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 28, 2011

SECOND SUPPLEMENTAL PRE-FILED TESTIMONY OF WILLIAM F. CARBONI

Q39. You have previously filed testimony in this proceeding and supplemental testimony. Why are you submitting this second supplemental testimony?

A39. On March 8, 2011, BNE Energy Inc. ("BNE") submitted supplemental testimony of Melvin Cline, which attached a whole new set of site plans, a new stormwater management plan and a new erosion control plan. These additions were Exhibits F, G and H to BNE's original petition. Those three exhibits appear to have been replaced, although I learned while at the evidentiary hearing on this matter on March 15, 2011 that BNE considers these to be "alternative" plans.

I am submitting this additional pre-filed testimony to provide the Council with an analysis of the stormwater and erosion impact of the proposed project on the Site under BNE's new "alternative."

Q40. Have you reviewed the site plans submitted by BNE on March 8, 2011, that Melvin Cline calls "revised site plans" in his testimony?

A40. Yes, I have.

Q41. Has your opinion that this project fails to comply with water quality standards changed as a result of your review of the revised site plans?

A41. No. The revised site plans make changes that improve the project and clearly demonstrate that the original plans (the proposed plan) are deficient. These revised plans show that the proposed project will result in the pollution of the waters of the State. Although the new plans will reduce the impact of some of the activities on the site, they suffer from many of the deficiencies and errors I noted in my pre-filed testimony. The plans still fail to comply with the water quality standards of the State.

Q42. What concerns do you have about the revised site plans?

A42. My primary concern continues to be slope stabilization. Although much improved, there still remain aspects of the grading that I believe could be unstable. The grading still does not comply with the 2002 Guidelines and could result in the erosion and sedimentation.

Again, good engineering practice is to use slopes of 2:1 or shallower, and that practice is included in the 2002 Guidelines, as I discussed in my earlier testimony. The 2002 Guidelines require that 2:1 or shallower slopes be the default grading. Where slopes will be steeper than 2:1, geotechnical testing must be conducted to demonstrate that the slopes will be stable, and "engineered structural design features" must be incorporated. The revised plans still fail to meet these requirements.

Q43. Can you provide examples of unstable slopes in the revised site plans?

A43. For example, the grading of the access road at Station 7+70 does not meet the 2002 Guidelines. On the left side of the road, the downhill side, the grading from the side of the road begins at a 2-foot horizontal to 1-foot vertical, or 2:1 slope. However, dropping 14 feet vertically, the slope changes to a 1:1 slope for the next 6 feet vertically. The next portion of the slope is a 5:1 slope then back to a 2:1 slope. The total height of the fill in this area is 28 feet. It is

not stable to have a steeper slope at the bottom of a 14-foot drop. Further, there is no cross slope bench. If this fill area had been graded with the proper slope and bench, the slope would extend 63 feet from the side of the road. The property line at this point is 65 feet from the side of the road. This is not a sufficient amount of room to construct the road and provide erosion control.

The undesirable use of the 1:1 slope on the bottom of a 2:1 slope continues for 400 feet from Station 7+00 to 11+00.

Mr. Cline has stated that reverse slope benches have been incorporated into the revised plans. There is no evidence of this on the new plans. From Station 6+00 to about 11+00, there is a level area. However, it is graded in the wrong direction. The contours should slope toward the road and provide a 1-foot depth of the bench. The grading is shown level, at best, and there is no depth to the bench. The significance of this that the grading does not reflect the amount of disturbance that will be required. As noted above, this will affect adjoining facilities and the ability to construct all the features. Further, the level areas shown on the plans are located in the wrong position to meet the requirements of a reverse slope bench. The 2002 Guidelines require that the maximum change in elevation is 15 feet. The level areas are shown on the plans 16 to 20 feet below the access road.

Another example is the grading associated with the blade laydown area of Tower 2. The slope to the northwest has a 1½ to 1 slope with riprap stabilization. However, the height of the slope is 24 feet and there is no bench. A properly graded slope with a bench would have a total width of 53 feet. The wetlands located northwest of the tower is 50 feet from the laydown area. To southwest, the slope would be 45 feet and the wetlands is 45 feet. This is insufficient room to construct a riprap slope and provide erosion control measures.

