the form of payments in lieu of taxes (PILOT) agreements and other compensation. Specifically, landowners receive lease payments associated with the use of their land and compensation for various goods and services that are purchased during the development cycle.

Employment and Secondary Economic Activity

During the operations and maintenance phases, approximately 24 full time jobs will be created. In additional other support services, such as equipment, food, fuel and transportation services will be needed to sustain the housing and support facilities on Galloo Island.

Landowner Payments

With the exception of WTG-1, all the WTG will be sited on land owned by the Project sponsor; therefore, landowner payments will not be necessary.

WTG-1 is proposed to be located on the State owned parcel located at the south west end of the island. The parcel (tax map parcel ID No. 95-1-1.2) is 25.3 acres in area and is occupied by the abandoned fog horn building. Pending approval by NYSDEC to locate WTG-1 on State property, its location will not be finalized. However, in order to assess the maximum potential impact (or worse case scenario), WTG-1 is included in this DEIS evaluation. Assuming an agreement for the location of WTG-1 is finalized, an arrangement for lease payments to the State will be formalized.

Taxes and Payments in Lieu of Taxes (PILOT)

Under New York State Real Property Tax Law (RPTL Section 487) the Project is exempt from property taxation (not including special district taxes) for a period of 15 years. However, the Town and County may disallow the exemption and require that a project pay its full tax burden. In order to satisfy Town and County needs, Upstate Power will negotiate a PILOT agreement that establishes a specified annual payment in return for continuation of the property tax exemption.

Although some Project property will be removed from the tax rolls to accommodate the WTG and related facilities; PILOT payments will result in a net increase in local payments. It is anticipated that PILOT payments will value $8,000 per MW. At 252 MW, total PILOT payments are anticipated to be approximately $2.02 million and are expected to be split between the Town of Hounsfield, Jefferson County, and the Sackets Harbor Central School District. After the term of the PILOT agreement expires, the Project will be taxed at its full assessed value. Additional detail on tax impacts is presented in Section 2.8 (Socioeconomics).

1.2 Description

Project Area

Location

The Project is located on Galloo Island in the Town of Hounsfield, Jefferson County, New York. Galloo Island is located in the eastern basin of Lake Ontario approximately 12 miles south of the head of the St. Lawrence River at Cape Vincent. Galloo Island is an isolated island having no permanent residents. It is approximately 6 miles from the closest mainland shoreline (Stony Point in the Town of Henderson) and approximately 8 miles west of the Village of Sackets Harbor.

The closest urban areas are the City of Watertown, NY (approximately 25 miles east) and the cities of Oswego, NY (approximately 31 miles south-southeast). Galloo Island lies approximately 7 miles from the United States and Canadian border, which roughly runs along the middle of the lake. Figure 1.1-1 depicts the location of Galloo Island in context of eastern Lake Ontario and northern New York State.

Topography

The island is approximately 4.5 miles long and up to 1.5 miles wide with an elevation range of 250 feet to 305 feet above mean sea level. The island is generally flat with cliffs of up to 98 feet along the western side of the island. A small (5 to 30 foot) northeast facing escarpment divides the northern third of the island with the remainder of the island having a relatively flat surface that gently slopes southwest towards the main basin of Lake Ontario.

Ownership and Land Use

In general, Galloo Island and the Town of Hounsfield are characterized as rural in nature. Today the island is comprised predominantly of vacant land. The Project Area is predominantly undeveloped, except for a part-time residence and guest house. Historically, limited agricultural activities, including sheep herding, and cedar shingle milling operations took place on Galloo Island. Aside from lighthouse and Coast Guard station activities (which have since been abandoned), other modern uses of the island have been limited to estate, and recreational activities.

Today, the 1,966 acre island is divided into seven parcels, owned by four separate owners. Development of all but one WTG, ECS, service roads and support facilities will occur on approximately 1,938 acres owned by the Galloo Island Corporation. The exception is WTG-1 which is proposed to be located on the State owned parcel located at the south west end of the island. Of these three Galloo Island Corporation parcels, two parcels are 1 and 2 acres each, leaving the majority of the wind farm on one 1,935 acre parcel. The Galloo Island property currently is used as a private vacation area. The part-time residence and guest house are the only actively used residential buildings on the island. The island is uninhabited in the winter.

Of the remaining four parcels on the island, one parcel located at the southwest end of the island hosts the dilapidated remains of the Galloo Island Lighthouse structure, which is listed on the National Register of Historic Places. The now decommissioned lighthouse and associated keepers house are located on a one acre parcel that is currently privately owned, and under contract for purchase by Upstate Power. Also located on the southwest end of the island is a 25.3 acre parcel owned by the State (the proposed site of WTG-1), which is occupied only by an abandoned fog signal building. The State also owns a three acre parcel along the southeastern shoreline, which was the site of a former United States Coast Guard station where four abandoned structures are located. Both of these State parcels are considered part of the NYSDEC Lake Ontario Islands Wildlife Management Area. The forth parcel is owned by the United States government. Formerly occupied by a rescue/observation tower, it is now vacant and occupies less than one acre in the north-central portion of the island.

Additional discussion of existing ownership and land use is provided in Section 2.2 (Land and Land Use).

Project Area

It is anticipated that development of the major permanent Project elements (WTG, ECS, service roads, Operations and Maintenance (O&M) facilities and other support facilities) will occupy a total of approximately 162 acres or 8.2% of the Island. The remaining Project property will remain undeveloped. Table 1.2-1 presents the breakdown of areas

to be devoted to permanent Project activity. There will be one turbine for approximately every 23 acres of Project property.

Temporary Project features built for use only during construction will include the temporary dock facilities and the temporary concrete batch plant and will occupy approximately 4.4 acres and be restored upon completion of Project construction. Although the modular housing facilities will be removed, the temporary housing for construction workers is located within the larger support facilities complex. Although the laydown areas will be restored following construction, 9.79 acres are forested and therefore are considered a permanent impact.

Table 1.2-1: Area Occupied by Permanent Project Features

PROJECT FEATURES	AREA (Acres)
WTGs (includes pedestal and crane pad)	18.66
Permanent Meteorological Tower	<1.0
Service Roads	93.64
ECS – Underground (cleared)	8.22
ECS – Aboveground (cleared)	23.46
Laydown Areas	9.79
On-island Substation	1.38
Dock Facilities – Permanent	1.76
O&M Buildings, Residential and Support Facilities	4.26
Helicopter Pad and garage	0.41
Wetlands Mitigation Area	0.27
TOTAL AREA	161.88 acres

Project Layout

The assessments, studies, and reviews of the Project's environmental impacts presented in this DEIS are based on the general project layout as depicted on Figure 1.2-1 which provide locations of the WTG, ECS, service roads, staging areas, offloading facilities, helicopter pad, temporary concrete batch plant, housing and supporting facilities complex.

For information purposes only, the route of the transmission line from the substation on Galloo Island to Stony Point in Henderson, NY is depicted in Figure 1.2-2. As noted

above, because the transmission line is certificated through the PSC Article VII process, it is not subject to SEQR.

In general, the Project occupies almost all of Galloo Island. Most of the WTG will be located in sparsely vegetated areas and existing agricultural fields and will avoid wetlands to the extent practicable. Approximately 35 of the WTG will be located in wooded areas and approximately 8 WTG will be located on agricultural land. With the exception of WTG-1, all the WTG and related facilities will be installed on private land to be owned by Upstate Power. Figure 1.2-3 depicts existing land uses and property lines.

The WTG are spaced a minimum of approximately 935 feet apart. The WTG will be accessible by approximately 17.25 miles of gravel roads, routed in a manner to reduce impacts to wetlands, woodlots and existing agricultural fields. Because there are no publicly owned and maintained roads on Galloo Island, there are no setbacks from roads. Cumulatively, the ECS, which connects the WTG, is 20.22 miles in length (9.06 miles above ground and 11.16 miles below ground). While in some instances the ECS parallels the service roads, it also follows the most direct route between WTG, while avoiding wetlands to the extent practicable. The Project layout including WTG, service roads and ECS is depicted on Figure 1.2-1.

Several supporting facilities, including temporary and permanent housing, a community building, operations and maintenance buildings, and the power generating system are grouped together in an 11 acre area along the south shore above Gill Harbor, in the vicinity WTG-53 and WTG-63. Figure 1.2-4 depicts the general layout of all the facilities within the support complex.

The offloading facilities are located along the south shore between WTG-10 and WTG-19.

Project Components

Wind Turbine Generators (WTG)

The Project will utilize a wind power generation system typical of contemporary wind power projects in the northeast. Upstate Power is proposing to use a 3.0 MW, Vestas model wind turbine as shown in Figure 1.2-5. Approximately 84 WTG collectively will generate a rated capacity of up to 252 MW of electric power.

The WTG will have three rotor blades manufactured from fiberglass, epoxy resin and carbon fibre. An outer gel coat will include coloring. Based on the WTG model proposed, Upstate Power anticipates utilizing wind turbines having rotors with a 90 meter diameter (approximately 295 feet). The swept area for the rotors will be approximately 6,362 m^2.

The rotors and hub transfer wind energy to the drive train and generator located in the nacelle, which sits atop the tower. The nacelle acts as a cover and protects the components inside, consisting of the gearbox, low and high-speed shafts, generator, yaw system, pitch system, controller and brake. The generator operates at a nominal 60 Hertz (Hz), 1,000-volt electric power. The yaw system components inside the nacelle rotate to turn the blades into the direction of the wind. The WTG electrically actuated blade pitch system regulates rotor speed (rpm) for optimum thrust at varying wind speeds and acts as the main braking control by feathering the blades parallel to the wind, minimizing dependence on large emergency braking systems. In addition to the electro-mechanical pitch control, the units also are equipped with a mechanical brake.

The towers will be steel monopole structures up to 80 meters (262 feet) in height – excluding the nacelle and rotors. The maximum height of the WTG with the blade in the perfectly vertical position ("tip height") will be approximately 125 meters (410 feet) from blade tip to ground. The towers will be approximately 4 meters (13.6 feet) in diameter at their base and 2.4 meters (8.0 feet) in diameter at their top. Similar to the rotors, the WTG units will be painted white or a pale color in order to reduce reflection of the sun and contrast with background conditions.

A maintenance door is located at the base of each wind turbine tower to provide access to the components inside the nacelle. This door will be locked to prevent entry by unauthorized personnel.

Construction cranes (main crawler crane and hydraulic helper cranes) will be used to assemble the WTG. The main crawler crane will have a lifting capacity of approximately of 400 tons and will be assembled on-site. Once assembled, the main crawler crane has a track width of approximately 32 feet and is able to move slowly across relatively level terrain. Disassembly and reassembly of the main crawler crane is not anticipated for construction activities on Galloo Island.

Upon completion of the foundation, each of the four (4) tower sections will be raised and set in place. The main crawler crane will then place the nacelle atop the tower. With support from a helper crane, the main crawler crane will raise each rotor to the nacelle where ironworkers will bolt the rotor to the nacelle. Upon installation of the rotor, all crane-dependent work will be completed for the WTG, and the main crawler crane will be relocated to complete the assembly of another WTG.

Meteorological Towers (Met Towers)

At this time there are a total of four (4) meteorological towers on the Project Site. They are temporary during the study and design phase of the Project and will be removed in 2011. The intent of the towers is to capture real time meteorological data including temperature, pressure and wind speeds as well as a data logger for future trend measurements.

The four temporary meteorological towers are 60 meter (197 feet) monopole structures constructed of galvanized steel tubes that are guyed at six levels in four directions. The sensors within the towers are powered by solar recharged batteries. At approximately 197 feet in height, the temporary meteorological towers are exempt from Federal Aviation Administration (FAA) lighting requirements.

For the operation and maintenance phase, one (1) permanent meteorological tower will be constructed at the southern end of Galloo Island, in the vicinity of the helicopter pad

and WTG-5. The 80 meter permanent tower will be lit in accordance with FAA standards.

No foundations, additional service roads, parking lots or other ancillary buildings are required for the meteorological towers. Existing vegetation is cleared from meteorological tower sites. Clearing is kept to the minimum necessary for construction purposes (less than one acre). Upon completing removal of each tower, the site will be re-graded and seeded. The overall permanent footprint of vegetation and soil disturbance for the permanent meteorological tower will be negligible.

Electrical Collection System (ECS) and On-Island Substation

The 60 Hz 1,000 volt electric energy produced by each wind turbine is conducted through cables running down the inside of the wind turbine tower, through an underground conduit, to a pad-mount transformer that sits near the base of each tower. The pad-mount transformer will be contained in a steel case approximately 5 feet on all sides and mounted on a similar sized concrete pad. It transforms power from the turbine output voltage to 34.5 kV.

The 34.5 kV side of the pad-mount transformer is connected to a system of insulated and shielded above ground and underground cables referred to as the ECS. The ECS collects the output of the wind turbines in eight circuits, which then carries power to the Project substation. At each WTG, the ECS will be installed approximately four feet below grade to a minimum distance of 150 feet from the base of the tower, at which point it will be pole mounted above ground until it reaches 150 feet from the next WTG location where it will be buried again.

The majority of the ECS (34.5 kV) will be above ground and installed on wooden poles. Poles will be installed into the bedrock. A rock drill will be used to create a 2.5 wide foot hole. The pole will then be set in place and backfilled with previously removed material and concrete.

The ECS is routed to minimize cable length and to minimize impact to existing wetlands. The reliance on above ground ECS is due to the extent of shallow soils and exposed

bedrock. The use of overhead 34.5 kV circuits also reduces the need to remove bedrock and minimizes wetland impacts. Overhead circuits are anticipated to be in a single bundled cable supported by wood utility poles, approximately 20 feet in height. It is anticipated that approximately 11.16 miles of 34.5 kV buried cable and 9.06 miles of overhead cable will be required to connect the WTG and tie into the substation.

Junction boxes are above-ground ECS components where different segments of buried cables are connected. Upstate Power does not anticipate using junction boxes to connect cables.

The ECS will be routed to an electric substation located in the vicinity of WTG 40 in the central portion of the island, as depicted in Figure 1.2-1. At the substation, which is anticipated to be 192 x 235 feet, the ECS circuits will terminate and feed into a Project transformer that will increase voltage from 34.5 kV to 230 kV.

From the on-island substation, power will be transmitted from the Project via the 230 kV overhead transmission line for a distance of 2.6 miles. On the island the 230 kV line travels overhead until it enters Lake Ontario and is submerged until it reaches its main overland route. The 230 kV line, which as described previously, is not a project feature subject to this DEIS.

WTG Foundations

WTG foundations will be constructed utilizing a spread footer foundation, which is wide and shallow. For each location, approximately 603 cubic yards of rock will be removed for the placement of each turbine foundation. Blasting in accordance with the Blasting Plan found in Appendix A, is anticipated, given the nature of the bedrock and its proximately to the surface.

Final dimensions and configuration of WTG foundations will be determined as part of detailed engineering design using geotechnical data from borings to be conducted for each turbine location. The typical tower foundation will be a spread footing design, approximately 45-feet wide and will generally be installed to a depth of approximately 6 to 8 feet below grade. A typical tower foundation is illustrated in Figure 1.2-6.

At grade, an 18 foot diameter pedestal section will be exposed at the center of the foundation. The center pedestal section extends 1 foot or less above finished grade and extends about 3.5 feet below grade to an octagon shaped spread footing. The center pedestal will be surrounded by a 15' wide gravel ring.

The spread footing is typically about 5 feet thick at the center and tapers to a thickness of about 2 feet at its outer edge. On slopes greater than 5%, the pedestal of the spread footing is buried deeper. On the uphill side, more of the pedestal is below grade, providing adequate foundation ground cover on the downhill side.

Service Roads

Service roads will be constructed to allow for delivery of concrete, equipment, and WTG components needed for wind turbine construction. Following construction, service roads will be maintained to provide long-term access for maintenance of the wind turbines.

The expected routing of service roads is shown in Figure 1.2-1 and is estimated to total 17.25 miles in length. A typical service road will be 36 feet wide with a 1 foot shoulders, for a total width of 38 feet in order to provide adequate clearance for the 34 foot wide crawler crane(s) necessary to assemble the 3.0 MW WTG. Roads will be designed to have a maximum grade of 10%, uniform cross slope, and minimum inside radius of 150 feet to allow delivery of the largest WTG components.

Crane Pads

A gravel crane pad, similar to that displayed in Figure 1.2-7, will be constructed at the base of each WTG to provide a firm footing for the main WTG installation crane that will be used to erect the WTG. The crane pad will be an area leveled to 1% or less slope with dimensions of approximately 65 feet by 135 feet.

Trenches

Where necessary, sections of the underground ECS may be installed by various trenching or directional bore methods. Methods of installation in bedrock sections will likely include a rock saw to rip a 9 inch channel which will be backfilled with engineered fill. In limited instances where top of bedrock is greater that 48 inches, open trenching for the

limited sections of underground ECS will involve the excavation of an approximately 3 foot deep trench that will be a maximum of 4 feet wide.

Support Facilities

The Project includes the construction and operation of a network of support facilities necessary to maintain the operation of the wind farm. These facilities include; operations and maintenance buildings, potable water treatment and distribution facilities, wastewater collection and treatment facilities, fire protection systems, power generation system, and temporary and permanent housing. As described above, the support complex will be located on the southeast side of Galloo Island, above Gill Harbor, along the service road between WTG-53 and WTG-63 and is depicted in Figure 1.2-4. Key support facilities are described below.

Operations and Maintenance Buildings

Operations and maintenance facilities will be housed in two 100-foot by 200-foot pre-engineered metal buildings within the larger area occupied by the housing and support facilities.

The northernmost O&M building will provide unheated space primarily for equipment and spare parts storage and high-bay storage for heavy equipment.

The operations and maintenance offices – or operations center, mechanical equipment and parts storage, potable water treatment system, wastewater treatment system, and fire protection system will be housed within the more southerly located O&M building.

Potable Water Treatment System

The Project will include construction and operation of water treatment facilities to provide for the potable water needs of wind farm employees and guests. Potable water demand will differ between the construction phases and the long term O&M phase. Average potable water flow will drop from 12,500 gallons per day (gpd) with a maximum flow of 15,000 gpd during construction to approximately 2,500 gpd with maximum flows of 5,000 gpd during the O&M phase. The highly automated packaged water treatment system described below will be designed with scalability to operate at the

lower flow rates. A schematic of the potable water treatment system is provided in Figure 1.2-8.

The Project area has an unlimited supply of relatively clean Lake Ontario source water within the immediate proximity of Galloo Island. Lake Ontario water can be processed with relative ease to yield drinking water that is compliant with the applicable New York State drinking water regulations. Successful potable water treatment will consist of filtration followed by disinfection. Filtration would consist of a 0.1-micron microfiltration membrane system. Piping will run from the southernmost O&M building to an intake wetwell above the bluff and continue approximately 400 feet into Lake Ontario for a depth of approximately 30 feet. A schematic of the lake-water intake system is provided in Figure 1.2-9.

The portion of the O&M building where the potable water treatment system will occupy is approximately 20-feet by 40-feet and will include an office/control room. Water treatment equipment will be skid mounted and will be housed within a heated portion of the building.

To meet the peak system flow demands and to satisfy the concentration and time requirements of the disinfection regulations a finished water storage tank will be provided after chlorination but prior to pumping into the distribution system. The tank will provide one day's worth of water storage with a capacity of approximately 15,000 gallons. The tank volume will be large enough to allow short duration system shutdowns for maintenance purposes without losing the ability to deliver finished water to the users. Finished water will be pumped from the finished water storage tank and will be delivered to the system users through a system of underground pipes.

Wastewater Treatment System

The Project will include a wastewater treatment system capable of handling the demand during both the construction phases when as many as 130 people will be working on Galloo Island and operation phase when it is expected approximately 50 workers will be on Galloo Island. During the construction time period the maximum wastewater production is estimated to be the same as the maximum water consumption (15,000 gpd).

The wastewater treatment system will be designed to accommodate the switch from the construction phases to the long term O&M phase, when the maximum number of people on site at any one time is estimated to be 50 people. During the O&M phase the maximum wastewater production is 5,000 gpd, which is equal to the maximum estimated potable water consumption. The average daily wastewater production is estimated from the average number of workers on site, which is expected to be 24 resident workers, resulting in a typical wastewater production rate of 2,400 gpd.

It is anticipated that an intermittent sand filter will be utilized for the Project. This wastewater treatment system consists of a septic tank and intermittent sand filter and is depicted schematically in Figure 1.2-10 (Wastewater Treatment System). The septic tank capacity would be equal to maximum daily system flow of 15,000 gallons.

Water is discharged from the septic tank to the intermittent sand filtration system. The intermittent sand filter would consist of multiple sand filters. A dosing tank or series of dosing tanks will be used to ensure that the filters are intermittently fed. Multiple filters are provided to allow individual filters to "rest" between dosing.

Underlying the sand filter is another pipe that serves to collect all the flow after it has passed through the filter. Underlying the collection pipe would be an impermeable membrane to prevent any discharge to groundwater. The collected effluent is directed to a Ultraviolet (UV) disinfection system, where it is disinfected and discharged. Following UV disinfection, discharge to the Lake Ontario outfall will be by gravity.

Fire Protection System

The Project will include a fire protection system for the structures located within the residential complex, including the O&M facilities. The system will be located within the operations and maintenance building. Untreated lake water will be used to charge the system. The same trench and wet well as used for the potable water piping will be used to convey intake water from the Lake to the southernmost O&M building. Water will be pumped from the intake wetwell to the O&M building and then though a series of fire hydrants in the housing complex to enable fire hose connections to be made. In addition,

the pumped water system will connect to a standpipe system that feeds sprinklers permanently installed in the structures.

It is assumed that a fire flow of 1,500 gallons per minute (gpm) for 90 minutes will be required during construction and the O&M phases of the project. Fire flow will be available in the area of the O&M building, temporary housing and permanent housing but not throughout Galloo Island.

Power Generation System

The Project will include a power generation system and associated diesel fuel storage to provide power during construction phases and for back up purposes for Project facilities. In the long-term O&M phase, power will be derived from the on-site power grid. The auxiliary power generation system described in this subsection will provide power to the housing and support facilities in the event of a disruption of power flow from the grid and for WTG start-up.

This auxiliary power generation system will consist of two generators connected to a diesel aboveground storage tank (AST) system. The generators and associated fuel storage system will be located approximately 200 feet southwest of O&M buildings. This location was selected to have minimal impact (noise and emissions) on the temporary and permanent housing.

The power generation system consists of operation of two 350-kWh diesel powered generators. The generators are sized such that both generators would be required to meet peak demand, however only one generator would be needed to meet power requirements during the majority of the Project. The total diesel fuel required for backup power generation (including heating) was calculated to be 85,141 gallons annually, with the peak month occurring in November (16,674 gallons).

Electrical Transmission and Interconnection Facilities

The electrical transmission and interconnection facilities will convey the power collected through the ECS to the NYS power grid. As described previously, the transmission and interconnection aspects of the Project fall under the jurisdiction of the PSC and are being

reviewed and certificated under the Article VII process, and, therefore are not subject to SEQR. However, for purposes of context they are described here. Additional description is also provided in Section 6.0 (Cumulative Impacts).

From the on-island substation, power is transmitted via a 2.4 mile low profile, overhead 230 kV line that connects the on-island substation to a transition station at the northeast end of the island. The transition station connects the overhead 230 kV line to a 230 kV submarine cable that runs 9.0 miles from Galloo Island to Stony Point. Horizontal directional drilling (HDD) will be utilized for approximately 0.19 miles to a point where the lake depth is approximately 15 feet. From that point, the marine cable will either lie on top of bedrock, or be jet-plowed into the sediment as conditions allow. At the shoreline at Stony Point, horizontal directional drilling will be utilized for approximately 0.15 mile to transition the submerged cable to overhead via a transition tower. The 230 kV transmission line will travel approximately 39.1 miles aboveground on 80 foot steel poles from Stony Point to a new substation in Mexico, NY where it will interconnect to a 345 kV line transmission trunk line. A complete description of the mainland transmission line is presented in Section 6.0 – Cumulative Impacts.

Permanent Housing and Community Building

Two 12-unit residential buildings

The Project includes construction of permanent housing and support services for use during the long-term O&M phase of the Project. The proposed permanent housing consists of two 12-unit, two bedroom condominium-style housing units located directly southwest of one of the existing residential houses. As indicated in Figure 1.2-4, the two permanent residential buildings will be situated on level ground just northwest of the steep slopes extending down to Gill Harbor. This vantage point was considered suitable due to the ability to observe advancing weather systems and the proximity to the harbor where small boats can dock.

The permanent housing is intended to house the O&M staff, O&M contractors and visitors to the island during the long-term O&M phase of the project. The housing will be condominium style and is intended to provide comfortable living quarters in an effort

to off-set the remote nature of Galloo Island. Each permanent housing unit will have two bedrooms, two bathrooms, kitchen, dining, laundry room, and a living room. Conceptual floor plans for these structures are presented in Appendix B.

Community Building

Part of the support facilities for the Project will be a community building that will house kitchen, dining room, infirmary, commissary, laundry and recreation facilities. The Community Building will be an approximately 10,000 square foot 1-story steel structure located between the permanent and temporary housing. An AST system will provide propane to this building for kitchen stoves/ovens as well as for laundry dryers.

Heating and Cooling Systems

Other than the northernmost O&M building which will be used primarily for equipment and spare parts storage, each of the remaining eight buildings will be heated with either hot water or steam boilers powered with diesel fuel during the construction phases. A 15,000-gallon diesel AST and a 5,000 gallon AST will be located southeast of the temporary housing and will provide diesel fuel to each of these buildings using buried piping. ASTs will be constructed in accordance with NYSDEC's Petroleum Bulk Storage (PBS) Regulations at 6 NYCRR 614. The northernmost O&M building will be heated with suspended electric heaters (high bay configuration).

Post construction heating and cooling systems will rely on propane for fuel for the O&M phase of the Project. A closed loop geothermal heating and cooling system is being evaluated as a long-term alternative. The geothermal system would provide the heating, cooling and domestic water heating for the two residential housing units, community building, and the office portion of the O&M building. The system would consist of a series of vertical bores at the building sites. These bores will each be approximately 6 inch round and 400 foot deep. Each bore will be provided with an 11/4 inch closed loop pipe which will be routed to individual heat pumps and water heaters located in the four buildings. Trenching from the bores to the building will be provided in order to locate the loops below the frost line. A schematic layout of the geothermal well system is depicted in Figure 1.2-11.

Offloading Facilities

The offloading facilities consist of the channel slip, 100 foot concrete aprons, and an approximately 5 acre offloading/staging area, and approach channel. The offloading facilities will be located on the southeast end of the island. The offloading facilities will be used to transport personnel, equipment and materials to and from the site. The slip is designed with a main channel (200 feet long by 180 feet wide by 14 feet deep) and approach channel (approximately 230 feet long). Figure 1.2-12 presents the Conceptual Offloading Facilities Layout.

Helicopter Pad

A helicopter landing pad will be constructed to provide another means of transportation to the island and as a means for emergency evacuation in case of a medical emergency. The helicopter pad will be located on the south western end of the island near WTG-5. This location was selected based on the best aviation approach due to prevailing winds and WTG placement. The concrete pad will be approximately 60' x 60'. The pad will be surrounded by a 90' x 90' flat grass surface area which will have a 2:1 transition surface out to 150'. A sketch of the helicopter pad is provided in Figure 1.2-13.

Proposed Wetlands Mitigation Area

Permitting for the Project will likely include a requirement to establish new wetlands on the island in order to mitigate impacts to wetlands that result from constructing Project components. The project will impact approximately 0.79 acres of wetland, mostly through construction of access roads and ECS. While the Project includes measures that will be taken during design and construction to avoid or minimize impacts, compensation for the unavoidable loss of approximately 0.79 acres of wetland habitat will be undertaken in the form of on-site wetlands creation. The proposed site for wetlands creation is in an area adjacent to existing NYSDEC wetlands in the southeastern portion of the island in the vicinity of WTG-21. Section 2.4.3 (Wetlands) provides compete detail on existing wetlands, wetlands impacts and the proposed wetlands mitigation plan.

Temporary Facilities

During the construction phases of the Project, several temporary structures and facilities will be necessary to support construction activates and workers. Although short-term in nature (for the 3 year construction schedule), these facilities will occupy the land, utilize energy and potentially result in short-term impacts.

Temporary Offloading Facilities

While the channel slip docking facility is being constructed, a temporary offloading facility will be necessary to service barges that will bring equipment, materials and personnel onto Galloo Island during the initial construction phases. The temporary offloading facility will involve construction of a temporary rock and gravel groin that will extend from the shoreline approximately 75 feet into the water. The facility will consist of an articulating ramp constructed atop the groin, supports for the ramp, and free-standing dolphins to guide and secure vessels. The dolphins will be constructed of steel pipe piles embedded in the lake bottom with concrete caps above the water surface.

The temporary offloading facility will be used during the construction of the permanent offloading facility. The temporary facility will allow barges to tie up enabling and trailers to roll off via the ramp. Once the channel and permanent offloading facility is constructed, the groin and ramp will be removed. The temporary offloading facility is depicted in Figure 1.2-12.

Temporary Laydown and Construction Staging Areas

In addition to the offloading storage area, the Project includes three temporary laydown and construction staging areas, the locations of which are depicted on Figure 1.2-1. The maximum total area to be occupied by the laydown areas will be approximately 51 acres. Located along a service road the staging areas will occupy approximately 18 acres (in vicinity of WTG-13), 17 acres (in vicinity of WTG-44) and 16 acres (in vicinity of WTG-61).

Temporary Housing for Construction Workers

During the construction phases of the Project, temporary housing will be required on Galloo Island. It is anticipated that during peak construction periods, approximately 130

construction workers will be mobilized to Galloo Island. The temporary housing consists of four modular style buildings located in the previously described housing and support facilities complex. See Figure 1.2-4.

Each temporary housing structure accommodates approximately 32 workers and will meet all applicable building codes. Temporary housing plans, specifications, and finished construction will comply with applicable local, county, state and federal standards, codes, ordinances, and laws. The residential buildings are characterized as temporary module housing and will be one story in height. The units will be ADA compliant. Each structure measures 66-feet by 168-feet and is comprised of 11 trailers or sections. There will be approximately 32, 10-foot square rooms designated as sleeping quarters. In addition, there will be separate bathrooms and showers for men and women. An HVAC room will be used for the hot water tank and boiler which will utilize fuel oil. These buildings will be removed from the island after construction is complete.

Temporary Concrete Batch Plant and Rock Crushing Equipment

A temporary on-site concrete batch plant will be utilized for the construction of the Project. The concrete batch plant will generate the concrete required for construction of the WTG foundations and support facilities.

Figure 1.2-1 indicates a site approximately 4.4 acres in area for the concrete batch plant. The concrete batch plant will be located about 1,500 feet from the southern shore of Galloo Island in the vicinity of proposed turbines WTG-25 and WTG-29. Figure 1.2-14 illustrates the Conceptual Concrete Batch Plant Layout based on a production rate of approximately 80 to 100 cubic yards of concrete per hour. Ancillary to the concrete production, include a rock crusher will be located at the concrete batch plant.

Based on preliminary estimates, each WTG may require between 400 to 600 cubic yards (CY) of high strength reinforced concrete. In addition, approximately 4,200 CY of reinforced concrete will be required for the support facilities planned for the project. Therefore, the concrete batch plant will need to prepare approximately 46,200 CY of concrete over the construction period of 16 months (about 2,900 CY/month).

Water for the concrete batch plant will be obtained from Lake Ontario through an offshore pipeline which will flow into an on-shore wetwell. The production water will then be pumped through cartridge filters and to a water day-tank, in the concrete batch plant operations building. The day tank will be approximately 15 feet in diameter and 15 feet tall, and will hold approximately 18,380 gallons.

1.3 Project Design Rationale

Project Location - Site Selection

Upstate Power is proposing to develop the Hounsfield Wind Farm project in New York State to respond the State's growing need for low cost electricity and the demand for renewable energy that is expected to develop as a result of New York State's policies to address greenhouse gas emissions and climate change in addition to the policies promulgated by the federal government.

Wind turbines are very location sensitive and wind power projects must be sited where sufficient wind resources exist in order to utilize the resource and provide the service. This is the primary and overriding criteria for site selection. Other secondary selection criteria include: appropriate land available for development, land owner interest, location of electrical connection to the utility grid and location relative to adequate transportation routes.

After considering several possible sites in New York State, Upstate Power identified Galloo Island as a particularly well suited location for the development of a wind energy project due to strong and consistent winds, open areas, predominately vacant land use and ownership/control of the required amount of land. After extensive study, Upstate Power determined Galloo Island is a uniquely viable location for a wind powered electric generation facility (the Project). Preliminary wind studies have demonstrated that the Project site possesses a particularly rare and productive wind resource capable of sustaining a viable wind energy project.

Due to its location at the eastern end of Lake Ontario, Galloo Island is exposed to regular winds blowing unimpeded across the lake from the west. The orientation of the island along an axis perpendicular to the wind allows for an efficient layout of wind turbines.

According to the Wind Resource Report prepared by AWS Truewind for the planned Italy/Prattsburgh Wind Farm, wind electric generation facilities must be sited where the wind resource meets the beginning of a Class 4 resource, a minimum speed of 7.5 meters per second at 80 m above ground. Energy conversion from a wind turbine increases exponentially as a wind resource exceeds this standard. Only a small percentage of the State of New York meets or exceeds Class 4 wind speeds, 1.55% of the total land area or 0.69% when protected lands such as the Adirondack and Catskill Parks are excluded from consideration. According to the New York Wind Resource Explorer developed by AWS Truewind, mean annual wind speeds at Galloo Island fall within Class 4 (7.5 – 8.1 m/s) and Class 5 levels (8.1 – 8.6 m/s) when measured at 70 meters.

Galloo Island's Class 4 wind resource makes it a truly unique wind resource and valuable addition to the State's renewable energy goals. Much of this is due to the unique geographical aspect of the site; namely, that the wind accelerates the open length of Lake Ontario to Galloo Island without significant friction or surface roughness. Therefore, the Project's location on Galloo Island provides the benefit of excellent wind conditions off the lake without having the environmental impacts that would result from constructing the WTG in the lake itself.

Additionally the Upstate Power's ownership of the Island allows for greater flexibility in the development process. Combined, these factors allow a wind energy facility on Galloo Island to provide an abundance of clean, low cost, renewable energy for New York consumers with significantly fewer environmental impacts than competing fossil fuel energy facilities being proposed in the State.

Layout – Site Planning Factors

WTG – Wind Resource Data

According to the map titled Wind Resource of New York published online by AWS Truewind, the average wind speed for Galloo Island ranges between 7.0 and 8.5 meters per second, (15.7 to 19.0 miles per hour). These average wind speeds are above the minimum industry standard of 6.5 meters per second. Proprietary data collected by the

project sponsors meteorological towers confirms the viability of the wind resource. The AWS Truewind wind resource data for the Project area is depicted in Figure 1.3-1.

Spacing – Orientation

In order to maximize the efficiency of the wind while minimizing the lengths of roads, the WTG were sited in lines generally perpendicular to the wind. For the majority of the Project (the WTG located on the southwest two third of the island) this layout generally follows the southwest-northeast axis of the island. In the northeast portion of the island, WTG primarily were sited to avoid impacts to wetlands.

WTG were also spaced a minimum distance to minimizes wake loss and increase WTG efficiency. Wake loss is the disruption in the wind energy that exists downwind of an operating wind turbine. Per manufacture's specifications, the 3.0 MW WTG are spaced a minimum distance of approximately 285 meters (935 feet), or approximately 3.2 times the 90 meter (295 foot) rotor diameter in order to minimize wake loss.

Site Constraints

The geographic nature of the Project site's island location presents a physical constraint due to its finite size, configuration and limits to developable area. Therefore, there is limited area within which the WTG can be located. Besides limited land area, there are other challenges to constructing and operating the Project on Galloo Island including: the need to house and accommodate up to 200 construction workers in a remote location; challenges related to marine construction (transmission cable and channel slip); logistical and seasonal concerns for delivery and storage of personnel, equipment and materials to an island; and other concerns not associated with mainland wind projects.

The primary siting constraint for the major Project components (WTG, ECS and service roads) is the existence of approximately 360 acres of wetlands within the Project Area. Project layout plans avoid placement of project elements within wetlands to the maximum extent practicable.

A second constraint is the steeply sloped shorelines. WTG were sited a minimum of 75 feet from the shoreline edges to allow sufficient geotechnical stability for the WTG foundation.

One of the major benefits of this project location is that the majority of the Project Area falls within a single property and there are a limited number of existing structures. Thus, the development of this wind project does not require the consideration of such typical constraints as setbacks to residential property lines and non-participating landowner concerns.

Wind Turbine Selection

The Project sponsors selected the Vestas model V90 3.0 MW, wind turbine for evaluation in this DEIS for two primary reasons. A 3.0 MW machine will produce the Project's target energy output, with the fewest number of WTG, reducing total project impacts. Siting a larger machine is facilitated by Galloo Island's remote location and lack of inhabitants. The Vestas is also the model that will most likely be available at the anticipated time of construction.

Service Road Routing

Routing for the Project's service roads was selected to minimize impacts to existing wetlands and, secondarily, to reduce the number/length of roads required. There are no existing roads on Galloo Island, and the existing trails have limited utilization for crane paths.

Electrical Collection System Routing and Substation Location

The ECS routing was designed in order to minimize impacts to wetlands. Secondarily, the ECS was designed to reduce the number and length of overhead 34.5 kV circuits in order to minimize corresponding electrical loses. The ECS will be buried a minimum of 150 feet from a WTG and will generally come above ground when it connects to the overhead trunk lines.

The on-island substation is located centrally within the WTG on a site outside of wetlands or steep slopes. This location was chosen because it is central to the Project,

thereby reducing ECS installation, avoids wetlands, and is sheltered from extreme weather conditions on the shoreline.

Offloading Facilities

A basis of design study, conducted to establish criteria for planning and design purposes was conducted for the offloading facility, is included in Appendix C. The relative exposure to environmental conditions (wind, storms, waves, ice, etc.) was a factor in siting, design and operational decisions for the offloading facility. The potential impacts and relative costs of rock excavation for the slip were factors in preliminary siting, which was based on topography and bathymetry. Siting objectives included:

- minimizing amount of underwater rock excavation;
- avoiding substantial elevation changes between water level and shoreline; and
- providing sufficiently large, relatively flat area adjacent to slip for unloading and temporary storage of materials.

Additional site selection considerations include navigational, operational and meteorological factors. While another potential slip location near North Pond offered a more sheltered environment, its relatively shallow water depths would have required extensive underwater rock excavation (blasting) and due to these potential impacts, was eliminated from consideration.

The temporary offloading facility location was selected based on shoreline elevation, submerged slope elevation and proximity to the permanent offloading facility.

Size and depth of the permanent slip were established in order to accommodate the "maximum design vessel", assumed to be a flat deck barge and associated tug boat necessary to transport large WTG components. The barge dimensions used for slip design are 195' length, 35' beam and 10.5' depth. The basis of design study (attached as Appendix B) considered conversations with barge/towing companies in determining the slip design. The length of the slip should be at least the length of the barge. The width of the slip should be approximately the beam of the barge plus two times the tug boat length. Additional width is necessary for maneuverability and to accommodate varying weather conditions.

The concrete aprons will be designed to support the crane weight of 200 tons (capable of moving the 70 ton WTG nacelles).

Floating breakwaters will be used to inhibit or reduce short-term wave action. Floating breakwaters are mooring structures that float at or near the water surface and dissipate wave energy by reflection, turbulence and other means to result in a reduction of wave height on the leeward side of the structure. Floating breakwaters were selected over fixed breakwater structures for several reasons, including but not limited to:

- adaptability to water level fluctuations;
- ease of relocation;
- less dependence on lakebed conditions;
- less potential obstructions to water circulation and fish migration; and
- less impact on marine sediment.

1.4 Construction

Construction Activities

Clearing and Grading Limits

Clearing and grading limits for Project components (including but not limited to individual WTG sites, service roads, ECS, on-island substation, and housing facilities) will be labeled on final construction drawings as well as in the Stormwater Pollution Prevention Plan. Specific clearing limits for the various construction activities are provided as follows:

<u>WTG Sites.</u>

Laydown areas at each WTG site will be approximately 300 feet in diameter (approximately 1.6 acres). They will be cleared and graded only to the minimum necessary to provide a generally level and stable work area. Silt fence will be placed at the limits of disturbance and a 75 foot vegetative buffer will be established in areas downslope of the WTG laydown areas. WTG laydown areas are depicted on Figure 1.2-1.

WTG Footings and Foundations.

Construction of the typical tower foundation will require excavation of an area approximately 45-feet in diameter. As depicted in Figure 1.2-1, the WTG foundation will be located within the WTG laydown area and no additional clearing area is required. Each WTG foundation will require between 400 to 600 CY of high strength reinforced concrete. Post construction, an 18 foot diameter pedestal section will be exposed at the center of the foundation, which will be surrounded by a 15' wide gravel ring. The remaining WTG laydown area will be re-vegetated.

Service Roads.

Service roads will be cleared to approximately 38 feet to allow a 36 foot travel path and additional clearance 1 foot shoulder free of vertical obstructions along the road side. To access WTG in wooded areas, clearing for service roads will minimized to the extent practicable for to allow the main crawler crane to reach the WTG site.

In areas where bedrock is not exposed, service roads will be constructed using standard construction methods. Following clearing and grubbing, topsoil stripping and stockpiling, the subgrade will be shaped and compacted. Wherever possible, the roads will be constructed flush with the surrounding grade, in order to minimize impact to stormwater flow. Geotextile fabric will underlay a gravel top course. Service roads will have a compacted 12 inch gravel top course, depending upon soil depth. Where service roads are constructed directly on bedrock, the top course will be approximately 6 inches, varying as necessary to fill depressions. The use of a gravel top layer may be eliminated, depending on surface conditions of the bedrock. See Figure 1.4-1 for typical details for service roads.

ECS.

Construction for buried or underground ESC will require a path approximately 15 feet wide. Construction of the 34.5 kV over head ECS will require an area approximately 2 feet in diameter to be disturbed to set poles. Long-term maintenance of the overhead ECS corridors will require a corridor approximately 50 feet wide be maintained and clear of danger trees. This area will be vegetated and mowed in order to discourage growth of

tall vegetation. Where ECS traverse open fields, a corridor of approximately 15 feet will be maintained.

On-island Substation.

Construction of the 34.5/230kV substation will require clearing and grading of an area approximately 235' x 192' (45,120 s.f.) to accommodate the substation yard transformer equipment, access drive, and control house. It is anticipated that the substation yard will have a gravel surface.

Housing and Support Facilities.

Construction of the housing and support facilities complex will require clearing and grading of individual construction sites within an overall area encompassing approximately 11 acres. While each facility (O&M buildings, temporary and permanent housing, community buildings, geothermal system and auxiliary power generating system) will have specific construction plans and specification, it is anticipated that the entire housing and support complex will be covered under a single Storm Water Pollution Prevention Plan (SWPPP). Other than small areas of concrete, the complex will not be paved.

Construction Staging Areas.

The three construction staging and laydown areas will be cleared and grubbed as necessary and finished with a gravel surface. Where the staging area consists of exposed bedrock, only minimal gravel will be utilized in order to create a flat and smooth surface. Upon completion of the construction phases, the construction and staging areas will be restored to pre-construction contours and seeded.

Concrete Batch Plant - Sand and Aggregate

An approximate 4.3 acre area will be cleared for the concrete batch plant, rock crushing equipment and storage of sand and aggregate materials. It is anticipated that most raw materials for construction such as cement in bags and bulk sand will be shipped to Galloo Island. Given the amount of excavated or blasted material necessary for constructing WTG and the inlet slip, it is not anticipated that additional aggregate will be required from off-site. A rock crusher will be located at the concrete batch plant and to greatest

extent possible, materials excavated on-site will be utilized in the construction of foundations, roads and for general fill requirements and for aggregate for concrete.

Sand and aggregate (if required) will be off loaded from barges and placed into dump trucks. The dump trucks will transport the sand and aggregate to appropriate hopper/conveyors within the concrete batch plant area. The hopper fed conveyor belts will deposit these raw materials onto conical piles which are expected to be as high as 35 feet high. Erosion and sedimentation control measures will be implemented in accordance with the SWPPP in order to control runoff from the concrete batch plant. These measures may include silt fences, diversion fences, temporary vegetation and sediment basin(s).

Transportation Routes for WTG Components, Material and Equipment

WTG component and materials will arrive by ocean vessels through the St. Lawrence Seaway and will be off-loaded and temporarily stored at the Port of Oswego. Once customs inspections are complete, the components will be shipped by domestic barge to the island for offloading. No local roads will be used for WTG transport.

Construction materials and equipment will be delivered to the Project site via barge to the permanent off loading facility where it may be temporarily stored. In order to minimize the number of times materials are handled, materials offloaded at the 5-acre storage area will remain until needed at a particular construction site. Materials delivered on trailer or truck (via barge) will be moved directly to their destination.

Road Crossings through Stream and Wetland

It is anticipated that one culvert will be utilized to cross the small tributary on the south side of the Island in the vicinity of WTG-38. The culvert is necessitated by the steep banks at that location. A conceptual stream crossing detail is provided in Figure 1.4-2. No other construction work is planned in the Project Area that requires stream culverts or crossings.

It is anticipated that the service roads will cross wetlands in four locations. These crossings are limited to four narrow wetland “fingers” for a total of approximately 0.096

acres. Wetland crossings will be constructed with a pervious stone fill rather than a culvert to maintain a hydraulic connection through the wetland. A wetland detail is shown on drawing D-001 of the SWPPP.

Construction of the Project ECS does not require include any stream crossings.

Blasting and Dewatering

As discussed in Section 2.1 (Geology) Galloo Island is underlain by limestone of the Trenton Group and the bedrock is overlain by a limited amount of overburden, approximately 0-2 feet. Therefore, due to the depth and competency of bedrock encountered in the area, it is anticipated that blasting will be required in most places where subsurface structures are required (WTG foundation and slip channel). Construction of the slip will require the largest amount of blasting for the Project. The 180 foot by 200 foot by 14 foot deep slip and an approach channel will require a total of approximately 30,151 CY of rock to be removed.

The potential impacts from blasting to the aquatic environment are discussed in Section 2.5.6 (Fish and Aquatic Species). As discussed in that section, employing mitigation in the submerged blast zones will significantly reduce aquatic species impacts. Proposed mitigation measures include: utilizing a line drilling method; placing explosives in drilled holes with adequate angular stemming, and timing blasting to avoid periods of fish spawning. Potential impacts from blasting and mitigation are further discussed in Section 2.11 (Blasting).

In addition, a "Blasting Plan" has been prepared for the project. The Blasting Plan will ensure that blasting activities for the Project will adhere to all applicable regulations pertaining to blasting, including New York State Department of Labor explosive handling regulations (12 NYCRR Part 39) and NYSDEC blasting/mining regulations. The Blasting Plan is located in Appendix A. The Plan outlines:

- general procedures to be followed for both above ground and below ground blasting activities;
- storage of explosives;
- transportation of explosive materials;

- handling of explosive materials;
- vibration and damage control;
- drilling and loading;
- firing safety; and
- insurance requirements.

Spill Management

A Spill Prevention, Control and Countermeasures (SPCC) Plan has been prepared for the Project and is found in Appendix E. The SPCC Plan has been prepared in accordance with requirements specified by the USEPA under Title 40 Code of Federal Regulation Parts 110 and 112. A SPCC Plan is required for facilities with more than 1,320 gallons of oil stored on site in containers 55-gallons in size or larger.

During construction and operation of the Project, it is anticipated that the following chemicals will be used and stored onsite.

- Electrical transformer oil,
- Yaw oil,
- Hydraulic oil,
- Gear oil,
- Diesel fuels, and

The SPCC Plan describes the equipment, structures and procedures designed to prevent the discharge of oil from the Project facilities into Lake Ontario, a navigable waters of the United States. Installation, operation and maintenance of PBS tanks will also be in accordance with NYSDEC regulations (6 NYCRR Parts 612-614).

Solid Waste Handling System

Solid waste will be generated during both the construction and O&M phases of the Project. Solid waste will be temporarily stored on the island and will be shipped weekly via service barge to a licensed landfill on the mainland. There will not be any landfilling or permanent disposal of solid waste on the island.

During construction, all pieces of wire, bolts and other unused metal, glass and plastics will be picked up and properly stored as soon as practical awaiting transfer for recycling

off the island. All other construction debris will be removed from the individual construction sites following completion of restoration activities at those locations. Excess subsoil and rock not used for construction purposes will be used in restoring the construction staging areas.

Non-construction debris generated from the operation of the housing and support facilities will be properly stored in dumpsters prior to being picked up and disposed of by a waste management operator.

Environmental Restoration

Habitat Restoration- Mitigation of Temporary Impacts

Construction of the Project will result in temporary impacts to habitat from clearing and other disturbances. In areas of temporary impacts, habitats will be restored to the extent practicable. Restoration areas include the construction staging areas, WTG construction areas outside the 15 foot gravel ring, buried ECS, areas disturbed by road construction outside their 38 foot width, concrete batch plant and areas disturbed during construction of housing and support facilities. Habitat restoration activities will include but not be limited to:

- removing construction debris;
- re-grading site and remaining excavated materials to pre-construction contours;
- restoring stockpiled topsoil to original contours; and
- seeding with native plant species in any replanting of temporarily disturbed areas.

Wetlands Mitigation

As described previously, permitting for the Project will include a requirement to establish new wetlands on the island in order to mitigate permanent impacts to wetlands. The project will impact approximately 0.79 acres of wetland, mostly through construction of service roads and ECS. Compensation for the unavoidable loss of approximately 0.79 acres of wetland habitat will be accomplished by creating approximately 0.268 acres of new on-site wetlands. The proposed area is an expansion of the wetland near turbine 25 (See Figure 1.2-1).

Temporary impacts to wetlands will affect less than 1 acre. Mitigation for temporary wetlands impacts are discussed in Section 2.4.3 (Wetlands) and will likely consist of: restoration disturbed wetland areas as close as practicable to pre-construction condition; and taking measures to prevent and reduce the impact of soil erosion during project construction operations.

SPDES Stormwater General Permit and Stormwater Pollution Prevention Plan

In accordance with the requirements of the NYSDEC State Pollutant Discharge Elimination Standards (SPDES), General Permit for Stormwater Discharges from Construction Activities, GP-0-08-001 a SWPPP has been prepared for the Project and is found in Appendix D.

The SWPPP presents a conceptual approach to drainage design and erosion and sedimentation control measures to be implemented during the construction of the Project. Implementation of the SWPPP will provide mitigation to potential impacts to surface waters also described in Section 2.4.1. Stormwater management control measures include:

- Restore WTG construction sites, resulting in less than 0.04 acres of impervious surface for the exposed WTG pedestal (3.4 acres total).
- Create vegetative buffers downslope of WTG sites and service roads.
- Construct service roads flush with grade to minimize post construction impact of flow paths.
- Use pervious stone fill where wetlands must be crossed in order to maintain hydraulic connection.
- Install sediment basins at temporary construction staging areas and concrete batch plant.
- Remove and restore temporary construction staging areas and concrete batch plant.
- Construct permanent erosion and sediment control measures in accordance with NYS Stormwater Management Design Manual at the residential housing and support facilities complex.

Temporary Road Materials

In order to ensure crane access to WTG for maintenance and emergency repairs, the service roads must remain permanently. Service roads have been designed for the Project

in such a way as to minimize their length and width and wetlands have been avoided to the maximum extent practicable. Given the lack of existing roads or other development on the island, the road layout was designed to go point to point, unless wetlands or grade changes (that would require excessive cut and fill) necessitated an alternative route. Given the difficulty in delivering materials and equipment to the island, especially in winter months, it will not be practical to remove service or cut back service roads after construction, therefore, there will be not temporary roads subject to restoration.

Environmental Monitoring Plan

A Draft Environmental Monitoring Plan (EMP) has been prepared for the Project and is found in Appendix F. The intent of the EMP is to ensure the mitigation measures, environmental protections and best management practices associated with construction of the Project are implemented in accordance with the permit conditions for the Project. The EMP provides the environmental monitor(s) a reference source to manage and document environmental issues encountered during construction of the Project.

The EMP contains the framework for the daily and long term monitoring and reporting structure to ensure that the project is constructed within the parameters set forth in the permits issued for the Project. The Plan will be in effect from the start of construction until the completion of the construction and restoration of the Project site.

Specific permit conditions will be established in the state and federal permits required, at a minimum, from United States Army Corp of Engineers (USACE) and NYSDEC. It is anticipated the Statement of Findings for the Project will also include thresholds and conditions to be implemented through the EMP. Upon completion of the Statement of Findings and environmental permitting, the relevant conditions and best management practices pertaining to construction and restoration will be incorporated into the final EMP.

The environmental monitor is responsible for monitoring, documenting, and reporting daily construction activities as well as managing environmental quality control and quality assurance issues. The Environmental Monitor has authority to order the correction of work which in violation of any permits or commitments until such time as

corrective measures have been implemented. Permit compliance issues will be reported to the appropriate local, state, and federal agencies as well as to Upstate Power. The environmental monitor will complete daily inspection logs. Weekly, monthly, and quarterly summaries of construction activities will be required as necessary by state or federal permits. A post construction report will be completed by the environmental monitor upon completion of the construction and restoration of the Project site.

Structural Considerations

Standards related to the design and operation of wind turbines are issued by the International Electrotechnical Commission (IEC), the recognized international body for standards development activities. IEC 61400-1, "Wind Turbine Safety and Design," deals with safety philosophy, quality assurance and engineering integrity, and specifies requirements for the safety of WTG systems, including design, installation, maintenance, and operation under specified environmental conditions. Its purpose is to provide the appropriate level of protection against damage from all hazards from these systems during their planned lifetime. This standard is concerned with all WTG subsystems such as control and protection mechanisms, internal electrical systems, mechanical systems, support structures, foundations and the electrical interconnection equipment. The standard applies to all sizes of WTG connected to electrical power networks and WTG with swept area equal to or larger than 40 m^2.

Germanischer Lloyd (GL) is an independent engineering and certification firm that provides certification to wind turbine manufacturers, insurers, operators, owners, and financiers of the adequacy of wind turbine designs and project installations. A Type Certification by GL indicates the wind turbine design is in conformance with applicable design codes and that an appropriate level of quality control is maintained. Type Certification includes assessment of design documentation, a thorough design review with respect to the requirements defined in the relevant codes and standards, prototype testing and review of quality the manufacturer's quality management system to be in accordance with ISO 9001.

The Project WTG will be certified by GL as meeting the design loads required by international standard IEC 61400-1, including fatigue loads, extreme loads, and normal operating loads due to wind, snow and ice. A site certification will include review of the proposed WTG design and layout for site specific seismic loads, average wind speed, maximum gusts, wake effects from turbine locations, soil conditions, and local climate data (e.g., air density, temperature, icing frequency, wind turbulence, etc.). Site specific load requirements for the Project will be identified and reviewed as part of the Project detail engineering design.

The WTG and its foundations will be designed to support the WTG based on regional conditions. These conditions include the local soil and or bedrock characteristics and ice loads. In addition, a review of the Seismic Zoning Map for New York State Seismic Building Code indicates that the Project Area is in Seismic Zone C and has a "Z" factor of 0.15. This information, combined with regional soil conditions, indicated that the Project Area is in a zone of moderate risk (Gergely, 1993). The foundation will be designed to these local seismic standards.

There are no public roads on Galloo Island and consequently, there area no public road construction standards that must be met. Therefore, the service roads will be designed for the maximum dimensional (38 foot width) and weight (200 ton) requirements for the construction of the Project.

Public Safety considerations are minimal given the Project's remote location and lack of permanent residences within 10 miles. Public safety issues typical to wind farms located on the mainland, such as ice shedding, ice throw, and noise, do not pose the same concern for the Project. Security measures will include an eight-foot high chain link fence with downward focused security lighting that will not attract birds, at the substation. Because of the remoteness of the island along with the presence of a construction work force and subsequent operations work force, additional security measures will not be required on Galloo Island.

Construction Schedule and Phasing

Upstate Power anticipates a three year duration for construction activities, beginning in April 2010 and to be complete in November 2012. The April 2010 date to commence construction activities is contingent upon obtaining all necessary permits and approvals, including but not limited to those from the USACE, NYSDEC and PSC (off-island Article VII).

Due to difficulties associated with working on Galloo Island during winter months, it is anticipated that on-island construction work will only take place from April through November each year. Detailed construction activities for key Project components are further described in Appendix B – Conceptual Design Report. Table 1.4-1 describes the anticipated construction tasks for during each construction year.

Table 1.4-1: Anticipated Construction Tasks

CONSTRUCTION TASKS	START DATE	COMPLETION DATE
Temporary Off-loading Facilities and Slip	April 2010	Nov. 2010
Temporary Housing Facilities	April 2010	June 2010
Helicopter Pad	April 2010	June 2010
Power Generation System	May 2010	Aug. 2010
Community Building	May 2010	Aug. 2010
O&M Buildings (O&M and Utilities)	July 2010	Nov. 2010
Fuel Storage Systems	May 2010	Aug. 2010
Water, Wastewater and Fire Protection Systems	Aug. 2010	Oct. 2010
Concrete Batch Plant	Sept. 2010	Nov. 2010
Permanent Housing Buildings and Support Facilities	April 2011	Nov. 2012
Construction Staging Areas	April 2011	Nov. 2011
Service Roads	April 2011	May 2012
ECS	April 2011	July 2012
WTG foundations	June 2011	June 2012
On-Island Substation	June 2011	June 2012
WTG Erection	July 2011	June 2012
Wind Farm Commissioning and Begin O&M	Sept. 2012	Oct. 2012

1.5 Operations and Maintenance

General Wind Farm Operation

Operating Hours and Operational Conditions

Upstate Power intends to operate the Project with a goal of having the WTG available to generate electricity 95% of the hours of the year or more. The actual hours that the WTG would be generating electricity will depend on wind speeds. Using wind speed data collected from its on-site meteorological stations, Upstate Power estimates that the WTG will generate electricity approximately 90% of the hours of the year. A large percentage of the hours in which the WTG will not generate electricity will occur during routine maintenance.

The Project is designed to operate when wind speeds at the hub height are within the operating range of the WTG. Each WTG is computerized to control critical functions, monitor wind conditions and report data back to a supervisory control and data acquisition (SCADA) system. An anemometer mounted on the top of the WTG nacelle provides wind speed information used to automatically set blade pitch and control the WTG. A wind vane mounted on top of the nacelle provides information needed to yaw the WTG into the wind. The SCADA system monitors problems and diagnoses failures. If a problem causes a WTG to shut down, the WTG will either be restarted by the SCADA system operator, or service personnel will perform the necessary repairs and then manually restart the WTG.

In addition to the normal computer control system in the WTG, the WTG can also be controlled manually at the nacelle, from a panel inside the base of the tower, or from a remote computer via the SCADA system. Using the tower top control panel, the WTG can be stopped, started, and turned out of the wind. Service switches at the tower top prevent service personnel at the bottom of the tower from operating certain WTG systems while service personnel are in the nacelle. To override any WTG operation, emergency-stop buttons located in the tower base and the nacelle can be activated to stop the WTG in the event of an emergency.

Employees: Numbers and Duties

For planning purposes, it is anticipated that once in the long-term operation and maintenance phase, the Project will employ a full-time staff of approximately 24 persons. A potential scheduling option is for a full-time crew of 12 persons to work two weeks on and two weeks off. When on-duty, the full-time crew stationed on Galloo Island will occupy six two bedroom permanent housing units. Full-time on-site staff during the long-term O&M phase of the project will likely include:

- Turbine Operation and Maintenance Staff - Estimated to be eight full time individuals on-site who will be responsible for the turbine operations.
- Project Manager - Estimated to be one individual who will manage the wind power project operations.
- Logistics/Inventory Manager - This person would be responsible for coordination of inventory, ordering, and shipping/receiving associated with all non-wind power project operations.
- Equipment Operator/Maintenance Staff - Estimated to be two full time individuals who will be responsible for all non-wind power equipment operation and maintenance as well as operation of equipment for any needs on the island.

At any given time at least two crew members with emergency care training will be on the island to provide first aid treatment.

Routine Maintenance and Required Equipment

The Operations and Management Plan (O&M Plan), found in Appendix G, provides further information on maintenance activities. The facility's maintenance schedule will require routine maintenance to be performed on every WTG twice per year. Each WTG maintenance visit is usually performed by the two man crew from the Turbine operations and maintenance staff. Routine maintenance procedures are estimated to take two days per WTG to complete.

Routine maintenance will be completed using WTG-provided access equipment (interior tower ladders or lifts) and will be conducted by accessing the nacelle from the interior of the tower.

Maintenance of Project service roads can be performed by Project personnel or contractors. To support routine maintenance, Upstate Power will maintain several work

(pickup) trucks, a workshop within the O&M building, an inventory of spare parts and supplies, and tool kits to be carried into nacelles to perform routine maintenance.

In addition to performing this routine WTG maintenance, Project personnel will perform unscheduled maintenance and quickly respond to signals from WTG that may be stopped for any reason. If major parts fail within the nacelle, hub or if rotor needs to be replaced, additional equipment such as cranes will be required from the mainland.

Project Life

Wind energy is a renewable resource and does not dissipate. Therefore, the Project Area is anticipated to remain a viable location for wind powered generation of electricity.

The proposed WTG have an expected useful life of at least 20 years and are certified as such by international agencies that include Underwriters Laboratories and Germanicher Lloyd AG. The WTG will be continually maintained throughout the life of the project. Moreover at the end of its useful life, or at any other time, if a generator needed to be replaced for any reason, Upstate Power would likely install a new generator at the site (repowering) to best make use of its investment in Project infrastructure and continue to take maximum advantage of the unique, clean, renewable, wind resource at the site.

The only scenario in which Upstate Power anticipates decommissioning the Project is if the wind farm becomes financially unviable. This is not anticipated to occur over the next 20 years and beyond.

The availability of infrastructure and the ability to generate electricity with relatively low operating cost will justify ongoing investment in equipment maintenance, repairs, or replacements for the foreseeable future. In addition, because Upstate Power will own the land, there will be no competing development pressures and the site can be dedicated to energy production for the long term. Therefore, it is not anticipated that the project will cease operations and need to be decommissioned for at least its anticipated 20 year useful life.

Storage and Use of Road Materials

Gravel for road construction, which is not derived from construction-related rock removal will be delivered to the Project site by barge. Upon complete of construction and the construction staging areas are restored, a limited amount of gravel needed for road maintenance will be stored in a covered bunker area at the O&M facilities.

Because the service roads will not be paved only limited amounts of sand for traction will be used. Sand will be stored in a covered bunker in the vicinity of the O&M buildings.

Operations and Management Plan Summary

An Operations and Management Plan has been prepared for the Project to ensure that environmental impacts are minimized during maintenance and repairs of Project facilities. The O&M Plan will be in effect once construction activities are complete and the Project enters the operational phase. The O&M Plan focuses on environmental based procedures and policies to follow during the ongoing maintenance and operation of the facility. The O&M Plan also serves as a contingency plan to assess and minimize the potential for environmental impacts to result from major repairs and decommissioning. The O&M Plan is found in Appendix G.

The O&M Plan provides policies, thresholds and procedures related to the following Project features:

- Routine maintenance activities for the WTG, ECS, on-island substation, service roads and drainage;
- Major repairs to the WTG, ECS, Service Roads;
- Decommissioning, including tower dismantling, removal of tower bases, restoration and monitoring;
- Handling and storage of petroleum products in accordance with the SPCC Plan and NYSDEC PBS regulations;
- Maintenance of the wetland mitigation area;
- Avoidance of future wetland impacts;
- Management and monitoring of restoration activities;
- Ice Management strategies for inlet slip; and

- Control and prevention of invasive species on the island and prevention of invasive species spreading from the Island to the mainland.

1.6 Required Permits and Approvals

SEQR Process and Chronology

As stated in the Introduction, the Project is subject to review under the State Environmental Quality Review Act (SEQRA). The SEQRA Regulations (6 NYCRR Part 617) provide guidance and a uniform process for regulatory agencies to follow in conducting an environmental evaluation of a proposed project. Key milestones for the SEQRA process conducted for the Project are described below.

On November 20, 2007, the Town of Hounsfield Planning Board received an Application for Site Plan Approval and a SEQRA Environmental Assessment Form (EAF) from Upstate NY Power for development of the Project.

The Planning Board determined that the Project was a Type I Action under SEQRA. Accordingly (pursuant to 6 NYCRR §617.6(b)(3)) on December 5, 2007 the Planning Board circulated a "Lead Agency Coordination Letter" and EAF Part 1 to all anticipated Involved Agencies. In this correspondence, the Planning Board indicated its desire to act as Lead Agency for the purpose of a "Coordinated" SEQRA review of the Project. By letter dated April 24, 2008 the NYSDEC advised the Planning Board of its desire to act as Lead Agency.

The Lead Agency dispute was submitted to the Commissioner of NYSDEC in accordance with the requirements of 6 NYCRR § 617.6(b)(5).On April 24, 2008, the Commissioner determined that based on the criteria set forth in 6 NYCRR § 617.6(b)(5)(v) NYSDEC should act as Lead Agency.

On May 21, 2008, the NYSDEC (pursuant to 6 NYCRR §617.7) determined that the Project may have the potential for a significant adverse environmental impact on the environment and that a DEIS must be prepared.

Also pursuant to 6 NYCRR §617.8, on May 21, 2008 the NYSDEC required Public Scoping for the Proposed Action. Public Scoping, under 6 NYCRR §617.8, is the process

by which the Lead Agency, in cooperation with the public and involved or interested agencies, identifies potentially significant adverse impacts that should be considered in a DEIS. As part of the EIS process and in accordance with 6 NYCRR §617.8, this Draft Scoping document was prepared by Upstate Power and circulated to Involved and Interested Agencies and the Public for review and comment.

Written comments on the Draft Scope for the Proposed Action were accepted until the end of the business day on June 30, 2008. The Final Written Scope was issued on September 22, 2008.

This DEIS has been prepared in accordance with the content requirements outlined in 6 NYCRR §617.9(b). Following the notice of completion of the DEIS the document will be published for review by agencies and the public. The public comment period must run for at least 30 days. During this period a public hearing will be held to allow for public comment. The public and agencies will also be able to submit written comments to the lead agency throughout the public comment period.

Subsequent to the close of the Public Comment period, the NYSDEC, as Lead Agency will be responsible to prepare the Final Environmental Impact Statement (FEIS). The FEIS will consist of the DEIS (by reference), any necessary revisions or supplements, a summary of the substantive comments received, and responses to those comments on the DEIS.

Upon completion of the FEIS, the Lead Agency will issue a Notice of Completion of the Final EIS. No sooner than 10 days following the filing, the Lead Agency will issue its Findings Statement. It is anticipated that the Lead Agency will issue a positive Findings Statement, documenting how the relevant adverse environmental impacts were avoided or minimized to the maximum extent practicable and that the Project is approvable. Issuance of the Findings Statement ends the SEQRA process and signifies the point when State and Local permits and approvals can be issued.

Permits and Approvals: Federal, State and Local

It is anticipated that the permits and approvals identified in Table 1.6-1 includes all the agencies and authorities having some level of review or approval authority over the Project. To date, only an application for site plan approval from the Town of Hounsfield was filed in order to trigger review under SEQRA. Completion of remaining permit applications is dependent on final engineering design and is anticipated to coincide with the filing of the Statement of Findings anticipated in Spring 2009.

