

**Site Location of Development**  
**TECHNICAL REVIEW MEMORANDUM**  
*Bureau of Land and Water Quality*

TO: **Donald Murphy, Project Manager, LURC**  
FROM: **David A. Waddell -- Division of Watershed Management**  
DATE: **May 5, 2011**  
RE: **T16MD – Bull Hill Wind Project**

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I have reviewed the additional information that was submitted by the applicant in response to my memo of 3/9/11. I have found that this response has addressed all of my concerns with this project at this time and that the project appears to meet the standards set forth in the Chapter 500 rules. I recommend approval of the project in its current form.

The following information may be useful to your process:

**PLANS USED FOR REVIEW:**

Pre-development: Plan Sheet C-701, "Pre Development Drainage Plan," dated 11/12/2010, revised 4/15/11.

Post-development: Plan Sheet C-702, "Post Development Drainage Plan," dated 11/12/2010, revised 4/15/11.

Erosion and Sediment Control Plans: Plan Sheets C-601 thru C-608, "Erosion Sedimentation Control Plan," dated 11/12/2010, revised 4/15/11.

Note: Other plans may have been reviewed that are not noted here.

**STORMWATER MANAGEMENT**

The applicant is proposing a 19 turbine windfarm on Bull Hill and Heifer Hill in T16MD and called Bull Hill Wind Project. This project lies within the watersheds of Narraguagus River, Narraguagus Lake, Spectacle Pond and Graham Lake. This proposed project will create 25.44 acres of developed area and 24.24 acres of impervious area. This project has been required to meet the "Stormwater Law" rules and as such must meet the Basic, General, and Flooding Standards. Under the General Standards the applicant is applying the phosphorus methodology to address impacts to Narraguagus Lake and Spectacle Pond. As such, the applicant is required to use the Phosphorous Methodology outlined in "Phosphorous Control in Lake Watersheds: A Technical Guide to Evaluating New Development" to assess the development. This project is being reviewed under the 2006 Stormwater Management rules and the design and sizing of the proposed BMPs for this project are based on the "Stormwater Management for Maine" January 2006.

Stormwater quality treatment will be achieved with numerous buffers.

Stormwater flooding mitigation will be achieved with disconnected impervious area and lengthening of flow paths.

The following comments need to be addressed:

**BASIC STANDARDS:**

***Note:*** *As always the applicant's erosion control plan is a good starting point for providing protection during construction. However, based on site and weather conditions during construction, additional erosion and sediment control measures may necessary to stop soil from leaving the site. In addition, other measures may be necessary for winter construction. All areas of instability and erosion must be repaired immediately during construction and need to be maintained until the site is fully stabilized or vegetation is established. Approval of this plan does not authorize discharges from the site.*

**Proposed Condition:** Due to the level of disturbance, steep slopes, and its close proximity to on site water resources, an independent third party site inspector reviewing erosion and sedimentation control is

suggested for this project. The applicant will retain the services of an approved site inspector to inspect the erosion and sedimentation controls on the site. Inspections shall consist of weekly visits to the site to inspect erosion and sedimentation controls from initial ground disturbance to final stabilization. If necessary, the inspecting engineer will interpret the erosion and sedimentation control plans and notes for the contractor. Once the site has reached final stabilization, the inspector will notify the department in writing within 14 days to state that the construction has been completed. Accompanying the engineer's notification must be a log of the engineer's inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit.

Approval recommended for this section.

**GENERAL STANDARDS**

**Non-linear Portion**

Percent of Impervious Treated: 100% (95% required)  
 Percent of Developed Treated: 86.12% (80% required)

**Linear Portion**

Percent of Impervious Treated: 76.54% (75% required)  
 Percent of Developed Treated: 76.54% (50% required) \*\*

\*\* Due to the lack of landscaped and lawn area associated with the road system the developed area and the impervious area are the same.

**Phosphorus to Spectacle Pond**

Per Acre Phosphorus Budget (PAPB):	0.062	lbs / acre / yr
Project Acreage (eligible for allocation)(A):	22.49	acres
Project Phosphorus Budget (PPB):	1.394	lbs / yr

Total Phosphorous Mitigation Credit (SEC + STC):	0.00	lbs / yr
Total Pre-treatment Phosphorus Export (Pre-PPE):	2.589	lbs / yr
Total Post-treatment Phosphorous Export (Post-PPE):	1.372	lbs / yr

Project Phosphorus Export:	1.372	lbs / yr
Level of Control:	adequate	

**Phosphorus to Narraguagas Lake**

Per Acre Phosphorus Budget (PAPB):	0.041	lbs / acre / yr
Project Acreage (eligible for allocation)(A):	2.48	acres
Project Phosphorus Budget (PPB):	0.102	lbs / yr

Total Phosphorous Mitigation Credit (SEC + STC):	0.00	lbs / yr
Total Pre-treatment Phosphorus Export (Pre-PPE):	0.201	lbs / yr
Total Post-treatment Phosphorous Export (Post-PPE):	0.0804	lbs / yr

Project Phosphorus Export:	0.0804	lbs / yr
Level of Control:	adequate	

Approval recommended for this section.

**Proposed Condition:** The applicant will retain the services of a professional engineer to provide "as-built" plans that detail any portions of the project that significantly deviate from the approved plans. Any changes in layout, grading, stormwater system, impervious area, or other changes that affect the stormwater quality need to be located and addressed as to how these changes have been treated and

meet the general standard. Significant changes in the proposed project may trigger the need for an amendment of the approved department order. This requirement is for the portion of the project constructed as common property. The applicant's agent will notify the department in writing within 14 days of final acceptance of the project to state that the project has been completed. Accompanying the engineer's notification must be updated project plan sheets (if necessary), a report on the changes in treatment and how they meet standard (if necessary), and a copy of the Notice of Termination (NOT) for the project.

**Proposed Condition:** The applicant will retain the services of a professional engineer to inspect the construction and stabilization of the stone bermed level spreaders and ditch turnouts to be built on the site. Inspections shall consist of weekly visits to the site to inspect each level spreaders /turnout construction, stone berm material and placement, settling basin from initial ground disturbance to final stabilization of the level spreader. If necessary, the inspecting engineer will interpret the stone bermed level lip spreader's location and construction plan for the contractor. Once the stone bermed level lip spreaders are constructed and stabilized, the inspecting engineer will notify the department in writing within 14 days to state that the level lips have been completed. Accompanying the engineer's notification must be a log of the engineer's inspections giving the date of each inspection, the time of each inspection, the items inspected on each visit, and include any testing data or sieve analysis data of the berm media.

### **FLOODING STANDARDS**

The applicant has provided a Hydro-cad model that shows the project's impact on the weighted curve number of each watershed and the subsequent impact to peak flows for these watersheds for the 2,10, and 25 year, 24 hour storm. The evidence shows that the weighted curve number for each sub watershed changes little. In addition the model does not take into consideration that flow on the proposed site is dispersed through natural buffers in sheet flow for 86% of the new roads. This lengthens the time of concentration for all of the watersheds while reducing the peak flow at the property boundary. For this project the model indicates that the project meets the flooding standard requirement of maintaining the preconstruction peak flows for the 2, 10, and 25 year, 24 hour storm at the property boundary.

Approval recommended for this section.