A third example of unstable slopes is at Tower 1, where the crane pad adjoins the tower assembly area. At this point, the plans propose an 8-foot high vertical soil embankment. It is obvious that the designers ran out of room to put all the necessary features in the area available.

Q44. Do you have any additional comments about slopes in the revised plans?

A44. Yes. The design has also employed a very unusual grading scheme. From the north end of the blade assembly area. there is a 1½:1 slope up to elevation 800 and then a 2:1 slope down to the crane assembly area. A preferable method would be to provide a uniform grade from the blade assembly area at elevation 764 uniformly to the crane assembly area at elevation 782. At the north end of the blade assembly area, there is 100 feet to the crane assembly area. If land was graded uniformly from one assembly area to the other, the result would be a gradual 18 percent slope (5½:1), thereby eliminating the less stable 1½:1.

The areas with 1½:1 slopes near Tower 1 are to be stabilized with temporary seeding. No riprap protection is proposed in this area.

Q45. What are your other concerns about the revised site plans?

A45. I still have some concerns about structural fabrication. If the plans filed with BNE's original petition 980 are still valid, as stated by BNE's attorney at the March 15, 2011 hearing, then BNE is requesting approval for a blade length of up to 50 meters (164 feet). I question the ability to assemble the blades in these areas. The 50-meter blades at Tower 1, northeast leg, will extend 32 feet into the hillside. At this point, the ground is 15 feet higher than the assembly area. This is not an area where the blade can "hang over."

Moreover, in the new plans, Sheet C-102 still contains a note stating that "Blade assembly area shall not have a flatness deviation of more than 6 inches over the length of the blades." This flatness criteria must have been placed on the plans for a reason, especially since that note has remained in place through significant revisions. Neither of the blade assembly areas meet the criteria.

I also still have concerns about the road section. The road section has been improved to show 2:1 side slopes on conveyance swale and on the cut/fill slopes. However, the details do not shows the use of cross slope benches, which are necessary extensively throughout the site.

Q46. Do the new plans comply with the state water quality requirements regarding basins and traps?

A46. No, the new plans still fail to comply with those requirements.

Mr. Cline states that temporary and permanent fill berms are used to divert runoff from undisturbed around the discharge point in order to reduce the need for traps or basins. This is an acceptable means of treating runoff while reducing the disturbance required for the treatment facilities. However, the plans do not provide the amount of treatment requires by the 2002 Guidelines, the 2004 Manual or the General Permit.

There is a discharge point at Station 7+15 which has no sediment control structure. There are two catch basins and culvert pipes that will carry runoff from the uphill side of the access road to a conveyance swale. This swale ends at Station 7+25 and discharges almost directly on the property of the Naugatuck Water Company. There are 1.14 acres of land tributary to the discharge of which 0.78 acres will be disturbed by the project. Due to the size of the tributary area, a temporary sediment trap is required by the 2002 Guidelines. The sediment trap would have a required volume of 4131 cubic feet. With a 4-foot depth, the trap would be 32 feet square. There is not sufficient room to construct this trap in the area between the discharge and the property line. The plans show no facility, only a silt fence at this location. The absence of an appropriately sized sediment trap at this discharge point violates the 2002 Guidelines.

There are two temporary sediment traps shown on the new plans. The traps do not comply with the requirements of the 2002 Guidelines for a multitude of reasons. The cut and fill slopes shall not exceed 2:1. The trap at Tower 2 has slopes steeper than 1:1. The maximum height of the berm is 5 feet. The trap at Station 12+00 has a height of at least 6 feet. There is no calculation of the wet and dry storage, the volume of the basin or the flow to the basin.

Most important is there are no outlets from the traps. The 2002 Guidelines provide the criteria for these outlets. Since there are no design calculations for the traps, the design storm

capacity is not know. With no an outlet, the capacity is small. When the capacity is exceeded, the trap will fail and there will be significant erosion and downhill sedimentation.

Q47. What about your previous testimony regarding water quality? Do the new plans fix those problems?

