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Joe Martens
Commissioner

August 13, 2013

Town of Denmark Planning Board
3707 Roberts Road
Carthage, New York 13619

RE: State Environmental Quality Review (SEQR)
Copenhagen Wind Farm
Town of Denmark, Lewis County & Towns of Rutland, Champion and Watertown, Jefferson County

Dear Town of Denmark Planning Board:

The New York State Department of Environmental Conservation (DEC) has reviewed the Draft Environmental Impact Statement (DEIS) for the proposed Copenhagen Wind Farm, Town of Denmark, Lewis County & Towns of Rutland, Champion and Watertown, Jefferson County, New York, May 2013, submitted by Copenhagen Wind Farm, LLC (c/o Own Energy), and prepared by EDR Companies.

PROJECT DESCRIPTION

The project sponsor, Copenhagen Wind Farm LLC, proposes construction and operation of a maximum capacity 79.9 megawatt (MW) wind power project consisting of up to 49 GE 1.6-100 (or equivalent) wind turbine generator (WTG) over a project area of 9700 acres. The proposed WTG would have a total maximal height 492 feet (tip of blade). The project area bounded by the northern boundary of the Town of Denmark and Route 126 to the North, Route 26 to the East, the southern boundary of the Town of Denmark and Route 12 to the South, and Route 12 to the West. The Project area has a rural and low-density character, with forestland and agriculture as the dominant land uses. The Project area is mostly forested, with agricultural fields located along the valley roads and on nearby gentle rolling hills.

In addition to the wind turbines, the Project will also involve construction of approximately 17 miles of gravel access roads, approximately 24 miles of buried or overhead 34.5 kV electrical collector lines, a collection and transforming substation, and three permanent 100-meter (328 feet) tall meteorological towers as well as an operations and maintenance (O&M) building and approximately 0.8 miles of overhead transmission line in the Town of Denmark. The Project also proposes that the Town of Rutland will feature 5.6 miles of overhead transmission line, the Town of Champion will feature 3.2 miles of overhead transmission line,

and the Town of Watertown will feature 0.2 mile of overhead transmission line and a Point of Interconnection facility.

The DEC comments will be presented in the following sections to include: 1) wetlands impacts & surface water impacts; 2) Invasive Species 3) stormwater pollution prevention plan 4) wildlife impacts; 5) noise impacts; and 6) cultural impacts. The purpose of the comments are to explain concerns and questions that the DEC has after reviewing the DEIS so that these concerns and questions can be addressed in the Final Environmental Impact Statement (FEIS).

WETLANDS & STREAMS (DEIS Water Resources 3.2)

GENERAL ISSUES

Projects that propose to disturb regulated wetland areas, buffer areas (DEC relevance only) and protected streams require permits from DEC and the U.S. Army Corps of Engineers (USACE). DEC wetland permit regulations at 6 NYCRR 663.2(z) define a "regulated activity" as any form of draining, dredging, excavation, or mining, either directly or indirectly; any form of dumping, clear cutting or filling, either directly or indirectly; erecting any structures, constructing roads, driving pilings, or placing any other obstructions whether or not changing the ebb and flow of the water; any form of pollution, including but not limited to installing a septic tank, running a sewer outfall, discharging sewage treatment effluent or other liquefied wastes into or so as to drain into a wetland; or any other activity which substantially impairs any of the several functions or benefits of wetlands which are set forth in section 24-0105 of the (Freshwater Wetlands) Act. These activities are subject to regulation whether or not they occur upon the wetland itself, if they impinge upon or otherwise substantially affect the wetland and are located within the adjacent area.

Before DEC can consider a permit application, wetland delineations prepared for the project must be verified by agency staff. DEC jurisdiction and resulting acreage impacts may vary based on DEC verification of wetland delineations. It is DEC policy that wetland impacts are not permitted, even with mitigation, until other alternatives have been explored, including avoidance, minimization or reduction of impacts. Generally applicants are required to: 1) Examine alternative project designs that avoid and reduce impacts to wetlands; 2) Develop plans to create or improve wetlands or wetland functions to compensate for unavoidable impacts to wetlands; 3) Demonstrate overriding economic and social needs for the project that outweigh the environmental costs of impacts on the wetlands.