Table 1.6-1: Anticipated Permits and Approvals

AGENCY	PERMIT / APPROVAL
Federal Aviation Administration	Notice of Construction or Alteration pursuant to 49 USC 44718
United States Army Corps of Engineers	Joint Application for Nationwide Permit for Alternation to Wetlands pursuant to 33 USC 1251
United States Army Corps of Engineers	National Environmental Policy Act determination pursuant to 42 USC 4321
Advisory Council on Historic Preservation	Consultation under Section 106 of the National Historic Preservation Act
US Fish and Wildlife Service	Consultation under Section 7 of the Endangered Species Act
New York State Department of Environmental Conservation	Findings for the State Environmental Quality Review Act pursuant to 6 NYCRR Part 617
New York State Department of Environmental Conservation	Joint Application for Water Quality Certification pursuant to 33 USC 1341
New York State Department of Environmental Conservation	Joint Application for Wetlands Permit pursuant to ECL Article 24
New York State Department of Environmental Conservation	Joint Application for Protection of Water Permit pursuant to ECL Article 15
New York State Department of Environmental Conservation	Joint Application for Potable Water Supply pursuant to ECL Article 15
New York State Department of Environmental Conservation	SPDES General Permit No. GP-0-08-001 for Stormwater Discharges from Construction Activities, pursuant to ECL Article 17
New York State Department of Environmental Conservation	Review and approval of Stormwater Pollution Prevention Plan pursuant to ECL Article 17
New York State Department of Environmental Conservation	SPDES Permit for Discharge of Treated Wastewater pursuant to ECL Article 17
New York State Department of Environmental Conservation	Registration for Petroleum Bulk Storage pursuant to 6 NYCRR Part 614
New York State Department of State	Consultation for Coastal Zone Consistency Review pursuant to 16 USC 1451
New York State Department of Health	Ministerial approvals for transient housing, infirmary, food service, sewage treatment plant.
New York State Office of Parks, Recreation and Historic Preservation, State Historic Preservation Office	Consultation required pursuant to PRHPL 14.09
Public Service Commission*	Certificate of Public Convenience and Necessity pursuant to Section 68 of the PSL and determination under Article VII of the PSL

Town of Hounsfield Planning Board	Site Plan Review pursuant to Hounsfield Zoning law Area Variance pursuant to Hounsfield Zoning law Building Permits pursuant to Hounsfield Town law.
Jefferson County Planning Board	Zoning Referral and recommendation pursuant to Gen. Mun. Law 239-m
Jefferson County IDA	Financing/leasing and PILOT Agreement
Sacket's Harbor Central School District	Approval of PILOT Agreement
Potential	
New York State Department of Environmental Conservation	Incidental Take Permit pursuant to ECL Article 11(Potential)

* Environmental assessment for transmission line is addressed outside this DEIS.

Record of Consultation with State and Federal Agencies

In addition to the agencies identified in Table 1.6-1 above that have jurisdiction over specific permits or approvals, Upstate Power has also consulted with the following agencies as part of the SEQR process. Theses letters are in Appendix H.

Table 1.6-2: Agency Consultation

AGENCY	DATE OF CONSULTATIOn	METHOD
New York State Historic Preservation Office (SHPO)	December 10, 2007	letter
NYSDEC	April 24, 2008	letter
NYSDEC Natural Heritage Program	December 7, 2007	letter and telephone
New York State Department of State (NYSDOS)	May 29, 2008	meeting
New York State Department of Public Service	January 2, 2008	letter and meeting
United States Department of the Interior Fish and Wildlife Service (USFWS)	January 10, 2008	letters and telephone conference
United States Army Corps of Engineers (USACE)	May 29, 2008	letter
National Marine Fisheries Service	February 1, 2008	letter
Untied States Coast Guard	March 26, 2008 (sent)	letter
Oneida Indian Nation	January 31, 2008	letters and telephone
Onondaga Indian Nation	January 31, 2008	letters
Cayuga Nation o f New York	January 31, 2008	letters
Haudenosaunee Standing Committee of Burial Rules and Regulations	January 31, 2008	letters

Coordination with NEPA process

The Project is subject to review under the National Environmental Policy Act of 1969 (NEPA). In accordance with NEPA, Federal agencies are directed to examine the consequences of proposed activities in light of an overall goal to protect and enhance the

human environment. NEPA applies to almost all actions undertaken or approved by a Federal agency including funding, licensing and permitting actions. Types of NEPA documentation include categorical exclusions, environmental assessments and environmental impact statements.

The Federal agency responsible for permitting many of the actions that will be undertaken for the Project is the USACE, Buffalo District Office. The authorities under which the USACE will permit and evaluate project features are Section 10 of the Rivers and Harbors Act of 1899 (RHA) and Section 404 of the Clean Water Act (CWA). Section 10 requires issuance of permits for any work (dredging, excavation, drilling, depositing materials, etc) or construction of structures in, over, or under a navigable water of the United States such as but not limited to Lake Ontario. Section 404 of the CWA requires authorization for any discharge of dredged or fill material into waters of the United States including freshwater wetlands. The geographic scope of waters of the United States goes beyond those waters listed as navigable under Section 10 of the RHA. Actions associated with the Project that require Section 10 and/or Section 404 permits include work and filling in freshwater wetlands on Galloo Island (ECS, access roads), the installation of the submerged electric cable from the island to the mainland, construction of the temporary and permanent offloading facilities (excavation, filling, bulkheads, floating breakwater, moorings, etc.) and installation of the water intake and sewage discharge structures.

Although other Federal agencies will be involved in the review of the Project, the lead Federal agency under NEPA is the USACE due to a greater degree of involvement than other agencies. Other agencies involved include the United States Coast Guard (USCG) in review of navigation and national security interests, review by the U.S. Environmental Protection Agency under NEPA, Clean Air Act and other authorities such as Section 404 CWA, and review by the U.S. Fish and Wildlife Service under the Fish and Wildlife Coordination Act and the Endangered Species Act. Other federal agencies will also receive Public Notice of the Project from the USACE.

It is anticipated that the USACE will use all information from the SEQRA DEIS and Article VII application and fulfill the NEPA requirements by preparation of an Environmental Assessment that incorporates the DEIS and Article VII by reference. The USACE will ensure as part of the NEPA review, that there is compliance with both the Endangered Species Act and the National Historic Preservation Act of 1966. The NEPA process begins with pre-application consultation between the Upstate Power, USACE and other involved parties. Once a permit application (accompanied by this DEIS) has been submitted by Upstate Power, the USACE will review it for completeness. Once the application is determined to be complete, the USACE will issue a thirty day Public Notice to obtain comments. If they determine it necessary, USACE will schedule a public hearing on the Project. At the conclusion of the permit review process, the USACE will then prepare an Environmental Assessment that includes a 404 (b) analysis under CWA and will prepare a Statement of Findings. This concludes the NEPA process and the USACE can then make a determination about issuance of permits including special conditions to protect the environment and other public interest factors (such as navigation, aesthetics, floodplain values etc.).

Compliance with Section 106

The Project is subject to review under Section 106 of the National Historic Preservation Act and Section 14.09 of the State Historic Preservation Act under the authority of the New York State Historic Preservation Office (SHPO). Panamerican Consultants, Inc (Panamerican) was contracted by Upstate Power to complete a Phase IA Cultural Resources Investigation (Phase IA); the investigation was conducted between November 2007 and February 2008. In December 2007, in conjunction with conducting the Phase IA, Panamerican provided a project description and project maps to the SHPO in an initial consultation (SHPO Project Review Number: 07PR67330). The findings of the Phase IA as well as the 'end-of-field letter' for the Phase IB studies conducted for historical and archaeological resources are summarized in Section 3.7 of this DEIS. The *Phase IA Cultural Resources Investigation for the Proposed Hounsfield Wind farm, Galloo Island Project Area*, is included in Appendix I.

As a result of the Phase IA findings, it was determined that additional field study be undertaken to evaluate potential impacts to both historic architecture and archaeological resources. It is anticipated that as a result of the Phase IB studies it will be determined that the Project will not result in any large and significant adverse impacts to the cultural resources in the project area.

PSL Article VII Process

The construction and operation of the 50.6-mile transmission line is subject to approval by the PSC in accordance with Public Service Law Article VII. As described previously, because the transmission and interconnection aspects of the Project are being reviewed and certificated under the Article VII process, they included in the SEQR evaluation for the Project.

Parallel to the EIS/SEQR process, Upstate Power filed with the PSC for a *Certificate of Environmental Compatibility and Public Need* in order to construct the transmission and interconnection facilities. The preliminary filing was be made on January 13, 2009. An evaluation of the cumulative impacts resulting from the on-island generation project and the transmission line project is presented in Section 6.2.

1.7 Project Sponsor

The project sponsor is Upstate NY Power Corp of West Seneca, New York. Upstate Power is a utility scale power producer developing clean energy projects in the New York State energy market. It is a New York State "electric corporation" pursuant to the Transportation Corporations Law, with the power of Eminent Domain. It is a "public utility" under both federal and state law, operating under significant measures of federal and state regulation. Among other things, it is subject to regulation by the FERC under the Federal Power Act, 16 USC 24(c)(d). As an electric corporation under New York's Transportation Corporations Law, Upstate Power's electric facilities are subject to regulation by the New York Public Service Commission under the New York State Public Service Law.

2.0 Resource Characterization, Impact Assessment and Mitigation

2.1 Topography, Geology and Soils

Characterization

The Project Area is located on Galloo Island in eastern Lake Ontario. Galloo Island is completely within the Town of Hounsfield, Jefferson County, New York. Figure 2.1-1 provides a topographic map of the Project Area.

Topography

Galloo Island is located in the Ontario Lowlands Physiographic Province of New York State and is approximately 4.5 miles long and up to 1.5 miles wide with an elevation range of 250 to 305 feet above mean sea level. The island is generally flat with a steep sloping northeast facing scarp at the northern end of the island. The rest of the island has a gently sloping surface that faces southwest toward the main basin of Lake Ontario (known as a cuesta feature).

The current topography is the result of erosion, caused by Pleistocene glaciers that covered the area approximately 18,000 years before present and post-glacial surface water drainage.

Geology

The Project Area and surrounding islands are part of a larger area formed from what is referred to as the Galloo Rock outcrop (Soil Survey of Jefferson County 1989) located in the area known as the Galloo and Stony Basin (NOAA Chart) and the Northeast Lake Ontario-St. Lawrence Basin. Within the basins there are a series of broad low northeast to southwest trending ridges that combine to form a complex ridge extending from the west near Prince Edward Point, Ontario to the east near Stony Point, New York. This ridge has a relief ranging from 20-30 meters and is asymmetrical, with steep northeast facing scarps, and gently sloping surfaces facing southwest toward the main basin of Lake Ontario. The cuesta features are gently rounded to flat on top, and several are capped by islands, the principal of which are Main Duck, Galloo, and Stony Islands.

Bedrock can be observed under water immediately adjacent to the island along the east, south and west sides of the island. A veneer of gravel is apparent on submerged bedrock along the northern tip and the northeast shore of the island.

Bedrock on land and submerged within the Project Area is primarily composed of limestones of the Trenton Group, deposited 505-440 million years ago during the Ordovician Period (New York State Museum, 1975). Limestone is subject to dissolution by acidic groundwater along bedding planes, fractures, joints and faults. While no limestone (karst) hazards are mapped on Galloo Island, the Trenton Group is comprised of carbonate rocks that are susceptible to dissolution and sinkhole formation, especially with joint and fractures common in limestone. In addition, an orthogonal joint system is developed in bedrock and can be seen in shallow water from the air.

Seismicity

Earthquakes have occurred in Jefferson County and are typically below magnitude 3 on the Modified Richter Scale. The only potential seismic hazard for Galloo Island would be generated northeast along the St. Lawrence Rift System. The 1000 kilometer system trends northeast and southwest and is suspected to extend into Lakes Ontario and Erie.

The New York State Seismic Building Code Seismic Hazard Map breaks the state into four distinct zones (Seismic Zone A through D). The geographic area described as Zone A (located in south-central New York) is considered as having the lowest seismic risk, while geographic areas described as Zones B through D are considered as moderate seismic risk areas. Each zone has a corresponding seismic zone factor of "Z". The "Z" numerically corresponds to effective peak acceleration in g, where g equals the earth's gravity acceleration (Klaus, 1993). The building code seismic hazard map for New York State uses these four zone factors, which are based on an exceedance probability of 10% in about 100 years (Klaus, 1993). "S" takes into account differences in seismic characteristics of soils types and bedrock found in each Seismic Zone. Five soil-type factors (S0-very hard rocks through S4-very soft soils) have been identified in the code (which includes a soil liquefaction screening procedure).

Review of the Seismic Zoning Map for New York State Seismic Building Code, indicates the Project area lies within Seismic Zone C and has a "Z" factor of 0.15. The Project area has a soil type factor designation of S2 (soft soil). This indicates that the Project Area is in a zone of moderate risk (Gergely, 1993).

Soils

Soil information for the Galloo Island was obtained from the Soil Survey of Jefferson County. According to the Soil Surveys, the surficial geologic deposits within the Ontario Lowlands province consist primarily of glaciolacustrine lake silts, clays and fine sands, with major areas overlain by glacial till or ground moraine. Surficial geology in the flat lying and gently rolling areas is composed of thin overlying inland soils comprised of loam or clay (New York State Museum, 1975).

The majority of the island is comprised of Galloo-Rock and Galloo, acid Rock outcrop (GbG/GcB). This soil consists of a thin layer (2 to 10 inches thick) of loamy till that overlies the limestone. Typically it consists of 55% soils and 25% rock outcrop with bedrock. Another dominant soil is the Newstead Silt loam (Nn). This soil is a loamy till derived from limestone with varying amounts of sandstone, shale and granite. It is somewhat poorly drained and ranges in thickness from 2-4 feet. Depth to water in this soil ranges from 6 to 12 inches below ground surface.

Soils on the northern end of the island (which is lower topographically) consist of an even mixture of silty and clayey glaciolacustrine deposits ranging in thickness from 10-40 inches. Typical soils found are the Collamer Silt loam, Chaumont Silty clay, Farmington loam, Wilpoint silty clay, Benson-Galloo complex, Guffin Clay, Newstead Silt loam, Galway silt loam, and Saprists and Aquents.

Wetlands are developed across the island in the hydric soils that are poorly drained where depth to groundwater is shallow. Wetlands on the island have been extensively delineated and are discussed in detail in Section 2.4.3 of this report. The turbines will utilize a spreadfooter design typical for WTG and the roads will be constructed of gravel or will use existing bedrock surfaces.

Table 2.1-1: Soil Classifications

Name	Unified Soil Classification	Description		Depth to bedrock (inches)	Depth to water (inches)
Benson-Galloo complex	BgB	channery loam till	somewhat excessively drained	10 to 20	> 80
Chaumont Silty clay	ClA	Clayey glaciolacustrine/glaciomarine deposit	poorly drained	20-40	6-8
Collamer Silt loam	Cob	silty and clayey glaciolacustrine deposit	moderately well drained	40-60	18-24
Galway silt loam	GlA/GlB	calcareous loamy till	well drained	20-40	18 to 40
Newstead Silt loam	Nn	loamy till	somewhat poorly drained	24-48	6 to 12
Galloo-Rock and Galloo, acid Rock	GbG/GcB	outcrop consists of a thin layer of loamy till that overlies limestone or sandstone Typically it consists of 55% Galloo soils and 25% rock outcrop		2-10	
Wilpoint silty clay loam	WnB	clayey glaciolacustrine or glaciomarine deposit	moderately well drained	20-40	15-24
Guffin Clay	Gv	clayey glaciolacustrine deposit or glaciomarine deposit		20 to 40	0-6
Farmington loam	FaB	loamy till In many places it is mixed with wind and water deposits		10-20	> 80
Saprists and Aquents, ponded	Sa	Generally found in marsh and swamp areas, the soil is comprised of organic material beneath a water surface		80	

Impacts

Potential impacts to topography, soils and bedrock are anticipated in both the construction and operational phase of the project. Each of the impact areas are discussed below.

Topography and Soil

No significant permanent impacts to surface topography or soils are anticipated from the construction of the Project. There are no soil or geologic factors present on the island that will require specialized engineering for either the service roads or turbines.

The topography of the island does limit some of the locations where WTG can be placed. In particular, WTG will be constructed at least 75 feet or more from the shoreline cliffs to ensure that sufficient counterweight is available to maintain the structural integrity of the foundation.

Limited, temporary impacts to soils from project construction will result from the clearing, excavation and filling activities associated with establishing crane pads, foundations and ECS. The project will consist of turbines built on reinforced concrete foundations, approximately 6 to 8 feet deep. The total amount of ground disturbance is discussed in Section 2.2 Land Use.

Excavated materials from all construction activities will be stockpiled during construction and subsequently reused on site for regrading or revegetation. Topsoil, particularly at the northeast end of the island, will be segregated and replaced on top of the existing ground surface.

No significant impacts to soils or topography are anticipated during the operation and management of the project. The Operations and Management Plan will be implemented for good housekeeping, preventative and corrective maintenance procedures, spill prevention and emergency cleanup, inspection and record keeping practices (The draft Operations and Maintenance Plan is attached as Appendix G).

Bedrock

Impacts to bedrock are anticipated from blasting during construction. Soils on the island are shallow with many areas of exposed bedrock (limestone). As noted earlier, no bedrock hazards such as limestone karst are mapped on Galloo Island; however, the Trenton Group is comprised of carbonate rocks that are susceptible to dissolution and sinkhole formation.

Blasting of bedrock will be required for the construction of turbine foundations, portions of ECS and for the construction of the ship channel. Impacts and mitigation of blasting are outlined in Section 2.11 Blasting.

Submerged bedrock is expected to be the same geologic unit as found on the island. One of the criteria for the selection of the slip channel was bathymetry to minimize the amount of submerged bedrock that will be excavated. Nonetheless, bedrock will be impacted in the area where the slip channel is constructed.

Bedrock that is excavated for either turbine foundations or the dock will be reused on the island as material for the roads and aggregate for the concrete batch plant.

Seismicity

No significant impacts from earthquakes are anticipated from the construction or operation of the Project. Although there are no known fault lines in the immediate vicinity of the island, New York State has experienced earthquakes in the Appalachian Province in the past. Risks in an earthquake include ground shaking, fault rupture, slope instability, and liquefaction. Potential damage could occur to the turbines and its immediate fall zone. Additionally, because Galloo Island is not inhabited, there will be no significant impacts to the health and safety of residents, and minimal potential impact to property damage (other than those owned or leased by Upstate Power) in the rare event of a tower collapse from an earthquake.

Mitigation

In general, any impacts to topography and soils are related to impacts to land and wetland disturbances associated with the construction of the Project and are therefore more thoroughly discussed in Sections 2.2 and 2.4.3. Impacts to topography and soils will be mitigated by avoiding wetland disturbance where practicable, obtaining required wetland disturbance permits, minimizing disturbance of agricultural fields, re-using topsoil on site, and implementing the requirements of the Project's Conceptual SWPPP (Appendix D). In addition, the Project will comply with all SPDES permit GP-0-08-001 requirements along with an Environmental Monitoring Plan for both the construction and

operation of the wind farm. The Plan will include use of silt fencing and water dispersion methods to prevent siltation of local water bodies.

Soil will be segregated between top soil and sub-soil. All soil will remain on the island. Subsoil will be used as fill at locations proximal to its original point of excavation. Topsoil will be used at surface locations for restoration and re-seeding.

Service roads will be constructed on bedrock. Roads will be constructed of crushed gravel, where needed. This will be done to limit excavation of bedrock to only WTG foundations, ECS near WTG locations, and excavation of the slip channel.

The risk of a tower collapse from ground shaking, fault rupture, slope instability and liquefaction are minimal. A turbine and its base are designed to withstand major structural stresses, including seismic activity. The turbines are not located on any steep slopes, so the foundations will not be affected by slope failure. Therefore, no mitigation is required for impacts associated with seismic activity.

Mitigating impacts to bedrock from blasting is discussed in Section 2.11. Excavated bedrock will be used as aggregate in concrete, for road ballast and for the construction of the temporary docking/mooring facilities for the project. Due to the shallow nature of bedrock on the island, blasting is only viable method of removing rock.

2.2 Land and Land Use

This section of the DEIS describes existing landforms and land uses on Galloo Island (Project Area). Land use and zoning in the Project area was determined through a review of available GIS data, aerial imagery, zoning law, tax parcel data, and a field review conducted in October of 2007.

Characterization

Land Form

Galloo Island is located in Lake Ontario within the Town of Hounsfield, Jefferson County, New York. It is approximately 4.5 miles long and up to 1.5 miles wide, totaling approximately 1,966 acres.

The island is relatively flat with a general southeast topographic gradient. Elevation ranges from about 250 ft to 305 ft above mean sea level. A small escarpment (5 to 30 feet high) exists on the northern one-third of the property (with the northern one-third of the property at a lower elevation than the majority of the island). This escarpment appears to be a reflection of the bedrock formation.

Aerial photography (NYS Orthoimagery Program, 2006) reveals a predominately undeveloped landscape comprised mostly of deciduous forest, grasslands, shrub/scrub, and active agriculture. This was confirmed by a field review of the area conducted on October 22, 2007.

Existing Land Use

The majority of the Project Area is comprised of a single 1,935 acre parcel primarily used as a seasonal residence classified as an estate. The rural landscape is used for hunting, fishing, and other outdoor recreational activities. A herd of up to 450 white-tailed deer were bred and raised on the island for the sole purpose of hunting.

The Island is comprised of seven parcels. These include tax map parcel numbers 95.00-1-2, 95.00-1-4, 95.00-1-3, 95.00-1-1.2, 95.00-1-5, 95.00-1-1.1, and 95.00-1-7. Figure 1.2-3 depicts the location of these properties relative to the Project area.

Tax map parcel 95.00-1-2 is one of three properties owned by Galloo Island Corp and is one of two parcels that will be occupied by the Project. Jefferson County tax parcel data (2006) identifies this parcel as an estate. Approximately 168 acres of the property is used for the agricultural production of alfalfa and grain. This parcel has three residences and ten auxiliary buildings that include storage structures, an airplane hanger, and a pump house. A small landing strip is also present on the property.

The Jefferson County tax parcel data (2006) lists the two remaining properties owned by Galloo Island Corp, 95.00-1-4 and 95.00-1-3, as seasonal residential and waterfront vacant respectively. Parcel 95.00-1-4 is located on the northeastern shore of Galloo Island. It is approximately two acres and is occupied by one abandoned residential

structure. Parcel 95.00-1-3 is a small island located northwest of parcel 95.00-1-4 and is less than one acre. This property does not contain any structures.

The NYSDEC owns two properties in the Project area, tax map parcels 95.00-1-1.2 and 95.00-1-5. Jefferson County tax parcel data (2006) lists both parcels as community service – protection. Parcel 95.00-1-1.2 is located on the southwest tip of Galloo Island and is approximately 25 acres. This parcel contains one abandoned fog signal building. Parcel 95.00-1-5 is approximately three acres and is located on Galloo Island's southeastern shore. It is formerly a United States Coast Guard station and has four abandoned structures that are in poor repair. Both parcels are considered part of the Department of Environmental Conservation's Lake Ontario Islands Wildlife Management Area. Along with Little Galloo Island and Gull Island, Parcels 95.00-1-1.2 and 95.00-1-5 are held by NYSDEC for the purpose of protection, management, and public use. At present, parcels 95.00-1-1.2 and 95.00-1-5 are not suitable for public use as access is inhibited by natural terrain and inadequate dockage.

Cara C. Dibnah owns parcel 95.00-1-1.1, a one acre property located on the southwest tip of Galloo Island. Jefferson County tax parcel data (2006) lists this parcel as a community service land use. The property is currently occupied by an abandoned lighthouse, an attached residence and an abandoned cast iron oil house. The lighthouse is listed on the National Register of Historic Places.

Parcel 95.00-1-7 is owned by the United States of America. It is less than one acre and is located in the northern center of the Project area. Jefferson County tax parcel data (2006) lists this parcel as vacant land – rural. There are no structures on this property.

Table 2.2-1 summarizes all parcels by their current land use, owner, and size.

Table 2.2-1: Project Area Parcels

Parcel ID (SBL)	LAND USE	OWNER	Size (Acres)
95.00-1-1.1	Community Service - Religious	Dibnah, Cara C.	1
95.00-1-1.2	Community Service – Protection (Army, Navy, Air Force, Marine and Coast Guard Installations, Radar, etc.)	NYS Department of Conservation	25
95.00-1-2	Residential - Estate	Galloo Island Corp.	1,935

95.00-1-3	Vacant – Waterfront Vacant	Galloo Island Corp.	< 1
95.00-1-4	Residential – Seasonal Residences	Galloo Island Corp.	2
95.00-1-5	Community Service – Protection (Army, Navy, Air Force, Marine and Coast Guard Installations, Radar, etc.	NYS Department of Conservation	3
95.00-1-7	Vacant Land – Rural	United States of America	< 1

Source: NYS Office of Real Property Services, Real Property Data, 2006

Existing Zoning

Land use in the Project Area is regulated by the Town of Hounsfield Zoning Law, adopted in 1988 and last amended in 2008. Galloo Island is located within the Marine (MR) zoning district (Article IV, Section 425 of the Town of Hounsfield Zoning Law, 2008). The purpose of the MR District, as described in the Zoning Law, is to "*promote agricultural, recreational, rural, residential and open space uses to enhance scenic, natural and recreational opportunities*."

Permitted Uses in the Marine District include:

- Agriculture,
- Single family Dwellings (Waterfront),
- Individual Mobile Homes,
- Individual Mobile Homes (Waterfront),
- Home Occupations,
- Single and Two-Family Homes,
- Rental Cottages,
- Seasonal Housekeeping Units, and
- Accessory Uses of the above listed uses.

Uses allowed as Site Plan Review (SPR) Uses include:

- Travel Trailer,
- Camp Grounds,
- Outdoor Recreation,
- Essential Services,
- Small Retail,
- Marinas,

- Restaurants,
- Motels/Hotels,
- Institutional Uses,
- Multi-family Dwellings, and Townhouses

SPR Uses require site plan approval from the Planning Board pursuant to Article VI-A of the Zoning Law.

As an electric corporation under New York's Transportation Corporations Law, Upstate Power is considered a public utility and its electric facilities meet the Town of Hounsfield Zoning Law definition for "Essential Services." Therefore, the Zoning Law regulates the wind farm features of the Project as an "Essential Service" which requires site plan approval from the Planning Board.

The proposed residential facilities Multi-family Dwellings are also regulated as SPR Uses. Permanent structures necessary for support services, such as the Inlet Slip and Operations and Maintenance buildings, are not directly identified in the Zoning. It is anticipated that the establishment of these uses will be allowed as Accessory Uses of the Project (an Essential Use) and will be part of the Site Plan Review.

Special Use Permit uses (SUP) require approval from the Planning Board pursuant to Article VI-B of the Zoning Law. However, the Zoning Law only requires SUP approval for certain uses within the Arterial Corridor Protection District and therefore, the SUP requirements are not applicable in the MR District.

The maximum height limit for "buildings" in the MR District is 35 feet. However, the definition of "building" is a "shelter having a roof supported by columns or walls and intended for the shelter or enclosure of persons, animals, or property" (Article II of Hounsfield Zoning Code), and therefore, is not applicable to the wind turbines. The 35' maximum height requirement is applicable to the residential buildings and other buildings housing support facilities. Therefore, an area variance(s) will be necessary.

Because the proposed Project is allowed as an "Essential Service" and the maximum height regulations are not applicable, it is not anticipated the WTG element of the Project will require zoning use or area variances.

Floodplains

Floodplains are described as areas adjoining a river, stream, drain, or lake that transmit floodwaters during high water conditions. Under the National Flood Insurance Program, floodplains are categorized as Special Flood Hazard Areas or Floodway Areas within the 100-year flood zone or Other Floodway Areas within the 500-year flood zone. Development activity within the Special Flood hazard Area (100-year flood zone) requires a Floodplain Development Permit from the Town.

Based on the Flood Insurance Rate Maps developed by the Federal Emergency Management Agency, portions of the Project Area are located within 100 and 500-year flood zone areas (FIRM Community Panel Number 360340 0020 C, Effective Date May 18, 1992 . The regulated 100-year flood zone closely follows the shoreline up to the base flood elevation (BFE) of 249 feet. Figure 2.2-1 depicts the floodplain boundaries on Galloo Island.

Impacts

The Project is likely to have impacts on land use. These include:

- The amount of area to be permanently reserved exclusively for Project operations, including wind turbine areas, access roads and support operations;
- The amount of the Project area to be temporarily disturbed during construction;
- Potential impact on existing land use patterns; and
- Potential impacts on steep slopes or hillsides.

Permanent Land Use Impacts

The permanent impacts to the land are associated with the permanent conversion of land from its existing use to new facilities. Permanent land conversions will result from the development of the 38 foot-wide access roads, WTGs, ECS, dock facilities, operation and maintenance building, residential community area, helicopter pad, permanent

meteorological tower, and on-island substation. Figure 1.2-1 depicts the location of the permanent facilities.

Permanent impacts to the land also include the upland area to be converted to wetlands as part of a plan for compensatory wetlands mitigation. According to the Conceptual Wetlands Mitigation Plan, prepared by C&S Companies, October 2008, which is included in Appendix J, the Project will involve unavoidable impacts to existing federally regulated wetlands. It is anticipated that the loss of approximately .79 acres (0.09 acres of fill) of regulated wetlands will require the creation of approximately .268 acres of new wetlands. The potential conversion of approximately .268 acres of vacant upland to vacant wetlands represents mitigation for the loss of wetlands and does not result in a significant impact to the vacant upland.

Total permanent impacts to the land resulting from the Project will be approximately 161.88 acres, representing 8.2% of the Project area. Table 2.2-2 lists the specific permanent impacts resulting from each Project component.

Table 2.2-2: Total Acreage of Permanent Impacts from Project

PROJECT FEATURES	AREA (Acres)
WTGs (includes pedestal and crane pad)	18.66
Permanent Meteorological Tower	<1.0
Service Roads	93.64
ECS – Underground (cleared)	8.22
ECS – Aboveground (cleared)	23.46
Laydown Areas	9.79
On-island Substation	1.38
Dock Facilities – Permanent	1.76
O&M Buildings, Residential and Support Facilities	4.26
Helicopter Pad and garage	0.41
Wetlands Mitigation Area	0.27
TOTAL AREA	161.88 acres

Temporary Land Use Impacts

Temporary impacts from the project include the staging area; lay down areas, ECS trenches, concrete batch plant, and areas cleared around the WTG site for assembly. This

will result in a total of approximately 154.09 acres of temporarily impacted area. Table 2.2-3 lists the specific temporary impacts resulting from each Project component.

Table 2.2-3: Total Acreage of Temporary Impacts from Project

IMPACT TYPE	TOTAL IMPACT (Acres)
Staging Area	47.91
Laydown Areas	101.40
Concrete Batch Plant	2.59
Underground ECS	0.57
Overhead ECSs	1.63

Existing Land Use

As a result of the Project, it is anticipated that the Jefferson County Department of Real Property Tax Services will reclassify parcels 95.00-1-2 and 95.00-1-4 to public service per the State's land use classification system. Current land uses and classifications surrounding the Project will remain the same. Given that the surrounding parcels in the Project area are currently inactive, these changes are compatible with existing land use. No adverse impacts to existing land use are anticipated.

Steep Slopes and Hillsides

The majority of project components (substation, operation and maintenance building, service roads, residential community area, and WTG) will be located on generally flat terrain. However, the ECS may cross steep slopes and/or hillsides. In these areas, the ECS will cross overhead; therefore, no adverse impact is anticipated.

Floodplains

The regulated 100-year flood zone on Galloo Island closely follows the shoreline up to a BFE of 249 feet. Construction activities for WTGs, ancillary facilities and, residential facilities, will not occur in locations below the 249 foot BFE and therefore, will not result in a significant adverse impact on the regulatory floodplain. It is anticipated that vertical and directional borings will be utilized in the transition from the island to the lake for the potable and fire protection lake water intake systems, treated waste water outfall and closed loop geothermal heating and cooling system. Therefore, the construction of these systems will not disturb the landscape below the 249 foot BFE in a manner that impacts

the floodplain. Construction activities in close proximity to the shoreline including dock facilities will occur at or below the 249 foot BFE.

Mitigation

Temporary facilities required for project construction but are not critical for the operation and maintenance of the Project (e.g. construction worker housing, lay down areas) will be removed in order to mitigate potential impacts to land. Land disturbed for temporary facilities will be restored to original conditions as soon as practicable using restoration techniques described in the Stormwater Pollution Prevention Plan (Appendix D)

The Project will result in a net conversion of vacant land to wind farm related uses. However, given the remoteness of the Project Area and limited other uses on the island, it is not anticipated that the change in land use will result in any significant adverse impacts requiring additional mitigation.

Construction activities in close proximity to the shoreline including dock facilities and water intakes for the potable and wastewater treatment systems will require Floodplain Development Permits from the Town of Hounsfield in order to ensure that the development does not increase the likelihood of flooding or damage from flooding. It is not anticipated that the construction of these facilities will increase the likelihood of flooding because:

- the inlet slip will not include structural obstructions to floodwaters; and
- the use of directional boring through the bedrock occurs below grade and will not obstruct the flood waters or cause a rise in flood elevation.

2.3 Agricultural Resources

Agricultural resources in the Project Area were determined through a review of NYS Digital Orthoimagery (2006) as well as U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) soil survey data for Jefferson County (2006). Agricultural resources are defined as active agricultural lands, agricultural districts, and prime and other important farmlands as determined by NRCS.

Characterization

Through a review of available aerial imagery, it was determined that the Project Area contains approximately 168 acres of active agricultural land located on the northeast portion of Parcel 95.00-1-2. Production includes alfalfa, grain, and hay which are used to support Galloo Island's nonindigenous deer population. Although feasible, agricultural production does not support livestock, human consumption or other agricultural uses due to its remote location from the mainland. Figure 2.3-1 illustrates the location of active agricultural land at the Project Area.

Agricultural Districts

The Agricultural Districts Law of New York State administered by the New York State Department of Agriculture & Markets (NYSDAM) encourages the continued use of farmland for agricultural production, preventing the unnecessary conversion of farmland to non-agricultural uses. According to the NYSDAM, the agency responsible for district certification, there are no identified agricultural districts located within the Project Area.

Prime and Other Important Farmlands

Land capability classifications are used by NRCS to categorize a land's capability to produce commonly cultivated crops and pasture plants. According to soil survey data derived from NRCS, the classifications found within the Project Area include 'prime farmland', 'farmland of statewide importance', 'prime farmland if drained', and 'not prime farmland'. Note that there is no 'unique farmland' found within the Project Area. Figure 2.3-2 illustrates the distribution of prime and other important farmlands at the Project Area.

Prime farmland is land which represents the best combination of physical and chemical attributes for the production of agricultural commodities. It has the soil quality, growing season, and moisture supply needed to produce sustained high-yields of crops when managed. The Project Area contains approximately 59 acres (3% of the area of the island) of prime farmland. The soils identified as prime farmland at Galloo Island include Hudson silt loam, 3 to 8 percent slopes; Collamer silt loam, bedrock substratum, 3 to 8 percent slopes; and Galway silt loam, 0 to 3 percent slopes.

Farmland of statewide importance is land which has a good combination of physical and chemical attributes for the production of agricultural commodities but does not meet the requirements for prime farmland. This could be due to steepness of slope, permeability, susceptibility to erosion, low available water capacity, or some other soil property. The Project Area contains approximately 231 acres (12% of the area of the island) of farmland of statewide importance. The soils identified as farmland of statewide importance at Galloo Island include Farmington loam, 0 to 8 percent slopes; Wilpoint silty clay loam, 3 to 8 percent slopes; Chaumont silty clay, 0 to 3 percent slopes; Chaumont silty clay, 3 to 8 percent slopes; Guffin clay; and Madalin silt loam.

Prime farmland if drained is land that meets the requirements for prime farmland but only if the soils are drained and adequately maintain the water table at a sufficient depth during the growing season to allow cultivated crops. The Project Area contains approximately 389 acres (19% of the area of the island) of prime farmland if drained. The soils identified as prime farmland if drained at Galloo Island include Newstead silt loam and Rhinebeck silt loam, 0 to 3 percent slopes.

The majority of land in the island is not classified as prime farmland, thus it is not suitable for agricultural production. This classification amounts to approximately 1,318 acres or 66% of the area of the island.

Impacts

Short Term

Construction activities may affect agricultural resources. These activities include clearing and grading, movement of heavy equipment, and trenching and excavation. Temporary impacts resulting from construction activities may include erosion, topsoil mixing, and soil compaction. Short-term erosion may occur as a result of the removal of vegetation during clearing and grading activities and the subsequent exposure of topsoil to wind and precipitation. Topsoil may be mixed with less fertile substrate soils and introduced to a number of large stones and rocks (greater than 4 inches in diameter) during grading, trenching and excavation activities. Vehicular traffic may result in soil compaction, particularly in cultivated fields and where soils are poorly drained.

Long Term

Potential long-term impacts from the Project on agricultural resources include the loss, by conversion to nonagricultural uses, of active agricultural land, prime farmland and farmland of statewide importance. The Project will result in the permanent conversion of 13.96 acres of active agricultural land.

Upstate Power does not intend to continue cultivating the 168 acres of active agricultural on the island once ownership is transferred. However, the majority of this land will be left fallow and available for agricultural use in the future.

Despite these permanent consequences, no significant impact is anticipated since agricultural resources within the island do not support livestock or human consumption and do not include an identified NYSDAM agricultural district.

Other potential long-term impacts, such as erosion, topsoil mixing, and soil compaction can also affect the long-term productivity of agricultural resources within the Project area. A significant impact is not anticipated, however, as they are expected to be limited to the short term as mitigation will restore preconstruction conditions.

Mitigation

Impacts resulting from construction activities to agricultural resources will be minimized by restricting Project equipment and access to designated construction boundaries. Any impacts to agricultural resources within these boundaries will be mitigated by preventive and restoration techniques as described below.

Soil Erosion

Soil erosion will be minimized through the implementation of erosion control measures to reduce unnecessary impacts. The erosion control measures are detailed in the SWPPP which is included in this DEIS as Appendix D. Control measures to be carried out include:

- the installation of temporary interceptor diversions and sediment filter devices prior to disturbance;
- the installation of temporary trench plugs immediately after excavation; and

- the application of mulch or erosion control fabrics to critical slopes or areas.

Temporary erosion control measures will be maintained and evaluated during construction. They will be removed following the revegetation process.

Soil Mixing

Topsoil within the designated construction boundaries will be stripped and segregated. Stripped topsoil will be stockpiled immediately adjacent to the work area and separate from other excavated material to avoid soil mixing. In areas where wetland soils are encountered, topsoil will be stockpiled separate from upland topsoil and placed adjacent to the wetland from which it was removed. Topsoil stockpile areas will be clearly marked and shall be used for restoration purposes.

Soil Compaction

Following construction, all disturbed agricultural areas will be de-compacted to a depth of 18-inches with a deep ripper or heavy-duty chisel plow. In areas where the topsoil was stripped, soil decompaction shall be conducted prior to topsoil replacement. Stones and rocks larger than 4 inches in diameter will be removed from the surface of the subsoil prior to the replacement of topsoil. The topsoil will be restored to original depth and contours to the maximum extent possible.

Any rock excavated for the burial of electric collection lines or other uses in the agricultural field will be removed from the agricultural areas or reused on site for foundation aggregate or road bed material.

Following restoration, all construction related equipment and debris will be removed from the Project Area.

2.4 Water Resources

2.4.1 Surface Waters

Characterization

Hydrology and Water Levels

Lake Ontario is the easternmost Great Lake, lowest in elevation, and smallest in surface area. Its shoreline is bordered by New York State on the U.S. side (south) and the Province of Ontario on the northern or Canadian side. The International Boundary Line between the U.S. and Canada generally follows the approximate centerline of the Lake between the Niagara River in the west to the St. Lawrence River in the east. The U.S. shoreline of Lake Ontario is about 330 miles in length. The Lake is 193 miles long and 53 miles wide with a total shoreline of 726 miles. (Wisconsin Sea Grant, 1998)

Lake Ontario has a surface area of 7,340 square miles. The watershed area of Lake Ontario is about 24,710 square miles. (Great Lakes Atlas, 1995) The Lake has the highest ratio of watershed area to lake surface area of all the Great Lakes. It is the third deepest (based on maximum depths) of the Great Lakes after Superior and Michigan with a maximum depth of 802 feet and has an average depth of 283 feet which is second only to Lake Superior. (U.S. Coast Pilot No, 6, 2007) The Lake has a storage volume, at chart datum, of 393 cubic miles. Maximum recorded water storage was 400 cubic miles in June 1952 and the minimum recorded value was 391 cubic miles in November 1934. (Wilcox, D.A. et. al., 2007) The variability in the lake storage capacity has been reduced since 1960 when lake-level regulation began. The average change in the regulated lake is 2.4 cubic miles between wintertime low and summertime high. The flushing time (residence time) of the lake is between 6 (Ontario MOE, 2008) and 7 (USEPA et.al., 1998) years.

Approximately 80 percent of the water flowing into Lake Ontario is derived from Lake Erie through the Niagara River. The long-term average flow of the River is 202,000 cubic feet per second. There are several flow re-routings in the Niagara area such as the Welland Canal and New York State Barge Canal. The remaining flow comes from Lake Ontario basin tributaries (14%) and precipitation (7%). Approximately 93 percent of the water from Lake Ontario flows out the St. Lawrence River, the remaining 7 percent

dissipates through evaporation. The long-term average outflow of the St. Lawrence River at Cornwall and Massena is 238,000 cubic feet per second. (Wilcox, D.A., et. al.)

The ordinary high water mark for Lake Ontario is 247.3 feet, International Great Lakes Datum, 1985 (IGLD, 1985). Low water datum for the Lake is 243.3 feet IGLD, 1985. (USACE, Detroit District, undated)

Physical Limnology

The Lake has two main sedimentary basin systems. The main basin is the largest and deepest portion of the lake and is southwest of the Duck Galloo Ridge (see Figure 2.4-1). North-Northeast of the Duck-Galloo Ridge is a much shallower basin system that includes from west to east the West Kingston Basin, East Kingston Basin, Galloo Basin, and Stony Basin (which includes the Black River Channel). Galloo Island is located on the eastern side of the Galloo Basin and the Western side of the Stony Basin.

The most important influences on the water circulation patterns of Lake Ontario are the eastward flow of water from the Niagara River and prevailing west-northwest winds. These result in a lake circulation that is generally counter-clockwise. Circulation of water mostly occurs along the eastern shore and within the three sub-basins of the main basin. There is very little net flow along the north, inshore zone (Kalinauskas, Rimi, 2004). The circulation pattern in western Lake Ontario has varied over time. It was counterclockwise (cyclonic) in 1965 and clockwise (anticyclonic) in 1972. (Beletsky, D., et.al., 1999) Cyclonic summer circulation in central Lake Ontario is generally stable as is the easterly current near the south shore of the Lake. In summer, when the lake is thermally stratified, only epilimnion source waters (warm surface water) flow out of the lake through the St. Lawrence River. In winter, after mixing has occurred, water from the deeper areas leaves the Lake via the St. Lawrence River. (Beletsky, D., et. al., 1999)

Water Quality

The New York State Section 305(b) Water Quality Report 2006 describes the current conditions in various drainage basins of New York State. The Galloo Island area falls into the Galloo and Stony Basins. This area includes all waters that enter Lake Ontario between Tibbetts Point (at the headwaters of the St. Lawrence River) and the Jefferson-

Oswego County line; including all minor tributaries entering Lake Ontario in this stretch of shoreline. The report indicates that most of the waters in the basin are of good to excellent quality but there are a few issues and water quality concerns. The most prevalent basin concerns relate to PCBs, mirex, dioxins/furans, DDT and its metabolites and dieldrin. For the Black River Basin which empties into the lake through Black River Bay near Sackets Harbor, the most prevalent problems are atmospheric deposition/acid rain and fish consumption advisories (many of which related to atmospheric deposition of mercury). (Page A-62, New York State Water Quality 2006 Report).

The USEPA and NYSDEC have developed a Pollution Minimization Plan Guidance Manual. The goal of this program is to regulate the effluent quality that reaches publically owned treatment facilities. The effluent from point source dischargers and industrial users discharging into these public facilities must achieve a quality at or below water quality based standards.

The waters of Lake Ontario in the vicinity of the project, with the exception of Black River Bay and Oswego Harbor, are classified by NYSDEC as Class A with a standard of quality and purity for Class A. (6 NYCRR Part 847) Class A waters have best usages as a source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. The Class A waters must be suitable for fish propagation and survival. Standards are contained in 6 NYCRR Part 703. The Black River Bay area of the Lake is designated a Class C water. Best usage of Class C waters is fishing. The Class C waters must be suitable for fish propagation and survival and the water quality must also be suitable for primary and secondary contact recreation, although other factors may limit the use of these waters for recreational purposes.

Regarding surface waters on Galloo Island itself, the NYSDEC in Part 847 lists a pond (unnumbered) and a small tributary (Tributary 1) to Lake Ontario and designates both as Class C. Habitat analyses of the pond (wetland F) included wetland cover typing, plant identification and setting of turtle traps by TES, Inc.; and, a wetland delineation by C&S Engineers and TES, Inc. (TES, 2008) (C&S and TES, 2008). The stream is described in more detail in the wetland delineation report (C&S and TES, 2008). The tributary to Lake

Ontario is about 0.22 miles long and the pond has a surface area of about 26 acres. The pond consists of open water and scrub-shrub wetland types. The stream bed averages about 2 to 4 feet wide and is about 0.75 to 2 feet below grade. See Figure 1.2-1 showing the location of these surface waters and the proximity to Project components.

Impacts

This section addresses the surface water impacts of the Project from upland activities and in-water activities during construction and operation.

The potentially affected surface waters include the NYSDEC unnumbered pond on the eastern end of Galloo Island adjacent to the lake, the small tributary number 1 located about 1.1 miles southwest of the Coast Guard Station on Galloo Island and the waters of Lake Ontario surrounding the island.

Potential impacts include:

- Impacts associated with discharges of eroded materials and stormwater to the stream and surface waters during construction and operation;
- Impacts from the construction of the docking facility and barges used to transport equipment and materials;
- Impacts from water and sewage treatment;
- Need for maintenance dredging at the offloading facility;
- Navigational impacts during construction, operation and decommissioning;
- Water quality impacts associated with boating activities for the maintenance and inspection of project facilities;
- Use of herbicides to control undergrowth;
- Impacts from releases of regulated materials to streams and surface waters; and
- Use of lake water intake for drinking, fire protection, dust control, and the concrete batch plant operation.

On-land Construction

Upland construction of WTG, the ECS, buildings and roads on the Island has the potential to increase wind and rain erosion at disturbed areas. The Project related upland construction activities will include the removal of natural vegetative cover that normally

attenuates surface water flow. This could potentially occur during the clearing, grubbing, and grading of the Project site.

Unchecked erosion by wind and rain from an active construction site can have impacts on the water quality of a receiving waterbody. Wind can blow exposed soil particles into nearby adjacent waterways. When erodible materials enter a receiving waterbody via surface runoff, it is treated as a non-point source discharge.

Soil particles and other forms of suspended matter in surface water runoff eventually accumulate as sediment that can restrict drainage, exacerbate flooding and divert flows resulting in an increase in erosion of the beds and banks of receiving waterbodies. Due to the shallow soils on site and the limited surface flow pathways on the island, construction on Galloo Island will not result in high quantities of sediment reaching the stream to an extent that would restrict drainage or increase flooding. Additionally, no impacts are expected on Lake Ontario from the on-land construction activities. Impacts on lake sediment are addressed in more detail in the Sediment Section, 2.4.2.

There will be one culvert constructed for the project. The culvert will span the unnamed tributary on the island. In order to protect wetlands and other waters, perimeter erosion and sediment control measures will be installed around any area to be disturbed. This will include upslope diversion fences, downslope silt fences, or stake-less measures (where limited overburden soils are present) and construction of temporary sediment traps or permanent ponds where required. Additionally, the proposed Project will not cause disturbances to the banks of the small tributary.

Any water quality impacts from construction related sedimentation on Galloo Island are expected to be minor and localized. Construction will follow standard and regulated practices to minimize sediment transport. Concrete truck washouts will be limited to the temporary batch plant area that will require controls to retain washout water. This will prevent the concrete washout water from uncontrolled discharges into Lake Ontario. A Conceptual SWPPP is included as Appendix D. The SWPPP presents the conceptual approach to drainage design, and erosion and sedimentation control measures, for construction work on Galloo Island. The Conceptual SPCC Plans is included as

Appendix E. The Conceptual SPCC addresses both the construction phase and long-term operation and maintenance.

In-Water Construction

In-water construction activities associated with the Project include excavation, blasting, backfilling, filling and installation of structures to create an underwater entrance channel to the permanent offloading slip, water intake structure, and the sewage treatment plant outfall. Excavation and blasting will re-suspend any bottom sediment at the construction sites resulting in some minor turbidity. Most of the bottom material at the nearshore littoral zone off Galloo Island is bedrock with limited amounts of cobble, gravel or sand (see Appendix K). Disturbance of this type of bottom will not result in a high degree of turbidity and siltation during construction. Dredging will not be required for the construction of the slip. No water quality impacts are expected from construction of open pile mooring dolphins or an anchoring system to hold a floating offshore breakwater in place. The breakwater will simply be secured to the lake bottom bedrock using heavy chains spaced at regular intervals. Since the lake bottom is mostly bedrock, the area can be drilled by auger and the attachments for the breakwater chains can be grouted into the lake bottom or concrete block anchors resting on the lake bottom will be used as anchorage. Mooring dolphins will only involve use of an auger and some grouting for installation of support piles. Three offshore temporary free swinging moorings will be used in open waters. They will be floating structures attached by chain to a block of concrete on the lake bottom. Impacts from both the mooring dolphins and breakwater will involve minimal disturbance (minor amounts of cuttings) and releases of concrete to grout will be minimize by use of tremie pipes. Selection of concrete block anchors for the offshore floating breakwater would involve even less disturbance to the lake bottom with minimal impact.

The permanent docking facility (slip, and reinforced concrete bulkhead, and adjacent upland concrete and gravel staging/offloading area) will be constructed “in the dry” for the upland portion of the slip. Once the upland construction is completed the earthen/stone barrier, about 10-25 feet thick between the slip and lake, will be removed. Slip construction will have only a minor, temporary impact on water quality when the

barrier is removed since the sides of the slip will have been stabilized by bulkheads prior to making the connection with the lake.

An approach to the slip channel will need to be excavated in the near shore area. This approach will be approximately 14 feet deep and 30 feet long (from the slip channel entrance) and will require the removal of submerged bedrock through blasting. This blasting will create a temporary impact to surface water as fines will be released into the water during rock removal. The use of explosives will be in accordance with New York State law. (Refer to the Blasting Plan, Appendix A)

It is possible that storms may push gravel and cobble materials into the entrance channel and slip requiring some future maintenance dredging. However, very little maintenance is anticipated as the proposed dock area currently is nearly devoid of sediment. Dredging coarse grained materials such as gravel and cobble will result in only minimal turbidity and sedimentation. Dredged gravel or cobble will either be deposited on upland property or be deposited back into the littoral drift system if required by NYSDEC and/or USACE. Upstate Power will apply for necessary USACE and NYSDEC permits for maintenance dredging as the need arises.

A temporary offloading facility will be constructed adjacent (just easterly) to the location of the permanent offloading facility. This facility will consist of a small groin with an articulating ramp. The fill for the temporary groin will consist of coarse grained materials ranging in size from gravel to boulders derived from bedrock excavation on the island and will be placed by proceeding from the upland area and working lakeward. Based on the coarse nature of the fill materials, the construction method and the existing coarse substrate of the lake bottom, no significant impacts on water quality will occur during construction of the temporary groin or during removal when it is no longer needed.

All personnel, equipment and materials required for construction of the offloading facility will be delivered by boat and LCM (Landing Craft Mechanized). A total of 26 deliveries by boat and 41 deliveries by LCM are estimated. Once the docking facility and entrance channel have been constructed, boats and barges will be used to deliver heavy equipment and materials to the island. It is anticipated that these materials will be delivered from

Oswego Harbor to the Island. Approximately 130 deliveries by boat, 26 deliveries by small barge and 20 deliveries by large barge will be needed for the construction of infrastructure on Galloo Island. The bulk of the wind farm construction (staging yard, batch plant, rock crushing system, and access roads) will occur after infrastructure construction and will require about 200 boat/large barge deliveries and 12 small barge deliveries. Starting in year three of construction, deliveries for the wind turbine generators, electrical collection system and substation, and Operation and Maintenance/Office Building will occur. These involve about 584 boat/large barge deliveries, 13 small barge deliveries and 68 large barge deliveries. A total number of 650 boat, 41 LCM, 216 large barge and 51 small barge deliveries will occur over a period of over three years. The island is well outside of commercial shipping lanes including the lane to Oswego Harbor which is about 3.0 miles northwest of the island. No adverse effects on commercial navigation will result from the barge deliveries during project construction. The deliveries during construction will not result in adverse effects on recreational boating, water skiing, or fishing in the area.

Watercraft used in this project will consist of vessels (tugs, cable laying ship) and barges to construct a docking facility and entrance channel. Tugs and barges or self propelled barges will be used to deliver materials to the island to construct the wind farm. All vessels will be in compliance with New York State and USCG regulatory requirements and impacts to the Lake due to potential discharges of solid or hazardous wastes is not anticipated. These vessels are also subject to the rules of the Saint Lawrence Seaway Development Corporation (U.S.) and the Saint Lawrence Seaway Management Corporation (Canada).

As indicated in the Sediment Section, 2.4.2, the little sediment that exists in the area of Project related construction in Eastern Lake Ontario is not expected to contain significant levels of contaminants. The Lake Ontario eastern watershed is a relatively small nearshore area with minor tributaries extending from the Oswego River watershed to the Black River watershed. The nearshore area is not heavily populated and therefore not considered a significant source of contamination to Lake Ontario. Transport of contaminated sediment from the west to the east is minimal as a result of deflection of

lake currents to the northwest by the configuration of the Rochester Basin and protection afforded by the Duck-Galloo Ridge.

Overall, there is no reason to believe that there are high quantities of contaminated fine grained sediments in and around Galloo Island. The Lake Ontario 2006 Lakewide Management Plan (USEPA, 2006) indicates that localized areas of sediment with persistent toxic pollutants exist in some harbors and river mouths. However, this is not considered a lakewide problem that warrants restrictions under the management plan. Most of the critical pollutants identified in the Lake Ontario LaMP (PCBs, DDT and its metabolites, mirex, dioxins/furans, and dieldrin) tend to bind tightly to fine grained particulate matter especially clays and organic matter and are not very water soluble. Since the sediment pathways in eastern Lake Ontario and the nature and characteristics of the bottom sediment at Galloo Island do not indicate sediment contamination at the in-water work sites, no significant water quality impacts are expected to occur during project construction.

Project Operation

Use of barges to deliver materials to the island during operations and maintenance will not have any significant impact on surface water quality or uses. Periodic ship deliveries of fuels, food and other supplies for island residents will be by barge. Most transportation of personnel to and from the mainland will be by small craft (about 30 feet long) and by helicopter. Helicopter will also be used for small deliveries to the island.

The proposed Project slip channel is designed with sufficient water depth to accommodate large delivery barges. Therefore, the water depth along with the sediment characteristics in the area (coarse grained) will insure that turbulence from tug boat propellers or dropping of anchors do not result in a high degree of turbidity. All ships using Lake Ontario waters are subject to the navigational control of the Saint Lawrence Seaway Development Corporation (U.S.) and Saint Lawrence Seaway Management Corporation (Canada). These agencies have joint regulations covering vessels and people using the Seaway. The regulations are codified at 33 CFR 401, Chapter 2. Ships are required to have garbage and sewage disposal systems that meet both U.S. and Canadian

regulations. These regulations are in place to ensure that operation of ships will not affect surface water quality and navigation. Deliveries by barge during operation and maintenance will not adversely affect commercial or recreational navigation and other water uses nor will it compromise water quality. During potential decommissioning of the project, for any reason, most structures would be left in place on the island and only the towers would be dismantled and shipped to the mainland, requiring a minimal number of trips.

All runoff water from the paved (concrete and gravel) offloading areas will be managed by capturing it to surface features such as curb and gutter or swales and conveying it to detention features or to sheet flow across the landform. The draft SWPPP is included as Appendix D.

Maintenance to control undergrowth beneath the electrical collection system on the island will be performed using selective management by mechanical means such as brush hogs for shrubs and topping of trees by use of chain saws. Herbicides will be used on a limited basis for the sole purpose of controlling invasive species in restored wetlands. This herbicidal use will be deployed under the direction of the NYSDEC. Upstate Power will conform to all pesticide requirements contained in 6 NYCRR Part 325. No other herbicide use is planned for the island.

Water Intake and Usage

There will be no point source discharges during operations to the wetlands, small stream or pond on Galloo Island from the concrete batch plant or the sewage and waste water treatment plant. All sewage and waste water will be collected and treated through a sewage treatment plant prior to discharge to Lake Ontario. Upstate Power will apply for the necessary discharge permits (SPDES) and comply with any discharge limitations imposed by the State. Additional information on effluent limitations is contained in the Section 2.4.2, Sediment. Except for the permitted discharges, there will be no other material releases to the stream, pond and lake that would cause adverse impacts on surface waters.

Upstate Power will obtain a water supply permit from the NYSDEC in accordance with Article 15, Title 15 of ECL. The water supply system will provide water for drinking and fire protection during construction and facility operation. A temporary water line will be used for dust suppression, the concrete batch plant and other construction related water uses. The water intake velocities and volumes of the temporary and permanent water intake systems will be small and no impacts on water quality and quantity, or water uses will occur from operation of the system. Operation of the sewage treatment plant will have no significant impact on Lake Ontario water quality.

Material Storage

During construction and operation, there is a need to store materials such as concrete, machinery fuels and oils and other chemicals. In addition, a temporary concrete batch plant will be required for construction. Concrete slurry (and leachates) and washout procedures will be controlled to ensure that the water quality of the stream, pond and Lake are not adversely affected. These procedures are contained in the draft SWPPP (see Appendix D). Concrete leachates have the potential to affect water quality by altering pH and total suspended solids levels. The pH of concrete can be as high as 11.0 to 12.0 units, which is highly alkaline. Concrete leachates also contain metals and trace elements including compounds of potassium, sodium sulfate, chromium and nickel.

Fuel will also be stored on site. The amount of fuel will trigger the NYSDEC PBS Registration process.

The potential for hazardous materials to enter surface waters from properly designed storage facilities at the Project is minimal. The greatest potential impacts would be from de minimus leaks of truck fuel or hydraulic oil from construction vehicles. Other than to control invasive species in restored wetlands, there are no plans to use fertilizers, herbicides, pesticides or deicing compounds on the island.

Mitigation

The construction and operation of the slip, slip channel, water intake structure and sewage outfall will have no significant effects on water quality and water. However, plans and procedures will be developed and implemented to reduce potential impacts

from construction. Upstate Power will adhere to all general and special conditions of the SPDES and Water Intake permits to minimize impacts. There will be a road crossing the one stream on the island. The crossing will be accomplished using a culvert that is sized to allow proper flow during high and low water periods. Except for temporary water quality impacts during construction, there will be no long term effects from the culverted crossing. Wetland crossings by roads will be constructed with a pervious stone fill to maintain a hydraulic connection through the wetland or where practicable will be constructed flush with grade.

Construction and Operation

Effective management of storm and surface water drainage will be incorporated into the project features during construction so that the physical, chemical and biological character of the receiving waterways is not compromised. (See SWPPP in Appendix D) Part II of the stormwater rules under the National Pollutant Discharge Elimination System (NPDES) Program (Section 402 of the Clean Water Act) requires that an erosion and sediment control plan be developed for projects that disturb greater than one acre of soil surface. Since the authority to issue NPDES permits has been delegated to the State of New York by the USEPA, the NYSDEC will review and approve the plan.

On May 1, 2008, the NYSDEC issued a general permit for stormwater discharges from construction activity (GP-0-08-001, pursuant to Article 17, Titles 7, 8 and Article 70 of ECL). Owners or operators of a construction facility must obtain coverage under this GP prior to commencement of a construction activity. This permit requires preparation of a SWPPP prior to submitting a Notice of Intent (NOI) to obtain permit coverage (see Appendix D). Upstate Power will submit an NOI and secure all other necessary Uniform Procedures Act permits such Protection of Waters, Water Supply, Freshwater Wetland, SPDES and others as required for coverage under GP-0-08-001.

The SWPPP includes the construction phase erosion and sediment control plans as well as post-construction stormwater management practices to reduce pollutants in, and control any increase in the rate of, stormwater discharges. Erosion controls have been designed in accordance with the most current version of the technical standard, New

York Standards and Specification for Erosion and Sediment Control. Post construction stormwater management has been designed in conformance with the most current version of the technical standard, New York State Stormwater Management Design Manual.

Typically, erosion control can be achieved by structural means including slope drains, diversions, using non erodible materials for roads, and use of retention systems. In addition, non-structural means to reduce sedimentation such as surface patterning, dust suppression such as watering, and temporary ground cover plantings can be utilized. In addition, a buffer zone should be established and maintained between the construction areas and the stream, pond, and lake and any vegetation in these areas should not be disturbed. Vegetated buffer zones would provide runoff filtration and moderation of water temperature changes.

To prevent soil particles from leaving construction sites and entering waterways, measures such as silt fences, turbidity barriers, and similar measures will be used. Although it is not possible to totally contain soils and impacts on waterways from sedimentation, proper control systems will ensure that water quality in receiving waters is not compromised. For detailed information on the Erosion and Sediment controls and water quality management practices refer to the Conceptual SWPPP in Appendix D.

Material Storage

Storage of fuels, oils and other chemicals present a potential for hazardous materials to adversely affect surface water quality. The procedures for storage, spill prevention and cleanup of these materials are contained in the SWPPP, the SPCC, and plans for containment of non-oil materials. Spill management plans include the identification of chemicals to be stored onsite and spill response plans. Pursuant to the regulations governing the SWPPP and SPCC, the NYSDEC will review these plans prior to implementation.

In order to ensure that no measurable impact occurs from losses of concrete to waterways, all concrete pours will be contained by watertight forms. Stored concrete and other construction materials that have the potential to adversely affect water quality will be adequately contained as shown in the SWPPP, SPCC and plans for containment of

non-oil materials. The SWPPP includes measures to ensure that concrete storage areas, the batch plant and concrete washout areas are designed and planned to control leachates. The SWPPP also covers landfill areas for the temporary storage of solid wastes.

2.4.2 Sediment

Characterization

Galloo Island is an elongate island situated in a northeast – southwest orientation on the US side of the northeastern end of Lake Ontario. Its length is close to 4.0 miles along its main axis of orientation and 1.5 miles at its widest point perpendicular to its main axis. Its coastline is approximately 10 miles long varying from near vertical bedrock cliffs to flat lying bedrock and cobble beaches with shallow waters and gentle slopes. The bedrock is limestone of the Trenton Group.

The island elevation rises from about 250 feet above mean sea level (amsl) at the south end to 304 feet amsl along the northeast coast at North Pond. (See Figure 2.1-1) Cliffs up to 30 feet high can be found along the northeast shore with the cliff face continuing below lake level from North Pond to the south end of the island. From the north end of North Pond around the north end of the island to Gill Harbor on the southeast shore there is low angle slope extending into the lake in a zone between 1,000 to 3,000 feet wide. The water depth at the limit of the zone is 30 feet measured from the lake low water datum 243.3 feet IGLD 1985.

Offshore at the south end of the island there is a similar low angle slope zone that ranges from 1,100 to 3,500 feet wide from a point along the shore about 650 feet northwest of the lighthouse to a point along the shore about 4,000 feet east northeast of the lighthouse (See Figure 2.1-1). From that location along the shore to 3,600 feet southwest of Gill Harbor the slope drops off abruptly. The distance from shore to a depth of 30 feet is less than 700 feet.

The sediment transport system on the island is limited. There is only one low flow, low gradient stream that is tributary to Lake Ontario It carries a limited amount of sediment as the gradient is low and there is only a thin soil cover over bedrock in its drainage basin.

The topography of the island is relatively flat with only 50 feet of vertical range. The thin vegetated soil cover does not provide a source of sediment to the lake from storm water runoff and there are a number of wetlands on the island to collect most runoff sediment. There are no other streams on the island. As indicated above, there are few sources of sediment at Galloo Island. Geophysical surveys at the work location for the offloading facility (attached as Appendix K) show the bottom to be bedrock and indicated a lack of overlying sediment.

Lake currents carry a minimal amount of sediment onto the Galloo Island shoreline because of their low velocity and remote location from the major sediment sources such as upstream tributaries like the Salmon, Oswego and Genesee Rivers. Coarse materials are deposited near the mouth of these tributaries and because of the distance involved and depth of the lake basins many of the finer materials are deposited before they reach Galloo Island. These sediments and any contamination associated with them would have limited transport to the shallow waters surrounding the island. This is evidenced by the geophysical surveys at the offloading facility site that demonstrate a lack of overlying sediment on the bedrock bottom. An additional geophysical survey was performed by ESS Group for the submarine cable being reviewed pursuant to Article VII of the PSL (see Appendix K). This report classifies the nearshore zone as Type 2 (rock, coarse till or bedrock) because it is predominantly bedrock. Most of the lakebed within the submerged cable route offshore of the shoreline zone is unconsolidated sediment.

The Black River channel is the closest mainland tributary to Galloo Island. It has a low gradient and Dexter Marsh, located at its mouth, with emergent vegetation that filters out fine suspended material. The river is also dammed at a number of upstream locations which reduces sediment load. In addition, Stony Island lies directly between Galloo Island and the Black River channel provides a barrier to sediment transport to Galloo Island.

On the northwest side of Galloo Island the deep water Galloo Basin prevents sediment or suspended contaminants from settling in the shallow water surrounding the island. To the south the deep water basin of Lake Ontario and the Duck-Galloo Ridge form a barrier to

sediment or suspended contaminant transport to the shallow waters surrounding the island. This lack of sedimentation is supported by the visual observations of exposed bedrock in the lake bottom along sections of the island shore as well as the bathymetry of the area (see Appendix K).

The Lake Ontario eastern watershed is a relatively small nearshore area with minor tributaries extending from the Oswego River watershed to the Black River watershed. The nearshore area is not heavily populated and therefore not considered a significant source of contamination to Lake Ontario. Transport of contaminated sediment from the west to the east is minimal as a result of deflection of lake currents to the northwest by the configuration of the Rochester Basin and protection afforded by the Duck-Galloo Ridge.

Since the island has no history of contaminant release, airborne particulates are the main source of contaminants that may collect in the sediment. The main contaminant found in the air is mercury which is ubiquitous over Lake Ontario and any concentrations found in offshore island sediments would be comparable to background levels found in other remote areas. There are no known areas of sediment contamination in the near shore waters, depth of 30 feet and less, of Galloo Island.

Overall, there is no reason to believe that there are high quantities of contaminated fine grained sediments in and around Galloo Island. Geophysical surveys at the work sites along Galloo Island indicate the areas are devoid of sediment. The Lake Ontario LaMP (2006 and 2008) indicates that localized areas of sediment with persistent toxic pollutants exist in some harbors and river mouths. However, this is not considered a lakewide problem that warrants restrictions under the management plan. Most of the critical pollutants identified in the Lake Ontario LaMP (PCBs, DDT and its metabolites, mirex, dioxins/furans, and dieldrin) tend to bind tightly to fine grained particulate matter especially clays and organic matter and are not very water soluble.

Sediment samples taken by ESS Group (for the Article VII application) along the submarine cable route classified sample material as inorganic clays of high plasticity in all but one sample. Sediment along the route was tested for metals, semi-volatile organic

compounds or polynuclear aromatic hydrocarbons (PAH), volatile organic compounds, pesticides, PCBs and dioxin/furans. (Refer to Article VII application for more detailed information on sediment testing). Results of the testing indicate that concentrations of detected compounds within the sediment are below the NYSDEC TOGS 5.1.9 Class A threshold (no appreciable contamination) at 10 of the 17 vibracore testing locations. The ESS report states that based on the results of the chemical testing, the majority of the route has no appreciable contamination. Moderate contamination, where it exists, was restricted to surficial sediment. Based on the minimal amount of impacted sediment indentified in the cable route, ESS Group indicates that adverse impacts from hydro jetting are considered unlikely. Potential impacts at the shoreline area where the lakebed is mostly rock would be even less than the cable hydro-jetting impacts.

Impacts

Impacts on sediments along the shore of Galloo Island would be limited to the location of the project components listed below. For all components, the main impact on Lake Ontario near shore sediments will be during the construction phase. During the operational phase, impacts on sediment will be minimal based on the low sediment capacity of littoral currents and the limited in-water operations of the project.

There will be no impact on the sediments in the two water bodies on Galloo Island. The NYSDEC lists two water bodies on the Island, a pond (unnumbered) and a small tributary (Tributary 1) to Lake Ontario. The NYSDEC designates both as Class C. Figure 1.2-1 shows these locations.

The tributary to Lake Ontario is about 0.22 miles long and the pond has a surface area of about 26 acres. Tributary one will be spanned by a culvert. The culvert will be appropriately sized to span the stream without causing impacts (see Figure 1.4-2). Measures prescribed in the SWPPP, a draft of which is included as Appendix D, for construction on the island will prevent erosion and sedimentation impacts from reaching these water bodies.

Construction Phase

Each of the components will have short term impacts during their construction. These impacts will be determined by the construction methods, the location of the component, regulatory mandates and the existing hydrologic conditions. A description of each component follows below.

