DRAFT Scoping Document
For the Preparation of a Draft Environmental Impact Statement

Noble Windpark in Wethersfield and Eagle
Wyoming County, New York

SEQRA Lead Agency:

Town of Wethersfield Town Board
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Project Sponsor:

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This draft scope (Scope) was prepared in accordance with 6 N.Y.C.R.R. §§ 617.9(a)(2) and 617.9(b)(5). Noble Wethersfield Windpark, LLC (Noble) proposes to construct a 129-megawatt (MW) wind energy facility. Portions of the facility are to be located in the towns of Wethersfield and Eagle (Towns), Wyoming County, New York (the "Project" or "Windpark"). The Project will include the construction, operation, and maintenance of approximately 85 wind turbines (59 of which are in the town of Wethersfield and 26 are in the town of Eagle), along with associated access roads and an electrical collection system, transmission lines, and substation.

Together with the Windpark, Noble proposes to construct a 5.6-mile 230-kilovolt (kV) transmission line, substation, and switchyard in the towns of Wethersfield and Orangeville, Wyoming County, New York. The construction of the transmission component of the Project is subject to Article 7 of the New York State Public Service Law. In accordance with 6 N.Y.C.R.R. §§ 617.5, actions reviewed by the New York State Public Service Commission (PSC) under Article VII of the New York State Public Service Law are not subject to review under State Environmental Quality Review Act (SEQRA). Therefore, the Project as described in the Draft Environmental Impact Statement (DEIS) will include only the Windpark. A detailed description of the transmission portion of the Project and an evaluation of the impacts of the transmission portion will be provided in the Article VII Application that will be included as Appendix A in the DEIS.

The current wind turbine layout is preliminary and forms the basis for the calculations presented in the Environmental Assessment Form (EAF) submitted to the Towns as part of Noble's applications for site plan approval and licenses. The facility locations will be modified, as and if needed, once environmental field studies are completed. A mapped facility layout, including the proposed locations of wind turbines, electrical collection lines, access roads, and the electrical substation will be included in the DEIS.

This scoping document will be used by the lead agencies to determine the adequacy of the impacts and mitigation measures to be included in the DEIS for the Noble Wethersfield Windpark.

Contents of the DEIS

Cover Page and Table of Contents: The DEIS will include a cover sheet stating that it is a DEIS, the name and location of the proposed action, and the name and address of the lead agency. The DEIS will include a copy of the final Scope. The cover sheet will be followed by a table of contents. The table of contents will be followed by a list of acronyms used in the DEIS.

A copy of the draft table of contents is attached to this Scope as Exhibit A.

Executive Summary: The DEIS will include an Executive Summary. The purpose of the Executive Summary is to accurately summarize the DEIS. It will include a brief description of the Project, a description of potential environmental impacts and proposed corresponding mitigation measures, and a description of the Project alternatives considered.

Section 1: Description of Proposed Action

The purpose of this section will be to provide a description of the Project that will assist the reader in understanding the Project's design and potential impacts. It will include the subsections described below.

Section 1.1, Site Description: This subsection will present a general description of the proposed action and the areas to be impacted by the proposed action. This subsection will also define critical terms that will be utilized throughout the DEIS.

Section 1.2, Detailed Description of the Proposed Action: Includes a more detailed description of the Project and its components, including the number of turbines proposed,

preparation of the Project Site, turbine selection and technical detail, operations and maintenance, and power generation. A description of the turbines to be erected, turbine components, associated facilities, methods of construction and interconnection will be included.

The description will include or reference figures that show the following:

- The location of each proposed turbine;
- All proposed facilities, including access roads, electrical lines, and equipment staging areas;
- Typical drawings of the turbines showing total height and turbine dimensions; and
- Typical drawings of roads and collection lines.

Section 1.3, Project Alternatives: This section will describe the methodology used to select the Project Site and the criteria and methods used to select turbine, collection system and access road locations. Each of the siting criteria will be described and the methodology for applying each criterion in the evaluation of alternative Project and turbine locations will be explained. The following Project alternatives will be evaluated, considering the objectives and capabilities of the Project Sponsor: alternative Project sizes, alternative turbine design, size and technology, alternative tower and turbine color, and the no-build alternative. Specific actions taken to minimize impacts on wetlands and agricultural lands will be discussed.

Section 1.4, Project Purpose, Need and Benefits: This section will explain the purpose, public need, and benefits of the proposed action, including social and economic considerations. The need for the proposed Project at the national and regional level will be evaluated in the context of the state and federal energy policies. The costs and benefits of the Project to the Towns will also be evaluated.

Section 1.5, Required Permits and Approvals: Will include a list of local, state, and federal permits and approvals necessary for the proposed Project, as well as a summary table documenting agency and public consultation.

Section 2: Environmental Setting, Potential Impacts, and Proposed Mitigation

The objective of this section will be to describe the current conditions in the Project Area and to evaluate, on a resource-specific basis, the potential adverse environmental impacts of the Project. Emphasis will be placed on identifying anticipated short-term and long-term environmental impacts caused by construction and operation of the proposed Project, and on identifying and discussing measures to avoid, reduce, or mitigate for potential impacts on existing environmental resources, including suggested refinements in Project facility site location, design, or operation. Areas identified in parts 2 and 3 of the EAF as having potentially significant impacts will be assessed thoroughly in the DEIS. The resource areas described below will be evaluated:

Geology: Will include a description of the geologic and topographic conditions within the Project Area including any unique geologic conditions at a proposed turbine site. Description of the topography and geology within the Project Area will be based on field observations and a review of applicable literature including the United States Geologic Survey (USGS) and the New York State Museum (NYSM) - GIS statewide datasets for surficial and bedrock geology and faults of New York State. A discussion of the potential for earthquakes at the Project site will be included. Any potential construction and operational impacts will be evaluated. Constraints to development caused by geology or topography as well as recommended mitigation to avoid or minimize impacts will be discussed.

Soils: Will include a description of regional soil types and a calculation of the total area of soil disturbance resulting from the construction and operation of all of the Project components. Impacts to various soil types from the Project will be quantified. Any measures that will be undertaken to avoid or minimize the impact to soils will be described. Existing agricultural resource maps and information provided by the New

York Department of Agriculture and Markets (NYSDAM) will be analyzed and their wind power-specific mitigation measures will be considered and integrated into the facility layout. Methods will be described to achieve compliance with NYSDAM guidelines (when practicable) for the restoration of soils in agricultural areas. Soils data will be obtained from state and federal soils databases and from the Natural Resource Conservation Service's databases called State Soil Geographic Database (STATSGO) and Soil Survey Geographic Database (SSURGO).

Water Resources: Will describe groundwater, surface water and drinking-water resources within the Project Area. Descriptions of water resources will be obtained from reviews of applicable documents, map and electronic databases, including information derived from topographic surveys of the Project footprint and documents published by the USGS. Information will be obtained from the following state and federal databases:

- The New York State Department of Environmental Conservation (NYSDEC) 2004 Section 303(d) Streams List, found at http://www.dec.state.ny.us/website/dow/303dcalm.html; and
- USGS, Groundwater Levels for the Nation, found at http://nwis.waterdata.usgs.gov/usa/nwis/gwlevels/?site_no=445052073350201.

Information for groundwater resources will include depth to groundwater, presence of deep and shallow aquifers, and wellhead protection and aquifer recharge areas, where available. Information for surface water resources will include stream type (perennial, intermittent), name, width, bank conditions and soil conditions, flow rates, and any special designations (e.g., fisheries, classes). Information for drinking water resources will include locations of surface water intakes and wells, where available. Information for irrigation wells will also be included in this section, where available.
Potential construction and operation impacts to water resources from the proposed Project will be evaluated. Recommended measures to avoid, reduce, or mitigate for impacts will be discussed.

Wetlands: Will present a general description of wetlands resources in the Project Area and the value of those resources within the Project Area and will include maps of delineated wetlands. All wetlands in areas where potential direct and indirect impacts may occur due to Project construction and operation will be identified on a map. Wetland delineation maps will be developed based on field studies, and any disturbances to delineated wetlands will also be identified. Wetland delineations will be performed according to standards and procedures outlined in the United States Army Corps of Engineers' (USACE's) *Wetland Delineation Manual* (Environmental Laboratories 1987) and the NYSDEC *Freshwater Wetland Delineation Manual* (1995). The Wetland Resources Methodology is attached to this scope as Exhibit B. The wetlands delineation report will be appended to the DEIS.

All efforts to avoid, minimize, or mitigate impacts to jurisdictional and delineated wetlands will be described. If impacts to wetlands or stream crossings are identified, the proposed Project will implement all mitigation measures (such as offsets) contained in permits obtained from the NYSDEC and USACE as appropriate. A discussion of invasive species management will also be included.

Biological Resources: Will characterize the plant and animal communities within the Project Area. A map of the Project Area depicting all identified plant communities will be provided. Aquatic habitat will also be described. A wildlife species list for the Project Area will be developed based on field observations, consultation with United States Fish and Wildlife Service (USFWS) and NYSDEC, and review of existing data. Copies of any correspondence with federal or state regulatory officials on this issue will be appended to the DEIS. The DEIS will also evaluate the potential for state and federally listed endangered, threatened, or special concern wildlife species, including the Indiana bat, to be located in the Project Site, as migrants or residents. See the Bird and Bat Resources subsection below for a further discussion of this issue. Potential impacts and proposed mitigation measures, if any, will be described.

