2.0 DESCRIPTION OF PROPOSED ACTION

The following discussion describes the proposed Project in terms of purpose, need and benefit, Project location, and layout. This Project description also describes construction, operation and maintenance, and decommissioning. In addition, a list of regulatory approvals is provided.

2.1 Introduction

This DEIS assesses the environmental effects of constructing and operating the proposed Project. Provided below are descriptions of the Project, the Project Applicant, the Project's purpose, need, and benefit; the Project's potential environmental impacts and related proposed mitigation measures; the alternatives analyzed in this DEIS; and the regulatory approvals necessary for the Project to be constructed and operated.

The Applicant, SLW, is proposing to develop a wind-powered electrical-generating facility of up to 96 turbine locations with a total capacity of approximately 136 MW. The proposed Project would be located in the Towns of Cape Vincent and Lyme in Jefferson County, New York. All 96 turbines, temporary construction laydown areas, access roads, underground interconnect lines, operations and maintenance building, meteorological towers, an electrical substation and other components would be located in the Town of Cape Vincent; most of the overhead electrical transmission line and the existing transmission grid substation would be located in the Town of Lyme.

The final wind turbine size for the Project will be dependent on availability of units at the time of construction. The size of likely units ranges between 1.5 MW to 3.0 MWs. Larger sized units of 3.0 MWs could reduce the total number of turbines and the associated environmental impact in the Project area. Since the actual turbine model and type will not be finalized until later in the development process, conservative impact assumptions are used for this DEIS. For example, this analysis assumes that a maximum of 96 turbines will be installed, which is the maximum number if smaller units, such as 1.5 MW turbines, are used. If the larger 3.0 MW units are used, fewer turbines would likely be installed. Based on the size range of potential units, the maximum blade-tip height is estimated to be 425 feet and the rotor width (diameter) estimated to be 300 feet (per the 3.0 MW turbine blades). Each turbine would ultimately consist of a tall steel tower; a rotor consisting of three composite blades; and a nacelle, which houses the generator, gearbox, and power train. A transformer may be located in the rear of each nacelle, or adjacent to the base of the tower, to raise the voltage of the electricity produced by the turbine generator to the voltage level of the underground collection system. The steel towers used for this Project would be manufactured in multiple sections. The towers would have a base diameter of approximately 15 to 20 feet depending on the turbine selected. This assessment was completed using the dimensions for a 20-foot tower base. Each tower would have a locked access door and an internal safety ladder to access the nacelle, and would be painted (off-white) to make the structure less visually obtrusive.

For a maximum of 96 turbine foundations, the Project also would result in the construction of approximately 29 miles of gravel access roads, 44 miles of underground interconnect cables, an electrical substation, and an operations and maintenance building. An approximately 9 mile long (34.5 kV to 115 kV) overhead transmission line would be constructed to connect the Project with the existing transmission grid and electrical substation in the Town of Lyme.

The Project facilities would be developed on leased private land. SLW plans to begin construction in the spring/summer of 2008 and to complete construction by the end of 2008. SLW would begin site work as early as possible after all required permits and approvals are received. This would enable SLW to commence construction as early as possible after the 2008 spring thaw. The geotechnical investigation and other engineering studies to support the civil design would be conducted prior to construction. Once the Project is in operation, the wind turbines and associated components operate in an almost completely automated fashion. SLW intends to employ approximately three (3) workers for operation and maintenance of the wind energy facility.

2.2 Purpose and Scope of Environmental Impact Statement

The proposed Project is subject to review under New York's SEQRA because it requires the issuance of discretionary permits by state and local agencies (see Section 2.9, Regulatory Approvals). SLW submitted a Full Environmental Assessment Form (EAF) to the Town of Cape Vincent on November 8, 2006, addressing the potential environmental impacts of the proposed Project. The submittal of the EAF initiated the SEQRA process for the proposed action.

SLW voluntarily agreed to prepare this DEIS. SLW retained a team of experienced environmental consultants to study the proposed Project and develop this SEQRA DEIS. The level of the analysis and information in this DEIS is consistent with other such documents prepared and deemed complete for a number of wind power projects in New York, and is compliant with the requirements of SEQRA (6 New York Code of Rules and Regulations [NYCRR] Part 617).

The purpose of the DEIS is to systematically assess the environmental impacts associated with construction of the Project. Each area of the affected environment will be concisely described, potential Project impacts will be outlined, and mitigation for potential adverse impacts will be proposed.

The next steps in the SEQRA process for this Project include the following:

- DEIS accepted as complete by Lead Agency (i.e. Town of Cape Vincent Planning Board);
- Town of Cape Vincent Planning Board files notice of completion of the DEIS and notice of public hearing and comment period (if the Board chooses to hold a public hearing);
- Town of Cape Vincent Planning Board may hold a discretionary public hearing on the DEIS (the hearing must be held at least 14 days after public notice is published); and
- Minimum 30-day public comment period.

After the public comment period on the DEIS, three alternative procedural pathways would be available to the Lead Agency. The Town of Cape Vincent Planning Board could require preparation of a Final EIS (FEIS). If that alternative pathway is chosen, the following steps would be taken:

- The Town of Cape Vincent Planning Board directs SLW to revise the DEIS as necessary to address relevant public and agency comments;
- SLW completes the Final EIS (FEIS);
- Town of Cape Vincent Planning Board accepts the FEIS as complete;
- Town of Cape Vincent Planning Board files notice of completion of the FEIS;
- 10-day public consideration period;
- The Planning Board as Lead agency issues its SEQRA Findings Statement; and
- Involved agencies consider the FEIS and issue their SEQRA Findings Statements as necessary to implement their permitting jurisdiction.

In the alternative, the lead agency could determine, based upon the DEIS and consideration of the public comments received, that the Project would not have a significant adverse impact on the environment (see 6 NYCRR § 617.9(a)(5)). In that event, the lead agency would prepare, file and publish a negative declaration, and the SEQRA process would be completed.

2.3 Project Purpose, Public Need and Benefits

The purpose of the proposed Project is to develop a wind-powered electrical-generating facility at the proposed Project location. This Project would be a significant source of renewable energy to the New York electrical power grid.

The proposed Project would assist New York State in complying with the objectives of New York State PSC Order 03-E-0188, which was issued on September 24, 2004. This order established the New York State RPS to increase the proportion of electricity from renewable energy sources used in New York State to 25 percent by the end of 2013. The RPS helps to ensure that New York State's growing need for electricity would be satisfied in an efficient and environmentally sound manner. Wind generated electricity provides increased stability to the price volatility of fossil-fuel electricity generation in New York. In addition, the proposed Project also assists in fulfilling objectives identified in the 2002 State Energy Plan (New York State Energy Planning Board, 2002), such as stimulating economic growth, increasing energy diversity, and promoting a cleaner and healthier environment.