Permanent Offloading Facility and Entrance Channel

The location of the dock is planned for the southwestern shore of the island. (see Figure 1.2-1). The slip will be excavated in dry land leaving a plug of land between the excavated area and the Lake. Once the slip is completed including installation of the majority of the reinforced concrete bulkhead, the plug of land (about 10-25 feet thick) will be removed allowing water to enter the slip slowly. Minimal amounts of sediment are expected to enter the slip with the inflow of water. The stabilization of the interior of the slip by a bulkhead will minimize any subsequent movement of soils back out into the lake from the slip.

Lakeward of the slip/land interface, a navigational entrance channel will be blasted and excavated within Lake Ontario. This construction will occur concurrently with slip excavation. The channel will be blasted and excavated using barge mounted clamshell from the shoreline to about the 14 foot depth contour to allow sufficient depth for large barges. Blasting of bedrock will be required for most, if not all, of the channel construction. Blasting is anticipated to occur over a 3 to 6 month period. Excavation will involve a surface area of approximately 36,000 square feet in size and will occur from the shore to about 175 feet offshore. The maximum width of the channel at the most offshore position is about 300 feet. This channel design would have the least impact on the lake floor sediments and the underlying bedrock as it would not require the construction of a permanent pier or groin that would impact long shore currents along the island. Geophysical data at the entrance channel site indicates that the bottom is bedrock devoid of sediment. Blasting and excavation will not cause resuspension of sediment or turbidity due to the lack of sediment.

The offloading slip is designed to accommodate large barges requiring a minimum water depth of 14 feet. The slip would be 180 feet wide and 200 feet long.

Offshore, the USCG Clayton to False Duck Island navigation chart (NOAA Chart #14802) indicates the lake water depth in the vicinity of the proposed slip location increases quickly to greater than 30 feet (reference depth is Lake Ontario Low Water Datum 243.3 feet, IGLD 1985.)

Temporary Offloading Facility

A temporary unloading facility consisting of a stone and gravel groin about 90 feet long and 56 feet wide at the bottom and an articulating ramp will be constructed to the east of the permanent docking facility. Once construction equipment and materials have been delivered and the facility is no longer required, it will be removed. It is anticipated that the groin will remain in place for 18 to 24 months before removal. The temporary groin will not result in accretion of littoral drift materials due to the nature of the bottom substrate at the site (very little sediment present). The temporary groin will not affect sediment transport. Likewise, due to the nature of the sediment and lake bottom in this area, the proposed offshore floating breakwater will have no effect on sediment transport and deposition.

Construction of the both the temporary and permanent offloading facilities will require issuance of permits by the U.S. Army Corps of Engineers, Buffalo District under Section 10 of the RHA of 1899 and Section 404 of the CWA. In addition authorizations will be required from the New York State Department of Environmental Conservation under NYS Protection of Water Regulations promulgated in Article 15 of the NYS Environmental Conservation Law.

Preliminary geophysical information at the south side of the island indicates the potential for little movement of sand or gravel along the shoreline (see Appendix K). Therefore, the potential for accumulation of sediment in the vicinity of the entrance channel is low. Therefore, no or a very limited amount of maintenance dredging is expected.

Potable Water Supply/Fire Protection Water Supply

A potable water supply will be established on Galloo Island to support the construction activities and the personnel located on the island. A location along the northeast shore of the Island near Gill Harbor (see Figure 1.2-1) has been selected. This supply intake would also serve to supply the fire protection holding tanks.

There is likely to no sediment in this area (see Appendix K). Where the intake portal is located offshore it would be above the lake floor. As the intake pipe approached the shoreline, burial may be necessary to protect it from freezing in the harsh winters and to protect it from shore ice impacts. Blasting or directional boring may be required to install this intake line onto the shore.

Water supply construction will require permits from the USACE under Section 404 of the CWA and Section 10 of the RHA and from NYSDEC under ECL Article 15 Title 15.

If the submerged portions of the water supply system are either buried under or laid across the lake floor, there would be little or no impact on sediment. If the system is buried it will be covered to the existing contour of the lake floor. If it is laid across the lake floor, the system will represent only a minor localized change in topography.

Process Water Intake (Batch Plant)

A temporary water intake structure will be required to provide water to the concrete batch plant. This intake structure would be installed along the near shoreline and would consist of exposed pipe and a pump house. Because the piping would be laid on the lake bottom, there would be no significant impact to sediments from this operation. Once concrete construction activities were over, the pipe would be removed. The temporary line would require authorization by the USACE under Section 10 of the RHA.

Operation Phase

Long term impacts of the project components discussed above will be minimal.

Offloading Facilities and Entrance Channel

The temporary and permanent offloading facilities will not have measurable long term impacts on near shore sedimentation since the near shore littoral currents do not carry a

high volume sediment load. However, it is possible that over an extended time, minor quantities of sediment may accumulate in the submerged slip channel and approach. This may require dredging to occur in order to maintain the full capacity of the channel. This is anticipated to be required every 10 to 20 years during the operational phase of the project. If required by the NYSDEC and USACE permits, any measurable quantities of clean material dredged for maintenance purposes will be returned to the littoral drift system.

Potable Water / Fire Protection Intake

The water intake structure and submerged supply line are static features that will have little long term impact resulting from their low profile and small scale. There will be small scale alteration of existing current caused by the pumping of water in the vicinity of the intake structure. The design of the intake orifice and the pumping rate can be designed to minimize any impact on sedimentation in the vicinity of the structure. At its maximum, the intake structure will require pumping of water into on-shore storage tanks with enough volume to supply water for up to 200 people during full construction periods. During operation, the water system will supply water for 10 to 20 people. The water supply intake volume and velocity will be low and effects on currents and sediment will be minimal. For instance about 15,000 gallons of water per day will be produced during construction and this drops to about 5,000 gallons per day during the operation and maintenance phase.

The fire protection water would be drawn from the lake at the same intake, however, the water would be stored in holding tanks for the fire protection system and, other than testing the system, and the water intake requirements would be minimal.

Sewage Treatment Plant Discharge

It will be necessary to construct a sewage treatment facility for the activities on Galloo Island. As a result treated water would be discharged into the lake. It will be in the vicinity of the residential area. It will be subject to the requirements of the Federal Clean Water Act - National Pollutant Discharge Elimination System (NPDES). Since the authority to issue NPDES permits has been delegated to the State of New York by the

USEPA, the NYSDEC will review the plan under the SPDES program. A NYSDEC permit to discharge effluent to Lake Ontario will be developed for the facility. Under the SPDES program, Upstate Power will supply information in the permit application on the type of treatment to be provided and specific information about the discharges. The NYSDEC will develop the limits for the types and quantities of pollutants in the effluent that will be permitted and the type of monitoring that is required to ensure the standards are met. These effluent limitations are based on both state and federal criteria designed to protect water quality, human health, and aquatic organisms. Effluent limitations are the maximum allowable concentrations or ranges for various physical, chemical and/or biological parameters. Upstate Power will comply with these effluent limitations. Treatment and monitoring of the effluent will ensure there is no measurable impact to sediments at the site.

Mitigation

Mitigation must be considered for all components with negative impacts on the sediment regime on and near Galloo Island. Tributary 1 will be spanned by a culvert. This is not anticipated to have a significant impact. For the unnamed pond no impacts are anticipated based on the planned construction pattern of the proposed project, furthermore the implementation of the required SWPPP (see Appendix D) will reduce the possibility of impacts from construction activities anywhere on the island.

The greatest potential for impacts exists in the near shore area of Galloo Island where the construction of project components will take place. These components are the:

- Temporary and Permanent Offloading Facilities and Entrance Channel;
- Potable Water/ Fire Protection Supply Intake;
- Sewage Treatment Plant Discharge.

The greatest impacts will take place during the construction and operation of the entrance channel. Reconfiguration of the lake floor will take place using blasting and excavation by barge mounted clamshell during construction. Due to the nature of the lake bottom in this area (bedrock with a lack of overlying sediment) no turbidity will occur as a result of excavation. As discussed in Section 2.5.5 Blasting, in water blasting work will be limited

to avoid sensitive fish spawning dates. No project construction will occur in sensitive fish habitat.

In the long term, redistribution of sediments by currents in the littoral zone should be minimal since the sediment load of these currents is low. Additionally, the nature of the sediment load in this area limits any impacts that can be caused by the groin for the temporary offloading facility.

The construction methods for the other project components can significantly limit or prevent turbidity impacts. The groin for the temporary offloading facility will consist of coarse fill materials from gravel to boulder size and will not cause any turbidity during construction. Mitigation by restoring the lake floor configuration following construction of the water intake and waste water treatment discharge system and the removal of the temporary groin should result in the return of preconstruction sediment conditions. If feasible, directional boring of the water intake and treated waste water discharge will be used in order to minimize potential sediment disturbance. However, geologic conditions and the slope of the submerged shoreline in the area of the lines may require blasting. A blasting plan, which includes underwater blasting operations, has been developed for the proposed Project and may be found in Appendix A.

Any contribution of materials in the sewage discharge resulting in a negative impact to sediment will be prevented by treatment and by a monitoring program to ensure that effluent limitations are met, particularly the limitations on biochemical oxygen demand, total suspended solids and pH. Upstate Power is committed to complying with the limitations.

To prevent soil particles from leaving construction sites and entering waterways, measures such as silt fences, turbidity barriers, and similar measures will be used. Although it is not possible to totally contain soils and impacts on waterways from sedimentation, proper control systems will ensure that water quality in receiving waters is not compromised. A draft SWPPP has been developed and is included as Appendix D.

2.4.3 Wetlands

Characterization

State and Federal Databases

The State of New York regulates wetlands in accordance with Article 24 of the Environmental Conservation Law. NYS primarily uses the presence of wetland vegetation in making boundary determinations. However, if specified vegetation indicators are not met but more than 50 percent of the dominant species of all vegetative strata are facultative species or wetter, then hydrology and hydric soils are investigated. As required by law, wetlands areas that are larger than 12.4 acres are delineated and mapped by the State. However, the State can regulate certain smaller wetlands that are determined to be of unusual local importance. NYS also incorporates a 100-foot regulated buffer zone when making boundary determinations. USACE does not utilize regulated buffer zones in making jurisdictional determinations but often will condition permits to require some buffer zones to limit project impacts.

The USACE regulates the discharge of dredged or fill material into waters of the United States, including freshwater wetlands, under Section 404 of the Clean Water Act. A wetland is defined by USACE as an area that is "inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions". Federal wetland cover types are generally classified using the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping system (http://www.fws.gov/nwi). The NWI maps and classification system (Cowardin et al., 1979) carry no federal jurisdictional value but do serve as a general reference value and description of various wetland cover types.

Prior to undertaking field work, a preliminary review of existing data resources was conducted to determine the presence or absence of existing mapped wetlands within the Project Area. Information sources included aerial photographs, United States Geological Survey (USGS) maps, NRCS (Jefferson County) Soil Survey maps, and NYS Freshwater Wetland Maps.

Field Reconnaissance

On November 12-14, 2007 C&S Engineers, Inc. and Terrestrial Environmental Specialists, Inc. (TES), performed a limited on-site preliminary wetland reconnaissance to obtain information pertaining to ecological communities that exist on Galloo Island. On May 20-23, 2008, C&S and TES conducted a field survey to perform wetland delineations and determine the ordinary and mean high water determinations on the Island. Wetland boundaries were delineated using the *1987 Corps of Engineers Wetland Delineation Manual* and the *1995 NYSDEC Freshwater Wetlands Delineation Manual.* The wetland boundaries were flagged, surveyed and mapped. On August 12, 2008 the USACE and NYSDEC accompanied C&S and TES to the Island to verify the delineated wetland boundaries. The wetland delineation report is attached as Appendix L. TES performed detailed studies and analysis (ecological resources report) during the growing season for the Island to better define each specific ecological community (upland and wetland communities) and to provide a more comprehensive list of plants including any threatened or endangered species that occur in each area. This comprehensive review ensures a more accurate account of plant species and ecological values of the wetland since wetland delineation procedures stress only the dominant plants.

The following describes the dominant ecological communities and representative plants identified during the November 2007 survey and the wetland delineation field survey performed in May 2008. Table 2.4-1 provides a general description of the flora, soils, and hydrology of each of the thirty-six wetlands found on the Island. Figure 2.4-2 shows the locations of these Federal and state wetlands within the Project Area that if impacted will require regulatory review by the USACE and NYSDEC.

Wetlands Description

The project area is 1,966 acres in size and of this overall acreage, 361 acres of freshwater wetland were identified and delineated in May 2008. A total of thirty-six wetlands were identified on the Island. Eight of these wetlands were classified as palustrine forested (PFO), twenty-one were palustrine emergent (PEM), four were PFO/PEM mosaics, and 3 were palustrine forest/palustrine scrub-shrub/palustrine emergent mosaics PFO/PSS/PEM. Four NYSDEC regulated wetlands were delineated on the site. Two are

Class II wetlands and two are Class III wetlands. These four wetlands also meet the federal definition for a wetland. However, the federal jurisdiction on one of these wetlands (Wetland J) will depend on determinations of its nexus or connection to a navigable water or its isolation from such waters.

There are several different wetland cover types that exist on Galloo Island. For purposes of defining the types of wetlands present, the wetlands are generally classified in accordance with the USFWS *Classification of Wetlands and Deep Water Habitats in the United States* (Cowardin, et al., 1979). According to Cowardin, et al., palustrine wetland systems include non-tidal wetlands with persistent vegetation and some small, shallow ponds. The wetlands on the Island are considered palustrine systems. Each of the wetland systems were then further classified into subclasses by vegetative characteristics. The following descriptions are the subclasses that were encountered during the site visits of November 2007 and May 2008, as well as representative vegetation noted within each community.

Palustrine emergent (PEM) wetlands are characterized by erect rooted herbaceous plants, excluding mosses and lichens. Representative herbaceous plants in PEM wetlands on the Island include broad-leaf cattails (*Typha latifolia*), loosestrife species (*Decodon sp.*), wood reed species (*Cinna sp.*), sedge species (*Carex sp.*), bentgrass species (*Agrostis sp.*), bluegrass species (*Poa sp.*), woolgrass species (*Scirpus sp.*), reedgrass (*Calamogrostis sp.*), mannagrass species (*Glyceria sp.*), spotted touch-me-not (*Impatiens capensis)*, smartweeds (*Polygonum sp),* marsh bedstraw (*Galium palustre)* and muhly grass (*Muhlenbergia sp.*). Some of the dominant species found in the PEM wetlands during the May survey included: *Typha latifolia*, *Carex sp. Impatiens capensis*, *Agrostis sp*., *Galium palustre*, *Phalaris arundinacea*, *Equisetum sp*., and *Eleocharis sp*. The PEM were found alone and in association with PFO and PSS cover types.

Table 2.4-1: Wetland Information

Wetland Identification	Community Type	Mapped Soil Type	Hydrology Indicator	Hydrologic Connection	Acreage
Wetland A	PFO/PEM	Newstead silt loam, Galoo-rock outcrop Complex, and Benson-Galloo complex	Inundated, saturated, drainage patterns, water-stained leaves, FAC-Neutral	Directly abutting unnamed tributary to Lake Ontario	183.58
Wetland B	PFO/PEM	Galoo-Rock outcrop complex	Inundated, saturated, drainage patterns, water-stained leaves, FAC-Neutral, algae films	Adjacent to Lake Ontario (by 150 ft)	2.53
Wetland C	PFO/PEM	Galoo-Rock outcrop complex	Saturated, FAC-Neutral	Adjacent to Lake Ontario (by 75 ft)	0.03
Wetland D	PFO/PEM	Chaumont silty-clay, Guffin clay and Saprists and Aquents	Inundated, saturated, drainage patterns, local soil survey data FAC-Neutral	Directly abuts North Pond, a portion of Lake Ontario	21.23
Wetland E	PEM	Guffin clay	Inundated, saturated, local soil survey data, FAC-Neutral	Adjacent to Lake Ontario via wetland D (by 50 ft)	0.32
Wetland F	PFO/PSS/PEM	Benson-Galoo complex	Inundated, saturated, sediment deposits, water-stained leaves, FAC-Neutral	Adjacent to Lake Ontario (by 50 ft)	28.20
Wetland FB	PFO/PSS/PEM	Guffin clay	Inundated, saturated, water-stained leaves, local soil survey data , FAC-neutral	Adjacent to Lake Ontario via non-jurisdictional conveyance into wetland F (by 300 ft)	4.22
Wetland G	PEM	Benson-Galoo complex	Saturated, FAC-Neutral	Adjacent to Lake Ontario (by 25 ft)	0.89

Wetland H	PEM	Guffin clay	Drainage patterns, water-stained leaves, local soil survey data , FAC-Neutral	Adjacent to Lake Ontario via wetland D (by 50 ft)	0.12
Wetland I	PEM	Galoo-Rock outcrop complex	Inundated, saturated, FAC-Neutral	Adjacent to Lake Ontario (by 300 ft)	1.03
Wetland J	PFO	Newstead silt loam	Saturated, drainage patterns, water-stained leaves, FAC-Neutral	No evidence of surficial hydrological connection (over 1200 ft)	29.18
Wetland K	PEM	Galoo-Rock outcrop complex	Inundated, saturated, FAC-Neutral	Adjacent to Lake Ontario (by 60 ft)	0.29
Wetland N	PEM	Galoo-Rock outcrop complex	Inundated, saturated, FAC-Neutral	Adjacent to Lake Ontario (by 50 ft)	0.16
Wetland O	PEM	Galoo-Rock outcrop complex	Saturated, water-stained leaves, FAC-Neutral	No evidence of a surficial hydrological connection (over 1350 ft)	1.06
Wetland P	PEM	Galoo-Rock outcrop complex	Saturated, FAC-Neutral	Adjacent to Lake Ontario (by 220 ft)	0.17
Wetland Q	PFO/PSS/PEM	Newstead silt loam, Chaumont silty clay and Benson-Galoo complex	Inundated, drainage patterns, saturated, water marks, FAC-Neutral	Adjacent to Lake Ontario (by 20 ft)	69.60

Palustrine scrub-shrub (PSS) wetlands include areas dominated by woody vegetation that is less than 6.0 meters (20 feet) tall. Representative shrubs in the PSS wetlands include red-osier dogwood (*Cornus sericea aka. C. stolonifera*), buttonbush (*Cephalanthus occidentalis*), silky dogwood (*Cornus amomum*), willow species (*Salix sp.*), and nannyberry (*Viburnum lentago*). The PSS wetland cover types were all found in mosaic wetlands associated with forested and emergent wetland cover types. Green ash (*Fraxinus pennsylvanica*) and buttonbush were the dominant woody species found in the PSS during May 2008. The PSS were found in wetlands F, FB, and Q.

Palustrine forested (PFO) wetlands include areas dominated by woody vegetation that is 6.0 meters (20 feet) tall or taller. Representative tree species in these areas included green ash (*Fraxinus pennsylvanica*), northern white cedar (*Thuja occidentalis*), silver maple (*Acer saccharinum*), American elm (*Ulmus americana*), and swamp white oak (*Quercus bicolor*). Additional dominant tree species in the PFO wetlands that were identified in May 2008 include yellow birch (*Betula alleghaniensis*), balsam poplar (*Populus balsamifera*), and American hornbeam (*Carpinus caroliniana*).

Palustrine unconsolidated bottom (PUB) wetlands under the Cowardin classification system are areas that are either permanently or semi-permanently flooded. Vegetation cover is less than 30%. Portions of wetlands F and Q contain some PUB cover types.

Hydric or potentially hydric (inclusions) soils in the project area include the Guffin series (hydric), the Saprists and Aquents complex (hydric at the subgroup level), and the Chaumont and Newstead series (hydric inclusions). The primary wetland hydrology indicators identified in the Galoo Island wetlands included inundation, saturation in the upper 12 inches of soil, water marks, drift lines, sediment deposits, and drainage patterns. Soil and hydrology data for each wetland are listed on Table 2.4-1.

Freshwater wetlands can provide many functions and values including shore stabilization, habitat for fish and wildlife, flood water storage and flood protection, ground water recharge/discharge, water quality functions including sediment filtration and biogeochemical cycling, production export of organic materials, atmospheric equilibrium, habitat for threatened and endangered species and economic, aesthetic, recreational and educational/scientific research functions. The primary functions and values associated with the various wetlands on Galloo Island include fish and wildlife habitat, production export, local flood flow alteration, water quality (sediment/toxicant retention, nutrient removal), and atmospheric equilibrium. Flooding is not a problem on the island and the functional role of the wetlands would only be of local importance. Galloo Island is not associated with any aquifers and wetlands on the island do not contribute to significant groundwater recharge/discharge functions. The portion of Wetland D along Lake Ontario has the potential to stabilize the shoreline but none of the other wetlands serve this

function. None of the wetlands on the island provide critical habitat for, or are known to be inhabited by any state or federally listed threatened or endangered species.

The wetlands do serve water quality functions and nutrient recycling and several in close proximity to or connected to the Lake serve as sediment traps helping to prevent siltation to near shore waters of Lake Ontario. Although insignificant in terms of overall carbon budgets, these wetlands do store carbon in their plant biomass instead of releasing it to the atmosphere as carbon dioxide thus helping to moderate global climatic conditions. These wetlands have the potential to provide educational and recreational benefits but are not unique except on the local level and are relatively isolated from public use. No commercial harvesting of fish and wildlife that would provide local or regional economic benefits occurs within the wetlands of Galloo Island.

Impacts

C&S Engineers and TES, Inc. performed a preliminary field survey and delineation of wetlands in the vicinity of possible impacted areas so the Project layout could be adjusted to first avoid and then minimize residual permanent and temporary wetland effects. Minimization of impacts also included consideration of avoiding and minimizing impacts to the NYSDEC one-hundred-foot regulated wetland buffer zones. One of the original Project alternatives was the maximum layout. The maximum layout would result in installation of 98 turbines on the island as shown in Figure 1.2-1. This layout would place the maximum number of turbines sited to achieve maximum possible output for the wind resources on the island. However, 14 of the 98 WTG would be located in wetland areas. This alternative would have resulted in loss of 26.05 acres of wetland. Since this alternative resulted in a significant increase of impacts to sensitive habitats, including wetlands, it is not the preferred alternative. The preferred alternative describe in this DEIS does not place any WTG in wetland areas.

The proposed Project has avoided wetland impacts to the greatest extent practicable and the unavoidable losses or impacts on wetland functions and values have been minimized through various control plans mentioned later on in this discussion. There are no

NYSDEC protected streams that will be crossed by service roads or ECS on Galloo Island.

Temporary Impacts: ECS

Based on the field surveys, none of the proposed WTG sites are located in Federal or State wetlands. The temporary impact of ECS construction includes .0004 acres of Federal and state regulated wetlands. This includes 0.0002 acres of wet meadow wetland and 0.0002 acres of scrub-shrub wetland. Although there are about 1.38 acres of wet meadow, 0.03 acres of emergent wetland and 0.22 acres of scrub-shrub wetland within the overhead ECS area, none of these areas will be disturbed (cleared, grubbed or graded) by aerial overhead ECS. ECS within emergent and scrub shrub wetland will result in temporary impacts since the areas will naturally revegetate within one to several seasons. Construction of buried ESC through emergent wetlands will have little impact due to the small acreage affected (0.0002 acres). Also, these areas will naturally revegetate soon after work is completed.

Permanent Impacts: ECS

Within wooded wetlands, the overhead ECS will result in clearing of about 0.6365 acres of wooded wetland. Underground ECS will affect 0.057 acres of wooded wetland. The overhead and underground ECS within wooded areas will cause permanent impacts for the life of the project since the wooded areas will be replaced with low lying vegetation (herbaceous and small shrubs). Table 2.4-2 provides the acreage of wetlands permanently or temporarily affected by the Project.

Permanent Impacts: Roads

The service roads will permanently affect approximately 0.037 acres of wooded wetland and 0.060 acres of non-wooded wetland or a total of 0.097 acres. Wetlands affected by road construction include wetlands A, D, and F. Table 2.4-2 shows the acreage of wetland affected by each component and by wetland designation.

Table 2.4-2: Wetland Impacts

Wetland	Type	Disturbance	Component	Acreage
F	Non-wooded	Temporary	Underground Electric	0.0002

Q	Non-wooded	Temporary	Underground Electric	0.0002
A	Wooded	Permanent	Overhead Electric	0.0332
AG	Wooded	Permanent	Overhead Electric	0.0030
B	Wooded	Permanent	Overhead Electric	0.0071
F	Wooded	Permanent	Overhead Electric	0.0041
J	Wooded	Permanent	Overhead Electric	0.2288
Q	Wooded	Permanent	Overhead Electric	0.1842
U	Wooded	Permanent	Overhead Electric	0.1384
VML	Wooded	Permanent	Overhead Electric	0.0336
Z	Wooded	Permanent	Overhead Electric	0.0039
O	Wooded	Permanent	Underground Electric	0.0002
A	Non-Wooded	Permanent	Electric Poles	0.0007
A	Wooded	Permanent	Underground Electric	0.0517
J	Wooded	Permanent	Underground Electric	0.0054
U	Wooded	Permanent	Underground Electric	0.00004
A	Wooded	Permanent	Access Roads	0.0366
A	Non-Wooded	Permanent	Access Roads	0.0101
A (Stream)	Non-Wooded	Permanent	Access Road	0.0107
D	Non-wooded	Permanent	Access Road	0.0089
F	Non-wooded	Permanent	Access Road	0.0305
			Total	**0.7914**

Impacts to NYSDEC Buffers

Impacts to NYSDEC buffer zones include 0.697 acres from access roads, 4.278 acres from overhead electric, and 0.716 acres of wooded upland areas from underground lines for a total disturbance of 5.682 acres. The open field buffer areas will be restored to pre-construction contour and condition once the underground cable has been installed. Roadways will have a permeable gravel base and will not adversely affect hydrology of adjacent wetlands.

Wetlands Impact Summary

The primary impact of the Project on wetlands is the loss and/or change in habitat by filling and clearing to construct service roads and ECS. Both the USACE and the

NYSDEC recognize that changes in habitat cover-type and habitat quality and quantity constitute permanent impacts. The loss of 0.097 acres of wetland from road construction and 0.695 acres from ECS constitutes 0.22% of the total wetland acreage and there will no change in overall wetland diversity, quality, juxtaposition or interspersion as a result of ECS and road construction. In addition, wetland habitat fragmentation will be minimal. Figure 1.2-1 shows roads or ECS that cross directly through wetlands. These roads and ECS crossings will not measurably change the wetland size or amount of edge within the wetlands nor will the distance between the separated sections be more than 40 to 50 feet. Thus, habitat value to fish and wildlife will not be diminished. There will be no measurable impact on other wetland functions and values such as water storage and filtration, water quality, nutrient recycling, groundwater recharge, and atmospheric equilibrium.

The proposed Project has also been designed to avoid placement of road fill in locations that would have adverse effects on wetland hydrology. Crossings have been placed at the narrowest sections of the affected wetlands and the design includes large permeable granular fill materials for the roads and placement of roads flush with grade to allow for water flow and circulation. Any construction activities that involve clearing of vegetation and earth moving and stockpiling that occur within several hundred feet of a freshwater wetland could contribute silt-laden runoff during precipitation events if left uncontrolled. The proposed Project includes an SWPPP designed to prevent these types of construction related discharges to wetlands and other waters. The Conceptual SWPPP is contained in Appendix D.

Accidental releases of materials to freshwater wetlands are highly unlikely. No accidental releases of oils, fuels, and concrete leachates to wetlands are expected. The proposed Project includes an SWPPP, a SPCC, and plans for containment of non-oil materials to ensure that proper precautions and containment procedures are taken to prevent such material releases and to ensure proper cleanup and containment in the unlikely event of an accident. The three staging areas and the concrete batch plant are not located near any wetlands minimizing any potential material releases during construction. The greatest

potential for any releases would be from de minimus leaks of truck fuels or hydraulic fluids from construction vehicles.

The benefits of the proposed Project as discussed in Section 1.1 of this DEIS include economic benefits derived during the construction and operation of the wind farm and the electrical power benefits from a clean energy source. These benefits far outweigh the minor wetland impacts on wetlands that occur on Galloo Island.

Mitigation

Wetland mitigation for the Project includes measures that will be taken during construction to avoid or minimize impacts, measures to restore disturbed areas as close as practicable to pre-construction condition, and compensation for the unavoidable loss of about 0.79 total acres of wetland habitat. The mitigation has been designed in accordance with NYSDEC wetland mitigation guidelines, *Freshwater Wetlands Regulation Guidelines on Compensatory Mitigation* and the latest USACE-USEPA guidelines, *Final Rule on Compensatory Mitigation for Losses of Aquatic Resources,* April 10, 2008. The goal is to first avoid impacts entirely. If impacts cannot be avoided, then they should be minimized to the greatest extent practicable. Finally, any residual losses that occur after avoidance and minimization must be fully compensated based on the affected wetlands values and functions.

The crossings of wetlands by service roads and ECS have been designed, wherever possible, to transect the wetlands at the narrowest possible points or at the peripheral edges in order to minimize habitat loss and impacts on wetland hydrology. Road crossing will have base layers of large stone to ensure a permeable media that allows proper movement of water between sections of wetland separated by the roads. The footprints of the roads have been kept to the minimum amount required to serve the project purpose. Where possible the roads will be constructed flush with grade to reduce hydrological impacts. Areas that must be temporarily cleared will be kept to the minimum width and length needed to accomplish the work and areas will be restored as close as practicable to preconstruction condition. The areas to be restored will be seeded with appropriate

grasses (facultative to facultative-wet or wetter species) and mulched to provide initial vegetation to stabilize disturbed soils.

Where ECS or service roads are constructed in wetlands, specialized equipment will be used to reduce the impact on wetland soils and hydrology. Typical measures include use of high floatation tires/wide tires, working from wooden mats or working from the upland side where possible. Wetland boundaries will be clearly flagged in work areas to assist the construction workers and environmental monitor with avoiding unplanned disturbances to the wetlands.

Wetland mitigation will also include taking all measures to prevent and reduce the impact of soil erosion during project construction and containment of various materials to protect wetlands and waterways during construction and operations. Typical controls include temporary and permanent vegetation, sedimentation basins, sediment traps, diversion fences, silt fences, erosion control blankets, rock outlet stabilization and permanent turf reinforcement mats among others. These controls are all described in the draft SWPPP found in Appendix D. In addition, to prevent the spread of invasive species during project construction, an Invasive Species Control Plan has been prepared and is included as Appendix M.

In wetland areas soils will be stockpiled next to trench or cleared areas for reuse. Storage time will be generally limited to about less than a month where ECS will be buried in wetlands. The top 12 inches of the backfill should be the topsoil layer of the material that was excavated from the wetland. Precautions will be taken in final design to ensure that trenching in wetlands does not create a French drain. Such precautions can include clay plugs within trenches where needed.

In order to compensate for the unavoidable loss of 0.79 acres of wetlands on Galloo Island, Upstate Power will provide compensatory mitigation. Upstate Power anticipates that the mitigation for fill to regulated wetlands will require .268 acres of new wetland creation. There are very limited opportunities on Galloo Island to create new wetlands or enhance existing wetlands and there are no degraded wetlands that could be restored. Bedrock on the island is relatively close to the surface making wetland creation

somewhat more difficult and susceptible to failure on many parts of the Island. A conceptual mitigation plan prepared by C&S identifies the area on the Island that would be suitable for onsite mitigation (See Appendix J). A second alternative for mitigation of unavoidable wetland losses involves the use of in-lieu fee arrangements with an approved third party for the purpose of enhancing, restoring, and/or creating wetlands off-site. Both of these plans have been found to be feasible and Upstate Power will consider both plans during the permitting process.

Consolidation of the mitigation creates larger wetlands that can provide more habitat value and diversity than a small isolated one that would just serve to mitigate impacts of wetland losses on the Island. Consolidation offsite by an in-lieu fee arrangement can keep the mitigation in the same ecological region and allow the opportunity to perhaps provide additional functions not attributed to those wetlands that will be filled on the island. For instance, constructing a consolidated wetland near a river or stream could provide flood storage and water quality benefits to an important fishery stream. During review of in-lieu fee opportunities, Upstate Power will give serious consideration to those options that would consolidate the mitigation with other mitigation actions in effect or planned in the affected ecological region. Consideration of consolidated mitigation versus onsite mitigation on Galloo Island will be based on comments and conditions from the NYSDEC and USACE.

2.4.4 Groundwater

Characterization

Groundwater Supply (Potable Water)

No municipal water service is available on Galloo Island. Potable water is derived from either the one groundwater well located on the island or pumped from Lake Ontario. The depth of the groundwater well is unknown. The water derived from Lake Ontario is pumped through above ground pipes and into a carbon filtration system. Because the pipes are above ground, water can only be obtained at above freezing temperatures.

Geologic and Hydrologic Conditions

As discussed previously, the Project Area is located within the Ontario Lowlands of New York State. The top of the bedrock throughout the upland portion of the Project Area is composed of the Trenton Group limestones and is not greater than four feet below ground surface, with many areas of exposed bedrock. The topography of Galloo Island is generally a reflection of the bedrock surface. Soils consist of glaciolacustrine silts and clays with wetland areas consisting of organic silts and clays.

Groundwater likely occurs as both perched groundwater in the shallow soils that are present on the island, and as a water table aquifer (unconfined) within the fractures in bedrock. Some of the perched groundwater likely flows in shallow units typically following local topographic gradients, with flow from higher elevations toward lower elevations that typically discharge into wetlands, an intermittent stream and ultimately Lake Ontario. Some of the perched water likely percolates downward through fractures into bedrock. Recharge of groundwater on the island is limited to rain water and infiltration into bedrock for Lake Ontario. Seasonal fluctuations are likely to occur due to shallow soil depth and limited recharge area.

In addition to the general bedrock surface, the geometry of Galloo Island is also influenced by both regional and localized fracture systems which are a likely source of groundwater in bedrock. Because limestone yields water primarily from bedding planes, fractures, joints, and faults, it generally yields more water than other types of rocks because carbonate rocks are subject to dissolution by slightly acidic groundwater. Dissolution along bedding planes, fractures, and joints enlarges these openings and increases the permeability of these carbonate rocks (Isachsen *et al.*, 2000).

No known sole-source aquifers occur within the Project area or its vicinity (USEPA, 2006a).

Impacts

Geothermal System

A closed loop geothermal system will be installed for heating, cooling and domestic water heating for the two residential housing units, the cafeteria, recreation building, and metal maintenance building. The system will consist of a series of vertical boreholes at each location that allows for the installation of a "geosource loop" that will circulate fluids in an enclosed piping system, and acts as a heat exchanger for purposes of heating and cooling.

Each borehole will be approximately six inches in diameter and approximately 400 feet deep in limestones and dolostones. Boreholes will be advanced with a rotary drill rig using air to circulate rock cuttings from the borehole. If significant groundwater is encountered during drilling activities, drilling mud will be used to circulate rock cuttings from the borehole. Once total depth of the borehole is reached, a geosource loop will be installed consisting of 1 ¼ inch polyethylene pipe. Once the pipe is in place, the borehole is then filled to the surface with conductive cement-bentonite grout completely encapsulating the geosource loop in cement. The geosource loop pipe will then be charged with water and glycol "Environal" that has been developed for deep-bore geothermal systems, and is an excellent heat transfer medium.

Temporary, short term impacts to groundwater can occur during actual drilling activities such as suspended solids associated with borehole placement and geosource loop installation, but this is likely temporary. There are no long term impacts expected, since the geosource heat loop consists of closed loop piping that is encapsulated in bentonite cement.

Construction Dewatering

Generally, impacts to groundwater due to the construction and operation of the Project are not anticipated. Dewatering of excavation sites may be necessary at times to facilitate proper placement of foundations. Impacts to unconfined, unconsolidated, shallow groundwater resources and/or natural springs (if encountered) may include temporary

lowering of the water table within the immediate vicinity of tower excavations via pumping.

Long Term Groundwater Impact

The deepest foundation installation depth for the Project, and therefore the component with greatest potential impact to groundwater, is WTG foundation. It is anticipated that the WTG foundation depth (ranging from 6 to 8 feet below grade) will be above the water table in bedrock. Therefore, WTG foundations are not anticipated to have a long-term impact on the groundwater supply on the island.

The substation, maintenance facility, residences, community facility, ECS and service roads will be constructed and installed either entirely above ground or with minimal subsurface intrusion (within four feet of the surface); installation of these features will have no impact on the deeper groundwater levels. It is anticipated that foundations at the substation and maintenance facility will be less than four feet. The ECS will only require, at a maximum if trenching is required, a 3 foot-wide trench with a maximum depth of 4 feet. The service roads themselves will cause no change in the flow of groundwater, as they are a surface feature. The substation and maintenance facilities, residences and community facility will require shallow foundations and slab on grade construction and will not have an impact on groundwater. Additionally, the only drinking water wells in the area will be temporarily installed and operated by Upstate Power. These wells will be decommissioned, once the permanent water treatment facility is constructed to treat water pumped from Lake Ontario.

In the long-term, there will be a limited impact on a small portion of the recharge area. The footprint of each WTG and associated crane pad permanently impacts approximately 4 acres, with a total of 36 acres of distributed infiltration reduction over the entire watershed resulting from the Project. The majority of the surface materials above the WTG base will be restored with native soil (if present) allowing for continued infiltration of rain water into the subsurface. For those acres that are permanently impacted with low permeable surfaces, including the permanent residences, substation and the community facility, the storm water (i.e. recharge water) will be shed to the sides, and allowed to

drain into the vegetated soils around the improvements, with minimal net affect to recharge rates for the island.

Groundwater impacts associated with the storage of petroleum are not anticipated and potential impacts will be minimized by the implementation of a SPCC Project Plan. In addition, all petroleum products stored on the island will comply with the New York State PBS Regulations and other applicable laws, regulations and guidance. Uses of petroleum on the island include gear oil in the nacelle of the towers (approximately 100 gallons for each turbine) and the above ground storage of fuel for Project vehicles and equipment. At this time, one 15,000 gallon AST and one 5,000 gallon are anticipated to be located near the operations and maintenance building. All petroleum product storage will be subject to, among other things, secondary containment regulations through the SPCC project plan.

The areas of new impervious surfaces from the construction of the project (gravel roads and crane pads) are minimal compared to the overall area available for recharge. Given the fact that bedrock is largely impervious (except along joints and fractures) and typically less than two feet below ground surface, no discernable impact is expected on groundwater levels or quality.

Mitigation

Construction Dewatering

Groundwater pumped from excavations will be handled in accordance with NYS SPDES requirements under general permit GP-0-08-001. Impacts to the local shallow groundwater due to pumping are not expected to affect groundwater flow and supply on the island and therefore, no mitigation is required.

Long Term Groundwater Impact

Groundwater will only be used temporarily for drinking water purposes until the water treatment plant is constructed. Drinking and operations water will be pumped from Lake Ontario to a water treatment plant, which will service the long term needs of the Project.

The Project is required to operate under the specifications outlined in its SWPPP as required by 40 CFR 125.3 (d) (2) or (3). This plan will limit impacts to groundwater through storm water infiltration by employing best management practices to facility maintenance, drainage and material (i.e. gravel, oil, etc.) storage. Upstate Power will also develop and implement a SPCC Plan [as required by 40 CFR 112], as the turbine nacelle oil storage and likely truck fuel oil storage will exceed the 1,320 gallon above ground storage threshold. The SPCC plan requires the identification of spill containment and emergency response measures for potential oil releases. The draft SPCC Plan is attached as Appendix E.

Because adverse impacts on groundwater are not anticipated, other than the implementation of the SWPPP and SPCC Plans, no additional mitigation is required.

2.5 Wildlife and Habitat

Galloo Island is approximately 1,966 acres in size and is located in the Saint Lawrence Valley ecozone of New York State. Elevations on the site range from about 300 feet above mean sea level (amsl) in the northern portion of the site to approximately 250 feet amsl in the southern part of the site. The island is in the eastern basin of Lake Ontario north and west of Little Galloo Island and west of Stony Island and Henderson Harbor. The Project site contains various vegetative cover types including deciduous and mixed forests, wooded and non-wooded wetlands, open fields, scrub-shrub areas, developed areas, agricultural areas and vegetation associated with rocky areas and cliffs as discussed below in the sections on flora and fauna. The island supports some populations of large and small mammals, avians, amphibians and reptiles. It is important to note that Galloo Island does not represent a pristine type of habitat or support highly diverse wildlife populations since this island has historically been disturbed by agricultural activities, deer management practices, clear cutting of cedar forests and pervasive invasions by pale swallow-wort (*Cynanchum rossicum*), an invasive plant species. This invasive species is found throughout the island and wherever it is found it dominates and out-competes all other ground cover plants important to wildlife species.

TES, Inc. observed two state threatened plant species on the island, rock cress and troublesome sedge. Rock cress was found in the cliff areas of the island. Troublesome sedge was prolific and was found in wetlands and upland cover types including fields, agricultural land, rocky shoreline, wet meadow and deciduous forested wetlands. Very little wetland habitat and rocky shoreline will be affected by the Project. See section 2.5.2, (Endangered Species) and Section 2.4.3 (Wetlands) for additional information.

Galloo Island is located within the eastern section of Lake Ontario which is an ecologically important area. Eastern Lake Ontario has important Bird Conservation Areas, Audubon Important Bird Areas and various Wildlife Management Areas. A portion of Galloo Island is within the NYSDEC Lake Ontario Islands Wildlife Management Area (LOIWMA) that consists of Little Galloo and Gull Islands. The LOIWMA is part of the larger "eastern basin ecosystem" of Lake Ontario. Little Galloo is designated as an Important Bird Area by the Audubon Society, is listed as a Significant Habitat by New York State, and is a state Bird Conservation Area (BCA). The LOIWMA has a large colonial water bird rookery with one of the largest ring-billed gull colonies in North America and one of two of New York State's Caspian tern rookeries. (NYSDEC, 2008a) Other important species in the BCA include Double-crested Cormorants, Herring Gulls, Great Black-backed Gulls, and Black-Crowned Night Herons. (NYSDEC, 2002) The Project is not anticipated to adversely affect Little Galloo island or the species that transit between Little Galloo and Galloo Islands.

Another Audubon Important Bird Area and state Bird Conservation Area is Point Peninsula located to the northeast of Galloo Island on the mainland and bordered by Chaumont Bay and Lake Ontario. The BCA covers 1,045 acres of the 6,600 acre peninsula. It may one of the most critical wintering areas for arctic breeding raptors in the northeast. Breeding raptors using the BCA include Short-eared Owl (state endangered species), Rough-legged Hawk, Snowy Owl, Northern Shrike, and Northern Harrier (state threatened species). The BCA also provides important stop over and feeding habitats for migratory birds and critical grassland habitats for many breeding, migrating and wintering bird populations. It supports a breeding population of Black Terns (state endangered species) and populations of breeding and migrating waterfowl. This area is

more than 6 miles from the Project. The avian populations at Point Peninsula BCA are not anticipated to be adversely affected by the Project.

Further to the south and east of Galloo Island, along the Oswego County shoreline of Lake Ontario is the Eastern Lake Ontario Marshes BCA. This area includes Deer Creek. Lakeview Marsh, and Black Pond WMAs and the Sandy Pond Beach Unique Area. This BCA is a complex of long barrier beaches and wetland complexes. This BCA has significant breeding and overwintering habitats and is a critical migratory corridor for birds. It provides habitat for Black Tern (state-endangered), Pied-billed Grebe (state-threatened), Least Bittern (state-threatened), American Bittern (state special concern) and Northern Harrier (state threatened). In part, this BCA has been designated a National Natural Landmark. Part of this BCA is federally designated as critical habitat for the piping plover, an endangered avian species. On Galloo Island there is no critical habitat for the piping plover. The Project is over 30 miles away from these areas and is not anticipated to have an adverse effect on the avian populations in this area.

NYSDEC Critical Environmental Areas (CEAs) are areas with exceptional or unique character with respect to one or more of several factors including human health; natural settings; agricultural, social, cultural, historic, archeological, recreational, or educational values; and, inherent ecological, geological, or hydrological sensitivity to change. Local agencies may designate these areas or state agencies may designate them in areas they own, manage or regulate. Currently, there are no designated CEAs in Jefferson County. (NYSDEC, 2008b)

Galloo Island has been identified in the New York State Open Space Plan as a part of the Great Lakes Shorelines and Niagara River priority conservation project area. (NYSDEC et. al., 2006) The Great Lakes shorelines of Lake Erie, the Niagara River, Lake Ontario (including Galloo Island) and the St. Lawrence River are recognized for the their value in providing spawning and nursery areas for fish including threatened and endangered species, nesting, feeding and resting habitat for waterfowl, natural resources including wetlands, sand dunes, bluffs, embayments and recreational and cultural resources. As indicated in Sections 2.5.5 (Fish and Aquatic Species) and 2.4.3 (Wetlands) of this DEIS

and in this Section 2.5 (Wildlife and Habitat), the Project is not anticipated to adversely affect any threatened or endangered aquatic or terrestrial plant and wildlife species, fish spawning and nursery areas, wetlands, nesting, feeding and resting habitat for waterfowl or migratory birds, important bird areas, significant coastal fish and wildlife habitats, or any other resources identified in the Open Space Plan. Galloo Island is privately owned and not currently accessible by the public. It is not identified in the Open Space Plan as an area considered for acquisition.

2.5.1 Flora and Fauna

Characterization

An ecological resources survey of Galloo Island was performed by TES, Inc. from November 2007 to September 2008 to assess the vegetation and wildlife resources, including endangered species, of the site. The report includes a literature review and field work is attached as Appendix N. In addition, freshwater wetlands on the Island were identified, characterized and delineated by C&S Engineers, Inc and TES, Inc. as discussed in Section 2.4.3 (Wetlands) of this DEIS. Vegetation cover types identified during the field work were mapped and described including a list of plants within each cover type. The major plant communities on the island are those associated with freshwater wetlands, rocky shoreline (RS) and cliffs, agricultural lands (AG) upland forests (DFU and MFU), upland scrub-shrub (SSU) and open fields (OF).

The upland vegetative areas were the dominant cover types and represented about 1,585 acres of the 1,966 acre island or about 80.6 percent of the area. The upland areas consisted of several cover types including developed areas, open fields, agricultural lands, cliff, upland scrub-shrub, deciduous forest and mixed forest. Figure 2.5-1 shows the vegetative cover types on the island.

Small skullcap, a species on the New York Natural Heritage Program (NYNHP) Watch List, was found within an open field on the island. Although suitable habitat was evidenced for the Autumnal Water-starwort (state-endangered) in the north pond and Gill Harbor, this aquatic plant was not identified.

Developed Areas (DEV)

Only 1.5 percent of the island is comprised of developed areas. These areas are located on the eastern part of the property and cover about 29 acres. Grass and other herbaceous species dominated these communities including species such as bird's foot trefoil, Canada thistle, orchard grass, timothy, slender vetch, smooth brome and viper's bugloss.

Open fields (OF)

Approximately 782 acres or 40 percent of Galloo Island consists of open field communities. These communities include pale swallow-wort dominated sites, clear cut cedar forest areas, areas dominated by Canada thistle, and characteristic open field areas.

Large areas of the invasive species pale swallow-wort were found in the central part of the site and there was a sparse herbaceous layer of other plants within this cover-type.

The clear cut cedar forest area contained many old cedar stumps and herbaceous and woody plants including bugleweed, common milkweed, green ash, timothy, basswood and others.

The area dominated by Canada thistle also included Canada goldenrod, catnip, dame's rocket, quack grass, redtop, and spotted St. John's wort.

Much of the characteristic open field areas were divided by roads and mowing and vegetation control measures had been used on these areas. Plants included herbaceous species, shrubs, and a sparse covering of trees. Some of the plants identified in these areas included American elm, black gum, beggar-ticks, field mustard, nannyberry, shagbark hickory, sweet vernal grass, tall fescue, common plantain, giant foxtail and others.

Agricultural Land (AG)

Agricultural land comprises about 8.5 percent of the site or 168 acres and is found on the northern portion of the island. These areas were used for hay to feed the managed white-tail deer population. Some of the dominant plant species included alfalfa, buckwheat, corn, green foxtail, lady's thumb, wheat, cow vetch and other herbaceous species.

Cliffs (Cliffs)

Cliffs are located along approximately 3.6 miles of the western and eastern edges of the Island and the vegetation is found within the crevices of the rock. Plants included trees, scattered shrubs, and herbaceous species. Typical species included bluebell, borage, Canada bluegrass, early goldenrod, fragile fern, rock cress, sugar maple, Virginia creeper, round-leaf dogwood and many others.

Scrub-Shrub Upland (SSU)

Choke cherry and silky dogwood were the dominant shrubs in this cover type and herbaceous species included common knotgrass, common milkweed, enchanters nightshade, herb Robert (Robert geranium), mouse–eared chickweed, old field cinquefoil, purple giant hyssop, shepherds purse, wild carrot and wind-flower. This community is about 4.6 acres in size and occurred along the northeastern section of the site.

Deciduous Forest Upland (DFU)

Deciduous forests are scattered throughout the island and comprise nearly 30 percent of the island or 588 acres. The central and northern parts of the Island are densely covered by upland forests. Most of the forests had trees ranging in height from 30 to 40 feet. Pale swallow-wort dominates the understory of some of the forested areas and in other areas deer have browsed the understory and herbaceous plants. Some of the trees and shrubs in these communities include big-toothed aspen, bitternut hickory, musclewood (aka American hornbeam), white oak and common juniper. Some herbaceous plants found in the understory include broad-leaf sedge, black bindweed, false-nettle, lady's sorrel, poison ivy, wild rye, and yellow sedge.

Mixed Forest Upland (MFU)

Less than 1 percent of the site was occupied by mixed forest upland cover type. It occurs in two areas within the central part of the Island. Both coniferous and deciduous trees are found in the cover type including balsam fir, eastern hemlock, northern white cedar, white spruce, eastern red cedar, northern red oak, paper birch, and white ash. Herbaceous plants included fox grape, jack-in-the-pulpit, common shepherd's purse, pale swallow-wort, and white snakeroot.

Wetlands

The remainder of Galloo Island vegetative cover types consisted of various freshwater wetlands and rocky shoreline (RS). About 20 acres of land were rocky shoreline and waters/wetlands occupied 381 acres or 19 percent of the site.

Rocky shoreline is found along the perimeter of the Island and while it is not actually a wetland cover type, it is associated with wet areas and plants. Some typical trees, shrubs and herbaceous species found in this cover type include beggar-ticks, blue vervain, blue flag (iris), common reed, water plantain, purple loosestrife, red osier dogwood, speckled alder, crack willow, staghorn sumac and others.

The wetland cover types were discussed in detail within Section 2.4.3 (Wetlands). Cover types found on Galloo Island included emergent wetlands (EW), wet meadow (WM), scrub-shrub (SSW), deciduous forest (DFW), mixed forest (MFW) and open water (OW).

The Island has about 7.7 acres of open water, 10.9 acres of emergent wetland, 45 acres of wet meadow, 48 acres of scrub-shrub wetland, 113 acres of deciduous forest wetland and 136 acres of mixed forest wetlands. Plant species found within these cover types are listed in both the Wetland Delineation Report (Appendix L) and the Ecological Resources Report (Appendix N) and dominant plants are summarized in 2.4.3, the Wetland Section of this DEIS.

Characterization

TES, Inc., prior to performing field investigation of the site, reviewed various literature resources including the New York State Amphibian and Reptile Atlas Project, the New York Breeding Bird Atlas Projects, and the New York Natural Heritage Program Rare Plant Species List among other resources including information that was provided by the NY Natural Heritage Program and USFWS. In the field, wildlife (mammals, birds, amphibians, reptiles) or their sign (tracks, sound, sight, scat, nests, feathers, etc.) were noted by vegetation cover and land use type. A turtle trapping survey was conducted on July 21-24, 2008. Detailed information on the wildlife resources of Galloo Island are

contained in the Ecological Resources Report prepared by TES, Inc. that is attached as Appendix N.

Amphibians and Reptiles

Six species of amphibians and five species of reptiles were observed at Galloo Island during the ecological resources survey. Amphibians included the eastern red-backed salamander, eastern American toad, American bullfrog, northern green frog, northern leopard frog and the pickerel frog. The reptiles found on the Island were eastern snapping turtle, northern map turtle, painted turtle, northern watersnake, and the common gartersnake. All of these species are common and widespread.

The red-backed salamander is an abundant species in the mature woodlands. The eastern American toad uses upland forests associated with wetlands, and the American bullfrog and green frogs rely on the permanent waterbodies. Northern leopard frogs and pickerel frogs use combination of habitats such as shallow, densely vegetated wetlands and their surrounding upland habitats. All of the species are common in New York.

Snapping turtles are highly aquatic and found in slow shallow waters, and painted turtles inhabit wetlands. These are the two most common species of turtles in the state. Northern map turtles prefer bays and inlets and slow moving water with soft bottom materials. They have a more restricted range than the other two species in the State of New York but are not rare. The northern watersnake and gartersnake are common species. The watersnake may be found in almost any permanent aquatic environment. Both of these snakes were very common on Galloo Island.

Although there are no data listed for the Galloo Island quadrangle, Banding's turtles (state-threatened) are known from two adjacent quadrangles (Herpetological Atlas 1990-1998). Therefore turtle trapping was performed, in part, to determine if the state threatened Blanding's turtle exists on the Island. A total of 16 turtle traps were set in four areas on Galloo Island where turtles were likely to be found. Sampling occurred from July 21 to 24 of 2008. No Blanding's turtles were found on the site. Table 3 of the Ecological Resources Report (Appendix N) indicates the cover types in which each of the amphibian and reptile species were found.

Mammals

Mammals observed on Galloo Island included eastern chipmunk, eastern gray squirrel, red squirrel, American beaver, deer mouse, meadow vole, common muskrat, coyote, raccoon and white-tailed deer. No federally or state listed threatened or endangered species were observed on the site.

White-tailed deer were found to use all of the cover types on the Island. Eastern chipmunk and eastern gray squirrel were present but were not abundant. The small mammals on Galloo Island used a mixture of upland, wetland, deciduous, and mixed forests for habitat. A list of species by cover type is found in Table 3 of the Ecological Resources Report (Appendix N).

The deer herd on Galloo Island is managed by the current owners of the island under the terms of a deer management permit (Class A Domestic Game Breeders Permit). The agricultural areas on the island are primarily used for hay production which is used for white-tailed deer feed. Hunting parties are hosted by the owners to cull the herd. The owners mow areas of grassland, harvest and bale hay, put out mineral licks and supply purchased feed to supplement the deer diet in winter. The owners also established multiple food plots with high protein crops scattered throughout the island. The state permit allows up to 4000 deer on Galloo Island and the present herd as of April 2008 was estimated at 250 adult deer. (Galloo Island Corp., 2008)

Impacts

Impacts to vegetation, wildlife habitat, and wildlife populations will result primarily from construction of individual turbine sites, staging areas, the electrical collection system, the substation, concrete batch plant, service roadways, and buildings. Impacts will also occur during operation of the Project. Sources of Project impacts during construction include clearing and grubbing activities, placement of structures, noise and general construction activities. Some of the impacts are temporary and highly localized such as noise and temporary clearing of vegetation and some are permanent such as losses due to construction of structures. Impacts to vegetation and habitat were determined using USGS Topographic Maps, cover type maps prepared by TES, Inc., wetland delineation

maps prepared by C&S Engineers Inc. and TES, Geographic Information System data, and project feature drawings and overlays.

Operational phase impacts from the Project could include bird and bat collisions and minor disturbances to wildlife during maintenance activities. Potential bird and bat impacts are discussed in Section 2.5.3 and 2.5.4 of this DEIS.

Temporary Impacts to Flora

Blade laydown areas and ECS will temporarily impact approximately 102.54 acres or 5.2% of the Project area. This is in addition to the permanent losses mentioned below. These areas will be restored once the work has been completed. Most of the temporary impact is on open field habitat (101.17 acres), deciduous upland forest (37.07 acres) and agricultural land (10.47 acres). Temporary losses of wetland will be minimal: 1.38 acres of wet meadow and 0.24 acres of scrub-shrub wetland. ECS, WTG and service roads have been designed to avoid wetland areas to the extent practicable and temporary impacts from these project features will be minimal.

Small areas of other habitat types that will be affected temporarily include: 0.87 acres of developed land, 0.71 acres of mixed forest upland, and 2.18 acres of rocky shoreline.

As previously indicated in the Wildlife Habitat Characterization section above, habitats on the island are not pristine having been subject to many disturbances and are similar to habitats found on the mainland. No unique habitats will be lost as a result of the Project.

Permanent Impacts to Flora

Permanent impacts to flora from the Project will be minimal. A total of 161.88 acres or will be affected by construction of structures, ECS, permanent maintenance facilities including service roads and the upland portions of the offloading facility and various buildings on the island. Table 2.5-1 demonstrates the Project features and amount of acres impacted by vegetation cover type. Most of the affected habitat consists of open field (63.95 acres), upland deciduous forest (75.98 acres) and agricultural land (13.96 acres). The remaining 7.99 acres consists of small quantities of mixed upland forest, scrub-shrub uplands, developed land, and wetlands.

Table 2.5-1: Permanent Impacts to Habitat

Disturb	Habitat	Acres
Permanent	Agricultural Land	13.96
Permanent	Deciduous Forest Upland	75.98
Permanent	Deciduous Forest Wetland	0.71
Permanent	Developed	2.07
Permanent	Mixed Forest Upland	4.81
Permanent	Mixed Forest Wetland	0.08
Permanent	Open Field	63.95
Permanent	Rocky Shoreline	0.16
Permanent	Scrub-Shrub Upland	0.16
	Total	161.88

As previously indicated in the Wildlife Habitat Characterization section above, habitats on the island are not pristine having been subject to many disturbances and are similar to habitats found on the mainland. No unique habitats will be lost as a result of the Project.

Temporary Impacts to Fauna

Temporary impacts to mammals, reptiles, and amphibians in the Project site are expected to be minimal. Mammal species utilizing the agricultural and open field cover types included the deer mouse, meadow vole, coyote and white-tailed deer. These mammals are common and opportunistic. These cover types were also used by eastern chipmunk a species present but not abundant on the island. All of these mammals are mobile, and, with the exception of small rodents, can readily avoid or leave an area that is disturbed by construction activities such as clearing, grubbing and grading. Once the WTG and ECS are constructed and the system is operational, these species will return once accustomed to the presence of the WTG. Some small rodents may be impacted during construction, but these species are abundant and reproduce quickly in large numbers.

The mammals using forested habitats include eastern chipmunk, eastern gray squirrel, red squirrel, meadow vole, coyote, and white-tailed deer. White-tailed deer were also observed in the upland scrub-shrub habitat. These areas will be impacted by service roads and ECS. The mammals in these habitats can readily survive temporary construction disturbances in these areas. The species will return to disturbed areas, since there will be minimal human activity once construction has been completed. During both construction

and operational phases of the project, traffic on the roadways will be low and direct mortality to wildlife from vehicles will be minimal.

Because a limited amount of wetland will be temporarily affected by the Project impacts to amphibians, reptiles and small mammals during wetland crossings will be minimal.

Permanent Impacts to Fauna

Permanent impacts to fauna will occur in areas where habitat cover types are either replaced by permanent structures such as buildings, service roads and paving and where habitats are changed from one cover type to another as a result of clearing and subsequent maintenance of low vegetation. Structures such as roadways and areas maintained by clearing can also result in habitat fragmentation. A total of 161.88 acres of habitat (8.2% of the island) will be permanently lost due to structures. Habitat cover types lost include 63.95 acres of open field habitat, 75.98 acres of deciduous upland forests, 13.96 acres of agricultural habitat and 7.99 acres of various other habitat cover types. Approximately 20.26 acres of deciduous and mixed upland forest affected by clearing for overhead ECS will actually be maintained as a successional community of field and low stature shrubs and saplings. Overhead ECS will result in clearing of about 0.71 acres of wooded wetland. Service roads will affect 0.01 acres of wooded wetland. This is a small reduction in the amount and quality of habitat for use by reptiles and amphibians.

Along with the direct loss of vegetation in these habitats, there will also be a loss of wildlife food, cover, nesting, resting and rearing areas.

The project has been designed to avoid or minimize fragmentation of wetland habitats by either by having roads and ECS crossing at narrow points of these wetlands or routing them around the perimeter of the wetlands. Figures 2.5-2 show the various roads and ECS in relationship to the habitat types. Fragmentation of wetland habitats has been minimized as much as practicable. However, the overhead ECS and roadways will fragment mostly open field habitats and upland deciduous forests and though this has been minimized as much as practicable it can not be entirely avoided. Roadways will be at or near existing ground level will not affect movement of wildlife typically inhabiting the forested and open field areas. Maintenance of low level vegetation in areas that are

cleared through forests for overhead transmission lines will also not impede movement or migration of animals. These cleared areas may be used as corridors by coyote and small mammals. Some additional edge (ecotones) will be provided by the cleared zones. Effects of fragmentation are anticipated to be minimal.

Current plans call for culling of the deer population to a population sustainable for the island as there are no plans to continue deer management during project operations. The existing herd is maintained for private hunting and is not a recreational resource open to the general public. Thus, culling the herd and ceasing deer management will not adversely affect recreation. Wildlife may become habituated to the presence of the WTG and human activity within several years of construction. However, the degree to which this would occur is currently unknown. Although there will be reduction and changes in habitat types, the wildlife species present on the site are relatively tolerant of human activities and are species common in the region. Overall, no significant losses of wildlife are anticipated.

Mitigation

WTG have been sited to avoid impacts to the freshwater wetland areas to the extent practicable. Habitats in which the three large temporary staging and laydown areas will be located, will be restored once they are not longer needed for the Project. Only the staging area at the offloading slip will remain for Project operation.

Areas that are temporarily disturbed in freshwater wetland areas will be restored to preconstruction contours and condition and will be planted with a mixture of herbaceous plants that are classified as facultative to facultative wet.

As stated in the Invasive Species Control Plan (Appendix M) various precautions will be taken during construction to avoid spreading any invasive plant species on the island including pale swallow-wort.

No sensitive mammal, reptile or amphibian species have been observed on the island that would require special timing requirements for construction activities. Additionally, protected open water areas that provide habitat for amphibians and reptiles will not be

affected by the Project. A Conceptual SWPPP (Appendix D) to ensure that open water and wetland habitats are protected from sediment laden runoff waters.

Soils disturbed during the installation of the ECS will be restored to original contours and seeded following construction. Native plant species will be used in any replanting that is necessary to restore temporarily disturbed areas. The substation is located in a mixed upland forested area and affects 1.37 acres. There is nothing unique or unusual about this location in terms of flora and fauna that warrant relocation of the substation to an alternative site.

Current plans for maintenance of service roads, ECS and WTG involve use of mechanical means to control vegetation. There are no current plans to use pesticides or herbicides, other than for invasive species control (See Appendix M).

2.5.2 Rare, Threatened and Endangered Species

Characterization

Federal Threatened and Endangered Species

The USFWS in a letter dated January 10, 2008 advised of the presence of critical habitat for the federally endangered piping plover, in the region, along the eastern shore of Lake Ontario. They also advised that the federally endangered Indiana bat and threatened bog turtle are known to occur in the regional area. Although no longer listed as threatened, the Bald Eagle is also known to be within the region and is still given protection under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The USFWS stated that the closest Bald Eagle nest is located about 16 miles from the Project.

A review of federally listed plant species shows no federally listed threatened or endangered plant species in Jefferson County, New York.

Avian surveys conducted by Old Bird, Inc. on the Island and the ecological resources survey performed by TES, Inc. did not result in identification of any Piping Plover on Galloo Island. There is no designated critical habitat for piping plover on Galloo Island. No federally listed threatened or endangered birds were documented in a breeding bird

survey or winter bird survey conducted by Old Bird, Inc. in spring/summer 2008 and winter 2007-2008, respectively.

Bald Eagles were observed by TES, Inc. flying over the cliff area on August 12th 2008 and in the area of North Pond on September 3, 2008. This species was also observed by Old Bird, Inc. during the breeding bird survey in 2008, consisting of a few non-breeding Bald Eagles. Bald Eagles were observed during the winter bird survey (2007-2008) conducted by Old Bird, Inc. Most Bald Eagle activity was observed out over the water but on February 14, 2008 five were seen roosting in the island's interior. They frequently roosted on piles of ice that formed on the shoal near the northeastern end of the island. A Golden Eagle (subadult) was also observed over the center of the island on March 10, 2008. The timing of the observation suggests the bird was likely a migrant but there is a report that one may have overwintered in the region this winter (2008). (Old Bird, Inc., 2008)

Black-billed Cuckoo, Bobolink, and Canada Warbler are identified on the USFWS's 2002 Birds of Conservation Concern list for the Lower Great Lakes/St. Lawrence Plain region that includes Galloo Island. Of these birds, only a single individual or a pair of birds was identified on Galloo Island by Old Bird, Inc except for Bobolink. There were about six to ten pairs of Bobolink nesting in the northern grassland part of the island that is cultivated for hay. None of these species are federally listed as threatened or endangered. The only avian federally listed in the northern New York State is the Piping Plover. This species feeds on exposed wet sand in wash zones and mud or sand flats and ephemeral ponds and breed on sparsely vegetated sand beaches. Most of Galloo Island consists of rocky shores and cliffs and provides little, if any suitable habitat for piping plover.

Indiana bat hibernacula (winter homes) are found in New York State in Albany, Essex, Jefferson, Onondaga, Ulster and Warren Counties. There are no hibernacula on Galloo Island but hibernacula exist in Dexter and Watertown, New York. Galloo Island is within the range of migrating bats that use hibernacula in Jefferson County. In the spring, Indiana bats disperse from the winter homes, some going hundreds of miles. Summer

habitat is often, but not always, along the banks of streams or lakes in forested habitat under loose bark of trees. The USFWS typically considers almost any wooded area to be potentially suitable habitat since this bat has been found roosting in over 30 different tree species. Although it is possible for Indiana bat to use the site for summer roosting because of potential roost trees with loose or exfoliating bark, bat studies conducted on Galloo Island by North East Ecological Services in 2008 did not result in observations of this species. The study included acoustic monitoring using Anabat II detectors and mist netting on the island. No Indiana bats were caught during the mist netting. Bat studies conducted on the island may be found in Appendix O.

State Threatened, Endangered and Species of Concern

State listed species identified during avian surveys conducted on the island by Old Bird, Inc. (Appendix P) include three species listed as threatened (Northern Harrier, Upland Sandpiper, and Bald Eagle) and five species listed as special concern (Common Loon, American Bittern, Cooper's Hawk, Common Nighthawk and Whip-poor-will). All New York State listed species were documented as only a single individual or a pair of birds with the exception of 3 individual Northern Harriers.

The Common Loon, Northern Harrier, Bald Eagle and Whip-poor-will were not breeding on the island but were migrants passing through or non-breeding visitors. Locations on the island where breeding birds were found are identified in the 2008 Galloo Island Breeding Bird Survey.

The NYNHP has identified eight listed avian species within a ten mile radius of Galloo Island. In addition to those discussed above, the list includes the Black Tern, Short-eared Owl, Pied-billed Grebe, Common Tern, Caspian tern and Cattle Egret. Short-eared Owl and Caspian Tern were observed on the island by TES, Inc. TES also recorded the following additional state-listed bird species on the site: Peregrine Falcon (endangered), Sharp-shinned Hawk (special concern), Red-headed Woodpecker (special concern) and Cerulean Warbler (special concern). Old Bird, Inc also observed Caspian Tern flying over the island during many point count surveys. The 2007-2008 winter bird survey

conducted by Old Bird, Inc did not result in observations of any peregrine falcons, sharp-shinned hawk or short-eared owls.

The NYNHP stated in a letter dated December 7, 2007 that one listed plant species and two significant communities could be in the vicinity of the Galloo Island site. The listed plant species is the Autumnal Water-starwort. This plant is listed as an endangered aquatic plant species by the State. Although appropriate habitat for this species could exist at North Pond, Gill Harbor and the large wetlands on each end of the island, no work is proposed in these areas. This is a loosely rooted submergent plant and is found in muddy or sandy substrates and in quiet areas. The offshore littoral zone along the south shoreline of the island is where work will be performed and this area does not contain suitable habitat for submerged aquatic plants due to the lack of sediment, high wave energy and ice scouring. (See Marine Sediment Section 2.4.2).

TES, Inc. observed two state threatened plant species on the island, rock cress and troublesome sedge. Rock cress was found in the cliff areas of the island. Troublesome sedge was prolific and was found in wetlands and upland cover types including fields, agricultural land, rocky shoreline, wet meadow and deciduous forested wetlands. Small skullcap, a species on the NYNHP Watch List, was found within an open field on the island. Although suitable habitat was evidenced for the Autumnal Water-starwort in the north pond and Gill Harbor, this aquatic plant was not identified (See also Section 2.5.6, Fish and Aquatic Species).

