STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

April 6, 2011

Robert Stein, Chairman
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

RE: 4.8 MW Wind Turbine Generating Project
BNE Energy, Inc.
Wind Colebrook South
Colebrook, Connecticut
Petition No. 983

Dear Chairman Stein:

Staff of this department have reviewed the above-referenced Petition for a Declaratory Ruling and have visited the proposed site for this facility. Based on these evaluations, the following comments are offered to the Council for your use in this proceeding.

BNE Energy, Inc. proposes to construct and operate three 1.6 MW wind turbines on a 79 acre site west of Flagg Hill Road and south of US-44 in the southwestern portion of Colebrook. This proposed facility would be one of the first commercial wind generation facilities in Connecticut. As the proposal at hand is a new technology for Connecticut and specifically for the Council, your initiative to secure independent expertise in the form of Epsilon Associates, Inc. to assist in evaluating this project was a wise decision which will benefit all parties and stakeholders in this proceeding.

Page 11 of Volume I of the Petition provides a quantification of the reductions in the emissions of nitrogen oxides, sulfur oxides and carbon dioxide postulated to result from the operation of the two proposed turbines based on the use of fossil fuel generation as the source of the electricity displaced by the output of the turbines. While it is entirely reasonable and justified to expect emissions reductions to result from the operation of these turbines as opposed to alternate sources of generation in their absence, experience has shown that it is very difficult to predict exactly which existing sources of generation would be displaced by any new source and, therefore, what the resultant emissions reductions would be. Nevertheless, a non-emitting source of electricity will result in emissions reductions over time as virtually every competing source of replacement power will yield emissions, and many of the generation units that would be called upon at the margins are older, less efficient and higher emitting units.

Site Description

The proposed host site for the Wind Colebrook South project is a 79 acre parcel in the extreme southwestern corner of Colebrook, southwest of US-44. The property is almost completely forested, with the two principal non-forested areas being the clearing for the meteorological tower at the high point of the parcel, and the beaver dam-impounded pond in the interior of the property.

Turbine site 3, in the northwestern corner of the BNE parcel, is essentially flat. The larger trees in the area of Turbine 3 are sugar maple and white pine, with black cherry, black birch and beech also present, and an understory of mountain laurel. No homes or structures are visible from the Turbine 3 site. Evidence of previous logging activity in the area is seen in stumps and slash. Noise from traffic on US-44 is barely perceptible at the site.

Turbine site 2 was not marked in any way at the time of the first DEP site review on March 15 but was located more precisely on March 19 when a sign was placed at the site. Site 2 is a moderately sloped area of white pine and red maple with smaller beech and a mountain laurel understory.

The access road crossing of the wetland between turbine sites 2 and 3 is an area of forested wetland which is not noticeably different from the surrounding forest in its vegetation except for possessing more hemlocks. The remnant of the old logging road referred to in the Petition as crossing the wetland at this location was not discernable under the snow cover at the March 15 site visit. It was discernable at the latter site visit but was not conspicuous in nature due to vegetation and leaf litter which have taken hold since the time this road was actively used.

Turbine site 1, in the southern portion of the BNE parcel, exhibits a moderate slope to the west, toward the beaver pond wetland. Evidence of previous logging activity is apparent at the site. Black birch dominates the existing forest cover, with small white pine and a denser mountain laurel understory than at the northern turbine sites 2 and 3. As with the other turbine sites, no homes or structures are seen from this site. No traffic noise from US-44 is heard.

The existing access road from Flagg Hill road to the area of the meteorological tower is not proposed to be used to access the Colebrook South turbines. Rather, a new road from the vicinity of the driveway at 17 Flagg Hill Road and then winding around the eastern side of the hill is proposed to lessen the grades and curvature of the access alignment as compared to the existing driveway. The proposed new route will, however, require a greater volume of cuts and fills due to the alignment wrapping around the sideslopes of the hill which are, in parts, steeply sloped.

As mentioned in our Petition 984 comments, it would be helpful in field locating turbine sites if any future petitions contained photos of the proposed turbine sites from several directions. In situations where the turbine sites have not yet been staked or signed, or when snow cover hides any stakes which mark turbine sites, such photos would be very useful.