The proposed Project would generate a number of other benefits to the host communities and to New York State in general. The proposed Project would result in increased tax revenues to local governments, annual income to participating landowners, and direct job creation during the development and construction of the wind energy project, as well as indirect job creation during operation of the wind energy project. For a lengthier discussion of potential socioeconomic benefits, see Section 3.11 (Socioeconomics).

Development of wind-powered electrical generation (such as the proposed Project), would result in an improvement to air quality by offsetting emissions created by fossil-fuel-burning power plants. The proposed Project would result in estimated annual reductions of approximately 236 tons of nitrogen oxides, 669 tons of sulfur dioxide, and substantial quantities of other pollutants including particulate matter (PM), carbon monoxide (CO), and volatile organic compounds (VOCs). This not only leads to healthier air, but also helps to reduce the climate change impacts associated with fossil-fuel-burning power plants. Carbon dioxide emissions contribute to global warming. The proposed Project would offset approximately 158,576 tons of carbon dioxide annually that would otherwise be released into the atmosphere. By offsetting air pollutants and greenhouse gases, the Project provides a benefit to environmental resources and human health.

The proposed Project would also support the long-term economic viability of agricultural areas in the host communities, enabling the primarily agricultural landowners to augment their farm incomes by realizing the full potential of the wind asset on their lands.

2.4 Project Description and Location

The proposed Project would be located in the Towns of Cape Vincent and Lyme in Jefferson County, New York. Figure 2-1 illustrates the conceptual location of the Project. All Project facilities would be located on individual leased land parcels located within a larger Project area of approximately 9,000 acres. The Project area would be located southeast of the St. Lawrence River and New York State Route 12E, which follows the riverbank. As proposed, the Project and associated turbines would be located within the Agricultural Residential District of Cape Vincent and part of the electric overhead transmission line would be located within the Agricultural and Rural Residence District in Lyme. The Project area extends from approximately one-half mile from the river bank to about two and one-half miles inland and extends from one mile south of the Village of Cape Vincent northeasterly about 10 miles southeast of Route 12E. Most of the Project area would be located in the Town of Cape Vincent. The overhead transmission line will extend several miles in an easterly direction from the Project area to an existing transmission grid substation within the Town of Lyme. Land use in the Project area is mostly agricultural, with farms and single family rural residences occurring along road frontage.

The general Project area would be served by a network of state, county and local highways and roads that vary from two-lane highways to gravel roads. The New York State (NYS) Highway system in and adjacent to the Project area includes Interstate Route 81, NYS Route 12E, State Route 12, NYS Route 180, and several County roads. The extensive road network provides excellent site access for construction vehicles and delivery of Project equipment.

2.5 Proposed Facility Layout and Design

The following section describes the Project conceptual layout as shown on Figure 2-1 and provides a description of the major components of the proposed Project. The St. Lawrence Wind Energy Project would consist of up to 96 wind turbine locations and construction of approximately 29 miles of gravel access roads, 44 miles of underground interconnect, an electrical substation, and an operations and maintenance building. An approximately 9 mile long (34.5 kV to 115 kV) overhead transmission line would be constructed to connect the Project with the existing transmission grid and electrical substation in the Town of Lyme.

The turbines would have a maximum height of approximately 425 feet from the tip of the rotor blade at the uppermost position to ground level, and the rotor diameter would be a maximum of 300 feet. There is one temporary meteorological tower with guy wires currently on the site that would be removed when Project construction is complete. There would be one or more permanent meteorological towers located on site, the location of which would be determined after a final construction layout is completed. Existing roads would be used to the extent feasible to bring equipment and material to the site (see Section 3.4).

2.5.1 Wind Turbines

The possible turbine size for the Project varies from a 1.5 MW through 3.0 MW turbine. Since the turbine model and type has not been finalized at this time, and a larger 3.0 MW machine might possibly be used to reduce the number of turbines (and ultimately impact) in the Project area, conservative impact specifications were used for this DEIS. For example, the maximum blade-tip height was estimated at 425 feet and the rotor width (diameter) was estimated at 300 feet (per the larger 3.0 MW turbine blades). Each turbine will ultimately consist of a tall steel tower; a rotor consisting of three composite blades; and a nacelle, which houses the generator, gearbox, and power train. A transformer may be located in the rear of each nacelle, or on the ground near the tower base, to raise the voltage of the electricity produced by the turbine generator to the voltage level of the collection system. The steel towers used for this Project will be manufactured in multiple sections. The towers will have a base diameter of approximately 15 to 20 feet. Each tower will have a locked access door and an internal safety ladder to access the nacelle, and will be painted (off-white) to make the structure less visually obtrusive.

2.5.2 Turbine Spacing

The first step in siting wind turbines for this Project was to assess the wind resource and place conceptual turbine locations where wind would appear to be the strongest and steadiest. Appropriate buffers (see Figures 2-2 and 2-3) from roads, property lines, and residences, are taken into account in developing the first conceptual layout. Once the conceptual layout was set, a team consisting of a land rights specialist, an environmental consultant, and an engineer reviewed the possible turbine locations in the field. Slight adjustments were made to the proposed turbine locations based upon land use, environmental, and engineering considerations. The suggested changes in turbine locations were then sent to a meteorologist, who ensured the adjustments in turbine positioning would not unreasonably impact the efficiency of the layout. Factors considered when siting the turbines included:

Wind resource assessment: In order to find the most efficient turbine sites for generating electricity, SLW uses computer models that combined wind resource data from meteorological towers in the Project area, long-term weather data, topography, and environmental factors.

Sufficient spacing: Wind turbines create turbulence, or wake, immediately downstream of the rotor. Wake can interfere with the operation of neighboring wind turbines, creating extra wear and tear, and decreasing their efficiency for producing electricity. Using computer models, SLW ensured that turbines were spaced correctly so as to avoid wake losses and turbulence.

Distance from residences: The turbine locations were selected to maintain a buffer of 1,200 feet from the nearest outer wall of an existing occupied residence to the center of the tower foundation. The turbine buffer minimizes the visual and sound effects of the turbines on local residences.

Distance from roads: The turbine locations were also selected to maintain a buffer from existing road rights-of-way of 615 feet or 1.5 times the turbine tip height, whichever is greater.

Distance from adjacent property lines: The turbine locations were also selected to maintain a buffer of 75 feet from adjacent property lines.

2.5.3 Access Roads

As described in Section 3.4, most of the transportation infrastructure needed for the Project is already in place. However, since turbine sites must be located a distance from existing roads, it will be necessary to create access roads from the existing roadways to the turbines. Turbine sites have been selected to optimize efficiency and avoid environmental impacts. Similarly, the locations of access roads have been selected to minimize impacts to agricultural land uses and environmental resources, and considered engineering and constructability concerns.