During the ecological survey performed by TES, Inc. at the site, no threatened or endangered amphibian or reptile species were observed. Although there are no data listed for the Galloo Island quadrangle, Blanding's turtles (state-threatened) are known from two adjacent quadrangles (Herpetological Atlas 1990-1998). Therefore, turtle trapping was performed, in part, to determine if the state threatened Blanding's turtle exists on the Island. A total of 16 turtle traps were set in four areas on Galloo Island where turtles were likely to be found. Sampling occurred from July 21 to 24 of 2008. No Blanding's turtles were found on the site (See Appendix N). Also, no suitable nesting habitat for the state threatened Blanding's turtle was found on the island.

The federally listed Indiana bat is also a state listed endangered species. As indicated previously, no Indiana bat were observed or captured on the island. The eastern small footed myotis, a state listed species of special concern, is known to exist within forty miles of Galloo Island but was not observed during the bat surveys performed for the Project.

Based on the presence of certain New York listed species, there is the potential for NYSDEC jurisdiction pursuant to Article 11, Section 11-0535 of the ECL as a result of a "take" of one or more endangered of threatened wildlife species, or their habitat as defined in the ECL. Pursuant to Article 11, "take" of a fish or wildlife species listed as endangered or threatened is prohibited without a permit from NYSDEC. At this time, it is the Project Sponsor's position that the construction and operation of the Project will not result in the "take" of a New York listed species but will continue to consider the jurisdiction of the NYSDEC under Article 11 in future planning, review and permitting efforts.

Impacts

Two sources of impact to rare, threatened and endangered species include habitat disturbances and losses due to construction of structures and roads and collision fatalities.

Minor impacts may occur for species that utilize agricultural and open fields such as the Northern Narrier (state-threatened), the Upland Sandpiper (state-threatened) and Short-eared Owl (state endangered). Approximately 111.6 acres or 14.3 percent of the open field and 13.7 acres or 8.4 percent of the agricultural habitat will be affected. Northern Harriers were observed hunting in grassland areas of the island but no evidence of nesting on the island was found and no juvenile birds were observed. There is a potential for nesting by northern harriers. Northern Harrier is a ground nester and uses both wetland and upland areas with good ground cover. One potentially nesting pair of Northern Harriers could potentially be affected by the Project depending on whether or not they succumb to turbine collision. On the other hand, the Project could benefit the Northern Harriers by opening up more grassland habitat for foraging.

The Short-eared Owl is known to roost, forage and nest in open areas. No short-eared owls were found nesting on the island and the owl observed by TES, Inc. in the scrub-shrub upland habitat was likely a low frequency transient. See 2008 Breeding Bird Study of Big Galloo Island (Evans, 2008b) in Appendix P of this DEIS. During winter raptor surveys (2007-2008), no Short-eared Owls were observed during the diurnal perimeter surveys or during dusk surveys of the island grasslands.

A single pair of Upland Sandpiper (state-threatened) was observed at the south western end of the island which is mostly open field with a few small areas of wet meadow. No young birds were observed. However, the one nesting pair could potentially be affected by the Project depending on the potential loss due to WTG collision. This species typically breeds in grasslands. The Project may actually benefit this species by opening up more grassland habitat. For additional information refer to the 2008 Breeding Bird Study of Big Galloo Island (Evans, 2008b) in Appendix P of this DEIS.

Two state listed species of special concern, the American Bittern and Cooper's Hawk may each have one nesting pair on the island. One adult male Cooper's Hawk was observed by Old Bird, Inc. during the breeding bird survey, hunting on the island. A single hawk was also seen during the winter raptor survey. This species breeds in deciduous, mixed and coniferous forests and feeds on medium sized birds and mammals. The species can begin breeding as early as March. Minor impacts could occur since about 75.2 acres of deciduous forested habitat and 3.8 acres of mixed forested habitat will be disturbed by the Project. Some degree of clearing can be tolerated by the Cooper's Hawk.

American bittern were observed by TES, Inc. in emergent and scrub-shrub wetland cover types. Although not detected in the breeding bird survey point counts, an individual bird was heard from the south end of North Pond and an individual was flushed from a small wetland at the north eastern part of the island. No impact on American Bittern is expected.

One other NYS threatened species, the Bald Eagle, and three other special concern species (Common Loon, Common Nighthawk and Whip-poor-will) were noted on the

island but there is no evidence of nesting. These species were likely either late migrants or non-breeding visitors.

As previously quantified, the amount of open field, wetland, and forested habitat affected by the Project is low and while some displacement of these listed threatened and endangered species may occur, the overall biological impact, including cumulative impact, of a small habitat loss is expected to be low.

Collision risks and fatalities of avian species, including those mentioned above, are addressed in the avian section (2.5.3) of this DEIS. A risk assessment prepared by Old Bird, Inc is attached as Appendix P.

The Project includes disturbances to vegetation cover types in which the state listed threatened species, the troublesome sedge, may be found. The species was prolific and found in many different cover types including wetlands and upland areas. Some individual plants could be lost during construction grading and clearing. Due to the prolific nature of this species on the island, the troublesome sedge population will not be substantially affected by the work. The acreage of the habitat types in which troublesome sedge was seen and the acreage of impact are below. Only 7% of the habitats in which the troublesome sedge is found will be impacted by the project.

Table 2.5-2: Habitats Known to Have Troublesome Sedge

Habitat type	Total Acreage on Island	Impacted Acres	% Impacted
Open Field	782	63.95	8.2
Agricultural Land	163	13.96	8.6
Rocky Shoreline	20.4	0.16	0.8
Wet Meadow	44.9	0.00	0.0
Deciduous Forest Wetland	112.7	0.71	0.6
Total	**1123**	**126.1**	**7%**

The state threatened species, rock cress is not likely to be affected by the Project since it is located primarily on the cliff areas of the north side of the island along the shoreline. No work is proposed at this area. Additionally, no work is proposed for areas that contain suitable habitat for the Autumnal Water-starwort. Significant losses of state threatened plants are not expected as a result of the project.

Mitigation

There is potential for minor impact on troublesome sedge but no substantial impact to any other rare, threatened and endangered species. Therefore, no mitigation is required. However, mitigation regarding potential impacts to avian populations is discussed in Section 2.5.3 below.

Since troublesome sedge was quite prolific and found in various habitats throughout the island, the loss of some plants at a particular worksite would not adversely affect population levels on the island and moving some plants to another on-island location would serve no useful purpose. As previous indicated the Project affects low percentages of the habitats being used by troublesome sedge.

2.5.3 Avian Species

To assess the existing status on the island and to determine potential impact various site specific studies discussed below were designed to assess the avian concerns related to the Project. Information on regionally important bird areas used for overwintering and migratory corridors was also reviewed and is discussed below.

Characterization

Information on avian species that frequent, visit or inhabit Galloo Island as breeding birds was obtained from the New York State Breeding Bird Atlas (1980-1985 and 2000-2005), the Lake Ontario Islands WMA Plan, and site specific field surveys conducted on the island by Old Bird, Inc and TES, Inc. Other sources of information including consultations may be found in the reference sections of the TES, Inc and Old Bird, Inc reports. There are several important habitat areas within a 25-30 mile radius of Galloo Island including the Audubon Derby Hill Observatory, the Eastern Lake Ontario Marshes Bird Conservation Area (BCA), Point Peninsula BCA, and the Lake Ontario Islands Wildlife Management Area (WMA) that includes Little Galloo Island, designated an Important Bird Area by the Audubon Society.

Galloo Island is also within six miles to the region designated by the USFWS as the St. Lawrence Valley Wetland and Grassland Management District. USFWS states that the

St. Lawrence Valley is the most important area for waterfowl production in the northeastern United States. It has the highest breeding density for mallards in the entire Atlantic Flyway. (USFWS, 2000)

The important regional areas previously mentioned provide a complex of wetlands (marshes and swamps), sand dunes and barrier beaches, embayments, cold water streams, islands and open fields (active and abandoned farmland) that provide breeding and overwintering habitats and serve as a critical migratory corridor for avian species. These areas provide critical wintering areas for arctic breeding raptors including Short-eared Owl (state-endangered), Rough-legged Hawk, Snowy Owl, Northern Shrike and Northern Harrier (state-threatened). These important regional areas also provide habitat for other listed species including Black Tern (state-endangered), Pied-billed Grebe (state-threatened), American Bittern (state-special concern), Least Bittern (state-threatened) and Piping Plover (state and federal-endangered) and Bald (state-threatened, federally protected) and Golden Eagles (state-endangered, federally protected).

Audubon's Derby Hill Observatory is located on the southeastern corner of Lake Ontario near Mexico Bay just east of the Town of Texas. It is one of premier hawk watch areas in the Northeast. On average, over 40,000 raptors are counted each spring as they migrate north, making this one of the best spring sites in the country. In spring 2007, 25,107 raptors were counted and this is the second lowest count in 29 years. The five most numerous species in Spring 2007 from highest to lowest were Broad-winged Hawk (8,349), Turkey Vulture (8,291), Red-tailed Hawk (3,366), Sharp-shinned Hawk (2,413), and Northern Harrier (590). As spring migrating raptors from Ohio move north-eastward they are joined by hawks coming up through Pennsylvania and Western New York and pass around Lake Ontario easterly to the eastern end of the Lake and Derby Hill. They then pass around the eastern end of the lake heading directly north. Some trends demonstrated over the recent years at Derby Hill are: indications of Turkey Vultures expanding their range northward; a fairly stable count of Northern Harrier over the past ten years; indications that Sharp-shinned Hawk are wintering further north than they did in past years; a very gradual decrease of Red-shouldered Hawk over the years, dependences of Broad-winged Hawks on favorable winds in the second part of April; an

increase over the years (except for the last three years) of Golden Eagles; and indications of a healthy comeback of the Peregrine Falcon.

Although hawks, eagles and vultures are the main attraction at Derby Hill, there are also impressive numbers of Snow Geese, Red-winged Blackbirds, Common Grackles, Blue Jays and Baltimore Orioles. The area has high numbers of warblers, tanagers, and thrashers. In March, small flocks of Horned Larks are almost a daily occurrence.

Point Peninsula provides shrub and forest areas important as habitat for a wide diversity of avians. This site may be one the most critical wintering areas in the northeast for Short-eared Owl, Rough-legged Hawk, Snowy Owl, Northern Shrike, and Northern Harrier. It also provides critical grassland habitat for a diverse assemblage of breeding, migrating and wintering bird populations. The marsh and western shoreline provide habitat for a breeding population of Black Terns.

Little Galloo Island, which is part of the Lake Ontario Islands WMA is listed as an Important Bird Area by the National Audubon Society and a Significant Habitat by New York State. Substantial populations of breeding and migrating waterfowl along with shore birds are supported by the regional habitats. Little Galloo Island is a spectacular colonial water bird rookery with the largest Ring-billed Gull colony in North America and one of two (and the largest) Caspian Tern rookery in New York State. Double-crested Cormorant, Herring Gull, Great Black-backed gull and Black-crowned Night Heron also nest on the island. Black-crowned Night Heron has nested in the past on Little Galloo but did not do so in 2008. There was one Great Black-backed nest this year.

TES, Inc. as part of the ecological resources report for Galloo Island, conducted field surveys that included recording bird species observed on the island from 2007 to 2008. Old Bird, Inc. conducted a winter bird survey (2007-2008) and a breeding bird survey (2008), a diurnal movement study (2008) and an acoustic study (2008). Spring and fall 2008 radar surveys were conducted on the island by Stantec Consulting.

Avian Species Observed During Ecological Resource Survey

Field surveys were conducted by TES, Inc. during various periods of time from November 2007 to September 2008. During this survey a total of 116 species of birds were observed in various habitat types. Most of the species were common and widespread throughout New York State, except for nine species. The report is found in Appendix N of this DEIS and lists the bird species observed by habitat type. The nine species that are not common or widespread include the Peregrine Falcon, Short-eared Owl, Bald Eagle, Northern Harrier, American Bittern, Sharp-shinned Hawk, Red-headed Woodpecker, and Cerulean Warbler (refer to the previous section 2.5.2 that discusses threatened and endangered species).

Bird species observed in the upland forested areas included Wild Turkey, Northern Flicker, Wood Thrush, Gray Catbird, Cedar Waxwing, Black-and-white Warbler, Rose-breasted Grosbeak and American Goldfinch. Avians in the mixed forest wetland areas were Great Horned Owl, Downy Woodpecker, Eastern Wood-pewee, Blue Jay and House Wren. Most of the northern portion of the island contained these habitat types and avian species.

A large part of the southern side of the island is open field and species frequently observed were comprised of Killdeer, Eastern Kingbird, Barn Swallow, House Wren, Field Sparrow, and Red-winged Blackbird.

Red-tailed Hawk, Downy Woodpecker, Blue Jay, Black-capped Chickadee, and American Robin were observed in various habitats on the island. At the eastern edge of the island shorebirds were observed in September of 2008. Some of these species included the Semipalmated Plover, Spotted Sandpiper, Semipalmated Sandpiper, and Least Sandpiper.

2007-2008 Winter Bird Survey

This was a baseline winter avian survey, primarily for raptors, conducted by Old Bird Inc., from November 28, 2007 through March 10, 2008. (Old Bird, Inc., 2008a) Diurnal and crepuscular visual surveys were attempted every 10-14 days. The winter bird survey is attached as Appendix P. The survey was designed to document the number of raptors,

the region of the island where they occurred and information as to whether the birds were perched or in flight, and the direction of flight. Waterfowl and some land birds were also noted during the winter survey. Other available regional surveys were also reviewed by Old Bird, Inc and where appropriate are discussed in the winter survey report.

Most raptors observed during the survey were perched in trees along the perimeter route. Small numbers of Rough-legged Hawks were regularly noted flying down the grassland corridor at the eastern end of the island at heights less than 50 meters above ground level (agl). They regularly flew across the broader grasslands at the northern and southern ends of the island also at altitudes less than 50 meters agl. They were not observed in transit across the wooded interior of the island.

The numbers of Red-tailed Hawks were lower than Rough-legged Hawks but demonstrated a similar distribution and behavior. However, an exception occurred on December 10, 2007 when the more forested western side of island had ten Red-tailed Hawks and only one Rough-legged Hawk. In other surveys the Rough-legged Hawks were the most abundant species on the western end of the island. Rough-legged and Red-tailed Hawks peaked in number during the December 20, 2007 observations and the numbers of both declined proportionately by January 16, 2008. Numbers of Rough-legged Hawks in late winter and early spring 2008 on both Galloo and Wolfe Islands, suggest a spring migration dynamic contributing to higher numbers on Wolfe Island but not Galloo.

A peak of 12 Bald Eagles was noted on February 14, 2008. They frequently roosted on piles of ice on the shoal near the northeastern end of the island. On February 14th, five Bald Eagles were seen roosting in the island's interior in trees along the edges of the forested part of the island. Bald Eagles were occasionally seen soaring over the island while most transit was observed over the water parallel to the eastern side of the island. A single Golden Eagle, likely a migrant based on timing of the observation, was observed on March 10, 2008.

No American Kestrels were seen during the winter survey and the only bird of the genus *Accipiter* (bird hawks, true hawks) spotted was a single Cooper's Hawk. One adult male

Northern Harrier was observed in March 10, 2008 and one Snowy Owl on December 20, 2007. No Short-eared Owls (state-endangered) were observed. Northern Shrike and Northern Raven were seen in small numbers during the survey.

Large numbers of wintering waterfowl were documented in the waters surrounding Galloo Island but very little transit of waterfowl species was observed crossing the island. Mallards and American Black Ducks dominated at the end of 2007 along with substantial numbers of Bufflehead late November and fewer Bufflehead in late December. In early 2008 (February-March) Common Goldeneye, Long-tailed Duck and Greater Scaup were dominant. Landbirds were scarce on Galloo Island during the 2007-2008 survey. Species observed are listed in the winter bird survey report (Appendix P).

2008 Breeding Bird Survey

An extensive breeding bird survey of Galloo Island was conducted by Old Bird, Inc in the spring and summer of 2008 during various times from late May to late August. The report is contained in Appendix P. The study protocol involved point counts following United States Geological Survey Breeding Bird Survey (BBS) guidelines. However, ten minute, instead of 3-minute survey periods were used. The study included point counts at 84 WTG sites and 8 sites not proposed for WTG siting. Point counts were conducted during the first five hours after sunrise. All birds identified by sight or sounds at each survey point were recorded. In addition to point counts, , eight additional bird survey visits to the island were made during the breeding season – June 5-6, June 12-13, June 18-19, July 1-2, July 17-18, July 25, August 5-6, and August 21-22. These visits included general bird observations, habitat-targeted surveys, crepuscular surveys for nightjars & owls (evenings of June 5, July 17), and targeted searches in the grassland areas for juvenile Northern Harriers, juvenile Upland Sandpipers, Sedge Wrens, and Henslow's Sparrows.

In two primary surveys (May 28-June 1; June 25-27), 123 species of birds were documented by point counts, transects, and incidental observations. Eighty of these species were documented to be breeders or were exhibiting behavior that indicated an intention to breed on the island. Thirty-one of these eighty species were represented by

no more than two breeding pairs or two territorial males. The other documented species were late spring migrants or apparently non-breeding visitors to the island.

The breeding bird population on Galloo Island is dominated by common species such as American Robin, Eurasian Starling, Yellow Warbler and House Wren. The Galloo Island avian community is similar to the species composition on the mainland although relative abundance of the species varies from that on the mainland. Federal and state threatened and endangered avian species and state special concern or rare species found on Galloo Island were addressed in Section 2.5.2 of this DEIS.

The top ten species by number of point counts where they were detected (from highest to lowest) were American Robin, Eurasian Starling, Yellow Warbler, House Wren, Song Sparrow, Baltimore Oriole, Eastern Kingbird, Brown-headed Cowbird, Red-winged Blackbird and Common Grackle. Generally, points where the most species were documented were along the central part of the northwestern side of the island and near the southern boundary of the northern grassland area.

The fact that 31 of the 80 suspected breeding species were only found in small numbers suggests that the base population of breeding birds on Galloo Island is only 49 species with about 31 additional species that may or may not have an annual breeding presence on the island. (Old Bird, Inc., 2008b)

The difference in relative abundance of avian species on the island as opposed to the mainland is likely due to the greater amount of mainland agricultural acreage. The island habitat favors species that prefer mixed grassland and woodland such as the Yellow Warbler, Eastern Kingbird, Baltimore Oriole and House Wren.

Spring 2008 Radar Survey

A spring radar survey was conducted on the island by Stantec Consulting from April 15 to June 2, 2008. Marine surveillance radar was used in the survey, sampling from sunset to sunrise on 42 of 45 targeted nights. The radar was positioned near the center portion of Galloo Island at an elevation approximately 88 meters. The radar efforts were supplemented by ceilometer/night vision visual surveys. The range of detection for the

ceilometer survey method used was approximately 150 meters. The survey goal was to provide information on nocturnal avian and bat activity at Galloo Island during the spring migration period. The report is found in Appendix P of this DEIS.

The overall mean passage rate for the entire survey period was 624 (plus or minus 55) targets per kilometer per hour (t/km/hr). Nightly rates varied from 74 to 1630 t/km/hr. The mean flight direction was 51 degrees (northeasterly). During the entire season, passage rates peaked during the fourth to sixth hour after sunset and gradually declined for the remainder of the night. Passage rate variances suggest that migration occurred in pulses most likely due to changing weather conditions from night to night.

The seasonal average mean flight height of all targets was 319 meters (plus or minus 6m) above the radar site. The average nightly flight height ranged from 152 meters to 490 meters. About 19 percent of the targets flew below 125 meters (the maximum turbine height) and varied by night from 4 to 48 percent. The percentage of targets flying below turbine height is very similar to most studies conducted at inland sites during spring mitigation periods. Overall, the distribution of targets in the vertical airspace was above the proposed turbine height.

Ceilometer/night vision data over the entire 42 nights resulted in 695 bird observations and 178 bat observations. About 554 birds and 146 bats were observed at the radar location and 141 birds and 32 bats at the shoreline location.

The results of the spring radar surveys fall within the range of other surveys conducted in the Northeast that used the same methods, data analysis procedures and equipment. Seasonal mean flight altitudes along with nightly mean altitudes suggest that a small portion of night migrants are flying as low as the height of the proposed WTG during spring migration. Since on all nights the targets were evenly distributed around the radar (within its range) it is likely that there is a broad front migration pattern rather than channeling to any part of the island.

Fall 2008 Radar Survey

Stantec Consulting conducted nocturnal radar surveys of bird and bat flight activity in the fall of 2008. Sampling occurred from August 8 to October 7, 2008 from sunset to sunrise over 60 targeted nights for a total of 674 hours. The radar site was the same as the one used for the spring survey. Ceilometer/night vision surveys supplemented the radar data. The survey goal was to provide nocturnal bird and bat activity during fall migration. This was the second radar survey performed on the island. The report may be found in Appendix P of this DEIS.

The overall mean passage rate for the fall survey period was 281 (plus or minus 10) t/km/hr. Nightly passage rates varied from 64 (plus or minus 14) to 835 (plus or minus 54) t/km/hr. Mean flight direction for the season through the Project area was 207 degrees (southwesterly). Flight direction during fall was much more variable than the spring. Passage rates peaked during the third to sixth hours after sunset and gradually declined for the rest of the night. Peak nightly passage rate was observed on September 10, 2008. As with the spring survey, results show that fall migration occurred in pulses likely due to weather conditions. The season mean passage rates was less than half of that observed in the spring survey.

The seasonal average mean flight height of all targets was 298 meters above the radar site. Average nightly flight height ranged from 207 (September 5th) to 465 meters (October 6, 2008). The season mean percent of targets below the WTG height was 17 percent. This varied by night from 7 to 32 percent. Hourly, nightly, and seasonal mean flight heights showed trends similar to other inland studies with varying topography.

Ceilometer/night vision data during the 60 targeted nights resulted in 337 bird observations and 18 bat observations. About 128 birds and 7 bats were observed at the radar location and 209 birds and 11 bats at the shoreline location.

The results of the fall surveys fall within the range of other surveys conducted in the Northeast that used the same methods, data analysis procedures and equipment. Seasonal mean flight altitudes along with nightly mean altitudes suggest that a small portion of night migrants are flying as low as the height of the proposed WTG during fall migration.

The fall study, similar to the spring study, indicates a broad front migration rather than channeling to any particular part of the island.

2008 Diurnal Bird Movement Study

The study consisted of forty-three diurnal bird movement surveys on the island carried out from March through mid-November of 2008 in the morning and late in the day on a regular basis. A copy of the diurnal bird movement study may be found in Appendix P of the DEIS. Five observation sites were established along the southeastern side of Galloo Island, a five-point survey. Visual counts of flying gulls, cormorants, Caspian Terns, and other species were made during 20- or 30-minute observation periods at each site. Observations typically began in early morning (within an hour after sunrise) and late afternoon (at least an hour before sunset) at either point 1 or 5 of the five point survey and then proceeded sequentially to adjacent survey points, with a 5- to 10-minute travel time between points. On four survey days in May 2008, the survey routine shifted to document spring migrant landbird flight behavior across the whole island. The goal of the survey was to assess avian flight activity and flight characteristics over Galloo Island with emphasis on Little Galloo Island colonial waterbirds (gulls, Caspian Tern, and Double-crested Cormorant). Other goals included documenting any unique flight characteristics that could be caused by the island geography of the Project site and to document any flight activity of waterbirds between the large pond/wetland (Wetland F) at the north end of the island and the island's prominent north bay called North Pond.

Little Galloo Island colonial waterbirds were found to make regular feeding flights across Galloo Island, as noted in crepuscular and daylight period flights. This began as soon as the colonial waterbirds arrived on Little Galloo Island in the spring and continued until they disperse in mid- to late summer. Mean passage rates across Galloo Island were: 265.6 birds/km/hr for Ring-billed Gull from late March through July; 21.1 birds/km/hr for Double-crested Cormorant from March through September; and, 16.8 birds/km/hr for Caspian Tern from late April to mid-August. Mean passage rates of Ring-billed Gull peaked between 300-600 birds/km/hr from June through early July and nearly ceased by early August. Gulls tended to fly lower into head winds and at higher altitudes with tail winds. The overall height distribution of typical daily flights of Ring-billed gulls was 63

percent below the rotor sweep zone (RSZ), 5 percent above the RSZ and 31 percent within the RSZ (35-125m agl).

During June and early July mean passage rates for Double-crested Cormorants peaked on several five-point surveys at over 50 birds/km/hr. The passage rates dropped after mid-July. From April through mid-August, 95 percent of the flight activity was below 35 m agl, 2 percent was within the RSZ and 3 percent was above the RSZ.

The Caspian Tern passage rate peaked from June through July to between 10-36 birds/km/hr. Very little Caspian Tern flight activity was observed in August and September. From April through mid-August, 65 percent of the flight activity was below 35 m agl, 30 percent was within the RSZ and 5 percent was above the RSZ. Overall, the flight passage rate of the three species was generally lower across the middle portion of the island and higher at either end. Early morning flights of Gulls, Caspian Tern and Double-crested Cormorants were predominantly birds flying away from Galloo Island while early evening flights were directed primarily toward Little Galloo Island.

On four mornings in May, small passerines were seen flying at 10-20 m agl from southwest to northeast over the island. On May 29, a higher flight of passerines, many being wood warblers, was observed at about 250m agl. Diurnal migrant landbirds such as Blue Jays, blackbirds and others were noted following the shoreline around the island. Nocturnal migrants in morning flight were observed to proceed as far as possible in their intended migration direction, either north in spring or south in fall. When they reached the end of the island, a typical reaction was to turn around and fly in the other direction down the center of the island. For instance, on four mornings in May 2008, active morning fight of night migrant species were noted on the island. On all four mornings when northbound small passerines reached the northeastern end of the island, some continued northward out over the water, some perched in the north-most grove of trees, and others circled about and flew back down the island again to the southwest. These movements of diurnal and nocturnal migrants were observed on several surveys conducted in spring and fall migration periods. The largest observation in the spring involved about 100 northbound small passerines per hour on May 29th.

Species noted in many observations include various wood warblers, Baltimore Oriole, Rose-breasted Grosbeak, and Bobolink. Substantial morning flight of nocturnal migrants occurred on two occasions in the fall. The largest was on October 6th when hundreds of Yellow-rumped Warblers were noted in low flight (less than 30 meters agl). Species commonly seen in the fall were blackbirds (primarily Red-winged and Common Grackle), Cedar Waxwing, Blue Jays, and American Goldfinches. Other diurnal migrant landbirds observed during the study in flight around the island were American Pipit, Horned Lark, Pine Siskin, and White-winged Crossbill.

No flight activity of waterfowl (ducks and geese) or waterbirds was noted between the North Pond and the northern pond/marsh designated as Wetland F. Flight activity of waterfowl over Galloo Island was noted in the winter bird and breeding bird surveys for Galloo Island (Old Bird, Inc., 2008a and 2008 b). These surveys were summarized above. The winter bird survey noted very little flight activity of waterfowl over the island but large populations residing in the waters around the island. The breeding bird survey noted regular flight activity over Galloo Island of female Common Merganser and Canada Geese, all at flight levels less than 30 meters agl.

No raptors were observed actively migrating during the spring surveys. The only raptors seen actively migrating in the fall were three Northern Harriers on October 6, 2008. These birds flew in from the north at about 300 m agl. Small numbers of various raptors were seen in April and May. All, with the exception of Rough-legged and Sharp-shinned Hawks were seen in June and July, again in small numbers. Some of these were local breeders and others migrants staging on the island. Most raptors were either perched or in low flights less than 30 m agl. The eagles, buteos (Rough-legged and Red-tailed hawks among others), accipiters and Turkey Vultures were normally seen soaring to altitudes over 200 m agl.

Shorebirds were not seen in active migration during any surveys, but many species of migrant (non-breeding) shorebirds were found feeding on Galloo Island. The only shorebird species that was found flying in the rotor sweep zone (35-125 meters agl) was the Greater Yellowlegs.

Avian Acoustical Survey Report

A single acoustic station was operated on Big Galloo Island, NY during the spring and fall migration periods of 2008. The study documented avian flight calls from the lower stratum of the atmosphere (< 700 m) for 10 hours a night beginning around sunset. 28 nights from the spring period and 20 nights from the fall period are presented in this report.

The data revealed flight calls of two cryptic species that are difficult to detect in diurnal surveys, and which were not detected in other avian surveys on Galloo Island in 2008: Common Moorhen and Least Bittern.

The vast majority of flight calls detected were from night migrating songbirds. Analysis of their flight calls indicated a typical species composition and seasonal timing as have been detected from other acoustic stations from in Upstate NY.

Over 4000 warbler and sparrow calls were logged during the 20-night fall study period. Over 5000 such calls were documented at two similar acoustic stations on the mainland (Cape Vincent Peninsula & Maple Ridge wind project) during the same period. This data is suggestive, but not conclusive, that songbird migration over Big Galloo in fall migration is of somewhat lower density than over the mainland.

The trend of night-to-night variations in flight calling detected at the acoustic station on Big Galloo was positively correlated with that documented on the Cape Vincent Peninsula but was poorly correlated to the nightly flight calling pattern at Maple Ridge.

The data from the Old Bird acoustic study suggests that there is gull activity over Big Galloo all night long during the breeding season, and that it increases substantially toward dusk and dawn. This data along with the altitude and passage rate data from the diurnal movement study (Old Bird, Inc. 2008c) indicates that gulls would make a substantial contribution to the passage rate and flight altitude of targets documented in the Stantec spring radar study.

Impacts

The main risks to avian species associated with wind farm projects are the displacement and loss of habitat from construction of project components (WTG, staging and laydown areas, service roads, buildings, and ECS) and collisions with WTG. Habitat loss includes those areas physically and permanently lost as a result of installation of structures, those areas permanently and/or temporarily modified from one habitat type to another (such as forest to successional open field), and fragmentation of forested habitats from construction of roads and maintained ECS rights-of-way. Displacement of avian species can occur from loss of a particular habitat type or be a temporary displacement caused by general construction activities and noise. These risk factors have been determined to be minimal at the Hounsfield Wind Farm proposed site. For detailed information on Project impacts to avian species related to habitat loss, displacement and WTG collisions refer to the Galloo Island Avian Risk Assessment prepared by Old Bird, Inc. (Old Bird, Inc., 2008d) that is contained in Appendix P of this DEIS.

Displacement, Habitat Loss, Fragmentation

Displacement of resident/breeding birds can occur because of the loss of habitat or due to disturbances that occur during nesting periods. Such disturbances include the presence of WTGs, buildings, access roads, ECS, staging areas, noise and human presence, general construction activity, forest fragmentation and loss or significant changes in ecotones (edge). Since the major cover types to be affected as a result of the Project are open field (63.95 acres), upland deciduous forest (75.98 acres) and agricultural land (13.96 acres), the species associated with these habitats will be the ones most affected by construction activities and placement of structures for the Project. The breeding bird survey on Galloo Island demonstrated that the relative abundance of breeding bird species on the island differs from the mainland due to less agricultural land. The island appears to have higher numbers of species preferring mixed grassland and woodland habitat.

The habitat impacts from the Project represent a loss of 8.2% of the open field habitat on the island, 12.9% of the upland deciduous forest and 8.6% of the agricultural land. The actual amount of total agricultural land that will be lost on the island and could be used as avian habitat is relatively low (13.7) acres and impacts on avian species would be

minimal. Including these three habitat types and all other habitat types affected by the Project on the island, the cumulative loss of habitat is 161.88 acres or about 8.2% of the Project area. These habitat losses for species preferring mixed grassland and woodland habitat are relatively low. In the last few decades, the invasive plant species, pale swallow-wort has radically changed the ground cover (including the understory of forested areas) on the island and in all likelihood affected the bird diversity and numbers on the island.

Disturbance and habitat losses have been found, in some cases, to make a site unsuitable or less suitable for use as nesting, resting, foraging and other avian life cycle functions. Some species also demonstrate avoidance and displacement, but subsequent habituation to wind project infrastructure has also been documented. Most of the avoidance and displacement studies involve grassland birds or those inhabiting agricultural fields. Many grassland birds have been found to inhibit or reduce the frequency of their activities (nesting, foraging) from about 250-300 to 650 feet from wind turbines. On the other hand, while wildlife may become habituated to the presence of wind turbines within a few years after construction and operation, the rate (and degree) is currently unknown because long-term studies have not been conducted. Although different species react differently to the presence of WTG, research has not been conducted to determine if particular species will habituate to WTG and how long that process may take.

Some displacement of ground nesting birds from the vicinity of the turbine sites may occur, and this could possibly reduce population sizes of several species (Old Bird, Inc., 2008d). In cases where there is just one or a few nesting pairs of birds such as the Northern Harrier and Upland Sandpiper, a worst case analysis is that these species would be extirpated from the island. On the other hand, the project could be potentially beneficial to these species by opening up more grassland area for foraging (depending on success of possible control of pale swallow-wort in opened areas). More common ground nesters like the Eastern Meadowlark could show declines in population on the island due to potential reduction of nesting habitat. This would occur if Eastern Meadowlark and Bobolinks (limited to a small population in cultivated fields at the north end of the island) are displaced from nesting within 100 meters of wind turbines. Any nesting disturbances

would be localized in nature and no substantial effects on population levels of the predominant avian species or avian diversity are anticipated.

No nesting displacements of Little Galloo Island colonial waterbirds are anticipated due to construction of the Project. However, it is not clear whether these waterbirds would continue to make feeding flights over Galloo Island once the Project is in place. Large numbers of waterfowl were documented in close proximity to the Galloo Island shoreline but little waterfowl flight over the island was noted. On Galloo Island, some feeding activity of Canada Geese was observed in open grasslands and at the hayfields at the northern end. However, the large numbers of Mallards, Black Ducks (and to a lesser extent Gadwall) that congregated offshore at Galloo Island in early winter were not feeding on the island and were not making flights over the island. Flight activity of most of the waterfowl that feed on aquatic organisms was generally found to occur along the near-shore waters. Habitat related impacts to waterfowl will be low.

With the exception of the Bald Eagle, winter raptor densities appear to be tied to the vole cycle on the island. The grounds on the island tend to be open (free of significant snow cover) for a longer period in the winter. Thus, when voles are present in good numbers, the island likely attracts and holds winter raptors more so than coastal and inland sites. Data indicate that spring migration of raptors (notably Rough-legged Hawks) occurs across the eastern Lake Ontario coastal plains and largely avoids Galloo Island. Fall raptor migration activity at Galloo Island is generally believed to be lower than along the primary eastern coastal zone of the lake (Old Bird, Inc., 2008d). Based on the breeding bird survey and risk assessment conducted on Galloo Island, Northern Harrier could potentially be displaced from breeding on the island. (Old Bird, Inc., 2008b, 2008d) Three other breeding or potentially breeding raptors on the island that could be affected and displaced from WTG areas include the America Kestrel, Cooper's Hawk and Red-tailed Hawk.

Forested areas (upland and wetland) are scattered throughout the island, with a dense covering in the central and northern parts of the island. The Project has been designed to avoid these largest blocks of forested areas to the extent practicable. Based on

information gathered during the breeding bird survey on the island, habitat changes caused by the construction and operation of the Project would not be expected to significantly impact the population of common woodland species in the post-construction forest areas. Deep forest areas do not exist on the site and thus it is not anticipated that forests will be significantly fragmented by the Project.

Collision

An avian risk assessment for the Project was prepared by Old Bird, Inc. (Old Bird, Inc., 2008d) and may be found in Appendix P of this DEIS. The avian impact of a wind energy project is generally defined as the realm of changes that occur to the pre-construction avian resource during and after construction of a wind farm project. The current understanding of potential avian impacts from modern wind farm projects, with WTG greater than 1.0 MW, is based on fatality studies at existing operating facilities and studies on the geographic distribution and behavior of certain species before and after such facilities are built. In order to assess the potential avian impact from the Project, this latter information (primarily regional studies) has been considered along with recent extensive field documentation of the existing bird resource on Galloo Island.

Currently, there are only a few credible avian mortality studies at wind energy facilities in the eastern part of North America, and therefore it is difficult to assess potential collision impacts from the Project. Each wind energy site typically has unique avian dynamics. This is especially true at Galloo Island because of the island geography. The primary basis for assessing avian risk from the Project is through comparison of the site specific bird study data at Galloo Island with that of other wind energy project sites, and through consideration of publicly available bird data and dynamics for the region. The avian risk assessment becomes primarily a series of relative comparisons of avian distributions and activity between proposed or existing sites. The risk assessment for the Project embodies that approach and focus on primary avian concerns at the Project.

Based on pre-construction avian studies at Galloo Island, bird studies at other regional wind farm projects and bird migration dynamics documented or theorized for the

northeastern Lake Ontario region, the following specific avian trends are likely for the Project:

- It is unclear as to whether Little Galloo Island waterbirds would continue to make feeding flights over Galloo Island or whether such flights would be diverted from passing through the Project. Substantial collision fatalities of Ring-billed Gulls might occur at the Hounsfield project if gulls continue to make foraging flights across the island once the project is built. But given that the Ring-billed 2008 population on Little Galloo was estimated by NYDEC to be over 70,000 birds, no significant effect to this colony's viability would be expected from a wind farm on Galloo Island. Based on the lower trans-island flight altitude noted for Double-crested Cormorants versus Caspian Terns (Old Bird, Inc. 2008c), one might expect that fewer cormorant than Caspian Tern fatalities would result from the proposed wind project. The Double-crested Cormorant nesting population on Little Galloo is managed by NYDEC to be around 1500 pairs.
- Waterfowl collision fatalities would likely have greater species diversity and occur in larger numbers per MW at the Project than at Maple Ridge Wind Farm, but still in small numbers because of the relatively little waterfowl activity in the RSZ over Galloo Island. Smaller numbers of waterfowl collision fatalities per MW would likely occur at the Project than at the Wolfe Island wind project. There is more waterfowl activity in the RSZ over Wolfe Island due to waterfowl foraging flights to and from agricultural fields in the interior of the island.
- Rough-legged Hawk and Bald Eagle collision risk during winter may be larger than at other proposed or existing wind projects in New York State. However it should be noted that to date no Bald Eagles have been impacted by Wind Projects and there is no study or data regarding avoidance or evasive behavior regarding this species. In general, raptor collision fatalities during migration are likely to occur in larger numbers per MW at the Maple Ridge, Cape Vincent, and Wolfe Island (especially in spring) wind farms than at the Project. Raptor collision fatalities in the breeding season would likely occur in larger numbers per MW at the Maple Ridge, Cape Vincent and Wolfe Island wind projects than at the Project. Four raptor fatalities were reported in a 2007 post operational mortality study at the 195 WTG Maple Ridge Wind Farm. Three were Red-tailed Hawks and one was a Sharp-shinned Hawk.
- Nocturnal and diurnal migrating passerines would likely have lower collision fatalities per MW at the Project than the Wolfe Island Wind Farm and other wind projects in the eastern coastal zone of Lake Ontario.
- While the Project would likely have fewer nocturnal and diurnal migrant passerines flying in the RSZ during the day than coastal and inland wind projects sites, there may be a higher collision risk per individual at the Project due to migrants repeatedly traversing the island, especially in the mornings.
- There are no grounds to expect that the Project would cause anything but very low collision mortality for the breeding birds on Galloo Island. Changes in some

breeding populations may occur. The most notable of these changes is the possibility that the Project could impact the small breeding presence of Upland Sandpipers and Northern Harriers (both NYS threatened species) on Galloo Island by introducing a new collision hazard. However, the Project may increase habitat for these species potentially leading to a benefit. The Northern Harriers are likely at less collision risk and habitat loss per MW than at the Maple Ridge or Wolfe Island wind facilities.

- The overall impact to NYS threatened and endangered avian species from the Project is likely to be on par or lower than that at Maple Ridge.
- More detailed information leading to the conclusions reached above may be found in the Avian Risk Assessment (Old Bird, Inc., 2008d) found in Appendix P.

Mitigation

Some of the measures that can reduce impacts on avian species have already been incorporated into the preliminary design of the Project. For instance, since guy wire supports to meteorological towers are a know source of high collision risk to birds, the permanent tower at the Project will be a free-standing tower without guy wires. Five temporary meteorological (guyed monopole) towers will be removed by about year 2011. Also, the WTGs and meteorological towers are designed with a single large diameter tubular tower (steel monopole), rather than lattice tower, which reduces the perching opportunities for birds. The turbines will be painted in white, off-white or a pale color to be readily visible to migrating birds.

The lighting scheme for the WTG and permanent meteorological tower will incorporate currently available technologies designed to minimize attraction to migrating birds to the extent allowed by Federal Aviation Administration standards. As indicated in the avian impact discussion above, the project has also been designed to minimize forest fragmentation to the extent practicable and this will minimize the impact on forest dwelling species. To the extent practicable, much of the ECS will be buried to reduce both habitat impacts and collision risks. Overhead lines will comply with Avian Power Line Interaction Committee Guidelines for insulation and spacing to reduce the impact on birds. Road widths and WTG pads have been kept to the minimum size necessary to reduce the loss of avian habitat.

In addition to the measures listed above to reduce impacts to avian species, the following mitigation is proposed:

- To minimize chances of disturbing breeding Upland Sandpipers, construction activities associated with wind turbines 1,2,3,4,7, & 8 should be planned after August.
- Reintroduce fox to the island and allow coyote to repopulate Galloo Island. This will help reduce the size of the vole population maxima and lead to lower winter raptor numbers. Though note that adding additional predators to the island could adversely affect the Upland Sandpiper and Harrier.
- Elimination of agricultural operations at the north end of Galloo Island to reduce or eliminate foraging areas for Canada Geese and migratory shorebirds.
- Culling the artificially high deer population on Galloo Island. This will lead to fewer dead deer and reduced flight activity of Bald Eagles in the island's interior for feeding on carcasses.
- Participation in nontoxic control programs to curtail pale swallow-wort, Canadian thistle and other introduced plant species that out compete native plant species diversity.
- Minimize permanent lighting on Galloo Island to only that necessary, especially at housing facilities, maintenance buildings and the substation. Unnecessary lighting will be turned off after evening activity hours of people residing on the island. Any required lighting should be shielded and pointed in the downward direction.

2.5.4 Bats

Characterization

In order to assess the effects of the Project on the bat population of Galloo Island, preconstruction field monitoring pursuant to a protocol approved by the New York State Department of Environmental Conservation (NYSDEC) and a bat risk assessment were conducted by North East Ecological Services (NEES). The onsite evaluation was undertaken from June 16th through June 21st of 2008 and again on November 22, 2008. A copy of the bat report is provided in Appendix O of this DEIS.

The report includes a Phase I habitat assessment, literature review of the current state of knowledge on New York State bat species (habitats, range, biology, life history, distribution, known collision risks, etc) , collision risks from wind power projects, and data collected through acoustic monitoring and mist-sampling. Data from the study is

intended to provide information about the scale of geographic, altitudinal, and temporal variation in bat activity across the island. Acoustical data were collected using Anabat ™ SD-1 ultrasonic detection systems placed at various heights on two existing meteorological towers at the site. Tower 2 (West) and Tower 3 (North) were used for bat activity monitoring because they appeared ideally located for such a study. Tower 2 is located on the west side of the island adjacent to the largest tracts of deciduous forest, including the majority of the shagbark hickory community. Tower 3 is at the northern tip of Galloo Island. It is located within an agricultural field adjacent to a tree corridor that shelters the island from coastal winds. All microphones were mounted facing north. The Low microphone (LOW) was installed at a height of 10 m, the middle microphone (MID) at 29 m and the high microphone (HIGH) at 59 meters. Details of the protocol used for the bat study may be found in the bat study report (Appendix O of the DEIS). Anabat detectors are frequency-division detectors, dividing the frequency of ultrasonic calls made by bats so that they are audible to humans. These detectors have the ability to detect a broad frequency range and are able to detect all bat species known to occur in New York State.

In addition to the Anabat surveys, NEES conducted mist-net captures of bats on Galloo Island. The net captures rely on monofilament mist nets to capture bats in flight. When placed across travel corridors or foraging areas, mist nets are a reliable method for capturing bats. Captured bats are then available for species validation, among other things. While mist-netting provides more information about bats than acoustic monitoring, the acoustic monitoring gives a more complete accounting of abundance and species diversity of the bat population. Prior to sunset each night, NEES deployed up to three ground-based acoustic monitoring systems. These systems monitored bat activity at the sampled site and were moved to new sites on consecutive nights to maximize the diversity of sampling environments. Combined, the two techniques (mist-netting and acoustic monitoring) provide a better data base than either one taken individually. Mist-netting was conducted on Galloo Island from 16 June to 21 June, 2008. Netting began in the northeastern side of the island and then to the southwestern side over the course of the survey. Most of the netting occurred in the north and central sections of the island due to the presence of appropriate habitat. Each survey area was typically at least 500m from

each other, with individual mist net locations placed at least 100m from one another. Details about the protocol may be found in the bat study report provided in Appendix O of the DEIS. See Figure 2.5-3 for the Anabat and Mist Net Sampling Locations.

Stantec Consulting, as discussed in the Avian Section (2.5.3) of this DEIS, conducted fall and spring radar studies in 2008 to provide information on nocturnal avian and bat activity during spring and fall migration periods. Passage rates and mean altitudes of targets are provided in those reports (Appendix P). As part of the studies, night vision/ceilometer observations were made. The observations made in the spring resulted in 695 birds and 178 bat observations. There were more birds and bats observed at the radar location than at the shoreline location. A total of 554 birds and 14 bats during the spring survey was observed at the shoreline area. Most of the observations were documented during the first three hours of the night. The most observations occurred at the end of May. In the fall survey, a total of 128 birds and 7 bats was observed at the radar station and 209 birds and 11 bats at the shoreline locations. Most observations occurred in August and early September during the first three hours of the night.

Nine species of bats are known to occur in New York State. Eight of the nine species have been documented in the Jefferson County region of New York State. Two of the species found in the state are either federally or state listed threatened and endangered species: Indiana bat (*Myotis sodalis*), listed as endangered federally and by the state; and, Eastern small-footed myotis (*Myotis leibii*), a state Species of Special Concern. The nine bat species that have been documented in the state are:

- *Eptesicus fuscus* (big brown bat)
- *Lasionycteris noctivagans* (silver-haired bat)
- *Lasiurus borealis* (eastern red bat)
- *Lasiurus cinereus* (hoary bat)
- *Myotis leibii* (eastern small-footed myotis)
- *Myotis lucifugus* (little brown myotis)
- *Myotis septentrionalis* (northern myotis)
- *Myotis sodalis* (Indiana bat)
- *Perimyotis subflavus* (eastern pipistrelle)

Despite sampling in habitat that is consistent with their known preferences, there was no evidence of resident populations of Indiana bat or eastern small-footed myotis on Galloo Island.

Bat Habitat on Galloo Island

A bat habitat assessment was conducted by NEES on Galloo Island on November 22, 2008 and habitat features were also noted during the mist-net survey. Habitat features were assessed for roosting and foraging activity by species of bats likely to occur on or near the Project. Detailed summaries of the biology (habitat, life history etc.) and distribution of each of the nine bat species are found in the bat report prepared for the Project (Appendix O of this DEIS).

The island has relatively flat topography to the southwest with some gently rolling hills to the northeast. Natural habitat types include old field habitat, open grassland maintained as hay fields (including some limited crop fields), second growth forest, limited wetland/marsh, rock outcrop and coastal cliff line, and coastal water edge habitats. The most contiguous forested habitats on the island are mainly concentrated in the central, western and southwestern regions of the Project. Several tree species that may be critical to bats were documented within the forest areas. These included shagbark hickory, red oak, bur oak, and eastern hemlock. Most of the shagbark hickory trees were alive and mature, and several large bur oak and red oak snags were found across the island. Most of these trees were within the deciduous forest in the center of the island.

Roosting habitat that would be appropriate for eastern small-footed myotis was documented mainly along the coastal edges of the island as exposed rock habitat. Coastal cliff areas appeared to contain suitable cracks and crevices for summer roosting by this particular species of bat. However, the cliff habitat was shaded from solar insolation (exposure to sunlight) for the early morning and early afternoon, a factor that likely decreases the suitability of these habitats for roost areas. However, horizontal rock slabs along the south, southeast, and eastern coast of the island at ground level do receive direct solar insolation for much of the day.

There are several human-related structures on the island that could serve as summer roost sites for mainly little brown myotis and big brown bats. One nursery colony of little brown myotis was found in a metal barn located on the island. No caves or mines that might serve as winter hibernacula for bats were found on the island. The island is surrounded by Lake Ontario which provides a perennial water supply for foraging habitat and drinking by bats. However, perennial waters sources on the island itself are very limited.

Acoustic Migratory Survey Results

A total of 19,397 of 194,809 files were determined to be of bat origin, or approximately 10 percent of the files. Bat echolocation recordings were separated from non-bat sounds based on differences in time-frequency representation of the data. Combining data from all microphones, bat activity was documented on 122 sampling days (June 18 to November 20, 2008) and mean daily bat activity was 30.4 calls per night at the West Tower (no. 2) and 89.6 calls at the North Tower (no 3). Species and species groups identified during the study were myotis bats, silver-haired/big brown bat group, hoary bat, eastern red bat, eastern pipistrelle and other bats. The "other bat" group was used for calls that were not of high enough quality to extract diagnostic features.

West Tower

NEES determined that 1,464 files recorded at the LOW microphone were of bat origin. A minimum of five species or species groups were detected at the LOW microphone of the West Tower. The *Myotis spp*. group and the silver-haired/big brown bat group were the dominant bats heard, comprising 54.5% and 24.5% of the calls respectively. A peak number of calls occurred during the seven-day period beginning August 16th and no activity was heard after October 13th.

A total of 1,383 files of bats origin were recorded at the West Tower MID microphone. A minimum of four species or species groups were detected. The hoary bat and silver-haired/big brown bat group were the dominant groups heard comprising 61.3 percent and 21.0 percent of the calls, respectively. A single dominant peak was recorded, occurring

during the seven-day period starting August 2nd. After October 15th no bat activity was recorded.

1,676 recorded files at the HIGH microphone were determined to be of bat origin. A minimum of four species or species groups were detected with hoary bat being the dominant group (81.3 percent of the calls). No bat activity was recorded after October 12th and a peak occurred at the HIGH microphone during the seven-day period beginning August 2nd.

North Tower

NEES determined that 11,044 files recorded at the LOW microphone were of bat origin. The *Myotis* group comprised 89.0 percent of the calls from a minimum of four species or species groups recorded. A peak activity occurred during the seven-day period starting July 30th. No activity, except for one bat, was recorded after October 14, 2008.

Myotis group and the hoary bat dominated the 2,357 files determined to be of bat origin, which were recorded at the MID microphone. *Myotis* group comprised 50.1 percent and hoary comprised 32.2 percent of the calls. A minimum of five species or species groups were recorded at the MID microphone. Peak activity was recorded during the seven-day period beginning July 20th. No bat activity was recorded after October 14th.

A total of 1,473 files determined to be of bat origin were recorded at the HIGH microphone. Hoary bat comprised 67.3 percent of the calls as the dominant group recorded. A minimum of four species or species groups were recorded. Peak activity occurred during the seven-day period beginning July 29th and no activity was recorded after October 13th.

Survey Summary

Substantially more bat activity was recorded at the North Tower than at the West Tower site. The North Tower had nearly three times the activity of the West Tower. At both sites, the highest level of bat activity was recorded at the LOW microphone level although it occurred almost exclusively at the North Tower. Activity generally declined with increasing altitude across the project site. Most of the *Myotis* group calls were

recorded at the LOW microphones (84.9 percent of the activity at the LOW microphones). Hoary bat represented 74.8 percent of the total activity at the HIGH microphones. Bat activity was present at the beginning of the monitoring period, increased substantially in late July and early August and then declined to lower levels by early September. The summer period had three times the bat activity as compared to the fall. These data are consistent with the use of the Project site as a summer foraging area. The site may also be within the migratory corridor of some bats, particularly hoary bats. Bat activity demonstrated a steady increase starting at 1945 hours (7:45 PM) that continued to increase until reaching a plateau at 2115 hours (9:15 PM). Activity declined in a similar pattern later in the evening beginning about 0430 hours (4:30 AM).

Summer Mist-netting and Summer Acoustic Monitoring Results

Mist-netting for bats occurred on six nights during the period from June 16 to June 21, 2008. Twelve mist net sites were sampled by NEES using a total of 30 nets and a sampling effort of 60 net-nights. A total of 214 individual bats, representing two species, were captured. All but one bat were little brown myotis (*Myotis lucifugus*). The only other species captured was a silver-haired bat (*Lasionycteris noctivagans*). The overall capture rate was 3.7 bats per net-night and all captured bats were adults. About 76 percent of the captured bats were reproductively active females.

A total of 16 sites were acoustically surveyed for bat activity, spanning the entire extent of Galloo Island. Habitats sampled included trails, forested areas, fields, wetlands and open water. Ground acoustic monitoring indicated relatively low bat activity, with an overall activity rate of 5.3 calls per detector-hour. Highest bat activity was in the field habitat and lowest in the forest and wetland habitats. Species diversity was also highest in the field habitat. *Myotis sp*p. represented 95 percent of all bat activity.

Survey Summaries

The mist-net survey was conducted primarily to determine whether or not the island was being used by the endangered Indiana bat (*Myotis sodalis*). The survey shows no evidence of Indiana bat within the area of the Project. There was also no indication of a resident population of eastern small-footed *myotis* (*M. leibii*) (state listed Species of

Special Concern) on Galloo Island. The project-wide capture rate of 3.7 bats per net-night is similar to other surveys in New York. The rate was just slightly higher at the Project than at other sites surveyed during the pre-construction phases.

The results of the ground-based acoustic monitoring were consistent, in terms of species composition, with the mist-netting results showing a dominance of *Myotis spp*. Acoustic monitoring did show greater species diversity of bats than the mist-netting, an expected result. The overall bat activity index of 5.3 calls per detector-hour is lower than most other acoustic monitoring surveys conducted in New York, Vermont, New Hampshire, and Massachusetts. It was also lower than pre-construction monitoring at other wind development projects in New York State (20.6 calls per detector-hour).

Impacts

Impacts to bats can occur during construction and operation of wind farms from habitat loss or degradation, habitat fragmentation, construction disturbances and collision with WTG. Impacts to resident bats from habitat disturbances are expected to be low in the Project area. Habitat losses from the Project of open field and forested areas are 8.2 and 13.3 percent of the available habitat on the island, respectively. Most of the resident bat activity appears to occur within the central and northern sections of Galloo Island. The capture of a single male silver-haired bat suggests that the island may also have a small population of migratory tree bats. The small percentage of habitat losses along with the fact that bat activity at the Project site consists of a small resident population that is dominated by the little brown bat suggests that the impact on bats of habitat losses and disturbances will be minimal. In addition, as stated in the Avian Impact Section of this DEIS (Section 2.5.3), the project layout avoids forest fragmentation to the extent practicable. As with other animal groups, bats may be temporarily disturbed during construction but will likely relocate to other areas within the Project area until construction is complete. Bat species respond to the presence of wind farms in different ways. Some species increase activity following construction while others seem to avoid wind farms. Myotis spp was found in at least one study to decrease its activity following construction of a wind farm.

Bat collision mortality has been shown to be an impact at modern wind farms as well as at other man-made structures such as communications towers, tall buildings and overhead electrical lines. Factors that may influence bat collision rates with WTG are largely unknown. Although onsite studies prior to construction can provide information on species composition and distribution, bat activity patterns, and the potential presence of targets in the rotor swept zone, they cannot predict how bats might interact with an operational turbine.

A review of bat mortalities at nineteen wind projects (15 in the United States and several international sites) by NEES shows estimated annual mortality rates of bats between 0.1 to 63.9 bats per turbine. The seasonal timing and species make-up of collision mortalities suggest that migrating tree bats including the hoary bat, eastern red bat, eastern pipistrelle, and the silver-haired bat appear to have a higher risk of collision with wind turbines based on mortality data collected at existing facilities. The migratory bats, specifically hoary bats, red bats and silver-haired bats accounted for 52, 24, and 9 percent, respectively, of all reported bat mortalities. Most mortality occurred during the month of August (53.8% of total mortality). A disproportionate number of tree bat mortality during autumn could be due to the fact that spring migration of the bats occurred at low altitudes (1-5 meters agl) while autumn migration was at greater heights. Bat mortality studies at several wind farms also show that the majority of fatalities are adults, suggesting seasonal variation in migration routes and migratory behavior.

Operational mortality data from the 198 WTG Maple Ridge Wind Farm which is on the Tug Hill Plateau of Lewis County in Northern New York revealed a mortality rate of 24.5 bats/turbine/year, with most of the mortality during the late summer and fall migratory period (data from 2005-2006). Operational data from 2007 demonstrated a mortality rate of 15.5 bats/turbine/year and most mortality occurred during the fall migration period. Fatalities represented at least 5 different species including hoary bat, silver-haired bat, red bat, little brown bat, and big brown bat. Hoary bats comprised 46.2 percent, silver-haired bats 14.7 percent, little brown bats 13.6 percent, red bats 12.5 percent and big brown bats 5.4 percent of the reported mortality. The Maple Ridge data showed slightly greater bat mortality at turbines close to wetland areas as opposed to those farther from wetlands,

although there was variation in these data. There did not appear to be a difference in bat fatalities between wooded and non-wooded turbine sites.

The spring and fall 2008 radar surveys conducted on Galloo Island provide some information on flight altitudes of all targets (avian, bat) in relationship to the rotor swept zone (RSZ). It is important to note that the marine surveillance radar used in the study cannot distinguish between birds, bats or individual species. The rotor swept zone (RSZ) of the Project extends from 35 to 125m (114-410 ft) above ground level (agl), a rotor diameter of 90 meters. Spring 2008 radar studies conducted by Stantec Consulting demonstrated a mean flight height of all targets of 319 m above the radar site. Average nightly flight height ranged from 152-490 meters. About 19 percent of the targets flew below the 125m top height of the RSZ. This percentage of targets flying below turbine height is similar to most studies conducted at inland sites. This suggests that a small percentage of night migrant targets are flying as low as the height of the proposed WTG in the spring. Ceilometer/night vision data suggest that, overall, about 20 percent of the observations (178) were bats while 80 percent were birds (695). Fall radar studies at Galloo Island indicated a seasonal average mean flight height of all targets at 298 m above the radar site. Average nightly flight height ranged from 207 to 465 m in the fall study. Ceilometer/night vision data suggest that overall about 5 percent of the observations were bats (18 out of 355). The seasonal mean percentage of targets below the WTG height was 17 percent. This is similar to studies conducted at inland sites, including regionally located sites. This may indicate a lower risk of collision at the Project since much of the seasonal migration occurs at elevations well above the RSZ.

Based on the pre-construction monitoring and risk assessment prepared by NEES, it is possible that a small population of migratory tree bats could be at risk of collision with WTG. Acoustic monitoring of migratory activity suggests high activity from hoary bats, a species known to be susceptible to WTG collisions. The activity of migratory bats at Galloo Island is consistent with data collected at other wind project sites showing most bat activity to occur near the ground and highest activity in the summer months relative to the migratory season. The Bat Risk Assessment prepared by NEES indicates that comparison of data from just the microphones sampling in the RSZ (HIGH), the bat

activity at Galloo Island (12.4 bats/detector-night) is higher than comparable data collected at other wind development sites. Bat fatality numbers at the Project will likely be similar in composition but may be higher in magnitude (on a per turbine basis) to other wind project sites in the northeastern United States.

Mitigation

Measures that can reduce the impact of wind farm construction and operation on bats have been included in the design of the project. For instance, the proposed full build-out alternative considered for the Project maximized the use of wind energy on Galloo Island but would involve the construction of about 98 WTG with greater impact on wetland and forest habitat than the Project now proposed. By reducing the number of WTG, the impact on bat habitat and potential collision mortality has also been reduced. Current design also results in lower impact to the largest forested tracts located in the central and northern parts of the side reducing forest fragmentation. No construction activity will occur during the winter months since the lake is frozen and transport of personnel and equipment is not possible. This will result in the avoidance of activity during roosting periods in the winter, especially at the forested tracts in the northern and central parts of the island. Any habitat alteration in these areas will occur outside the winter period.

Many bats, especially tree bats are also known to suffer mortality from collisions with human-made structures in a manner similar to birds. The Project will use a free standing permanent meteorological tower and ECS will be buried to the extent practicable to reduce the amount of overhead transmission lines. These features of the Project will also help to reduce or mitigate impacts on bats. However, significantly fewer bats than birds are normally found in mortality studies of structures such as towers and aerial transmission lines.

FAA lighting requirements on WTG do not appear to have a significant impact on bat behavior and mitigation for the lighting is not needed. Recent studies suggest that bats are not attracted to lighting on wind turbines. Similar mortality was found at lit and unlit turbines. The recent Maple Ridge Fatality study also indicated that is no clear evidence

that FAA obstruction lighting attracted bats to the towers or that the presence of the lights caused large scale fatality events.

2.5.5 Post-Construction Monitoring Plan

A driving force behind the development of large wind energy facilities is that they potentially have less impact on the environment than traditional electricity sources and are therefore often termed 'clean' or 'green' energy. As such they bear a burden of extra scrutiny regarding all aspects of their environmental impact. Modern wind facilities have been documented to be a collision hazard for flying animals, alter their flight behavior, and affect their distributions in the landscape. However at the present time regulators and the industry do not have sufficient data or analysis to understand the interrelationships, or circumstances that cause or contribute to these impacts.

In order to advance this understanding, State and Federal regulators, including the NYSDEC, are requiring developers to conduct post-construction studies at large-scale wind energy facilities. These studies are required in order to develop data, which are essential to gain an understanding of these phenomena and to develop strategies for avoiding or mitigating these events. Like other developers throughout New York, the Applicant has agreed to participate in this research effort and has accordingly proposed the following Post Construction Monitoring Plan:

The post-construction surveys proposed for the Hounsfield wind energy project would consist of:

- 1) *3-year collision fatality survey*: Ground searches for bird and bat carcasses would be conducted under operational wind turbines for three years. Searches would be carried out year round. In the first year, searches would be carried out from April 15-November 15 at 100% of the project's wind turbines with 8 wind turbines searched daily and up to 22 additional turbines searched once a week (the number would depend on the total number of turbines in the wind project). A standard search protocol involving 28 5-m transects (70-m by 70-m area) under the wind turbines would be performed where terrain allowed (e.g., not in water or woodlands). From November 16 – April 14, all turbines would be searched once a week (weather permitting) with a focus on finding raptor and waterfowl carcasses. Searcher efficiency and scavenging studies would be performed in accordance with NYSDEC guidance. All flying animal specimens found would be frozen as soon as possible. Bat specimens would be sent to NYSDEC following a pre-

arrange schedule. After the first year of this fatality study, results would be reviewed with NYSDEC with the purpose of making adjustments to the protocol for the next year of study.

- 2) *Bird habituation and avoidance studies*: The pre-construction avian breeding bird survey and diurnal movement study would be carried out again in the first year after the project was constructed. The methods and scope for these studies would be the same as carried out in pre-construction. Winter raptor and waterfowl surveys would be carried out concurrently with fatality surveys for three years. After the first year of all these studies, results would be reviewed with NYSDEC with the purpose of making adjustments to the protocol in for the following year of study.
- 3) *Participation in bat genetic isotope studies and bat migration radio tracking studies*: The Applicant is willing to participate in these research projects if NYSDEC is conducting such studies during the three-year post-construction study of the wind project.

2.5.6 Fish and Aquatic Species

Characterization

There have been significant changes to the Lake Ontario ecosystem during the past three and a half decades. The changes have been caused by a combination of various physical, chemical and biological stressors including eutrophication, input of toxic chemicals, phosphorous reductions, lamprey control, stocking of salmonids, introduction of aquatic invasive species, and others. These stressors have caused changes in the food web and the species composition and diversity of the benthic, planktonic, microbial and fish communities. (NYSDEC, 2007) Cultural eutrophication of the offshore area has been reversed but the consequence has been lowered productivity and carrying capacity of offshore fisheries. (USEPA, LOLA report, 2003) Contaminant levels have declined in Lake Ontario fishes, but the levels of PCBs, mirex, dioxin, and mercury are still high enough for fish consumption advisories. (GLFC, 2007)

The Lake has two main sedimentary basin systems. The main basin is the largest and deepest portion of the lake and is southwest of the Duck Galloo Ridge (see Figure 2.4-1). North-Northeast of the Duck-Galloo Ridge is a much shallower basin system that includes from west to east the West Kingston Basin, East Kingston Basin, Galloo Basin, and Stony Basin which includes the Black River Channel. Galloo Island is located

between Galloo Basin and Stony Basin. The aquatic resources in the Project area are primarily located in the Galloo Basin, Stony Basin and Black River Channel.

Benthic and Zooplankton Communities

Numerous physical, chemical and biological stressors have caused profound changes in the Lake Ontario ecosystem and its fish community in recent decades. Benthic communities in the Kingston and main basins of the Lake were dominated by the aquatic crustacean, *Diporeia*. (Lake Ontario LaMP, 1998) *Diporeia* is a sensitive species, does not tolerate low dissolved oxygen levels and most toxicants, and is generally indicative of oligotrophic conditions. It is an important organism in the diet of many fish. However, in the shallower nearshore areas, *Diporeia* is at risk because of food chain disruptions caused by zebra and Quagga mussels. Zebra and Quagga mussels dominate most hard substrates out to the 100 meter depth along the north and south shores of the Lake. These areas constitute the preferred habitat of *Diporeia* and this organism was generally extirpated from areas less than 100 meters deep by 1997. The loss of this organism from a large portion of the offshore area created a critical loss in the food web. (Lake Ontario LaMP, 2006)

Two of the more important aquatic invaders in the zooplankton community are the spiny waterflea (*Bythotrephes longimanus*) and the fish hook waterflea (*Cercopagis pengoi*). The fishhook waterflea is now one of the most dominant zooplankters in the lake.

Benthic communities in most nearshore areas of the Lake are dominated by zebra and Quagga mussels. In some nearshore areas, the benthic community is dominated by oligochaete worms. Zebra and Quagga mussel dominate most of the cobbled shores with low abundance of macrophytic vegetation while the oligochaete worms and chironomids dominate most of the exposed mud areas. (GLFC, 2007) Amphipods, caddisflies (Tricoptera*),* and snails (Gastropoda*)* are found in areas of high and moderate macrophyte communities. Flatworms (Tubellaria) and isopods (Isopoda) are also significant in these high and moderate macrophyte areas. (GLFC, 2007) Overall, the zebra and Quagga mussel populations have created severe changes in the biodiversity of the benthic community.

Phytoplankton and Aquatic Macrophytes

Approximately 379 species comprised the offshore phytoplankton community of Lake Ontario from 1986 to 1992. Forty-two common species and varieties of phytoplankton accounted for over 90 percent of the total abundance and 88 percent of the biomass during this time period. (Makarewicz et. al., 1995) Mesotrophic diatoms accounted for about 30.4 percent of the biomass while eutrophic diatoms represented less than 10 percent of the biomass. From the early 1970s to the 1980s relative summer biomass of the Chlorophyta and possibly Chrysophyta appeared to increase. Diatoms and green algae are now the most common types of phytoplankton. (Lake Ontario LaMP, 2006)

Aquatic macrophytes can contribute to an increase in fish abundance as compared to waterbodies that have low abundance or are devoid of such aquatic plants. In deep lakes with small littoral zones, the importance of macrophytes to the overall functioning of these lakes decreases proportionately as the lakes get larger and deeper. In Lake Ontario, which is a deep lake with limited amounts of shallow littoral zone, abundant beds of macrophytes are restricted to the shallow embayments and tributaries. Most of the Eastern Lake Ontario area near Stony Point and the various offshore islands is deep water with a bottom consisting of rock, cobble and gravel. This limits the abundance of macrophytic vegetation.

The invasion of the lake by dreissenids (zebra and Quagga mussels) has result in an increase in water clarity and where physical condition such as water depths, protection from wave action, and substrate are suitable, the result has been expanded beds of macrophytes. Macrophytic beds and nearshore emergent vegetation areas are important to the fish for feeding, cover and for spawning and nursery areas. In areas of expanded macrophytic beds, conditions are favorable to largemouth bass and other centrarchids. Northern pike also benefit from increased vegetation. The nearshore vegetated areas and shallow water areas with variations in bottom substrate and relief are important to most Lake Ontario fish with only a few exceptions. Most of the Lake Ontario fish spend at least some of the life cycle in the nearshore zones of the lake. (GLFC, 1999) The eggs, larvae and juveniles of most species depend on the nearshore areas and many depend on the submergent and emergent vegetated areas.