Visual Impacts and Project Scale

Approximately fourteen homes plus one foundation of another home possibly under construction are located along Flagg Hill Road. The closest of these homes to any of the proposed turbine sites is the home at 17 Flagg Hill Road which is owned by the applicant. The next closest home is that at 29A Flagg Hill Road, which shares the existing access driveway to the BNE property and is just slightly over 1,000 feet from both Turbines 1 and 2. The third closest home appears to be 1,200 feet from Turbine 2. Turbine 2, which is the closest one to US-44, is over 1,700 feet from the nearest homes on that road. In general, the Colebrook South site is more isolated from the residences than the Colebrook North site.

As mentioned for the Colebrook North project in our Petition 984 comments, in Exhibit J, for site line 5 from the lookout tower at Haystack Mountain State Park, the Colebrook South turbines would be easily visible at a distance of slightly over four miles. As the Colebrook North turbines would be similarly visible from Haystack Mountain at approximately the same distance, a simulation showing all six turbines from that vantage point would be useful. While DEP would, in an ideal world, prefer to keep the view from the Haystack Mountain lookout tower as undeveloped as possible, the visibility of the turbines from a distance of over four miles does not change the overall richness of the view from that vantage point.

On a related note, should the Council ultimately approve the BNE Energy petition, DEP requests that the Council require the applicant to submit post-construction photos of the actual Colebrook South turbines from the same vantage points as the six sight lines in Exhibit J to verify the accuracy of the visual modeling techniques, given that a balloon float was not employed for the visual analysis.

As DEP noted in our Petition 980 comments on BNE's Prospect facility, the Council has a challenging responsibility to strike an appropriate balance between the scale and aesthetic impact of the proposed turbines and the public policy and environmental benefits of developing clean alternative energy facilities. As a densely populated state, there are no locations in Connecticut which are miles from neighboring land uses, including residences. Some level of impact upon neighboring properties cannot be avoided in the siting of facilities such as that proposed in this petition. The critical considerations are whether, after all appropriate siting optimization and mitigation measures are incorporated, the level of impact is tolerable and justified, and whether the scale of the facility is appropriate. DEP is confident that the Council will be very deliberate and diligent in determining if the impacts at hand are appropriate and acceptable.

Acoustic Bat Survey – Exhibit K

It is not possible to provide accurate conclusions on the acoustic bat survey without the final report and additional survey data that spans the migratory period for tree bat species, the group of bats most likely to be negatively impacted by turbines. This final report is not available at the time these comments are being submitted.

In general, the methods and process used in the bat survey were appropriate, but a few modifications would have improved the results. The Interim Report indicates that the purpose of the survey was to document activity during the maternity season and yet goes on to note that

most strike hazards from turbines to bats occur during the migratory period for red and hoary bats. Both species were documented in the project area and the report indicated their use of the area could be greater than reported due to degradation in the calls recorded. Both red and hoary bats are listed as species of special concern under the Connecticut Endangered Species Act and have been noted as species of regional conservation concern. The report indicates that anticipated fatality rates are low to moderate, yet again notes that the real rate could be higher due to the sampling issue previously discussed. It is possible that placement of Anabat detectors at a higher position within the forest canopy may have increased the quality and detection rate of hoary bats in particular. This species forages at the top of the forest canopy and can be very difficult to sample accurately. It is also the species most often negatively impacted by turbines. The interim report indicated that numbers for red and hoary bats increased in late August which is consistent with migratory movements of these species, and suggested that site use during migration should be better evaluated. Without the final report, it is impossible to determine if this assessment was completed.

The start date used for the "maternity" surveys is a bit later than ideal for our area. (The vast majority of our bats give birth in late May and early June.) The interim report indicates that the project is not in the vicinity of known maternity colonies. What the report does not mention is that the project area is not far from several known large hibernacula locations. This increases the likelihood that cave bats heading for over-wintering sites are more likely to be moving through this area in large numbers at certain times of the year. This has the potential to increase the risk of mortality associated with turbine operation. Again, the level of risk cannot be accurately evaluated without additional data.