The DEC guidance document, *Freshwater Wetlands Regulation Guidelines on Compensatory Mitigation,* October 26, 1993, states that "Temporary disturbances, where pre-construction conditions are essentially restored, for example when laying a pipeline, do not require *compensatory* mitigation since there is no permanent loss. However, impacts to the wetland still must be first avoided and then minimized as with any other project, and efforts to reduce disturbances during construction, such as erosion control, will still be required." USACE defines "permanent" impacts as the loss of waters of the United States, and includes the area where fill is placed plus areas that are adversely affected by flooding, excavation or drainage as a result of a project. Where the project area is restored to pre-construction contours and elevation,

it is not included in the calculation of permanent loss of waters (permanent impacts). This includes temporary construction mats (e.g. timber, steel, geotextile) used during construction activities and removed upon the completion of the work. However, where certain functions and values of waters of the United States are permanently adversely affected (such as the conversion of a forested wetland to an herbaceous one in a permanently maintained utility right-of-way), USACE requires mitigation to reduce the adverse affects of the project to the minimal level. The wetlands analysis in the DEIS should be refined to apply the full range of potential impact criteria to the proposed construction activity in the determination of total area of permanent impact; not just those areas proposed for permanent placement of fill. This is necessary to quantify the total affected area for permitting and requirements for mitigation.

Simple re-grading to pre-construction contours following excavation in a wetland area may not be enough to restore the full function of the existing wetland area. Any clearing or grading that disturbs wetland soils can result in permanent impacts to wetlands. Grading a wetland or adjacent area can substantially alter surface water drainage and flow patterns, may temporarily increase erosion, and may eliminate fish and wildlife habitat. Clear-cutting removes the vegetative cover of wetlands and may reduce their ability to absorb water and serve as habitat, and can also cause soil erosion. Dredging or excavation may increase water depth and remove wetland vegetation, thus altering the basic characteristics of, and perhaps destroying, wetlands. Fish and wildlife feeding or reproductive capacities may be altered, as may cover types, turbidity, sediment deposition, and erosion patterns. Clearing vegetation and any form of soil disturbance can lead to the introduction of invasive plants. Any of these activities can cause the permanent loss of benefits provided by wetlands and may, in fact, destroy wetlands entirely.

All waters of the State are provided a class and standard designation based on existing or expected best usage of each water or waterway segment. The classification AA or A is assigned to waters used as a source of drinking water. Classification B indicates a best usage for swimming and other contact recreation, but not for drinking water. Classification C is for waters supporting fisheries and suitable for non - contact activities. The lowest classification and standard is D. Waters with classifications A, B, and C may also have a standard of (T), indicating that it may support a trout population, or (TS), indicating that it may support trout spawning (TS). Special requirements apply to sustain these waters that support these valuable and sensitive fisheries resources. Waters classified as AA, A, B, C(t) and (Cts) are classified as "protected." Disturbance to the bed or banks of a protected stream requires a Protection of Waters Permit from DEC.

Navigable waters include lakes, rivers and other waterways and water bodies on which water vessels with a capacity of one or more persons are operated or can be operated. A Protection of Waters Permit is required for: Excavating or placing fill in navigable waters of the state, below the mean high water level, including adjacent and contiguous marshes and wetlands.

For protected and navigable streams (and wetlands), Horizontal Directional Drilling (HDD) is the preferred method for crossing and should be considered for all such crossings. HDD has the advantages of minimizing land disturbance, avoiding the need for dewatering of the stream and leaving the immediate stream bed and banks intact, reducing erosion, sedimentation and project induced watercourse instabilities. If other methods are to be used, the project narrative should addresses why directional drilling will not work or is not practical for that specific crossing. It is

important to note that where HDD cannot be utilized, in-stream work for streams with a standard of T or TS is permitted by DEC only between the dates of [specific work window for the particular stream]. This narrative is derived from information on the DEC website at: http://www.dec.ny.gov/permits/6042.html and http://www.dec.ny.gov/permits/6548.html

With respect to this DEIS, more detail needs to be provided with respect to stream crossings and disturbances (without regard to classification) to determine if the waterway meets the NYS definition of "navigable." Under this definition, navigable waters include lakes, rivers and other waterways and water bodies on which water vessels with a capacity of one or more persons are operated or can be operated. If any stream segment meeting this criterion will be disturbed by project activities, a DEC permit will be required for this reason as well. Stream crossings should be designed with the goal of protecting stream continuity, as described in the DEC web page, Stream Crossings: Guidelines and Best Management Practices, available at: (http://www.dec.ny.gov/permits/49066.html). As with wetlands, the FEIS should discuss how the proposed project will avoid streams and minimize impact where disturbance is required. The steps taken to avoid and minimize impacts should be clearly addressed in the FEIS. The sections below represent specific comments along these lines.

SPECIFIC ISSUES

The NYSDEC is awaiting electronic data files from OWN Energy depicting the total Project layout (e.g. tower locations, interconnection lines, transmission lines, buildings, roads, temporary construction areas, state lands, stream and wetland crossings … etc.) in relation to known locations and associated habitats of disturbance. While a layout is provided, it is not in sufficient resolution to permit this examination. Hence, until we receive this information, we cannot adequately address specific wetland and stream crossing concerns. The following represents our observations based on the limited information provided to date and referenced by which section and page of the DEIS that the statement was found. The questions and concerns raised should be dealt with in the Final Environmental Impact Statement (FEIS) and preferably involve consultation with the DEC on the various issues prior completion of the document so as to ensure a satisfactory response.

Section 1.0 Executive Summary (Pages 3 - 7)

Page 3 - Summary of Potential Impacts Environmental Factor – Physiography, Geology, and Soils states; "Proximity to the Cortland County landfill."

Response/Recommendation(s):

We believe this is a typo, please fix.

Page 4 states "Construction of the Project will result in disturbance of up to 372 acres of soil and 590 acres of vegetation, most of which is forest land or active agriculture. In addition, approximately 14 acres of wetland could be disturbed by Project construction."

Response/Recommendation(s):

Is that 14 acres of NYSFWW or USACE or Both? Please clarify.

Page 4 states "A total of 58 acres will be converted to built facilities, including 17 acres of forest land and 0.5 acre of wetland."

Response/Recommendation(s):

The Freshwater Wetlands Act of 1975 describes the process of how to avoid, minimize, and then mitigate for impacts to NYS Regulated Freshwater Wetlands and this department recommends the buildings to be shifted to avoid impacts to regulated wetlands.

Can the buildings be shifted to show avoidance of NYS Regulated wetlands? Please advise as to why 0.5 acres of wetlands needs to be affected.

Page 5 states "Utilizing 'best practice' construction techniques that minimize disturbance to vegetation, streams, and wetlands."

Response/Recommendation(s):

Are "best practices" meant to be Best Management Practices (BMP)? We would like to see a list of BMPs that would be employed so as to avoid and minimize disturbance to vegetation, streams, and wetlands.

Page 6 states "**Alternatives.**" section

Response/Recommendation(s):

Where are the alternatives located? What were the impacts (both temporary and permanent) of the alternatives? The brief description of the alternatives is not adequate. Please show the department the alternative analysis as described above in our "General" section. The tactic should be first, avoid; second, minimize; third, mitigate.

Section 2.5 Project Layout and Components

Page 20 states "*Wetlands and Waterbodies.* The O&M facility, temporary turbine construction staging area, substation, meteorological tower, and turbine foundations will not be located within State-regulated freshwater wetlands. Placement of the electrical collection/transmission lines and access road in wetlands/streams will be avoided to the extent possible.

Response/Recommendation(s):

The O&M facility, temporary turbine construction staging area, substation, meteorological tower, and turbine foundations should also be outside the regulated adjacent area of state regulated areas. The adjacent area is a 100 foot buffer around New York State mapped wetlands. This adjacent area needs to be emphasized as an area to avoid as well.

Section 2.6 Project Construction

Page 27 states "Project construction will be initiated by clearing woody vegetation from all tower sites, access roads, and electrical interconnect routes. Trees cleared from the work area will be cut into logs and stockpiled on the edge of the work area or removed from the defined work area, while limbs and brush will be chipped and spread in upland areas (safely away from water resources) on-site so as not to interfere with existing land use practices. Landowners will have the right to any materials, including trees, taken from their property during site preparation, and any trees not claimed by the landowner will be sold to a local forestry operation or timber mill. For the purposes of this DEIS, it is assumed that a radius of 150-200 feet will be cleared around each tower, a 100-foot wide corridor will be cleared (or forested vegetation trimmed) along access roads, and a 25-foot-wide corridor will be cleared along underground electric collection lines that are not adjacent to access roads."

Response/Recommendation(s):

The clearing is not to interfere with wetlands or their adjacent areas. Shift the laydown areas into the fields and out of the wetlands and adjacent areas. Chipped material could be used by the new cogeneration plant located on Fort Drum. They need approximately 70 to 80 truckloads per day to operate their facility.