Although *Cladophora glomerata* is a macroscopic filamentous attached alga, not a macrophyte, and causes water quality and aesthetic problems, it does provide some cover habitat for lower aquatic organisms that provide food for fish. *Cladophora* grow attached to rock, bedrock and cobble substrates. The 2007 State of the Great Lakes Conference report (SOLEC) indicates that some nearshore waters and embayments of the Lake are experiencing elevated phosphorous levels that may likely contribute to nuisance algal growths of *Cladophora*. The aquatic invasive plant species, *Myriophyllum spicatum* is found in Lake Ontario's embayments and the water chestnut, *Trapa natans*, is well established in Sodus Bay. *Trapa* and *Myriophyllum* occur in the Eastern Lake Ontario Barrier Beach and Wetlands complex to the south of Stony Point. European frog-bit, *Hydrocharis morsus-ranae*, is an invasive species first found in Lake Ontario in 1972. It is a free-floating plant that inhabits slow moving sections of rivers and lakes and wetlands and forms dense canopies that prevent penetration of sunlight into the water column.

The Autumnal Water-starwort, *Callitriche hermaphroditica*, is a submerged aquatic plant that is listed by NYSDEC as Endangered and may inhabit some waters of Lake Ontario. It is most commonly found in sandy and muddy soil and is loosely rooted. The work site areas in Lake Ontario for the offloading facility, the intake and discharge structures, and the geothermal system lines and coils are in areas almost devoid of sediment. During field surveys performed in 2007 by Terrestrial Environmental Specialists Inc. at Galloo Island they observed that no habitat suitable for submerged vascular aquatic vegetation, exist at the work sites in Lake Ontario.

Fish

The current fish community in Lake Ontario can be described for two major habitat zones that overlap: the nearshore zone and the offshore zone. Since 1976, forty-four species of fish were captured by NYSDEC during eastern basin gillnetting assessments. (NYSDEC, 2008) The NY State designated threatened species, the lake sturgeon, was rarely caught in the eastern basin prior to 1995. At least one lake sturgeon per year and three in 2007 have been collected in the eastern basin since 1995. (NYSDEC, 2008)

Nearshore Fish Community

The nearshore zone includes waters less than 15 meters in depth and the embayments. Within the embayments, the fish community is the most diverse and fish production is the greatest. These areas are critical for fish fry, eggs, and juvenile life stages of almost all Lake Ontario fish species. Although the nearshore is dynamic and has undergone some disturbances during a short period of time, it supports many healthy populations of native species. (Lake Ontario LaMP, 2006)

The nearshore area provides habitat for a large number of warm water fish species including walleye (*Sander vitreus*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), yellow perch (*Perca flavescens*), sunfish such as bluegill, pumpkinseed, black crappie and rock bass (Centrarchidae), northern pike (*Esox lucius*), brown bullhead (*Ameiurus nebulosus*), freshwater drum (*Aplodinotus grunniens*), longnose gar (*Lepisosteus osseus*), bowfin (*Amia calva*), channel catfish (*Ictalurus punctatus*), common carp (*Cyprinus carpio*), trout-perch (*Percopsis omiscomaycus*), suckers (Catostomidae), white perch (*Morone americana)*, gizzard shad (*Dorosoma cepedianum*), and various minnows such as emerald and spottail shiners. Muskellunge (*Esox masquinongy*) are present in the Lake but are rare. (GLFC, 2007) The American eel (*Anguilla rostrata*) is also an important nearshore predator but it is currently at historically low abundance.

The aquatic invasive species, round goby, is becoming abundant in nearshore waters of the Lake. Nearshore darters and logperch will likely decline as round goby abundance increases. (NYSDEC, 2003)

The 2003 Fish Community Objectives for Lake Ontario indicates that catches of warm water fish species has declined to record lows in eastern Lake Ontario. (NYSDEC, 2003) In 2005 total catch of warmwater fish in the eastern basin increased to the highest level since 1994. Total catch of warmwater fish in 2006 gill net sampling was comparable to 2005 and 37.2% higher than 1995-2004. (NYSDEC 2006 & 2007). In 2007 sampling the total warmwater fish species catch was 14 percent lower than the 2005-2006 mean but still 6.1 percent higher than the previous ten-year mean. (NYSDEC, 2008)

Smallmouth bass reached record lows and walleye and rock bass demonstrated declines in 2003. In 2006 sampling, smallmouth bass was 149 percent higher than the previous five year mean but walleye abundance was comparable to the previous five and ten year mean. Smallmouth bass abundance deceased in 2007 but remained higher than the 2000-2004 average (low period). Yellow perch abundance was low in 2003 but stable compared to historic trends. In 2006 yellow perch abundance was 11 percent higher than the previous five year mean and in 2007 it was the highest since 1985. (NYSDEC, 2007, 2008)

The high abundance of double-crested cormorants in the eastern basin likely contributed to the decline of localized fish populations since smallmouth bass and yellow perch have increased in abundance in other areas of the Lake in New York. Recent smallmouth bass population trends (increases) may reflect a response to the double-crested cormorant controls that were implemented by NYSDEC. (NYSDEC, 2008)

Offshore Fish Community

The offshore fish community area is generally considered to be waters of depth greater than 15 meters. In this area, temperature is a dominant influence on fish distribution. The development of thermal bars and a thermocline in the Lake results in large variations in temperature among depths and regions.

Offshore Benthic Fish Community

The offshore benthic fish community consists of juvenile and adult lake trout (*Salvelinus namaycush*), lake whitefish (*Coregonus clupeaformis*), rainbow smelt (*Osmerus mordax*), slimy sculpin (*Cottus cognatus*), burbot (*Lota lota*), lake herring (*Coregonus artedii*) and sea lamprey (*Petromyzon marinus*). (GLFC, 2007) (NYSDEC, 2003) The round whitefish (*Prosopium cylindraceum*) is also part of the benthic fish community and is a species listed by NYSDEC as “endangered.” Lake trout populations are maintained by a stocking program. The rainbow smelt are included in the offshore benthic community since they inhabit deep cold water throughout the year and are more likely to interact with the lake trout and lake whitefish than with the coho and chinook salmon.

Age-one and older rainbow smelt in 2002 were just above record low levels that had been observed in 2000. In 2005 rainbow smelt abundance increased to levels similar the early 2000s but in 2006 declined by almost 42 percent from 2005. The number of age-1 rainbow smelt declined even further in 2007. Deep water sculpin (*Myoxocephalus thompsoni*), a state listed endangered species, is rare in the benthic fish community. Several recent captures indicated that a remnant population persists. In 2006 sampling, NYSDEC caught 16 deepwater sculpin continuing a 2005 trend of increased catches. (NYSDEC 2007)

Offshore Pelagic Fish Community

The offshore open water or pelagic fish community are those species that inhabit the mid-water thermal zones rather than the bottom areas. The fish community of the pelagic area is relatively simple. The community is composed of three main planktivors, the alewife (*Alosa pseudoharengus*), rainbow smelt (*Osmerus mordax*) and the three-spine stickleback (*Gasterosteus aculeatus*) and their predators. The prey species feed on zooplankton, opossum shrimp (*Mysis relicta*), and the swimming larval form (*veligers*) of dreissenids. The most common zooplankters eaten are the cladocerans and copepods.

The predators include chinook (*Oncorhynchus tshawytscha*) and coho salmon (*Oncorhynchus kisutch*), rainbow (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*), adult lake trout (*Salvelinus namaycush*) and Atlantic salmon (*Salmo salar*). Chinook is the most abundant salmonid in the pelagic fish community. (GLFC, 2007) Its abundance is mainly dependent on stocking programs. The major prey of all of the salmonids in the lake is the alewife.

Significant Coastal Fish and Wildlife Habitat Areas

The eastern end of Lake Ontario has many areas that are designated by the New York State Department of State, Coastal Management Program as Significant Coastal Fish and Wildlife Habitats (SCFWH). Although there is very deep water in the eastern end of Lake Ontario in the vicinity of the Project (from 65 to 145 feet), the areas around the islands have shallow shelves and rocky shoals suitable for fish spawning and rearing. Islands in the vicinity of the Project that are listed as SCFWH and are significant fish habitat areas

include: Little Galloo Island, Gull and Bass Islands, Stony Point-Lime Barrel Shoals, Stony Island, and Calf Island. This entire area is a well known smallmouth bass fishery attracting anglers throughout the state and is also providing a growing fishery for lake trout and other salmonids. (NYSDOS, SCFWH rating forms)

The rocky littoral zone surrounding Little Galloo Island (about 200 acres) provides prime spawning habitat for smallmouth bass mostly between the 2 to 20 foot depth contours. Stocked lake trout are also known to spawn in the vicinity of the island. Other species using the Little Galloo Island shoals for spawning and nursery are rock bass, pumpkinseed, brown bullhead, yellow perch and white perch. Calf, Gull and Bass Islands provide spawning and nursery habitat for many of the same fish species as Little Galloo. Calf Island shoals are about 600 acres in size, and the Gull and Bass island shoals are approximately 340 acres in size.

The shoals surrounding Stony Island are a regionally significant fish spawning area. They provide prime habitat for smallmouth bass and are regionally significant for lake trout spawning. This area also provides habitat for brown trout, rainbow trout, coho and chinook salmon and Atlantic salmon as well as rock bass, pumpkinseed, white perch, yellow perch and brown bullhead.

The Stony Point-Lime Barrel Shoals area includes an approximate 900 acre shoal area extending from shore out to the 20 foot depth contour. These shoals provide an extensive shallow water area for fish spawning and feeding that is relatively rare in the New York waters of the Great Lakes. Smallmouth bass use these shoals for spawning and feeding grounds. Lake trout have been confirmed spawning in this area around Association Island which is included in this SCFWH. Other species using this habitat are the same ones mentioned for the other shoal areas. All of these SCFWH areas are rated by NYSDOS as "Irreplaceable."

Little Galloo Island, Gull Island and two holdings by NYSDEC on Galloo Island constitute the Lake Ontario Islands Wildlife Management Area. None of the proposed in-water construction activities will occur in a SCFWH.

Impacts

Impacts to fish and other aquatic biota will occur during construction, operation and maintenance activities associated with the Project. The majority of project impacts occur as a result of construction. During the construction phase, it will be necessary to blast the lake bottom to provide an entrance channel to the offloading facility sufficient for use by large delivery barges capable of bringing in the heavy equipment and supplies for the Project. Although the permanent unloading facility will be constructed on an upland area, the removal of the plug of land to join the slip with the lake waters and entrance channel will result in some minor impacts. The temporary unloading facility will include a stone groin that will occupy aquatic habitat for a period of approximately 18 to 24 months prior to its removal. In-water construction to install the water intake structure and sewer outfall will also have minor impacts on the aquatic ecosystem.

Construction of Unloading Facility

The lake bottom in the shallow nearshore areas of Galloo Island provides habitat for benthic invertebrates and fish species. The bottom at the offloading facility site is mostly flat bedrock nearly devoid of sediment. The benthic community is likely to be dominated by zebra mussels in water depths less than 10 feet and by Quagga mussels in the deeper areas. No submerged vascular aquatic plants were observed on the lake bottom at the site of the offloading facility. Construction of the entrance channel will result in a water depth of about 14 feet in the affected areas. The barge slip entrance channel will affect about 0.82 acres (36,000 sq. ft.) of this shallow water littoral zone area. On completion of the entrance channel, these areas will be recolonized and inhabited by the dreissenids since they dominate nearshore zones of the lake and the slip provides suitable habitat for this species. The substrate in the new slip will be bedrock and water depth will be 14 feet below ordinary low water datum, IGLD, 1985. Bottom water temperatures in the excavated channel would be similar to what currently exist throughout the littoral zone will not cause changes in the benthic community.

The entrance channel will result in minor modification (slightly increased depth) of shallow water habitat used by fish species for spawning and nursery areas. Stocked lake trout are known to spawn in this part of Lake Ontario and Galloo Island, which has

suitable cobble substrate with little fine material or organics, and has been reported as a historical spawning ground. (Goodyear et.al., 1982) Galloo Island has also historically supported lake whitefish and smallmouth bass spawning. The island shoals likely support spawning of other warm water species that use the shoals at adjacent islands listed as Significant Coastal Fish and Wildlife Habitats. The most significant shallow water shoal areas around Galloo Island are found at the western and eastern ends of the Island. These large shoals are not located near the slip channel and therefore will not be impacted by the construction of the slip. The shallow water shoals along the northern and southern shorelines of Galloo Island are limited in size to a relatively narrow band. Lakeward of the narrow shoal band there is a steep drop off to deep waters. This narrower shoal area along the southern shoreline is where the slip channel will be excavated.

The amount of habitat impacted by the construction of the slip channel is small (0.82 acres) in comparison to the hundreds of acres of shallow water shoals around the island that are available for spawning and nursery areas. The slightly deeper water of the entrance channel may provide juvenile fish with some hiding cover from aerial predators. The impacts to habitat will be localized and the amount of habitat affected is small (30,151 cy). Adverse effects on regional fish populations, community structure, and the food chain will not occur. Overall, no changes in the benthic community diversity and abundance are expected. The change in water column depth will have no measureable impact on zooplankton and phytoplankton since these communities are constantly in motion and are not sessile.

Construction of the inland offloading slip will create new aquatic habitat from upland areas. The barge slip/offloading facility will create about 0.43 acres (18,700 sq. ft.) of water at a depth of 14 feet below low water datum. The slip would provide sheltered areas for use by resident fish species.

The temporary offloading facility will consist of a stone groin and articulating ramp. The groin will consist of clean gravel and boulders ranging in size from 1/2 –inch to 12-inches. This fill will occupy about 5,000 sq. ft of benthic habitat at the shoreline for a period of 18 to 24 months at which time it will be removed. Impacts on aquatic

organisms and habitat from the groin will be minimal since the area is small and will be lost on a temporary basis. Once the groin is removed and the bottom is restored, it will be available for aquatic habitat.

There will be no measurable impacts on the aquatic ecosystem from construction of the floating offshore breakwater, mooring points and mooring dolphin piers. Anchorage for the breakwater and construction of the moorings involves only minor disturbances to the lake bottom from using augers and from grouting. An alternative anchoring system for the breakwater would be precast concrete blocks and the amount of habitat occupied will be small. The dolphins are steel pipe pile supported structures with a concrete cap that will be formed and poured in place. Overall, there will be no significant loss of habitat from these structures and the construction activities do not involve actions that would affect organisms.

Underwater Blasting

Use of underwater explosives to construct the entrance channel will affect aquatic organisms, especially fish. This is because explosives produce pressure waves with unique shapes, intensities, and frequencies. The energy from explosives is released as physical, thermal and gaseous products but the physical shock is the aspect causing most damage to fish in the environment.

Underwater blasting can cause both lethal and sub-lethal effects on fish and possibly some invertebrates. Generally, blasting has minimal effects on mollusks, shellfish and crustaceans. While data on the effects of explosions on aquatic plants is limited, some studies show that when damage occurs it may be from cellular disruption in some species and from reductions in the rate of photosynthesis. The impact is generally limited to areas very close to the blast and there is a rapid recovery of the aquatic bed of vegetation. (CADGF, 2002)

Underwater blasting tends to have more impact on fish than other aquatic organisms. The main cause of mortality and some severe injuries to fish is associated with damage to the swim bladder and other internal gas-containing organs from rupture and hemorrhage. (USAED, New York, 2004)(Kevin and Hempen, 1997) The susceptibility of fish to the

lethal effects of explosions is species dependent. Fish eggs and larvae may also be damaged during underwater explosions and juvenile fish tend to be more susceptible to the lethal effects of a blast than adults. Change in fish behavior has also been observed and is one of the sub-lethal effects of underwater blasting. Ultimately sub-lethal effects can result in mortality or increased susceptibility of stunned fish to predation by other fish and aerial predators such as gulls and cormorants.

Some studies show that fish near the surface of the water column may be more vulnerable to lethal effects of blasts than those deeper in the water column. (Lewis, 1996) The reason for this is that for buried explosives, the lethal zone is conical in shape with the narrow part at the point of explosion near the bottom with expansion of the zone near the surface.

Typically, fish killed during an underwater blast do not float to the surface but generally sink to the bottom of the waterway. Some studies found that explosions may have very little deterrent effect on fish; they are not frightened from the area. Therefore, some fish will not necessarily disperse from the area after the first few detonations. The extent of mortality and injuries tends to decrease with increased distance from the source of the underwater explosion. (USAED, New York, 2004)

Much of the energy in buried explosion radiates into the rock and this reduces the amount of wave energy reaching the water column itself. Although burial of the charges does not prevent fish mortality, it does reduce it. Overall, no significant losses of fish are expected to occur during the blasting of the entrance channel area with the implementation of the mitigation procedures discussed below.

Water Intake

The water intake structure will be placed in a shallow trench constructed in the lake bottom and the trench will then be backfilled. Material excavated from the trench will be temporarily placed alongside the trench (sidecast) until the intake line has been placed in the trench. The sidecast material will then be used to backfill the trench to preconstruction contour and condition. Any excess material not needed for backfill will be removed from the lake bottom. Thus changes in habitat adjacent to the trench from

sidecasting are temporary in nature. The intake pipeline will only be buried from shore to about the 10 foot contour and thus the trench would be only between 100 to 200 feet offshore. From the 10 foot contour to the 30 foot contour the pipe will be placed on the natural bottom of the lake.

The sidecasting of excavated material will result in temporary change of habitat adjacent to the trenches. The amount of habitat temporarily disturbed (trench and sidecast area) for the sewage outfall, and the geothermal system is estimated between 100 to 200 feet offshore and about 8 to 10 feet in width. Once the work is completed and the area is restored there will be no permanent loss of habitat (except for the intake head and exposed coils if any).

Operation and Maintenance

Operation and maintenance of the water supply intake system and sewage outfall structure will not have adverse effects on the aquatic organisms or aquatic habitat. The water supply intake volume and velocity will be low and entrainment of aquatic organisms will be minimal. For instance about 15,000 gallons of water per day will be produced during construction and this drops to about 5,000 gallons per day during the operation and maintenance phase. Upstate Power will apply for a SPDES permit for the sewage outfall system.

Zebra and Quagga mussels have the potential to affect the water intake structure and maintenance may be required to keep them from clogging the water supply structure. A metal alloy will be used to construct the system in order reduce biofouling from the zebra and Quagga mussels.

Mitigation

Offloading Facility Construction

The size of the fill for the temporary unloading facility has been kept to the minimum amount needed to support the delivery of heavy construction equipment to the island and the use of the articulating ramp further minimizes the amount of fill required. Once the fill is removed, the bottom of the lake will be restored to preconstruction contour and condition. The hydraulic pump and piston system of the articulating ramp will be

periodically inspected to ensure that there are no leaks of hydraulic fluid to the adjacent habitat and waters. Additional mitigation for the temporary facility is not required since the impacts of the facility are minor.

Mitigation for the entrance channel excavation will consist of the procedures listed below to minimize blasting impacts along with timing of the activity to avoid significant fish migration and spawning periods. Upstate Power will comply with conditions of USACE and NYSDEC permits regarding spawning period restrictions. To further reduce impacts, there will be no sidecasting or double-handling of any dredged material during excavation and all material will be brought upland for reuse on gravel access road construction and maintenance.

Underwater Blasting

The numbers of fish lost by blasting can be reduced by use of various mitigation measures. Blasting activities will be scheduled to avoid timeframes when there are high numbers of fish spawning and using the area for a nursery. Upstate Power will schedule this work based on the results of consultation with the NYSDEC and the USFWS.

Generally, spring spawning period occurs from March 31st to July 15th. Fall spawning periods occur from late August through late October and mid- November. Due to the international importance of the Lake Trout programs in Lake Ontario, avoidance of blasting during spawning periods from the second week in October through the second week of November will protect this species. The work will be located, to the extent practicable, outside of significant spawning and nursery areas. The most significant and extensive shoal areas surrounding Galloo Island are on the east and west ends. The area selected for the slip channel is on the south shoreline which drops off steeply from shore to deeper water and does not likely provide a substantial spawning and nursery area.

The most effective method of reducing mortality of fish from shock waves is the use of blasting methods that essentially involves “confined blasting”. Explosives are typically placed into boreholes that are drilled into the lake bottom. The hole is then backfilled with stemming materials up to the substrate/water interface. The stemming materials are generally uniform, crushed, angular stone. Use of this method along with the proper type

and amount of explosive is the best way to reduce fish mortality, although it will not totally eliminate it. Additionally, when multiple charges are used in a project such as the Project, time-delays should be used to reduce the overall detonation pressures to a series of smaller explosions. Initiation of the explosive charge should use a minimal length of detonation cord, which has its own impact radius on fish. (CADGF, 2002) These techniques will be used during the blasting for the entrance channel to minimize impacts on fish.

Water Intake

As no significant impacts are anticipated, no mitigation is required. The intake will be screened prevent aquatic vegetation and fish from being drawn into the system. The system will be constructed of a metal alloy to resist biofouling by zebra and Quagga mussels.

Operation and Maintenance

As no significant impacts are anticipated, no mitigation is required. An Operations and Management Plan may be found in Appendix G and an Environmental Monitoring Plan is contained in Appendix F.

2.6 Visual Resources

This section of the DEIS presents the conclusions of the *Visual Resource Assessment for the Hounsfield Wind Farm* (VRA) prepared by Saratoga Associates (Appendix Q). The purpose of the VRA was to identify potential visual and aesthetic impacts resulting from the Project; and to provide an objective assessment of the visual character of the Project, using standard accepted methodologies of visual assessment, from which agency decision makers can render a supportable determination of the visual significance of the Project. The VRA was conducted in accordance with the NYSDEC Program Policy: *Assessing and Mitigating Visual Impact* - DEP-00-02, issued July 31, 2000 (DEC Visual Policy).

Methodology

In accordance with the DEC Visual Policy, the potential visibility of the Project was evaluated and the difference between the visual characteristics of the landscape setting with and without the Project in place was objectively determined. Both quantitative and

qualitative aspects were evaluated; quantitative assessment (visual impact) determines how much is seen and from what locations and qualitative assessment (aesthetic impact) describes how it will be perceived and whether there is a detrimental effect on the perceived beauty of a place or structure.

The study area for this visual resource assessment includes coastal areas up to 15 miles from Galloo Island. This highly conservative study zone extends well beyond the 5-mile background distance normally considered the outer limit for most visual impact studies. Fifteen miles was selected as a reasonable study limit considering distance, meteorological conditions and the curvature of the earth. Combined with the slender form and low contrast coloration of the wind turbines, views beyond this distance are unlikely to create an adverse impact.

Viewshed Mapping

The first step in the visual impact analysis was to determine whether or not the Project would likely be visible from locations within the study area. For this purpose, the zone of visual influence was defined using viewshed mapping. Two viewshed maps were prepared, topographic and vegetated. The Topographic Viewshed Map considers the potential visibility of the Project based on topographic obstructions only, without any vegetative screening. The Vegetated Viewshed Map considers the probable screening effect of mature vegetation. The viewshed maps are found in Appendix Q.

Characterization of Existing Landscape and Visual Setting

In general, outside the village and hamlet centers, the study area is largely rural and undeveloped. Broad tracts of agricultural land are either actively maintained or brush covered due to inactivity (fallow fields). While much of the study area has historically been cleared for agricultural purposes, secondary growth woodlots are scattered throughout the study area in the form of hedgerows, wood borders and old fields. Built features typically include a wide variety of single family home types (including second or seasonal homes).

FAA Lighting

FAA regulations require that WTG be of uniform design - painted an off-white color with a low-reflectivity finish and will be illuminated with L-864 red flashing lights with a maximum gap between lit WTG of no more than ½ mile. See Section 2.13 Mandated FAA lighting for details.

Inventory of Aesthetic Resources

The DEC Visual Policy requires that all aesthetic resources of Statewide Significance be identified along with any potential adverse effects on those resources resulting from the Project.

Table 2.6-1: Potential Aesthetic Resources

Receptor Name	Municipality	Inventory Type
Cultural Resources		
Point Salubrious Historic District	Town of Cape Vincent	Statewide Significance
Chaumont Historic District	Village of Chaumont	Statewide Significance
Chaumont House	Village of Chaumont	Statewide Significance
Evans, Gaige, Dillenbeck House	Village of Chaumont	Statewide Significance
George House	Village of Chaumont	Statewide Significance
Cedar Grove Cemetery	Village of Chaumont	Statewide Significance
Taylor Boathouse	Town of Lyme	Statewide Significance
Taft House	Town of Lyme	Statewide Significance
Menzo Wheeler House	Town of Lyme	Statewide Significance
Old Stone Shop	Town of Lyme	Statewide Significance
Three Mile Bay Historic District	Town of Lyme	Statewide Significance
The Row	Village of Chaumont	Statewide Significance
Wilcox Farmhouse	Town of Lyme	Statewide Significance
Johnson House	Village of Cape Vincent	Statewide Significance
Captain Louis Peugnet House	Village of Cape Vincent	Statewide Significance
St. Vincent of Paul Catholic Church	Village of Cape Vincent	Statewide Significance
St. John's Episcopal Church	Village of Cape Vincent	Statewide Significance
Broadway Historic District	Village of Cape Vincent	Statewide Significance
Jean Philippe Galband du Fort House	Village of Cape Vincent	Statewide Significance
John Borland House	Village of Cape Vincent	Statewide Significance
Vincent LeRay House	Village of Cape Vincent	Statewide Significance
Otis Starkey House	Village Cape Vincent	Statewide Significance
James Buckley House	Village of Cape Vincent	Statewide Significance

Roxy Hotel	Village of Cape Vincent	Statewide Significance
Glen Building	Village of Cape Vincent	Statewide Significance
E. K. Burnham House	Village of Cape Vincent	Statewide Significance
Aubertine Building	Village of Cape Vincent	Statewide Significance
Lewis House	Village of Cape Vincent	Statewide Significance
Cornelius Sacket House	Village of Cape Vincent	Statewide Significance
Levi Anthony Building	Village of Cape Vincent	Statewide Significance
Duvillard Mill	Village of Cape Vincent	Statewide Significance
Tibbetts Point Light	Town of Cape Vincent	Statewide Significance
Rogers Brothers Farmstead	Town of Cape Vincent	Statewide Significance
Galloo Island Lighthouse	Town of Hounsfield	Statewide Significance
Lance Farm	Town of Lyme	Statewide Significance
Angell Farm	Town of Lyme	Statewide Significance
Getman Farmhouse	Town of Lyme	Statewide Significance
Stoney Point Lighthouse	Town of Henderson	Statewide Significance
Bedford Creek Bridge	Town of Hounsfield	Statewide Significance
Sackets Harbor State Historic Site	Village of Sackets Harbor	Statewide Significance
Shore Farm	Village of Sackets Harbor	Statewide Significance
Madison Barracks	Village of Sackets Harbor	Statewide Significance
Sackets Harbor Battlefield	Village of Sackets Harbor	Statewide Significance
Fort Volunteer and Fort Pike	Village of Sackets Harbor	Local Importance
Sackets Harbor Historic District	Village of Sackets Harbor	Statewide Significance
Elisha Camp House	Village of Sackets Harbor	Statewide Significance
Union Hall	Town of Lyme	Statewide Significance
United Methodist Church - Point Peninsula	Town of Lyme	Statewide Significance
Recreational and Tourist Resources		
Long Point State Park	Town of Lyme	Statewide Significance
State Boat Launch	Town of Chaumont	Statewide Significance
State Boat Launch	Village of Chaumont	Statewide Significance
Cape Vincent Fisheries Research Station (NYS DEC)	Village of Cape Vincent	Statewide Significance
Cape Vincent Village Green	Village of Cape Vincent	Local Importance
North Market Street, Swimming Area	Village of Cape Vincent	Local Importance
Waterfront Park	Village of Cape Vincent	Local Importance
Cape Vincent Village Ramp Public Boat Launch	Village of Cape Vincent	Local Importance
Lake Ontario Waterway Access (NYSDEC)	Town of Cape Vincent	Statewide Significance

Grenadier Island Grassland		
Preserve (Thousand Islands Land Trust)	Town of Cape Vincent	Local Importance
Eastern Ontario Waterway Access	Town of Lyme	Statewide Significance
Point Peninsula WMA	Town of Lyme	Statewide Significance
Galloo Island WMA	Town of Hounsfield	Statewide Significance
Little Galloo Island Unique Area	Town of Hounsfield	Statewide Significance
Robert Wehle State Park	Town of Henderson	Statewide Significance
Henderson Shores Unique Area	Town of Henderson	Statewide Significance
Robert Wehle State Park #2	Town of Henderson	Statewide Significance
Southwick Beach State Park	Town of Ellisburg	Statewide Significance
Lakeview State WMA	Town of Ellisburg	Statewide Significance
Black Pond WMA	Town of Henderson	Statewide Significance
Stoney Creek Boat Launch	Town of Henderson	Statewide Significance
El Dorado Beach Preserve (Nature Conservancy)	Town of Henderson	Local Importance
Henderson Boat Launch	Town of Henderson	Local Importance
Association Island	Town of Henderson	Local Importance
Westcott Beach State Park	Town of Henderson	Statewide Significance
Seaway Trail	Town of Henderson	Statewide Significance
Bedford Creek Marina and Campground	Town of Hounsfield	Local Importance
Willows Campground	Town of Henderson	Local Importance
Bedford Creek Golf Course	Town of Hounsfield	Local Importance
Seaway Trail Discovery Center	Village of Sackets Harbor	Statewide Significance
Sackets Harbor Visitor Center	Village of Sackets Harbor	Local Importance
Rustic Golf and Country Club	Town of Dexter	Local Importance
Dexter Marsh WMA	Town of Dexter	Statewide Significance
Highway Corridors/Roadside Receptors		
Stony Point Road	Town of Cape Vincent	Other Places for Analysis
CR 57	Town of Lyme	Other Places for Analysis
Shore Road	Town of Lyme	Other Places for Analysis
NYS Route 3/Seaway Trail Overlook (Naval Operations)	Town of Henderson	Statewide Significance
CR 123	Town of Henderson	Other Places for Analysis
NYS Route 3 Seaway Trail Scenic Overlook (VP)	Town of Henderson	Statewide Significance
CR 59 near Pillar Pt	Town of Henderson	Other Places for Analysis
Residential/Community Resources		
Lyme Central School	Town of Lyme	Local Importance
Herrick Grove	Town of Lyme	Local Importance

Three Mile Point Bay (Residential)	Town of Lyme	Local Importance
Three Mile Point Bay	Town of Lyme	Local Importance
Bedford Corners	Town of Cape Vincent	Local Importance
Mud Bay - Martin's Marina	Town of Cape Vincent	Local Importance
Elementary School and Recreational Park	Village of Cape Vincent	Local Importance
Cape Vincent Historical Museum	Village of Cape Vincent	Local Importance
Ferry to Wolfe Island - Marina - US Coast Guard Station	Village of Cape Vincent	Local Importance
Henderson Harbor	Town of Henderson	Local Importance
Sackets Harbor Battlefield	Village of Sackets	Local Importance
Museum	Harbor	
Sackets Harbor Central School	Village of Sackets Harbor	Local Importance

Visual Characteristics

Various factors affect the visibility of objects as the move into the distance.

Distance Zones

Distance affects the apparent size and degree of contrast between an object and its surroundings. Distance can be discussed in terms of distance zones, e.g., foreground, middle-ground and background.

At a foreground distance (0 to ½ mile), viewers typically have a very high recognition of detail. Cognitively, in the foreground zone, human scale is an important factor in judging spatial relationships and the relative size of objects. From this distance, the sense of form, line, color and textural contrast with the surrounding landscape is highest. The visual impact is likely to be considered the greatest at a foreground distance.

With the nearest coastal vantage point more than 5.6 miles from the Project, only far offshore vessels passing in very close proximity of Galloo Island will view the facility from the foreground distance zone. With the outer margin of the foreground distance zone at least 4½ miles off shore, the number of vessels passing within ½ mile of the proposed Project is expected to be very limited considering smaller watercraft typically navigate much closer to shore.

Middleground (1/2 mile to 3 miles) is the distance where elements begin to visually merge or join. Colors and textures become somewhat muted by distance, but are still identifiable. Visual detail is reduced, although distinct patterns may still be evident. Viewers from middleground distances characteristically recognize surface features such as tree stands, building clusters and small landforms. Scale is perceived in terms of identifiable features of development patterns. From this distance, the contrast of color and texture are identified more in terms of the regional context than by the immediate surroundings.

Only boaters passing within three (3) miles will view the Project from the middleground distance zone.

At a background (3 miles to horizon) distance, landscape elements lose detail and become less distinct. Meteorological conditions and atmospheric perspective change colors to blue-grays, while surface characteristics are lost. Visual emphasis is on the outline or edge of one landmass or water resource against another with a strong skyline element.

All coastal vantage points will view the project from far background distances (5.6 miles and greater). Due to its unique visual character, under clear weather conditions the proposed wind farm may be considered a point of interest over open water from the closest coastal vantage points. However, turbine structures will decrease in visibility, clarity and perceived importance with increasing distance up and down the coast.

Linear Perspective

Linear, scientific or size perspective is the reduction in the apparent size of objects as the distance from the observer increases. An object appears smaller and smaller as an observer moves further and further from it. At some distance, depending upon the size and degree of contrast between the object and its surroundings, the object may not be a point of interest for most people. At this hypothetical distance it can be argued that the object has little impact on the composition of the landscape of which it is a tiny part. Eventually, at even greater distances, the human eye is incapable of seeing the object at all.

Exclusive of the effect of earth curvature and meteorological visibility a proposed wind turbine on Galloo Island as viewed from the nearest coastal vantage point (5.6 miles) would measure only 0.8 degrees vertically above the horizon (base to blade tip at apex of rotation). This is roughly equivalent to the width of a pencil held at arms length. At 15 miles, the full height of the turbine would measure just 0.3 degrees. This is roughly equivalent to the width of two pennies held at arms length. While this very small degree of visibility might be perceptible to a distant observer, it is unlikely to be considered a point of interest at such extended distance.

Meteorological Visibility

Visibility can be reduced by fog, snow, particulate matter, or any combination of them, and is a part of normal atmospheric phenomena.

Meteorological conditions would obscure the project from all coastal receptors (five [5] miles or greater from the facility) approximately 10 percent of the time in the eastern lake Ontario region on an annual basis. This frequency is generally consistent throughout all seasons, ranging from 7.7 percent of the time during summer months to 17.0 percent of the time during winter months. There is also no significant variation between day and night conditions with the frequency ranging from 10.5 percent during daylight hours and 9.8 percent during the hours of darkness, on an annual basis.

For receptors located further up the coast, nine (9) miles or greater from the Project, visibility is further limited. At this distance, the Project would be will be obscured by atmospheric conditions approximately 22 percent of the time, on an annual basis.

Curvature of the Earth

From all vantage points the proposed project will be viewed over open water at great distance (greater than 5.6 miles from any coastal vantage point). At such extended distance the curvature of the earth will affect the visibility of proposed wind turbines. The degree of screening caused by earth curvature depends on the elevation of the viewer above lake level (asl), the ground elevation of the turbine above lake level and the distance of the viewer from the subject turbine.

For an observer standing at beach elevation, the base of an object begins to fall below the visible horizon at a distance of approximately three miles. At 10 miles, the lower 25 feet of an object will be screened by the horizon. This increases to 75 feet at a distance of 15 miles.

Because the atmosphere bends light around the earth (atmospheric refraction) allowing a viewer to see farther, the distance to the optical horizon is slightly greater than the simple geometric calculation. The exact amount of bending depends on several variables including elevation, and the composition of the atmosphere (which varies with location, weather, etc.).

Mirage Effects

The effect of mirage will occasionally alter the appearance of the wind turbines, as well as Galloo Island itself. A mirage is a naturally occurring optical phenomenon where distant objects appear displaced from their true position. The bending of light rays by thermal gradients in the atmosphere causes this optical displacement.

Impacts

Viewshed Analysis

The viewshed analysis illustrates that the vast majority of views of the proposed project will be limited to immediate shoreline locations. In most areas project visibility is quickly screened from potential inland vantage points by dense coastal vegetation and topography. Few publicly accessible vantage points with views of the Lake were found more than several hundred yards inland. While there are discrete exceptions (locations where large expanses of agricultural land extend to the lakeshore), viewshed analysis demonstrates that views of the proposed wind energy Project will be substantially limited to shoreline locations.

When visible from coastal areas, views are at great distance over open water. The closest mainland vantage point is Point Peninsula, 5.6 miles northeast of Galloo Island and Stony Point, 6.1 miles southeast of Galloo Island. All mainland vantage points fall within the background distance zone, where turbines will be less visually distinct and lack visual clarity due to atmospheric and linear perspective.

Project visibility is also found within limited agricultural upland areas inland from the coast. However, opportunity for upland views of Lake Ontario is substantially limited by existing coastal vegetation. Open views of the Project will be available from offshore vantage points on Lake Ontario. The greatest potential for close proximity views will be for those boating on Lake Ontario.

Visibility Evaluation of Inventoried Resources

Consistent with the NYSDEC's Policy, each inventoried aesthetic resource was evaluated to determine whether it lies in the viewshed of the Project. This consisted of reviewing viewshed maps and field observation to determine whether or not individual resources would have a view of the Project.

Impact on Visual Resources

111 receptors generally meeting the defined criteria for visual resources of statewide significance or local importance were identified within the 15-mile radius study area. Fifty-four (54) of these places were determined through viewshed analysis and field confirmation to be screened from the Project by intervening landform and vegetation. Of the remaining potentially affected resources, the vast majority are located on the mainland, a minimum of 5.6 miles from Galloo Island; within the far background distance zone. As such impact on these resources located on the mainland is expected to be minimal to negligible.

Only visual resources on Galloo and nearby islands, and Lake Ontario itself offer views of the Project from the foreground and middleground distance zones. The following summarizes the resource type and public access opportunities for each resource located within five miles of the Project:

- Galloo Island Lighthouse – The Galloo Island lighthouse and keeper's quarters, are listed on the National Register of Historic Places. The lighthouse property is privately owned. Structures are uninhabited and in a state of disrepair. Public access is not permitted.
- Galloo Island Wildlife Management Area – This 26-acre WMA is located at the southwestern end of Galloo Island and serves as a preserved habitat for the Island's numerous wildlife species. Access to the Galloo Island WMA is by boat only and due to the remoteness of the island and difficult access (there are no

docking facilities on this rocky coastline) the WMA is not readily available to the general public.

- Little Galloo Island Unique Area – This 45-acre Unique Area is located approximately ½ mile south of Galloo Island. The Unique Area includes the Lake Ontario Islands Bird Conservation Area, managed by the NYSDEC. Access to the Little Galloo Island Unique Area is available by boat and is currently restricted.
- Lake Ontario – Lake Ontario is the overarching scenic feature of the eastern Lake Ontario region and principal source of regional tourism. As such it must be considered an important aesthetic resource. The vast majority of recreational and scenic opportunities are afforded to the general public from coastal vantage points a minimum of 5.6 miles distant from the Project site. Only recreational powerboats and sailing craft have opportunity to venture closer to the Galloo Island. While on water recreational viewers will be directly impacted by views of the project when within immediate proximity to Galloo Island, boaters traveling five miles offshore represent a relatively small percentage of the general public visiting the study area. Furthermore this sort of travel is further restricted by the inclement weather prevalent in the region, especially during the winter months. The presence of the project may, to some degree diminish the aesthetic experience of boaters for the time they are within immediate proximity of the Project. However, such impact is transient and will diminish with distance.

Visual Simulations

To demonstrate potential Project Visibility visual Simulations were prepared from the following locations:

- Tibbetts Point Lighthouse
- Eastern Ontario Waterway Access (NYSDEC Boat Launch)
- Galloo Island Lighthouse
- Robert G. Wehle State Park (Cliff View)
- Robert G. Wehle State Park
- Southwick Beach State Park
- Black Pond WMA
- NYS Route 3/Seaway Trail Scenic Byway (Overlook)
- Association Island
- Westcott Beach State Park (Camping Area – North End)
- Westcott Beach State Park
- Sackets Harbor State Historic Site (Battlefield)
- Lake Ontario (Grenadier Island)

- Lake Ontario (Fox Island)
- Lake Ontario (Isthmus Island)
- Lake Ontario (Cliffs on North Side of Galloo Island)
- Lake Ontario (North Pond)
- Lake Ontario (Gil Harbor – ½ mile from Galloo Island)
- Lake Ontario (Gil Harbor)
- Lake Ontario (Dock Facility)
- Lake Ontario (Calf Island Spit)
- Lake Ontario (Approximately ½ Mile Southwest from Galloo Island Lighthouse)

Three line of sight profile were completed from the mainland. These were done to demonstrate that majority of the distance between the tower and the viewer is over open water (Appendix P).

Due to access and visibility issues, the Eastern Ontario Waterway Access (NYSDEC boat launch) and two (2) locations in the Westcott Beach State Park were simulated in place of Stony Point Lighthouse and Point Peninsula WMA. Also, due to vegetation screening a simulation was completed from the top of the Galloo Island Lighthouse instead of at ground level. These simulations are included in Appendix P.

The NYSDEC visual Policy states,

> *"Aesthetic impact occurs when there is a detrimental effect on the perceived beauty of a place or structure. Significant aesthetic impacts are those that may cause a diminishment of the public enjoyment and appreciation of an inventoried resource, or one that impairs the character or quality of such a place. Proposed large facilities by themselves should not be a trigger for a declaration of significance. Instead, a Project by virtue of its siting in visual proximity to an inventoried resource may lead staff to conclude that there may be a significant impact."*

Based on this definition, it is reasonable to conclude that simple visibility of the proposed wind farm (albeit a large facility) from any of these affected resources of statewide significance does not result in detrimental effect on the perceived beauty of the place or structure. Given the significant distance of the project from virtually all publicly accessible vantage points, the project will not cause the diminishment of public

enjoyment and appreciation of an inventoried resource, or impair the character or quality of such a place.

Mitigation

The DEC Visual Policy states that only where "significant impacts are identified" by the visual assessment is the applicant required to employ reasonable and necessary mitigation measures. The Visual Assessment for this Project does not identify significant impacts and therefore, no mitigation is required.

Nonetheless, the DEC Visual Policy provides typical mitigation options that "may reduce or eliminate the visibility of the project or alter the project's effect on the scenic or aesthetic resource in some way". The applicability of these mitigation options were evaluated and are summarized below.

Direct Mitigation

Professional Design:

- Proposed turbines will not be used for commercial advertising, or include conspicuous lettering or corporate logos identifying the Project owner or equipment manufacturer.
- Ancillary facilities (e.g. substation, transition station, operations and maintenance, etc) will be located on Galloo Island, which is over 5.6 miles from the mainland in order to minimize the perceived visual impact from those parts of the Project, from most potential viewers.

Screening:

Considering the Project includes up to 84 wind turbines that will be visible over a wide viewshed area, traditional treatments such as fences, earthen berms and vegetative screening cannot be applied on Galloo Island in an effective manner to screen these structures from nearby islands, boaters, or the mainland.

Project Siting/Relocation:

The Project is located on Galloo Island for the following reasons:

- Favorable elevation and exposure of the Project area which is well suited for receiving prevailing winds;
- Reliable winds that meet the necessary criteria for a commercially viable wind energy Project;

- Its distance to the nearest point along the mainland exceeds 5 miles lessening the potential for visual impact; and
- By their nature, modern wind energy projects are large and highly visible facilities. Given the necessary scale of wind energy turbines and the number of turbines required for a sustainable project, there is no opportunity to relocate the Project or any of its components to a site on the mainland where it would be substantially less visible.

WTG placement on Galloo Island will be largely dictated by environmental constraints.

Camouflage/Disguise:

The color of the blades, nacelle, and tower will be a neutral off-white. While the FAA recommends this color for aviation safety, this color is well suited to minimize visual contrast with the background sky (from the ground).

Non-specular Material:

Wind turbine towers will be painted metal structures and blades will be painted fiberglass composite. Where specifications permit, non-specular paint will be used on all outside surfaces to minimize reflected glare.

Lighting:

Due to the height of the WTG, the Federal Aviation Administration requires red flashing aviation obstruction lighting be placed atop the nacelle on approximately 23 of the 84 turbines to assure safe flight navigation in the vicinity of the Project. Lighting will be at the lowest intensity required for pilot safety. This federally mandated safety feature cannot be omitted or reduced.

Maintenance:

How a landscape and structures in the landscape are maintained have aesthetic implications to the long-term visual character of a Project. Recognizing that its public image will be directly linked to the outward appearance of its facilities and desiring to be a welcomed member of the community, a strict policy of maintenance, including materials and practices that ensure a clean and well-maintained appearance over the full life of the facility will be implemented.

Mitigation Offsets

No additional mitigation measures are necessary as the Project does not result in detrimental effect on the perceived beauty of an inventoried resource; nor will the Project cause the diminishment of public enjoyment and appreciation of an inventoried resource, or impair the character or quality of such a place.

2.7 Archaeological and Historic Resources

Panamerican Consultants, Inc (Panamerican) was contracted by Upstate Power to complete a Phase IA cultural resources investigation (Phase IA); the investigation was conducted between November 2007 and February 2008. In December 2007, in conjunction with conducting the Phase IA, Panamerican provided a project description and project maps to the SHPO in an initial consultation. SHPO subsequently issued a Project Review Number: 07PR6733. The findings of the Phase IA are summarized in this section as well as the End of field letter for the on-island archeological investigation. The Phase IA Cultural Resources Investigation for the proposed Hounsfield Wind farm, Galloo Island Project Area, is included in Appendix I.

The purpose of the Phase IA investigation was to determine if any previously recorded cultural resources are present within the Project Area. The methodology employed by Panamerican included archival, documentary, and historic map research, a site file and literature search, the examination of properties listed in the State and National Registers of Historic Places (S/NRHP), a "windshield survey" of historical structures, a walkover reconnaissance of the Project area, assessments of cultural resource sensitivity and past disturbances within the Project area, and photographic documentation of conditions throughout the on-island Project area. This methodology conforms to SHPO Guidelines for Wind Farm Development (2006), as well as Section 106 of the National Historic Preservation Act and Section 14.09 of the State Historic Preservation Act.

Consultation with SHPO will take place in accordance with Section 106 of the National Historic Preservation Act. Following SHPO review of all historic and archaeological reports and a determination of impacts from the Project, the Project Sponsor and SHPO will negotiate appropriate actions to mitigate for or offset those impacts. These

mitigations will be memorialized in a Memorandum of Agreement (MOA) between the Project Sponsor and SHPO.

Additional cultural resources investigations are being conducted as part of the transmission line from Galloo Island to the system interconnect at Parish, NY. Because the transmission line is subject to review and approval by the NYS Department of Public Service, under Public Service Law Article VII, it is not subject to SEQRA and the results are therefore not included in this DEIS.

Characterization

Archaeological resources include known archaeological sites (prehistoric and historic) and highly sensitive areas suspected to contain archaeological sites. Historic Architecture resources consist of historic structures, sites or other above ground features that are listed or eligible for listing on the S/NRHP.

Prehistoric Archaeological Sensitivity

Based on a review of the archaeological on-line resources and site files at the SHPO and New York State Museum (NYSM) conducted as part of the Phase IA investigation, no previously recorded prehistoric or historic archaeological sites were identified on Galloo Island. In addition, results were identified using the SHPO Sphynx model.

Prehistoric groups did not consider the Project area attractive for long-term settlement. A major contributing factor of this assessment is the Project area's inaccessibility. However, the Project Area is sensitive for small campsites, proximate to the coast and adjacent to wetlands. Due to the limited carrying capacity of the island, the likelihood of an unreported village site on the island is low. The setting of the Project area on a relatively large island in Lake Ontario, however, made it suitable for resource procurement (e.g. hunting, fishing, and limited gathering).

Sensitivity varies for finding other prehistoric sites; such as quarries, rockshelters, mounds, and burial sites. Due to the limestone bedrock underlying the Project area, the likelihood of finding prehistoric quarry sites is moderate. Since the terrain is relatively

flat, the likelihood of finding rockshelter sites is near zero. As the island lacks reasonably deep soil, the possibility of finding mounds or burial sites is generally low.

Historic Archaeological Sensitivity

Based on a review of the archaeological site files, no historic archaeological sites are recorded as being within the Project area.

The production of shingle and shakes from the once extensive stand of cedar is the likely initial historic use of the Project area. Following deforestation, the island was used for grazing and agricultural purposes. Historic farmsteads and milling were located all along the southeastern shore.

Existing Historic Architecture Resources

Of the existing architectural resources on the island, there are six structures on Galloo Island that are greater than 50 years old. These include the lighthouse with attached keeper's house, the fog-horn house, the Main Lodge, the "Clubhouse", the former Coast Guard Station main structure, and the associated boathouse. Only the lighthouse with attached keeper's house and fog-horn building are listed on the NRHP, added in 1983. The Coast Guard Station main structure and associated boathouse are both in deteriorated condition and do not appear to meet the National Register criteria for individual listing. They may be eligible for listing as part of a thematic (maritime) multiple resource listing if they can be associated closely with the lighthouse. However, the present lighthouse pre-dates the Coast Guard Station by eighty years and originally by more than a hundred years. The Main lodge and "Clubhouse" do not appear to be eligible for NRHP listing as their origins are unknown. Additionally, the Main Lodge has been significantly modified over time and the "Clubhouse" may have been relocated.

Impacts

Prehistoric and Historic Archaeological Resources

As a result of the Phase IA findings, it was determined that additional field study be undertaken to evaluate potential impacts to both historic architecture and archaeological resources.

While the prehistoric sensitivity of the island is low to moderate, it is reasonable to assume that Native Americans may have used the island periodically throughout prehistory for hunting, fishing, and trapping. Seasonal, short-term camps would be the most likely settlement type to occur on Galloo Island. Prehistorically sensitive areas account for approximately 300 acres.

Locations within the Project Area sensitive for Historic Archaeological Resources are likely to be located in proximity to structures documented historic maps available from 1887 and 1895. There is a moderate to high possibility that midden or artifact deposits, may be found along the southeastern shore.

The Phase IA report recommends that a Phase IB survey (utilizing an 8-10% sample surveyed through a combination of plowing and shovel testing) be conducted to address the potential for prehistoric remains. The recommended Phase IB survey for historic period archaeological remains would:

- Locate and map foundation remains not observed during Phase IA
- Determine presence of middens or artifact deposits associated with historic period foundations.
- Locate and map the remains of one or (possibly two) map referenced watchtower(s).
- Determine the likely locations of any interior refuse disposal areas.

At the time of preparing this DEIS, field work for the Phase IB Archaeological Survey Investigation has been complete and an "end of field letter" has been prepared and included in Appendix I. The Phase IB field work to investigate sensitive areas for archaeological (underground) resources results was conducted following a testing plan provided to SHPO in a letter dated August 4, 2008 (found in Appendix I). Approximately 370 acres were investigated with 5,939 shovel tests. The Phase IB testing did not result in the identification of any significant archaeological finds.

Historic Architecture Resources

Project construction is not anticipated to have any direct physical impact on NHRP listed or eligible for listing historic resources within the Project area. Specifically, the potential impact to the Galloo Island Lighthouse and the other six structures on Galloo Island that

are greater than 50 years old will be limited to visual impacts. The Visual Resource Assessment includes a photographic simulation demonstrating the visual impact to the lighthouse. The historic architectural significance of the lighthouse will not be adversely affected by the visual impact.

Mitigation

Archaeological Resources

If during construction a previously unknown significant archaeological resource is discovered, all work at that site will cease until a representative from SHPO and a cultural resources company can be consulted. In addition, all areas identified in the Phase IB study as containing significant archeological resources will be avoided.

Architectural Resources

To minimize contrast with the S/NRHP listed lighthouse, turbines will be painted off-white and have a neutral, low reflectivity finish. Additionally, mandated FAA lighting will be lowest intensity required for pilot safety as described in Section 2.13.

Other Archeological and Historical Resources Mitigation

If impacts are determined to require additional mitigation, one potential mitigation measure is photo documentation and discussion of historic features/activities on the island that would likely be disturbed as a result of project construction including the cedar stump field and fences. Amitigation plan will be prepared with the input of SHPO if deemednecessary to mitigate potential impacts. The mitigation plan will be incorporated herein and memorialized in a Memorandum of Agreement with the Army Corps of Engineers and SHPO.

2.8 Socioeconomics

Characterization

The Project Area is located on Galloo Island in the Town of Hounsfield, Jefferson County, New York. The Town of Hounsfield is part of the larger area of Watertown-Fort Drum and lies on the western side of northern New York State; it is located

approximately 60 miles due north of the City of Syracuse. The Project Area is located approximately 5.8 miles offshore in Lake Ontario.

Schools

The Project Area falls within the limits of the Sackets Harbor Central School District, which serves the Towns of Hounsfield, Henderson, and Adams. Total K-12 enrollment of this district was 480 students in 2006 (New York State Department of Education). According to the New York State School Report Card Fiscal Accountability Supplement, total instructional expenditures for the Sackets Harbor Central School District amounted to $4,940,184 for the 2005-2006 school year. There are no students of the Sackets Harbor Central School District permanently residing in the Project Area.

Open Space and Recreation

There are currently no designated public open spaces or recreational areas in the Project Area. Since the Project Area is mostly undeveloped, the landscape consists of passive open space.

Two Project Area parcels, owned by the NYSDEC, are part of the Lake Ontario Islands Wildlife Management Area. These parcels are not currently suitable for public use as both parcels are virtually inaccessible by boat. According to the Lake Ontario Islands Wildlife Management Area Management Plan, the NYSDEC desires to improve public use of these parcels through the development of appropriate use facilities and opportunities. However, no formal current plans are in place by the NYSDEC to provide public access to their properties. Even if public access were eventually provided, the remote nature of the island, often coupled with the potentially severe weather conditions in the area, would generally result in relatively few public visits to the NYSDEC lands and limit those visits to the days in which open water allows boating.

The portion of Lake Ontario near Galloo Island is sparsely used for recreational activities including boating, fishing and other water based recreation.

Police, Fire and Emergency Services

The Town of Hounsfield is served by the Jefferson County Office of Fire & Emergency Management, the lead coordinating agency for regional preparedness and computer-aided dispatch services. Specifically, law enforcement services are provided to the Town of Hounsfield by the Jefferson County Sheriff's Department and fire/emergency medical services by the all-volunteer Sackets Harbor Fire Company. There are three hospitals that serve the area; Carthage Area Hospital in Carthage, New York, River Hospital in Alexandria Bay, and Samaritan Medical Center in Watertown. Of the three, Samaritan Medical Center is the largest facility with 294 beds. It is also the closest facility to the Project Area at a linear distance of approximately 23 miles.

Operational Requirements for Septic, Sewer, Lighting and Solid Waste

Operation of the island will require electricity for the water intake system, wastewater treatment and lighting the towers and buildings. These systems will be private on-site services that will be approved as required by the NYSDEC and other regulatory agencies. Solid waste will also be generated both during construction and operation of the Project.

Existing Employment Base and Industry

There are no employees permanently residing within the Project Area. According to the 2000 Census of Population and Housing, the Town of Hounsfield has a civilian employment base of 1,583 persons, while Jefferson County has a civilian employment base of 40,482 persons. The largest industry in both the Town of Hounsfield and Jefferson County is Educational, Health, and Social Services. This industry accounts for 397 civilian jobs in the Town of Hounsfield and 9,886 civilian jobs in Jefferson County. Table 2.8-1 summarizes employment by industry in Town of Hounsfield and Jefferson County.

Table 2.8-1: Employment Base

Industry	**Employed Civilian Population 16 Years and Over** **Town of Hounsfield**	**Employed Civilian Population 16 Years and Over** **Jefferson County**
Agriculture, Forestry, Fishing, Hunting, and Mining	85	1,369
Construction	118	2,363

Manufacturing	137	3,890
Wholesale Trade	40	1,083
Retail Trade	212	5,764
Transportation, Warehousing, and Utilities	70	1,838
Information	27	1,078
Finance, Insurance, Real Estate, Rental & Leasing	68	1,381
Professional, Scientific, Management, Administrative, and Waste Management	77	1,858
Educational, Health, and Social Services	397	9,886
Arts, Entertainment, Recreation, Accommodation, and Food Services	101	3,698
Other Services	100	2,070
Public Administration	151	4,204
Total	**1,583**	**40,482**

Source: U.S. Census Bureau, 2000

Tax Base and PILOT Payments

According to the New York State Office of the State Comptroller, the total real property tax base for the Town of Hounsfield was reported in 2006 to be $172,443,268. The total real property tax base for Jefferson County was reported in 2006 to be $4,263,118,806.

Real property that contains a wind farm approved by the New York State Energy Research and Development Authority is exempt from property taxation (not including special district taxes) for a period of 15 years under New York State Real Property Tax Law (RPTL Section 487). While the RPTL property tax exemption provides an attractive incentive for developers of wind power facilities, local taxing jurisdictions including counties, towns, cities, and villages, may disallow the exemption and require that a project pay its full tax burden. However, many local taxing jurisdictions use the exemption as a means to negotiate a PILOT with the project developer. Local taxing jurisdictions can negotiate a PILOT agreement that establishes a specified annual payment in return for continuation of the property tax exemption. Upstate Power has discussed the potential PILOT payment with the Town of Hounsfield, current negotiations are for $8,000 per MW.

Public Funding and Tax Credits

The Project may benefit from the Federal PTC which currently amounts to about $19 per mwh. This PTC is scheduled to expire at the end of 2009, and the ability of the Project to benefit from the PTC allowance is dependent upon the allowance being renewed by Congress, and still being in effect at the time the Project could qualify.

The Project could also benefit from NYSERDA's Renewable Energy Credit program ("REC"). The RECs are currently being auctioned off by NYSERDA at an average of about $17 per mwh. RECs are competitively awarded through auction, and the Project may or may not bid on RECs, and may or may not be a successful bidder.

Commercial Business

There are no commercial businesses located in the Project Area. Most commercial activity within the Town of Hounsfield is conducted in the Village of Sackets Harbor, located onshore approximately 12 miles west of the Project Area. Businesses in this area generally include art galleries, hotels, marinas, museums, restaurants and specialty shops.

Local Demographics

Total Population

There are no permanent residents in the Project Area. According to the 2000 Census of Population and Housing, the Town of Hounsfield and Jefferson County have total populations of 3,387 and 111,738 persons, respectively.

Racial Composition

The majority of the population in the Town of Hounsfield is 'white alone', representing approximately 95.9% of the total population. Jefferson County is slightly more diverse with minority populations composing 11.4% of the total population. Table 2.8-2 provides a summary of the racial composition in the Town of Hounsfield and Jefferson County. Note that Hispanic ethnicity is a separate data category from race and should not be added to race totals.

Table 2.8-2: Racial Composition

Population Group	Total Population Town of	Percent of Total (%)	Total Population Jefferson	Percent of Total (%)

	Hounsfield		**County**	
Total Population, All Races	3,387	100	111,738	100
White Alone	3,247	95.9	99,014	88.6
Black/African American Alone	14	0.4	6,310	5.6
American Indian or Alaska Native Alone	30	0.9	682	0.6
Asian Alone	15	0.4	1,171	1.1
Native Hawaiian and other Pacific Islander Alone	0	0.0	143	0.1
Some Other Race Alone	11	0.3	2,207	2.0
Two or More Races	70	2.1	2,211	2.0
Hispanic or Latino	57	1.7	4,479	4.0

Source: U.S. Census Bureau, 2000

Households

There are no households in the Project Area. According to the 2000 Census of Population and Housing, there are 1,384 households (942 family, 442 non-family) in the Town of Hounsfield. In Jefferson County, there are 40,108 households (28,250 family, 11,858 non-family). The median household income (in 1999 dollars) is $42,011 in the Town of Hounsfield and $34,006 in Jefferson County.

Poverty Status

Poverty in the Town of Hounsfield is relatively low, approximately 10.6% of town residents possessed incomes below the poverty level in 1999. Poverty in Jefferson County is slightly higher at approximately 13.3%. Table 2.8-3 provides a summary of poverty status by population group in the Town of Hounsfield and Jefferson County.

Table 2.8-3: Poverty Status

Population Group	**Income in 1999 Below Poverty Level – Town of Hounsfield**		**Income in 1999 Below Poverty Level – Jefferson County**	
	Total	**Percent of Total (%)**	**Total**	**Percent of Total (%)**
Total Poverty, All Races	359	10.6	13,751	13.3
White Alone	326	10.1	12,275	13.0
Black/African American Alone	5	35.7	565	13.8
American Indian or Alaska Native Alone	0	0.0	130	21.8
Asian Alone	0	0.0	101	9.3
Native Hawaiian and other	0	0.0	25	18.4

Pacific Islander Alone				
Some Other Race Alone	0	0.0	244	16.7
Two or More Races	28	40.0	411	20.8
Hispanic or Latino	23	40.4	608	19.4

Source: U.S. Census Bureau, 2000

Housing

There are a total of 1,843 housing units in the Town of Hounsfield and 54,070 housing units in Jefferson County. Approximately 74% of housing units in both the Town of Hounsfield and Jefferson County are either owner-occupied or renter-occupied. The remaining housing units are classified as vacant. Of the 485 vacant units in the Town of Hounsfield, 418 are classified as seasonal residences. In Jefferson County, 10,248 of the 14,002 vacant housing units are classified as seasonal residences. Table 2.8-4 provides a summary of housing characteristics in the Town of Hounsfield and Jefferson County. Note that "median value" is indicative of all owner-occupied housing units only.

Table 2.8-4: Housing Characteristics

Housing Characteristic	Town of Hounsfield	Percent of Total (%)	Jefferson County	Percent of Total (%)
Total Housing Units	1,843	100	54,070	100
Renter-Occupied Unites	449	24.4	16,118	29.8
Owner-Occupied Units	909	49.3	23,950	44.3
Vacant Units	485 (418 seasonal)	26.3 (22.7 seasonal)	14,002 (10,248 seasonal)	25.9 (19.0 seasonal)
Median Value	$73,300	N/A	$66,100	N/A

Source: U.S. Census Bureau, 2000

Impacts

Schools

No adverse impacts are anticipated for the Sackets Harbor Central School District as the Project is not expected to increase school enrollment above current levels. The school district will benefit from increased tax revenue through PILOT payments provided by the Project.

Open Space and Recreation

There are currently no designated public open spaces or recreational areas at the Project area; therefore, no significant adverse impacts are anticipated. The Project is not

expected to hinder future recreational opportunities at the NYSDEC-owned parcels, part of the Lake Ontario Islands Wildlife Management Area.

The increased boat traffic to and from the Island associated with the construction of the Project has the potential to limit but will not preclude the recreational use of this portion of Lake Ontario. However, due to the relatively infrequent use of this portion of Lake Ontario for recreational activities (only accessible by boat) it is not anticipated that construction and operation of the Project will interfere with the overall use of Lake Ontario for recreational activities. In addition, the impacts associated with the use of the Lake will be limited to during construction, which is anticipated to be three years. These temporary impacts will not permanently impact recreational use of this portion of Lake Ontario.

Police, Fire, and Emergency Services

The Jefferson County Office of Fire & Emergency Management and the USCG are able to provide support if necessary. Due to the remote location of the Project, however, the primary responsibility of emergency management and response will belong to the facility operator, Upstate Power. Upstate Power will maintain a small infirmary, staff trained in emergency medical services and access to a helicopter for emergency transport on the island, and trained personnel to handle fire protection. There is no additional need for increased fire or emergency medical services due to the construction and operation of the Project; therefore, no significant adverse impact is anticipated.

Operational Requirements for Septic, Sewer, Lighting and Solid Waste

Sewer needs on the island will be provided by the Project. A sewage treatment plant will be installed prior to construction; treated sanitary waste will be discharged into Lake Ontario. A septic system will not be installed on the island as part of the Project.

Electrical needs on the island will be provided by the Project. Electricity generated on the island will be fed into the transformer and then to the Project components that require it. During construction, electrical needs will be provided by an on-site generating facility.

Solid waste will be temporarily stored on the island, and will be shipped weekly via service barge to a regulated landfill on the mainland for disposal.

Existing Employment and Industry

No adverse impacts are expected for employment and industry in the Town of Hounsfield. Positive impacts to employment may occur during construction of the project as it is anticipated that over 200 employees will be required during construction. The workers will be mostly housed on the island.

Operationally, the project is anticipated to staff 24 full-time employees who would live on the island for shifts that are anticipated to be from several days to a week-long. This employment may add approximately $1,440,000 annually of new salary income to the Hounsfield area.

Local Employment Tourism, Boating, and Fishing

Due to the remote location of the Project, no impact to tourism or tourism-related employment on the mainland is anticipated. Regardless, a survey conducted in 2003 for the East Haven Windfarm in Vermont revealed that 95 percent of visitors to the state's Northeast Kingdom would not be deterred from further visits by the existence of wind turbine generators. The survey was conducted by the Institute for Integrated Rural Tourism. The Project sponsor does not anticipate promoting the Project as a tourist attraction.

Outside of deliveries, addressed in Section 2.4.1, there will be no activity within Lake Ontario. As such, no impact to boating and fishing is anticipated. The USCG, at their discretion, may issue a warning to mariners during Project construction notifying them of construction-related activity in the vicinity of the Galloo Island.

Tax Base and PILOT Payments

Some property will be removed from the tax rolls to accommodate the WTG and related facilities; however, PILOT payments will result in a net increase in tax payments. It is anticipated that PILOT payments will value $8,000 per MW. At 252 MW, total PILOT payments are anticipated to be $2,016,000 and are expected to be split between the Town

of Hounsfield, Jefferson County, and the Sackets Harbor Central School District. Use of PILOT payments is at the discretion of these agencies. After the term of the PILOT agreement expires, the Project will be taxed at its full assessed value.

Commercial Business

No significant adverse impact in the form of net economic losses is anticipated for commercial businesses in the Town of Hounsfield or Jefferson County. It is likely some supplies will be purchased locally during the construction and operation of the wind farm.

Local Demographics

No significant adverse impacts are anticipated for local demographics in the Town of Hounsfield and Jefferson County including population, racial and household composition, poverty status, and housing conditions.

Navigation during Construction and Operation

Due to the remote location of the Project, no impact to commercial or recreational navigation is anticipated. According to National Oceanic and Atmospheric Administration Lake Survey Chart #14802, there are no commercial shipping channels in the vicinity of the Project. The closest commercial shipping channel is located approximately 3 miles northwest of Galloo Island.

Electricity Rates and Reliability

The Project is not anticipated to impact local electricity rates and reliability. According to the Utility Wind Integration Group, when a large amount of wind energy is added to the grid, modest amounts of additional generation may be required to accommodate wind energy's variability so as not to affect reliability. These costs are generally small, about 10% or less of the wholesale value of the wind energy, and depend on the mix of generation on a given system and various other factors. These factors, however, can be managed through proper plant interconnection, integration, transmission planning, and system and market operations. In many cases, customer payments can be decreased when wind is added to the system because the operating-cost increases could be offset by savings from displacing fossil fuel generation (UWIG, 2006).

The Project will comply with New York Independent System Operator and Federal Energy Regulatory Commission regulations.

Mitigation

Opportunities for Local Education and Tourism Based on Green Energy

Although docking facilities will be operational, it is not anticipated that the Project will be used for educational and tourism purposes. Opportunities for local education and tourism based on green energy are limited due to the Project's location.

As there are no identified significant adverse impacts, no mitigation is required.

2.9 Public Safety

This section identifies potential health and safety risks to the public from the construction and operation of the Project. It is anticipated that due to the fact the public will not have access to the island, the construction and operation of the project will not require additional fire and emergency services from mainland emergency providers. In the event of a fire or other emergency the emergency response plan will ensure response by trained Upstate Power personnel.

Characterization

The Project will be located on Galloo Island which is private property and is approximately 8 miles from the mainland. The island is accessible only by boat, plane or helicopter. There are no public access ports, docks, or airstrips on the island. Once the Project is built, the island will only be accessible by boat or helicopter.

Fire Response

Emergency fire response to the island is limited by its remote nature. Currently, the island is occupied seasonally. Seasonal residents are responsible for their own emergency fire response services.

Aircraft Routes

A private grass landing strip is present on the island and is used by the island operators to access the island during periods of high waves. No public airfields are near the island.

The nearest public airport is Watertown International Airport, approximately 20 miles to the east.

Shipping Services

Galloo Island is not within the designated St. Lawrence Seaway/Lake Ontario shipping routes. Supplies and materials are currently brought to the island via airplane, small boats or small barges. Boats and barges are off loaded at a small private dock in Gill Harbor.

Impact

Due to the remote location and lack of permanent residences within 6 miles of the island, typical public safety issues for wind farms located on the mainland, such as ice shedding, ice throw, and tower collapse, do not pose the potential for impact for the Project. However, the following issues are assessed for their potential impact on public safety.