Based solely on the interim report, it appears that negative impacts to some of these species are likely. At a minimum, post-construction monitoring should be completed to document any mortality and allow for adaptive management if possible. Ideally, funding for post-construction monitoring preferably conducted by an experienced in-state academic institution should be provided. If multiple turbine projects are permitted by the Siting Council, similar work could be conducted at other locations as part of one large project. Minimally, the DEP Wildlife Division should be given permission to access the site to search for bat carcasses. The design of the post-construction monitoring studies and the qualifications of the entity doing that work should be coordinated with Jenny Dickson of the DEP Wildlife Division who can be reached at (860) 424-3494.

As a minor note, there appears to be an error in the listed hoary bat activity period as described in page 11 ("...between August 27 and August 3.")

Breeding Bird Surveys – Exhibit L

The survey period reported (June 29, July 6 and July 15) is not ideal for an accurate estimate of breeding birds, especially for species using heavily forested areas. By these dates, many of our nesting species are calling for greatly limited time periods or using call and chip notes, making accurate species identification extremely challenging. In addition, the survey period of 5 minutes is too short to adjust for this reduced level of calling activity. No information was provided to assess the skill level of the observers to determine their ability to detect or identify birds not completing full calls or songs. A notation of 46 unidentified passerines confirms that identification during this timeframe was challenging. The report

indicates that no sensitive species were recorded. Despite the late timing of the surveys and based on the species list provided, we do not anticipate significant negative impacts to these species by the proposed project. However, it is important to recognize that, due to the late survey period, species of regional conservation interest could occur in the vicinity of the project and may not have been documented.

Natural Diversity Data Base Listed Species

Great St. John's-wort (*Hypericum ascyron)*, a State Species of Special Concern, was identified from the Natural Diversity Data Base as occurring in the area of the Colebrook South project. As the more precise location of this plant is east of the project site, across Flagg Hill Road, it is not envisioned to be impacted by the activities at the Colebrook South site.

Watercourse Crossings

The wetland and watercourse crossing by the access road in the area between Turbines 2 and 3 is at a much flatter and lower velocity location than the watercourse crossings at Colebrook North, particularly as compared to the larger of the crossed watercourses at Colebrook North. Unlike Petition 984, this petition does not specify the type of crossing structure to be used at this location. DEP recommends that a structure which allows retention of the natural stream substrate be used. Whether this is a 3-sided culvert or a larger pipe which is recessed below the stream bed elevation to allow for streambed sediments to establish a natural bottom within the pipe, a crossing structure which allows for as natural of a stream bottom as possible is preferred. As at Colebrook North, a construction window of June 1 to September 30 consistent with the DEP Stream Crossing Guidelines should be specified to take advantage of seasonal low flow conditions.

Upland Meadow Vegetative Treatment

Sheets C-314 and C-315 of Exhibit F contains some specifications for upland meadow creation and a planting schedule for the areas so noted in cross-hatching on the site plan. The larger blocks of upland meadow creation include the blade assembly areas at the turbine sites. As a general rule, it is preferable to minimize the extent of breaks in the forest canopy. Therefore, if the blade assembly areas or other portions of the areas designated for upland meadow creation do not require permanent maintenance in a grassed, open state, these areas should be allowed to naturally revert to forest. Any supplemental plantings should be made with native shrubs.

For those areas that do require maintenance in an open state, native grasses should be favored in the seed mix. If site conditions are suitable, warm season grasses such as little blue stem and Indian grass would be a preferred alternative. These grasses often grow better in areas of limited topsoil and provide additional benefits to native wildlife species. Additional information on establishing and maintaining grasslands and other early successional habitats can be found on the DEP web site as follows: http://www.ct.gov/dep/cwp/view.asp?a=2723&q=325732&depNav_GID=1655. The minimization or avoidance of supplementing the on-site topsoil will reduce chances for invasive species to be introduced to the site via off-site soils. It also reduces the opportunity for such species to access the site on machinery. The Council should require that the disturbed sites be monitored for invasive species and that such species be removed as necessary for a period of at least three years.

Lastly, the applicant is commended for adding specification no. 5 under the upland meadow creation section. Too often erosion control barriers are not removed from the site after the affected areas have been planted and stabilized. It is beneficial to get barrier materials, which can often include plastic sheeting, off the site as soon as practical.