Page 30 states "Direct burial methods through use of a cable plow, rock saw, rock wheel and/or trencher will be used during the installation of underground electrical collector system whenever possible."

Response/Recommendation(s):

Be mindful of "piping" for flows eroding the pipes and altering natural flows. 'Piping' occurs when normal path of groundwater is intercepted because the soil and sediment compactness has been altered, modifying the hydraulic conductivity of the soil and sediment layers, allowing water to flow in the path of least resistance along the cable, line, or pipe that has been buried. This is a common practice around residential dwellings to keep groundwater from entering a basement known as interceptor trenches for positive groundwater control.

Section 2.7 Operations and Maintenance

Page 35 states "Consumables such as various greases used to keep the mechanical components operating and oil filters for gearboxes and hydraulic systems are used for routine maintenance tasks. Following all maintenance work on the turbine, the area is cleaned up. All surplus lubricants and grease-soaked rags are removed and disposed of as required by applicable regulations. All maintenance activities will adhere to the same spill prevention industry best practices undertaken during the construction phase."

Response/Recommendation(s):

All spills must be reported to the NYS Spill Hotline: 1-800-457-7362.

Appendix F – Wetland and Ecological Resources Inventory

The following represents specific concerns with respect to wetlands with respect to general turbine locaton and project layout as detailed in Appendix F.

While the figures show approximate turbine locations and maps are not detailed, turbine # 1 – appears to be located within NYS FWW CT-20.

Response/Recommendation(s):

We suggest it be removed or moved toward the east into the nearby field,

The connection line between turbine 52 and 19 traverses through NYS FWW CT-20.

Response/Recommendation(s):

Our recommendation is to directional drill under the wetland or cross at the narrowest location.

Connection line and road from turbine 20 to 21 appears to be within the regulated adjacent area of NYS FWW CT-21.

Response/Recommendation(s):

The road will need to be shifted to avoid impacts to the adjacent area.

Turbine # 44 is located within or too close to NYS FWW CT-22.

Response/Recommendation(s): The department recommends removal of the turbine or shifting it to avoid impacts to NYS FWW's.

Connection line between Turbine # 45 and Turbine # 49 involves a stream crossing

Response/Recommendation(s):

This crossing should be directionally drilled under the stream.

Turbine # 56 appears to have a direct impact on the nearby stream.

Response/Recommendation(s):

and recommend moving it to the east to avoid impacts to the water resources.

Section 3.2 Water Resources

Pages 56 thru 59 - No listing of the three protected streams within the project boundaries

Response/Recommendation(s):

The classified streams within the project boundary are ONT-19-39-2-3, Unnamed water is a Class C(t); ONT-19-39-2, Unnamed Water is a Class C(t); and ONT-19-31-10, Unnamed Water is a Class A. The first two listed waters flow directly into a C(ts) water.

Page 65 states "Permanent impacts to surface waters and wetlands… …Based upon the proposed layout, the permanent footprint of access roads (drivable width of 20 feet wide) is anticipated to result in roughly 0.53 acre of permanent impacts to wetlands/streams. No permanent impacts to NYSDEC freshwater wetlands or protected streams are proposed."

Response/Recommendation(s):

Changing the wetland type will be considered a permanent impact to the wetland and will require mitigation. Thus, clearning of trees will be a permanent impact to forested wetland areas – to include adjacent areas.

Appendix C – Blasting Plan

Page 1 states "Blasting: If it is determined that blasting is necessary, the final blasting plan shall be submitted to (and approved by) the County."

Response/Recommendation(s):

Our department must be in the communication chain of the submitted blasting plan also.

INVASIVE SPECIES CONTROL PLAN

Laws and Regulations, Pages 2 and 3 of Appendix I, explain the interim list of invasive species and many plants are listed after that. Please include insects such as the Emerald Ash Borer or any other known occurrences in this area. Any firewood material is not be moved more than 50 miles from the location where they were cut.

Proposed Control Methods; Page 3 Item # 1 of Appendix I under "Construction Materials Inspection" does not include the need to inspect the imported wind turbine towers, blades, or nacelles for foreign insects or spiders. Please include this and report on it. Other wind turbine projects currently being built or previously built have had reports of invasive or non native species being within the turbine and tower parts imported from the manufacturer.

STORMWATER POLLUTION PREVENTION PLAN

The final Stormwater Pollution Prevention Plan (SWPPP) must provide design specifications for water quality and quantity controls that conform to the ***New York State Stormwater Management Design Manual***. The Design Manual is currently undergoing revision; therefore it will be the responsibility of the applicant to ensure that the SWPPP is developed in accordance with the most recent version. Any deviations from the Design Manual will be subject to a 60 day review and approval process by the Division of Water *at the time of construction.*

WILDLIFE IMPACTS

The following comments represent our questions and concerns with respect to respective categories specified below. The questions and concerns raised such be dealt with in the Final Environmental Impact Statement (FEIS) and preferably involve consultation with the DEC on the various issues prior completion of the document so as to ensure a satisfactory response.

Section 3.3.2.2.2 Potential Impacts- Operation- ***Fish and Wildlife***

Habitat Loss

This section states that "Given the relatively small area of lost or converted natural communities, the cumulative habitat loss/conversion resulting from Project development is not considered significant." What is this statement based on and how was it determined that 58.1 acres of habitat, plus 192.5 acres of forest loss would not be a significant impact on the wildlife that uses those habitats?

Forest Fragmentation

This section mentions that the project could impact forest interior nesting birds, but provides no possible ramifications of such an impact, or potential mitigation options.

Disturbance/Displacement- Breeding Birds

The statement "Many of the proposed turbines are sited in active agriculture fields that are already subject to periodic disturbance and have limited habitat value. Therefore, there is a low risk of substantial displacement of breeding grassland birds" is misleading. Current land uses such as pesticide/herbicide spraying and mowing during the breeding season does not lessen the impacts turbines located in grassland habitat may have on birds.

Bird Collision Risk- Raptors

This section cites the results of some post-construction studies conducted in New York between 2008-2011 to support the statement that "raptor migration is typically diffuse in the region" and

that "evidence to date shows that risk to migrating raptors is not great and not likely to be biologically significant."

DEC would like to point out that the dates these raptors were found were largely during the breeding season, not spring or fall migration. With the possible exception of two red-tailed hawks found in April, and the turkey vultures, these raptors were most likely resident breeding birds within the project sites. Please note the findings and their respective dates below:

Bliss 2008: The 3 red-tailed hawks were found between July 14-August 5, and the sharp-shinned hawk was found June 8.

Bliss 2009: The 3 red-tailed hawks were found between June 22-August 1.

Wethersfield 2010: Two red-tailed hawks were reported, an incidental find on April 21, and a standard search find on July 14. The sharp-shinned hawk was found August 31.

High Sheldon 2010: The sharp-shinned hawk was found June 14, and three, not two, turkey vultures were found between April 15-September 2.

High Sheldon 2011: Two red-tailed hawks were found incidentally on April 13 and July 12.

Bat Fatality Approximations

The range of bat fatalities stated in the second paragraph of this section is incorrect. The correct range of bat fatalities in New York, based on studies conducted between 2006 and 2012, is between 0.5 and 40 bats per turbine (0.46 and 26.7 bats per MW).

Section 3.3.3 Proposed Mitigation

DEC does not consider building a wind energy project to be mitigation for not building an energy generation facility that uses coal, gas, or some other fuel type, as power is still generated from the other sources of energy listed in Table 19 after a wind project becomes operational. DEC does not agree with the statement on page 115 that "because wind powered electricity offsets electricity generated by fossil-fueled power plants, implementation of the Project can be considered mitigation for the impacts caused by coal, oil, etc."

Section 3.3.3.2 Fish and Wildlife

A work plan describing details of post-construction monitoring should be submitted to DEC and USFWS for review, and a final plan in place prior to the start of project operation.

Section 3.3 Biological Resources Issues Specific to a Given Page
(Comments listed by page)

The mammal species list should also include bear, fisher, otter, squirrels, etc. (page 84)

Monitors placed at a location 198' and 3.3' above the ground for 168 days recorded 281 calls, but monitors used in conjunction with mist netting collected 995 files in 267.5 hrs or 3.7 calls/hr, Can the discrepancy between detection rates be explained? (Pages 85-86)

Myotid calls were unidentifiable. May these have been Indiana bat calls? (Pages 87-13)

Successional old field/wet meadows, state that they are small and don't provide preferred nesting and foraging habitat, but then goes on to state that species were found to be breeding there in 2012. Would this not indicate the area is thus suitable at least? (Page 88)

With respect to "adverse impacts on bat populations", restricting tree clearing to winter months would be preferable even in the absence of Indiana bat confirmation. (Page 97)

It states that "None of the construction-related impacts …will be significant enough to affect local populations of any resident or migratory wildlife species". However, this can't be said definitively, but it can be said that impacts are not anticipated to be significant enough to impact "local populations of any resident or migratory wildlife species." (Page 98)

Please clarify the following "Wind, 3 to 4 avian fatalities/gigawatt-hr, fossil fuel 5.2/gigawatt-hour, brief" in terms of how it was derived. Also, the DEC disagrees with the statement that agricultural lands have limited wildlife value- this statement should be reworded or eliminated. (Page 99)

Losing forest, conversion to successional community (old field, shrubland or saplings) is viewed as a loss, but not a significant loss. Depending on the species being considered, this could be a gain. (Page 100)

Was the Kerlinger & Guarnaccia 2010 study also conducted in NY?
"Any impacts to grassland-nesting species are anticipated to be much less than the impacts from existing hay mowing and pesticide use in the same area" As there is no citation, this statement seems to be pure conjecture. Also, "Forest and forest edge birds are not likely to be significantly disturbed because these species are familiar with tall features (i.e.,trees) in their habitat. This is cited, but was it peer reviewed? (Page 101)

With respect to waterbirds, "no significant, long term displacement or mortality is expected". A sweeping statement such as this seems worthy of more than one 8 year old citation. (Page 102)

With respect to raptors, "May experience displacement, decrease in density w/in the project area after construction, but will most likely acclimate to the turbines with time." What does this mean and what is it based on? (Page 102)

Final paragraph on this page states, "no hibernacula in area". However, the project is within approximately 20 km of a hibernacula and 12km of a foraging area. (page 108).

It is stated that the "Habitat within project area not suitable for breeding bald eagles". DEC and the USFWS would consider eagle impacts within a 10 mile buffer of the project footprint. There are two nests in proximity to the project which may be close to the 10 mile buffer (without a shape file it is difficult to tell exactly how far they are from the project footprint). Clarification is necessary. There are other sites in the project area which could also be potentially expected to support breeding bald eagles. (Page 111)

Paragraph 2 on this page states that hibernacula is approximately 25 miles away but is actually 20 km from site. Moreover, saying that the risk to the species is low based on their rarity in NY is counterintuitive and misleading. (Page 112)

Paragraph 4- DEC would not consider implementation of this project in itself to be considered mitigation. (Page 115)

Paragraph 1, Should read "no mitigation is proposed". DEC, may require mitigation based on analysis of the final application for construction. (Page 116)

Section 8.0 Cumulative Impacts

Though immediate cumulative impacts to habitats greater than 10 miles away from the Project may be limited to local fragmentation, potential impacts on the wildlife utilizing these habitats across a greater distance is possible, particularly to bats and wide-ranging birds. Projects proposed in Jefferson County should also be considered in the cumulative impact analysis for bats and birds. Though mortality rates at the proposed Copenhagen project may be expected to be similar to Maple Ridge and other operating projects in New York, the potential for impacting Indiana bats is greater in Jefferson County, and potentially also at Copenhagen, than in most other areas of the state.

Appendix H
Proposed Copenhagen Wind Farm Raptor Migration Observation

Lewis and Jefferson Counties, New York, Surveys Conducted Spring and Fall 2012, January 8, 2013

Three other sites are referenced to compare raptor passage rates, but the report does not disclose which sites were used. The names, locations, and raptor passage rates for these sites should be

included in the report

In section 1, two different locations were used for spring and fall surveys – is there a reason that the same location was not used for both survey periods? Or that more than 1 location was not surveyed during each survey period?

It is doubtful that it was really possible to discern migrating and local birds from one another, given the criteria used and the distance many were viewed from. This issue should be addressed.

In section 4.10 flight height, given that the height categories seem random, were they just "made up" for this project? Wouldn't radar used in conjunction with the visual observations (multiple points used in both spring and fall surveys), have been much more effective?

Raptor Daily Report Forms – it seems hard to believe that for days on end one could observe the sky in any location for up to 580 minutes/day and not see raptors of any description. How is this explained?

The report sheets refer to heights as 1,2,3 or 4 – or does this correspond to L, M, H, VH?

If the harriers were determined to be local, it seems odd that they were not seen more regularly when surveys were conducted daily for 71/2 months?

It doesn't seem possible to determine if an immature bald eagle is local or migratory (L or M) with any confidence - based on a single observation.

SOUND IMPACT ASSESSMENT (DEIS Section 3.7 "Sound" & Appendix M "Environmental Sound Survey and Noise Impact Assessment")

On the Nature of Sound Characteristic of Wind Turbines

The sound from wind turbines is variable and periodic thus can be more annoying to the public then a continuous noise of the same average amplitude. The characteristic of the sound generated is important in considering its impact on the public (as discussed in our guidelines). As wind turbine generator noise is characterized by amplitude modulation (whooshing, for example), this should be considered in the analysis as some studies have shown amplitude modulation as an annoyance factor for the public (e.g, "Noise Annoyance from Wind Turbines – A Review", Eja Pedersen, Swedish Environmental Protection Agency, Report 5308, August 2003). In this light, per the "Factors to Consider" section (under "Evaluation of Sound Characteristics") of the DEC guidelines, it may be advisable to add a calculated number of dBA to the generated sound in an attempt to compensate for this characteristic. The sound from the mechanics of wind turbine may also be considered potentially "tonal'. Sound of this nature, per our Guidelines, is also noted as also being of a more irritating quality at a given sound decibel level. Thus, the annoyance generated may be greater than that indicated by simple comparison of sound decibel level without including the correction factor as described above.

On Need to Consider Nighttime Impacts

According to a Swedish study ("Human Response to Wind Turbine Noise", Eja Pedersen, Goteborgs Universitet, 2007) an additional complicating factor may be at play in consideration night-time impacts: wind velocity may be nearly double that anticipated at hub height during nighttime stable atmospheric conditions. Thus resultant sound levels might be much higher than anticipated relative to background. In any case, whether this proves to be an issue or not, care should be taken to compare likely lower background noise levels at night and consequent possible higher spreads between background and wind turbine generated sound at a time when annoyance may be the greatest. Stable atmospheric conditions at night when the difference between ground level wind and hub height wind speeds may be most pronounced should be modeled to examine noise impacts during periods of atmospheric stability. As our guidelines indicate, nighttime noise is perceived as more irritating and the use of correction factors for such periods is discussed as "Ld/n"

In section 3.7.2.2., it is stated that "...it would be incorrect and meaningless to compare the maximum turbine sound level, which requires high winds for it to occur, to the background sound level on a calm, quiet night." The Swedish study may indicate that this scenario may be approaches more closely than commonly thought.

On Need to More Closely Examine Point Source Assumption and In Phase Generation

The sound study provided by the applicant assumes that wind turbine generators (WTG) will act as a point source in generating sound. However, as WTG are commonly configured in a line, noise may not drop off as quickly as possibly assumed. It is not clear if this consideration is examined.

Furthermore, particularly at night, wind speeds may be relatively uniform and thus a synchronicity in the sound from various WTGs may result in an unexpected additive effect from an "in phase" generation of sound from the various WTGs. This is particularly the case since WTG blades are at most 60 degrees out of phase.

On Need to Consider Error Margins

Error is a component of any study. Some discussion is encouraged to focus on the likely degree of measurement and model error. An analysis should be included in the Final Environmental Impact Assessment to ensure that the results are not in danger of underestimating possible impacts. One possible source of error to discuss is the fact that sampling represented only several days and this may not represent atmospheric conditions common over the course of a year. Two other sources of error to consider are 1) the degree of uncertainty in the manufacturers' estimate of sound power for their wind generators and 2) the error associated with following the ISO 9613-2 modeling protocol.

CULTURAL RESOURCES

The applicant needs to complete any outstanding requests for cultural resource survey work that has been requested by OPRHP/Division for Historic Preservation so that our agency can appropriately assess potential impacts to historic/cultural/archaeological resources. The applicant needs to contact OPRHP directly and work closely with them to ensure protection of cultural resources.

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In conclusion, DEC appreciates the opportunity to comment on the DEIS for this project. We look forward to continuing to work with the Town of Denmark as Lead Agency throughout the remainder of the SEQR and permit review processes. If you have any questions or comments, please contact me at (518) 402-9150.

Sincerely,

Rudyard G Edick

Rudyard G. Edick
Project Manager

cc: Copenhagen Wind Farm LLC
edr Companies
A. Davis, DPS
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J. Bonafide, OPRHP
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P. Ambeau, DEC Reg 6
J. Drabicki, DEC Reg 6
DEC Review Team