Herpetological Assessment of Colebrook Wind Energy (BNE)Proposed Wind Turbine Sites, a.k.a. Colebrook North, Rock Hall Road, Colebrook, CT

Prepared for Vanasse, Hangen, and Brustlin in RE: CT Siting Council Petition 984

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Introduction:

At the request of Vanasse, Hangen, and Brustlin I conducted an evaluation of the subject parcel on April 12 and 29, 2011. The goals of my study were to determine the suitability of the wetlands on and immediately off site to support vernal pool obligate amphibians. Vernal pool obligate amphibians contribute significantly to the food chain and nutrient cycling of the forest ecosystem and require extensive areas of forested habitat surrounding their breeding sites (Calhoun and Klemens, 2002). In addition, one State-listed Special Concern vernal pool obligate amphibian, the Jefferson salamander (*Ambystoma jeffersonianum*), has been reported from North Colebrook (Klemens, 1993: 27; Bogart and Klemens, 1997). I also assessed the suitability of the watercourse habitats on site to support the State-listed Threatened spring salamander (*Gyrinophilus porphyriticus*). Within Connecticut, the spring salamander is restricted to the upland areas of the northwest and northeast uplands including Colebrook (Klemens, 1993:65). I also assessed the suitability of the site for any of Connecticut's listed amphibians and reptiles, including the smooth green snake (*Liochlorophis vernalis*) which has been reported from this general area of Colebrook (Klemens, 1993:245).

Methods:

Vernal pool amphibians were detected both by cover searching, as well as examination of wetland areas for egg masses and spermatophores (sperm packets deposited by male Ambystomid salamanders). Frogs were also detected by audible calls. Live-trapping along wetland edges was not conducted as no cryptic vernal pools were identified on the site or along the edges of the Mill Brook wetlands. Habitat suitability for spring salamanders was assessed by examination of seepages and watercourses to document perennial, cold, detritus rich systems seepage systems. Other species were assessed using the habitat descriptions contained in Klemens (1993) augmented by the investigator's knowledge of habitat types used by these species in the northwestern uplands of Connecticut.

Results (Vernal Pools):

No vernal pools were identified on the subject property. Wetland 1 encompasses Mill Brook and its various tributary seeps. Mill Brook (Wetland 1) opens into a large and diverse shrub swamp along the southeast boundary of the property. A single, developing wood frog (*Rana sylvatica*) egg mass was found off-site in a small flooded area in the woods south of the southeast boundary of the subject property, close to the edge of the Mill Brook marsh. It is anticipated that this species breeds within portions of the Mill Brook marsh that lie to the southeast of the subject property. The proposed project will not impact wetlands or significant upland habitat used by this species. Additional amphibian species that were recorded along the edges of the Mill Brook marsh included four-toed salamander

(*Hemidactylium scutatum*), redback salamander (*Plethodon cinereus*), red-spotted newt (*Notophthalmus viridescens*), spring peeper (*Pseudacris crucifer*), and green frog (*Rana clamitans*). None of these are State-listed species, and all are common and widespread with the exception of the four-toed salamander. There is excellent breeding habitat for this species in the wooded sphagnum tussock portion of the Mill Brook wetland along the southern property boundary where this specimen was found. Four-toed salamanders are secretive, but quite widely, albeit spottily, distributed in Connecticut, especially in the lower lying portions of the State. Klemens (1993: 69-70) noted that this species is quite rare in the higher elevations of western Connecticut. The discovery of this species at the 1220 foot elevation at the Colebrook North BNE/Mill Brook wetlands site is the highest known extant population in the State, possibly exceeded only by a vague historical reference from an unspecified location on Bear Mountain in Salisbury. The lack of open habitats in many areas, including northwestern Connecticut, has impeded recovery of this species. The proposed project will not affect this population of four-toed salamanders, however, it does underscore the diversity and importance of the large marsh and swamp that begins to develop along the southern boundary of the subject property extending onto the abutting property to the south.

Additional State-listed Species of Amphibians and Reptiles that May Occur on the or near the Colebrook North Site:

I have assessed the site to determine if any other State-listed species of amphibian or reptile could potentially occur on the site. The high elevation of the area precludes many species, however, there is habitat on and near the site for two State-listed Special concern snakes. The smooth green snake has been recorded by the NDDB in the general vicinity of the project site. Smooth snakes were once widely distributed in Connecticut, even occurring in vacant lots in New Britain and Hartford, and suffered a population crash in the 1950s because of the use of pesticides coupled with a loss of grassland habitats (Klemens, 1993: 244-248). The lack of open habitats in many areas, including northwestern Connecticut, has impeded recovery of this species. The proposed clearing activities (i.e., limits of disturbance) of the project do not impinge upon any areas that could be considered good habitat for either of these snakes. However, there are large areas of open grassy habitat associated with the edges of the Mill Brook marsh that could support this species as well as well as the eastern ribbon snake (*Thamnophis sauritus*) , another State-listed Special Concern species. Similar to the smooth green snake, the clearing resulting from the proposed project will actually enhance habitat for both of these species as they require unforested open habitats. While the ribbon snake requires wetland edges and wet meadows, the smooth green snake is equally at home in grassy wetlands as well as drier meadows

Western EcoSystems Technology, Inc. in their *Breeding Bird Survey- Final Report* noted an incidental observation of a leopard frog (*Rana pipiens*) ***on the Colebrook South site***. I believe that Mr. Klein mistakenly included this report from Colebrook South in his pre-file for Colebrook North. None-the-less, this species would not likely occur on Colebrook North for a variety of reasons. Leopard frogs are uncommon and localized in Connecticut, and are State-listed Special Concern species. They have no tolerance for the low pH levels anticipated (by the presence of sphagnum moss and hemlock) on site. The distribution of this species in Connecticut is limited to circum neutral water, with a pH of 6 or higher. Therefore, this species is restricted to the limestone valleys of western Connecticut, and the larger river basins of central Connecticut, where there is considerable buffering of the wetlands adjoining rivers such as the Farmington, Connecticut, Coginchaug, and Scantic rivers. A detailed discussion of leopard frog ecology and distribution in Connecticut can be found in Klemens, 1993: 134-140. I suspect that the report of a leopard frog from Colebrook South is a result of a misidentification of the common and widespread pickerel frog (*Rana palustris*). Upon casual observation is easy to mistake

a leopard frog for a pickerel frog, especially if not held in the hand to closely examine the dorsal patterning and under-leg coloration.

The wood turtle (*Clemmys (Glyptemys) insculpta*) is a State-listed Special Concern species that inhabits larger streams and rivers with deep pools and undercut stream banks, such as exist on the portion of Mill Brook upstream of the marsh, i.e., between Rock Hall Road and the marsh. Klemens (1993: 171) has recorded this species from the Mad River flood control area in nearby Winchester into which Mill Brook flows. The portion of Mill Brook upstream of its confluence with the marsh looks especially promising for this species, though none were detected. Wood turtles exist in small populations, and are very vulnerable to incidental take and road mortality. I am proposing the following set of protocols for construction and related work surrounding Turbine 1, the only part of the project site that could coincide with areas of wood turtle terrestrial activity. If these protocols are followed, they should prevent any incidental take of wood turtles during site clearing and construction of Turbine 1.

Wood Turtle Protection Program

The following is a methodological plan that will avoid unintentional mortality (take) of the wood turtle, a State-listed Special Concern species, as a result of construction activities for the site improvements proposed.

It is of the utmost importance that the contractor complies with the requirement for the installation of protective measures and the education of employees and subcontractors performing work on the project site if work will occur during the wood turtle's terrestrially active period (April 1 to November 1). A third party environmental monitor for this project should be hired to ensure that these measures are implemented properly. The contractor shall contact the environmental monitor for a pre-construction meeting.

The proposed wood turtle protection program consists of several components: isolation of the project perimeter; periodic inspection and maintenance of isolation structures; education of all contractors and sub-contractors prior to initiation of work on the site; protective measures; and, reporting.

1. **Isolation Measures**
   a. Installation of conventional silt fencing, which will also serve as an isolation of the work zone from surrounding areas and required for erosion control compliance, shall be performed by the Contractor prior to any earthwork. A third party environmental monitor will inspect the work zone area prior to and following barrier installation to ensure the area is free of wood turtles.

   b. The fencing will consist of conventional erosion control woven fabric, installed approximately six inches below surface grade using a Ditch-Witch or similar machine and staked at seven to ten-foot intervals using four-foot oak stakes or approved equivalent. In addition to required daily inspection by the Contractor, the fencing will be inspected for tears or breeches in the fabric following installation and at approximately one-week intervals or after storm events of 0.5 inch or greater by the third party environmental monitor. Inspections will be conducted by the third party environmental monitor throughout the course of the construction project.

   c. Weekly inspection reports (brief narrative and applicable photos) will be submitted to the Connecticut Siting Council for compliance verification. Any observations of wood turtle will be reported to the Connecticut Department of Environmental Protection Wildlife Division.

   d. The extent of the barrier fencing will be as shown on the site plans.

   e. No equipment, vehicles or construction materials shall be stored outside of barrier fencing.

2. **Contractor Education**
   a. Prior to work on site, the Contractor shall attend an educational session at the pre-construction meeting with the third party environmental monitor. This orientation and educational session will consist of an introductory session with photos stressing the non-aggressive nature of wood turtles, the absence of need to destroy animals that might be encountered, the importance of adult survivorship to the population, and the need to follow Protective Measures as described in Section 3.

b. Also stressed in the education session will be means to discriminate between the species of concern and other native species to avoid unnecessary, “false alarms”.

c. The Contractor will be provided with cell phone and email contacts for the third party environmental monitor to immediately report any encounters with Wood Turtle. Illustrated poster materials will beposted on the job site to maintain worker awareness as the season progresses.

3. **Protective Measures**
   a. Prior to the start of construction each day, the Contractor shall search the entire work area for wood turtles.

   b. If a turtle is found, it should be carefully grasped in both hands, one on each side of the shell, between the turtle’s forelimbs and the hind limbs, and placed just outside of the isolation barrier in the approximate direction it was heading.

   c. Special care shall be taken by the Contractor during early morning and evening hours so that possible basking or foraging turtles are not harmed by construction activities.

4. **Reporting**
   a. Following completion of the construction project, the third party environmental monitor will provide a summary report to CTDEP documenting the monitoring and maintenance of the barrier fence.

   b. Any observations of wood turtle will be reported to CTDEP by the third party environmental monitor with photo-documentation (if possible) and with specific information on the size, sex, location and disposition of the animal and any other data that DEP may require to be collected

The Wood Turtle protection program detailed above will adequately protect this Special Concern species in the unlikely event that this species is encountered on the subject property during construction activities. With adherence to these protective measures, BNE's proposed development at this property will not have an adverse affect on the wood turtle.

Results/Discussion (Spring Salamander):

Wetland 1 (Mill Brook) is fed by seepage wetlands. The most extensive areas of habitat are on the northern portion of the site and need to be crossed to access Turbines 2 and 3. These areas appear suitable for spring salamanders and both dusky salamanders (*Desmognathus fuscus*) and two-lined salamanders (*Eurcyea bislineata*) were found in these hillside seepage areas. These smaller salamanders are key prey items for spring salamanders, and in the case of the dusky salamander, indicate high quality seepage areas. Dusky salamanders were especially abundant at WF(Wetland Flag) 1-249 and WF 1-368. Dusky salamanders are an indicator of streams able to support spring salamanders. Forest clearing around these seepage areas should be minimized, and the loss of hemlock especially avoided. In order to avoid impacts to this hillside seepage area, I have suggested that the roadway be re-routed about 40 feet upslope onto an old woods road that is relatively level and dry and already has a relatively open canopy of young deciduous trees. This will avoid placing the road and clearing across high quality seepage areas by making use of an abandoned, old, built-up roadbed that already has had the seepage areas around it channelized. This realignment will reduce considerably the loss of mature hemlocks that shade the seepage area where to road was previously aligned through. I met with Curtis Jones of Civil 1 late in the afternoon of April 29th to discuss with him in the field the relocation of the road to protect this potential spring salamander habitat. I also would suggest that the clearing for stormwater basins alongside the road be minimized/eliminated to the maximum extent practical. I believe that Mr. Jones will discuss these plan modifications in his continued testimony before the Siting Council. I am appending to this report two photographs illustrating the road realignment that I am proposing.

I examined both Wetlands 2 and 3 as they are located near areas that are/were proposed for turbine location. Wetland 2 (adjacent to Turbine 3) does not pool water and is not a vernal pool, and has limited value for wildlife. Wetland 3 located near the previous location for Turbine 1 is a much lower quality intermittent watercourse and associated wetland that does not appear to have sufficient water year round to support stream salamanders.

One incidental bird observation was made during my survey. A barred owl (*Strix varia*) was heard calling (from Rock Hall Road) late in the afternoon (ca. 4 PM) from the Mill Brook wetland system to the east on April 29th.

Conclusions:

I have examined the various site plans submitted to the Siting Council by BNE and have concluded that there will be no adverse impacts to the State-listed amphibians and reptiles discussed in this report from the proposed activities of Wind Colebrook North provided that my recommendations for impact avoidance and project management are followed as outlined in this report. In the case of the smooth green snake, I would anticipate that the project, with the maintenance of the open areas as indicated in this report, will result in a net benefit to this species by the creation of a significant new area of prime habitat. The Mill Brook wetland system has exceptional values for wildlife and other ecological functions. I would suggest that BNE explore options of placing that portion of the site into a conservation easement to ensure long term protection of the stream and its marsh and wooded swamp. I look forward to addressing any additional questions that the Siting Council and other parties may have concerning these issues.

Literature Cited:

Bogart, J. P. and M. W. Klemens. 1997. **Hybrids and genetic interactions of mole salamanders *(Ambystoma jeffersonianum* and *A. laterale*) (Amphibia: Caudata) in New York and New England**. American Museum Novitates 3218, pp. 78., 8 figs., 16 tabs.

Calhoun, A. J. K. and M. W. Klemens. 2002. **Best Development Practices (BDPs) for Conserving Pool-breeding Amphibians in Residential and Commercial Developments.** MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY.

Klemens, M. W. 1993. **The Amphibians and Reptiles of Connecticut and Adjacent Regions.** Conn. Geol. Nat. Hist. Surv. Bulletin 112:1-318 + 32 plates.

Attachments:

Two photographs illustrating habitat in the area of the proposed road realignment.

PHOTO DOCUMENTATION
Herpetological Assessment of Colebrook North Wind Generating Project
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Photo 1: Proposed new watercourse crossing looking south (blue flagging tape marks approximate road center, watercourse is between two flags). This route corresponds to an abandoned woods road which is evidenced by a lack of mature trees, level grade and stones marking the edge of historic fill. The clearing limits associated with the original crossing location are immediately to the right of photo.

Photo 2: Proposed new watercourse crossing looking north. Intermittent watercourse is in center of photo. The watercourse is conveyed within a narrow, clearly defined channel at this location.