STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Petition of BNE Energy Inc. for a Declaratory Ruling for the Location, Construction and Operation of a 3.2 MW Wind Renewable Generating Project on New Haven Road in Prospect, Connecticut ("Wind Prospect")

Petition No. 980

March 8, 2011

SUPPLEMENTAL PRE-FILED TESTIMONY OF MICHAEL LIBERTINE, LEP

Q1. What is the purpose of your supplemental testimony?

A. The purpose of my supplemental testimony is to provide information regarding the former U.S. Cap and Jacket property and a photo-simulation submitted by interveners.

Q2. Please summarize your understanding of subsurface conditions at the former U.S. Cap and Jacket property.

A. VHB reviewed a Brownfield Targeted Site Assessment ("BTSA") report, dated April 2003, prepared by Tetra Tech NUS, Inc. for the abutting industrial property that lies east of the BNE Energy, Inc. ("BNE") project site, at 214 New Haven Road (Route 69). The parcel is approximately 5 acres in size and is currently vacant. According to information contained in the BTSA report, the former on-site building was developed in 1961 and occupied approximately 21,116 square feet of the parcel. Former manufacturing operations included the use of degreasing fluids and generation of waste solvents and waste oils. Releases of contaminants to the site's septic system, soil and water are documented in Connecticut Department of Environmental Protection ("CTDEP") records. Remedial actions initiated by the U.S. Environmental Protection Agency ("EPA) included the removal of several underground and above ground storage tanks, oil-water separator, and contaminated (with volatile organic compounds) soil. Impacts to groundwater at the former U.S. Cap and Jacket site were documented as having extended to the underlying bedrock aquifer and migrating off-site towards the northeast. No information beyond the 2003 report was found at the CTDEP.

Q3. What is your opinion regarding conditions at the abutting industrial property and their affects on the project site?

A. Based on the abutting property's location with respect to the project site, I do not have significant concerns about contamination impacting the project site nor do I feel that project development activities will have an influence on underlying contamination at the former U.S. Cap and Jacket property. The industrial parcel lies on the east side of a broad drumlin that includes the project site. Planned project activities would occur generally on the west side of this drumlin, with a high point physically separating the turbine locations from the industrial parcel. Groundwater flow from the former manufacturing site flows generally northeastward, away from

the project site. I am aware that concern has been raised about blasting at the project site and its potential impacts to the underlying subsurface geology, most notably the possibility of bedrock fracturing which could conceivably create a preferential pathway for contamination. Publicly available geologic information indicates that the drumlin is overlain by a thick, dense till layer that may extend anywhere from 30 to 60 feet beneath the ground surface before interfacing with bedrock (consisting of gneiss and schist). The BTSA report documents similar subsurface information for the area. It is my understanding from conversations with the site engineers that excavations associated with the proposed development would not extend to depths that are likely to encounter bedrock, thereby negating any need for blasting. As a result, I do not believe subsurface contamination at the adjoining property raises concerns for the project.

The project would include a potable well which will be drilled on-site and withdraw water from the bedrock aquifer. The well water will be directed to a restroom that will be used periodically by site personnel and in all likelihood represents significantly less use than a typical single-family residence. The minimal use of the well suggests that draw down from the bedrock aquifer will be minimal and should not have an influence on the contaminant migration.

It is my understanding that BNE will undertake geotechnical investigations upon approval, and the results of these investigations will be submitted to the CSC before construction commences. If for some reason blasting is anticipated, a blasting plan will be required and submitted to the CSC for review and approval.

Q4. Have you reviewed the photo-simulation prepared by Andrey Kamenskiy submitted February 15, 2011?

A. Yes, I have seen the photo-simulation.

Q5. Do you believe it to be an accurate representation of the proposed development?

A. No. I believe the size and scale of the turbine is exaggerated in the photograph. I cannot speak to Mr. Kamenskiy's methodology because it is not explicitly stated in his pre-file testimony; however, it appears that the size of the proposed structure was based solely on the size of the existing met tower while not fully taking into consideration a three-dimensional space. Factors that appear to be neglected include: the ground elevation of the existing met tower 808 feet ASML); the actual height of the met tower (197 feet above grade); distance between the two features (over 350 feet); and their relationships to one another.

