POST-CONSTRUCTION BIRD AND BAT MONITORING PLAN
STONY CREEK WIND FARM
WYOMING COUNTY, NEW YORK

January 7, 2009

1 BACKGROUND

Stony Creek Energy LLC ("Stony Creek") is developing a wind energy project of up to 99 MW in the Towns of Stamford and Roxbury, in Delaware County, New York State. This facility will be operated by Stony Creek. The Stony Creek Wind Farm (the "Project") will consist of:

- Up to 59 wind turbines located in a Project Area of approximately 14,500 acres of high elevation farm land and wooded areas;
- Approximately 15 miles of access roads that will connect to each wind turbine to allow vehicles access for construction and maintenance of the facilities; and
- An electrical collection system consisting of underground installations that will allow delivery of electricity to a new substation.

Stony Creek plans to install GE 1.5xle wind turbines or similar machines. These turbines are three-bladed, upwind, horizontal-axis wind turbines with a rotor diameter of 82.5 meters and towers that are 80 m tall. The nacelle will be located at the top of each tower and will contain the electrical generating equipment. The maximum height of these turbines with one blade in the perfectly vertical and upward direction (the "tip height") is 398 feet. Once installed, each wind turbine will occupy a round, slightly exposed base approximately 16 feet in diameter at the ground surface.

Stony Creek prepared this plan for post-construction avian and bat studies to respond to concerns raised in the SEQRA process being led by the Town Board of the Town of Orangeville.

This plan is designed to be consistent with the guidelines of the New York State Department of Environmental Conservation ("NYSDEC" or "DEC") for ***standard*** post-construction studies as described in the DEC's "Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects," dated August 2009.

2 OBJECTIVES OF THE MONITORING PLAN

The post-construction studies described in this plan are designed to quantify the avian and bat collision impacts that may result from operation of the Project. The post-construction studies will complement the pre-construction studies conducted by Stony Creek as part of the Project's environmental reviews.

The post-construction studies have three objectives:

- To estimate the Project's direct collision impacts to birds and bats in terms of annual per turbine mortality rates,
- To document indirect impacts of construction and operation to resident birds, and

- To determine how daily weather events and conditions may correlate with the number and species composition of animals found beneath turbines.

3 METHODOLOGY

This plan includes the following three types of surveys:

- Ground searches,
- Bird Habituation and Avoidance Studies, and
- Bat Acoustic Sampling.

Protocols for each of these surveys are described in the following sections.

Stony Creek will provide NYS DEC access to study areas while studies are in progress, and Stony Creek will provide annual study reports as described in Section 4

3.1 Ground Searches

Stony Creek will conduct field surveys and statistical evaluations to estimate the magnitude of avian collisions associated with the Project, i.e., "ground searches". Stony Creek will conduct the ground searches for up to three years.

3.1.1 Ground Search Years

Stony Creek will conduct ground searches in two consecutive calendar years, starting with the first year where project construction and restoration activities are completed before April 15. As an example, if restoration activities are completed in June 2011, no ground searches would be done during 2011; ground searches would be done in 2012 and 2013.

The need for, and timing of, a third year of ground searches will be determined by Stony Creek after reviewing the results of the first two years of ground searches in consultation with the NYSDEC.

3.1.2 Selection of Turbines to be Searched

Daily or weekly ground searches will be conducted at 33% of the installed Project turbines. Stony Creek will select the wind turbines to be searched using a variety factors, including accessibility and surrounding land cover, but also to ensure that, to the extent practicable, the searched turbines are representative of the different habitats, geographical areas, physical conditions, and turbine features (e.g., lighting) that exist in the Project.

3.1.3 Ground Search Season

Stony Creek will conduct ground searches from April 15 to November 15 (the "Search Season") of every year in which such searches are conducted.