SLW is currently developing the Project construction plan, which would include transportation considerations. Existing roads may need to be improved in order to accommodate construction traffic, as described in Section 3.4. The proposed access road system is shown on Figure 2-1. SLW would be responsible for the maintenance of new private roads.

2.5.4 Underground Interconnect Line

Electricity from the wind turbines would be generated at a specific voltage and transported through underground cables that would connect groups of turbines together electrically. The interconnect lines would feed to the Project substation within the Project area. At the Project substation, the electrical power from the entire wind energy project runs through a station transformer and is converted to a higher voltage for interconnection with the substation in Lyme and the existing system transmission grid.

2.5.5 Substation and Interconnection Facilities

The Project substation would step up the voltage of the electricity so that it can be reliably interconnected with the 115 kV transmission line at the existing substation in Lyme, owned by National Grid. At this location electricity delivered would be metered and a protection system put into place to ensure reliability and integrity of the infrastructure. SLW anticipates that the substation structural elements would be installed on concrete foundations. In addition, SLW anticipates that the substation would consist of a graveled footprint area, a chain link perimeter fence, and an outdoor lighting system. The design of the substation and attachment facilities to the 115 kV line would be finalized based on a facility study conducted by the transmission line owner and the New York Independent System Operator (NYISO) in accordance with the Federal Energy Regulatory Commission Transmission Tariff.

2.6 Construction

The following section describes the various activities that would occur as part of Project construction. Project construction would be performed in several stages and would include the following main elements and activities:

- Clearing and grading of the temporary field construction office, substation, access roads, crane pads, turnaround areas and turbine locations;
- Construction of access roads;
- Construction of turbine tower foundations and, if necessary, transformer pads;
- Installation of the underground interconnect line;
- Construction of the approximately 9 miles of overhead transmission line;
- Assembly and erection of the wind turbines;
- Construction and installation of the substation;
- Plant commissioning and energizing;
- Final grading and drainage; and
- Restoration.

Project construction would occur over one construction season (likely mid-April through mid-November 2008) and would require the involvement of 50 to 150 construction-related personnel depending on the stage of construction.

2.6.1 Geotechnical Investigation

Prior to construction a geotechnical investigation would be performed to identify subsurface conditions necessary for engineering final design of the Project. The geotechnical investigation would include drilling test borings at designated locations to evaluate subsurface geology and groundwater conditions, and perform field tests and geotechnical laboratory tests on recovered samples to evaluate the physical and engineering properties of the strata encountered. SLW would also perform engineering analyses to develop design and construction specifications for foundations, site subgrade, and fill preparation. Soil borings, or test pits as necessary, are required at each wind turbine location, the substation, and at certain intervals along access roads.

Borings would be performed in accordance with local requirements, such as filling boreholes with grout after testing is complete.

2.6.2 Design and Construction Specifications

SLW would establish a set of site-specific construction specifications for the various portions of the Project using all of the data gathered for the Project. The design specifications would be based on well proven and established sets of construction standards set forth by standard industry practice. Qualified engineers would tailor the design and construction specifications for site-specific conditions.

2.6.3 Access Road Installation

The Project would include approximately 44 miles of gravel access road construction. To the greatest extent possible, SLW would upgrade existing roads and farm drives for use as Project access roads in order to minimize agricultural and environmental impacts. New gravel access roads would also be constructed. Road construction would typically involve clearing and grubbing of the right-of-way and topsoil stripping in active agricultural areas, as necessary. Stripped topsoil would be stockpiled along the road corridor for use in site restoration. Agricultural protection measures would be followed so that topsoil is not mixed with subsoils or gravel. The topsoil, when replaced, would retain its unique characteristics. These agricultural protection measures were developed during the construction of past wind energy projects in New York and are strongly suggested for use by the NYS Department of Agriculture and Markets.

For evaluation purposes, it is assumed that access road construction would disturb, at most, a temporary 44-foot wide area. In certain locations, vegetation clearing activities might extend slightly beyond the footprint of anticipated ground disturbance. Cleared vegetation would be chipped and properly spread on-site or hauled to an off-site location for disposal or reuse. Topsoil would then be stripped and segregated. Subsoil would then be graded, compacted, and surfaced with gravel or crushed stone in accordance with the requirements of the wind turbine supplier and recommendations from the geotechnical engineer. Geotextile fabric or grid may be installed beneath the road surface to provide additional support, if engineering studies indicate it is necessary. Permanent access roads would generally be 30 feet wide, including side slopes. Cross-sections at turning radii and pull-offs to accommodate passing vehicles would be slightly wider, as necessary for safety. No jurisdictional stream or wetland crossings are anticipated. However, if needed, culverts would be placed in wetland/stream crossings in accordance with state and federal permit requirements and where needed to facilitate cross drainage. Appropriate sediment and erosion control measures would be installed when access road construction is near sensitive environmental resources.

2.6.4 Foundation Construction

Turbine foundation construction would begin only after access roads to turbine locations are constructed. Foundation construction usually includes drilling, hole excavation, outer form setting, rebar and bolt cage assembly, casting and finishing of the concrete, removal of the forms, backfilling and compacting, if required, and foundation site area restoration.

A construction work area consisting of a temporary 200-foot radius around each turbine foundation is necessary for wind turbine assembly and erection. This would typically involve clearing and stripping/stockpiling topsoil. Backhoes would then excavate a foundation hole. In agricultural areas excavated subsoil and rock would be segregated from stockpiled topsoil. If bedrock is encountered it is anticipated it would be excavated with a backhoe. If this is not possible, pneumatic jacking, hydraulic fracturing or blasting, as a last resort, would excavate the bedrock. The Project geotechnical/civil engineer would specify the foundation type. Typical wind turbine foundations are approximately 7 to 10 feet deep and approximately 50 to 60 feet across. Foundations typically require approximately 320 cubic yards (cy) of concrete. After the concrete is cured, it is backfilled with the excavated on-site material. Permanent loss of usable land would be restricted to the tower diameter which for the Project is between 15 and 20 feet. To provide adequate foundation for the erection cranes, a gravel crane pad (approximately 100 feet by 60 feet) would be constructed at the base of each tower. Excess subsoil or other excavated material generated from foundation work would be used to backfill or fine grade roads and wind turbine erection areas.