A47. No. There are no calculations for the sizing of the temporary the sedimentation facilities. In order to comply with the 2002 Guidelines and the General Permit, sizing calculations must be provided. In order to compute the required size of the basins, these calculations will show the area tributary to each discharge point, the amount of disturbed area, erosion rates and peak discharge rates. The computation should also determine the size of the basins/trap that are being proposed.

According to Section 2.2 of the new Stormwater Management Plan, there will be 9.79 acres disturbed. According the Supporting Calculations, Appendix K of the new Stormwater Management Plan, 18.66 is the drainage study. Calculations should be provided to show why up to three temporary sediment basins are not required.

Section 2.3.1 of the new Stormwater Management Plan states "Following construction of the towers units, the site will be returned to pre-construction conditions." It also states that "Once site conditions and vegetation have been reestablished, stormwater discharge will return to the pre-construction state for quality and quantity." However, the plans do not show a restoration of the woods. In fact, Sheets C-312 through C-314, the upland meadow (creation and restoration) plans, do not show anything. The restoration and planting schedules provided on the original set of plans have been removed.

Q48. Do the new plans provide adequate outlet protection?

A48. No. There are 13 separate discharge points show on the plans, including nine pipe outlets, two sediment trap outlets and two pocket ponds with pipes and weirs. None of these

points have outlet protection that meet the requirements of the 2002 Guidelines. There are no design calculations for these facilities to show compliance with 2002 Connecticut Guidelines for Soil Erosion and Sediment Control design criteria for level spreaders. These should be provided in the supporting calculations, Appendix K.

The plans show a 10 foot-diameter riprap area at the discharge of the pipes. Although unlabeled, these could be taken to be riprap stilling basins. However, they do not meet the criteria of stilling basins, and, even more importantly, stilling basins are not applicable in this situation. The proper facilities are level spreaders. The ability to install level spreaders conforming to the 2002 Guidelines is questionable on this site. The design of the spreader is based on the pipe diameter and discharge rate. As a minimum, the length of the spreader is 10 feet and the last 20 feet of the channel entering the spreader shall be no steeper than 1 percent. This 30-foot minimum length would be difficult if not impossible in several of the locations shown on the plans.

The 2002 Guidelines also states that the discharge from the spreader shall be ". . . to an undisturbed well-vegetated area having a maximum slope of 5%." The existing slope at the end of the pipe culvert is 10 to 20 percent.

As noted above, there are no outlets from the temporary sediment traps. When and if these outlets are included in the design, they too will have to have outlets complying with the 2002 Guidelines.

Sheets C-310 and 311 show two pocket ponds. The ponds each have outlet weirs and multiple outlet pipes. These outlets are not shown and no outlet protection is provided. The outlet protection from the weirs will be extensive. If the 2002 Guidelines for trap outlets is followed, this protection may extend to the wetlands downhill of Pond #1.

Q49. Do you have any comments about the stormwater quantity reflected in the new plans?

A49. Yes. The peak runoff calculations provided in the revised Stormwater Management Plan are confusing. There is no map to define the drainage areas. In the previous report, the pre-development and post-development conditions were calculated and reported separately. The new report groups the pre- and post-development conditions together.

Due to the lateness of disclosure, I have not made a detailed analysis of the report. However, I have made the following observations. Section 2.2 of the revised Stormwater Management Plan states that the area to be disturbed is 9.79 acres. This has increased from the last report by 1.43 acres. However, in Appendix K, the input data for the drainage analysis shows the area disturbed in the post development condition is less than 3.43 acres. This is a decrease from the original report. It appears that the calculation of the change in peak rates of flow did not account for 6.36 acres of land that has been changed from woods to gravel road or grassland. That is, about 65 percent of the area that will be disturbed by this project was not included in the analysis. In the November 2010 analysis, the study included 69.0 acres. In the revised analysis, the study area includes only 18.66 acres.

Despite not including 65 percent of the land conversion, the tables in the new Section 2.3.3 of the new Stormwater Management Plan show increases in the peak rate of runoff in all areas where there is any change. BNE's plans fail to conform to the 2004 Connecticut Stormwater Quality Manual, which requires that post-development runoff decrease.

Q50. Do you have other concerns about the new plans?