3.1.4 Search Frequency

For one third of the turbines being searched, Stony Creek will perform ground searches every day of the Search Season. For the other two thirds of the turbines being searched, Stony Creek will perform ground searches once every seven (7) days. Stony Creek will establish a search schedule where the same turbines

are searched daily and the same turbines are searched weekly. Adjustments and exceptions to these search frequencies may be necessary due to severe weather.

As an example, if 59 turbines are installed, Stony Creek will conduct searches at 20 turbines. At 7 of these turbines, Stony Creek will conduct daily searches, and at the other 13 turbines it will conduct searches every seven (7) days.

3.1.5 Search Areas

At each turbine searched, ground searches will be performed within an approximately square area 405 ft x 405 ft (123 m x 123 m) in size and centered around the turbine tower. This area is 1.5 x rotor diameter of the expected turbines.

Searches will not be conducted in forested areas and trees will not be removed to facilitate the ground searches. Thus, if the areas cleared for turbine construction are less than the search area above, then search areas extend to the limit of what was cleared for turbine construction and will be less than the search area above.

The search area will be separated into survey transect lines evenly spaced at 16 ft (5 m) intervals.

3.1.6 Vegetation Management

At turbines where mortality surveys are being conducted Stony Creek will maintain vegetation to be 12 inches or less during the Search Season, unless such practices would cause an unacceptable risk of ground erosion.

3.1.7 Recording of Weather Data

Stony Creek will document weather conditions for every survey day and will maintain this information as part of the ground survey records. Weather conditions to be documented include:

- Weather from the night prior to the survey day, collected from local sources and supplemented by National Weather Service (NWS) data. Night visibility characterized by estimating the percent of cloud cover and the presence or absence of fog. Precipitation from the night prior to the survey day shall be documented using NWS data sources.
- Weather for the morning of the survey day, including: cloud cover, temperature, wind direction and wind speed.

3.1.8 Field Search Methodology

Ground searches will commence near sunrise and will proceed until all turbines to be searched that day have been surveyed. Searches will be temporarily delayed if severe weather or safety conditions occur.

The transect lines within each search area will be slowly walked to locate any bird or bat carcasses, including feathers or portions thereof. A search time of 45 to 75 minutes per turbine is anticipated, but actual times will vary based terrain, habitat, and weather conditions. Field modification of transect lines may be necessary to avoid unwalkable areas (e.g., pits, steep slopes).

For every turbine ground search, Stony Creek will record data on the time of the search and the ground cover conditions at the turbine site.

Any carcass observed during the survey effort will be collected and labeled for possible use the scavenging loss or searcher efficiency tests. For every carcass observation, field surveyors will complete a data sheet with the following information:

- Date, time, and turbine number.
- Location on a plot marked with GPS coordinates.
- Distance and cardinal direction from the turbine.
- Distance and bearing from the transect from which the carcass was first spotted.
- Condition of the carcass (whole or partial, extent of injury and some measure of decomposition to estimate time of death).
- Position of the carcass (face-up, face-down, sprawled, balled up, etc.)
- Species, age and sex, if determinable.
- Substrate conditions when found (gravel, short grass, long grass, crops, brush, etc.)
- Name of the searcher that found the carcass.
- Digital photographs of the observation, showing (i) the position in which it was found; (ii) the dorsal and ventral sides; (iii) for bats the gender and reproductive condition; (iv) any identifying characteristics such as bill, foot, wing, or tail shape and plumage coloration for birds. At least one of the photographs shall include a ruler or other standard item to show the scale of the carcass.

3.1.9 Incidental Finds

Incidental finds shall be defined as any bird or bat carcass found in the vicinity of a Project turbine but not as part of an organized ground search. This includes carcasses found by Project personnel not trained for ground searches, at turbines that are not part of the ground search protocol, at times outside of the Search Season, or during a day when ground searches are not being done.

For incidental finds, the personnel making the find shall record as much of the information listed in Section 3.1.7 as is practicable and shall label and store the carcass in the same manner as if it were found in a ground search, except that it shall have a marker identifying it as an incidental find.