Fire

There is a risk of an accidental fire during Project construction and as part of ongoing operations and maintenance. A fire could be caused by mechanical malfunction inside the wind turbine generators and at other project facilities such as the substation. In addition, the potential exists for fire from a lightning strike. Since the project is situated on a private island, there are no residential, commercial or industrial areas near the site. Therefore, there are no significant impacts to the public in the event of a fire onsite. Fire could result in the need for an evacuation of onsite personnel by either helicopter or boat.

Aircraft

Upstate Power engaged Aviation Management Associates, Inc. to perform an obstruction analysis for Galloo Island. The report, *An Obstruction Evaluation for the Galloo Island Project* is provided in Appendix R. The purpose of the study was to identify obstacle identification surfaces established by the FAA in close proximity to the study area. Both commerical and military airspace and FAA long range radar were evaluated. The study found that Galloo Island was 8.5 nautical miles (approximately 10 statute miles) west of Watertown International Airport Class E airspace. Class E airspace is (according to the International Civil Aviation Organization classification) “a combination of controlled and

uncontrolled airspace, generally above 8,500 feet." The study also showed that Galloo Island is outside the three instrument approaches for Watertown International Airport. An instrument approach is a type of navigation that allows pilots to land in reduced visibility conditions around airports. The fact that Galloo Island is outside the three instrument approach indicates that the Project should not impact flights into Watertown International Airport.

The evaluation also looked at military airspace and flight paths. Although there was one IFR Military Training Route identifed that borders the western edge of Galloo Island, it was determined that proximity to an IFR Military Training Route is not justification for the issuance of a hazard determination nor should it limit the the height of proposed turbines on the island. This assessment is included in Appendix R.

The study also evaluated the FAA's long range radar using the FAA's long range radar impact tool. The study concluded that the Project fell outside of the areas identified by the FAA as having a high probability of impact. Therefore, it is unlikely that the Project will have any impacts on long range radar and therefore there is no need to consider limiting turbine heights on Galloo Island.

The study found that there are no FAA obstacle identification surfaces; thus there are no impacts to commercial airports and/or military bases in the region. Local small aircraft do fly over the lake and may from time to time fly near or over Galloo Island. WTGs may pose a risk to these planes. However, the towers will be lit to FAA standards to provide visible warning to local pilots. This is discussed in detail in Section 2.13 – Mandated FAA Lighting

There are no private airfields within 13 miles of the project. Figure 2.9-1 shows the locations of private airfields registered with the FAA and near the Project Area. This map shows reference locations for airfields that have been registered with the FAA or independently reported to airnav.com, a voluntary internet listing of airfields. Private airfields are not subject to FAA airfield obstruction regulations, but FAA regulations [FAA 77 C.25(1)] for small, regularly-used public access airports generally limit the height of structures within 5,000 feet (0.9 miles) of the ends of runways.

Shipping Security

Security must be maintained regarding the transfer of materials and equipment from international sources to the project. The Project will construct a slip channel docking facility to allow for equipment plus supplies to be brought to the island during construction and operation. This facility will be able to accommodate large industrial shipping barges. International shipments will be delivered to transfer facility prior to being delivered to Galloo Island.

All international shipments will be delivered through the St. Lawrence Seaway Corporation to the Port of Oswego. Both of these corporations are certified to handle international shipments. The Port of Oswego adheres to the strict regulations of the Department of Homeland Security and the USSCG. During vessel operations, the Port establishes both secure and restricted zones as required under the published Facility Security Plan. Once inspected and cleared by Customs at the Port of Oswego, materials and equipment will either be shipped by barge to Galloo Island and stockpiled for use, or equipment will by stored at the Port of Oswego until required on site for construction purposes.

Substation Site Security

As discussed earlier, Galloo Island is a remote, private island with access largely limited to Project workers. The substation will be fenced with an eight-foot high chain link fence with downward focused security lighting. Given the remote nature of the island and the security measures that will be in place, there are no impacts to public safety associated with substation site security.

Lightning

Due to the height of the turbines, there is a potential for lightning strikes. However the Project area is remote, there are no residents on the island and there is limited access to the island. Therefore, impacts associated with lightning strikes is not anticipated. In addition, the WTG blades will be grounded in order to minimize the damage from lightning strikes. Once struck, lightning will be discharged to the ground where it will

dissipate quickly, posing little threat to the area. If lightning damages a blade, the WTG will shut down and will remain inoperable until the blade is replaced.

Mitigation

Due to the remote location of the island and limited public access, it is anticipated that the Project will have no public safety impacts. Nonetheless, the Project Sponsor will implement a number of measures to further address emergency situations and ensure protection of workers on the island. In order to construct and operate the Project safely and securely, the all Project components will be constructed and operated in accordance with federal, State and local regulations and codes, including New York State Fire and Building Codes.

Fire

As discussed in Section 2.8 - Socioeconomics, the local fire department will not be responsible for responding to fires on the island. Instead an Emergency Response Plan for the island will be implemented which will include procedures (preconstruction through project operation) for mitigation of fire and emergency services. This plan will outline on site equipment and the procedures for fire suppression, medical and weather emergency evacuation as well as other critical areas. In addition, regularly scheduled meetings will be held with local emergency providers. A Conceptual Emergency Response Plan is included in Appendix S. Typical procedures for fire response are also provided below.

The most serious of fires that would cause a need for assistance would be in the nacelle. However, there are several safety measures that will be in place prior to operation. Turbine operations will be monitored 24 hours/day by a resident crew of employees. The towers are designed with internal fire suppression systems that will automatically activate if a fire occurs in the nacelle. In the event that a fire escapes the nacelle, trained personnel onsite will respond by using an onsite water truck to saturate the ground to prevent the fire from spreading along the ground and the tower will be allowed to “burn-out”.

Additionally, the base of the turbine will be constructed of a permanent gravel pad approximately 2,000 square feet in size that will reduce vegetation growth. The lack of vegetation immediately below the tower will reduce the possibility of grass acting as fuel for the fire and a means for a fire to migrate. The grounds of the switchyard and substation will be surfaced with gravel which will also minimize fire hazards. The vehicles and operations building will be equipped with a fire extinguisher at all times. All worker housing and ancillary buildings will be equipped with fire suppression systems. In the event that no onsite personnel can contain a fire, the personnel will be evacuated from the island by emergency helicopter.

As with any development project, project components including electrical generation, maintenance and residence buildings are required to meet all state and federal building and safety and fire codes. The project will also adhere to local building ordinances as they apply to the maintenance and residential facilities.

Private Aircraft

In most instances air traffic in the middle of Lake Ontario is flying higher than the airspace occupied by the project. As stated earlier, AMA has determined that constructing the Project in this area will not be a significant issue or concern for aviation safety. Upstate Power will provide all necessary information to the FAA to be added to aviation charts and FAA notices that would serve to communicate the location of the project to the aviation community.

In addition, the current private airstrip on the island will be removed and replaced by a private helipad for use by the Project and emergency aircraft only.

Last, to reduce potential air navigation impacts to small, low altitude aircraft, the project towers will be lit according to recommended FAA standards for wind farms. These standards are provided in FAA advisory circular DOT/FAA/AR-TN05/50 “Development of Obstruction Lighting Standards for Wind Turbine Farms”. This is discussed in more detail in Section 2.13, FAA Lighting. Final approval of tower lighting will be granted by the FAA just prior to construction. However, an estimated tower lighting plan, based on criteria established in TN05/50 is provided in Figure 2. 9-2.

Shipping Security

No additional mitigation measures are necessary for international shipment of materials and equipment, since international shipments will be handled through the St. Lawrence Seaway Corporation and the Port of Oswego, both of which are Corporations certified to inspect, handle, store and secure international shipments.

Because of the remoteness of the island along with the presence of a construction work force and subsequent operations work force, additional security measures will not be required on Galloo Island.

Substation Security

Given the remoteness of Galloo Island, the limited access to the island, substation fencing and security lighting, no additional mitigation measures will be required.

Lightning Strikes

The effects of lightning strikes are mitigated by turbine design. Each blade is grounded to minimize impacts from lightning. In addition, an emergency response plan, already discussed under "Fire Mitigation" is designed to minimize impact from fire, which is the primary impact associated with lightning strikes. Thus, no additional mitigation measures are required.

2.10 Microwave Beam Interference

Characterization

Microwave paths are wireless point-to-point communication links that require a clear line-of-sight path to pass telephone and other data between the two points. A typical microwave path is 30 miles long, and by linking several paths together, data can be transmitted long distances over varying terrain and land uses. Because microwave transmissions are line-of-sight communications antennas, which are approximately 10 feet in diameter, are mounted on towers to ensure the path will clear terrain and other physical obstacles (e.g., buildings) that could interfere with transmission of data along the path.

The diameter of a microwave path varies elliptically with distance from the antennas at each endpoint. The path diameter is smallest at the end points where it is equal approximately to the antennae diameter. The diameter increases gradually from the antenna to the path mid-way point. The maximum diameter of the path occurs at the path mid-way point and is a function of the path length and transmitting frequency. This diameter is referred to as the "Worst Case Fresnel Zone" or "WCFZ".

The Federal Communications Commission regulates microwave transmission and detailed data are maintained on the exact configuration of every path in the country. These data include path operating frequency, exact coordinates of endpoint towers, and mounting heights of endpoint antennas.

Impacts

Wind farms may cause interference of microwave paths in three different ways (Bacon 2002). Near field effects may occur when a wind turbine interferes with microwave signals due to the electromagnetic fields emitted by the generator and turbine components within the nacelle. Diffraction can occur when the presence of the turbine changes an advancing wave front by obstructing the path. This occurs either by the object reflecting or absorbing the signal. The third type of interference is reflection or scattering. This can occur when a wind turbine reflects or obstructs a wave between the transmitter and receiver. Typically this would be caused by rotating turbine blades.

Upstate Power engaged Comsearch, a telecommunications firm with expertise in microwave path analysis, to identify all paths and associated data in the vicinity of the Project. The report is provided in Appendix T.

No microwave paths were identified within the vicinity of Galloo Island. See Figure 2.10-1.

Mitigation

No microwave paths were identified within the vicinity of Galloo Island; therefore, the Project will not affect microwave transmissions and no mitigation is required.

2.11 Blasting Issues

Characterization

As discussed in Section 2.1 (Geology) the project site is underlain by limestone of the Trenton Group. The bedrock is heavily jointed, which would facilitate minimal blasting as the fractures already present can be expanded for rock removal. On the island (project site), bedrock is overlain by approximately 0-2 feet of overburden consisting of glaciolacustrine lake silts, clays and fine sands, with a thin layer of soil in most areas. Deeper soil depths are present on the northern quarter of the island, which is used currently used as hay fields. Numerous areas of bedrock are exposed with no overburden.

The turbine foundations will be approximately 45-feet wide and will generally be installed to a depth of approximately 6 to 8 feet below grade. The ECS will be installed approximately 3 feet below grade. Service roads will be gravel pack and will not require excavation.

A shallow slip channel (80 feet by 200 feet by 14 feet deep) will be constructed along the south-eastern side of the island that will facilitate the construction and operational shipping needs of the project.

Impacts

Based on the nature of the rock and its proximity to the surface, blasting will be required in most places where subsurface structures are required (WTG foundation and slip channel). Turbine foundations have a spread footer foundation, which is wide and shallow. For each location approximately 603 cubic yards of rock will be removed for the placement of each turbine foundation. Temporary dewatering could be necessary to facilitate construction of turbine foundations if groundwater is encountered.

Portions of ECS will be installed by various trenching and directional bore methods. Methods of installation will likely include rock saw or limited directional blasting. Open trenching for the ECS will involve the excavation of an approximately three foot trench that will be a maximum of four feet wide. Both the trenching machines and the

directional bore rig have the ability to operate in some weathered limestone conditions. Approximately 14,044 cubic yards of rock will be removed for the construction of the WTG pads and ECS by either saw cutting or blasting.

Blasting will not be required for service road installation.

The largest amount of blasting that will be required for the project is from the construction of the slip channel. The channel which is located on the southeast end of the island will be used to transport equipment to and from the site. The slip channel is designed with a main channel (80 feet wide by 200 feet long by 14 feet deep) and an approach with a total of roughly 30,151 cy of rock to be removed. Impacts from blasting to the aquatic environment are not anticipated to be significant and are discussed in Section 2.5.6 Fish and Aquatic Species. As discussed in that section, employing mitigations in the submerged blast zones will significantly reduce aquatic species impacts. These mitigations include:

- Blasting activities will be scheduled to avoid dates when there are high numbers of fish spawning and using the area for a nursery.
- The work will be located, to the extent practicable, outside of significant spawning and nursery areas. The most significant and extensive shoal areas surrounding Galloo Island are on the east and west ends. The area selected for the slip channel is on the south shoreline which drops off steeply from shore to deeper water and does not likely provide a substantial spawning and nursery area.
- Employing the use of air bubble curtains. Upstate Power will investigate the practicability and feasibility of using air bubble curtains after consultation with the federal and state resource agencies and licensed explosive experts.
- Employing “confined blasting” techniques.
- Since the bedrock already contains significant joint systems that facilitate bedrock groundwater flow to the lake, blasting within the bedrock would have minimal additional impact to groundwater flow. Furthermore, there are no permanent residents on the island and future operation and maintenance personnel on the island will receive drinking water from the lake. Since groundwater is not used on the island, any potential impact from blasting is minimal. In addition, property damage (i.e cracked windows, damaged property) that could occur would be minimized by the fact that the island will be owned by the developer and the mainland is more than five miles from blasting that would occur on the island.

Mitigation

All rock removed for construction will be reused on site as either aggregate for concrete or road base for the project.

A blasting contractor that is certified to operate in New York State and complies with all necessary and applicable Federal and regional requirements will be used. All blasting practices and appropriate personnel will conform to 12 NYCRR 39, as enforced through the New York State Department of Labor (April 1991).

Mitigation for the impacts to fish are discussed in Section 2.5.6 Fish. Mitigation measures include a prohibition of blasting during fish spawning season and the use of bubble curtains.

Additionally, a "Blasting Plan" describing blasting operations and potential impacts to local above and below grade structures will be prepared and is in Appendix A. The Blasting Plan will adhere to all applicable regulations pertaining to blasting, including NYS Departmetn of Labor explosive handling regulations (12 NYCRR Part 39) and NYSDEC blasting/mining regulations.

2.12 Decommissioning

Characterization

Expected Project Life

Wind energy is a renewable resource and does not dissipate. Therefore, the Project Area is anticipated to remain a viable location for the generation of electricity.

The wind market in the United States is experiencing strong growth. According to the U.S. Department of Energy, as referenced in their *Annual Report on U.S. Wind Power Installation, Cost, and Performance Trends: 2007*, U.S. wind power capacity increased by 46% in 2007 from the previous year. The same report states that the State of New York is among the top-twenty states in terms of annual capacity growth, increasing nearly 15% from 2006 to 2007.

The proposed WTGs have an expected useful life of at least 20 years and are certified as such by international agencies that include Underwriters Laboratories and Germanicher Lloyd AG. The WTG will be continually maintained throughout the life of the project. Moreover beyond at the end of its useful life, or at any other time, if a generator needed to be replaced for any reason, Upstate Power would likely install a new generator at the site (repowering) to best make use of its investment in Project infrastructure and continue to take maximum advantage of the unique, clean, renewable, wind resource at the site.

The only scenario in which Upstate Power anticipates decommissioning the Project is if new technologies in energy production would make the wind farm financially unviable. This is not anticipated to occur over the next 20 years and beyond. Upstate Power will own the property upon Project commissioning and therefore can dedicate the land to energy production in the long term. The availability of infrastructure and the ability to generate electricity with relatively low operating cost will justify ongoing investment in equipment maintenance, repairs, or replacements.

Impacts

In the unlikely scenario the Project is abandoned, potential impacts may be related to aesthetics, erosion and sedimentation, public safety, and navigation.

Aesthetic

Aesthetic impacts as a result of decommissioning potentially include facilities becoming dilapidated through neglect and the negative perception of a non-operating WTG. Since the Project Area is located away from residential centers, this impact is reduced. Views from the water, however, would be negatively impacted by the long-term dormancy of WTGs.

Erosion and Sedimentation

Impacts to soil include erosion and sedimentation would occur in the unlikely event that the Project was abandoned during construction and site work is not completed through re-grading and restoration

Public Safety

Impacts related to public safety are limited to unauthorized access to abandoned towers and equipment. In addition, if the towers remain in place, and maintenance is neglected, the WTG would fall into disrepair and may pose a safety hazard. Since the Project Area is remote and located 10 miles offshore from residential centers, this impact is reduced.

Mitigation

To facilitate the removal of any WTG at the end of its useful life, Upstate Power has developed a Decommissioning Plan which is included in this EIS as Appendix U. The Decommissioning Plan includes specific steps that will be taken in removing WTG and the overhead ECS. A summary of these steps are provided below.

In the unlikely event that the Project is abandoned during construction, wind turbine foundations and pedestals will be removed to a minimum depth of 36" below grade or until bedrock whichever is less. In addition, all construction materials and debris will be removed and disturbed land will be restored to original or better conditions through re-grading and re-seeding.

In the event the Project is decommissioned after it has begun operating, mitigation would include the removal of the WTG and towers, removal of each of the tower pad transformers, and removal of foundations/pedestals to a minimum depth of 36" below grade or until bedrock whichever is less. The disturbed areas will be restored to original or better conditions through re-grading and re-seeding.

In the event that either construction of the wind farm is not completed or if the wind farm ceases operation, the financial incentive of its salvage value will facilitate decommissioning. Depending on market conditions, the salvage value of the scrap steel, wire and other equipment is anticipated to be sufficient to provide the incentive for a contractor to pay for the salvage rights to remove the equipment.

Prior to the start of construction, a bond or fund will be established to ensure that sufficient funds are available to decommission and restore the Project site. This bond will be based on the net cost to decommission the towers and foundations less the

expected salvage revenue of the towers themselves. This bond or fund will be held by the Town of Hounsfield or its successor agency and will be reviewed every five years.

2.13 Mandated FAA Lighting

Characterization

Pursuant to FAA regulations because the overall height of the WTG will exceed 200 feet above ground level, Upstate Power is required to submit a Notice of Proposed Construction or Alteration form (FAA Form 7460-1) for each turbine to the FAA at least 30 days prior to the date the proposed construction is to begin. The FAA will acknowledge in writing receipt of such Notice and provide a statement on how the structure(s) should be marked and lighted in accordance with the FAA Technical Report DOT/FAA/AR-TN05/50 dated November 2005 "Development of Obstruction Lighting Standards for Wind Turbines". The FAA will also provide a statement in the acknowledgement letter whether the structure(s) would or would not exceed any standard of obstruction and/or be a hazard to air navigation.

In addition to the necessary lighting for wind farms, the Project is also required to abide by FAA lighting requirements for the proposed heliport. Because access to Galloo Island is limited to boat or aircraft, the heliport is necessary for a safe and fast method of transport of both personnel and equipment.

The heliport lighting will also be designed per FAA regulations. The lighting requirements could potentially impact navigational airspace, wildlife and visual/aesthetic resources. For night operations, the Takeoff and Landing (TLOF), the final approach & takeoff area (FATO), taxiways, taxi routes and the windsock need to be lighted.

Impacts

The Project will result in a variety of visual impacts, one of which is lighting placed on wind turbine structures and the helipad The FAA establishes minimum lighting requirements in order to ensure adequate identification of obstructions to navigable air space.

Because the Project consists of multiple steel monopole structures, each approximately 262 feet in height (approximately 410 feet with a rotor in the extreme vertical position), lighting per FAA requirements will be required and, therefore, a visual impact may result. Potential impacts related to required lighting include impacts to air navigation, wildlife and aesthetic/visual resources.

According to the 2005 FAA Technical Report, lighting on wind turbine structures will now be positioned on the outer turbines of a wind farm cluster or at a standard spacing of turbines position in a linear array. The Project turbines are configured in a non-uniform grid limited to the 4.5 mile long by 1.5 mile wide boundaries of Galloo Island. It is anticipated that only the outer turbines will be lit with a separation between lit towers to be approximately ½-mile, and red lights/strobes will flash simultaneously. In addition, turbines will now only have to display one red slow-pulse beacon (L-864), with the lighting positioned on the turbine housing elevated to above the hub height. The guidance also requires white painted turbines to provide a significant contrast to virtually all varying terrain. The red beacon will also be less of an attraction to birds migrating through the area at night.

The impact from the required lighting could result in the introduction of approximately 23 new light sources onto the landscape. Figure 2.9-2 shows the potential lighting design, based on the recommendations of FAA Technical Report DOT/FAA/AR-TN05/50. Because Galloo Island is located 10 miles off shore, it is unlikely that the lights will create a significant visual impact to shoreline viewers. The impact is further minimized as the island and towers are not visible from all shoreline areas and weather conditions (i.e. fog and haze) would also greatly visibility of the lights at that distance.

Heliport lighting normally consists of a circle or square of inset lights around the TLOF surrounded by another inset of lights around the FATO. According to the AC 150/5390-2B, a square or rectangular FATO perimeter lights provide a pilot with better visual cues and a circular pattern even if the TLOF is circular. Both sets of lights may be elevated or inset and are now recommended to be green by ICAO and FAA. The TLOF and FATO lights may be supplemented with surface floodlights. Floodlights would be aimed down

and should provide a minimum of 3-foot candles of illumination on the apron surface. Taxiway centerlines are required to be lit by flush green lights. The edges of the taxi way are required to be lit by blue omni directional lights.

A lighted windsock is also necessary. At ground-based locations, as in this instance, a row of lead-in lights in the preferred direction of approach is sometimes used. Due to the presence of the WTG on the island, it is assumed that the row of lead in lights will be utilized.

All helipad lighting [including the windsock] would only be activated for night take-offs or landings, that are not anticipated to occur frequently. Due to the limited footcandles (i.e limited light intensity) these lights are not anticipated to have any adverse impacts on aesthetics or wildlife.

Mitigation

While the WTG structures will be constructed significantly above ground level, it is not anticipated that the structures or helipad lighting will create a significant visual impact because they will be located approximately 10 miles from the shore and the helipad will be located on the open lakeside (western) side of the island.

Turbine lighting will be kept to a minimum allowable by the FAA. Based on the FAA Guidelines (2005) turbines do not require daytime lighting and allow nighttime perimeter lighting at a maximum of 0.5 miles between lit turbines.

In accordance with FAA regulations, the Project will mitigate any impacts to navigable air space by submitting a Notice of Proposed Construction or Alteration form (FAA Form 7460-1) to the FAA for each WTG structure at least 30 days prior to the date the proposed construction is to begin. The Project will follow all requirements specified in the FAA's acknowledgment letter(s), including lighting specifications in accordance with the FAA Advisory Circular AC 70/7460-1 or its subsequent pending guidance. By following this guidance, Upstate Power will be able to reduce the visual impact of mandated FAA lighting by lighting approximately 23 WTG. However, the required FAA lighting will create a visual impact to lake-borne, and possibly, shoreline viewers that

cannot be mitigated without reducing its safety objective. However, this impact has been significantly limited based on the location of the island.

To the extent permitted by the FAA, to minimize attractions to birds, Upstate Power will employ red lights instead of white lights for FAA obstruction lights.

Because the helipad lighting will be at or close to ground surface and due to the distance from the mainland, no significant visual impacts are expected and therefore no mitigation is required.

2.14 Air Resources

The WTGs themselves will not generate any air emissions. In fact, from an air resource perspective, as discussed in other sections of the DEIS, the operation of the Project will provide a net reduction of various pollutants compared with the construction of a comparable electric generating facility burning fossil fuels. However, as with a typical construction project, the construction equipment will generate temporary emissions of various pollutants. As discussed in more detail below, the temporary operation of construction equipment will not result in emissions exceeding the nonattainment New Source Review (NSR) and Prevention of Significant Deterioration (PSD) thresholds or the emission thresholds that trigger the need for a conformity determination. Accordingly, no pre-construction permits are required under these programs.[2] Moreover, no construction or operating permits are needed under 6 NYCRR Part 201 either during or after construction of the Project[3].

In particular, it is anticipated that two 350 kw-hr diesel-powered generators will be on-site during the construction period to provide power to the island All electric power

[2] The nonattainment NSR and PSD programs require new major sources of certain pollutants to comply with strict emission control and other requirements. The nonattainment NSR program applies to new major sources proposed to be constructed in areas with ambient air quality that violates the National Ambient Air Quality Standard (NAAQS) for the particular pollutant under review; the PSD program, by comparison, applies in so-called "attainment areas" that meet the NAAQS. 6 NYCRR subpart 231-2 (nonattainment NSR); 40 CFR § 52.21 (PSD). The general conformity regulations require the government to review actions in nonattainment areas which are funded, approved or otherwise supported by the federal government to confirm that they will not violate state plans for achieving NAAQS attainment. Such reviews are required only where total direct and indirect emissions of the nonattainment pollutant exceed specified thresholds. 40 CFR Part 51, subpart W.

[3] Due to the number of hours of use registration of the generators with the NYSDEC may be required.

needs on the island will be provided by these two generators during the construction period. Upon commencement of operation of the Project, the generators will remain on the island as back up power.

The two 350 kw-hr diesel powered generators will be operated during the construction season, which depending on the weather extends from April to November. In order to characterize the emissions for the generators, diesel generator emissions for Ozone (VOC's and NOx) were estimated using emissions factors from the USEPA's WebFIRE database v.6.25 and AP-42 Section 3.3 and based on the planned construction schedule.

As stated in the Conceptual Design Report (Appendix B), the generators were sized so that both generators would be required to meet peek demand, however only one generator would be needed to meet power requirements during the majority of the Project. Moreover, it is likely that even the single operating generator would not operate at its full capacity continuously.[4] A likely assumption is that the power demands averaged over one year will be comparable to one generator running continuously at a 90% load factor from April to November. This would produce 38.313 tons of NOx and 3.090 tons of VOC emissions per year. This assumes that the generators operate without emission controls for 5,856 hours per year. With typical emission controls equipment in place, the total emissions will be significantly less.

Jefferson County has been designated as a moderate nonattainment area for ozone under the National Ambient Air Quality Standards (NAAQS), which establish nationwide standards for acceptable ambient air quality. As a result, the Project would be considered significant for ozone under various federal and New York State pollution control programs only if emissions exceed 50 tons per year (tpy) VOCs or 100 tpy of NOx. 40 CFR § 51.853 (general conformity applicability); 6 NYCRR Subpart 231-2 (nonattainment NSR). As discussed above, both the unrealistic "worst-case" scenario or the more likely projected emissions of VOCs and NOx associated with both construction

[4] Using a conservative load factor of 90%, the hypothetical maximum potential emissions from these units would not exceed 76.6 tons of NOx and 6.18 tons of VOCs. This assumes that the units operate continuously during the construction season (for a total of 5,856 hours per year) without controls. This duration of operation is improbable and the maximum emission is unlikely to occur.

and post-construction operation of the Project fall well below these thresholds. As a result, the Project also does not necessitate completion of a conformity determination by the State. Moreover, the Project does not require a pre-construction NSR permit.

Jefferson County is in attainment with the NAAQS for the remaining four "criteria pollutants" (SO_2, PM, CO, and lead) and so is subject to thresholds of 250 tpy with respect to these pollutants. 40 CFR § 52.21 (prevention of significant deterioration). Emissions of these pollutants associated with the Project are well below this threshold. As such, no pre-construction permit is required under the PSD program.[5]

Finally, all other emission sources on-site (i.e. trucks and cranes) both during and after construction of the Project are either exempt or trivial pursuant to 6 NYCRR Subpart 201-3 and so no construction or operating permit is required under 6 NYCRR Part 201.

Mitigation

Although operation of two generators at full capacity would not require an air permit, emissions will be reduced by the use of emission control equipment on the generators.

[5] Both the nonattainment NSR and PSD programs apply only to stationary sources. It is unlikely that the equipment proposed to be used during construction would meet the definition of stationary source. Even assuming certain equipment, such as the 350 kW generators were considered stationary sources, potential emissions will not exceed the major source nonattainment NSR and PSD thresholds.

3.0 Alternatives

Under SEQRA, an EIS must contain a discussion of alternatives. ECL § 8-0109[4](EIS shall discuss "reasonable alternatives to the action"), ECL § 8-0109[9][(2][d](EIS must include "alternatives to the proposed action"), ECL § 8-0109[2](among the purpose of an EIS is to "suggest alternatives to such an action so as to form the basis for a decision whether or not to undertake the action")). The SEQRA regulations require the discussion to include "a description and evaluation of the range of reasonable alternatives to the action." (6 NYCRR § 617.14[f][5]). Generally, the courts have confirmed that SEQRA "requires consideration of such alternatives to various aspects of the project as might result in amelioration of environmental problems caused thereby." (Rye, Town/King Civic Ass'n v. Town of Rye, 82 AD2d [2d Dept. 1981]).

The leading Court of Appeals cases provide a "rule of reason" to guide the courts and reviewing agencies in determining whether an applicant has sufficiently assessed potential alternatives. According to the Court of Appeals in Jackson v. New York State Urban Development Corp., 67 NY2d 400 [1986]: First, an agency's substantive obligations under SEQRA must be viewed in light of a rule of reason. Not every conceivable environmental impact, mitigating measure or alternative must be identified and addressed before a FEIS will satisfy substantive requirements. The degree of detail will vary with the circumstances and nature of the proposal. Second, the Legislature in SEQRA has left the agencies with considerable latitude in evaluating the environmental effects and choosing among alternatives. Nothing in the law requires an agency to reach a particular result on any issue or permits the courts to second-guess the agency's choice, which can be annulled only if arbitrary, capricious or unsupported by substantial evidence. (internal citations omitted).

In providing meaningful and reasonable alternatives, according to the Court of Appeals, an alternatives assessment must be based on an awareness of all reasonable options other than the proposed action. (Webster Associates v. Town of Webster, 59 NY2d 220[1983]). However, this does not mean that the applicant must assess "all" alternatives. As the First Department stated in a leading discussion on this topic, SEQRA does not require that

every conceivable alternative must be considered before an EIS will be considered acceptable. Rather, the rule is one of reasonableness and balance. SEQRA does not require the evaluation of every possible alternative. What is required is that information be considered which would permit a reasoned conclusion. (Coalition against Lincoln West, Inc. v. New York, 94 AD2d 483]1st Dept. 1983]).

The SEQRA regulations somewhat guide the choice of what is considered "reasonable" by stating that the alternatives discussion must include "the range of reasonable alternatives to the action which are feasible, considering the objectives and capabilities of the project sponsor." (6 NYCRR § 617.9[b][5][v]). Thus, one consideration of whether an alternative is reasonable is whether it is feasible. Alternatives which are not feasible do not need to be considered. As one court stated, "It is not necessary that every possible alternative be thoroughly explored. The only requirement is that information permitting a reasoned choice be considered." (Natural Resources Defense Council v. City of New York, 112 Misc2d 106 [Sup. Ct. New York Co. 1982]). Where there is a continuum of possibilities, only a few points along that continuum need to be considered. (Environmental Defense Fund v. Flacke, 96 AD2d 862 [2d Dept. 1983]; Halperin v. City of New Rochelle, 24 AD3d 768 [2d Dept. 2005] (alternatives section does not need to identify every conceivable alternative, especially where various options lie along a continuum of possibilities).

Finally this analysis should evaluate alternatives that are feasible, considering the objectives and capabilities of the Project Sponsor (6NYCRR§617.9[b][5][v]. In this case as noted in the Project Description the Project sponsor's objective is to develop utility scale energy projects for distribution of low cost energy to the public in the New York State energy market using clean, renewable resources such as wind. For this particular project the project sponsor intends to maximize the energy production from this unique wind resource and other unique characteristics of Galloo Island in order to deliver clean, renewable, low cost electricity to the utility grid, and provide economic benefits to the local economy.

Consistent with the approved Scope and SEQRA, this DEIS will assess the following alternatives:

- Preferred Alternative – The layout that was selected based on the maximum MW production, with impacts on wetlands, flora and fauna minimized to the extent practicable.
- No Action – A discussion of the implications of not undertaking this Project
- Maximum Turbine Build-out (Alternative 2) – A layout that places the maximum number of turbines to achieve the maximum possible output for the wind resources on the island. This layout is assessed for the impact to wetlands and other potential environmental concerns.
- Fewer Turbines (Alternative 3) – A layout that focuses on using the Preferred Alternative and reducing the number of Turbines based on further reducing potential impacts to the wooded areas on the island.
- No Impact from Project Layout (Alternative 4) – A layout that focuses on the viability of a project that would be designed to avoid all impacts to wetlands, sensitive habitat and forested areas.
- Lower Turbine Height – Impacts from lower turbines will be assessed with special attention to impacts on visual resources, habitat/wetlands; economics; efficient use of wind resource; and impact of renewable energy to the public.

3.1 Preferred Alternative

The goal of the Preferred Alternative is to maximize the benefit derived from the renewable resource available on the island, while minimizing the impacts to wetlands and other sensitive habitat.

The layout that most effectively minimizes the impacts to wetlands and other sensitive habitat while attaining the maximum benefit from the wind resources on the island has been determined to be the 84 3.0 MW turbine layout. This is the layout, as presented on Figure 1.2-1, that is analyzed throughout this document as the proposed "Project." In addition to the 84 3.0 MW turbine layout, the Preferred Alternative also consists of:

- Service/Access roads - 17.5 miles.
- Aboveground and Underground ECS – 9.9 and 11.2 miles respectively
- A substation – 1.38 acres.
- Four (4) Staging/Wind Turbine Component Lay down Areas – totaling 58.1 acres (9.79 acres are permanent)

- Slip and Temporary Slip Locations – 1.7 and 0.27 acres respectively.
- Concrete Batch Plant – 4.4 acres (1.81 acres are permanent).
- Blade lay down area - 156 ft radius encompassing each turbine location.
- A residential and operations area consisting of: Permanent and Temporary housing, Cafeteria, Operations and Maintenance buildings, Fuel storage area, etc. – totaling 2.4 acres.

The following table indicates the number of turbines, of the 84 turbines in the Preferred Alternative, located within each habitat type:

Table 3.1-1: Number of Turbines per Habitat Type

Habitat Type	Number of Turbines
Agricultural Land	8
Developed Land	0
Open Field	41
Deciduous Forest Upland	34
Mixed Forest Upland	1
Scrub-Shrub Upland	0
Wet Meadow	0
Scrub-Shrub Wetland	0
Emergent Wetland	0
Deciduous Forest Wetland	0
Mixed Forest Wetland	0

Impacts

Impacts from the preferred alternative are thoroughly discussed in Section 2 of this DEIS. As stated in Section 2.6, visual impacts from the Preferred Alternative are significantly mitigated by the distance from the island to the mainland, impacts will still occur to viewers in the Lake Ontario. Surface water, sediment and fish impacts related to the construction of the dock and water intake and outflow structures for the residential and operational needs of the island (Section 2.4.1) will still occur. Some avian and bat impacts will occur based on the construction and operation of the Preferred Alternative (Section 2.5). These impacts are not likely to be significant.

Land Use

Based on the data obtained during the Habitat Assessment, which is presented in Section 2.5.1, the areas of impact for the Preferred Alternative are:

- 161.88 acres of permanent land impact (including 0.79 acres of permanent wetland impact).
- 154.10 acres of temporary land impact.

The following table details the amount of land impacts for the Preferred Alternative:

Table 3.1-2: Preferred Alternative Land Impacts

Habitat Type	Area of Impact (Acres)
Permanent Land Impact	
Agricultural Land	13.96
Developed Land	2.07
Open Field	63.95
Rocky Shoreline	0.16
Deciduous Forest Upland	75.98
Mixed Forest Upland	4.81
Scrub-Shrub Upland	0.16
Deciduous Forest Wetland	0.71
Mixed Forest Wetland	0.08
Total	**161.88**
Temporary Land Impact	
Agricultural Land	10.47
Developed Land	0.87
Open Field	101.17
Rocky Shoreline	2.18
Deciduous Forest Upland	37.07
Mixed Forest Upland	0.71
Scrub-Shrub Wetland	0.22
Wet Meadow	1.38
Emergent Wetland	0.03
Total	**154.10**

Based on the above analysis, a total of 161.88 acres of land will be permanently impacted for the production of 252 MW, using Vestas 3.0 MW turbines.

Of the 161.88 acres of impacted land, 80.79 impacted acres are classified as Deciduous and Mixed Forest Upland, while 0.79 impacted acres are classified as Deciduous and Mixed Forest Wetland. This averages approximately:

- 0.64 acres of disturbed land per MW.
- 0.32 acres of disturbed forest land per MW.
- 0.003 acres of wetland disturbed per MW.

Socioeconomics

For the Preferred Alternative, operational requirements such as septic services, sewer, lighting and solid waste would all be provided by the project sponsor (see Section 1.2). The numbers of employees that would be required during construction and operational phases would be approximately 200 workers and 24 individuals respectively. There would be no impacts to tourism, boating, fishing, navigation/shipping lanes or commercial businesses.

Current negotiations with the Town estimate a PILOT payment of $8,000 per MW of installed capacity. At this rate the proposed project with 84 3.0 MW turbines would generate a yearly payment to the local communities of $2,016,000.

Air Emissions

The Preferred Alternative would allow for energy to be generated from a clean renewable source. Assuming that a 1 MW turbine on the site operates at 35% capacity factor over its 20-year life span, the turbine would produce 3,066 MWh/year or a total of 61,320 MW/h in 20 years. Using the average fuel mix in New York State for coal, natural gas, and oil for the year ending 2002 to quantify emissions required to generate 61,320 MW/h: 0.892 pounds of carbon dioxide (CO2), 0.003 pounds of sulfur dioxide (SO2), and 0.0012 pounds of nitrogen oxides (NOx) were produced for 1 kWh of electricity. Therefore, if the Preferred Alternative were selected, this amount of power (252 MW) would not have to be produced from other sources, which, given the NY fuel mix, would also produce environmentally damaging byproducts including: approximately 13.8 billion pounds of CO2, 49.9 million pounds of SO2, and 18.5 million pounds of NOx over a period of 20 years.

RPS Goals

There are approximately 21 wind power projects currently operating or under construction in New York State. As of June 2008, New York State had 706.8 MW of operating wind power, with 588.5 MW under construction. Based on the NYISO Interconnection Queue; existing, under construction and proposed wind projects have a

combined capacity of approximately 4,409 MW. The addition of 252 MW would increase the State's wind power production by 6%.

The State of New York has demonstrated a commitment to producing and promoting clean renewable sources of energy. New York's renewable energy policy (Renewable Portfolio Standard – PSC Case 03-E-0188) requires 25% of the State's energy to come from renewable sources such as wind by 2013. Currently, 2,775,564 MWh per year of energy from renewable resources puts New York at 78% of the 2008 RPS (Main Tier) target, and 28% of the 2013 target. Approval of the Project will add an additional 252 MW or 728,482 MWh per year (another 20.5% towards meeting the 2008 target).

Wind Resources

According to the Wind Resource Report prepared by AWS Truewind, see Figure 1.3-1, wind electric generation facilities must be sited where the wind resource meets the beginning of a Class 4 resource, a minimum speed of 7.5 meters per second at 80 m above ground. Energy conversion from a wind turbine increases exponentially as a wind resource exceeds this standard. Only a small percentage of the State of New York meets or exceeds Class 4 wind speeds; 1.55% of the total land area or 0.69% when protected lands such as the Adirondack and Catskill Parks are excluded from consideration. According to the New York Wind Resource Explorer developed by AWS Truewind, mean annual wind speeds at Galloo Island fall within Class 4 (7.5 – 8.1 m/s) and Class 5 levels (8.1 – 8.6 m/s) when measured at 70 meters. Site conditions at Galloo Island are also of rare quality as WTG will be sited along open water with little natural obstruction, with up to 180 miles of fetch (the distance that wind can travel over seas without being blocked) along Lake Ontario.

The Project area also has the benefit of having approximately 2,000 acres that belong to one property owner, which will be purchased by the Project sponsor. In addition, the Project area is sited away from residential centers, thus allowing for limited views of WTG and essentially reducing the impact on a vast majority of the regions population.

Determination

The Preferred Alternative provides benefits to the local region, advances the state's renewable energy goals, utilizes a unique wind resource while minimizing negative impacts to the greatest extent practicable.

3.2 No Action Alternative (Alternative 1)

The "No Action" alternative assumes the proposed Project area would continue to be used as a seasonal residence, forest, and active agricultural land. No WTG, ECS, dock, residential community or other developments on Galloo Island would be constructed. No potential adverse environmental impacts associated with the construction and operation of the Project would occur. In particular, no impacts would occur to wetlands, significant habitats or shoreline; no excavation of soil or blasting would occur; and there would be no visual impacts beyond those that are presently associated with the built structures on the island.

Socioeconomic

If the "No Action" alternative were selected, then no socioeconomic benefits would accrue to the area. In particular, $2,016,000 in PILOT payments would not be made to the Town, County, or School District; approximately 200 temporary and 24 permanent construction and operation jobs would not be created; and one of the largest development projects in upstate New York and potential contributor to the region's "Green Economy" would not be built.

Under the "No Action" alternative, the State, local communities, the public and the environment will lose the opportunity for adding a significant source clean, renewable energy to New York State's energy mix; and would thereby lose the opportunity to reduce dependence upon fossil fuels, which are known to contribute to acid rain, green house gases (carbon dioxide (CO2), sulfur dioxide (SO2), or nitrogen oxides (NOx)), smog, and other environmental harms. Specifically, if the "No Action" alternative were selected, this amount of power (252 MW) would have to be produced from other sources, which, given the NY fuel mix, would also produce environmentally damaging byproducts

including: approximately 13.8 billion pounds of CO2, 49.9 million pounds of SO2, and 18.5 million pounds of NOx over a period of 20 years.

RPS Goals

The No Action alternative would not add 252 MW to the State's wind power production (a 6% increase).The No Action alternative would also fail to advance the States' RPS goals.

Wind Resources

As mentioned above, the No Action Alternative would also fail to take advantage of the unique wind resource available on Galloo Island, offshore quality wind without placing turbines in the water and located more than 5 miles from any permanent residences.

Determination

Based upon the arguments listed above the "No Action" alternative is not preferred considering the objectives and capabilities of the Project Sponsor. Moreover the "No Action" alternative would not obtain the significant economic, energy and environmental benefits of the proposed Project, which would produce these benefits with comparatively minor environmental impacts.

3.3 Maximum Turbine Build-out (Alternative 2)

The maximum turbine layout that could be constructed would install 98 3.0 MW wind turbines on the island as presented on Figure 3.3-1. The 98 wind turbines will generate a maximum of 294 MW of energy (an increase of 45 MW over the Preferred Alternative). The wind turbines for this layout were sited using a Geographic Information Systems (GIS) model that used the following parameters for placement; a fifty-foot setback from the shoreline (to allow for sufficient room for the foundation) and a three rotor diameter (270 meter) setback from other wind turbines, which was used to minimize wake-loss.

Access/Service roads for this layout were designed using the most direct route to minimize use of materials while promoting an efficient means of transportation between wind turbines and other project components. The electrical collection system for this layout was designed using the following parameters; a majority of the ECS would be an

aboveground and co-located with the access/service roads and any ECS within a 300 foot radius surrounding a wind turbine would be underground and also co-located with the access/service roads.

In addition to the 98 3.0 MW turbine layout, this alternative also consists of:

- Service/Access roads – 20.9 miles.
- Aboveground and Underground ECS – 14.2 and 6.9 miles respectively
- A substation – 1.38 acres.
- Four (4) Staging/Wind Turbine Component Lay down Areas – totaling 58.1 acres (9.79 acres permanent impact).
- Slip and Temporary Slip Locations – 1.7 and 0.27 acres respectively.
- Concrete Batch Plant – 4.4 acres (1.81 acres permanent impact).
- Blade lay down area - 156 ft radius encompassing each turbine location.
- A residential and operations area consisting of: Permanent and Temporary housing, Cafeteria, Operations and Maintenance buildings, Fuel storage area, etc. – totaling 2.4 acres.

Excluding the WTG locations, access/service roads, and ECS, all project components presented above are identical to those in the Preferred Alternative.

The following table indicates the number of turbines, of the 98 turbines in Alternative 2, located within each habitat type:

Table 3.3-1: Number of Turbines per Habitat Type

Habitat Type	Number of Turbines
Agricultural Land	7
Developed Land	2
Open Field	37
Deciduous Forest Upland	35
Mixed Forest Upland	1
Scrub-Shrub Upland	1
Wet Meadow	2
Scrub-Shrub Wetland	1
Emergent Wetland	1
Deciduous Forest Wetland	5
Mixed Forest Wetland	5

Impacts

Impacts to visual resources would likely be the same, additional towers would not increase or decrease the visibility of the project. Impacts to surface waters would stay the same because the docking facility and the water intake structure would still be constructed. Avian and bat impacts may increase due to the additional towers and the habitat impacts.

Based on the data obtained during the Habitat Assessment, which is presented in Section 2.5.1, the areas of impact for Alternative 2 are:

- 168.86 acres of permanent land impact (including 26.05 acres of permanent wetland impact).
- 167.47 acres of temporary land impact.

The following table details the amount of land impacts for Alternative 2:

Table 3.3-2: Alternative 2 Land Impacts

Habitat Type	Area of Impact (Acres)
Permanent Land Impact	
Agricultural Land	10.99
Developed Land	3.01
Open Field	42.211
Rocky Shoreline	0.15
Deciduous Forest Upland	77.69
Mixed Forest Upland	4.65
Scrub-Shrub Upland	0.42
Wet Meadow	1.12
Scrub-Shrub Wetland	2.30
Emergent Wetland	0.27
Deciduous Forest Wetland	12.80
Mixed Forest Wetland	13.25
Total	**168.86**
Temporary Land Impact	
Agricultural Land	10.14
Developed Land	2.71
Open Field	103.70
Rocky Shoreline	1.04
Deciduous Forest Upland	43.11
Mixed Forest Upland	1.58
Scrub-Shrub Upland	1.21
Wet Meadow	3.91

Emergent Wetland	0.07
Total	**167.47**

Based on the above analysis, a total of 168.86 acres of land will be permanently impacted for the production of 294 MW, using Vestas 3.0 MW turbines.

Of the 168.86 acres of impacted land, 82.35 impacted acres are classified as Deciduous and Mixed Forest Upland, while 26.05 impacted acres are classified as Deciduous and Mixed Forest Wetland. This averages approximately:

- 0.57 acres of disturbed land per MW.
- 0.28 acres of disturbed forest land per MW.
- 0.088 acres of wetland disturbed per MW.

Socioeconomics

For Alternative 2, operational requirements such as septic services, sewer, lighting and solid waste would all be provided by the project sponsor (see Section 1.2). The numbers of employees that would be required during construction and operational phases would be the same as the Preferred Alternative approximately 200 and 24 respectively. There would be no impacts to tourism, boating, fishing, navigation/shipping lanes or commercial businesses.

Based on current negotiations with the Town for PILOT payment of $8,000 per MW. The proposed project with 98 3.0 MW turbines would generate a yearly payment of $2,352,000.

Air Emissions and RPS Goals

Alternative two would increase the displacement of air emissions more than the preferred alternative. It would also and an additional 849,896 MWh per year to the amount of energy produced in NY from renewable resources. This would move the state 23.9% closer to the 2008 RPS target than the current status.

Determination

Alternative 2 will generate approximately $336,000 (16.6%) more in PILOT revenues than the Preferred Alternative. However, in comparison to the Preferred Alternative,

using Alternative 2 there would be an increase of 45 MW capacity (16.6%), while the permanent impacts to wetlands and forest land would increase 3,116% and 1.93% respectively.

Table 3.3-3: Comparison of Preferred Alternative and Alternative 2

	Installed Capacity MW	Permanent Impacts to Wetlands (Acres)	Impacts to Wetlands per MW (Acres)	PILOT Payment
Preferred Alternative	252	0.79	0.003	$2,016,000
Alternative	294	26.05	0.088	$2,352,000
Change	42	25.26	0.085	$336,000
% Change	+16.7	+3197.5	+2833.3	+16.7

Under a maximum build scenario, impacts to wetlands will increase dramatically. Given the development of other wind projects in the State, it can be assumed that the amount of wetland impacts associated with the "maximum build" alternative would not be acceptable to the DEC. In addition, the net increase of installed MW capacity (45 MW), and PILOT revenues ($336,000), does not justify the related increase of 25.26 acres of wetland impacts for Alternative 2.

3.4 Fewer Turbines (Alternative 3) – Minimize Impacts to Forest Land

The Fewer Turbine Layout (Alternative 3) was designed to maximize the benefit derived from the renewable resource available on the island, while minimizing the impacts to wetlands and other sensitive habitat, specifically impacts to deciduous and mixed forest habitat while retaining the Project benefits.

The fewer turbine layout that could be constructed would install 51 3.0 MW wind turbines, with a total installed capacity of 153 MW, on the island as presented on Figure 3.4-1. The wind turbines for this layout were sited using a GIS model that modified the existing Preferred Alternative. As the Preferred Alternative previously minimized the impact to wetland and sensitive habitat, the GIS model further modified this alternative by eliminating a majority of the turbines that were proposed in a deciduous or mixed forest habitat. The access/service roads and ECS presented in the Preferred Alternative were modified accordingly in order to minimize impact to deciduous and mixed forest habitat as well.

In addition to the 51 3.0 MW turbine layout, this alternative also consists of:

- Service/Access roads – 13.8 miles.
- Aboveground and Underground ECS – 8.3 and 7.2 miles respectively
- A substation – 1.38 acres.
- Four (4) Staging/Wind Turbine Component Lay down Areas – totaling 58.1 acres (9.79 acres permanent impact).
- Slip and Temporary Slip Locations – 1.7 and 0.27 acres respectively.
- Concrete Batch Plant – 4.4 acres (1.81 acres permanent impact).
- Blade lay down area - 156 ft radius encompassing each turbine location.
- A residential and operations area consisting of: Permanent and Temporary housing, Cafeteria, Operations and Maintenance buildings, Fuel storage area, etc. – totaling 2.4 acres.

Excluding the WTG locations, access/service roads, and ECS, all project components presented above are identical to those in the Preferred Alternative.

The following table indicates the number of turbines, of the 51 turbines in Alternative 3, located within each habitat type:

Table 3.4-1: Number of Turbines per Habitat Type

Habitat Type	Number of Turbines
Agricultural Land	8
Developed Land	0
Open Field	41
Deciduous Forest Upland	2
Mixed Forest Upland	0
Scrub-Shrub Upland	0
Wet Meadow	0
Scrub-Shrub Wetland	0
Emergent Wetland	0
Deciduous Forest Wetland	0
Mixed Forest Wetland	0

Impacts

Impacts to visual resources would likely be the same, fewer towers would not increase or decrease the visibility of the project. Impacts to surface waters would stay the same as the docking facility and the water intake structure would still be constructed. Avian and

bat impacts may decrease due to the fewer towers which may pose a collision risk. Impacts from habitat fragmentation may also be somewhat reduced.

Based on the data obtained during the Habitat Assessment, which is presented in Section 2.5.1, the areas of impact for Alternative 3 are:

- 123.71 acres of permanent land impact (including 0.42 acres of permanent wetland impact).
- 112.12 acres of temporary land impact.

The following table details the amount of land impacts for Alternative 3:

Table 3.4-2: Alternative 3 Land Impacts

Habitat Type	Area of Impact (Acres)
Permanent Land Impact	
Agricultural Land	12.64
Developed Land	2.07
Open Field	57.10
Rocky Shoreline	0.15
Deciduous Forest Upland	47.51
Mixed Forest Upland	2.55
Scrub-Shrub Upland	0.16
Wet Meadow	0.87
Scrub-Shrub Wetland	0.24
Emergent Wetland	0
Deciduous Forest Wetland	0.42
Mixed Forest Wetland	0
Total	**123.71**
Temporary Land Impact	
Agricultural Land	9.94
Developed Land	0.93
Open Field	95.94
Rocky Shoreline	1.47
Deciduous Forest Upland	3.84
Mixed Forest Upland	0
Scrub-Shrub Upland	0
Wet Meadow	0
Emergent Wetland	0
Total	**112.12**

Based on the above analysis, a total of 123.71 acres of land will be permanently impacted for an installed capacity of 153 MW, using Vestas 3.0 MW turbines.

Of the 123.71 acres of impacted land, 47.51 impacted acres are classified as Deciduous and Mixed Forest Upland, while 0.42 impacted acres are classified as Deciduous and Mixed Forest Wetland. This averages approximately:

- 0.80 acres of disturbed land per MW.
- 0.31 acres of disturbed forest land per MW.
- 0.003 acres of wetland disturbed per MW.

Socioeconomics

For Alternative 3, operational requirements such as septic services, sewer, lighting and solid waste would all be provided by the project sponsor (see Section 2.5.1). The numbers of employees that would be required during construction and operational phases would be approximately 200 workers and 12-18 individuals respectively. There would be no impacts to tourism, boating, fishing, navigation/shipping lanes or commercial businesses.

Based on current negotiations with the Town for PILOT payment of $8,000 per MW of installed capacity. The proposed project with 51 3.0 MW turbines would generate a yearly payment of $1,224,000.

Air Emissions

Alternative 3 would allow for energy to be generated from a clean renewable source. However, based on the air emission assumptions in section 3.1 this alternative would displace 5.45 billion fewer pounds of CO2, 19.64 million pounds less of SO2 and 7.28 billion pounds less than NOx over the 20 year life-cycle of the project. This Alternative would provide 12.4% of the state's 2008 RPS target.

Determination

Alternative 3 will generate approximately $792,000 (39%) less in PILOT revenues than the Preferred Alternative. Additionally, Alternative 3 would result in a decrease of 99 MW of installed capacity (39%), while the permanent impacts to wetlands and forest land would also decrease 48% and 41% respectively. However, in the terms of a comparison of MW of installed capacity vs. permanent impact to land, Alternative 3 will increase the actual acreage of disturbed land per MW produced (25.9% increase over the Preferred

Alternative), due to the project elements that will not change including the dock and the residential and operational area .

Table 3.4-3: Comparison of Preferred Alternative and Alternative 3

	Installed Capacity (MW)	Total Land Impacts (Acres)	Land Impacts per MW (Acres)	PILOT Payment
Preferred Alternative	252	161.88	0.64	$2,016,000
Alternative	153	123.71	0.81	$1,224,000
Change	-99	-38.17	0.17	$792,000
% Change	-39	-23.8	+25.9	-39.3

In summary, the net decrease of installed MW capacity (reduction of 49 MW) vs. the acreage of permanently disturbed land per MW (increase of 0.17 acres per MW) produced and the decrease in PILOT revenues ($792,000) does not justify this as a viable alternative. This reduction obtains only incremental and very local reductions in impacts at the cost of losing significant local economic benefits and potentially significant regional environmental and NY policy benefits.

3.5 No Impact from the Project (Alternative 4)

The goal of the No Impact Layout (Alternative 4) is to avoid all impacts to wetlands and other sensitive habitat located on the island.

The No Impact layout that could be constructed would install 8 3.0 MW wind turbines on the island as presented on Figure 3.5-1. The wind turbines for this layout were sited using a GIS model that modified the existing Preferred Alternative. As the Preferred Alternative previously minimized the impact to wetland and sensitive habitat, the GIS model further modified this alternative by eliminating all turbines, access/service roads and ECS that impacted wetland/streams and deciduous or mixed forest habitats.

In addition to the 8 3.0 MW turbine layout, this alternative also consists of:

- Service/Access roads – 1.4 miles.
- Aboveground and Underground ECS – 2.36 and 0.61 miles respectively
- A substation – 1.38 acres.
- Staging/Wind Turbine Component Lay down Area – 4.2 acres.

- Slip and Temporary Slip Locations – 1.7 and 0.27 acres respectively.
- Concrete Batch Plant – 4.4 acres.
- Blade lay down area - 156 ft radius encompassing each turbine location.
- A residential and operations area consisting of: Permanent and Temporary housing, Cafeteria, Operations and Maintenance buildings, Fuel storage area, etc. – totaling 2.4 acres.

The following table indicates the number of turbines, of the 8 turbines in Alternative 4, located within each habitat type:

Table 3.5-1: Number of Turbines per Habitat Type

Habitat Type	Number of Turbines
Agricultural Land	0
Developed Land	0
Open Field	8
Deciduous Forest Upland	0
Mixed Forest Upland	0
Scrub-Shrub Upland	0
Wet Meadow	0
Scrub-Shrub Wetland	0
Emergent Wetland	0
Deciduous Forest Wetland	0
Mixed Forest Wetland	0

Impacts

Impacts to visual resources would likely be the reduced although the project would still be visible to those using Lake Ontario. Impacts to surface waters would stay the same as the docking facility and the water intake structure would still be constructed. Avian and bat impacts would decrease due to the significantly fewer towers which may pose a collision risk. Impacts from habitat fragmentation would also be reduced as no forest fragmentation would occur.

Based on the data obtained during the Habitat Assessment, which is presented in Section 2.5.1, the areas of impact for Alternative 2 are:

- 24.09 acres of permanent land impact (with no permanent wetland impact).
- 10.65 acres of temporary land impact.

The following table details the amount of land impacts for Alternative 4:

Table 3.5-2: Alternative 4 Land Impacts

Habitat Type	Area of Impact (Acres)
Permanent Land Impact	
Agricultural Land	0
Developed Land	3.95
Open Field	19.04
Rocky Shoreline	0.04
Deciduous Forest Upland	1.06
Mixed Forest Upland	0
Scrub-Shrub Upland	0
Wet Meadow	0
Scrub-Shrub Wetland	0
Emergent Wetland	0
Deciduous Forest Wetland	0
Mixed Forest Wetland	0
Total	**24.09**
Temporary Land Impact	
Agricultural Land	0.01
Developed Land	0.93
Open Field	9.44
Rocky Shoreline	0
Deciduous Forest Upland	0.27
Mixed Forest Upland	0
Scrub-Shrub Upland	0
Wet Meadow	0
Emergent Wetland	0
Total	**10.65**

Based on the above analysis, a total of 24.09 acres of land will be permanently impacted for the production of 24 MW, using Vestas 3.0 MW turbines.

Of the 24.09 acres of impacted land, 1.06 impacted acres are classified as Deciduous and Mixed Forest Upland. This averages approximately:

- 1 acres of disturbed land per MW.
- 0.04 acres of disturbed forest land per MW.
- 0 acres of wetland impacts

No wetlands will be impacted based on this layout.

Socioeconomics

For Alternative 4, operational requirements such as septic services, sewer, lighting and solid waste would all be provided by the project sponsor. There would be no impacts to tourism, boating, fishing, navigation/shipping lanes or commercial businesses.

Based on current negotiations with the Town for PILOT payment of $8,000 per MW. The proposed project with 8 3.0 MW turbines would generate a yearly payment of $192,000.

Determination

Alternative 4 will generate approximately $1,824,000 (90.5%) less in PILOT revenues than the Preferred Alternative. Additionally, using Alternative 4 there would be a decrease of 228 installed MW capacity (90.5%), while the permanent impacts to wetlands and forest land would also decrease 100% and 98.7% respectively. However, in the terms of a comparison of MW produced vs. permanent impact to land, Alternative 4 will increase the actual acreage of disturbed land per MW produced (17.6% increase over the Preferred Alternative). All the other benefits of the Preferred Alternative would be lost including advancing the RPS target and displacing air emissions. This alternative would not achieve the Project Sponsor's goals.

Table 3.5-3: Comparison of Preferred Alternative and Alternative 4

	Installed Capacity (MW)	Permanent Total Land Impacts (Acres)	Land Impacts per MW (Acres)	PILOT Payment
Preferred Alternative	252	211.51	0.85	$2,016,000
Alternative	24	24.09	1	$192,000
Change	-228	-187.42	0.15	-$1,824,000
% Change	-90.5	-88.6	+17.6	-90.5

In summary, the net decrease in MW capacity vs. the acreage of permanently disturbed land per installed MW capacity and the decrease in PILOT revenues does not justify this as a viable alternative. Additionally, with Alternative 4 the use of the dock and slip channel facility is precluded, as all potential access road alignments to the dock and slip channel facility would need to cross wetlands and/or forested habitat areas. If the dock and ship channel facility is not accessible, this Alternative can not be constructed.

3.6 Lower Turbine Height

The wind industry has moved toward using larger scale wind turbine generators to improve efficiency in harnessing the wind resource. The Preferred Alternative for the Project proposes the use of the Vesta 3.0 MW turbine. As an alternative, the shorter GE 1.5 MW SLE turbines were evaluated using the same 84-turbine layout as the proposed project. This layout using the GE 1.5 MW was then evaluated to assess the impacts to ground, visual, and socioeconomics versus the total power production.

Impacts

Although the GE 1.5 MW SLE is one of the shortest commercially viable wind turbines available on the market it will require the same infrastructure as the 3.0 Vestas for the 84-wind turbine proposed layout.

Visual Disturbance

Visually, a lower turbine height would not significantly change the visual impacts. The Preferred Alternative proposed maximum tip height of 125 m (410 feet), while the smallest GE 1.5 MW wind turbine has a maximum tip height of 103.5 m (339.5 feet). While the view shed would be slightly altered, because of the clear line of site from water based or shoreline views the shorter turbine would not have a significant effect to visual impacts. As shown in Figures 3.6-1 and 3.6-2, the reduction of 21.5 m (approximately 70.5 feet) in the tip height (a change of 17.2%) would not significantly alter the views that would be most impacted (within 5 miles of the island). Additionally, due to the distance from land the turbines as proposed are minimally visible and therefore the impact is extremely low as noted in Section 2.6. Therefore using a turbine with a lower height would not significantly change the visual impacts.

Other impacts would remain the same or similar including impacts to surface water because the dock and water intake and outflow will still be constructed. Although the GE turbine is shorter than the Preferred Alternative impacts to avians and bats would likely be the same because the number of turbines and any habitat fragmentation would remain the same.

In Section 3.1 Preferred Alternative, the amount of infrastructure, and as a result, impacts to habitat and land were discussed. Because this alternative uses the same layout, the use of a shorter turbine would result in the same amount of habitats disturbed, total permanent land impacts (161.88 acres) and total temporary land impacts (154.10 acres) as the larger 3.0 MW turbine. Because the number of turbines remains the same in this evaluation, a lower turbine height would not change the land impacts from the project.

Of the 161.88 acres of impacted land, 80.79 impacted acres are classified as Deciduous and Mixed Forest Upland, while 0.79 impacted acres are classified as Deciduous and Mixed Forest Wetland. This averages approximately:

- 1.28 acres of disturbed land per MW.
- 0.64 acres of disturbed forest land per MW.
- 0.006 acres of wetland disturbed per MW.

In the terms of a comparison of installed MW produced, with a lower turbine height, vs. permanent impact to land there would be an increase the actual acreage of disturbed land per MW produced (100% increase over the Preferred Alternative).

Benefits

As noted above the use of the 1.5 MW turbines would have similar impacts as the Preferred Alternative, 3.0 MW turbines. For example here would be no reduction in the services required with the use of shorter turbines. Operational requirements such as septic services, sewer, lighting and solid waste would be the same. It would also provide some of the same benefits as the Preferred Alternative. The same number of employees would be required during construction (approximately 200 workers) and operational phases (approximately 24 people) of the proposed Project. There would be no change in impacts to tourism, boating, fishing, navigation/shipping lanes or commercial businesses.

Based on current negotiations with the Town, PILOT payment is anticipated to be $8,000 per installed MW capacity. The proposed project with 84 1.5 MW turbines would generate a yearly payment of $1,008,000. This is half of what would be expected if the Preferred Alternative was constructed.

A reduction in the turbine height would result in a significant loss in power output. The total installed capacity of the proposed 84 3.0 MW turbines is 262 MW. If a 1.5 MW turbine is used, the efficiency of the project in producing energy would be halved to 126 MW of installed capacity. This would be an inefficient use of the site's unique wind resource while not significantly reducing impacts. In comparison to the Preferred Alternative, there would be a 100% in increase the actual acreage of disturbed land per MW.

Table 3.6-1: Comparison of Preferred Alternative and Shorter Turbines

	Installed Capacity MW	Permanent Total Land Impacts (Acres)	Land Impacts per MW (Acres)	Permanent Impacts to Wetlands (Acres)	Impacts to Wetlands per MW (Acres)	Impacts to Forested Areas (Acres)	Impacts to Forested Areas per MW (Acres)	PILOT Payment
Preferred Alternative	252	161.88	0.64	0.79	0.003	80.79	0.32	$2,016,000
Alternative	126	161.88	1.28	0.79	0.006	80.79	0.64	$1,008,000
Change	-126	0	0.64	0	0.003	0	0.32	-$1,008,000
% Change	-50	0	100	0	100	0	100	-50

Halving the production of energy from a renewable source would reduce the Projects contribution towards meeting the state's RPS goal and would also halve the displacement of air emissions.

Determination

Using a lower turbine height is not a viable alternative as the amount of disturbance per MW generated will increase, while the PILOT payment versus the acreage of disturbance would decrease. This alternative doe not maximize the benefit of the wind resource when compared to the resulting impacts.

4.0 Coastal Zone Consistency

This section of the DEIS is intended to summarize the Coastal Zone Consistency Review provided to the New York State Department of State pursuant to New York's approved Coastal Management Program. The full Coastal Zone Assessment is attached as Appendix V. The following is a summary of the Applicant's determination of consistency with the policies set forth in the State Coastal Management Program and the Sackett's Harbor Local Waterfront Revitalization Plan.

The Project lies within the designated Coastal Area of Lake Ontario and Upstate Power has certified pursuant to the Coastal Zone Assessment that the Project complies with New York State's approved Coastal Management Program and with the applicable local waterfront revitalization plan of the Village of Sackets Harbor, and will be conducted in a manner consistent with such program. The work on Galloo Island will not have any affect on Significant Coastal Fish and Wildlife Habitats as discussed in the Surface Water Resources Section 2.4 of the DEIS. The Coastal Management Program requires a balancing of economic development and preservation of important natural resources. This Project is consistent to the maximum extent practicable with the balancing required by the Coastal Management Program in that it promotes the policies of the Coastal Management Program as discussed in more detail below.

New York State has a very unique and diverse coastal zone area covering about 3,200 miles of coastline. Designated coastal zone areas include segments of the Atlantic Ocean and Long Island Sound, the Hudson River, Lakes Erie and Ontario, the Niagara and St. Lawrence Rivers and numerous tributaries to these waterbodies and watercourses. Over the course of many years the New York State coastline has been subjected to numerous stresses as a result of increased residential, recreational, tourist and commercial developments focused on the coastal corridor. Dramatic increases in coastal population associated with this development induced many of these stresses.

In order to better manage the coastal zone and improve land and water use planning, the New York State Legislature passed the Waterfront Revitalization and Coastal Resources Act (WRCRA) in 1981, pursuant to the Federal Coastal Zone Management Act of 1972 (CZMA), as amended. The New York State Coastal Management Program was approved by the U.S. Department of Commerce in September of 1982, in accordance with the standards set forth in the CZMA. The state agency responsible for administration of the coastal management program is the New York State Department of State (NYSDOS), Division of Coastal Resources.

The principal function of the New York State Coastal Management Program is to provide a framework for government decision-making processes in the coastal zone. The Coastal Management Program is based on 44 policies which are grouped into 11 categories that address: 1) Development, 2) Fish and Wildlife, 3) Flooding and Erosion Hazards, 4) General Safeguards, 5) Public Access, 6) Recreation, 7) Historic and Scenic Resources, 8) Agricultural Lands, 9) Energy and Ice Management, 10) Air and Water Resources, and 11) Wetlands. Under the Federal Consistency Provisions of the CZMA, applicants for Federal licenses or permits, including certifications, approvals, leases and other forms of permission must submit a certification that their proposal is consistent with all applicable State coastal policies. The NYSDOS is required to review the consistency statements provided by applicants and make a decision as to whether the activity is consistent with applicable policies and any approved Local Waterfront Revitalization Plans (LWRP).

Local Waterfront Revitalization Programs (LWRPs), once approved by the NYSDOS, allow local governments the opportunity to adopt and implement their own coastal policies. A LWRP is essentially a refinement of the State's coastal policies, developed jointly by the State and a municipality.

Located on Galloo Island, the proposed Hounsfield Wind Farm project is located within the designated coastal area of Lake Ontario. The Project is not physically located within any LWRPs. However, Sackets Harbor, located just north of the project area, has an approved LWRP. Since this project is located in the designated coastal zone area, has some proximity to an LWRP, and requires Federal permits, the Project was reviewed for

consistency with the State's Coastal Policies. In addition, the Coastal Zone Assessment addresses some applicable Sackets Harbor LWRP Policies even though the work is not located within the LWRP boundaries.