A50. The Zapata plans make extensive use of a drainage ditch paralleling the roads. The erosion control plans show culverts under the road to carry runoff from one side of the road to the other. The cross culvert at Stations 3+50 will not function. The inlet catch basin is positioned on the side slope of the road. Runoff will not be able to enter the basin. Second, will

not fit under the road. The bottom of the pipe at the outlet is at elevation 774. The road surface is at elevation 772. The culverts will have to have at least 2 feet of cover in order to carry the large cranes that will be necessary to erect the towers and blade assemblies. The culverts are 30-inch pipes. The bottoms of the pipes will have to be 4 and a half feet below the road, not two feet above the road as shown on the plans.

The swales have side slopes of 2:1 and in some areas 1:1. These swales are shown on the erosion control plan as having only temporary seeding to protect the side slopes. On the downhill side of the road, the channels do not have riprap bottoms.

Q51. Based on your review, do these new plans meet the water quality standards of the State of Connecticut?

A51. No, they do not.

Mr. Cline states that the new plans comply with the CT Public Health Code, DOT Form 816 and the CT DOT 2000 Drainage Manual. I do not believe that statement is true.

- There is no analysis of the shear forces on the bottom and sides of the conveyance swales that show they are within the acceptable limits of stability included in the plans. These analyses must be in compliance with the 2000 CT DOT Drainage Manual. The slope of the swales has been increased to 9 percent. Therefore, velocity in the channels will be approaching 10 feet per second.
- The road section detail continues to call for a wearing surface of "24 inches of compacted #57 stone." The road surface does not conform to CT DOT, Form 816, "Standard Specifications for Roads, Bridges and Incidental Construction," 2004, Section M.02.03. Form 816 call for the use of Rolled Bank Gravel or Traffic Bound Gravel for travel surfaces.

- There is no septic system for the maintenance building. No information regarding deep test holes or percolation tests information or septic design showing compliance with the Health Code has been provided.

Mr. Cline also states that the requirements of the 2002 Guidelines and the 2004 Manual have been met. For the reasons states above, I do not believe this is true, either. The lack of sedimentation and erosion controls will lead to the pollution of the waters of the State.

Mr. Cline also states that the temporary sediment traps have been proposed in accordance with the 2002 Guidelines. They are not in conformance and will fail as currently designed. Mr. Cline states that the ponds and drainage area were revised to provide runoff attenuation in order to comply with state standards. In fact, the summary tables in the new Stormwater Management Plan show increases in the peak runoff.

Moreover, the plans are incomplete. Zapata acknowledges this in its notes at the two pocket ponds, where it states that the final pond design to be completed upon receipt of geotechnical report. Compliance with the water quality standards cannot be shown by relying on incomplete plans.

Q52. Do you have any additional comments?

A52. Yes. Mr. Cline concludes his supplemental testimony by saying ". . . the biggest challenge in designing the proposed drawings was incorporating the general requirements of the turbine manufacturing for the layout of the project with the topographical and environmental feature of the site." I believe that the biggest challenge should have been to provide environmental safeguards to protect the waters of the State. The needs of the developer and the turbine manufacturer are secondary.

This is the third set of plans I have reviewed related to this petition. Not one of those sets of plans complies with the water quality standards of this state. These new plans still do not comply with the water quality standards of the state and, as a result, will lead to pollution of the waters of the state.

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

March 28, 2011
Date

William F. Carboni, P.E., No. 22722

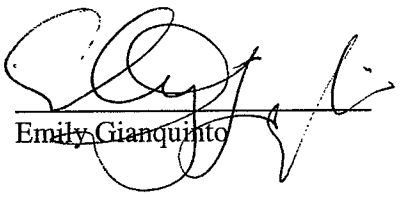
CERTIFICATION

I hereby certify that a copy of the foregoing document was delivered by first-class mail and e-mail to the following service list on the 28th day of March, 2011:

Carrie L. Larson
Paul Corey
Jeffrey J. Tinley
Hon. Robert J. Chatfield
Thomas J. Donohue, Jr.
Eric Bibler
Andrew W. Lord
Cindy Gaudino

and sent via e-mail only to:

John R. Morissette
Christopher R. Bernard
Joaquina Borges King



Emily Gianquinto