VHB took the liberty of using Mr. Kamenskiy's photograph and preparing a photo-simulation that incorporated the following factors:

- Based on existing features in the photograph, we determined its location in a geo-referenced three-dimensional space.
- Scale, locations and ground elevations of existing elements in the photograph were modeled and spatially referenced in the digital three-dimensional space and used as control points. There features included the existing 152-foot tall lattice tower (800 feet ASML); the existing 160-foot tall cell tower (802 feet ASML); and, the existing 197-foot

tall meteorological tower (808 feet ASML). Tower heights were obtained from the Connecticut Siting Council's Database (dated March 2010). The existing ground elevation contours were obtained from the 2010 Connecticut LiDAR-based digital elevation data.

- The turbine in VHB's simulation was modeled at 492 feet (150 meters) in height to the tip of blade.

The VHB photo-simulation is attached hereto as Exhibit 1. As can be seen, VHB has determined that the scale of Mr. Kamenskiy's photo-simulation appears to at least double the actual size of the proposed turbine.

Q6. The Visual Resource Evaluation Report in BNE's Petition at Exhibit J presents the estimated visibility of the proposed turbines using 100-meter blade diameters. Did VHB evaluate visibility of the proposed turbines with 82.5-meter blade diameters? What, if any, differences in visibility would result from using the shorter length blades?

A. Yes. VHB modeled the turbines using 82.5-meter blade diameters to estimate the visibility of the turbines within a 5-mile study area. In comparing the results of 100-meter versus 82.5-meter blade lengths, year-round visibility of the blades above the tree canopy drops from approximately 347 acres to approximately 313 acres. As might be expected, the most notable difference when shortening the blade lengths is that areas of predicted blade visibility are slightly reduced. This information is presented in BNE's Responses to Interrogatories, Set Four, dated March 8, 2011 (Question 53).

Q7. Has VHB evaluated the potential visibility of the proposed turbines on points of interest located beyond 5 miles from the project site?

A. Yes. VHB identified areas that may have some visibility of the project. These are included in the attached table, Areas of Interest (Exhibit 3).

Q8. Has VHB evaluated the difference, if any, between the use of 100-meter versus 82.5-meter blade diameters as it relates to shadow flicker? If so, please provide a summary of these results.

A. Yes. Incorporating the revised location for the northernmost turbine, VHB used the SHADOW module of the WindPRO software to evaluate potential shadow flicker at receptor locations within the 2,000-meter Study Area. The shift in turbine location reduces the total number of receptors down from 860 to 840. The same parameters and assumptions discussed in VHB's February 2011 Shadow Flicker Analysis were used in this evaluation. If 100-meter diameter blades are used, a total of 93 receptors are predicted to have some shadow flicker occurrences. Annual durations of shadow flicker range from an approximate low of 9 minutes per year up to nearly 33 minutes. Four receptor locations on Route 69 (New Haven Road) could slightly exceed 30 hours annually, including two residential structures located at 177 New Haven Road, one residential structure at 213 New Haven Road, and the commercial office building located at 207 New Haven Road.

When employing 82.5-meter blade diameters, a total of 77 receptors a predicted to have some shadow flicker occurrences. Annual durations of shadow flicker range from an approximate low of 14 minutes per year up to nearly 25 minutes. No receptor locations are predicted to exceed 30 hours annually.

Shadow flicker results for both blade lengths are presented in the attached tables and depicted on the accompanying figures under Exhibit 2.

Please note that the February Shadow Flicker Analyses, which included the originally-proposed location of the northernmost turbine, was conducted at the 82-meter diameter blade length. There was a typographical error in the report indicating that the analysis was conducted at the 100-meter diameter blade length.

Q9. Can you please describe the methodology used in calculating potential shadow flicker effects on the receptor locations discussed in the Shadow Flicker Analysis?

A. VHB ran the Greenhouse mode in the SHADOW module of WindPRO software. Greenhouse sensors can see in all directions. One way to visualize this is to think of each receptor as a glass house; if you were in the house, you would see a shadow from a blade regardless of what direction it was coming from. Another way to think of it is as a glass dome sitting on top of the house. Shadows will not be blocked at all by the building under this scenario. That said, it is evident that the analysis was conducted using a scenario that does not exist at the receptor locations.