Summary Analysis of Coastal Policies

The following discussion summarizes the consistency of the Project with the Coastal Policies discussed at length in the Coastal Zone Assessment. The Project is consistent with each of the policies listed below. Policies that are not applicable to the Project are not summarized below.

The Project is consistent with the following policies promoted by the Program:

- Policy 2: Facilitate the Siting of Water Dependent Uses and Facilities on or Adjacent to Coastal Waters- The Project is consistent with this policy. This policy states that water-dependent developments shall be given priority over non-water dependent actions and uses within and adjacent to coastal areas. The submarine cable, water intakes, docking facility and entrance channel are all activities that are considered water-dependent or water-related since they must be located within or below the water surface to fulfill their intended purposes. The offloading facilities are activities that involve sea/land transfer of goods and structures or activities related to navigation as specified in CZM Policy 2. There are no publicly available water supplies on the island or sufficient groundwater resources making it necessary to construct the water intake system which depends on a reliable water source. The WTG, which are non-water dependent structures, will not be located within coastal waters but will be in the adjacent coastal area which covers the entire island. Although the WTG are not technically water-dependent or water-related activities, their location on the island makes the transmission of energy they produce dependent on passage through, or under, the water. Frequent strong winds over the lake and the location of the WTG on an island enhance the ability of the Project to generate electricity.
- Policy 5: Encourage The Location Of Development In Areas Where Public Services And Facilities Essential to Such Development Are Adequate- The project is consistent with this policy. Upstate Power will provide necessary septic systems/water supplies for the residence area and maintenance building on the island. These utilities will not adversely affect any public utilities on the mainland or encourage additional land development in the coastal areas.
- Policy 7: Significant Coastal Fish and Wildlife Habitats Will Be Protected, Preserved, And Where Practical, Restored So As To Maintain Their Viability As Habitats- The Project is consistent with this policy. With respect to the WTG, an assessment of bird and bat impacts with WTG (on Galloo Island) has been conducted, and the results are addressed in Appendices N and O. Radar studies

indicate that mean seasonal target flight height, as well as mean seasonal targets below turbine height, observed at Galloo Island are within the range of other similar regionally based studies and tend to support indications of a lowered risk of collision at the site due to the fact that much of the seasonal migration occurs at heights well above the turbine heights. For a more detailed discussion of fish species and habitats, see Section 2.5.6 of the DEIS.

- Policy 8: Protect Fish and Wildlife Resources In The Coastal Area From The Introduction Of Hazardous Wastes And Other Pollutants Which Bioaccumulate In The Food Chain Or Which Cause Significant Sub-Lethal Or Lethal Effect On Those Resources- The Project is consistent with this policy. This policy requires the protection of fish and wildlife resources from hazardous waste materials. The Project will not use chemical additives that contain constituents that would bioaccumulate in the food chain at levels which would cause mortality or create physiological and behavioral disorders. Normal operation of the Project does not result in the generation of hazardous waste materials. The upland maintenance building and living quarters will be served by septic systems, privately built. A separate treatment system will be required for any solvents, etc. used in the maintenance building. A SPCC will be developed to account for any WTG gear box oil storage and maintenance vehicle fuel storage associated with the project. For those operations and maintenance activities at the Project that require use of hazardous materials, appropriate storage, transport, treatment, and disposal will occur in accordance with Federal and state requirements. Discharges associated with the project will comply with applicable laws and regulations and would not degrade water quality criteria.

- Policy 11: Buildings And Other Structures Will Be Sited In The Coastal Area So As To Minimize Damage to Property And The Endangering Of Human Lives Caused By Flooding And Erosion- The Project is consistent with this policy. The activities proposed within Lake Ontario and along its shorelines will not have any adverse impact on flooding and erosion and Galloo Island is not designated a Coastal Erosion Hazard Area.

- Policy 12: Activities Or Development In The Coastal Area Will Be Undertaken So As to Minimize Damage To Natural Resources And Property From Flooding And Erosion By Protecting Features Including Beaches, Dunes, Barrier Island And Bluffs- The Project is consistent with this policy. Natural protective features such as beaches, dunes, and barrier islands that help safeguard coastal lands and property will not be adversely affected by the proposed work in the Coastal Management Area.

- Policy 15: Mining, Excavation Or Dredging In Coastal Waters Shall Not Significantly Interfere With The Natural Coastal Processes Which Supply Beach Materials To Land Adjacent To Such Waters And Shall Be Undertaken In A Manner Which Will Not Cause An Increase In Erosion Of Such Land- The Project is consistent with the policy on dredging and excavation. The Project, with the exception of a temporary offloading facility, does not include construction of any solid structures that extend out from shore into the lake such

as solid docks or groins which could trap littoral drift and starve adjacent shoreline areas.

- Policy 17: Non-Structural Measures To Minimize Damage To Natural Resources And Property From Flooding And Erosion Shall Be Used Whenever Possible- The Project is consistent with this policy. Since the cables will be buried in a trench and then backfilled, there is no need to construct any structural shore protection for this project. If it becomes necessary to disturb any vegetated shoreline areas to lay the transmission line, the areas will be immediately seeded and mulched to prevent post construction erosion.

- Policy 18: To Safeguard The Vital Economic, Social And Environmental Interests Of The State and Of Its Citizens, Proposed Major Actions In The Coastal Area Must Give Full Consideration To Those Interests, And To The Safeguards Which The State Has Established To Protect Valuable Coastal Resource Areas- The Project is consistent with this policy. This policy requires consideration of vital economic, social and environmental effects of major actions situated in the Coastal Zone. The Project will not adversely affect coastal natural resources, water levels and flows, shoreline damage, hydroelectric power generating facilities and recreation nor will it adversely affect the social, economic or environmental interests of the State and its citizens. It will provide beneficial economic impacts and increase renewable energy availability in the State. The Project is a wind energy project that furthers the State's goals of reaching 25 percent renewable sources by 2015. The operation of the Project will provide a net reduction of various pollutants compared with the construction of a comparable electric generating facility burning fossil fuels.

- Policy 19: Protect, Maintain, And Increase The Level And Types Of Access To Public Water-Related Recreation Resources And Facilities- The Project is consistent with this policy. The Hounsfield Wind Farm will not interfere with any public water-related recreational resources or facilities nor will it have effects on the capacities or access to such facilities.

- Policy 20: Access To The Publicly-Owned Foreshore And To Lands Immediately Adjacent To The Foreshore Or The Water's Edge That Are Publicly-Owned Shall Be Provided In A Manner Compatible With Adjoining Uses- The Project is consistent with this policy. The Project will maintain existing public access ways and will not interfere with the public's use of existing resources. The Project will not interfere with existing public uses of the lake nearshore such as recreation or navigation. The siting of the Project and its design will be protective of coastal resources such as water quality, fisheries, wetlands, and significant coastal fish and wildlife habitats as described under various policies above.

- Policy 21: Water-Dependent And Water-Enhanced Recreation And Water-Enhanced Recreation Will Be Encouraged And Facilitated, And Will Be Given Priority Over Non-Water Related Uses Along the Coast- The Project is not in conflict with this policy. Project-related structures and the slip channel will not restrict the use of the waters for recreational activities such as boating, fishing and water skiing. There will be some temporary restrictions on recreational activities,

but only during the time that in-water work is being performed. The WTG while not water-dependent or water-related are enhanced by proximity to the water due to frequent strong winds along the lake.

- Policy 22: Development, When Located Adjacent To The Shore, Will Provide For Water-Related Recreation, Whenever Such Use Is Compatible With Reasonably Anticipated Demand For such Activities, And Is Compatible With The Primary Purpose Of The Development- The Hounsfield Wind Farm is consistent with this policy. As stated above, the Project is a renewable (wind) energy generation and transmission project and not one that is recreational in nature. The ancillary in-water work associated with the wind farm project does not present practicable opportunities for providing recreational facilities as an additional use of the site. The dock and access channel are strictly for use in delivery of materials and personnel to the island for construction and maintenance of the wind farm.
- Policy 23: Protect, Enhance, And Restore Structures, Districts, Areas Or Sites That Are Of Significance In The History, Architecture, Archeology Or Culture Of The State, Its Communities, Or The Nation- A study of cultural and archeological resources will be conducted, and the results are included in Section 2.6, Visual Resources, of the DEIS. Impacts on the Galloo Island Lighthouse, which is listed on the National Register of Historic Places, is included in the cultural resource study.
- Policy 25: Protect, Restore Or Enhance Natural And Man-Made Resources Which Are Not Identified As Being Of Statewide Significance, But Which Contribute To The Overall Scenic Quality Of The Coastal Area- The proposed work within the Coastal Area is not expected to have any adverse effects on the scenic quality of the area. The proposed docking facility will not detract from the scenic resources of the island or mainland, as docking facilities are located throughout the eastern Lake Ontario region.
- Policy 26: Conserve And Protect Agricultural Lands In The State's Coastal Area- The Project is consistent with this policy. Galloo Island itself does not represent prime and unique farmland.
- Policy 27: Decisions On The Siting And Construction Of Major Energy Facilities In The Coastal Area Will Be Based On Public Energy Needs, Compatibility Of Such Facilities With The Environment, And The Facility's Need For A Shorefront Location- The Project is totally consistent with this policy. The Article VII proceedings conducted by the NYS Public Service Department will assess the need for and environmental effects of the transmission system. Article VII policy is entirely consistent with the general coastal zone policies. Siting of the windfarm on an island in Lake Ontario takes advantage of the strong frequent winds over the lake enhancing the generation of renewable electrical energy.
- Policy 30: Municipal, Industrial, and Commercial Discharge Of Pollutants, Including But Not Limited To, Toxic And Hazardous Substances, Into Coastal Waters Will Conform To State And National Water Quality Standards- The Project is consistent with this policy. Overall, the project is not expected to have

any significant effects on the quality of coastal waters or to violate any water quality standards. Upstate Power will comply with all state and national requirements and standards.

- Policy 32: Encourage The Use Of Alternative Or Innovative Sanitary Waste Systems In Small Communities Where The Costs of Conventional Facilities Are Unreasonably High, Given the Size Of The Existing Tax Base Of These Communities- The Project is consistent with this policy. Sewage treatment facilities associated with the maintenance building and the living quarters will be designed to meet State and local laws and ordinances. The treatment systems will be entirely funded by Upstate Power and will therefore have no effect on costs to local governments and there will be no adverse effects on the Town of Hounsfield tax base.

- Policy 33: Best Management Practices Will Be Used To Ensure The Control Of Stormwater Runoff And Combined Sewer Overflows Draining Into Coastal Waters- The Project is consistent with this policy. SWPPP for both construction and operation will be designed and implemented to ensure that the project does not result in the release of contaminants to the coastal waters from runoff. (See Appendix D). Upstate Power will comply with all effluent limitations and any other discharge criteria specified by the NYSDEC.

- Policy 34: Discharge Of Wastes Materials Into Coastal Waters From Vessels Subject To State Jurisdiction Will Be Limited So As To Protect Significant Fish And Wildlife Habitats, Recreational Areas and Water Supply Areas- The Project is consistent with this policy. All vessels used for the Project will not discharge sewage, rubbish, and other solid and liquid wastes into State regulated waters. All vessels must be in compliance with New York State and USCG regulatory requirements. These vessels are also subject to the rules of the Saint Lawrence Seaway Development Corporation (U.S.) and the Saint Lawrence Seaway Management Corporation (Canada). These agencies have joint regulations that govern the vessels and people using the seaway and include pollution prevention from garbage and sewage.

- Policy 35: Dredging and Filling In Coastal Waters and Disposal Of Dredged Material Will Be Undertaken In A Manner That Meets Existing State Permit Requirements, and Protects Significant Fish And Wildlife Habitats, Scenic Resources, Natural Protective Features, Important Agricultural Lands, And Wetlands- The Project is consistent with this policy. The water intake structure and sewage outfall will be either buried and encased in concrete or bored at the shoreline up to about the 10 foot water depth. The remainder would be placed on the lake bottom to reach a distance of about 400 to 500 feet offshore in about 30 feet of water depth. This construction technique involves minimal amounts of excavation. Blasting will be timed to avoid fish spawning periods in the spring (generally March 31st to July 15th) and the fall lake trout spawning period (generally second week in October to second week in November). The most sensitive areas for spawning are at the eastern and western ends of the island

where shallow shoal areas exist. The offloading facilities are not located in these shoal areas.

- Policy 36: Activities Related To The Shipment And Storage Of Petroleum And Other Hazardous Materials Will Be Conducted In A Manner That Will Prevent Or At Least Minimize Spills Into Coastal Waters; All Practicable Efforts Will Be Undertaken To Expedite Cleanup Of Such Discharges; And Restitution For Damages Will Be Required When These Spills Occur- The Project is consistent with this policy. For the most part shipment or storage of petroleum products will occur only during the construction phase of the proposed project. Petroleum products will be used to fuel construction equipment. Vessels transporting fuels must be certified by the USCG. Additionally, Upstate Power will prepare a SPCC to account for oil and fuel storage on the island (See Appendix E). During the operational phase, significantly less fuel will be required as compared to the construction phase.
- Policy 37: Best Management Practices Will Be Utilized To Minimize The Non-Point Source Discharge Of Excess Nutrients, Organics and Eroded Soils Into Coastal Waters- The Project is consistent with this policy. See discussion for *Policy 30* (*Pollutant Discharges)* concerning the use of best management practices to reduce soil erosion and properly direct site drainage during construction of the project.
- Policy 38: The Quality And Quantity Of Surface Water And Groundwater Supplies Will Be Conserved And Protected, Particularly Where Such Waters Constitute The Primary Or Sole Source of Water Supply- The Project is consistent with this policy. As indicated in Policy 30 above, the work is not expected to cause water quality problems. In addition the work will not affect any primary source aquifers or municipal water supplies.
- Policy 43: Land Use Or Development In The Coastal Area Must Not Cause The Generation Of Significant Amounts Of Acid Rain Precursors: Nitrates and Sulfates- The Project is consistent with this policy. This project will not contribute any measurable amount of acid rain precursors to the atmosphere. The Wind Farm will help reduce emissions to the atmosphere, such as acid rain precursors, by reducing the need to use fossil fuels in the generation of electrical power. The global community's increased and urgent focus on clean and renewable sources of energy is largely due to the negative environmental effects of burning fossil fuels. The growing consensus among scientists is that the burning of fossil fuels and the associated release of carbon dioxide and other greenhouse gases stoke global climate change, intensify droughts in some parts of the world, floods and storms in others, and add to the deterioration of air quality, among other negative health and environmental consequences. One of these other negative consequences from burning of fossil fuels is the generation of acid rain precursors. Automobile emissions and emissions from the use of fossil fuels in stream electric generating stations (as well as other industries) are major sources of acid rain precursors.

- Policy 44: Preserve And Protect Tidal And Freshwater Wetlands And Preserve The Benefits Derived From These Areas- The Project is consistent with this policy. Upstate Power has designed the work to avoid wetland disturbance to the greatest extent practicable. WTGs, maintenance facilities, residential structures and other project features will not be placed in freshwater wetlands regulated by the Department of the Army under Section 404 of the Clean Water Act and by the NYSDEC under Article 24 ECL. The only potential impact to freshwater wetlands on Galloo Island will be during placement of the electrical collection system and construction of permanent roads. Impacts from ECS in non-forested wetlands will be temporary as the cable system would be buried and the areas will be restored to preconstruction condition after installation. Permanent impacts to wetlands are anticipated where clearing occurs in forested wetlands for overhead lines since there will be a long-term change in cover type from forested to open successional field or scrub-shrub wetland. Permanent impacts to wetlands also will occur where fill is placed in wetlands to construct permanent roads. The total impacts to wetlands from the Project include 0.0004 acres of temporary disturbances to wet meadow and scrub-shrub wetland and permanent impacts to about 0.643 acres of wooded and non-wooded wetlands. Impacts to NYSDEC wetland buffer zones include 0.697 acres from access roads, 0.005 acres from electric poles, 0.039 acres of open field from underground lines and 0.716 acres of wooded upland areas from underground lines for a total of 1.457 acres. Upstate Power will provide mitigation on Galloo Island for the unavoidable impacts to wetlands. A draft mitigation plan that shows the only potential area on the island that is suitable for wetland creation may be found in Appendix J.

In addition, as discussed in Appendix V, the Village of Sackets Harbor has a Local Waterfront Revitalization Program that was approved by the New York State Department of State in October 1986. The Project is not located within the LWRP boundaries, however, Upstate Power has considered the policies of the Village of Sackets Harbor Local Waterfront Revitalization Program and has determined that the Project is consistent with the policies described in the Program.

Additional details on the Coastal Zone Program along with Upstate Power's consistency certification statement and supporting evidence that the work complies with applicable policies are attached as Appendix V of this document.

5.0 Growth Inducing Aspects

Various types of projects can directly or indirectly foster economic or population growth or construction of additional housing in the surrounding environment. Certain projects can influence growth by removing impairments to growth such as establishment of essential public services or new access to an area. Projects can also change the revenue base in an area. The Village of Sackets Harbor is the largest population center in the immediate vicinity of the Project and is approximately 10 miles from Galloo Island. Other towns within the vicinity of the Project besides Hounsfield include the Towns of Lyme, Brownville and Henderson.

The work force will mostly stay on Galloo Island and will be transported to the Island from Sackets Harbor. With the exception of shift changes and time-off, there will be little impacts associated with the construction crew on the mainland. Henderson Harbor may be used as an alternative harbor for transporting construction workers to the Island. Heavy equipment and materials will be brought to Galloo Island by barge from Oswego Harbor. Delivery of large components of the wind farm (blades, turbines etc) will be by lake ship to Oswego Harbor and then to the Island by large barge. Thus, major construction deliveries will not affect any of the local townships in the project area. Oswego Harbor is a major port on Lake Ontario and has the infrastructure and capacity to handle deliveries by large ship and barge.

The direct effect of the Project will be the construction of project features on the island and employment during construction and operation of the wind farm. Secondary effects may accrue to various service businesses that provide commodities used by workers such as food, clothing, household items and personal need items etc. The commodities for employees and materials for construction activities will be brought to the island by watercraft and offloaded at the proposed slip. A commissary will be constructed in the proposed community facility for sale of items to the workforce. Items used by employees may be obtained locally but fuels and construction materials will likely be obtained regionally. Locally purchased items will contribute to economic growth in the Sackets

Harbor area of the Town of Hounsfield, and to a lesser extent in the Towns of Brownville, Henderson and Lyme.

The March 2007 draft changes to the Sackets Harbor Local Waterfront Revitalization Plan (LWRP) indicates that the village police force has had an increase in service calls due to increases in tourism and residential housing (March 2007 LWRP). Due to increased demands the Village plans to provide additional space and staff for expanded service capabilities. In addition, the Village has a need to provide additional space to meet the growing demand on the volunteer fire department (March 2007 LWRP). The nearest hospital that serves this area is located in Watertown, about 8 miles from the Village. The village fire department provides advanced EMT and critical care emergency medical services. The solid waste from the Village is taken to the Jefferson County Recycling and Transfer Center in Watertown, NY. The county transfers waste from this center to the Development Authority of the North Country, Solid Waste Disposal Facility in Rodman, NY. The counties of Jefferson, Lewis and St. Lawrence and the City of Watertown are ownership partners in the Rodman facility. The workforce will not place stress on community services in the Sackets Harbor area or adjacent towns and townships or result in any induced growth that causes a need for additional capacity. Potable water, solid waste storage and sewage treatment will be provided on the island and an infirmary and fire services will also be provided. At set intervals, solid waste will be transferred by barge to shore and then by truck to a certified facility.

Growth of population in the Town of Hounsfield has not been rapid. In 1880 the town population stood at 2,700 and increased to 3,300 in 2000, a gain of 600 people over 120 years. About one-third of this gain occurred between 1990 and 2000. (U.S. Census Bureau) The Village of Sackets Harbor is currently the home of about 1,400 people. (March 2007 LWRP) The Village gained about 73 people between 1990 and 2000. The Town of Hounsfield includes the Village of Sackets Harbor and Gull, Bass, Stony, Galloo and Little Galloo Islands. (Town of Hounsfield homepage) U.S. Census Bureau 2006 population estimates are 1,395 for Sackets Harbor and 3,409 for the Town of Hounsfield.

The other towns in the general area of Black River Bay, Henderson Bay and Chaumont Bay are small towns similar to Sackets Harbor and also have not experienced rapid population growth. For instance the populations of Brownville, Adams Center, Chaumont, and Henderson were 1054, 1576, 612, and 1454 in July 2007.

The construction workers will be provided temporary housing on the Island and will not be traveling extensively to the Sackets Harbor area or to adjacent townships. Approximately 256 workers will be employed during construction. About 65 housing units will be constructed on the island to accommodate the temporary workforce. Once the work on the island has been completed, 12 permanent personnel at a time will remain on the island. Any excess residential units not required by the permanent work force will be removed. No subdivisions will be constructed and sold on the island.

A permanent increase of up to 50 people (workers and families) would represent about a 1.5% increase in population. The temporary work force represents a 7.75% increase in population. The construction workforce creates a temporary population increase and this will provide minor economic benefits through their purchases of food, clothing and other commodities. The small incremental increase from the permanent workforce will not induce any measureable growth in the Sackets Harbor area. With the exception of a population increase on Galloo Island, the construction and permanent workforces will not influence growth and development patterns elsewhere in the Town.

The 252 MW of electricity produced by the wind farm will be connected to the existing power grid in New York and be distributed statewide. No spin-off industries, commercial enterprises or residential developments are expected to be constructed in the local and immediate regional areas due to the availability of the produced electricity.

6.0 Cumulative Impacts

SEQRA requires a discussion of cumulative impacts where such impacts are "applicable and significant" (6NYCRR § 617.9(b)(5)(iii)(a). Cumulative impacts are two or more individual environmental effects which, when taken together, may be significant or which are compounded or increased by other environmental effects.

6.1 Other Developments

6.1.1 Cumulative Impacts to Avian and Bat Populations

Cumulative impacts to avian and bat populations will be analyzed using study results from this project as well as publicly available data and studies from the proposed Cape Vincent Wind Farm, the proposed St. Lawrence Wind Power Project, the proposed Horse Creek-Clayton Wind Project, Wolfe Island Wind Power Project, the proposed Roaring Brook Wind Project, and the operational Maple Ridge Wind Power Project. The Maple Ridge facility is the only one in the region with mortality data obtained through actual operating conditions. The Wolfe Island Wind Power Plant is currently under construction and only pre-construction monitoring data is available. Figure 6.1-1 shows these proposed or operating projects in relation to the proposed project.

Selected Studies: Northern New York and Southwestern Ontario

This section describes the avian and bat environment for each proposed or operating project as well as potential impacts from each project as well as the potential cumulative impact of operating the Hounsfield Wind Farm as well as the other projects.

Hounsfield Wind Farm

The below summarizes the findings from avian and bat studies conducted for this 84 turbine, 252 MW project located on 314 acres. The zone of risk, or the Rotor Swept Zone (RSZ), for this project is 35 -125m.

Migratory Birds: Existing Environment - The diurnal bird movement survey spanned late March through mid-November of 2008 and included 43 surveys. The survey observed

flight heights of all species observed and noted that 31% of Ring-billed Gulls, 2% of Double-crested Cormorants, and 30% Caspian Terns flew within the RSZ.

While protected species were less common than other birds, protected species observed within the RSZ included Osprey (100% within Rotor Swept Zone), Cooper's Hawk (100% within RSZ) and Sharp-shinned Hawk (65% within RSZ). Neither the Bald Eagle nor the Northern Harrier were observed within the RSZ.

Almost all passerines, Great Blue Heron, and American Crow were observed below RSZ while the Common Raven, Canada Goose and raptors such as Northern Harrier, Rough-legged Hawk, Peregrine Falcon and Bald Eagle were observed flying higher than RSZ. Red-tailed Hawk and American Kestrel were observed below RSZ.

Migratory Birds: Potential Impact - The Project may have lower overall raptor mortality during the migration periods (especially spring) than other sites in the northeastern coastal region of Lake Ontario.

Least Bittern, Common Loon, American Bittern, Cooper's Hawk, Sharp-shinned Hawk, Common Nighthawk, Whip-poor-will, Osprey, Grasshopper Sparrow and Horn Lark may be exposed to some collision risk. Nocturnal migrant passerines may be exposed to a marginally higher collision risk. However, relatively fewer diurnal migrant passerines would be exposed to the collision hazard than a similar sized wind project in mainland New York.

Because of its location within Lake Ontario, risk of shorebird collision would be greater on Galloo than inland sites, but lower than other projects on the Lake Ontario coastline.

Ring-billed Gull would have a higher collision risk than Caspian Tern while the Double-crested Cormorant would be have a lower collision risk than Caspian Tern.

Breeding Birds: Existing Environment – Targeted habitat observations and 176 10-minute point count surveys were conducted in the spring and summer of 2008. During this survey, 123 species of birds were documented, of which 80 species were documented

as potentially breeding including Northern Harrier, Upland Sandpiper, American Bittern, Cooper's Hawk, and Bobolink.

Most commonly detected species included American Robin, Eurasian Starling and Yellow Warbler.

The Bald Eagle, Common Loon, Common Nighthawk, and Whip-poor-will were also detected during the study but were not observed to be breeding.

Breeding Birds: Potential Impacts – The Project may introduce some displacement risk to Eastern Meadowlark, as well as to three protected species Upland Sandpiper (one breeding pair), Northern Harrier and Bobolink. Because some avian species have aerial displays near or within the RSZ, the project may introduce collision risk to Eastern Kingbird, Red-tailed Hawk, Northern Harrier and Upland Sandpiper (one pair).

Winter Raptors and Waterfowl: Existing Environment – During late fall 2007 and winter 2008, winter raptors were observed including Rough-legged Hawk, Red-tailed Hawk, Golden Eagle, Cooper's Hawk, Northern Harrier, Snowy Owl and unidentified buteo. The majority of raptors perched in trees below RSZ; however, Rough-legged Hawk and, in smaller numbers, Red-tailed Hawk were seen flying within RSZ. Northern Ravens were also seen flying within RSZ. The survey observed up to 12 Bald Eagles, a count that was higher than expected on Galloo,

Aerial surveys for waterfowl took place from November 2007 through March 2008. Despite the Project's proximity to Little Galloo Island, very few waterfowl were seen flying over the island; most waterfowl were located in close proximity to the shoreline and near shore waters. Mallard and American Duck were prevalent during November and December while Golden Eye, Long-tailed Duck and Scaup dominated in January, February and March.

Winter Raptors and Waterfowl: Potential Impacts – Because of its location, winter raptor usage and, therefore, collision risk from the Project would be anticipated to be larger in the winter than inland sites in New York with typically deep snow cover (e.g., Maple Ridge). In particular, due to population size, Rough-legged Hawk and Bald Eagle

collision risk during winter will be low but may be greater than at other proposed or existing wind projects in New York State. However, raptor population, with the exception of the Bald Eagle, fluctuates with the vole cycle on the island, so raptor collision risk, however low, would be tied to the annual population counts of voles, and subsequently, raptors on the island.

Because of the small numbers of waterfowl activity that cross the island, waterfowl collision with turbines would occur in relatively small numbers, but would likely have greater species diversity and occur in larger numbers per MW at the Project than at Maple Ridge Wind Farm. Smaller numbers of waterfowl collision fatalities per MW would likely occur at the Project than at the Wolfe Island Wind Project, where there is more waterfowl activity in the RSZ due to waterfowl foraging flights to and from agricultural fields in the interior of the island.

Bats: Existing Environment - Bat activity was monitored using Anabat™ detectors at two met towers between June and November of 2008. Calls were measured at 10m, 29m, and 59m at two towers on Galloo Island. At the west met tower, which averaged 30.4 calls per night, the majority of calls at 59m and 29m were from Hoary Bat while *Myotis spp.* were most common at 10m. At the north met tower, which averaged 89.6 calls per night, the majority of calls at 59m were from Hoary Bat. Approximately half the calls at 29m and the majority of calls at 10m were from *Myotis spp.*

Averaging out calls heard at the three different nights for both met towers, the microphones at 10m heard 42.6 calls per night while the microphones at 29m and 59m heard 13.3 and 12.4 calls per night, respectively.

A mist netting survey was conducted on six nights in June 2008 at 12 sites located on Galloo Island using 30 nets. Each site was sampled twice while the number of nets at each location varied from 2 to 4 nets per site, yielding a total sampling effort of 60 net-nights captured. Of the 214 individual bats, all but one bat was of the *Myotis spp*. The remaining bat was a migratory tree bat, a Silver-haired Bat.

Acoustical monitoring and mist netting took place during the summer of 2008. No Indiana Bat were caught during mist netting. There is also no evidence of eastern small-footed myotis on the island.

Bat: Potential Impacts: The estimated bat fatality rate would likely be similar in composition but slightly higher on a per turbine basis to other wind project sites in the northeastern United States.

At the species level, it is possible that a small population of migratory tree bats could be at risk of collision with turbines. The acoustic monitoring found high activity of Hoary Bats, which have shown susceptibility to WTG collisions at other sites.

Cape Vincent Wind Farm

The Cape Vincent Wind Farm is located approximately 10.5 miles north of the Hounsfield Wind Farm. This project proposes the construction of 140 turbines for a capacity of 210 MW. The total project area is 335 acres. The RSZ for this project is 25-125m.

Migratory Birds: Existing Environment - Sixty-three diurnal point count surveys were conducted during spring 2006 and 2007 and fall 2006. Mean use was calculated to estimate the frequency of a bird species within the project area. Mean use was calculated using the number of a species observed within 400 m of the survey point in each 3 minute survey. The most frequently observed bird was the Canada Goose (51.0 mean use / 29% within RSZ) while the most frequently observed raptor was the Turkey Vulture (2.20 mean use / 57% within the RSZ). American Crows (3.56 mean use / 38% within RSZ), Mallard and Unidentified Duck (2.11 and 2.19 mean use / 48% and 2.89% within RSZ, respectively), Northern Harrier (1.46 mean use / 24% within RSZ), European Starling (1.36 mean use / 0% RSZ), Ring-billed Gull and Unidentified Gull (1.06 and 2.10 mean use / 18% and 57% within RSZ, respectively) were also reported.

Other species, which have the potential for some exposure to collision risk in the Hounsfield Project, were less common than other avian species in the Cape Vincent Project Area. These avian species include Caspian Tern (0.02 mean use / 100% within

RSZ), Common Loon (0.01 mean use / 0% within RSZ), Cooper's Hawk (0.06 mean use / 60% within RSZ), Sharp-shinned Hawk (0.05 mean use / 50% within RSZ), Osprey (0.02 mean use / 50% within RSZ), Red-tailed Hawk (0.94 mean use / 50% within RSZ), and Rough-legged Hawk (0.47 mean use / 36% within RSZ).

Migratory Birds: Potential Impacts – Exposure indices, defined as the mean use of the birds multiplied by percent of individuals flying multiplied by percent of individuals flying within the RSZ were calculated for the Cape Vincent project to estimate risk to individual species. The Canada Goose had the highest exposure index at 15.03.

Raptors in general did not have high exposure indices due to either low numbers recorded or flight heights outside the zone of risk. Turkey vultures did have a high exposure index (1.25), however. The exposure indices for protected raptors were as follows: Northern Harrier, 0.35; Common Loon, (NA); Cooper's Hawk, 0.04; Sharp-shinned Hawk, 0.02; Osprey, 0.01.

The exposure indices for other raptors are Red-tailed Hawk, 0.42, and Rough–legged Hawk, 0.14.

The exposure index for the Caspian Tern was 0.02 while exposure indices for Ring-billed Gull and Unidentified gulls were 0.19 and 1.19, respectively.

Breeding Birds: Existing Environment - Forty point count surveys were conducted in the summer of 2006. The most frequently observed species were the Red-winged Blackbird (1.88 mean use) and the Bobolink (1.63 mean use). American Crow (1.0 mean use) and Song Sparrow (1.4 mean use) were also commonly seen.

Other species, which have the potential for some increase in either displacement or collision risk in the Hounsfield Project, that were seen included Northern Harrier (0.2 mean use), Grasshopper Sparrow (0.05 mean use), Horned Lark (0.05 mean use), Ring-billed Gull (0.95 mean use), Eastern Kingbird (0.5 mean use), Eastern Meadowlark (0.65 mean use) and Red-Tailed Hawk (0.15 mean use).

Breeding Birds: Potential Impacts – Impacts are expected to be evenly distributed among species commonly seen, especially gulls, Canada goose, turkey vulture and American Crow. Turbine layout was unknown at the date of the study, so impacts were difficult to predict.

Winter Raptors and Waterfowl: Existing Environment - During late fall 2006 and winter 2007, a total of 640 individuals were observed in 40.5 hours driving and stationary point surveys. During the stationary point surveys, Canada Goose (6.1 mean use) was the most common waterfowl while Rough-legged Hawk (1.38 mean use) and Red-tailed Hawk (0.62 mean use) were the most common raptor species. American Crow (2.62 mean use) was also common. Northern Harriers (0.33 mean use) were also observed.

The most numerous species during the driving surveys, which observed 395 total individuals, was the Ring-billed Gull (12% of all individuals), followed by the Canada Goose (10%), and Rough-legged Hawk (9% of all individuals). Northern Harrier (2%) and Red-tailed Hawk (5%) were also observed.

Winter Raptors and Waterfowl: Potential Impacts – The Cape Vincent Wind Project would increase risk to Canada Goose, but the impacts are not expected to be significant due to the large number of species in the region. The proposed Cape Vincent Wind Project would also increase collision risk for Rough-legged and Red-tailed Hawks; however, impacts are expected to be relatively low.

Bats: Existing Environment - Bat activity was monitored at one met tower between April 13 and June 2, 2006 (spring); June 28 and August 8, 2006 (summer); and August 13-October 9, 2006 (fall).

The number of calls per night in spring 2006 averaged 4.92 while the average number of calls per night in summer 2006 was 28.73. Calls during fall 2006 were broken down by height as follows: average number of calls at 1.0m, 9.9: at 25.0m, 4.27; and at 50.m, 0.65.

An additional Anabat detector was placed near a wooded riparian area while roaming sampling was also conducted during the summer of 2006.

Myotis spp. was the most frequent caller while 25 calls were identified from Indiana Bat after further analysis. Calls were also received from Silver-haired Bat and Hoary Bat.

Bats: Potential Impacts - A comparison of bat activity recorded at the riparian area within the Project Area with activity/mortality results from other wind projects predicts mortality rates similar to or higher than those experienced in West Virginia or Tennessee (20.8 – 38 bats/turbine/year).

St. Lawrence Wind Power Project

The St. Lawrence Wind Power Project proposes 96 turbines to generate 136 MW of electricity within a project area of 289 acres. This project is located 15 miles north of the Hounsfield Wind Farm. The RSZ for this project is 25-125m.

Migratory Birds: Existing Environment – Sixty-three diurnal point count surveys were conducted during spring 2006 and 2007 and fall 2006. Mean use was calculated to estimate the frequency of a bird species within the project area. The most frequently observed birds were Unidentified Gull (93.46 mean use / 44% within RSZ) while the most frequently observed raptor was the Turkey Vulture (3.42 mean use / 73% within the RSZ). Ring-billed Gulls were also frequently seen with a mean use of 12.67. Of the Ring-billed Gulls observed, 42% flew within the RSZ. American Crows (5.28 mean use / 38% within RSZ), Northern Harrier (1.59 mean use / 20% within RSZ), Rough-legged Hawk (1.42 mean use / 47% RSZ), Red-Tailed Hawk (1.20 mean use / 53% RSZ) and Wild Turkey (1.10 mean use / 0% RSZ) were seen.

Other species, which have the potential for some increase in collision risk in the Hounsfield Project, were less common than other avian species in the St. Lawrence Wind Farm Project Area. These avian species include, Cooper's Hawk (0.05 mean use / 100% within RSZ), Sharp-shinned Hawk (0.16 mean use / 58% within RSZ), Osprey (0.02 mean use / 50% within RSZ), and Bald Eagle (0.01 mean use/ 0% within RSZ).

Migratory Birds: Potential Impacts – Exposure indices, defined as the mean use of the birds multiplied by percent of individuals flying multiplied by percent of individuals flying within the RSZ were calculated for the St. Lawrence Wind Power Project to

estimate risk to individual species. The Canada Goose had the highest exposure index at 16.74.

Raptors in general did not have high exposure indices due to either low numbers recorded or flight heights outside the zone of risk. Turkey vultures did have a high exposure index (2.47), however. The exposure indices for protected raptors were as follows: Northern Harrier, 0.31; Cooper's Hawk, 0.05; Sharp-shinned Hawk, 0.09; Osprey, 0.01; and Bald Eagle (0%).

The exposure indices for other raptors are as follows: Red-tailed Hawk, 0.55, and Rough–legged Hawk, 0.56.

Exposure indices for Ring-billed Gull and Unidentified gulls were 3.71 and 23.21, respectively.

Breeding Birds: Existing Environment – Forty point count surveys were conducted during the summer of 2006. The most frequently observed species were the European Starling (5.88 mean use), Red-winged Blackbird (3.4 mean use) and the Bobolink (1.9 mean use). Ring-billed Gull (1.18 mean use), American Crow (1.33 mean use) and Song Sparrow (1.2 mean use) were also commonly seen.

Other species, which have the potential for some increase in either displacement or collision risk in the Hounsfield Project, that were seen included Northern Harrier (0.1 mean use), Grasshopper Sparrow (0.03 mean use), Horned Lark (0.15 mean use), Ring-billed Gull (0.95 mean use), Eastern Kingbird (0.1 mean use), Eastern Meadowlark (0.8 mean use) and Red-Tailed Hawk (0.1 mean use).

Breeding Birds: Potential Impacts – Impacts are not expected to be significant and are expected to be evenly distributed among species commonly seen.

Winter Raptors and Waterfowl: Existing Environment - During late fall 2006 and winter 2007, a total of 795 individuals were observed in 40.5 hours driving and stationary point surveys.

During the stationary point surveys, Unidentified Gull was the most common bird species observed with a mean use of 11.9. American Crow (mean use 6.14) and Canada Goose (mean use 5.48) were also frequently observed. The mean use of the Ring-billed Gull was 0.19.

Rough-legged Hawk (3.00 mean use) was the most common raptor species while Northern Harrier (0.90 mean use) and Red-tailed Hawk (0.71 mean use) were also observed.

The most numerous species during the driving surveys, which observed 795 total individuals, was the Canada Goose (almost 60% of all individuals) followed by American Crow (17%), Wild Turkey (8%) and Rough-legged Hawk (7% of all individuals). Bald Eagle (0.3%), Northern Harrier (2%) and Red-tailed Hawk (3%) were also observed.

Winter Raptors and Waterfowl: Potential Impacts – The St. Lawrence Wind Farm would increase risk to Canada Goose, but the impacts are not expected to be significant due to the large number of species in the region. The proposed St. Lawrence Wind Farm would also increase collision risk for Rough-legged and Red-tailed Hawks; however, impacts are not expected to be significant.

Bats: Existing Environment – Bat activity was monitored at one met tower between April 13 and June 2, 2006 (spring); June 28 and August 8, 2006 (summer); and August 13-October 9, 2006 (fall).

The average number of calls per night at the met tower in spring 2006 was 19.7 2 at ground level while the average number of calls per night in summer 2006 was 22.0 at ground level. The average number of calls per night in fall 2006 was 9.26 at ground level.

An additional Anabat detector was placed at the wooded edge of a field for the spring and summer surveys. At this detector, 29-33 calls per night were made in the spring (height unknown) and 55.56 calls per night were made in the summer (height unknown). During the fall of 2006, an Anabat detector was located in a tree; 32.58 calls were made per night during the fall (height = 10m). Roaming sampling was also conducted during the summer of 2006. Calls came from Hoary Bat, Myotis spp., and Silver-haired Bat.

Eastern Red Bat accounted for the majority of vocalizations at the met tower while the hoary bat accounted for the majority of vocalizations at the additional Anabat detector; however, these calls may be from one or a few bats.

Of the total calls, 16 were identified from Indiana Bat after further analysis.

Bats: Potential Impacts – Bat collision with turbines is a potential impact

Horse Creek Wind Farm

The Horse Creek Wind Farm proposes 62 turbines to generate 130 MW of electricity within a project area of 714 acres. This project is located 20 miles northeast of the Hounsfield Wind Farm.

Migratory Birds: Existing Environment - The spring 2005 diurnal raptor survey, which lasted 10 days, found 700 raptors, representing 14 species. Flight heights were categorized as below or above 150m. Broad-winged Hawk (36% of the birds observed in spring / 42% below 150m) and turkey vultures (37% / 27% below 150m) were the most commonly observed species, followed by Red-tailed Hawk (10% / 59% below 150m), Sharp-shinned Hawk (5% / 12% below 150m) and Northern Harrier (2% / 43% below 150m). Other species, which have the potential for some increase in either displacement or collision risk in the Hounsfield Project, that were observed included Osprey (1% / 63% below 150m), Bald Eagle (0.3% / 50% below 150m), Golden Eagle (0.3% / 0% below 150m), and Cooper's Hawk (0.1% / 0% below 150m).

The fall 2005 diurnal raptor survey, which lasted 11 days, found 575 raptors, representing 13 species. Flight heights were categorized as below or above 150m. The most common species observed was turkey vulture (68% of the birds observed in fall / 8% below 150m), followed by Red-tailed Hawk (14% / 16% below 150m), Northern Harrier (5% / 3% below 150m), Sharp-skinned Hawk (3% / 18% below 150m) and American Krestrels (2% / 0% below 150m). Other species, which have the potential for some increase in either displacement or collision risk in the Hounsfield Project, that were observed included Osprey (0.9% / 0% below 150m), Bald Eagle (0.7% / 50% below 150m), Golden Eagle (0.2% / 0% below 150m), and Cooper's Hawk (1.6% / 22% below 150m).

Unidentified buteos, raptors and accipters were not included in the above species breakdowns. The sum of these unidentified birds totals 6% of the spring survey and 0.9% of the fall survey.

Migratory Birds: Potential Impacts – The number of fatalities will probably small and limited to Red-tailed Hawk and American Krestel. The Northern Harrier is at some risk; however, documented fatalities involving the species at wind farms are low. The open country landscape limits the estimated fatality of Sharp-shinned Hawk and Coopers Hawk because these species forest in forested areas. Bald Eagles are not known to be susceptible to colliding with structures such as wind turbines.

Breeding Birds: Existing Environment – Forty point count surveys were conducted in June 2005. A total of 573 birds were observed in early successional/field and forest edge habitats. The most frequently observed species were Bobolink (15% of all birds observed), Red-winged Blackbird (15%), and Yellow Warbler (11%).

Other species, which have the potential for some increase in either displacement or collision risk in the Hounsfield Project that were seen included Eastern Kingbird (2%), Eastern Meadowlark (5%), Grasshopper Sparrow (2%), and Upland Sandpiper (0.2%).

Breeding Birds: Potential Impacts – Eastern Meadowlark, Bobolink, Northern Harrier, Upland Sandpiper, Horned Lark and Grasshopper Sparrow may be displaced, the extent to which may be dependent on turbine location.

Winter Raptors and Waterfowl: Existing Environment – Christmas Bird Counts were used here to determine the presence of wintering raptors. Red-tailed Hawk, Rough-legged Hawk, Sharp-shinned Hawk, and Cooper's Hawk are likely to be present on the site but their numbers are dependent upon the vole population. Bald Eagles and Golden Eagles may occur in the vicinity of the Horse Creek Wind Farm in winter if Perch River Wildlife Management Area (WMA) is not frozen over. Horned Lark is likely to be present in years without significant snow cover.

Northern Harrier is likely to be in the vicinity of the Horse Creek Wind Farm during winter.

Waterbird habitat is sparse within the immediate vicinity of the Horse Creek Wind Farm; however, this wind farm is proposed adjacent to the Perch River WMA, which supports Osprey, American Bittern and Least Bittern. Snow and Canada Goose are likely to feed in the agricultural fields in the immediate vicinity of the Horse Creek Wind Farm.

Winter Raptors and Waterfowl: Potential Impacts – See description of Migratory Birds: Potential Impacts for potential impacts to wintering raptors.

Displacement impacts to Snow and Canada Goose are not likely to be significant although these species may have some collision risk as they forage; however, Canada Goose have never demonstrated susceptibility to colliding with turbines, so this risk is low to no risk. Collision impacts to other waterfowl and waterbirds during migration is likely to be minimal because they migrate at a high altitude. Collision to nesting waterfowl and waterbirds is minimal; however, American and Least Bitterns may be exposed to some collision risk as these species may nest in the small wetlands within the Horse Creek Wind Farm project area.

Bats: Existing Environment – Bat migration studies were completed during the fall of 2005 and spring of 2006. Two Anabat detectors were installed on a met tower within the project area for both studies. During the Spring 2005 survey, the detectors were installed at 15m and 20m and an average of 1.6 calls per night were heard. The majority of calls were from Myotis Sp, including Big Brown Bat. Silver-Haired Bat and Hoary Bat were also heard.

During the Fall 2005 study, the detectors were installed at 2m and 30m and the average calls per night was 4.7. The majority of the calls were from Myostis.spp, but Silver-haired Bat was also heard.

Mist netting took place in summer 2006; 17 Indiana Bats were captured.

Bats: Potential Impacts - Bat collision rates are not anticipated to be high.

Wolfe Island Wind Power Project

The Wolfe Island Power Project is currently in the construction phase. Located on Wolfe Island in the Province of Ontario, Canada, this project would include 86 turbines at full build-out and would generate 197.8 MW of electricity. The project is 13 miles north-northwest of the Hounsfield Wind Farm. The RSZ for this project is 36-125m.

Avian studies conducted for this project took place in both 2004 and 2006. The studies looked at Simcoe Island and Wolfe Island, which is designated by BirdLife International as an Important Bird Area due to the significant presence of wintering hawks and owls. The bat study was conducted in 2007 after the avian studies.

Migratory Birds: Existing Environment - Fall (2004) and spring (2004, 2006) migration surveys were conducted. A road-based survey took place in fall of 2007.

The 2004 fall migration survey, which included 4 observation days, noted 54 species of birds accounted for approximately 18,773 individuals. The Canada Goose accounted for 53% of all individuals, followed by the Red-winged Blackbird (27%). All other species accounted for 10% or less of the total individuals observed.

Other species, which have the potential for some increase in either displacement or collision risk in the Hounsfield Project, that were seen included Common Loon (0.05%), Northern Harrier (0.2%), Sharp-shinned Hawk (0.02%), Cooper's Hawk (0.01%), Red-tailed Hawk (0.07%), Rough-legged Hawk (0.01%), and Horned Lark.

The 2006 spring migration survey, which included 4 observation days, noted 115 species of birds accounted for 10,390 individuals. The Ring-billed Gull (16% of all individuals) followed by Canada Goose (13%), and Red-winged Blackbird (11%) were the most commonly seen birds. All other species accounted for 5% or less of the total individuals observed.

Other species, which have the potential for some increase in either displacement or collision risk in the Hounsfield Project, that were seen included Northern Harrier (0.06%), Upland Sandpiper (0.2%), Caspian Tern (0.4%), Common Loon (0.03%),

Eastern Kingbird (0.7%), American Bittern (0.08%), Osprey (0.01%), Horn Lark (0.6%), Grasshopper Sparrow (0.08%), Eastern Meadowlark (1.8%), bobolink (4%), and Red-tailed Hawk (0.04%).

During the fall of 2007, road-based driving surveys took place on 13 days and stationary surveys took place on 8 days. The most common species observed included turkey vulture, Northern Harrier, and American Kestrels. A total of 686 Raptors were observed during the driving surveys, including Northern Harriers, Red-tailed Hawk, Rough-legged Hawk, Sharp-shinned Hawk, Cooper's Hawk, and Osprey. 215 birds were observed during the stationary surveys, including Northern Harriers, Red-tailed Hawks, Sharp-shinned Hawk, Cooper's Hawk, Osprey, and Red-shouldered Hawk. Peregrine Falcon (flight heights over 300m), Golden Eagle (flight heights between 30 – 60m), and Bald Eagle were also observed.

Migratory Birds: Potential Impacts – Impacts to Double-breasted Cormorants may be higher than to other species because they were observed flying within the RSZ. Mortality of Ring-billed Gulls is expected; however, the rate will be very low in comparison to gull populations and is not considered a threat to the species.

Impacts to other migratory waterfowl, which were captured in the migration surveys, are discussed below under Winter Raptors and Waterfowl.

Fatalities among raptors are expected to be low because of observed low raptor fatality rates at similar facilities. Further because of the inland location of turbines, fatalities of shorebirds is not expected.

Breeding Birds: Existing Environment – Sixty-two point count surveys were conducted in June 2004, and 30 point count surveys were conducted June 2006. A total of 83 species were observed although five of these species were not expected to be breeding, including Double-crested Cormorant, Great Blue Heron,, Turkey Vulture, Ring-billed Gull and Caspian Tern.. The most common breeding species was the Red-winged Blackbird (17% of all individuals), followed by the Bobolink (11%), European Starling (9%), Savannah Sparrow (8%), American Robin (5%), Yellow Warbler (4%), Eastern

Meadowlark (4%), and Mourning Dove (4%). The remaining species each composed less than 3% of the breeding bird population.

Other species, which have the potential for some increase in either displacement or collision risk in the Hounsfield Project, that were seen included Upland Sandpiper (1.8%), American Bittern (0.1%), Eastern Kingbird (1.4%), Horned Lark (1.7%), and Grasshopper Sparrow (0.3%).

Breeding Birds: Potential Impacts – Two birds with aerial breeding displays, Horned Lark and Bobolink were frequently observed, but were observed below RSZ. For other birds, limited amounts of habitat removal for access roads, and to a lesser extent, turbine footprints should not result in significant habitat fragmentation.

Winter Raptors and Waterfowl: Existing Environment – During the winters of 2004, 2005, and 2006 - 2007 winter raptor surveys were conducted.

Winter surveys conducted in 2004 and 2005 resulted in smaller numbers of raptors than that observed during 2006-2007, and the species distribution of these two earlier surveys was different. Rough-legged Hawks and Red-legged Hawks outnumbered the Northern Harrier. In 2004 five Northern Harrier, 18 Rough-legged Hawk and 8 Red-tailed Hawk were observed. In 2005 one Northern Harrier, 4 Rough-legged Hawk and 12 Red-tailed Hawk were observed.

During the 2006-2007 survey, a total of 455 birds were observed on Wolfe Island and 74 birds were observed on Simcoe Island. A total of 10 species was observed. The most frequent observations were made of Northern Harrier (33% of all individuals), Rough-legged Hawk (27%), and Red-legged Hawk (20%). The remaining species each composed less than 3% of the winter raptor population.

Other species, which have the potential for some increase in either displacement or collision risk in the Hounsfield Project, that were seen included Snowy Owl (4%), Bald Eagle (1.1%), Sharp-shinned Hawk (0.2%), and Osprey (0.2%).

Waterfowl studies were conducted in mid-fall 2004 and mid-spring 2005. During the spring, Canada Goose were abundant, as well as Mallard and Red-breasted Merganser. Shorebirds observed included Killdeer and Wilson's Snipe. Double-crested Cormorants were most abundant among the waterbirds while Great Blue Herons and American Bitterns were also observed.

During the fall, Canada Goose, Greater Scaups, Mallards, Common Goldeneye and Northern Pintails were among the waterfowl seen. Double-breasted Cormorants were again the most frequently observed waterbird while Dunlins were the most frequent shorebird.

Winter Raptors and Waterfowl: Potential Impacts – Due to the concentration of raptors, there is some risk of potential negative effect, including direct mortality.

Waterfowl fatality is expected to be low because of previous studies that indicate few waterfowl fatalities occur as a result of contact with wind turbines. Further, the main flight paths of waterfowl in the project area do not often intersect with the proposed turbine locations.

Bats: Existing Environment – The fall 2005 and 2006 bat surveys were conducted at selected locations and consisted of driving to each location and standing at the roadside with an ultrasonic detector. Sixteen bats were observed in the study area. The majority of bats were in the Big Brown Bat (*Myostis spp*.)/Silver-Haired groups.

No Indiana Bat, which is not a protected species by either the governments of Canada or Ontario, was observed.

Bats: Potential Impacts – Given the lack of habitat features that would be attractive to bats, coupled with the small number of bats observed during the field surveys, bat activity is considered to be low. Therefore, no significant potential effects are anticipated.

Roaring Brook Wind Project

The Roaring Brook Wind Project is proposed 39 miles east southeast of the Hounsfield Wind Farm. This project would include 39 turbines and would generate 79.9 MW of

electricity. The RSZ for this project was determined as the percent of birds flying below 150m, which would be the maximum turbine height. The project area would be 211 acres.

Migratory Birds: Existing Environment – Fall (2007) visual and acoustic and spring (2007) visual studies were completed. The 2007 spring visual spanned 42 nights. The percentage of bird flight altitudes within the RSZ ranged from 0-100%. The mean visual observation rate was 4.39 birds/h. The median flight direction was 0 degrees. Detailed species breakdowns are not available.

The 2007 fall visual and acoustical survey spanned 86 nights. The percentage of bird flight altitudes within the RSZ was 25%. The mean visual observation rate was 2.0 birds/h. The median flight direction was 225 degrees. Detailed species breakdowns are not available.

Migratory Birds: Potential Impacts – The project poses low risk to migrating hawks as the project site does not contain lake shores or ridgelines that would concentrate hawks as they migrate, so flight heights of hawks would be greater than 600 feet.

For potential impacts to waterfowl, see the discussion under Winter Raptors and Waterfowl: Potential Impacts.

Breeding Birds: Existing Environment – Thirty-nine point counts were conducted in June 2007. A total of 1761 individuals of 55 species were observed. The most frequently observed species was the White-throated Sparrow, accounting for 8.8% of the total species observed. The next most commonly observed species was the Veery (7.4%), followed by Red-eyed Vireo (7%), American Redstart (5.7%), Mourning Warbler (5.6%), and Chestnut-sided Warbler (5.1%). All other species accounted for 5% or less of the total individuals observed.

Other species, which have the potential for some increase in either displacement or collision risk in the Hounsfield Project, that were observed included the Northern Harrier (0.1%).

The Breeding Bird Atlas was also consulted. The Project Area is included in four blocks of the Atlas. Species, which have the potential for some increase in either displacement or collision risk in the Hounsfield Project, that were included in the Atlas were American Bittern (probable breeder) and Sharp-shinned Hawk (confirmed breeder). The bobolink, Horned Lark, Eastern Kingbird were noted as breeding species according to the USGS Breeding Bird Survey.

Breeding Birds: Potential Impacts – Impacts to the American Bittern are unlikely as the project would be constructed away from wetland habitat. The project lacks habitat for open country birds such as the Northern Harrier that perform aerial courtship displays.

Winter Raptors and Waterfowl: Existing Environment – A winter bird survey was not conducted for this project, so Audubon's New Boston and Watertown Christmas Bird Counts were consulted. The New Boston Count overlaps the project site while the Watertown Count is 19.5 miles northwest of the project area. European Starling and Black-capped Chickadee were the most common species recorded on the New Boston Count.

Other species, which have the potential for some increase in either displacement or collision risk in the Hounsfield Project, that were included in the two counts included Horned Lark and Bald Eagle, but neither are believed to occupy the project site due to lack of open water and water habitat during winter. Northern Harrier, Common Loon, Sharp-shinned Hawk, Rough-legged Hawk, Red-tailed Hawk were also reported in the counts.

Large lakes, marshes or any other ecological magnets that would attract waterbirds exist in the project area. No agricultural fields that could act as foraging sites during migration are located within 1.5 miles of the project area.

Winter Raptors and Waterfowl: Potential Impacts – Some impacts may occur to wintering raptors if nests are placed close to turbines.

Because waterfowl, waterbirds or shorebirds are unlikely at the project site, it is unlikely that fatalities if they occur would have a significant effect at the regional population level.

Bats: Existing Environment – A 2007 spring visual and acoustic study that spanned 42 nights identified 68% of the 44 identified bats were tree-roosting bats. The percentage of bat flight altitudes within the RSZ ranged from 0 – 100%.

A 2007 fall visual and acoustic survey that spanned 88 nights used Anabat detectors installed at three met tower locations: Average calls per night at 1.5m – 39.3. The majority of these calls came from *Myostis spp.* Average calls per night at 44m – 6.7. The majority of these calls were made from Hoary Bat.

The majority of calls considering both altitudes came from *Myostis spp.* No study was undertaken to determine whether or not calls were made from the Indiana Bat, which is of the *Myostis spp.* The percentage of bat flight altitudes within the RSZ was 75%.

Bats: Potential Impacts – There is relatively low exposure of bats to turbine collision. The project is not expected to result in any impacts to the Indiana Bat.

Table 6.1-1: Results of Radar Studies at Select Wind Project Sites

Project	**Overall Passage Rates (t/km/hr)**		**Mean Flight Height (m)**		**% Targets Below Max. Turbine Height**		**Mean Flight Direction (degrees)**	
	Fall	**Spring**	**Fall**	**Spring**	**Fall**	**Spring**	**Fall**	**Spring**
Hounsfield Wind Farm (Proposed)	281	624	298	319	17 (below 125m)	19 (below 125m)	207	51 ± 59
Cape Vincent Wind Farm (Proposed)	346	166	490	441	8 (below 125m)	14 (below 125m)	209.2	34
St. Lawrence Wind Power Project (Proposed)	346	166	490	44	8 (below 125m)	14 (below 125m)	209.2	34
Horse Creek Wind Farm (Proposed)	418	450	475	443	10 (below 150m)	14 (below 150m)	168	30
Wolfe Island Wind Power Project (Under Construction)*		NA	233	NA	23 (below 125m)	NA	95	NA

Roaring Brook Wind Project (Proposed)*	NA	NA	NA	NA	NA	NA	NA	NA
Maple Ridge Wind Power Project (In Operation, formerly Flat Rock) *	166		430		8		195	

*Note: The Wolfe Island study also included flights per hour rather than targets per hour. Overall passage rates for Wolfe Island cannot be calculated.

**The Roaring Brook Wind Project did not include a radar study.

Operational Results from Maple Ridge Wind Project

Three studies have been conducted at the Maple Ridge Wind Project – Annual Reports for 2006 and 2007 (Jain et al 2007, 2008) and a report on the project's impact on grassland/hayfield nesting songbirds (Kerlinger and Dowdell 2008). The Maple Ridge Wind Project is a 198 turbine project that began operation in 2006. This wind farm is located approximately 41 miles to the east southeast of the Hounsfield Wind Farm.

2006 Annual Report

During the first year pilot post construction study, carcass surveys were conducted at 50 out of 120 (41.7%) operational turbine sites and at two permanent met towers. A total of 2244 surveys were conducted at the wind turbines as follows: ten turbine sites were searched on a daily basis from June 17 – November 15, 2006; ten turbines were searched every three days from June 29 – November 15, 2006 and 30 turbine sites were searched every seven days from July 11 – November 12, 2006. One met tower was searched on a daily basis between July 17 – November 15, 2006 while the second met tower was searched every three days between July 17 – November 14, 2006. The number of searches around met towers totals 131 searches, meaning that the total number of searches conducted for the 2006 study is 2355.

A total of 125 avian incidents, which represented 30 species, were recorded, including American Kestrel (one fatality), Yellow-Bellied Sapsucker (one fatality) and wild turkey (three fatalities). The remaining species were chiefly songbirds. A total of 326 bat incidents, representing five species (Hoary Bat, Silver-haired Bat, Eastern Red Bat, Little Brown Bat and Big Brown Bat) were recorded. The Hoary Bat experienced more fatality

than other bats. The mortality rate is estimated at 24.5 bats/turbine/year, with most of the mortality during the late summer and fall migratory period (Jain et al., 2007).

There is no significant difference in the numbers of birds and bats killed at towers with L-864 FAA obstruction lighting (flashing red strobes) versus towers without FAA obstruction lighting.

2007 Annual Report

No Northern Harrier fatalities were documented in the 2007 Maple Ridge fatality survey, yet 18 sightings of this species were reported in the 2003 Maple Ridge breeding bird survey.

The Jain et al. (2008) report does indicate that three Red-tailed Hawk "incidences" (presumed fatalities) were documented at the Maple Ridge wind project in 2007.

Mortality data from 2007 revealed a mortality rate of 15.5 bats/turbine/year; again, most of the mortality occurred during fall migration (Jain et al., 2008).

2007 Breeding Bird

The Maple Ridge wind project currently has one full year of fatality surveys during the breeding season (Jain *et al.* 2008) to compliment its 2003 and 2008 breeding bird studies (Kerlinger and Dowdell 2003, 2008). The 2007 fatality study at Maple Ridge extended from May through mid-November. 64 turbines were surveyed for fatalities once a week and during these searches 64 bird carcasses were salvaged. 22 of these (~ one third) were found during the primary breeding season months of June and July; however, only 10 were identified to species.

Regarding the species identities of these 10 birds, the Jain *et al.* report does not provide a species list of the fatalities by the date they were found. However, because Bobolink and Savannah Sparrow were the two most common breeding species documented in the Maple Ridge (Flat Rock) pre-construction and post-construction breeding bird surveys, it can be suggested that a low (or nonexistent) fatality rate is possible for the local breeding populations of these two grassland bird species in the Maple Ridge wind project area.

Avian and Bat Cumulative Impact Assessment

Avian and bat species may be cumulatively impacted by the construction and operation of the Hounsfield Wind Farm on two fronts. First, the Hounsfield Wind Farm, as well as the construction and operation of other wind farms, may reduce the population of one particular bird/bat species significantly, such that the current population of the species within New York State may be significantly decreased. Cumulative impacts to an avian or bat species on this front may be assessed by determining species that may be impacted at Hounsfield that may also be impacted at other wind farms.

On the second front, the Hounsfield Wind Farm in combination with other wind farms may introduce cumulative risk to migrating avian and bat species as individuals move across the Northern New York and Southwestern Ontario or migrate northward from Lake Ontario to northern Ontario. Migration through this area would expose avian and bat species to hazards from each wind farm they encounter along their route.

It should be noted that a lack of transboundary bird studies translates to a high degree of uncertainty regarding bird populations across water, for example Lake Ontario as the boundary between the United States and Canada. Therefore, impacts on bird and bat species in New York State from the Wolfe Island Wind Farm are difficult to determine. Likewise, impacts on bird and bat species in Canada from wind farms in New York are difficult to determine.

The table below lists the avian and bat species that may experience displacement or collision risk due to the construction and operation of the Hounsfield Wind Farm. This species list may be compared with impacts to the same species at the other wind farms discussed in this section.

Table 6.1-2: Cumulative Avian and Bat Risk

	Hounsfield Wind Farm	**Cape Vincent Wind Farm**	**St. Lawrence Wind Farm**	**Horse Creek Wind Farm**	**Wolfe Island Wind Farm**	**Roaring Brook Wind Farm**
Raptors						
Northern Harrier	Medium	Medium	Medium	Medium	Medium	Low

Bald Eagle	Medium	None	Medium	Medium	Medium	Low
Golden Eagle	Low	None	None	Low	Low	None
Cooper's Hawk	Medium	Medium	Medium	Low	Low	Low
Osprey	Medium	Medium	Medium	Medium	Medium	None
Sharp-shinned Hawk	Medium	Medium	Medium	Low	Medium	Low
Red-tailed Hawk	Medium	Medium	Medium	Medium	Medium	Low
Rough-legged Hawk	Medium	Medium	Medium	Low	Medium	Low
Northern Raven	Medium	None	None	None	None	None
Breeding Birds						
Upland Sandpiper	High[1]	None	None	Low	Low	Low
American Bittern	Low	None	None	Low	Low	Low
Least Bittern	Low	None	None	Low	None	None
Common Loon	Low	Low	None	None	Low	Low
Common Nighthawk	Low	None	None	None	None	None
Whip-poor-will	Low	None	None	None	None	None
Grasshopper Sparrow	Low	Low	Low	Low	None	None
Horned Lark	Low	Low	Low	Medium	Low	Low
Bobolink	Low	Medium	Medium	Medium	Medium	Low
Eastern Kingbird	Low	Low	Low	Low	Low	Low
Eastern Meadowlark	Low	Low	Low	Low	Low	Low
Waterbirds						
Caspian Tern	Medium	Medium	None	None	Low	None
Ring-billed Gull	Medium	Medium	Medium	None	Medium	None
Bats						
Silver-haired Bat	Medium	Medium	Medium	Medium	Medium	Medium
Hoary Bat	Medium	Medium	Medium	Medium	None	Medium
Myostis Spp.	Medium	Medium	Medium	Medium	Medium	Medium

None – Species is not known to occur in project area

Low – Species is known to occur in project area, but displacement or collision risk are low.

Medium – Species meets one or more of the following criteria: thirty percent or more of the species were seen flying within the project-specific RSZ; species has aerial courtship displays within the RSZ; species may experience both displacement and collision risk; species spends migrating and nesting seasons in project area; species may experience higher fatality rates at this wind farm than other wind farms.; species experiences high fatality at wind farms; species frequently occurs in project area.

High – Species may be extirpated from project area.

[1]While the impact upon Upland Sandpiper may be characterized as 'high,' only one pair of Upland Sandpiper has been observed breeding on Galloo Island; therefore, extripation here means that one pair of Upland Sandpipers may choose to breed elsewhere. Upland Sandpiper has also been observed migrating through Galloo Island in small numbers and may continue to both breed and migrate through the island.

Raptors

Collision fatalities of raptors have been noted at wind projects in North America and Europe. In North America most raptor fatalities have been documented in the western half of the continent. The four intensive fatality studies in eastern North America have documented few raptor fatalities (Evans 2009). Four raptor fatalities were reported in a fatality study in 2007 at the 195-turbine Maple Ridge wind project, 70 km east-southeast of Big Galloo (Jain *et al.* 2008). Three were Red-tailed Hawks and one was a Sharp-shinned Hawk. Based on the results at Maple Ridge, potential for cumulative impacts likely exists for Red-tailed Hawks and Sharp-shinned Hawks as they migrate throughout the region.

Cumulative impacts to most other hawk species can also be assumed to be low. In particular, no Northern Harrier fatalities have been reported at Maple Ridge, despite their abundance across all projects. Cumulative impacts to Northern Harrier, then, would not be expected.

Much is unknown about the Bald Eagle displacement and fatality from wind farms. No incidences of Bald Eagle fatalities have been documented in North America. Bald Eagles have not been seen breeding on Galloo Island, so that species' exposure to collision and/or displacement risk is limited to the time they spend wintering on the island. Bald Eagles prefer feeding on fish but in times when the lake freezes completely, the Bald Eagles feed on land, which would increase the likelihood of Bald Eagle fatality at Hounsfield Wind Farm, Cape Vincent Wind Farm, St. Lawrence Wind Farm and Wolfe Island Wind Farm. The 2008 field reports indicate that Wolfe Island had more wintering

Bald Eagles in its vicinity than Galloo Island. The Wolfe Island wind project may be the first indicator of Bald Eagle susceptibility to wind turbine collision in eastern North America. As more becomes known about the relationship between the Bald Eagle and wind farms, cumulative risk to wintering Bald Eagles from the Hounsfield Wind Farm can be estimated.

Breeding Birds

Relatively low displacement and mortality impacts will be experienced by breeding birds in Galloo Island with one notable exception, the Upland Sandpiper. The Project may permanently displace the single pair of Upland Sandpiper on the island; however, this impact cannot be characterized as cumulative since impacts to Upland Sandpiper elsewhere are minimal.

Waterbirds

The Project's proximity to water resources may bear measureable impacts to both Ring-billed Gull and Caspian Tern. Because Hounsfield Wind Farm, Cape Vincent Wind Farm, St. Lawrence Wind Farm and Wolfe Island Wind Farm are located near water, it is possible that impacts from these wind farms on the billed gull population may be cumulative. However, this species' population in NY has been increasing annually and has benefited greatly from human activities such as agriculture, landfills, and parking lots of fast food restaurants. This species has been managed on Oneida Lake in the past and will likely be managed at other sites in the state in the future. There are no grounds to suspect that an indirect culling of potentially hundreds a year from the Hounsfield project would affect the viability of the Little Galloo Ring-billed nesting colony or the increasing population trend of this species in NY.

Medium impacts are expected to Caspian Tern from both the Hounsfield Wind Farm and from the Cape Vincent Wind Farm. These impacts have the potential to be cumulative but would not threaten species viability or the increasing population trend of this species in NY.

Bat

The bat species observed at the Hounsfield Wind Farm are similar to bat species at other wind farms; further, these species have a high mortality rate at operational wind farms, including Maple Ridge. It is anticipated that impacts to bat species on Galloo Island will be cumulative on both a regional species count basis and on a migratory impacts species basis. Numbers of Hoary Bat and Myotis spp may decrease somewhat in the region due to high concentrations near project sites. It is likely that impacts to all three bat species observed at the Hounsfield Wind Farm may be additive as each species migrates throughout the region. However, it is important to note that the Hounsfield Wind Farm presents a notable exception to species distribution as it is likely outside the migratory and breeding range of the Indiana Bat, an endangered species in both the United States and the State of New York, and the Eastern Small-footed Myotis, a state species of special concern. Unlike other proposed wind farms within the region, with the exception of the Roaring Brooks Wind Farm, Indiana Bat has not been identified within the project area, either through acoustical or mist netting surveys.

Evaluation of Significance

The results of this evaluation suggest that, overall, cumulative environmental impacts to avian and bat species may be considered minimal. While impacts of medium magnitude may occur on waterbirds, these species are populous in nature, so any impact that may occur should not affect species viability. There is the potential for impacts of medium magnitude to raptor species; however, the four intensive fatality studies in eastern North America have documented few raptor fatalities. While some bat mortality may occur, the construction and operation of the Hounsfield Wind Farm will not impact protected bat species, particularly the Indiana Bat who may be susceptible to fatality at other projects within the region.

Like any other wind project in New York, the Hounsfield project may have some impacts associated with collision risk and habitat alteration on avian and bat species. However, the project's location within New York State's highest wind resource (excluding Atlantic Ocean sites) enables the project to utilize wind more efficiently than any other existing or

proposed project in the region. Moreover, in terms of fewer towers per MW, the project makes the most compact use of wind in comparison to any the other wind farms considered in the Cumulative Impact Assessment.

Table 6.1-3: Cumulative MW and Disturbances

Project	**#WTG**	**#MW**	**Temporary + Permanent Disturbance**
Hounsfield Wind Farm (the Project)	84	252	314 acres (1.3 acres/MW)
Cape Vincent Wind Farm (Proposed)	140	210	335 acres (1.6 acres/MW)
St. Lawrence Wind Power Project (Proposed)	96	136	289 acres (2.1 acres/MW)
Horse Creek Wind Farm (Proposed)	62	130	714 acres (5.5 acres/MW)
Wolfe Island Wind Power Project (In Construction)	86	197.8	Not calculated
Roaring Brook Wind Project (Proposed)	39	79.9	211 acres (2.6 acres/MW)
Maple Ridge (In Operation)*	195	321.75	Not available

Any cumulative risk from the Hounsfield Wind Farm and other proposed and constructed wind farms can be compared to the negative impacts that may be sustained from continued reliance on fossil fuels and, thus, from global warming. In producing energy from a non-fossil fuel resource, wind energy may decrease the rate of global warming and its related impacts to avian and bat species. The Audubon Society links global warming to decreased vitality of bird species. The Society notes that due to global warming, "There will be major shifts in the ranges and abundances of many of the 150 common bird species in the Eastern Untied States over the next 100 years or so; 50-52% of the species will decrease in abundance by 25% or more, while 37-40% of species will exhibit range reductions of 25% or more." The potential impact from global warming to the viability of bird species may be far more catastrophic than potential cumulative impacts from the operation of these wind farms within the northern New York/southern Ontario region. If these wind farms are prevented from operating, then important opportunities to impede global warming would be missed.

Further, this project works to establish New York as a leader in wind energy generation. As of June 30, 2008, only Texas and Iowa had more wind capacity under construction (Tierney 2008).

As of June 2008, New York State had 706.8 MW of operating wind power, with 588.5 MW under construction and approximately 3,113 MW proposed. Based on the NYISO Interconnection Queue; existing, under construction and proposed wind projects have a combined capacity of approximately 4,409 MW. Further, operation of this 252 MW Project would increase the state's wind power production by 6%

6.1.2 Cumulative Impacts – Visual

This section addresses the potential cumulative visual impacts that may arise from interactions between the impacts of the Project and nearby projects. Cumulative visual impacts were considered from the perspective of the Seaway Trail Scenic Byway (Route 3) in the Town of Henderson, New York.

Based on viewshed mapping and field evaluation discussed in the Hounsfield Visual Resource Assessment (Appendix Q), the Project will be visible from sections of the Seaway Trail Scenic Byway. Of the 11 miles of the Seaway Trail traversing the study area, the high point of one or more turbines will be visible in the distant background for approximately 3.8 miles of this road. At its closest point, the Seaway Trail is 10 miles from the Project site.

The nearest wind farm projects are the existing Maple Ridge Wind Farm and proposed Roaring Brook Wind Farm. The Maple Ridge Wind Farm is located in the Towns of Lowville, Martinsburg, Harrisburg, and Watson in Lewis County, New York. The Roaring Brook Wind Farm is planned for the Town of Martinsburg, New York.

A viewshed analysis was conducted by Environmental Design & Research for the Roaring Brook Wind Farm; it was a cumulative assessment that also looked at the viewshed of the Maple Ridge Wind Farm. The referenced analysis utilized a ten mile radius, which does not include the Seaway Trail Scenic Byway.

No cumulative visual impacts are expected from the three projects as their viewsheds do not overlap. Views from the Seaway Trail toward the Maple Ridge and Roaring Brook Wind Farms cannot be determined from existing public documentation; however, it can be assumed that these Projects are not visible as they are located approximately 28 miles from the Seaway Trail Scenic Byway at its closest point in the Town of Henderson, New York.

6.2 Transmission Line

In order to convey the 252 MW generated by Hounsfield Wind Farm (the Project) to the New York State Power Grid, Upstate Power proposes to construct and operate a single circuit 230kV electric transmission line (Proposed Route) approximately 50.6 miles in length between the Project on Galloo Island to a substation in the Town of Mexico, Oswego County, New York where the line will connect to the regional power grid (Figure 1.2-2). Under Public Service Law Article VII the construction and operation of the Proposed Route is subject to the exclusive review jurisdiction of the NYDPS, which represents the public interest in all Article VII proceedings. As such the Proposed Route is a Type II action under SEQRA (6 NYCRR §617.5[c][35] and, therefore, not subject to SEQRA review (6 NYCRR §617.5[a]). Nevertheless, impacts may occur from the construction and operation of the Proposed Route and will be summarized here because the Proposed Route is required to operate the Project. Appendix W to this document contains Exhibit 4 (Environmental Impact) of the Article VII Application that was submitted to the NYS Public Service Commission, which is empowered to decide on any application filed under Article VII, the NYSDEC, and other state agencies on January 13, 2009.

Once the NYPSC determines that the Article VII Application is complete, an Administrative Law Judge (ALJ) will be selected by the NYSPSC to preside over public statement and evidentiary hearings. These hearings will help the NYSPSC decide whether the construction and operation of the Proposed Route will fulfill the public need and will be compatible with environmental values and the public health and safety. NYSPSC will also determine if the Proposed Route complies with legal requirements. After these hearings, a recommendation may be made by ALJ for NYSPSC

consideration. Comments from other governmental agencies, organizations and the general public are included within this consideration. If the Commission determines that a Certificate of Environmental Compatibility and Public Need should be granted, then the Proposed Route would be certified. Following certification, it is likely that the NYSPSC would require additional documents to verify compliance with its certification order. Deviations of up to 1/8 mile (660 feet) are sometimes allowed to accommodate design refinements, property lines, soil conditions, new structures and other concerns identified during final facility design and siting.

Since the inception of the Proposed Route, its design has undergone several refinements in order to address preliminary input received from public and municipal organizations. Upstate Power recognizes that pro-actively addressing any perceived issues early on in the process is an important step in fostering an open relationship with all interested parties and ultimately will lead to the development of a more successful project.

Throughout the process, Upstate Power has sought input from numerous federal and state agencies, including: USFWS, USACE, the Department of Public Service, NYSDEC, NYSDAM, Department of State, Department of Transportation and Office of General Services. Upstate Power has also held meetings with State and local political representatives (e.g., county managers, supervisors, and legislators; city/town supervisors, board members and elected officials).

The Proposed Route runs through the Towns of Henderson and Ellisburg in Jefferson County and the Towns of Sandy Creek, Richland and Mexico and Village of Pulaski in Oswego County. Through a series of public meetings, Upstate Power has also sought input from both affected counties (Jefferson and Oswego) and the seven municipalities which are affected, along with input from local community-based organizations, local residents and neighborhood associations in all of these affected jurisdictions.

Upon acceptance of the Article VII Application for the Proposed Route by the NYSDPS, the NYSDEC will participate as a statutory party in the review of the Application. Further NYSDEC involvement would occur when Upstate Power makes application to

the NYSDEC for a State Pollutant Discharge Elimination Standards General permit for Stormwater Discharges from Construction Activities associated with the Proposed Route.

The USACE will also review both the Project and the Proposed Route under authorities granted by Section 10 of the RHA and Section 404 of the CWA. Section 10 requires issuance of permits for any work (dredging, excavation, drilling, depositing materials, etc) or construction of structures in, over, or under a navigable water of the United States such the approximately 53 stream crossings located along the Proposed Route. Section 404 of the CWA requires authorization for any discharge of dredged or fill material into waters of the United States including freshwater wetlands. Actions associated with the Project that require Section 10 and/or Section 404 permits include work and filling in freshwater wetlands along the Proposed Route (substation, access roads) and the installation of the submerged electric cable from the island to the mainland.

Although other Federal agencies will be involved in the review of the Project and the Proposed Route, the lead Federal agency under NEPA is the USACE due to its greater degree of involvement than other agencies. Other agencies involved include the USEPA under NEPA, Clean Air Act and other authorities such as Section 404 CWA; the USFWS under the Fish and Wildlife Coordination Act and the Endangered Species Act; and the Advisory Council for Historic Preservation under Section 106 of the National Historic Preservation Act. Other federal agencies will also receive Public Notice of the Project and the Proposed Route from the USACE.

While Appendix W consists of Exhibit 4 (Environmental Impact) of the Article VII Application, a description of the components of the Proposed Route and a Summary of Impacts from the Proposed Route will be considered within the Cumulative Impact Assessment of the Hounsfield Wind Farm.

6.2.1 Components of the Proposed Route

In total the Proposed Route would span approximately 50.6 miles and cover a geographical area between Galloo Island in the Town of Hounsfield, Jefferson County, and the Town of Mexico in Oswego County. Approximately 41.6 miles of the Proposed Route are upland and approximately 9 miles are subaquatic. The upland segments are

further divided into overhead (approximately 41.6 miles) and underground (approximately 0.34 miles) segments.

The Proposed Route begins as a 2.6 mile long overhead line between the substation on Galloo Island and the transition station at the northern tip of the Island. From this transition station, the Proposed Route extends approximately 9 miles across Lake Ontario from the eastern shore of Galloo Island to the landfall in Henderson in Jefferson County, New York. From the point of landfall in Henderson, the Proposed Route runs underground approximately 0.15 miles to a second transition station. At this structure the conductor transitions to an overhead single circuit 230kV electric line and runs approximately 38.7 miles through the Town of Ellisburg in Jefferson County, New York and through the Towns of Sandy Creek and Richland, as well as the Village of Pulaski in Oswego County, New York. South of the Town of Richland, the line crosses into the Town of Mexico, Oswego County, New York to the third transition station located 0.19 miles north of the Mexico interconnect substation. At this structure the overhead line will transition underground in order to cross under existing 345kV transmission lines. The underground line segment will connect to a riser structure inside the Mexico interconnect substation. At the Mexico interconnect substation, voltage will be stepped up from 230kV to 345kV for connection to the regional power grid via a NYPA transmission line.

The length of the Proposed Route as it crosses each town is shown on the table below.

Table 6.2-1: Proposed Transmission Line Route

County	**Town**	**Distance (approximate miles)**
Jefferson County (Total miles in County – 31.38)	Hounsfield	11.58 (230 kV on Galloo Island and subaquatic)
	Henderson	7.5
	Ellisburg	12.3
Oswego County (Total miles in County – 19.2)	Sandy Creek	5.7
	Richland (including 2.4 miles in the Village of Pulaski)	10.2
	Mexico	3.3

The underwater portion of the route will be constructed by jet plow embedment in the bottom of Lake Ontario. Subaquatic-upland transitions will occur via open trench or horizontal directional drilling installation of an underground cable that will originate or terminate at riser structures transitioning the transmission line to the overhead configuration.

The Proposed Route will include a 150-foot wide Right of Way (ROW) along both overhead and underground portions. To ensure reliable operation of the transmission line, clearing of vegetation along the overhead portion of the Proposed Route will be required to maintain adequate electrical clearance between the conductor and vegetation and to facilitate the survey and construction activities. Topography and existing vegetation type and quantities will determine the extent of the required clearing. In order to characterize the potential impacts within the Proposed Route's ROW, a 2,400 foot buffer (Study Area) was assessed on either side of the centerline.

The construction of the underground cable will include clearing the 150-foot wide ROW, grubbing the width of the trench as well as an approximate 20-foot wide area on either side of the trench. This clearing will also ensure that trees and other large root growing species will be kept away from the underground cable.

The overhead Proposed Route will likely include steel monopole structures that require reinforced concrete caisson foundations. The diameter and depth of the caisson foundations will vary according to the type of structure and soil characteristics. The steel monopoles will be 90 – 95 feet in height.

Access roads will be constructed along the Proposed Route to move equipment, materials, and personnel to each construction site. In addition, to facilitate construction or to minimize environmental impacts, access roads may also be constructed in locations off the Proposed Route to connect nearby public roadways to the Proposed Route. Newly constructed access roads will be gravel, and they will generally be 16 feet wide (traveled way plus shoulders).

New facilities required for the Proposed Route include two substations, one on Galloo Island and one in the Town of Mexico, and three transition stations, one at the Galloo Island landfall, a second at the Henderson landfall, and a third to transition the cable from overhead to underground near the substation in the Town of Mexico. The substation in Galloo will be approximately 1.4 acres while the Mexico interconnect substation will occupy approximately 4.7 acres. Each of the three transition stations will be approximately less than an acre.

6.2.2 Summary of Impacts from the Proposed Route

The transmission line and associated facilities have been planned, sited, and conceptually designed and will be constructed and operated in a manner that avoids or minimizes impacts to environmental resources within the Project area.

The Proposed Route will maximize the utilization of previously developed transportation and energy corridors. In total, approximately 57.4% of the overhead Proposed Route has been sited adjacent to existing corridors. The following table shows the utilization of existing corridors:

Table 6.2-2: Utilization of Existing Corridors

Existing Corridor	**Mileage / Percent of Total Overhead Proposed Route**
Abandoned Low Voltage Line	9.2 miles / 23.8%
Active Gasline	3.9 miles / 10.1%
Abandoned Railway	0.7 miles / 1.8%
Interstate 81	2.6 miles / 6.7%
Active Railway	5.8 miles / 15%
Total Proposed Route Utilization of Existing Corridors	22.2 miles / 57.4%

6.2.3 Topography, Geology and Soils

Characterization

No unique geologic features are identified within or near the Proposed Route based on a review of the NYSDEC Division of Lands & Forests database. The Proposed Route is located approximately 1 mile north-northeast of the Robert G. Wehle State Park and the Henderson Shores Unique Area, which is a reforestation area and not a unique geologic

feature. No National Natural Landmarks have been designated by the National Park Service along the Proposed Route or in any of the towns where the Project is proposed.

A search of the NYSDEC Division of Mineral Resources mines and well databases located two active sand and gravel mines and eight oil and gas wells, respectively within the 2,400-foot wide study area. Neither of the mines and none of the oil and gas wells were mapped within the Proposed Route's ROW.

Slopes - Nearly all of the Proposed Route will traverse relatively level areas with less than 10% slopes. Approximately 0.15% will be located in areas with slopes with 10 to 20%. None of the Proposed Route will be located in areas with 21% slopes or greater.

Soils - Based on a GIS analysis of maps of USDA Soil Surveys for Jefferson and Oswego Counties, approximately 115 different soil types are present within the upland Proposed Route. Rock, rock outcrops and/or rocky soil are most common within the northern portion of the Proposed Route. Well drained loams are most common in the mid portion of the route, primarily in Henderson and Ellisburg. Soil types are more "variable" in Ellisburg and the end of the Proposed Routed in Mexico, but are primarily comprised of moderately well to somewhat poorly drained sandy loams. Hydric soils and poorly drained soils are most prevalent in the southern portion of the Proposed Route.

The erosion hazard of soils is characterized as slight by the USDA for approximately 82% and moderate for 10% of the soils mapped within the 2,400-foot wide study area. Hydric soils are mapped within approximately 13% of the study area. The spacing of towers may warrant adjustment to avoid areas of hydric soils, wherever feasible.

Bedrock - Review of published surficial and geological maps indicates that unconsolidated deposits along the majority of the upland portions of the Proposed Route consist of lacustrine silt and clays (45.0%), lacustrine sands (25.9%), and till (16.1%). Bedrock is exposed along approximately 4.9% of the Proposed Route. Shallow and/or exposed bedrock, typically the carbonate Trenton Group, has been observed within the 2,400-foot wide study area on Stony Point in Henderson and the northern portion of Ellisburg. Accordingly, installation of some tower footings and excavation along the

Proposed Route (if in bedrock) may require the use of mechanical excavators, pneumatic hammers, or controlled rock drilling.

No mapped outcrops of bedrock are present within the southern portion of the route through Sandy Creek, Richland, and Mexico.

Subaquatic Transmission Line - The subaquatic portion of the Proposed Route is entirely within Lake Ontario and runs from Galloo Island to landfall in the Town of Henderson. In general, lakebed elevations along the subaquatic portion of the Proposed Route range from 246 feet NAVD88 at the landfalls to 148 feet NAVD88 in the middle of the Black River Channel near STA 380+00 (water depths 0 to 98 feet, respectively).

The majority of the lakebed within the Proposed Route is comprised primarily of clay with traces of sand and gravel present in the upper few inches to top 1 foot. Areas of dense glacial till, and/or exposed bedrock were identified on the lakebed near the landfalls and near the northern end of Stony Island. The properties of the unconsolidated deposits suggest that the majority of the lakebed is likely amenable to cable installation via the use of a jet plow.

Bulk chemical testing indicated the concentrations of detected compounds within sediment along the subaquatic portion of the Proposed Route are below the Class A thresholds (no appreciable contamination) at 10 of the 17 vibracore locations. Exceedances of Class B thresholds (moderate contamination) were identified in surficial sediments (0 to 1 foot below the sediment/water interface) at 7 locations, and in deeper sediment at one vibracore location VC-08-08. The Class C Threshold (high contamination) for pesticides (Sum of DDT,DDD,DDE) was exceeded once in the surficial sample (0 to 1 foot below the sediment/water interface).

Impacts

There are no large scale topographic changes that are proposed as part of this project; therefore, impacts to topography will be minimal.

Along overhead portions of the Proposed Route, potential impacts to the physical resources from construction will be temporary, of short duration, and highly localized. Impacts will be minimized by the typical 400 to 600 foot separation between tower structures along the length of the Proposed Route. The ability to have some flexibility in siting the precise location of these structures will help to minimize impacts.

Structures will be sited to be compatible with site-specific physical resources such as shallow bedrock, high water table, and soil bearing capacities, which will be identified during detailed field studies. Potential impacts will be mitigated through appropriate siting of foundations and use of Best Management Practices during construction.

Slopes - There are limited changes in local relief along the Proposed Route with slopes at less than 10% along 99.8% of the Proposed Route. Thus, potential impacts due to steep slopes will not pose a significant construction concern along the Proposed Route.

The erosion hazard of soils is characterized as slight by the USDA for approximately 82% and moderate for 10% of the soils mapped within the study area. The relatively gentle slopes within the Proposed Route are unlikely to exacerbate erosion during construction.

Soils - At the landfall in Henderson and the transformer station in Mexico, the cables will be installed using an open cut trench method. Excavated native soil will be temporarily stockpiled adjacent to the trench for re-use once tested for its thermal characteristics. Remaining excavated soils may be re-used on site or removed. High-angle direction drilling (HDD) installation methods will be also used at the landfalls to avoid disturbing shoreline areas.

Access roads will be 16 feet wide and constructed for single lane traffic. Permanent access roads will be constructed with graded gravel base and surface and will be designed for minimum maintenance. Temporary access roads will be constructed using native soils to minimize imported materials that may require removal when the road is deactivated. Where the addition of imported materials is necessary to provide a stable

road base, these will be kept to an absolute minimum consistent with the duration of use and loads to be carried.

Hydric soils are mapped within approximately 13% of the study area, and the depth to maximum high water is less than 6 feet below grade within 77% of the study area. Impacts to hydric soils will be minimized by the typical 400 to 600 foot separation between tower structures along the length of the Proposed Route. The ability to have some flexibility in siting the precise location of these structures will help to minimize construction and associated impacts in areas of hydric soils.

If construction is required in areas with hydric soils, groundwater dewatering may be required in excavations. Dewatering mitigation measures including settlement or filtration of pumped water to reduce turbidity, discharge control, and other measures will be used in accordance with NYS guidelines. Impacts associated with dewatering would be temporary during actual construction with no long term impacts.

Bedrock - Foundation design and installation, trench excavation for underground conductors, and other construction activities may be affected by areas of shallow bedrock. Geotechnical studies will be conducted post-permitting to evaluate bedrock competency and confirm depth to bedrock. Installation of some tower footings and excavation of some of the trenches, if in bedrock, may require mechanical excavators, pneumatic hammers, or controlled rock drilling. Blasting (if necessary) will be conducted in accordance with all applicable regulations and professional standards.

Subaquatic Transmission Line - Results of sediment transport modeling suggest that potential sediment dispersion and subsequent deposition associated with proposed cable installation using a jet plow will be minimal (sediment deposition is expected to be less than approximately 1 millimeter or less and a return to pre-construction water quality is predicted within 24 hours of the completion of jet plowing). Similarly, impacts associated with proposed dredging in the HDD exit points near the landfalls at Galloo Island and Henderson are also expected to be minimal and of short duration (deposition of less than 1 millimeter of sediment and return to pre-construction water quality in less than 24 hours).

6.2.4 Land and Land Use

Characterization

The subaquatic section of the Proposed Route crosses Lake Ontario for approximately 9 miles from Galloo Island, across Stony Basin and Black River Channel, and reaches its landfall at Stony Point in the Town of Henderson. Stony Basin and Black River Channel are both navigable sections of Lake Ontario, but do not contain designated federal shipping lanes. Once the Proposed Route makes landfall in the Town of Henderson, it crosses navigable waterways at approximately nine locations along various sections of Sandy Creek, South Sandy Creek, the Salmon River, and their associated tributaries.

Approximately 20.6 miles of the Proposed Route's 150-foot wide ROW is located in the Towns of Henderson and Ellisburg, Jefferson County. Land use within the Proposed Route's ROW consists of agricultural land, followed by vacant and residential land. Among the land that has been classified as agricultural, over half of the acreage is used for dairy farming, while the remainder is used for field crops or is designated as agricultural vacant (productive) land. In Jefferson County, the Proposed Route centerline crosses designated agriculture districts for approximately 10.67 miles, or 22% of the onshore Proposed Route.

Approximately 19.3 miles of the Proposed Route's 150-foot wide ROW is located in the Towns of Sandy Creek, Richland, and Mexico, Oswego County. Land use within the ROW consists of vacant land, followed by residential and agricultural land. Among the land that has been classified as agricultural, over half of the acreage is designated as agricultural vacant (productive), while the remainder is used for dairy products or is land used to raise cattle, calves, and hogs. Additionally in Oswego County, the Proposed Route centerline crosses designated agriculture districts for approximately 5.48 miles (11.3% of the onshore Proposed Route). The Mexico interconnect substation will occupy approximately 4.7 acres.

There are approximately 48 locations where the Proposed Route crosses existing roadways. A total of 36 local roads, five state roads, and two federal roads are crossed at least once along the Proposed Route. Land use at these areas consists of agricultural

land, followed by vacant and residential land. The land use in these areas that has been classified as agricultural is used primarily for dairy farming.

The Proposed Route crosses an active railroad (CSX Railroad), at one location in the Town of Richland and at one location in the Town of Mexico. Coordination of construction activities with CSX will assure minimal interference at the locations in the Towns of Richland and Mexico where the Proposed Route will cross the railroad.

Impacts

Installation of the subaquatic cable will result in limited, short-duration impacts to navigation in Lake Ontario. Impacts to navigation and establishment of the safety zones around the work area will be addressed with the USCG and the St. Lawrence Seaway Authority to ensure that potential conflicts with boat traffic are minimized. However, once the cable is in regular operation, there are no anticipated navigational impacts.

Once it makes landfall in the Town of Henderson, the Proposed Route crosses all of the navigable waterways in an overhead configuration so as not to impact navigation.

Land use patterns will not change with the addition of the Proposed Route. The potential for impact to designated land uses is greatest in those areas designated as either agricultural or wild, forested, conservation lands and public parks. Permanent impacts to these lands will be minimized by selective placement of structures. Traffic patterns will not permanently change with the addition of the proposed transmission line; however, patterns may be temporarily impacted during route construction and during maintenance activities. Upstate will coordinate with the New York State Department of Transportation (NYSDOT) and local transportation and highway departments to develop appropriate plans for route construction and maintenance that consider traffic and public safety.

6.2.5 Agricultural Resources

Characterization

Approximately one-third of soils within the 2,400-foot wide study area bounding the Proposed Route are classified as prime farmland and/or farmland of statewide importance. In areas containing these soils and in areas under active agriculture,

construction activities and mitigation measures will fully comply with NYSDAM agricultural protection guidelines.

In the Towns of Henderson and Ellisburg, over half of the acreage that has been classified as agricultural is used for dairy farming, while the remainder is used for field crops or is designated as agricultural vacant (productive) land. Additionally in Jefferson County, the Proposed Route centerline crosses designated agriculture districts for approximately 10.67 miles, which represents 22% of the onshore Proposed Route.

In the Towns of Sandy Creek, Richland, and Mexico, Oswego County, land use within the Proposed Route's ROW consists of vacant land, followed by residential and agricultural land. Among the land that has been classified as agricultural, over half of the acreage is designated as agricultural vacant (productive), while the remainder is used for dairy products or is land used to raise cattle, calves, and hogs. Additionally in Oswego County, the Proposed Route centerline crosses designated agriculture districts for approximately 5.48 miles, which represents 11.3% of the onshore Proposed Route.

Impacts

Land use patterns will not change with the addition of the proposed transmission line. The potential for impact to designated land uses is greatest in those areas designated as either agricultural or wild, forested, conservation lands and public parks. Permanent impacts to these lands will be minimized by selective placement of structures in consultation with NYSDAM. In agricultural lands, this will minimize impacts to active fields. In addition, topsoil protection and restoration measures will be implemented to further reduce impacts.

6.2.6 Water Resources

Characterization

Surface Waters - The Proposed Route centerline crosses approximately 26 individual streams, rivers, and tributaries, at a total of 53 crossings. One of the more significant streams crossed by the Proposed Route is the Salmon River along the Lower Salmon River in the Town of Richland where it crosses in close proximity to where Interstate

Route 81 also crosses over the Salmon River. Two individual Class C streams (Sage Creek and one of its Four separate flood zone classifications are located within the 2,400-foot wide study area (1,200 feet on both sides of the Proposed Route centerline). The greater proportion (approximately 97%) of the study area for the route is located in the X zone (minimal risk areas outside of the 1% annual chance floodplain).

Sediment - The majority of the lakebed within the Proposed Subaquatic Route is comprised primarily of clay with traces of sand and gravel present in the upper few inches to top 1 foot. Areas of dense glacial till, and/or exposed bedrock were identified on the lakebed near the landfalls and near the northern end of Stony Island.

Wetlands – The Proposed Route and its access roads were developed to avoid wetlands to the extent practicable, and the Proposed Route's centerline crosses a total of 1.47 miles of wetlands according to publicly available data. The Galloo Island substation is not located within state or federally regulated wetlands. The Mexico substation is not located within a state wetland; however, it is located near a National Wetland Inventory (NWI) wetland.

Based upon a review of available NWI mapping, the Proposed Route centerline on the mainland crosses a total of 0.57 miles of USACE-regulated wetlands at 18 locations in Jefferson and Oswego Counties. The total acreage of wetlands within the ROW is 10.4 acres of wetlands. The vegetation associated with these wetlands is shown below:

Table 6.2-3: Wetland Vegetation Types along the Transmission Line

Wetland Vegetation Type	Acreage
Scrub-Shrub	2.3 Acres
Emergent	1.8 Acres
Riverine	1.7 Acres
Forested	1.6 Acres
Forested/Scrub-Shrub	1.6 Acres
Unconsolidated Bottom	0.8 Acres
Scrub-shrub Emergent	0.6 Acres
Total	10.4 Acres

Based upon a review of NYSDEC maps, approximately 0.4 miles of the Proposed Route centerline on the mainland cross seven state regulated wetlands at nine locations. The

total acreage of these wetlands within the Proposed Route ROW is approximately 7.61 acres.

Groundwater - The Proposed Route does not cross or run adjacent to any USEPA designated sole source aquifers, NYSDEC designated primary aquifers, or designated public drinking water supply aquifers. The Proposed Route does traverse or run adjacent to some small aquifers that are not designated as sole source, primary, or public drinking water supply aquifers. The depth to maximum high water is less than 6 feet below grade within 77% of the 2,400-foot wide study area bounding the Proposed Route.

Impacts

Surface Waters - The Proposed Route crosses all waterways and water bodies in an overhead configuration so as not to impact surface waters. Impacts to these water bodies will be further minimized by selective placement of structures outside of water bodies, their banks, and any adjacent sensitive areas.

Sediment - Results of sediment transport modeling suggest that potential sediment dispersion and subsequent deposition associated with proposed subaquatic cable installation via the use of a jet plow will be minimal. Similarly, impacts associated with proposed dredging in the HDD exit points near the landfalls at Galloo Island and Henderson are also expected to be minimal and of short duration (deposition of less than 1 millimeter of sediment and return to pre-construction water quality in less than 24 hours).

To minimize impacts from sedimentation associated with upland transmission line activities, best management practices will be utilized to control stormwater runoff. In general, sediment and erosion control plans will be developed and implemented to comply with permit conditions under a "SPDES General Permit for Stormwater Discharges"

Wetlands – Wetland vegetation would be impacted during ROW clearing, temporary access road construction and operation, and during the operation and maintenance phases of the mainland transmission line. A total of 18.01 acres of NWI and NYSDEC wetlands

is located within the Proposed Route's ROW. The type of vegetation present within the wetland influences the type of impact, if any. Trees within forested wetlands within the ROW will be removed, while herbaceous and shrub vegetation within emergent and scrub-shrub wetlands will be cleared as needed. After construction, herbaceous and shrub species will be allowed to revegetate partially along portions of the ROW. The disturbance to wetlands from clearing and construction may allow invasive plant species, such as common reed, multi-flora rose and purple loosestrife, the opportunity to colonize. The maintenance of the ROW will require trimming or selective removal of larger vegetation in order to meet clearance requirements from the transmission line.

The typical 400 to 600 foot separation between tower structures along the length of the Proposed Route will minimize impacts to wetlands from the transmission poles. The ability to have flexibility in siting the precise location of these structures will help to minimize construction and associated impacts in areas of hydric soils. Structures placed within wetlands will permanently impact approximately 20 to 40 square feet of vegetation for the foundation placement. The construction of any access roads which require wetland crossings will result in additional impacts to wetland vegetation.

If construction is required in areas with hydric soils, groundwater dewatering may be required in excavations. Dewatering, when required for construction of foundations in or near wetlands will be temporary, short term and limited in nature at small localized sites along the Proposed Route, and is therefore expected to have only a temporary impact on small localized areas.

There will be no permanent access roads routed through wetland areas, though some temporary access roads may be necessary, impacts to wetlands from these roads would be temporary in nature.

Groundwater - In areas near aquifers, subsurface construction activities will occur at a depth well above the aquifers, and therefore, no impacts are anticipated to local aquifers. Groundwater dewatering may be required in excavations, particularly during wetter seasons (typically spring) and during periods of high rainfall and/or snowmelt.

6.2.7 Wildlife and Habitat

Characterization

Flora and Fauna - A variety of upland and wetland vegetation occurs within the upland portion of the Proposed Route. The shoreline at the landfall in Henderson includes habitat for a variety of waterfowl, shorebirds, raptors, and passerines (LaMP, 2006). Forest habitat is generally fragmented near the lake but includes stands of deciduous and pines (USGS, 1992). The terrestrial vegetative communities change as the Proposed Route moves inland. Deciduous forest comprises approximately 26% of the Study Area, mixed forest covers 4% and evergreen forest 7%. Remaining vegetative communities include active and abandoned agricultural fields, pasture, row crops and wetlands. Large portions of the route appear to pass through old successional fields comprised of forbs and grasses that occur on former agricultural lands that are now abandoned. At a regional scale, dominant forest cover along the Proposed Route is comprised primarily of eastern transitional and mixed deciduous forest.

Based on the existing habitat found in the area, a variety of common reptiles, amphibians, birds, mammals and insects are expected to live along upland portions of the Proposed Route. Most of these species are commonly found in the region. The Proposed Route is routed to pass through or close to the Lake Ontario Bird Conservation Area and three Significant Coastal Fish & Wildlife Habitat (SCFWH) areas: the Lakeview March SCFWH, Sandy Pond Tributaries SCFWH and the Salmon River SCFWH.

Numerous species of invertebrates are likely to be found in the vicinity of the Proposed Route. Reproduction of nearly all species in New York requires appropriate aquatic habitat for the growth of nymphs. However, adults may use terrestrial habitats such as forests, shrublands and fields far from their natal habitat for foraging during dispersal and/or mating.

Rare, Threatened and Endangered Species - Two federally endangered (piping plover and Indiana bat) and one threatened species (bog turtle) potentially occur within the Proposed Route study area. In addition, one state endangered animal species (Indiana bat) and one threatened animal species (Upland Sandpiper) were listed on the NYSDEC Natural

Heritage Report as potentially occurring within the Proposed Route study area. A historical record of a state endangered plant species (Autumnal Water-starwort) is also listed in the vicinity of the Proposed Route study area. Upstate Power carried out two habitat studies to determine the likelihood that Indiana Bat and Bog Turtle would be present along the Proposed Route. Each study is appended to the Article VII Application.

The Indiana Bat Study consisted of a habitat assessment and subsequent field survey to identify and delineate Indiana Bat habitat suitability within the ROW and on immediately adjacent lands. This survey found 3.6% of habitat along the route to be characteristic of Indiana Bat Maternity habitat while 34.4% of habitat along the Proposed Route resembled Moderate habitat. The remainder, or 62%, of the route was classified as Poor, Unsuitable and Unknown habitat. Indiana Bats may roost in Poor or Unknown value habitats within the ROW, but the potential for use in these areas is notably lower than Moderate or Maternal habitat.

The Bog Turtle Study consisted of a desktop analysis of natural resources and potential wetland habitats, as well as a roadside survey. This analysis determined that only 10 areas within 5 one-mile sections of the Proposed Route's ROW appear to have potential as bog turtle habitat. No large-sized wetland complexes characteristic of bog turtle habitat were located within the area surrounding the Proposed Route. However, all wetlands within the project site would need to be delineated to determine the need for Phase I bog turtle surveys.

Avian Species - Several rare or threatened birds are supported by the ecological communities found along the eastern Lake Ontario shoreline. The New York State Breeding Bird Atlas (BBA) was reviewed to create a list of species whose breeding distribution occurs within the subaquatic and upland portions of the Study Area. According to the BBA, 149 different breeding bird species, from 41 different avian families have been observed near or within the Study Area. These species include 17 Game species, 112 that are Protected Wildlife under New York State Law as well as 11 Special Concern species, five Threatened species and one Endangered species which are protected under federal and/or New York State law. The species list includes those that

are typically found on larger bodies of water and coastal areas as well as early successional and forest interior species. Relatively few obligate grassland avian species are anticipated to breed in the vicinity of the Proposed Route. No federally listed grassland bird species are anticipated to occur along the Proposed Route.

Bats - According to correspondence received from NYSDEC, an Indiana Bat (Myotis soldalis) maternity colony occurs either within or in close proximity to the Proposed Route. Correspondence received from the USFWS on the Draft Proposed Scope of Environmental Services indicated that an initial set of field investigations would be needed to identify potential roosting and foraging habitat. Thus, an assessment of Indiana bat habitat along the terrestrial portions of the transmission line route was conducted in September 2008, to respond to this request from the USFWS.

Post-construction Monitoring – Post-construction monitoring will not be necessary along the upland transmission line since most impacts to flora and fauna are short term, temporary and are related to construction activities.

Fish and Aquatic Species - The Proposed Route crosses 26 individual streams and rivers. However, several streams and rivers are crossed at multiple locations. Therefore, there are a total of 53 stream crossings within the Proposed Route. There will be approximately 22 crossings of 5 streams that are classified as trout and trout-spawning streams.

The potential diversity of freshwater mussels in surface waters along the Proposed Route is expected to be relatively low. Strayer and Jirka (1997) suggest that the eastern tributaries of Lake Ontario may possess the lowest diversity (perhaps as few as six species) of freshwater mussels of all major river basins in New York. Many of the species that were once common in the region have been in a long-term decline.

Impacts

Flora - Impacts to terrestrial vegetation will occur during clearing for the Proposed Route's ROW and access road construction. Approximately 360 acres of forested vegetation will be cleared within the upland portion of the Proposed Route. The

remainder (approximately 398 acres) is not currently forested but may be temporarily cleared of herbaceous and shrubby vegetation, as necessary, during Project construction. Additional vegetation may be cleared outside the ROW for the construction of temporary laydown areas, staging areas and access roads. The vegetation within structure foundation areas will be permanently lost. The typical excavation area for transmission poles will be five feet in diameter or 20 square feet depending on the structure and soil type. Based on the 384 structures proposed for the route, there will be approximately 10,000 square feet (0.23 acres) of permanent vegetation loss.

Cleared areas within the ROW will be allowed to partially re-vegetate following construction. Although there will be some re-growth of vegetation, the ROW will be maintained as an early successional, meadow and shrub community. The ROW maintenance will also require that "danger" trees be trimmed or selectively removed to meet transmission line clearance requirements.

Fauna - Potential impacts to fauna (wildlife) along the Proposed Route include habitat destruction due to land clearing for structures, staging areas, storage yards and access roads consist of: habitat conversion from forest to meadow due to long term maintenance of ROW, and displacement of wildlife from habitat as a result of construction operations. Displacement from foraging, cover or mating habitat may have temporary negative impacts on wildlife. In greenfields and in areas paralleling existing electric or gas pipeline utility ROWs, clearing of some forested areas and permanent conversion to early successional communities (principally old field and shrubland) will take place. Fragmentation of forest habitat in cleared areas may isolate wildlife populations and make them more susceptible to disease, predation and local extirpation.

Rare, Threatened and Endangered Species – According to preliminary studies, it is possible that Indiana Bat and Bog Turtle, both protected species, live along the Proposed Route. After final determinations for the Proposed Route and substation sites are made by the NYSDPS, a detailed analysis of potential impacts to threatened and endangered species that are within or near the Proposed Route will be possible.

Avian Species - Impacts to birds during construction are expected to be low along most portions of the Proposed Route, especially those portions which do not require clearing. In areas which require clearing, there will be a loss of bird nesting, breeding, foraging and cover habitat. Forest habitat will be converted to meadow habitat and maintained as such. Some species which prefer these open, grassland habitats will likely re-colonize cleared areas after construction. Bird species may be temporarily displaced from habitat during construction by the operation of vehicles and other heavy equipment. This could potentially lead to interference with critical bird breeding activities and nesting activities during certain times of the year.

The operation of the transmission line is expected to have minimal impacts on avian species. Potential impacts include disturbance of habitat during ROW maintenance and fatal collisions with electric transmission structures and wires. The greatest concerns for impacts to birds during operations are those that may result from habitat fragmentation when new areas of ROW, termed "Greenfields," are created. Habitat fragmentation can isolate woodland bird populations, lead to greater incidence of Brown-headed Cowbird and American Crow nest parasitism and greater exposure to predation which can all cause local population declines.

Grassland Birds - Impacts to obligate grassland bird species from construction activities are expected to be low, negative, temporary and limited to existing patches of suitable habitat within the Proposed Route. Impacts to obligate grassland bird species from operation of the Proposed Route are expected to be low, positive and limited to Proposed Route's site.

During operation, vegetation management within the Proposed Route's ROW is anticipated to have a negligible impact on upland species.

Bats - After final determinations for the Proposed Route and substation sites are made, a detailed analysis of potential impacts to Indiana Bat will be possible. However, preliminary studies indicate that presence of Indiana Bat along the Proposed Route is rare.

Fish and Aquatic Species - Potential impacts to fish and aquatic invertebrates along the upland portion of the Proposed Route include habitat destruction due to construction of structures and access roads adjacent to streams, reduction of canopy cover over low-order streams and potential siltation of waterways. Access road construction related runoff and siltation present the greatest potential impact to aquatic resources.

Reduction of canopy cover at stream crossings could locally alter the carbon, light and heat inputs to the stream. Construction related runoff may result in local increases in erosion, deposition and pollutant loading, which may affect downstream fish and aquatic invertebrate communities. However, impacts are expected to range from negligible (larger streams) to minor (low-order streams).

6.2.8 Visual Resources

Characterization

A Visual Resource Assessment (VRA) was conducted for the Proposed Route that followed the NYSDEC's Program Policy entitled "Assessing and Mitigating Visual Impacts" (NYSDEC, 2000) (the NYSDEC Visual Policy) and SEQR criteria. The visual study area included areas within a 3-mile radius on either side of the centerline of the proposed route (hereafter referred to as the "3-mile radius study area" or "visual study area"), as potential visual impacts of the relatively slender profiles of the aboveground transmission structures will significantly lessen beyond 3-miles. However, site-specific consideration was given to resources of high cultural or scenic importance that were located beyond this study area.

The mainland transmission line is the longest section of the Proposed Route and visible components include a substation, two transition stations, and 384 monopole structures (tangent and angle transmission towers) across its 39-mile long route. Pole heights will generally range between 90 and 105 feet in most locations.

Impacts

The VRA found no adverse visual impacts due to construction or operation of the Proposed Route on visually sensitive resources. The construction period is expected to

be relatively short and as such, construction related visual impacts are not expected to result in prolonged visual impacts to area residents or visitors.

Analysis of the mapped vegetated viewshed indicates that approximately 59 percent of the study area will likely have no visibility of the proposed mainland transmission line structures due to intervening landforms or vegetation.

Based on the viewshed analysis, one or more of the proposed transmission towers will be visible from approximately 95 of 145 (approximately 66%) inventoried visual resources including Resources of Statewide Significance, Resources of Local Interest or Open Vistas Along Roadways.

The proposed transmission cable across Lake Ontario will be subaquatic; thus, there are no visual impacts associated with this portion of the Proposed Route.

Based on the visual simulations from 21 locations and other analysis in the VRA, although the proposed structures may be taller and more noticeable than many of the existing structures in the area, the Proposed Route is not anticipated to significantly affect the visual or aesthetic characteristics within the study area, and will be consistent with the existing visual character in the study area.

6.2.9 Archeological and Historical Resources

Characterization

A Phase 1A survey was completed that included review of the archaeological site files of SHPO and the NYSM, field inspection of the Proposed Route area and a site file check. Files were examined for known archaeological resources within the 6-mile corridor (3 miles on each side) of the area of potential effect (APE). Cultural resources identified for the site included historic Native American sites, archaeological sites (prehistoric and historic), standing structures, and other aboveground features.

A total of 101 archaeological sites were identified including singular features ranging from wells to entire farmsteads within the 6-mile wide search corridor along the upland

Proposed Route. A total of 58 sites were located in Jefferson County, and 48 sites were located in Oswego County.

A search of the SHPO inventory and of the National Register of Historic Places (NRHP) did not identify any archaeological resources located adjacent to, or along the Proposed Route. However, a total of 28 National Register Listed structures and districts have been identified in the upland portion on the mainland (26 within the study corridor and 2 abutting the corridor): two are in Jefferson County; and 26 are located in Oswego County. There are also 27 National Register Eligible properties located within the corridor located 3 miles either side of the Proposed Route: six in Jefferson County and 21 in Oswego County. Four of these properties are Historic Districts, and the remainder are categorized as individual structures.

Shipwrecks have occurred in the area surrounding the subaquatic portion of the Proposed Route. However, SHPO has no records of shipwrecks within the subaquatic Proposed Route.

Impacts

Although cultural resources occur in the vicinity of the Project's upland route, all sensitive areas have potential to be avoided through route or design adjustments, so impacts to archeological and historical are expected to be minimal. In addition, areas where ground-disturbing activities associated with construction or operation of the Project may occur will be assessed using shovel and/or surface testing for the presence of significant archaeological resources, as feasible.

6.2.10 Socioeconomics

Impacts

Positive socioeconomic impacts would result from acquisition of ROW for the Proposed Route, PILOT agreements with local jurisdictions and future tax payments, and an increase of employment due to the construction of the onshore and subaquatic transmission line.

Although the Proposed Route presents the opportunity to infuse approximately $106 million into the local economy during the construction phase, the Project construction cost and the relatively short duration of its installation will not impact the local economy sufficiently to induce any significant changes in the local agricultural, residential, commercial, or industrial land use patterns. In addition, outside of the potential temporary disruption of agriculture production, line construction is not anticipated to disrupt any retail establishments which would cause a loss of business income.

Acquisition of ROW - It is the Project's intent to acquire a 150-foot wide ROW for the construction and operation of the transmission line. Where the Proposed Route is along an existing abandoned overhead 34.5kV line it will occupy an existing 50 foot wide ROW[6.] This ROW would need to be expanded by 100 feet. Property rights for the ROW will be acquired via easements negotiated with the involved owners. The project will offer property owners market or greater value for the property rights being obtained.

For the subaquatic portion of the route, it is Upstate Power's intent to acquire a 400-foot wide installation corridor through a permit or easement from the New York Office of General Services.

Pilot Agreement and Future Tax Payments - After completion of construction and the Project becomes operational, the capital value of the facilities within each taxing jurisdiction will become part of the local tax base, after the expiration of the anticipated PILOT Agreements.

The estimated local tax base impacts are anticipated to be $2 million dollars annually during the life of the PILOT. At the conclusion of the PILOT, the revenues to local jurisdiction will significantly release as the project goes back on the tax polls at full assessment.

Construction of the Onshore and Subaquatic Transmission Line - Construction of the subaquatic and upland overhead portions of the transmission project will require a

[6] Discussions with NGRID the abandoned line owner has indicated their willingness to transfer any property rights they have to Upstate.

contract work force in various disciplines. The anticipated labor for on-site construction and installation cost is approximately $64 million over the construction period. The payroll and its local impacts will follow the path and time-line of construction. As noted above, there are induced effects of the construction jobs, not only the direct support services for the jobs and project, but the indirect effects from the income earned and spent by workers. A Cornell University study(Bills, 1196) found that this "multiplier effect" may be in the area of 1.66 for income in the construction sector. While multiplier analysis does have some limitations, it is safe to conclude that the injection of approximately $64 million into the local economies should generate approximately $106 million.

Upstate Power will include provisions during construction contract development for the use of local New York construction labor and services to the fullest extent practicable. Although some construction workers may temporarily relocate to the vicinity of the Project area, it is unlikely that workers not already residing in the Project area will permanently move their families to the Project vicinity due to the relatively short duration of Project construction in any one area. Therefore, Project construction should not cause increases in the school populations or add significantly to demands on community services and housing stocks. There are no anticipated long-term negative infrastructure effects on the towns traversed by the Project, as there will be no permanent increases in population requiring additional expenditures for schools or other services such as water, sewer, fire, etc. due to the Project.

6.2.11 Public Safety

Characterization

An analysis of land uses along the Proposed Route concludes that no airports are located within 1 mile of the Proposed Route.

Impacts

All site plans developed for the Proposed Route will address the potential hazards associated with the location to ensure that worker safety is maintained. The plans will include coverage of worker training, worker and community health and safety, waste

characterization, minimization, handling, and disposal. The Construction Supervisor(s) and Environmental Monitor(s) will keep the local fire department and emergency management teams apprised of chemicals and waste on site and periodically conduct safety inspections at the sites that focus on housekeeping issues related to fire prevention and spill prevention

Construction – The subaquatic and upland transmission line will be constructed in phases that will progress in a linear manner along the line. All construction work and equipment use will be conducted in accordance with local, state, and federal safety regulations and industry accepted practices, including the Pipeline ROW Construction Project guidance document prepared by the NYSDAM. Construction activities will also be coordinated to allow all contractors and consultants to assure that appropriate environmental and safety standards are met at all times.

Upstate Power will ensure that the construction contractor for the subaquatic cable has passed the International Safety Management (ISM) audit for vessel operation and is subsequently qualified for ISM. Further, during installation of the subaquatic cable, precautionary safety zones around cable installation and work vessels would be established.

During the stringing of conductors along the transmission line, temporary guard structures will be placed at all crossings of highways, railroads, stream crossings, and existing utility lines to ensure public safety.

Project Components - The transmission facilities and associated structures design will be in accordance with applicable national and state codes and regulations, the most significant of which is the National Electrical Safety Code (NESC). This code specifies both the minimum structural loads to determine the required structural capacity and also clearances to energized parts and wires. Some of the most typical requirements defined by the NESC include clearances to ground, adjacent transmission lines, railroads, buildings and other facilities.

Substation Site Security Measures - All station facilities will be secured and enclosed by a 6' chain link fence topped by 1' of three rows of barbed wire meeting NESC requirements for public safety.

The substation control houses shall be metal, brick or block structures meeting government requirements and local ordinances for safety including exits, aisle access, ventilation, battery eyewash stations, lighting, structure loadings (wind, ice and snow), etc.

No lighting of the transmission lines is anticipated. Lighting of substations and transition stations will be at minimum levels necessary for safety. Because of the low profile of the transmission line, neither lightening protection nor FAA lighting is anticipated.

6.2.12 Microwave Beam Interference

Characterization

Private or public communication structures registered with the Federal Communications Commission that are close to the proposed line were identified.

Table 6.2-4: Registered Antennae Structures in the Vicinity of the Proposed Route

Registration Number	Status	File Number	Owner Name	Latitude/ Longitude	Structure City/State	Overall Height Above Ground (AGL) in feet
1006172	Constructed – 580' from proposed centerline	A0385233	St. Lawrence Seaway RSA Cellular Partnership DBA Verizon Wireless	43-44-29.9N 076-05-27.6W	Ellisburg, NY	77.4
1002928	Constructed – 150' from proposed centerline	A0003296	Niagara Mohawk Power Corp	43-34-38.0N 076-07-12.0W	Pulaski, NY	64

Source: FCC Antenna Structure Registration Search, 2008. (http://wireless2.fcc.gov/UlsApp/AsrSearch/asrRegistrationSearch.jsp) most recently accessed on October 29, 2008. Federal Communications Commission, 445 12th Street SW, Washington, DC 20554.

Impacts

In general, microwave communication is immune to power line interference. The exception is where a transmission tower happens to be constructed dead center in the microwave path. In this case, the transmission tower could cause some disruption in the microwave signal.

6.2.13 Blasting Issues

For approximately 58% of the route, the depth to bedrock is not reported. However, shallow and or exposed bedrock, typically the carbonate Trenton Group, has been observed on Galloo Island and mapped within the 2,400-foot wide study area on Stony Point, in Henderson, and the northern portion of Ellisburg. Localized ledges that may hinder construction of roads or hinder vehicle access may be present. Geotechnical studies will be conducted post-permitting to determine the competency of the bedrock and confirm depth to bedrock. No bedrock outcrops have reportedly been mapped within the portion of the study area in the towns of Sandy Creek, Richmond, or Mexico.

Based on known exposures of bedrock within the Proposed Route ROW, specialized construction methods such as the use of pneumatic hammers, rock drills, and limited blasting may be required in addition to mechanical excavation to address the presence of bedrock particularly in the northern portion of the Proposed Route. Foundation design and installation, trench excavation for underground conductors, and other construction activities are often affected by areas with a shallow depth to bedrock.

Installation of some tower footings and excavation of some of the trench portions of the Proposed Route ROW, if in bedrock may likely be accomplished using mechanical excavators, pneumatic hammers, or controlled rock drilling. However, blasting may be required in limited areas. Blasting, if found necessary, will be conducted in accordance with all applicable regulations and professional standards.

6.2.14 Decommissioning

At the end of the Project's lifetime, the transmission structures, substations, transition stations, and other associated structures no longer are necessary will be removed and the areas stabilized and restored, depending on planned future uses.

6.2.15 Mandated FAA Lighting

The transmission line does not require FAA lighting.

6.2.16 Air Resources

Impacts (other than temporary de minimus impacts) to air quality are not expected from construction and operation of the transmission line.

6.2.17 Cumulative Impacts from the Project and the Proposed Route

As shown in the following table, there is minimal cumulative impact from constructing and operating the Hounsfield Wind Farm with the construction and operation of the Upstate Power Transmission Line.

Table 6.2-5: Cumulative Impact from the Transmission Line and Wind Farm

	Hounsfield Wind Farm Potential Impacts	**Upstate NY Power Corp Transmission Line Potential Impacts**	**Cumulative Impact**
Topography, Geology and Soils	No significant permanent impacts to surface topography or soils are anticipated from the construction of the Project. Impacts to bedrock are anticipated from blasting during construction. No significant impacts from earthquakes are anticipated from the construction or operation of the Project	No large scale topographic changes are expected. Impact to bedrock may occur through blasting, if required.	Impacts to bedrock may result from blasting; however, these impacts will not result in cumulative impacts.
Land and Land Use	The Project will likely result in a change of land use on the island from its existing use to industrial use. The island is predominately used as an estate. This use will change to public service once the Project	Land use patterns will not change with the addition of the Proposed Route. Installation of the subaquatic cable will result in temporary	While neither the Project nor the Proposed Route occur in designated commercial shipping lanes, cumulative impacts to navigation

	is constructed. The United States Coast Guard, at their discretion, may issue a warning to mariners during Project construction notifying them of construction-related activity in the vicinity of the Galloo Island. There are no commercial shipping channels in the vicinity of the project.	impacts to navigation in Lake Ontario.	may result from construction of the wind farm and the transmission line. Construction activities will be coordinated so that impacts to navigation are minimized. If impacts do result, the USCG may issue a warning to mariners notifying them of construction related activity.
Agricultural Resources	No significant impact is anticipated since agricultural resources within the island do not support livestock or human consumption and do not include an identified NYSDAM agricultural district.	Permanent impact to agricultural resources will be minimized by the selective placement of structures in consultation with NYSDAM.	No cumulative impact.
Water Resources		The Proposed Route crosses all waterways and water bodies in an overhead configuration so as not to impact surface waters. Impacts to these water bodies will be further minimized by selective placement of structures outside of water bodies, their banks, and any adjacent sensitive areas. Sediment dispersion from the construction of the transmission line will be minimal. Best Management Practices will be utilized to minimize impacts from stormwater runoff. Permanent impacts to wetlands will be minimized by the separation between tower structures along the Proposed Route. Flexibility in siting the precise location of these structures will help to minimize construction and associated impacts in areas of	Both projects may impact wetlands and may result in stormwater runoff. Because of its size, Lake Ontario will experience no cumulative impacts as a result of these projects. Impacts to wetlands will not be cumulative in nature as the water sources for wetlands impacted by the Project and the Proposed Route are not the same. Upstate Power will make application to the NYSDEC for SPDES permits for stormwater discharge. However, impacts from stormwater from the Project and the Proposed route are not cumulative in nature.

		hydric soils. Permanent impacts to wetlands will occur through vegetation clearing for the ROW. Partial revegetation will occur within scrub shrub and emergent wetlands. The Proposed Route does not run adjacent to any designated aquifers. No impacts are anticipated to local aquifers.	
Wildlife and Habitat	No unique habitat loss will occur from the project. Construction may displace some wildlife. Operation will likely result in a loss of food, nesting, resting and rearing areas. Impacts to fish and other aquatic biota will occur during construction, operation and maintenance activities associated with the Project. Some displacement and collision risk exists for Gull Species and some hawks. Impacts to woodland birds are not expected to be significant. Recent studies have observed or indicated the presence of Upland Sandpiper[ST], Bald Eagle[BGEPA,ST], Northern Harrier[ST], Short-eared Owl[SE], Least Bittern[ST], Common Loon[SC], American Bittern[SC], Cooper's Hawk[SC], Sharp-shinned Hawk[SC], Common Nighthawk[SC], Whip-poor-will[SC], Grasshopper Sparrow[SC] and Horned Lark[SC] on the island. These species could be subject to minor collision risk from operation of the wind farm.	Approximately 360 acres of forested vegetation and approximately 398 acres of scrub vegetation will be cleared or disturbed within the upland portion of the Proposed Route. Partial re-growth will be allowed after construction. Construction impacts to wildlife include habitat destruction and susceptibility due to forest fragmentation. Impacts to fish during subaquatic cable installation would be short-term in nature. Upstate will consult with USFWS and NYSDEC on mitigation for these impacts. Impacts to fish and aquatic species from the upland transmission line are expected to range from negligible to minor as reduction of canopy surface run off can alter stream environs. Construction impacts to avian include potential effects to bird breeding activities. Minimal permanent impacts are expected on avian species. Forest fragmentation may make some woodland birds more susceptible to predators. Recent studies indicate that	While vegetation will be cleared for the project, and partial re-growth will occur, neither project affects unique habitat. Further, because of the distance between the two projects, impact to flora from the projects is not cumulative in nature. The impacts from both projects to wildlife species do not impact particular species. Therefore, the impacts from the projects are not cumulative in nature. Construction, operation and maintenance for both the Project and the subaquatic Proposed Route will likely result in cumulative impacts to fish and aquatic species around Galloo Island. Upstate Power will consult the USFWS and NYSDEC to develop mitigation methods. Upstate Power will comply with conditions of USACE and NYSDEC permits regarding spawning period restrictions.

		the Indiana Bat [SE,USE] and Bog Turtle[SE] may be impacted. Upland Sandpiper[ST] is listed as occurring within the project area. The Upland Sandpiper[ST] may be impacted during the breeding season.	Permanent impacts to fish and aquatic species are insignificant. No cumulative impacts would be expected for common birds. The potential exists for the projects to have both positive and negative cumulative impacts to the Upland Sandpiper[ST] species.
Visual Resources	Viewshed analysis, field investigation, and simulations determined that visual resources of Statewide Significance will have visibility of the proposed Project.	The VRA found no adverse visual impacts to sensitive receptors due to construction or operation of the Project.	No cumulative impact.
Archeological and Historical Resources	The Phase IA Reports indicated the need for both archeological and architectural Phase IB Surveys.	Although cultural resources occur in the vicinity of the Project's upland route, all sensitive areas can be avoided through minor route or design adjustments, so impacts to archeological and historical are expected to be minimal.	No cumulative impact.
Socioeconomics	No adverse impacts are expected. Positive impacts are expected due to increased employment on the island, PILOT payments and to increased tax base.	No adverse impacts are expected. Positive socioeconomic impacts would result from acquisition of ROW for the Proposed Route, PILOT agreements with local jurisdictions and future tax payments, and an increase of employment due to the construction of the onshore and subaquatic transmission line.	Both projects will result in cumulative positive impacts to the socioeconomic environment. These impacts are the result of increased employment opportunities, PILOT payments and increased tax base.
Public Safety	While the risks of accidents and fire are associated with any project, a Conceptual Emergency Response Plan has been prepared that will be re-visited prior to construction. No FAA obstacle	All site plans will include worker training, worker and community health and safety, waste characterization, minimization, handling, and disposal. The transmission facilities and associated structures design	No cumulative impact.

	identification surfaces were found within areas of probable impact. WTG will be lit to FAA standards. Security will be maintained regarding the transfer of materials and equipment from international sources to the project. No impacts to public safety are associated with the substation. WTG will be grounded.	will be in accordance with applicable national and state codes and regulations	
Microwave Beam Interference	No microwave paths were identified in the vicinity of Galloo Island; therefore, no impacts are anticipated.	Microwave communication is immune to power line interference	No cumulative impact.
Blasting Issues	Based on the nature of the rock and its proximity to the surface, blasting will be required in most places where subsurface structures are required (WTG foundation and slip channel). Mitigation measures will be employed to minimize impacts.	Blasting, if necessary, will be conducted in accordance with all applicable regulations and professional standards.	Because the areas that may require blasting are separated by distance, the impacts from blasting will not be cumulative.
Decommissioning	In the unlikely scenario the Project is abandoned, potential impacts may be related to aesthetics, erosion and sedimentation, public safety, and navigation.	All structures will be removed, and the areas will be stabilized and restored.	No cumulative impact.
Mandated FAA Lighting	The helipad and WTG will be lit in accordance with FAA requirements.	The transmission line structures do not require FAA lighting.	No cumulative impact.
Air Resources	The use of diesel on the island will result in emissions of NOX and VOC; however, these emissions are in conformance with USEPA regulations.	Impacts to air quality are not expected from construction and operation of the transmission line.	No cumulative impact.

ST Listed as threatened in New York State.
SC Species of Special Concern in New York State
SE Listed as endangered in New York State.
BGEPA Protected under the Federal Gold and Bald Eagle Act

Potential cumulative impacts resulting from the construction and operation of the Hounsfield Wind Farm and the Upstate Power transmission line are limited to temporary impacts to navigation and fish and aquatic species and permanent impacts to Upland Sandpiper, listed as threatened in New York State. Permanent impacts may also be felt within the socioeconomic environment. Temporary impacts to navigation are minimal and will be further minimized through USCG notification to boaters. Consultation with the NYSDEC and USFWS, as well as limiting in water construction during spawning periods, will minimize temporary impacts to fish and aquatic species.

Both positive and negative cumulative impacts may occur to the Upland Sandpiper, a state threatened species. Impacts from the wind farm could include extirpation while impacts to the species from the transmission line would be temporary in nature and could be minimized as construction may be timed to take place outside of the breeding season. The Upland Sandpiper's extirpation from Galloo Island is a worst case scenario. Indeed, the wind farm may even be beneficial to the species by opening up more grassland for foresting. See Section 2.5.3 for further detail on the positive impacts the wind farm may have on the Upland Sandpiper.

7.0 Unavoidable Adverse Environmental Impacts

Unavoidable adverse environmental impacts associated with the proposed Project are the long-term effects that remain after mitigation efforts have occurred. These generally are impacts for which there is no additional feasible method for mitigation. Impacts can be temporary, due to construction activities, or long-term, due to physical alteration of the landscape and environmental conditions. This section summarizes those adverse impacts that cannot be avoided as per SEQRA statute contained in 617.9 (b) (5) (iii) (b).

The majority of these unavoidable adverse impacts will occur during the construction phase of each WTG and will therefore be temporary. Initial site clearing, site preparation, and construction and installation of roads, WTG, ECS, the substation, maintenance building, residential area facilities, helicopter pad, unloading dock, meteorological tower, water and sewer facilities, and construction facilities (concrete batch plant, staging areas etc.) will have short-term and localized adverse impacts on the soil, water and ecological resources of the site. Construction will also have short-term impacts on local air quality and noise levels but these will be minimal and are attenuated by the approximately 6 miles distance between the island and the mainland. These impacts are primarily from movement and operation of construction equipment.

Water quality impacts during construction and operation can be mitigated to a point where no significant adverse effects will occur. Short-term impacts on fish and to a lesser extent on invertebrates will occur during underwater blasting to construct the slip channel. Some fish will suffer mortality but, due to the localized area of construction and its temporary nature, no long-term effects on the fishery will occur. The water supply intake volume and velocity will be low and there will be no adverse impacts on aquatic organisms from entrainment and impingement. The magnitude and extent of impact to each of these resources has been discussed throughout this DEIS.

This DEIS also identified long-term unavoidable adverse impacts associated with operation and maintenance of the proposed Project. These impacts include:

- Bird and bat collision mortality

- Habitat reduction and alteration
- Wildlife displacement
- Elimination of agricultural land
- Visual and aesthetic features

As indicated in this DEIS none of the impacts will be significant. A small number of birds and bats will be impacted by collision with the WTG, but effects on populations will not be large. Some woodland and other natural habitat will be eliminated, but the majority of the WTG will be constructed on pasture and open successional field areas. Some resident birds and mammals will be displaced by WTG construction, but most species are common and should return following a period of acclimation. Mortality of individual fauna from displacement will be minimal.

Approximately 168 acres of the property is used for the agricultural production of alfalfa and grain. The amount of active and inactive agricultural land eliminated (13.96 acres) is small compared to the amount in the local and regional area within Jefferson County. Once the Project is completed, no agricultural production will continue on the island. None of the agricultural land impacted will be located in an agricultural district. There has been no agricultural production on Galloo Island generating products that were exported off of the island. With the construction of the Project, there will be no export of agricultural products off of the island thereby resulting in no net change in the availability of agricultural products.

Although the proposed Project has been designed to minimize impacts to freshwater wetlands by locating WTG outside of the wetland boundaries, some impact will occur from installation of the ECS and roadways. The impacts on wetlands, while unavoidable, are minor in nature and mitigation will be provided.

Visual and aesthetic impacts are subjective. Some individuals will regard WTG as an unwanted intrusion. Others will find them interesting and pleasing. Although visual and aesthetic resource assessments can determine the extent and magnitude of aesthetic impacts in a viewshed, perceptions of impact vary from individual to individual. A long-term unavoidable impact the proposed Project is that the WTG, and its mandated FAA

lighting requirements, will become a part of the visible landscape and can be seen from various areas of the Town and from boats navigating in Lake Ontario. Most of these views are attenuated by distance. Furthermore, over time, most people will likely become accustomed to the WTG as they have to other existing visual intrusions such as high voltage overhead electrical power transmission lines, communications towers, commercial signs, and clearing of forests for roads, farmlands and residential developments.

Overall, the proposed Project will present very few unavoidable adverse effects since most impacts of the project can either be mitigated or will be of low magnitude. Residual impacts after mitigation will be minor.

8.0 Irreversible and Irretrievable Commitments of Resources

This section identifies the unavoidable environmental impacts of the proposed Project that will irreversibly curtail the range of potential uses of the environment or result in the commitment of resources that are neither renewable nor recoverable. An irreversible commitment results in environmental changes that cannot, at a future date, be altered to restore the environment to its preconstruction state. Resources include not only the commitment of labor, fiscal resources, and materials, but also natural and cultural resources committed as a result of project construction, operation and maintenance.

As with most land development projects, commitment of natural resources will be necessary for construction. Construction of the proposed Project will result in the short-term and long-term commitment of natural resources. Some of the natural resources include structural steel, gravel, wood, and concrete to be used in the construction of the access roads, WTG, maintenance building, housing units, geothermal heating/cooling system, water supply facility and sewage treatment plant. The long-term commitment of these materials will limit their availability for future projects. However, the actual amount of materials used to build any structures will comprise a very small percentage of the U.S. and world production of these materials. Some materials, at the end of the project life, such as steel and stone, will be available for reclamation and recycling. The proposed Project will not have a significant impact on the availability of these materials.

The proposed Project will require the commitment of land for the life span of the project. About 161.88 acres of land will be directly impacted by this project. This includes the terrestrial and aquatic habitats to be occupied by structures or altered by the work. Land used for the WTG, various buildings and roadways will not be available for alternative uses. This land use is considered an irreversible commitment but only during the expected lifetime of the project. Once the land is no longer needed for this energy facility, the land can be converted to a different purpose after project decommissioning (see Appendix U). Therefore, in the long-term this is neither an irreversible nor irretrievable commitment of resources.

Construction, operation and maintenance of the proposed Project will require irreversible and irretrievable commitments of human and fiscal resources to design, build, operate and maintain the wind farm system as well as to transport equipment to the sites. Human and financial resources will also be expended by the local, state and federal governments for the planning, environmental reviews, permitting and monitoring of the proposed Project. These commitments are justifiable in light of the energy and financial benefits to be derived from the proposed Project. There will be no net loss of tax revenues as a result of land use by this Project since Upstate Power is a private enterprise and will be required to pay taxes. As indicated in the discussion on growth inducement in Section 4.0 of this DEIS, no significant impacts on human and fiscal resources of local governmental services (fire, police, etc.) are expected.

Project construction and maintenance work will irretrievably commit energy resources derived from petroleum products and electricity. Fuels and electrical energy will be consumed during the manufacturing and transport of materials and workers to be used for the Project. Additional fuel will be expended by construction equipment used for site preparation for the WTG and other facilities and to actually construct the structures. Some fuels will also be used by maintenance vehicles and equipment on Galloo Island intermittently during the life time of the project. These commitments will be temporary and minor and will not affect the local energy supply. Energy commitments for the construction and maintenance of the proposed Project are significantly offset by the benefits of up to 280 MW of clean, renewable energy produced by the wind farm.

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