Bird and Bat Resources: Will describe the birds and bats and habitat present within the Project Area and evaluate the potential impact to habitat and the mortality risk presented to birds and bats by the operation of the turbines. All surveys will comply with the Bird and Bat Resources Data Collection and Risk Assessment Methodology attached to this scope as Exhibit C. A baseline bird survey of the Project Area during migratory and breeding seasons including reconnaissance surveys will be included to document bird species, threatened and endangered species, and appropriate habitat. The seasonal occurrence and distribution of birds in the Project Area will be described. Additionally, the results of nocturnal avian radar studies of the proposed Project Area and simultaneous visual observations will be presented. An evaluation of the seasonal occurrence and distribution of birds and bats and an assessment of the potential for listed, endangered or threatened bird and bat species to be located within the Project Site will be provided. Based on the above information, a qualitative assessment of the avian risk presented by the proposed Project will be presented. Proposed mitigation measures, including a post-construction mortality study, will be described. The study will include a discussion of practical adaptive management strategies.

Visual Resources: Will describe the existing vistas in the Project Area and evaluate impacts on those vistas. The DEIS will contain a visual impact assessment (VIA) of the proposed Project prepared in accordance with NYSDEC policy, "Assessing and Mitigating Visual Impacts." The VIA will include computerized photographic simulations of representative vistas, demonstrating visual impacts from multiple vantage points. Local and regional significant public resources will be identified on a map and evaluated. The existing visual character of the landscape will be described and viewer groups within this area will be identified. The impacts indirectly caused by lighting requirements imposed by the Federal Aviation Administration will be described. The visual analysis will also indicate the color treatment of the Project's components and any visual screening intended to lessen visual prominence.

The VIA will include a shadow flicker analysis, to identify locations where proposed wind turbines may cast shadows, including areas where shadows may affect residences,

public roadways, fish hatcheries, and trout streams, and to identify the expected duration and character of the shadows at these locations. The study will also describe measures that shall be taken to eliminate or mitigate visual impacts, if any. The analysis of visual resources will be conducted in accordance with the Visual Resources Impact Assessment Methodology, attached as Exhibit D, as well as the NYSDEC policy referenced above, attached as Exhibit E.

Sound: Will evaluate Project sound levels and determine whether Project operations will meet applicable state and local noise standards. The DEIS will include a discussion of any laws, regulations, or official guidance governing the potential noise impact of the Project. A noise modeling analysis will be performed documenting the sound levels associated with the operation of the proposed turbines and comparing them with local noise ordinances. Sound from construction will also be addressed specifically. Infrasound related to operations will be assessed. The noise modeling analysis will be conducted in accordance with the Noise Assessment Methodology attached to this Scope as Exhibit F.

Climate and Air Quality: Will discuss the expected net impact of construction of the proposed Project to air quality within the Project Area. The expected impacts of increased dust and emissions during construction will be described. Mitigation measures will be identified and implemented where necessary to avoid or correct these adverse impacts quickly.

A general discussion comparing the substantial positive impacts to air resources from windparks to fossil fuel-burning electricity sources will also be provided. Emission comparison estimates will be provided for the following contaminants:

- Nitrogen oxides;
- Sulfur dioxide;
- Carbon dioxide;

- Particulate matter; and
- Mercury emissions.

Communication Signal Study: Will present a description of the existing microwave transmitters identified within the Project Area and the steps taken to avoid impacts to these transmitters from turbines. Radiowave studies will be included with evaluations demonstrating and discussing the potential for Project components to interfere with existing microwave, radio, television, personal communications systems, and other wireless communication. Also included will be a report on the search for existing microwave transmitters that was performed within the Project Area as well as figures demonstrating that turbines have been located so as to avoid interference with microwave signals. This subsection will evaluate path clearance based upon existing frequency user- or industry-defined criteria, identify nearby transmitters already licensed, and identify potential areas where turbines might cause reflective interference from a nearby system. The DEIS will list the site name, call sign, status, location, frequency band, ground elevation, path azimuths, antenna centerline, antenna manufacturer and model, and antenna gain for existing microwave transmitter identified.

Traffic and Transportation: Will provide a discussion of the current traffic and transportation conditions, potential impacts from the Project, and the ways in which impacts from traffic and transportation associated with the Project will be minimized and/or mitigated. The DEIS will contain a discussion identifying primary travel routes for the construction of the Project and Project operations, any limiting road conditions that exist, and any known traffic safety or congestion problems within the area surrounding the Project components. The gross weights and heights of loaded vehicles that will be utilized for construction and operations will be provided. A Traffic and Transportation Plan (Plan) will be appended to the DEIS. The Plan will be designed to (1) minimize traffic impacts from construction and delivery vehicles; (2) avoid Project-related traffic during times of school bus activity; and (3) avoid impacts on local business operations. The Plan will also include a section on the dissemination of traffic route information to the public.

Land Use: Will describe existing regional and local land use trends, local community facilities, and applicable comprehensive/land use plans within, and in the vicinity of the Project Area. Information for existing and proposed land use and zoning will be obtained from county and Town agencies, comprehensive/land use planning documents, and local zoning ordinances and regulations for the Project Area. Local laws and ordinances that apply to the construction and operation of the Project will be identified and summarized. The proposed Project will also be evaluated for consistency with existing or proposed land uses and state and local laws and ordinances that apply to the effects of construction and operation of wind energy development projects on local and regional land use and zoning. Any potential areas of conflict, if present, (e.g., where the proposed Project may be inconsistent with local existing, proposed or future land uses, or not in compliance with laws or zoning ordinances) will be identified and discussed. Recommended measures to avoid, reduce, or mitigate for impacts will be discussed, including the implementation of all mitigation measures (e.g., adjustments to facility locations, timing of construction, and maintenance activities) recommended by local, regional, and state review agencies, where appropriate.

Socioeconomics: Will describe the existing socioeconomic conditions in the Project Area, including available housing/lodging, demographic characteristics, economy and employment, and municipal budgets. The existing tax base and tax contributions from various sources will be identified and the current budgets for the county, Towns and local school districts will be described. This information will be obtained from the Wyoming County Treasurer's Office and the New York State Department of Education. A discussion of impacts to low-income and minority populations will be included, in accordance with NYSDEC Commissioner's Policy 29. The short-term impacts due to Project construction and long-term impacts over the life of the Project will be evaluated. The DEIS will contain a property value analysis prepared by a licensed appraiser in accordance with industry standards, regarding the potential impact of values of properties neighboring wind energy conversion facilities. The property value analysis will be included as an appendix to the DEIS.

An estimate will be made of the total annual economic effects from construction and operations of the Project. The impacts to short and long-term employment opportunities from the proposed Project will be described.

Construction: Will describe the plan for construction and installation of all Project components, including access roads, turbines, and the collection system. The location of turbine laydown and staging areas will be discussed. This section will include a construction schedule describing commencement and completion dates; a description of the routes to be used by construction and delivery vehicles; and the gross weights and heights of those loaded vehicles. Methods to minimize impacts during construction will be discussed. Preconstruction documentation, monitoring of the Project during and post-construction, post-construction monitoring and restoration, implementation of best management practices, and complaint resolution procedures will be provided.

Decommissioning Plan: Will describe the decommissioning plan developed for the proposed Project. This plan describes removal of the facilities if the Project is no longer deemed viable. A copy of this decommissioning plan will be appended to the DEIS.

Health and Safety: Will describe the existing fire protection and emergency response capabilities and will evaluate whether those capabilities are sufficient to support the Project; will also describe how the Project meets the safety measures required by the local laws of both towns regulating wind energy conversion devices/farms. A draft Health and Safety Plan will be appended to the DEIS. The potential for snow and ice shed from the turbines will be evaluated, and safety concerns from these potentialities will be discussed. The DEIS will address winter time users that could be affected (e.g., farmers and snowmobilers), and describe mitigation measures that will be taken to reduce or eliminate the risks from snow and ice fall.

Cultural Resources: Will describe culturally significant resources located in the Project Area and evaluate the potential for impacts to these resources. Specifically, this

subsection will describe existing cultural resources within the Areas of Potential Effect (APEs) for the proposed Project, consisting of a 1.0-mile radius around the Project footprint for archaeological resources, and a 5.0-mile radius around the Project footprint for architectural resources. A literature review will be conducted to determine what resources have already been documented within the Project Area. Additional archeological and architectural resource surveys of the Project Area will be prepared in consultation with the New York State Office of Parks, Recreation and Historic Preservation (OPRHP). An architectural survey identifying potentially eligible National Register Historic Properties within a 5-mile radius of the outer boundary of the turbine sites will be completed and submitted to the State Historic Preservation Office. All cultural resource investigations (archaeological and architectural) will be performed in accordance with the OPRHP's *Guidelines for Wind Farm Development Cultural Resources Survey Work (2006)*, *State Historic Preservation Office Archaeological Report Format Requirements* (2005), *The New York Archaeological Council's Standards for Cultural Resources Investigations and the Curation of Archaeological Collections in New York State* (1994), *How to Apply the National Register Criteria for Evaluation* (1995), and *Guidelines for Evaluating and Registering Archeological Properties* (2000). The results of the archaeological investigations will be reported according to the new *State Historic Preservation Office Archaeological Report Format Requirements* (2005). The guidelines for wind farm development identified above are attached to this Scope as Exhibit G. The architectural and archaeological surveys will be included as appendices to the DEIS.

Potential construction and operation impacts to cultural resources will be evaluated. Recommended measures to avoid, reduce, or mitigate for impacts will be discussed, including the implementation of all mitigation measures (e.g., adjustments to facility locations, vegetative screening, exterior design of wind turbines [material, color, and reflectivity], timing of construction and maintenance activities, the indirect mitigation for potential impacts to historic structures) as recommended by local, regional, and state review and regulatory agencies, where appropriate.

Section 3: Cumulative Impacts: Windpark and Transmission Components

The purpose of this section of the DEIS is to evaluate whether there is a potential for cumulative impacts to occur from the implementation of the proposed Project in conjunction with the construction and operation of Noble's proposed 5.6-mile transmission line and associated facilities. The cumulative impact evaluation will address all areas of environmental concern analyzed in the DEIS but will focus on potential impacts such as visual, sound, wetlands, biological resources, and risks to birds and bats. The potential cumulative impacts on noise, land use, socioeconomics, and transportation will also be evaluated, as appropriate.

Section 4: Cumulative Impacts: Windpark and Regional Development

This section of the DEIS will evaluate whether there is potential for cumulative impacts to occur from the Project, in addition to the previously approved Noble project in the town of Eagle (Noble Bliss Windpark), the proposed Dairy Hills Project, and the proposed High Sheldon Wind Farm. The cumulative impact evaluation will address all areas of environmental concern analyzed in the DEIS but will focus on potential impacts such as visual, noise, land use, socioeconomics, risks to birds and bats, electromagnetic interference, cultural resources, and air quality. The potential cumulative impacts on soils, wetlands, biological resources, and transportation will also be discussed.

Section 5: References

A list of all sources utilized in the preparation of the DEIS will be presented.

Section 6: List of Preparers

A list of all those entities involved in the preparation of the DEIS will be included.

Exhibit A: Table of Contents
Draft Environmental Impact Statement
Noble Wethersfield Windpark

Executive Summary

Sections

Exhibit B: Wetland Resources Methodology

Surveys for wetland and waterbody resources will be conducted using a delineation corridor around identified areas of potential construction including turbines, access roads and associated electric collection lines connecting the individual turbines and turbine clusters. A 90 meter (300 foot) corridor will typically be surveyed around access roads and electrical collection lines (150 feet on either sides of the proposed centerline). A 75 meter (250 foot) radius will be surveyed around the proposed turbine location. Ecological communities adjacent to the project site should be examined. Additional areas may be surveyed in the vicinity of NYSDEC-regulated wetlands to ensure that the extent of the associated buffer is determined.

Field surveys will be conducted to determine:

- The delineation of wetland boundaries and the characterization of wetland functions and values to obtain sufficient data about individual wetlands within the Project site to allow for a complete assessment of potential Project-related impacts;
- The characterization of all waterbodies and water courses that occur within the Project site; and
- The classification of the vegetation cover types into distinctive upland, wetland, and aquatic ecological communities.

The field teams will utilize established delineation procedures as outlined in the USACE *Wetland Delineation Manual* (Environmental Laboratory 1987) and the NYSDEC *Freshwater Wetlands Delineation Manual* (1995). The specific procedures for use in evaluating the soils, vegetation, and hydrology at each potential wetland location are described below.

Soils

Soils will be examined using a tile spade shovel, or "sharpshooter," to a depth of 36 centimeters (cm) (14 inches). Wherever disturbance of the soils is evident because of

past excavation or fill activity, the soil characterization will be performed in adjacent, undisturbed areas within the potential wetland. Soils will be characterized at a depth immediately below the A-horizon or at 30 cm (12 inches), whichever was shallower. Soil colors should be identified using a Munsell Soil Color Chart (Munsell 1996), and other characteristics such as the presence of mottles and soil texture. Hydric characteristics such as organic soil layers, gleying, mottling, and oxidized rhizospheres must be noted where they occur. The soils will be evaluated both within and outside the wetland boundaries.

Hydrology

The *Wetlands Delineation Manual* (Environmental Laboratory 1987) provides guidelines for determining the presence of wetland hydrology. In general, the criteria for wetland hydrology are met if the area is inundated or saturated at the soil surface during the growing season for a time sufficient to develop hydric soils and support hydrophytic vegetation. In some instances, it will be necessary to use other field characteristics to identify wetland hydrology. These characteristics may include water staining, sediment deposits, drainage patterns, or drift lines. Hydrology characteristics, as well as the depth of surface water or depth to soil saturation must be recorded for each wetland area.

Vegetation

To determine the presence of hydrophytic vegetation, the dominant species in each major vegetative stratum (i.e., tree, shrub/sapling, herbaceous, and woody vine) will be identified and recorded. Each plant will then be assigned a wetland indicator status (i.e., obligate wetland, facultative wetland, facultative, facultative upland, or upland) from USFWS's *National List of Vascular Plant Species that Occur in Wetlands: 1998 National Summary* (USFWS 1998). A prevalence of dominant species that are facultative, facultative wetland, and obligate wetland will be utilized to indicate the presence of hydrophytic vegetation.

Delineation

If the soils, hydrology, and vegetation at a survey point indicate that it was within a wetland, the boundary of the wetland will be determined and flagged with wetland delineation tape. The approximate boundary must be recorded on site maps and the flagged boundary should be surveyed using a global positioning system (GPS) unit. The electronic files generated from the GPS survey will then be downloaded and integrated into the existing alignment drawings to identify where the delineated wetlands and the proposed Project site overlapped. Photographs will be taken at select wetland areas representative of the Project area.

Exhibit C: Bird and Bat Resources Data Collection and Risk Assessment Methodology

Nocturnal Radar and Visual Study

Mobile marine radar and visual techniques will be employed to assess migratory bird and bat activity in order to obtain site-specific information on passage rates, behavior, and flight for both birds and bats. A single location will be identified and used to conduct nocturnal radar at the survey site during the spring migration and during the fall migration.

Nocturnal radar and visual studies will focus on obtaining the following data:

- Baseline information on flight altitude, passage rates, and flight direction of migratory birds and bats;
- An estimate of the relative proportions of birds vs. bats in the study area (based on visual estimates);
- An estimate of the number of birds and bats that flew at heights within the proposed turbine zone during spring 2006 and fall 2006; and
- The amount of among-night and within-night variation in passage rates and flight altitudes of nocturnal targets (bats/birds).

Nocturnal Radar Methodology

The study goal will be to conduct simultaneous radar and visual observations on 45 nights during the spring season and 60 nights during the fall season in order to overlap with the peak of passerine migration (Buffalo Ornithological Society 2002) and bat migration (Johnson 2004). During each night, radar and visual surveys will be conducted between sunset and sunrise, approximately between the hours of 2030 and 0530 (spring), and 0700 and 0630 (fall), for a total of ~8–9 h/night (spring) and ~ 9–12h/night (fall). This sampling period, as recommended by the NYSDEC, provides coverage during and beyond the peak hours of nocturnal passerine migration within a night (Lowery 1951,

Gauthreaux 1971, Alerstam 1990, Kerlinger 1995) and includes approximately 90 minutes of the crepuscular period (45 minutes after sunset and 45 minutes before sunrise). The nocturnal period data will be calculated independent of the crepuscular period sampling.

The mobile radar laboratory utilized for the survey will consist of a marine radar, mounted on the roof of a vehicle that will function as both a surveillance and vertical radar. Information on flight direction, flight behavior, passage rates, and groundspeeds of targets will be manually recorded with the antenna of the radar in the horizontal position. When the antenna of the radar is in the vertical position, the flight altitudes of targets will be manually measured with an index line on the monitor. A description of a similar acceptable radar laboratory can be found in Gauthreaux (1985a, 1985b) and Cooper et al. (1991), and a similar acceptable vertical radar configuration was described by Harmata et al. (1999). A standard marine radar will be utilized which is capable of transmitting at 9.410 GHz (i.e., X-band) through a 2-m-long slotted waveguide (antenna) with a peak power output of 12 kW. The antenna will have a beam width of 1.23° (horizontal) × 25° (vertical) and a sidelobe of ±10–20°. Range accuracy will be at least 1% of the maximal range of the scale in use or 30 m (whichever is greater) and bearing accuracy is ±1°.

Differentiating among various targets (e.g., birds, bats, insects) is central to any radar study, especially with X-band radars that can detect small flying animals. Because bat flight speeds overlap with flight speeds of passerines (i.e., are >6 m/s; Tuttle 1988, Larkin 1991, Bruderer and Boldt 2001, Kunz and Fenton 2003; Cooper and Day, ABR Inc., unpubl. data), it may not be possible to separate bird targets from bat targets based solely on flight speeds.

Insect contamination will be reduced by (1) omitting small targets (the size of gain speckles) that only appeared within ~500 m of the radar and targets with poor reflectivity (e.g., targets that plotted erratically or inconsistently in locations having good radar coverage); and (2) editing data prior to analyses by omitting surveillance and vertical radar targets with corrected airspeeds <6 m/s (following Diehl et al. 2003). The 6 m/s airspeed threshold was based on radar studies that have determined that most insects have

an airspeed of <6 m/s, whereas that of birds and bats usually is ≥6 m/s (Tuttle 1988, Larkin 1991, Bruderer and Boldt 2001, Kunz and Fenton 2003; Cooper and Day, ABR Inc., unpubl. data).

Sampling will be done during all nocturnal hours of the study to ensure that migration metrics are based on all possible hours and nocturnal conditions and are therefore representative of the nocturnal period. Each of the 8–12 one-hr crepuscular and nocturnal radar sampling sessions will consist of: (1) one 10-min session to collect weather data and adjust the radar to surveillance mode; (2) one 10-min session with the radar in surveillance mode (1.5-km range) for collection of information on migration passage rates; (3) one 15-min session with the radar in surveillance mode (1.5-km range) for collection of information on groundspeed, flight direction, tangential range (minimal perpendicular distance to the radar laboratory), transect crossed (the four cardinal directions—north, south, east, and west), species (if known), and the number of individuals (if known); (4) one 10-min session to collect weather data and adjust the radar to vertical mode; and (5) one 15-min session with the radar in vertical mode (1.5-km range) to collect information on flight altitudes, speed, and direction. For each vertical radar session, the antenna will be oriented parallel to the main axis of migration (determined by the modal flight direction seen during the previous surveillance radar session) to maximize the true flight speed of targets.

Weather data will be collected each hour and must consist of the following: wind speed (collected with a "Kestrel" anemometer in 5-mph [2.2-m/s] categories); wind direction (in ordinal categories to the nearest 45°); cloud cover (to the nearest 5%); ceiling height (in m agl; 1–50, 51–100, 100–150, 151–500, 501–1,000, 1,001–2,500, 2,501–5,000, >5,000); minimal visibility in a cardinal direction (in m; 0–50, 51–100, 101–500, 501–1,000, 1,001–2,500, 2,501–5,000, >5,000); precipitation level (no precipitation, fog, drizzle, light rain, heavy rain, snow flurries, light snowfall, heavy snowfall, sleet, hail); and air temperature (measured with a thermometer to the nearest 1°C). Where possible, weather data will be obtained any meteorological towers located near the site.