2.6.5 Underground Interconnect Line Installation

A width of approximately 25 feet, centered on the interconnection route, will be cleared prior to installation. The project is designed to minimize the cutting of trees and other vegetation. This 25-foot wide corridor would be accessed by cable installation machinery, which is not anticipated to involve excavation of soil. Electrical interconnects would follow Project access roads whenever practicable (approximately 3.4 of the approximate 44 miles of interconnect would be co-located with access roads). In areas where co-location with access roads is not practical, interconnect design would follow field edges as much as possible and avoid cutting directly across fields. Where the interconnect must cross active agricultural fields, the location of any subsurface drainage (tile) lines would be determined (through consultation with the landowner[s]) to ensure that these lines are not damaged during cable installation, or, if damage is unavoidable, that the tiles are subsequently restored. Direct burial methods, via cable plow, rock saw and/or trencher, would be used during the installation of underground interconnect lines where possible. Interconnect installation would disturb an area approximately 12 to 36 inches wide in which bundled cable would be placed at a minimum depth of 36 inches. Generally, no restoration of the interconnection line is required, as the opening closes in on itself following installation. Similarly, surface disturbance associated with the passage of machinery in the 25-foot wide cleared corridor would be minimal, and should not require restoration. However, should disturbance require surface restoration, it would occur shortly after installation, and would be accomplished by a small bulldozer, or equivalent. Direct burial, via a trencher or rock saw, would be similar to cable plow installation. The trencher or rock saw would use a large circular blade to excavate a 14-inch wide, 36-inch deep trench. Excavated material would be sidecast immediately adjacent to the trench, in accordance with NYS Department of Agriculture and Markets guidance, in active agricultural land. Up to two parallel cables can be installed by trenching without the need to strip and segregate topsoil. Sidecast material would be replaced after the interconnect is installed. All areas would be returned to pre-construction grades, and restoration efforts would be as described above for cable plow installation. In the unlikely event that three or more cables must be installed, agricultural protection measures requiring the stripping and segregating of topsoil and restoration would occur. Any tiles that are cut or damaged during construction of the interconnect would be repaired during restoration.

Installation of interconnect via an open trench would be avoided, if possible. Areas where open trench installation may be required include unstable slopes, excessive unconsolidated rock, and standing or flowing water. Open trench installation would be performed with a backhoe and would result in a disturbed trench approximately 36 inches wide and a minimum cover of 36 inches deep. In active agricultural areas, agricultural protection measures would be followed; including possible minimum burial depths of 48 inches for the interconnection lines in agricultural fields. Replacement of excavated material would occur immediately after installation of the underground interconnect. Any damaged tiles would be repaired, and all areas adjacent to the open trench would be restored to original grades and surface condition.

Although not currently anticipated, portions of the interconnect could be installed aboveground. Aboveground installation would be indicated when burial would not be economically feasible or could result in significant environmental impacts. If that occurs, the interconnect would be installed aboveground on treated wood utility poles.

2.6.6 Wind Turbine Assembly and Erection

Wind turbines consist of three main components: the tower, the nacelle, and the rotor blades. Turbine components would be delivered to the Project site on uncovered transport trucks. Turbine erection is typically performed in six stages: (1) setting of the electrical components in the foundation, (2) erection of the tower, (3) erection of the nacelle, (4) assembly and erection of the rotor, (5) connection and termination of the internal cables, and (6) inspection and testing of the electrical system.

Turbine assembly and erection is performed with large track mounted cranes, smaller rough terrain cranes, boom trucks and rough terrain fork-lifts for loading and off-loading materials. The erection crane(s) would move from one tower to another along a designated crane path. This path would generally follow existing public roads and Project access roads, but in a few places may traverse open fields. If this approach is not feasible, topsoil would be stripped and stockpiled in accordance with agricultural protection measures and 44-foot-wide temporary roads would be installed in these areas. In addition, the use of construction mats would be considered during constructability review of the Project. The crane may also be partially disassembled and carried by a flatbed tractor-trailer, but this is inefficient and expensive.

After a turbine is erected, site restoration activities would begin. Restoration of crane paths would include removal of temporary fill and gravel materials. In agricultural fields, restoration would also include subsoil de-compaction (as necessary) and rock removal, spreading of stockpiled topsoil, and re-establishing pre-construction contours. Exposed soils at restored tower sites and along roads and crane paths would be stabilized by seeding and/or mulching.

2.6.7 Substation

The proposed Project substation would be located on approximately four acres in the Town of Cape Vincent. The substation would be accessed by Swamp (Wilson) Road. The substation construction area would be cleared, grubbed, and graded. Concrete foundations and gravel surfacing would occur prior to the installation of the electrical infrastructure. The substation would include a gravel parking area and be enclosed by a chain link fence.

2.6.8 Overhead Transmission Line

The construction right-of-way would serve as access for construction vehicles. The temporary construction right-of-way for the overhead transmission line may be up to 120 feet, as necessary for construction equipment. The construction right-of-way would be cleared and grubbed. Additional access to the work area would include use of existing farm roads and drives. To the extent new access roads are necessary; the siting criteria described in Section 2.6.3 would be employed. Construction vehicles and equipment would then set the treated wood utility poles and associated transmission infrastructure. Later, stringing crews would install electrical cable on the utility poles. Testing of the system prior to energizing the wind generating facility would occur. Restoration of the construction right-of-way would occur as required by use of agricultural protection measures. The final overhead transmission line right-of-way would be identified post-construction on as-built drawings and would be presented to the Towns of Cape Vincent and Lyme.

2.6.9 Operations and Maintenance Facility

The proposed Operations and Maintenance Facility would be located on approximately 0.3 acres in the Town of Cape Vincent. The facility would be accessed from Hell Street. The facility construction area would be cleared, grubbed, and graded. Concrete foundations and gravel surfacing would be completed prior to the installation of the infrastructure. The facility would include a gravel parking area.

2.7 Operations and Maintenance Plan

The Project would be operated and maintained by SLW. A Post-Construction Monitoring, Operation and Maintenance Plan would be prepared prior to commencement of continuous operations. Once operational, the Project would be almost completely automated. SLW would employ a staff of approximately three (3) administrative/operations and maintenance personnel.

In the event of turbine or plant facility outages, the Supervisory Control and Data Acquisition (SCADA) system would send alarm messages to the on-call technician via pager or cell phone to notify him of the outage. The Project would always have an on-call local technician who can respond quickly in the event of emergency notification or critical outage.

Wind turbines would receive scheduled preventative maintenance inspections. In certain circumstances, heavy maintenance equipment such as a lifting crane might be required to effectively repair any exposed turbine problems (such as, in rare instances, nacelle component replacement).

2.8 Decommissioning

Project life is planned for at least 20 years. In fact, it is expected that the proposed turbine technology would continue to perform well beyond a 30-year horizon. In the wind industry, it is common to replace or “re-power” older wind energy projects by upgrading older equipment with more efficient turbines over time. Except for the underground collection system, which is provided for under a perpetual easement, SLW’s lease agreements with the landowners provide that all wind Project facilities would be removed following the end of the Project’s useful life.

2.9 Regulatory Approvals

Development of the Project would require permits, approvals, and consultations with local, state, and federal agencies. The permits and approvals that are expected to be required are listed in Table 2-1.

Table 2-1 (Sheet 1 of 2)
Permits and Approvals for the St. Lawrence Wind Energy Project

Agency	Description of Permit or Approval Required
Towns	
Town of Cape Vincent Planning Board	Administration of SEQRA Process, and issuance of findings (as Lead Agency under SEQRA).
Town of Cape Vincent Code Enforcement Officer	Site Plan Approval (Planning Board) and other land use considerations for construction of turbine foundations and transmission line to Town boundary
Town of Cape Vincent Code Enforcement Officer	Zoning Permit
Town of Cape Vincent Departments	Issuance of building permits/certificates of compliance. Review and approval of highway work permits/road agreements.
Town of Lyme Planning Board	Participation in SEQRA Process as an involved agency; issuance of SEQRA findings.
Town of Lyme Zoning Board of Appeals	Special Permit (Zoning Board of Appeals) and other land use considerations for construction of transmission line to substation
Town of Lyme Departments	Issuance of building permits. Review and approval of highway work permits/road agreements.
Jefferson County	
Planning Department	Completion of a NYS General Municipal Law Section 239-m review and issuance of recommendations.
Highway Department	County road work permits.
Jefferson County IDA	Potentially involved with PILOT approval. If so, issuance of SEQRA Findings.
New York State	
Department of Environmental Conservation	Potentially, Article 24 Permit for disturbance of state jurisdictional freshwater wetlands. SPDES General Permit for stormwater discharges (creation of SWPPP and SPCCP). Section 401 Water Quality Certification. Issuance of SEQRA Findings as an involved agency.
Department of State Division of Coastal Resources	Coastal Zone Management Act Consistency Determination
Department of Transportation	Special Use Permit for oversize/overweight vehicles. Highway work permits.
New York State	
Department of Agriculture & Markets	Submit Notice of Intent for work in an Agricultural District.

Table 2-1 (Sheet 2 of 2)
Permits and Approvals for the St. Lawrence Wind Energy Project

Agency	Description of Permit or Approval Required
Public Service Commission	PSL §68 Certificate. Issuance of SEQRA Findings.
NYSERDA	Administration of Renewable Portfolio Standard procurement.
NYSOPRHP (SHPO)	Cultural Resources Consultation.
Federal Agencies	
FAA	Notice of Construction and Aviation Lighting Plan.
U.S. Army Corps of Engineers	USACE Nationwide Section 10 Permit for aerial crossing of the Chaumont River. Potential for USACE Section 404 Nationwide Permit for placement of fill in federal jurisdictional wetlands/waters of the U.S. Remote Potential for USACE Section 404 Individual Permit for placement of fill in federal jurisdictional wetlands/water of the U.S. NEPA compliance if Individual Permit. Federal consistency and applicable permits for the Coastal Zone Management per USACE.
U.S. Fish and Wildlife Service	Consultation regarding special status species.
OSHA	29 CFR 1910 regulations (standard conditions for safe work practices during construction).

2.10 Public and Agency Involvement

SLW has conducted outreach with local governments prior to the submittal of this DEIS. SLW has had numerous informational sessions, meetings, and discussions with the involved Towns regarding the Project over the past several years. SLW has conducted numerous individual meetings with participating landowners and Project neighbors. SLW has also initiated consultation with the New York State Historic Preservation Office (SHPO).

SLW intends to hold community open houses, as necessary, to inform the public of the Project. SLW would also create a Project website, as required by Chapter 641 of the NYS Laws of 2005 (“Ch. 641”) where the public can review the DEIS, obtain other Project information, and submit comments to SLW.

During the SEQR process, the public and agencies would have a 30-day review and comment period for this DEIS. The lead agency would hold a public hearing during that period. In addition, several of the permits required for the Project would have public review and comment periods.

3.0 ENVIRONMENTAL SETTING, IMPACT ANALYSIS AND MITIGATION MEASURES

3.1 Soils, Topography and Geological Resources

3.1.1 Existing Conditions

3.1.1.1 Surficial Geology

The surficial geology of the Project area was mapped by the New York State Geological Survey (Cadwell *et al*., 1991). Based upon an evaluation of the maps (including Figure 3-1), the surficial geology of the Project area consists primarily of glaciolacustrine lake, silts, and clays. As glaciers from the last Ice Age melted from south to north, they filled low-lying areas with water, which became inundated with silts and clays. A small portion of the Project area consists of peat muck (swamp deposits) which are poorly drained areas and consist of organic silts and sands. The proposed wind turbine locations within the peat muck areas would include Nos. 14, 15, 18 and 85. Local areas may also consist of mixed glacial and residual soils weathered from the underlying limestone bedrock. The thickness of glacial soils is expected to vary widely across the site from very shallow to very deep (McDowell, 1989).

3.1.1.2 Bedrock Geology

The proposed Project area is located in the Ontario Lowlands Physiographic Province which includes sedimentary rocks (Cambrian and Ordovician) of the Lower Paleozoic age. The underlying bedrock (Figure 3-2) is comprised of rocks of the Trenton group (Trenton Limestone) and Black River Group (Lowville Limestone and Watertown Limestone) (Ruedemann, 1908).

The New York State Geological Survey indicates the primary mineral resources of Jefferson County include crushed stone, construction gravel, and topsoil. The New York State Department of Environmental Conservation (NYSDEC) Mined Land Database (NYSDEC, 2006b) indicates records of commercial mining around the proposed Project area. The mineral resource mined in the vicinity of the Project area is carbonate rock (limestone), which can be used in the construction industry for concrete or highway paving materials. The Project is not anticipated to impact these resources.

A review of United States Geological Survey and New York State Geological publications did not identify any specific geological hazards within the Project area. Since the Project area is located mainly on lowlands and consists predominantly of glacial till there is no possibility of landslides. Review of topographic maps (Figure 2-1) and aerial photographs of the site (Figure 3-3) revealed no evidence of landslides. While no limestone (karst) hazards are mapped, the Trenton and Black River Groups are comprised of carbonate rocks that are susceptible to dissolution and sinkhole formation. Caverns have been mapped in the Project area and mapping has indicated numerous closed depressions. Due to its particular characteristics, including an irregular bedrock surface, the presence of large voids and rapid underground drainage, karst limestone presents special problems for civil engineering projects such as roads, bridges, tunnels, sewerage pipelines, and mining. Careful preparatory investigations are therefore required with special design measures and provisions for unforeseen problems. As a result, bedrock in the Project area should be investigated for karst and other dissolution features as part of the geotechnical investigation(s) prior to construction.

The proposed Project area lies in a zone of relatively low seismic risk. The maximum earthquake ground motion is expected to be 0.20 times the acceleration due to gravity (0.20g) for 0.20 second response acceleration and 0.08g to 0.11g for one second response acceleration (Building Code of New York State, 2002).

Based upon the soils information and geologic setting, it appears that the Project area conditions could vary considerably from shallow hard rock to deeper organic soils; as a result the Project area may include site classes A through F. Based on the prevalence of shallow rock across the site it appears likely that most of the Project area would include Site Classes A, B or C. Nonetheless, detailed geotechnical investigations would be required to assess the specific site class for each proposed wind turbine location.

3.1.1.3 Soils and Floodplain Designations

The Soil Survey of Jefferson County, New York (McDowell, 1989) indicated that the proposed Project area is underlain by nine soil series, comprised of several soil types of similar developmental origin. These soil series consist predominantly of silt loams and loams of glacial origin. The soil survey indicates that the soils in and around the Project area vary from shallow to very deep and have been formed from glacial till derived from the underlying limestone. The soils identified within the Project area are presented in Figure 3-4. The soil series listed in the legend of Figure 3-4 are designated by a two letter code, followed by a third letter indicating the degree of slope, and, when data are available, by a number that indicates the degree of erosion. The primary soil types underlying the Project area include the following:

Benson (Bg)

The Benson series consist of nearly level to gently sloping, shallow and very shallow, somewhat excessively drained soils. These soils are mainly in broad, undulating areas interspersed with rock outcrops on ridges. Typically, the surface layer is dark brown channery silt loam about 3 inches thick. The subsoil is reddish brown and dark reddish brown, very channery silt loam about 9 inches thick. Bedrock is commonly at a depth of 10 to 20 inches. Most of these soils are used as permanent pasture or cedar woodland, or are reverting to brush. This soil is generally not suited for cultivated crops. The rate of runoff on the Benson soils is medium, and the capacity of these soils to store water available for plant growth is very low. The primary soils mapped within the areas of the proposed Project are BgB (see Figure 3-4) and have slopes of 0% to 8% in the vicinity of proposed turbine Nos. 20, 38, and 39.

Chaumont (Cl)

The Chaumont series consist of level to gently sloping, moderately deep and somewhat poorly drained soils in concave, sloping areas of lowland plains. Typically, the surface layer is dark grayish brown silty clay about 5 inches thick. The subsoil is mottled and about 22 inches thick. It is grayish brown to dark grayish brown clay in the upper part and dark grayish brown silty clay in the lower part. Bedrock is commonly at a depth of 20 to 40 inches. Most areas of this soil type have been cleared and are used for cultivated crops. Some areas are used as pasture and woodland; as a result drainage is needed in extensively cropped areas. The rate of water movement through the soil is slow or very slow, and runoff is slow. The capacity of the soil to store water available for plant growth is moderate to high. The surface layer is moderately acidic to neutral. The soils mapped within the Project area include ClA and ClB (see Figure 3-4) and have slopes of 0% to 3% and 3% to 8%, respectively.

Covington (Cp)

The Covington series consist of nearly level, very deep, poorly drained soils in smooth, broad, mostly level areas and depressions of the lowland plains. Slopes range from 0 to 3 percent, but are predominantly less than 1 percent. Typically, the surface layer is very dark silty clay about 6 inches thick. The subsoil is mottled, about 26 inches thick, and consists of dark gray to grayish brown clay. The substratum is mottled, gray firm, sticky and plastic silty clay to a depth of 60 inches or more. Most areas of this soil type have been cleared and are used for cultivated crops. The rate of water movement through the soil is slow or very slow in the surface layer and very slow in the subsoil and the substratum; in addition runoff is slow. The capacity of the soil to store water available for plant growth is moderate to high. The surface layer is moderately acidic to neutral. Bedrock is commonly at a depth of 20 to 40 inches. The prolonged seasonal high water table, the clayey texture, slow rate of water movement through the soil, poor stability, and potential frost action are limitations of this soil for urban uses.

Galoo (Gb)

The Galoo series consist of very shallow excessively drained and somewhat excessively drained soils. The areas are mainly on undulating ridges and knolls. The Galoo soil is 2 to 10 inches deep over limestone of calcareous sandstone bedrock. Typically, the surface layer consists of dark brown silt loam about 4 inches thick. The subsoil is reddish brown channery silt loam to a depth of 7 inches. Most of the areas used as pasture are reverting to brush, or are poor quality woodlands. This soil is not suited to cultivated crops because of the very shallow depth to bedrock, droughtness and rock outcroppings. The rate of water movement through the soil is moderate, and the runoff rate is slow or medium. The capacity of the soil to store water available for plant growth is very low. The surface layer is moderately acidic to mildly alkaline. Soils mapped within the Project area include GbB, and GcB (see Figure 3 4) and have slopes of 0% to 8%.

Hudson (Hu)

The Hudson series consist of gently sloping to steep, very deep, moderately well drained soils mainly in smooth, irregularly shaped areas and on convex slopes. Typically, the surface layer consists of brown silt loam about 8 inches thick. The subsurface is mottled brown silt loam about 4 inches thick, and the subsoil is mottled and approximately 47 inches thick. It is brown to dark brown silty clay in the middle part and yellowish brown silt loam in the lower part. Most areas of this soil have been cleared and used for cultivated crops for dairy farming. The rate of water movement through the soil is moderately slow or moderate in the surface layer, and slow or very slow in the subsoil and the substratum; in addition the runoff is medium. The capacity of the soil to store water available for plant growth is moderate to high. The surface layer is moderately acidic to neutral. Erosion is a serious hazard if the slopes are bare of vegetation. Mapped soils in the Project area include HuB, HuC and HyE3, (see Figure 3-4) and have slopes of 3% to 8%, 8% to 15% and 15% to 35%, respectively.

Kingsbury (Kg)

The Kingsbury series consist of nearly level, very deep, somewhat poorly drained soils mainly in smooth, broad, irregularly shaped areas on plains. Typically, the surface layer consists of dark grayish brown silty clay about 7 inches thick. The subsurface is mottled, grayish brown silty clay about 5 inches thick, and the subsoil is mottled and about 16 inches thick. It is firm, grayish brown clay in the upper part and olive gray clay in the lower part. Most areas of this soil have been cleared and used for cultivated crops and dairy farming. If properly drained this soil is moderately suited for cultivated crops. The rate of water movement through the soil is moderately slow in the surface layer and very slow in the subsoil and the substratum. The clayey subsoil somewhat restricts rooting depth, and runoff is slow. The capacity of the soil to store water available for plant growth is high. The surface layer is moderately acidic to mildly alkaline. Soils mapped within the Project area include KgA and KgB (see Figure 3-4) and have slopes in the range of 0% to 3%.

Livingston (Lc)

The Livingston series consist of nearly level, very deep and poorly drained soils mainly in smooth, broad, flat or depressional areas on plains. Typically, the surface layer is black mucky silty clay about 6 inches thick. The subsoil is mottled and about 24 inches thick. It is dark greenish gray to dark gray, very firm, very plastic and very sticky clay. Most areas of this soil are used as pasture or woodland. The rate of water movement through the soil is slow or very slow in the subsoil and the substratum. The runoff is very slow or ponded. The capacity of the soil to store water available for plant growth is high. The surface layer is moderately acidic to neutral. Soils mapped within the Project area include Lc and Ld (see Figure 3-4) and have slopes in the range of 0% to 3%.

Reinbeck (Rh)

The Reinbeck series is barely level to gently sloping very deep, somewhat poorly drained soil mainly in smooth, broad, irregularly shaped areas on lake plains and at the margins of uplands. Typically the surface layer is dark grayish brown silty loam about 8 inches thick. The subsurface layer is mottled, grayish brown silt loam about 4 inches thick. The subsoil is mottled and about 14 inches thick. Most areas of this soil have been cleared and are used for cultivated crops in dairy farming. The rate of water movement through the soil is moderately slow in the surface layer and slow in the subsoil and the substratum; in addition the runoff is very slow. The capacity of the soil to store water available for plant growth is high. The surface layer is moderately acidic to neutral. Soils mapped within the Project area include RhA and RhB (see Figure 3-4) and have slopes in the range of 0% to 3% and 3% to 8%, respectively.

Wilpoint (Wn)

The Wilpoint series consist of gently sloping, moderately deep, moderately well drained soil mainly on convex slopes. Typically, the surface layer is dark grayish brown silty clay loam about 6 inches thick. The subsoil is mottled and about 16 inches thick. It is dark brown silty clay in the upper part and dark brown to dark grayish brown clay in the lower part. Bedrock is at a depth of 20 to 40 inches. Most areas of this soil have been cleared and are used for cultivated crops. The rate of water movement through the soil is slow or very slow, and the runoff is medium. The capacity of the soil to store water available for plant growth is moderate. The surface layer is moderately acidic to neutral. Soils mapped within the Project area include WnB and WnC (see Figure 3-4) and have slopes in the range of 3% to 8% and 8% to 15%, respectively.

The Soil Survey of Jefferson County indicates that ground water is seasonally perched within the upper 0.0 to 6.0 feet during the months of December to May and/or March to May depending on the underlying soils (McDowell, 1989). The soils mapped within the proposed Project area are described as poorly drained, and groundwater is expected to be shallow in most areas.

A summary of soil properties for the various soil series are presented in McDowell (1989), and a summary of the properties listed for the soils mapped within the Project area is included as Table 3-1.

3.1.1.4 Unusual Landforms or Geologic Formations

The Project area contains landforms that are unique to the local geologic environment. The landforms are typical of a glacial lacustrine plain and include relatively flat terrain with small lakes and wetland areas. The area also includes surficial peat deposits. Other landforms include a cave near the northern limit of the Project area, just south of Millen Bay, and numerous closed depressions. The closed depressions are likely remnant glacial features, but may also reflect karst (sinkhole) activity in the underlying limestone.

The Project area is mapped as part of four United States Geological Survey (USGS) 7.5 Minute Topographic maps: Cape Vincent North, Cape Vincent South, Chaumont and St Lawrence Quadrangles. Based upon the USGS Topographic maps (USGS, 1958a, b, c, d), the proposed Project area is located in the St. Lawrence River Valley (or the Thousand Island Region). The St. Lawrence Valley and the Erie-Ontario plain together are referred to as the "lowlands." The elevations across the Project area vary from about 249 feet above mean sea level (msl) to about 370 feet above msl. The proposed Project area is encompassed by rivers and lakes, which include the St Lawrence River, the Black River, and Lake Ontario. A majority of the Project area consists of nearly level agricultural land (row crops). Approximately 80% of the Project area has slopes within the range of 0 to 10%, approximately 16% of the area is between 10 to 15% and approximately 4% of the Project area includes slopes greater than 15%. A majority of the area is level and the drainage pattern is generally in the direction of small streams and creeks (e.g., Kents Creek, Fox Creek, Shower Creek, Super Creek, Three Mile Creek), which discharge directly into the St Lawrence River.

3.1.2 Potential Impacts

3.1.2.1 Potential Short-Term Impacts

Based on the information reviewed and described above, the soils and geologic conditions should be properly evaluated prior to construction of the proposed wind energy project. The subsoils are expected to consist predominantly of silt loams and loams of glacial origin. The soil survey indicates that the soils in and around the Project area vary from shallow to very deep and have

Table 3-1

General Description of Soil Series

(Taken from Soil Survey of Jefferson County, New York [McDowell, 1989])

Soil Name	Hydrologic Group[1]	Water Table Depth (ft)	Bedrock Depth (in)	Permeability (in/ hr)	pH	Risk of Corrosion		Erosion Factors K	Unified Soil Classification[2]	Plasticity Index
						Uncoated Steel	Concrete			
Benson	C/D	>6	10-20	0.6-2.0	5.6-7.3	Low	Low	0.02	SM/GM	NP-10
Chaumont	D	1.5-1.5	20-40	<0.2	5.6-7.3	High	Low	0.49	MH,CH	15-50
Covington	D	0.5-1.0	>60	<0.2	5.6-7.3	High	Moderate	0.49	CH,MH	10-40
Galoo	C/D	>6	2-10	0.6-2.0	5.6-7.8	Low	Low	0.32	CL,ML	3-15
Hudson	C	1.5-2.0	>60	0.2-2.0	5.1-7.3	High	Low	0.49	ML,CL-ML	5-19
Kingsbury	D	0.5-1.5	>60	0.06-0.2	5.1-7.8	High	Moderate	0.49	ML,MH	11-20
Livingston	D	0-1.0	>60	0.2-0.6	5.1-7.3	High	Low	0.49	CH,MH	10-40
Reinbeck	D	0.5-1.5	>60	0.2-0.6	5.1-7.3	High	Low	0.49	ML,MH	10-25
Wilpoint	D	1.5-2.0	20-40	<0.2	5.6-7.3	High	Low	0.49	MH,CH	15-50

[1]**a) Definition**
Hydrologic group is a group of soils having similar runoff potential under similar storm and cover conditions. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonally high water table, intake rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The influence of ground cover is treated independently.
(b) Classes
The soils in the United States are placed into four groups, A, B, C, and D, and three dual classes, A/D, B/D, and C/D. In the definitions of the classes, infiltration rate is the rate at which water enters the soil at the surface and is controlled by the surface conditions. Transmission rate is the rate at which water moves in the soil and is controlled by soil properties. Definitions of the classes are as follows:
A. (Low runoff potential). The soils have a high infiltration rate even when thoroughly wetted. They chiefly consist of deep, well drained to excessively drained sands or gravels. They have a high rate of water transmission.
B. The soils have a moderate infiltration rate when thoroughly wetted. They chiefly are moderately deep to deep, moderately well drained to well drained soils that have moderately fine to moderately coarse textures. They have a moderate rate of water transmission.
C. The soils have a slow infiltration rate when thoroughly wetted. They chiefly have a layer that impedes downward movement of water or have moderately fine to fine texture. They have a slow rate of water transmission.
D. (High runoff potential). The soils have a very slow infiltration rate when thoroughly wetted. They chiefly consist of clay soils that have a high swelling potential, soils that have a permanent high water table, soils that have a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material. They have a very slow rate of water transmission.
(1) Dual hydrologic groups, A/D, B/D, and C/D, are given for certain wet soils that can be adequately drained. The first letter applies to the drained condition, the second to the undrained. Only soils that are rated D in their natural condition are assigned to dual classes. Soils may be assigned to dual groups if drainage is feasible and practical.
[2] Unified Soil Classification, see ASTM D2487.