Miscellaneous Petition Commentary

As additional wind projects are submitted for the review of the Siting Council, DEP believes that the process of evaluating and siting wind turbines would be assisted by having regulations in place for these facilities. Regulations providing guidance as to setbacks from property lines and residences, noise levels, flicker effect and other pertinent parameters would add consistency and predictability to the process, but should also include flexibility to address site-specific concerns.

In common with Petition 984, page 3 of this Petition refers to the project's location in Litchfield County which it cites as one of the most constrained capacity areas in New England. Studies submitted in connection with previous transmission and generation project applications to the Council have documented that the Southwestern Connecticut demand region (SWCT), along with the Boston metro region, are the most constrained capacity areas in New England. The SWCT region encompasses roughly the southwestern quadrant of Connecticut but does not include Litchfield County. A similar statement on page 3 of Petition 980 for Prospect is accurate for that project because of Prospect's location within the SWCT region, but this statement is not accurate for Colebrook.

Plan C-100 of Exhibit F shows a future support, maintenance and educational building to be sited near the area of the meteorological tower clearing. The Petition does not indicate when the applicant proposes to construct this building. As this structure would be served by an on-site septic system, local approval of the septic system would be required from the Farmington Valley Health District, 50 Avon Meadow Road, Avon, 06001. The district can also be reached at (860) 676-1953.

Table 3 on page 6 of Exhibit M indicates that there are other turbine models which could potentially have higher annual energy yields than the proposed General Electric 1.6 MW turbines proposed while having lower hub heights and blade tip heights. If it has not already done so, the Council should inquire as to the rationale for the selection of the GE model turbines over other turbine models. Also, on page 10 of the same exhibit, the methodology cited in the wind speed analysis indicates that, where there were gaps in the wind speed data from the meteorological tower due to anemometer failure or other reasons, data from the Prospect meteorological tower was used for that time period. The value of using Prospect data for a wind analysis in Colebrook, with a distance of 35 miles between those sites, seems questionable.

Though it may be correct, the data on Table 3 of the Noise Report (Exh. M) indicates that the background noise levels at the Flagg Hill Road sound receptor location recorded higher background levels of noise at night than during the day (38dBA vs. 37dBA). The Council may wish to verify that this finding is correct.

Page 5 of the Visual Analysis, Exhibit J, indicates that 19 residential properties within one mile of the turbines would have at least partial views of the turbine hubs during leaf-on conditions, while 18 residential properties within one mile would have views of the turbines hubs during leaf-off conditions. This seems unlikely. Also concerning the Visual Analysis, there is a discrepancy between the text on page 4 which says that a 50mm lines was used for views 1, 3 and 5 and a 24mm lens was used for views 2 and 4, and the notations below the photos for those sight lines which indicate exactly the opposite lens use.

Another slight discrepancy involves the area of site disturbance which is given as 11.34 acres in Volume I (p. 31) and as 10.75 acres in Exhibits G (p. 2-1) and H (also p. 2-1).

Based on the scale and turbine locations shown on the wetlands resource map in Exhibit I, the fall zones for Turbines 1 and 3 would extend off the host property based on hub height, while this would also apply to Turbine 2 if blade height is considered. While no residences are located within these distances, are any easements or other rights necessary given the turbine heights relative to the setbacks?

The Petition states (Exh. I, p. 17) that the proximity of adjacent habitat similar to that at the turbine sites will allow for wildlife species to relocate off-site to avoid construction-related noise and disturbance. While this may be the case, if the surrounding habitat areas are already at their carrying capacities for any given species, resident species on the project site would not be able to relocate without stressing either themselves or individuals in the adjacent areas. Thus, while the statement on page 17 may be correct, such assumptions cannot be made in a blanket fashion for all species in all similar situations.

Thank you for the opportunity to review this petition and to submit these comments to the Council. Should you, other Council members or Council staff have any questions, please feel free to call me at (860) 424-4110.

Respectfully yours,

Frederick L. Riese

Frederick L. Riese
Senior Environmental Analyst

cc: Daniel C. Esty, Commissioner