Radar data files will be checked visually for errors after each night and subsequently checked again electronically for irregularities at the end of the field season, prior to data analyses. All analyses will be conducted with SPSS statistical software (SPSS 2005), or equivalent. The resulting passage rate estimates (and other estimates derived from passage rates) will be considered an index of the actual number of birds and bats passing through the area. To describe migration passage rates within the potential turbine area, a turbine passage rate index will be calculated to identify the number of nocturnal migrants flying within the turbine area throughout the study period.

Nocturnal Visual Observations

Visual observations with Generation 3 night-vision goggles with a 1X eyepiece (Model ATN-PVS7; American Technologies Network Corporation, San Francisco, CA), or the equivalent in order to assess relative numbers and proportions of birds and bats flying at low altitudes (≤150 m agl, the approximate maximal distance that passerines and bats could be discerned) will be conducted. Spotlights with infrared lens filters will be used to illuminate targets flying overhead while eliminating the attractiveness of the light to insects, birds, and bats. Spotlights can be used in a fixed, vertical position and can also be handheld to track and identify potential targets flying through the fixed spotlight's beam. Two sampling sessions of ~20–25 min will be conducted each hour, concurrent with radar surveys, during all nightly sessions. For each bird or bat detected visually, the taxon (to species when possible), flight direction, flight altitude, and behavior (straight-line, erratic, circling, hovering) will be recorded. Whenever possible, bats will be classified as "small bats" or "large bats," in an attempt to discriminate the larger Hoary (Lasiurus cinereus), Eastern Red (Lasiurus borealis), Big Brown (Eptesicus fuscus), and Silver-haired (Lasionycteris noctivagans) bats from smaller species (e.g., Myotis spp.).

Migratory Raptor Surveys

Migratory raptor surveys will be conducted in both spring and fall at the proposed project sites. Three days of surveys will be conducted in both spring and fall. Survey locations will be selected in the field based on proximity to proposed turbines and having an

unobstructed view. Surveys will be conducted between 9 a.m. and 4 p.m. Field data on migrating raptors will then be collected for species identification, number of individuals, and flight direction. Surveys will be conducted on days of preferable raptor migration weather to the extent possible.

Spring Migratory Surveys

Baseline avian surveys will be conducted at the proposed project site during the spring (migratory) season. Spring migratory surveys will include reconnaissance surveys to document bird species and search for threatened and endangered species and appropriate habitat.

Point count style surveys are appropriate. Sampling points will be pre-selected based on the proposed locations of project components, accessibility of land, viewing distances, a variety of habitats, and areas suited for avian occurrence. Some point locations may be modified slightly in the field based on site conditions.

The observer will document all birds (except the unprotected Rock Pigeons, European Starlings, and House Sparrows) identified by sight or sound in five-minute periods at selected survey points. Because avian activity is greatest in the morning, the surveys will be conducted and concentrated in the morning hours. Data from these surveys will be used to document the occurrence and distribution of bird species, especially spring migrants, in the proposed project areas and the information will be used to identify the presence/absence of listed species and areas of higher/lesser bird activity. These surveys will be used to supplement the information collected in the spring radar surveys, especially with regard to species-related data.

Breeding Bird Surveys

Breeding bird surveys will be conducted at the proposed project site during the primary breeding season (June). A surveyor will work at the proposed project site, following USFWS Breeding Bird Survey techniques, recording all birds identified by sight or sound in three-minute periods at each survey point. Survey points will be selected based on

proposed turbine locations, accessibility, and a variety of habitats. Any breeding behavior and species in the study area observed during other site visits and surveys will also be documented.

Data from these surveys will then be used to document the occurrence and distribution of breeding bird species in the study area and will help identify the presence/absence of listed species and areas of higher/lesser bird activity.

Acoustical Monitoring for Bats

AnaBat detectors will be used to detect the echolocation calls of bats within the project site. Data from the anabat detectors will be logged onto compact flash media through Anabat ZCAIMs and downloaded to a computer for subsequent analysis.

Potential call files will be extracted from the data files using CFCread software with settings applicable for bats in the northeast. Following the initial screening, each file will be visually inspected to ensure that files created by static or some other form of interference are not included in the data set. Call sequences will be identified based on visual comparison of call sequences with reference libraries of known calls. Call sequences will be identified to species whenever possible; however, due to similarities of call signatures, all classified calls will be grouped into four guilds including: big brown/silver-haired/hoary; red bat / eastern pipistrelle; Myotid species; and unidentified. Total number of call sequences recorded at each detector will be noted for each night.

The Anabat detectors will be operated for a period of six weeks in the spring and eight weeks in the late summer / fall at the project site. Two Anabat detectors, or the equivalent, will be mounted on a meteorological tower (met tower) in or near the project site. One Anabat detector will be placed as high as possible on the met tower as possible, while the second detector will be placed approximately half the distance of the first detector to the ground.

Bat Habitat Level Surveys

An initial habitat-level survey at the proposed project site will be conducted to determine if the habitat within that location is suitable for bat species of concern. Habitats within the proposed project area will be documented based on species composition and general landscape position. Particular emphasis will be placed on forested riparian, floodplain, and wetland areas, which tend to be preferable roost and foraging locations for the Indiana bat.

Cumulative Impacts

The potential cumulative impacts to bird and bat mortality rates from nearby projects being proposed will also be evaluated in the final Bird and Bat Risk Assessment. The approximate number of bird and bat fatalities for all proposed projects will be calculated by multiplying the average national and eastern fatality rates with the proposed number of turbines for all projects and then compared to mortality rates from other sources.

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Exhibit D: Visual Resources Assessment Methodology

A Visual Resource Assessment (VRA) to evaluate the potential visibility of the proposed windpark will be completed to objectively determine the difference in the visual character of the landscape with and without the project in place (visual impact). The assessment will be completed to be consistent with the New York State Department of Environmental Conservation Program Policy "Assessing and Mitigating Visual Impacts" (DEP-00-2).

The proposed process, in completing the VRA, includes both quantitative (how much is seen) and qualitative (what it will look like) aspects of potential visual impact. The process to be used includes the following procedural steps:

- Identify a 5-mile study area around the outermost turbines;
- Conduct a visibility analysis (viewshed mapping) to define the geographic area within the radius of impact from which portions of the project might be seen – this will be prepared for topography only and topography with vegetation;
- Inventory sensitive aesthetic resources to establish priority places from which further analysis of potential visual impact is conducted;
- Define the existing landscape character/visual setting to establish the baseline visual condition from which visual change is evaluated;
- Select key/representative viewpoints where a detailed impact analysis is to be conducted;
- Prepare photo simulations, using industry standard software, to illustrate the visual character of the proposed facility as it would appear from key/representative viewpoints;
- Evaluate the nature of visual change (qualitative analysis) resulting from project construction and completion and the public's probable reaction to the visual change (assessment of visual significance); and
- Identify opportunities for effective avoidance, mitigation (e.g. color treatment and screening), or offsets of potential adverse visual impacts

The impacts due to lighting requirements imposed by the Federal Aviation Administration (FAA) will generally be evaluated using a viewshed map to identify where potential light sources (on top of selected turbines) may be visible. The FAA will determine final lighting plan at a later date.

Cumulative Impacts.

Cumulative visual impacts of select proposed windparks will be evaluated. Proposed projects include Noble's Bliss Windpark in the town of Eagle, the High Sheldon Wind Farm in the town of Sheldon, and the Dairy Hills Wind Farm in the towns of Covington, Perry and Warsaw. A viewshed map will be completed that will incorporate these projects. In addition, select locations will be identified where simulations may be completed to show the Wethersfield and portions of other projects.

Shadow – Flicker Analysis

Using industry standard software the geographic area falling within the shadow zone of one or more wind turbine rotors will be mapped. The maximum hours of potential flicker for affected receptors (residences, public roadways, fish hatcheries and trout streams) based on the closest turbine, existing topography and the precise solar conditions of the project area will be calculated. Solar conditions will be based on publicly available data. The work product will include:

- An isoline map will be prepared illustrating the maximum cumulative shadow area for all proposed wind turbines. This map will be used to identify the geographic area where additional investigation (e.g., the presence of existing residences or other sensitive receptors) may be required.
- The potential duration of shadow impact (annual hours) for each identified receptor will be noted.
- This analysis will be conducted using sunshine "probabilities" from meteorological data compiled at the nearest airport, and operational time/rotor orientation from data supplied by Noble.

Exhibit E: NYSDEC Visual Impacts Policy

THE DEC POLICY SYSTEM

New York State
Department of Environmental Conservation

PROGRAM POLICY	Department ID: DEP-00-2	Program ID: n/a
Title: Assessing and Mitigating Visual Impacts		
Issuing Authority: Article 8, 49 Name: Jeffrey Sama Title: Director Signature: /s/ Date: 7/31/00 Issuance Date: 7/31/00	**Originating Unit: Division of Environmental Permits** Office/Division: Environmental Permits Unit: Phone: (518) 402-9167 Latest Review Date (Office Use):	

Abstract: Facilities regulated by the Department of Environmental Conservation located in visual proximity to sensitive land uses can produce significant visual impacts. This policy and guidance defines what visual and aesthetic impacts are, describes when a visual assessment is necessary and how to review a visual impact assessment, differentiates State and local concerns, and defines avoidance, mitigation and offset measures that eliminate, reduce, or compensate for negative visual effects. A glossary of terms is provided for reference.

I. Purpose

This memorandum provides direction to Department staff for evaluating visual and aesthetic impacts generated from proposed facilities. This guidance defines State regulatory concerns and separates them from local concerns. There is nothing in this program policy that eliminates or reduces the responsibility of an applicant to local agencies to address local visual or aesthetic concerns. In addition, this program policy does not relieve applicants from requirements of other State agencies, such as Department of State Coastal Zone Program or Department of Public Service. This guidance will also define important technical concepts and provide a mechanism for complying with the balancing provisions of the State Environmental Quality Review Act (SEQR) with respect to environmental aesthetics.

II. Background

An ever expanding body of research has demonstrated that environmental aesthetic values are shared among the general population. This research finds that such values are not idiosyncratic, random, or arbitrary. For example, millions of people visit Niagara Falls for our shared appreciation of its beauty.

Many places have been recognized for their beauty and designated through Federal or State democratic political processes, reinforcing the notion that environmental aesthetic values are shared. Recognition of aesthetic resources also occurs at local levels through zoning, planning or other public means. That these special places are formally recognized is a matter of public record. This guidance contains a

generic listing of all aesthetic resources of statewide significance and serves as the template from which aesthetic issues of State concern can be distinguished from local issues. Generally, it is staff's responsibility to identify and mitigate impacts to Federal and State designated aesthetic resources. With respect to local resources, Department staff should defer to local decision makers, who are likely to be more familiar with and best suited to address them.

III. Policy

In the review of an application for a permit, Department staff must evaluate the potential for adverse visual and aesthetic impacts on receptors outside of the facility or property. When a facility is potentially within the viewshed of a designated aesthetic resource, the Department will require a visual assessment, and in the case where significant impacts are identified, require the applicant to employ reasonable and necessary measures to either eliminate, mitigate or compensate for adverse aesthetic effects.

IV. Responsibility

The environmental analyst, acting as project manager, for review of a new application must assure that visual and aesthetic impacts are properly evaluated by the applicant. For new permits or significantly modified permits, staff must determine the potential significance of the action pursuant to SEQR.

In the review of an application for a permit, staff must evaluate the potential for adverse aesthetic impacts to sensitive places. Sensitive places of statewide concern are listed in this guidance (see V. Procedure). From the State's perspective there may be a significant impact if one or more of the listed places lies within the viewshed of a proposed project. From a local perspective there may be a significant impact if a local resource lies within the project's viewshed. This simple concept may help staff and decision makers distinguish local concerns from State concerns, and public concerns from individual expressions of concern.

With respect to aesthetics, an individual citizen's expression of concern is usually based on the belief that a property or particular "neighborhood" lies within the viewshed of a proposed project. This is different from the concerns of the public at large which has a stake in aesthetic resources recognized as having designated value under the public domain.

Significant impacts are identified and confirmed by staff during the review of an application. SEQR obligates the Department to mitigate such impacts to the maximum extent practicable [6NYCRR Part 617.11(d)(5)]. Local involved agencies must do the same with respect to local resources and likewise comply with Article 8 of the ECL and 6NYCCR Part 617. Impacts to aesthetic resources of statewide concern may require more substantial mitigation strategies to achieve project approval. Mitigation costs and practicality of the mitigative measures must be weighed in the balancing required by the State Environmental Quality Review Act.

Local resources are frequently designated through local zoning and planning processes. Accordingly, local jurisdictions may require additional and somewhat different information than the Department. The legislature has recently recognized and addressed this jurisdictional difference. In 1999, the Legislature, revised Article X of the Public Service Law to eliminate a DEC requirement to testify on behalf of local

jurisdictions concerning the impacts of power plant siting. In doing so, they explicitly eliminated the requirement that DEC staff testify with regard to local jurisdictional needs.

V. Procedure

Staff must assure that the full scope of visual and aesthetic concerns are addressed. This includes impacts from all project components and their operation on all inventoried resources. In addition, an equitable level of expectations between the potential significance of the impact, the degree of sophistication of the analysis required of applicant and appropriate level of mitigation strategies must be established. The goal of visual assessment is to reveal impacts and effective mitigation strategies. Small scale, low budget projects should not be burdened with the costs of sophisticated visual analyses. In these instances, it is generally more effective to reserve applicant investments for mitigation rather than complex visual assessments. Simple line-of-sight profiles may suffice for revealing impacts and potential mitigation strategies (see appendix A for an illustration of their use).

Staff must take certain basic steps to assure that visual concerns have been fully addressed in each application. Those steps are:

A. Verify the applicant's inventory of aesthetic resources.

B. Verify the applicant's visual assessment, using either graphic viewshed and line-of-sight profile analysis as illustrated in Appendix A, or more sophisticated visual simulations and digital viewshed analysis, as needed.

C. Determine or verify the applicant's assessment of the potential significance of the impact.

D. Confirm that applicant's mitigation strategies are reasonable and are likely to be effective, or assure mitigation by requiring the applicant to submit a design that includes the required mitigation, or, impose permit conditions consistent with those mitigation requirements.

A discussion of each follows:

A. Inventory of Aesthetic Resources.

It is important to note that all significant scenic and aesthetic resources may not have yet been designated in New York State. However, for the purposes of this policy all aesthetic resources of statewide significance may be derived from one or more of the following categories:

1) A property on or eligible for inclusion in the National or State Register of Historic Places [16 U.S.C. § 470a et seq., Parks, Recreation and Historic Preservation Law Section 14.07]; e.g. Trinity Church in Manhattan, Schuyler Mansion in Albany;

2) State Parks [Parks, Recreation and Historic Preservation Law Section 3.09]; e.g. Grafton Lakes State Park, Rensselaer County;

3) Urban Cultural Parks [Parks, Recreation and Historic Preservation Law Section 35.15];

4) The State Forest Preserve [NYS Constitution Article XIV]; Adirondack and Catskill Parks;

5) National Wildlife Refuges [16 U.S.C. 668dd], State Game Refuges and State Wildlife Management Areas [ECL 11-2105]; e.g. Montezuma National Wildlife refuge; Perch River Wildlife Management Area, Jefferson County;

6) National Natural Landmarks [36 CFR Part 62]; e.g. Iona Island Marsh, Hudson River, Rockland County;

7) The National Park System, Recreation Areas, Seashores, Forests [16 U.S.C. 1c]; e.g. Gateway National Recreation Area, Staten Island; Finger Lakes National Forest, Schuyler County;

8) Rivers designated as National or State Wild, Scenic or Recreational [16 U.S.C. Chapter 28, ECL 15-2701 et seq.]; e.g.Cedar River (Wild), Ampersand Brook (Scenic); West Branch of the Ausable River (Recreational);

9) A site, area, lake, reservoir or highway designated or eligible for designation as scenic [ECL Article 49 or DOT equivalent and APA.Designated State Highway Roadside; e.g. Storm King Highway (Article 49 Scenic Road), Rockland county;

10) Scenic Areas of Statewide Significance [of Article 42 of Executive Law][1]; e.g. Catskill-Olana SASS;

11) A State or federally designated trail, or one proposed for designation [16 U.S.C. Chapter 27 or equivalent]; e.g. Appalachian Trail;

12) Adirondack Park Scenic Vistas; [Adirondack Park Land Use and Development Map]

13) State Nature and Historic Preserve Areas; [Section 4 of Article XIV of the State Constitution];

14) Palisades Park; [Palisades Interstate Park Commission]; e.g. Harriman State Park;

15) Bond Act Properties purchased under Exceptional Scenic Beauty or Open Space category; e.g. Star Hill, Oneida County.

Note: The Hudson River has recently been designated an "American Heritage River" by a Presidential Order under [PL 91-190]. The details and criteria of the program as they may relate to this policy are currently under review.

B. Visual Assessments.

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[1] State Coastal Policies number 24 and 25 derived in part from Section 912 of Article 42 of the Executive Law define the criteria that, when properly employed, assure project consistency with coastal zone management objectives. Such policies are consistent with the review mechanisms contained in this DEC policy. Also for reference is the July 1993 DOS SASS publication for Columbia-Greene, Catskill-Olana, Estates District, Ulster North, Esopus-Lloyd, and the Hudson Highlands.

In all visual assessments, significant resources must be identified along with any potential adverse effects on those resources from the proposed project. If, in staff's judgement, a place designated in any of the above categories may lie in the viewshed of the proposed project then a visual assessment should be required to confirm or refute this potential. At a minimum a line-of-sight-profile, or, depending upon the scope and potential significance of the activity, a digital viewshed may be used to determine if a significant property is within the potential viewshed of the proposed project (see the Appendix A attached for guidance on how to construct and use a line-of-sight profile). Staff must then review the applicant's visual assessment for adequacy, accuracy and thoroughness. The control points (see glossary for definition) must be established by staff and should include a worst case scenario. Worst case here means establishing the control points that reveal any project visibility at an aesthetically significant place. Most of the time, though not always, high points reveal worst case. For example, the tallest facility component (e.g. combustion exhaust stack), may be the control point at the project end of the profile, while a high point of ground upon which the observer stands within a State Park may be the control point at the resource end of the profile.

With respect to determining the radius of the impact area to be analyzed, there has been a general guideline for large actions that it is usually "safe" to use 5 miles. The 5 mile distance probably owes its origins to the U.S. Forest Service "distance zones" set forth in their landscape management journal written in 1973[2] (5 miles is still largely considered "background," i.e. distances at which most activities are not a point of interest to the casual observer). However, for very large activities, such as power plants (particularly those that generate wet cooling tower plumes), and large landscape alterations, greater distances have been shown to be important in some landscape settings, and must be considered. In those instances, applicants must document to the satisfaction of staff that impacts beyond five miles to listed resources have been considered. They must also provide a clear demonstration that impact to any resource of statewide concern is insignificant. Such demonstrations may be convincing if resource inventories beyond 5 miles are coupled with line-of-sight profiles (see Appendix A for a complete discussion of these graphic tools) or other accepted visual criteria, such as computer simulations, analogous comparative studies or worst case presentations.