It is also noteworthy to comment on the use of this software tool. WindPRO is the only commercially-available, reliable software program that VHB is aware of that is specifically designed to model shadow flicker phenomena. It is used throughout the world in assessing wind projects. Once the decision was made to purchase this software, VHB sent personnel to a week-long WindPRO-sponsored training seminar to ensure a proper understanding of the software and its components.

The statements above are true and accurate to the best of my knowledge.

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Date

Michael P. Libertine

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EXHIBIT 1

Due to the size of this document, an electronic version will be filed with the Siting Council on disk.

EXHIBIT 2

Points of Interest

Location	Elevation	Distance	Comment
Mt. Higby	892 Ft. AMSL	± 13.1-Miles	Exposed W/SW views along Mt. Higby ridgeline; Mattabasett Trail
Guiffrida Park	680 Ft. AMSL	± 12.5-Miles	Ledge with exposed W/SW views
Hubbard Park East Peak	976 Ft. AMSL	± 8.9-Miles	Ledge with exposed W/SW views; Metacomet Trail
Hubbard Park West Peak	1024 Ft. AMSL	± 9.0-Miles	Ledge with exposed W/SW views; Metacomet Trail
Mattatuck SF Whitestone Cliffs Trail	750 Ft. AMSL	± 11.1-Miles	High point with southern portion of Mattatuck SF
Sleeping Giant State Lookout Tower	739 Ft. AMSL	± 5.1-Miles	Open views from tower; views to turbines may be obstructed by vegetation adjacent to tower
Sleeping Giant State Park Left Knee	700 Ft. AMSL	± 5.3-Miles	High point in eastern portion of the park; some NW views
West Rock Ridge State Park	490 Ft. AMSL	± 8.0-Miles	Ledge with exposed W/NW views
West Rock Ridge State Park	602 Ft. AMSL	± 6.3-Miles	Ledge with exposed W/NW views
York Mountain	680 Ft. AMSL	± 4.9-Miles	High point to the SE of site, no trails or info
Beacon Cap	770 Ft. AMSL	± 1.6-Miles	Exposed NE views, turbines should be visible from this location
Andrews Hill	870 Ft. AMSL	± 6.2-Miles	High point to the NW of site, no trails or info
***784 Ft. AMSL**	784 Ft. AMSL	± 5.8-Miles	High point within western Naugatuck SF; no identified vista in Walk Book
Beacon Hill	670 Ft. AMSL	± 3.5-Miles	High point located west of Beacon Capp
High Rock	664 Ft. AMSL	± 4.5-Miles	Exposed W/SW views away from turbines
***724 Ft. AMSL**	724 Ft. AMSL	± 3.7-Miles	High point NW of site, no trails or info
Mt. Sanford	890 Ft. AMSL	± 1.3-Miles	High point within far eastern portion of Naugatuck SF; close to site, would anticipate some limited seasonal views; walk book doesn't indicate a vista
Southington Mountain	950 Ft. AMSL	± 9.6-Miles	Southington Mountain Ski Area
***1003 Ft. AMSL**	1003 Ft. AMSL	± 10.1-Miles	High point to the NE of site, no trails or info
***850 Ft. AMSL**	850 Ft. AMSL	± 7.3-Miles	High point to the NE of site, no trails or info
Bald Hill	680 Ft. AMSL	± 6.1-Miles	High point to the NW of site, no trails or info
***854 Ft. AMSL**	854 Ft. AMSL	± 2.0-Miles	High point to the N of site, no trails or info
***1000 Ft. AMSL**	1000 Ft. AMSL	± 10.1-Miles	High point along Route 69 to the N of site
***845 Ft. AMSL**	845 Ft. AMSL	± 8.8-Miles	High point to the N of site, no trails or info
***750 Ft. AMSL**	750 Ft. AMSL	± 8.2-Miles	High point along I-84 to the NW of site
***950 Ft. AMSL**	950 Ft. AMSL	± 9.5-Miles	High point to the NW of site, no trails or info

***Unnamed hills/locations with 10 miles of proposed turbines**

EXHIBIT 3

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