3.1.10 Searcher Training

Each field surveyor will be trained in the search protocol in advance of his or her first ground search.

3.1.11 Field Tests for Searcher Efficiency and Scavenging Losses

Stony Creek will conduct field tests on scavenging losses and searcher efficiency as described below.

The scavenging loss field tests will be performed to estimate the proportion of bird and bat carcasses that are removed from search areas by wildlife before they can be found by ground searchers. The searcher

efficiency tests will be performed to quantify ground search errors that may exist due to detection biases and ability of searchers to successfully locate carcasses in the search area.

Scavenging Loss Tests

Stony Creek will conduct a scavenging loss test at least once every 30 days during the Search Season. The scavenging tests performed over the course of a calendar year shall use a variety of carcasses that represent the various sizes and species of birds and bats that breed and migrate through the project area. Carcasses used in the scavenging tests will be as fresh as possible, since NYSDEC expects long-frozen carcasses will be more difficult to find and less attractive to scavengers.

In the morning that a scavenging loss test is to begin, someone will place carcasses around one or more turbines in a variety of habitats. The number of carcasses will not be too large as to cause an excessive attraction to scavengers. Location of the scavenging carcasses will be noted when placed, and then revisited as follows to check whether the carcass has been removed or decomposed. Checks will be made daily in the first week after placement and then every two days thereafter until the carcass is removed or decomposed. On each check, the location and condition of the carcass will be recorded to determine if any scavenging has occurred. Notes on tracks, scat, marks, or other signs of scavenger activity, if any, will be noted on every check.

Stony Creek will use data from the scavenging loss test to estimate the scavenging rate, i.e., the proportion of bird and bat carcasses removed from the search area by other wildlife (scavengers). Scavenging rates will be determined as a function of season and habitat type.

Searcher Efficiency Tests

Stony Creek shall perform a searcher efficiency tests at least once every 30 days during the Ground Search Season. The searcher efficiency tests performed over the course of a calendar year shall use a variety of carcasses that represent the various sizes and species of birds and bats that breed and migrate through the project area. Searcher efficiency tests will be conducted unbeknownst to the searchers.

In the evening before or the morning of the day for a searcher efficiency test, a project manager will place carcasses in the search areas under one or more turbines and in a variety of habitats. Each carcass placed for a searcher efficiency trial will be discreetly marked with a non-reflective marker so it can be readily identified as a test carcass when found, but so as not make it any more noticeable than a non-test carcass. For searcher efficiency trials, if enough bat carcasses are not available, brown mice may be used as a surrogate. The project manager will document the date, time, and location of each searcher test carcass placed.

After ground searches are completed, searcher efficiency carcasses will be visited and records will be made on which test carcasses are found and not found. Stony Creek will use data from searcher efficiency tests to determine a searcher efficiency for every individual ground searcher.

3.1.12 Mortality Estimate Calculations

Stony Creek will calculate an estimated mortality rate separately for the spring and fall sample periods and for birds and bats. Scavenging loss estimations, searcher efficiency, and the proportion of turbines

searched will be used to adjust the total number of carcasses found during the searches. The following formula will be used to estimate the mortality rate (Koford and Jane 2005):

M = uM / ((1-SC)*(1-E)*P)

M = Mortality Rate (adjusted) for entire project.

uM = Mortality Rate (observed); the number of carcasses found in search area.

SC = Scavenging Rate (percentage birds/bats removed by scavengers within 2 days).

E = Searcher Efficiency Rate (percentage of test carcasses missed).

P = Proportion of turbines included in the search area.

3.2 Bird Habituation and Avoidance Study

Stony Creek will conduct bird habituation and avoidance studies in two consecutive calendar years, starting with the first year where project construction and restoration activities are completed by April 15. The need for, and timing of, a third year of habituation and avoidance studies will be determined by Stony Creek after reviewing the results of the first two years of such studies in consultation with the NYSDEC.