C. Significance.

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. For example, a cooling tower plume may drift between viewers standing on an overlook at a State Park thereby blocking the view of the panorama. Staff must verify the potential significance of the impact using the qualities of the resource and the juxtaposition (using viewshed and or line-of-sight profiles) of the proposal as the guide for the determination.

D. Mitigation.

[2] U.S. Forest Service, Agricultural Handbook Number 434, Feb. 1973

Mitigation may reduce or eliminate the visibility of the project or alter the project's effect on the scenic or aesthetic resource in some way. It is usually easier to deal with the visibility of the project than its composition to achieve mitigation. Altering the composition of a project lies within the realm of professional designers. When given the opportunity, however, staff should encourage applicants to design aesthetically compatible projects that incorporate environmentally friendly design principles and components, as may be employed from the mitigation menu below.

Mitigation strategies can be categorized into three general groups as outlined below.

1) Professional Design and Siting.
    a) Screening
    b) Relocation
    c) Camouflage/Disguise
    d) Low Profile
    e) Downsizing
    f) Alternate Technologies
    g) Non-specular materials
    f) Lighting

2) Maintenance
    a) Decommissioning

3) Offsets

A discussion of each follows:

1. Professional Design and Siting. A properly sited and designed project is the best way to mitigate potential impacts. Under optimum circumstances a project can be sited in a location which precludes the possibility of having an aesthetic resource within its viewshed. Also, through sensitive design treatment, elements of particular concern may be sited or dimensioned in a way that reduces or eliminates impacts on significant resources. Sometimes circumstances prevent the realization of optimal siting and sometimes engineering, economic or other constraints preclude optimum dimensioning or other appropriate design treatments. Under those circumstances, other mitigation strategies should be considered.

Staff should assure effective mitigation is thoroughly explored by requiring project sponsors to consider the following tools to mitigate impacts:

a. Screening. Screens are objects that conceal other objects from view. They may be constructed of soil, rocks, bricks, or almost anything opaque. Vegetation can, despite its visual porosity, function as a screen when a sufficient mass is employed. Screens may be natural, e.g. vegetation, or artificial, e.g. fences and walls. Screens may appear natural e.g. wood, stone, or may appear artificial, e.g. plastic, metal. In natural settings it is generally better to employ natural materials, while in urban places designers may employ a broader range of materials.

Screens constructed from soil are called berms. Berms may appear natural e.g. blend with nearby topography, or appear artificial e.g. geometrical or symmetrical shape. Each

may be employed depending upon the overall design intent. Berms may be vegetated or not vegetated depending upon their particular function, e.g. spill containment and/or screening.

Properly sized and placed screens may completely conceal an object, while improperly sized and placed screens may fail to conceal. Screens may block desirable views when improperly placed (see Appendix A to see how screen placement is important).

Screens are not necessarily buffers and buffers are not necessarily screens. A buffer may attenuate noise, soften a landscape or provide other functions that may or may not include screening.

Screens possess line, form, texture, planes and color, and therefore, have their own aesthetic qualities. At times, they may be more impacting than the object to be concealed. Screens may draw attention to the object to be concealed. Screens may physically connect two similar or dissimilar areas.

b. Relocation. A facility component may be relocated to another place within the site to take advantage of the mitigating effects of topography and vegetation.

c. Camouflage/Disguise. Colors and patterns of color may conceal an object or its identity. Disguise may take many forms, and is limited only by the imagination of the project designers. As an example, communication towers can be disguised as trees, flagploles, barn silos, church steeples, or any other "in-character" structure depending upon circumstances.

d. Low Profile. Reducing the height of an object reduces its viewshed area.

e. Downsizing. Reducing the number, area or density of objects may reduce impacts.

f. Alternate Technologies. Substituting one technology for another may reduce impacts (e.g. dry cooling tower technology versus wet cooling tower technology).

g. Non-Specular Materials. Using building materials that do not shine may reduce visual impacts.

h. Lighting. With respect to regional issues, such as a tall combustion exhaust stack or radio tower, the Federal Aviation Administration (FAA) requires certain lighting for public transportation safety. These impacts may be considered unavoidable unless lower profiles can be achieved. Applicants should also document that they have consulted with and met all applicable lighting standards under local jurisdiction. Consideration should be given to off-site light migration, glare and "sky glow" light pollution. Lighting requirements, through best engineering practices, should not exceed the functional requirements of the project.

2. Maintenance. How a landscape and structures in the landscape are maintained has aesthetic implications. "Eyesores" result from neglect. This should be part of any mitigation strategy.

a. Decommissioning. Removing an object from the landscape after its useful life is over, reduces the duration of a visual impact (see page 9 for further discussion).

3. Offsets. Correction of an existing aesthetic problem identified within the viewshed of a proposed project may qualify as an offset or compensation for project impacts. A decline in the landscape quality associated with a proposed project can, at least partially, be "offset" by the correction. In some circumstances a net improvement may be realized (see page 9 for further discussion).

An applicant may assert that all economic and effective mitigation strategies have been incorporated into the proposed design and, when properly designed, such self-imposed mitigation should effectively mitigate any negative effects on a listed resource. However, if staff concludes that significant impacts remain then staff must still ensure that impacts are minimized. In this regard, staff should first investigate visibility mitigation strategies. Manipulating design elements to achieve adequate mitigation usually lies within the purview of professional designers.

Staff should not try to judge the quality of a design nor its effect on the aesthetics of the listed resource unless they are qualified to do so. Such qualifications normally include academic or other accepted credentials in architecture or landscape architecture. Nevertheless, it is the burden of the applicant to provide clear and convincing evidence that the proposed design does not diminish the public enjoyment and appreciation of the qualities of the listed aesthetic resource. Staff can and should review the strength or merit of such proof. An applicant's mere assertion that the design is in harmony with or does not diminish the values of the listed resource is insufficient for the purposes of reaching findings. Instead, an applicant must demonstrate through evidence provided by others e.g. recognized architectural review boards, comparative studies that are clearly analogous, or other similar techniques, that the public's enjoyment and appreciation of the qualities of the aesthetic resource are not compromised.

Staff must be assured that consistent with social, economic and other essential considerations, the action is one that avoids or minimizes adverse impacts to the maximum extent practicable. This can be accomplished by asking and responding affirmatively to the following questions.

1) Was the full mitigation menu considered?

2) Will those mitigation strategies selected be effective?

3) Were the costs of mitigation for impacts to other media considered and were those mitigation investments prioritized accordingly?

4) Are the estimated costs of all mitigation insignificant (for example, are the costs of visual mitigation taken together with all other mitigation less than10% of the total project cost?)

5) Were the mitigation strategies employed consistent with previous similar applications? If not, was the reasoning for any changes reasonable and justified?

6) Was the mitigation cost effective? For example, if fully mature vegetation with an immediate screening effect costs 10 times the amount that less mature vegetation would cost, is it appropriate to require the less costly option if its full screening effect can be realized in just, say, 3 years? (See Appendix A for details concerning this subject).

7) Were offsets and decommissioning considered?

It is important to bring the project sponsor into the discussion of mitigation strategies. If more than one mitigation strategy meets all environmental protection needs, the applicant's needs and preferences should be considered.

It is preferred that all mitigation options selected be specified in the applicant's plans for Department review. The plans should sufficiently depict readily understandable and enforceable details. Adherence to such plans should then become a permit condition. During and after facility construction, staff should visit the site and ensure that all mitigation strategies detailed in the plans and specifications have been adequately incorporated into the facility design.

If all mitigation options available from the menu are considered, applied where appropriate, and those applied are cost effective, then one can assert that impacts have been minimized to the maximum extent practicable. However, the residual impact after all such strategies have been employed may still be significant. Offsets should then be considered to help achieve the balancing required of SEQR. Finally, decommissioning options may be considered that reduce the duration of impacts for projects with severe residual impacts. A discussion of each follows:

1. Offsets.

Offsets should be employed in sensitive locations where significant impacts from the proposal are unavoidable, or mitigation of other types would be uneconomic and mitigation to be used is only partially effective. Offsets should be employed when significant improvement can be expected at reasonable cost. An example of an offset might be the removal of an existing abandoned structure that is in disrepair (i.e. an "eyesore") to offset impacts from a proposal within visual proximity to the same sensitive resource.

2. Decommissioning.

Decommissioning may take many forms, and other disciplines in Department program areas may have an interest in decommissioning. However, from the perspective of aesthetics, three are of most significance: 1) the total removal from the site of all facility components and restoration to an acceptable condition, usually with attendant revegetation; 2) partial removal of facility components, such as elimination of visually impacting structures; and 3) conditions designed to maintain an abandoned facility and site in an acceptable condition that precludes "eyesores"or site and structural deterioration. Applicants should provide such plans when deemed necessary.

Glossary

Aesthetic impact: Aesthetic impact occurs when there is a detrimental effect on the perceived beauty of a place or structure. Mere visibility, even startling visibility of a project proposal, should not be a threshold for decision making. Instead a project, by virtue of its visibility, must clearly interfere with or reduce the public's enjoyment and/or appreciation of the appearance of an inventoried resource (e.g. cooling tower plume blocks a view from a State Park overlook).

Aesthetically significant place: A formally designated place visited by recreationists and others for the express purpose of enjoying its beauty. For example, millions of people visit Niagara Falls on an annual basis. They come from around the country and even from around the world. By these measurements,

one can make the case that Niagara Falls (a designated State Park) is an aesthetic resource of national significance. Similarly, a resource that is visited by large numbers who come from across the state probably has statewide significance. A place visited primarily by people whose place of origin is local generally is generally of local significance. Unvisited places either have no significance or are "no trespass" places.

Aesthetic Quality: There is a difference between the quality of a resource and its significance level. The quality of the resource has to do with its component parts and their arrangement. The arrangement of the component parts is referred to as composition. The quality of the resource and the significance level are generally, though not always, correlated.

Atmospheric perspective: Even on the clearest of days, the sky is not entirely transparent because of the presence of atmospheric particulate matter. The light scattering effect of these particles causes atmospheric or aerial perspective, the second important form of perspective. In this form of perspective there is a reduction in the intensity of colors and the contrast between light and dark as the distance of objects from the observer increases. Contrast depends upon the position of the sun and the reflectance of the object, among other items. The net effect is that objects appear "washed out" over great distances.

Control Points: The two end points of a line-of-sight. One end is always the elevation of an observer's eyes at a place of interest (e.g. a high point in a State Park) and the other end is always an elevation of a project component of interest (e.g. top of a stack of a combustion facility or the finished grade of a landfill).

Line-of-sight profile: A profile is a graphic depiction of the depressions and elevations one would encounter walking along a straight path between two selected locations. A straight line depicting the path of light received by the eye of an imaginary viewer standing on the path and looking towards a predetermined spot along that path constitutes a line-of-sight. The locations along the path where the viewer stands and looks are the control points of the line-of- sight profile.

Scientific Perspective: Scientific, linear, 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.

Viewshed: A map that shows the geographic area from which a proposed action may be seen is a viewshed.

Visual Assessments: Analytical techniques that employ viewsheds, and/or line-of-sight profiles, and descriptions of aesthetic resources, to determine the impact of development upon aesthetic resources; and potential mitigation strategies to avoid, eliminate or reduce impacts on those resources.

Visual impact: Visual impact occurs when the mitigating effects of perspective do not reduce the visibility of an object to insignificant levels. Beauty plays no role in this concept. A visual impact may also be considered in the context of contrast. For instance, all other things being equal, a blue object

seen against an orange background has greater visual impact than a blue object seen against the same colored blue background. Again, beauty plays no role in this concept.

APPENDIX A

SCREENS

THE RELATIONSHIP BETWEEN SCIENTIFIC PERSPECTIVE AND A LINE OF SIGHT PROFILE.

Scientific or linear perspective is a geometric procedure that projects space onto a plane. This technique provides the analyst with a simplified way to verify the effectiveness of applicants mitigation proposal.

USE THE DIAGRAM BELOW TO ANSWER THESE SAMPLE QUESTIONS

Q: At what height should a screen be constructed to completely conceal a 23 foot object from an observer standing 80 feet from the object?
Constraint: Screen must be located 10 feet inside property line.

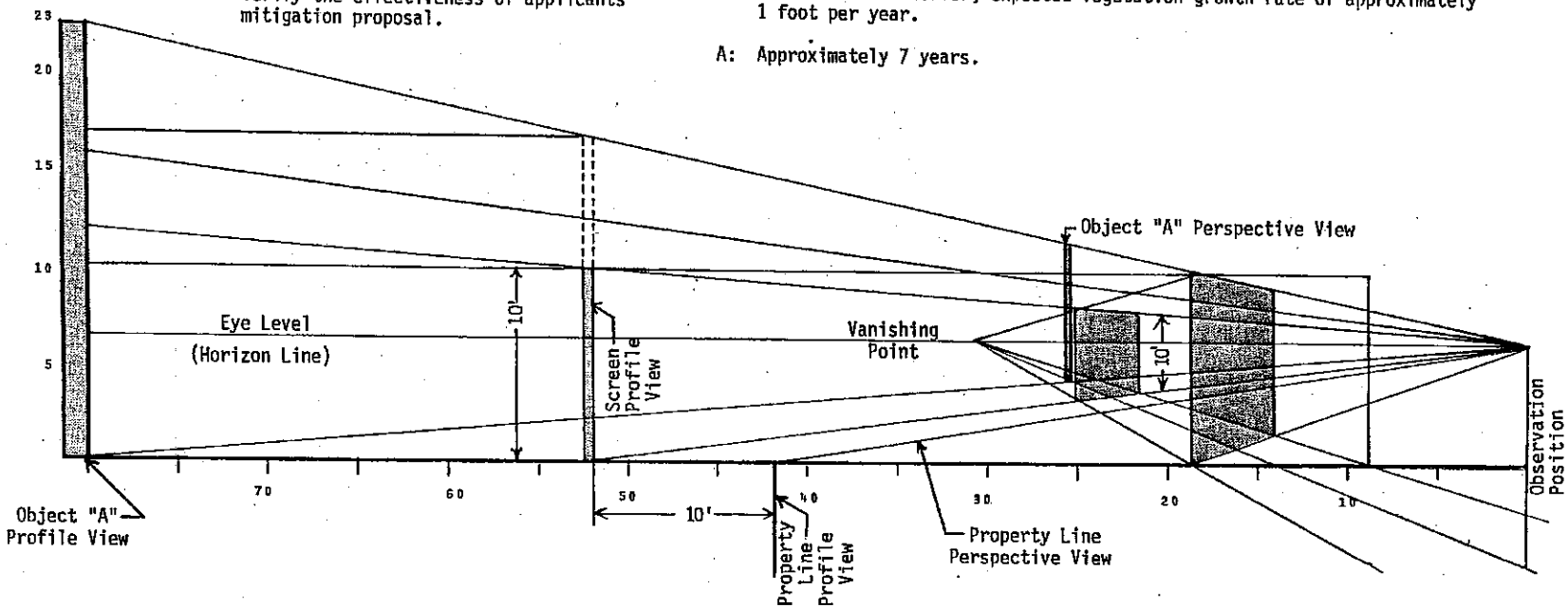
A: About 17 feet.

Q: What is the maximum height of an object to be concealed behind a 10 foot screen that is located 80 feet from an observer?
Constraint: The observer is standing about 18¼ feet behind the screen.

A: About 23 feet.

Q: In approximately how many years would a vegetative screen 6 feet in height planted on a berm 4 feet in height completely conceal a 23 foot object?
Constraints: Berm must be located 10 feet inside property line; object is 80 feet from observer; expected vegetation growth rate of approximately 1 foot per year.

A: Approximately 7 years.



VIEWSHEDS

For illustrative purposes only, a "partial" viewshed has been constructed below. A partial viewshed is distinguished from a full viewshed in that it only shows a selected area from which an object may be seen. A full viewshed shows all such areas.

The shaded area in the northwest corner of the lake is the only area within the lake that a hypothetical object 100 feet in height and situated at A (where the profile radii converge) may be seen.

The defined viewing area has been constructed by connecting each point along each profile where a viewer just begins to see the hypothetical object. To add realism to the viewshed, 40' vegetation has been factored into the lines of sight. The vegetation alters the viewing angle and hence the initial viewpoint indicated by the large black dots at the intersection of the shaded area with each profile radii.

LEGEND

VIEWSHED
(Area within lake from which a hypothetical 100 foot object located at "A" may be seen)

N

SCALE 1" = 2,000'

PROFILES

To construct a profile, first position the graph paper parallel and contiguous to the horizontal alignment of the desired profile (indicated by line A-B). Proceed by extending vertical lines (indicated by dashed lines) to the correct height according to any selected convenient vertical scale (in this case 1" = 100'). This must be done from each spot where the horizontal alignment crosses a contour line. It is the elevation of the intersected contour that determines the height of each vertical line. Then, simply connect the top of each vertical line to form the profile (indicated by line C-D). The profile C-D depicts the depressions and elevations one would encounter walking a straight path from Point A to B on the plan map. To add realism add vegetation at the proper locations at the proper height (in this case 40').

Sample Questions and Answers

According to the profile:

Q. Can an observer at location "Z" see the east shore of the lake?

A. No

Q. At what point will the observer no longer be able to see object "X"?

A. At point "Y".

Q. What is the visible portion of object "X" to an observer at location "Z"?

A. About 20 feet.

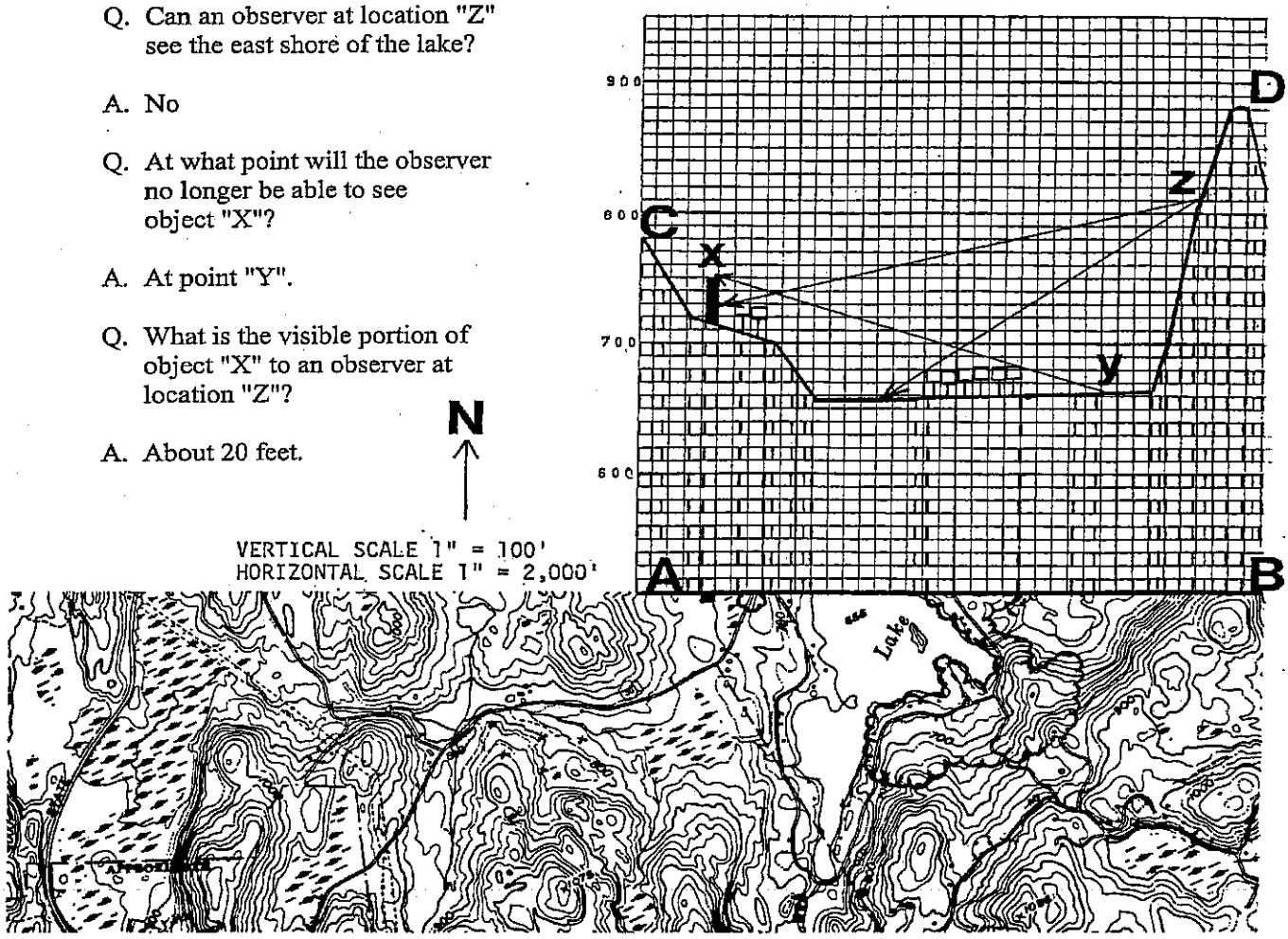


Exhibit F: Noise Assessment Methodology

To identify any potential noise impacts, the wind farm operational noise levels will be predicted for the nearest noise sensitive receptors by computer modeling and then compared to the wind energy facility laws adopted by the towns of Wethersfield and Eagle. These laws limit Project noise to 50 dBA (measured in terms of the L10 statistical sound level_ at all non-participating residences, as well as schools, hospitals, churches, public parks, or public libraries, except where Noble has obtained a noise easement, as recorded in the Wyoming County Clerk's Office.

A further analysis of possible noise impacts from the Project will be conducted in accordance with New York State Department of Environmental Conservation's Program Policy *Assessing and Mitigating Noise Impacts* (2001). This procedure effectively requires a fairly extensive field survey of existing background levels in the site area and evaluates potential impacts in terms of project audibility relative to the pre-existing ambient sound level. In general, a 6 dBA cumulative increase in the total sound level at potentially sensitive receptors is considered acceptable by the guidance.

Noise Receptor Locations

Potentially sensitive noise receptors will be determined and mapped by Noble and identified on all sound contour plots.

Noise Modeling

The collected baseline ambient sound level data will be used to determine if an adverse impact can be expected at any of the receptors from the nearest wind turbines. Impacts will be assessed by applying the incremental A-weighted sound level criteria described in the NYSDEC Program Policy *Assessing and Mitigating Noise Impacts* .

Sound levels from the future turbines will be modeled using the "Cadna/A" software program that was developed by DataKustik, GmbH (Munich) specifically for power generation applications. This modeling tool allows, among other things, the site terrain to

be accurately recreated in three-dimensions and wind/atmospheric effect on sound propagation to be evaluated as needed. The program output is in the form of detailed sound level contour maps that can be overlaid on aerial photographs of the project site.

Noise Impact Assessment

Potential noise impacts will be evaluated from the predicted sound contours based on the absolute limit of 50 dBA imposed by local law and in terms of a relative increase in

Construction Noise

During the construction period, a variety of heavy equipment would be temporarily utilized at various locations within the site area. Noise levels produced by the construction equipment that will be used on the project will be identified by activity and predicted at the various relevant distances, such as the minimum setback distance of 1320 ft., based on measurements of similar equipment at 50 ft. This information will be obtained from the ”Power Plant Construction Noise Guide” prepared for the Empire State Electric Energy Research Corporation (1977). An assessment will be made as to the audibility of such activities at potentially sensitive receptors and the likelihood of any adverse impact.

Low Frequency Noise

Potential impacts from low frequency and infrasonic noise will be evaluated through field measurements of the extreme low end of the frequency spectrum at operational wind turbine sites, most notably the Fenner Windpower Project in Madison County, NY. A separate report specifically on low frequency noise prepared by an independent expert in the field of low frequency noise, will be submitted as an appendix to the DEIS noise study.

Potential impacts from low frequency noise will also be considered in the noise modeling analysis by predicting C-weighted Project sound levels at the nearest potentially sensitive receptors and comparing these levels to known perception thresholds.

Tonal Noise

Tonal noise emissions from the Project are restricted by local law to certain 1/3 octave band prominence limits. The 1/3 octave band sound spectrum of the turbine model proposed for the project will be evaluated for tonal content and compared to allowable limits.

Cumulative Noise

There is a possibility that residents within the Wethersfield Project area may experience a cumulative increase in noise from another planned, but not yet constructed, wind energy project to the south of the site (Noble's Bliss Windpark). A special cumulative modeling study will be carried out to quantify the net potential increase in sound level at sensitive receptors due to this other project; i.e. an assessment will be made of the total potential impact from not only the Project but also from the neighboring project should it be constructed.

Appendix G

New York State Historic Preservation Office
Guidelines for Wind Farm Development Cultural Resources Survey Work

The New York State Historic Preservation Office has established the following guidelines for the assessment of historic and cultural resources associated with the development of wind farm projects in New York State.

Survey for Historic Buildings

1. Establish a five-mile Area of Potential Effect (APE) around the project site.
    i. Establish boundary of APE using topographic survey to determine where project may be visible from.

2. Conduct field survey within the positive visual APE as defined by topographic study.

3. Using NYSHPO data, the survey will initially identify all buildings/sites within the study area that were previously determined eligible for inclusion in or are already listed in the New York State and National Registers of Historic Places.

4. The survey will assess all buildings 50 years old or older within the study area. Surveyors will determine potential State and National Register eligibility of each resource using the National Register Criteria for Evaluation.
    i. Surveyor will schedule a meeting with NYSHPO staff prior to undertaking survey work to verify the APE.
    ii. Surveyor will schedule a meeting with NYSHPO staff after completion of survey of mile-1 "ring" of study area to verify eligibility determination methodology. Meeting will review properties determined eligible and will provide a sampling of resources determined not-eligible.
    iii. After evaluation methodology is verified by the NYSHPO, survey of remaining APE area will be completed.
    iv. All properties previously listed in the State and/or National Registers in addition to all properties determined eligible prior to the survey and as part of the project survey are to be marked using a single GPS point. The single point should be taken at the edge of the property generally at the mid-point of the property's street frontage.
    v. The GPS data will be linked to the street address and/or SHPO Unique Site Number (if one already exists).
    vi. All survey data will be provided to the NYSHPO in a standardized format that will be discussed at the initial pre-survey meeting.

Archaeological Survey

1. Phase I Archaeological Survey is recommended for all wind farm project areas. The goal of this work is to augment the state's understanding of upland locations and small site types.

2. Archaeological Survey will be limited to the *Archaeological* Area of Potential Effect (APE) associated with the construction of the project. This smaller core of the project APE is composed of areas that will experience ground disturbing activity during the construction phase of the project. These areas include but are not limited to:
    i. Turbine sites
    ii. Construction staging areas
    iii. Borrow pits
    iv. New/Access Roads
    v. Utility corridors
    vi. New building locations
    vii. Other areas where the current ground surface may be modified as a result of the project.

3. Phase I survey will be conducted by sampling Environmental Zones. Necessary steps in this process include:
    i. Determining the total acreage of the *Archaeological* APE.
    ii. Determining the total number of shovel tests recommended for the *Archaeological* APE by multiplying the acreage by 16 shovel tests per acre.
    iii. Identifying the various environmental zones within the *Archaeological* APE following Robert E. Funk's 1993 work, *Archaeological Investigations in the Upper Susquehanna Valley, New York State* (Chapter 5).

4. Once the zones are defined, the archaeological consultant will divide up the total number of shovel tests previously determined and apply an equal percentage of tests to each defined environmental zone. Any previously identified archaeological site(s) or map documented structure (MDS) must be included in the Phase IB testing.

5. Within each zone shovel testing will be conducted using a five meter interval or other acceptable methods such as plowing/disking for previously plowed farm land.

6. Prior to implementing a proposed testing methodology the project consultant will schedule a meeting with SHPO staff to consult on the proposed plan. A copy of the plan will be provided for SHPO staff review in advance of the meeting.

7. Sites, identified as part of the survey process will be documented using standard practices (such as site forms or approved data bases) and will all be located using a single GPS point.

8. Once the Phase I survey is completed a report will be provided to the SHPO using the established New York SHPO Phase I Archaeological Report Format Requirements and the Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State.

Electronic Survey Data

1. Project sponsors will provide the following data sets to the SHPO as part of their submission. Sponsors or their consultants should contact the SHPO staff to verify specific data requirements.
    i. GIS data coverage defining the five-mile survey area.
    ii. GIS data locating (as best as practical) each of the proposed tower locations.
    iii. GPS data locating by singe point each building, structure, object or site identified as being eligible for or listed in the New York State and/or National Registers of Historic Places.
    iv. GIS data locating the boundary of all archaeologically tested areas.
    v. Final archaeological reports should be provided in bound format (see New York SHPO Phase I Archaeological Report Format Requirements) as well as in PDF format on CD.

2. Project's consultant should contact SHPO staff to determine exact format of data to be submitted.

For more information about the New York State Historic Preservation Office, please call us at 518-237-8643 or visit our web site at **http://nysparks.state.ny.us** then select **HISTORIC PRESERVATION.** Select the **On Line Resources** option to find specific information regarding historic and cultural resources in any community in the state.