been formed from glacial till derived from the underlying limestone. The water table is expected to be shallow in the Project area. In addition, bedrock depths across the area would vary greatly in areas underlain by karst limestone. The finer grained soils may have a tendency to soften on exposure to weather and would likely require protection from weather and vehicle traffic to prevent rutting. Slopes are generally slight to moderate in the area of the proposed wind turbines and slope stability is not expected to be an issue for design. The seismic risk is low.

Based upon the topographic features (see Figure 2-1) and drainage characteristics of the proposed Project area, grading and other construction activities could cause the disruption of soils and the increased potential for erosion during construction without appropriate erosion and sediment controls. In addition, the short-term removal of vegetation, including the root system from portions of the site, would expose soils to erosive factors such as wind, rain and surface runoff. Without appropriate erosion controls, soil transported by surface runoff could potentially migrate to nearby surface waters where it may settle out as sediment. The Project is required to obtain a soil Stormwater Pollution Discharge Elimination System (SPDES) permit, which entails creation of a SWPPP for construction. Construction traffic could also create airborne dust. Dust control measures are addressed in Section 3.9.

3.1.2.2 Potential Long-Term Impacts

The proposed Project, once built, could potentially cause a minor alteration to existing drainage patterns. A SWPPP would be created to address any potential sediment and erosion impacts associated with Project operation.

3.1.3 Proposed Mitigation

3.1.3.1 Soil Erosion and Siltation

To avoid and mitigate the short-term potential impacts associated with soil erosion and siltation, and ensure that downstream waterways are not adversely impacted, a sediment and erosion control plan would be developed as part of the Project Stormwater Pollution Prevention Plan, which is required by the SPDES permit for construction and the SPDES permit for operation.

3.1.3.2 Soils in Agricultural Areas

In order to prevent the loss or compaction of topsoil, SLW commits to following the NYS agricultural protection measures during construction, as set forth in Appendix A of the NYS Department of Agriculture and Markets Guidelines for Agricultural Mitigation for Wind Power Projects.

Soils impacted during construction would also be minimized by inclusion of applicable soil protection erosion control and soil restoration measures in the final construction documentation and plans for the contractor(s) and subcontractor(s). One or more pre-construction meetings would be held between the construction contractor(s) and a representative of the New York State Department of Agriculture and Markets. During construction the environmental inspector would monitor compliance with the soil protection measures (including potential access restrictions) described above and included in Appendix A.

3.1.3.3 Shallow Bedrock, Blasting and Geotechnical Investigation

A geotechnical investigation would be conducted to assess conditions (including potential karst features) at locations where construction is proposed to determine soil properties for design, specific groundwater depths, and to verify suitability of the native materials for support of the proposed roadways and wind turbine foundations. The investigation would also assess areas where shallow groundwater or bedrock might impact proposed underground construction for buried electric lines and foundations. A limited number of deep borings are necessary to evaluate the geotechnical considerations discussed above.

The investigation would include at least one boring at each proposed wind turbine location. Additional borings may be added where karst features are identified or suspected. The borings would be drilled to bedrock. Bedrock would be cored if encountered within 20 feet of the ground surface. Where rock is not encountered, borings would extend to depths equal to 1 to 2 times the foundation width below the foundation elevation, depending on the quality of the subsoils encountered. If compressible strata are encountered, the borings would extend through the compressible soil into a competent bearing stratum. Cone Penetration Testing (CPT) would be considered as a low cost method to evaluate subgrade conditions for proposed roadways. Additional borings would be made at the proposed substation location and where directional borings might be needed. Borings would obtain undisturbed samples of cohesive materials. Geotechnical borings and slope stability analyses may also be necessary.

Geophysical investigation, coupled with a limited number of geotechnical borings, would be provided to determine the depth to rock along proposed underground interconnect lines. The geotechnical data would be presented in a geotechnical report that includes boring logs, laboratory test results, recommended foundation types, depths and allowable pressures, seismic site classification, and recommended soil and rock parameters to be used for the design of foundations and roadways. This report would be prepared prior to the final engineering design.

3.1.3.4 Management of Oil and Hazardous Materials

Wind turbines, and their associated equipment, use lubricating and insulating oils in a closed system. A SPCC Plan would be developed as part of the SWPPP for the construction and operation of the Project as required by the SPDES permits.

3.2 Water Resources

3.2.1 Groundwater and Groundwater Quality

3.2.1.1 Affected Environment

Glaciolacustrine lake silts and clays overlie consolidated rocks of sedimentary origin in the area of the Project (Cadwell *et al.*, 1991). Small portions of the Project consist of peat muck (swamp deposits) which are poorly drained areas and include of organic silts and sands. The glacial till deposits form surficial aquifers, while bedrock consisting of carbonate rocks (primarily limestone) form deep aquifers. These consolidated rocks yield water primarily from bedding planes, fractures, joints, and faults, rather than from intergranular pores. Carbonate rocks generally yield more water than other types of consolidated 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 (United States Environmental Protection Agency [EPA], 2006a). In 2000, total freshwater use was 17.21 million gallons per day (Mgal/d), of which 13.25 Mgal/d (27 percent) was from surface-water sources and 3.96 Mgal/d (73 percent) was from groundwater (USGS, 2006). However, domestic users acquired 100 percent of their water supply from groundwater sources (USGS, 2006). Table 3-2 lists an excerpt from the USGS report of water usage statistics in Jefferson County, New York. Current data (October 2006) from the EPA indicates that drinking water is obtained from groundwater, surface water and purchased groundwater/surface water resources in Jefferson County (EPA, 2006b).

Table 3-2
Year 2000 Water Usage Statistics in Jefferson County [1]

Type of Usages	Water Withdrawals[2]		
	Groundwater	Surface	Unit
Public supply[3]	2.17	8.20	Mgal/d
Domestic, self-supplied withdrawals	0.45	0.00	Mgal/d

[1] Source: http://water.usgs.gov/watuse/data/2000/index.html
[2] 6.39 Mgal/d was industrial use
[3] Population (Year 2000) in Jefferson County was approximately 111,740