The bird habituation and avoidance study shall be performed using a protocol similar to the pre-construction "breeding bird" study performed by Stony Creek. Specific protocols to be used shall include:

- Surveys shall be conducted once per week for every week during the months of May, June, and September.
- For each survey day, observers shall start at first light and continue until no later than 10 am. During this time, he, she or they shall visit predetermined observation points to look and listen for songbirds, raptors, and waterfowl. For each point, the observers shall record the number and type of each species observed.
- Observation points shall be the same points included in pre-construction surveys, to the extent practicable. For observation points that have become turbines sites, the surveys will, to the extent practicable, take place when turbine noise does not interfere with the ability of the observer to identify birds.
- Stony Creek will not conduct bird habituation and avoidance surveys on days that are excessively windy, rainy, or cold. Ideal survey days will be days where weather conditions are conducive to hearing and seeing birds in flight and moving about in vegetation.

3.3 Bat Acoustic Sampling

Concurrently with the Ground Search Seasons and for every year in which ground searches are conducted, Stony Creek will deploy, maintain, and monitor bat acoustic monitors using the Project's permanent met tower. One detector shall be located at a height that is within the height of the turbine rotor zone and a second detector shall be located two to three meters above ground level. Recording at all

detectors will occur daily from one half hour prior to sunset until one half hour after sunrise between April 15 and October 15.

During the summer of any season in which ground searches are conducted, Stony Creek will also perform active acoustical sampling to determine which species of bats are present on the site. This will entail a field investigator with a detector walking across the study area in a variety of habitats that are likely to contain bats, and recording what is present. To the extent practicable, active sampling will be conducted on at least nine warm (>55 deg F), dry, and calm evenings between June 1 and July 10, starting at dusk and ending no earlier than 2:00 AM.

Analysis of calls from the stationary and active bat monitoring will be based on a criteria verified by a reputable, independent authority on bat vocalization.

4 REPORTS

For each year in which ground searches are conducted, Stony Creek shall generate and submit to the DEC reports:

- An interim ground search progress report summarizing results of ground searches conducted from the beginning of the ground search season through mid-June. The interim progress report will be submitted to the DEC no later than July 31 of the year in which it is summarizing results.
- A final ground search report summarizing results of mortality surveys conducted for the full ground search season, including estimates of overall mortality for the search period on a per turbine, per MW, per MWh produced, and per rotor swept area basis. The final report will be submitted by March 1 of the year following the year in which the searches were performed.
- A final report summarizing the results of any other post-construction studies, other than the ground searches, for the full study period. This report will be submitted by March 1 of the year following the study period.

5 ADJUSTMENTS TO THE MONITORING PLAN

If the post-construction avian mortality rate at the Project exceeds 10 birds per turbine per year in both of the first two years of ground searches, then at the request of the NYSDEC, Stony Creek shall conduct additional tests, provided such tests do not result in costs of more than $300,000 in total.

If the post-construction mortality estimate of the avian fatality rate at the Project is less than 1 bird per turbine per year, then ground search studies shall not be required in any subsequent years.

If the post-construction mortality estimate of the bat fatality rate at the Project is less than 1 bat per turbine per year, then bat acoustic studies shall not be required in any subsequent years.

6 REFERENCES

Erickson, W. and J. Kerns. 2005. Bat Mortality at wind energy facilities during fall migration: a proposal for intensive mortality searches. Appendix V in E.B. Arnett, technical editor, Relationships between bats

and wind turbines in Pennsylvania and West Virginia: an assessment of bat fatality search protocols, patterns of fatality, and behavioral interactions with wind turbines. A final report submitted to the Bats and Wind Energy Cooperative. Bat Conservation International. Austin, TX, USA.

Koford, R. and A. Jain. 2005. Avian Mortality Associated with the Top of Iowa Wind Farm. Progress Report, Calendar Year 2004. Iowa Coop. Fish and Wild. Red. Unit and Iowa State University.

New York State Department of Environmental Conservation, January 2009. New York State Department of Environmental Conservation (NYSDEC) Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects.