



## Memorandum

*To: William Cundiff, Town Engineer*

*From: Bob Burkard*

*Date: July 27, 2010*

*Subject: Review of Douglas Woods Wind Farm Reports*

As requested, CDM has completed a preliminary review of the Acoustical, Shadow/Flicker and Photo simulation Reports Dated February 16, 2009 and supplemental addenda dated July 12, 2010 prepared by Atlantic Design Engineers Inc. We have no significant comments on the photo simulation study and found it to be sufficiently complete. However, in order to complete our review of the Acoustical and Shadow/Flicker studies, CDM will need to have a technical discussion with Atlantic Design Engineers to obtain additional information and discuss particular details of the input parameters and assumptions to the Windpro model that was used to generate the technical basis of the reports.

We expect that this can be completed over the phone with their design engineers by the end of this week.

I have attached to this memo our initial notes from the review of these reports for your use and information.

cc: Bruce Haskel,  
Daniel Gugliemi

## Notes on Douglas Woods Wind Farm Studies

### Acoustic Analysis

- Both the original report and the addendum have elevation Z values entered for both the turbine base and the receptor locations. The reference topo information is not stated. Also need to know if the complete area topo was used in the model or if the spot elevations of the turbines and receptors only were inputted.
- Turbine locations have changed with the addendum. Receptor coordinates and elevations are also slightly different in the addendum. I presume the receptor locations did not change but perhaps the map/elevation data was updated?
- Analysis was updated based on the on-site MET tower data. Figure should show location of the Met Tower.
- The February data collection is still valid and the analysis done in original report should be revised to reflect the change in ground factor value from 1.0 to 0.8. With the 2<sup>nd</sup> background data set taken in June, this will provide indication of both winter and summer conditions with the only difference being the use of the nearby MET data vs. the on-site MET tower (not much difference). It may also be useful to run both the February and June noise analysis using a worst case ground attenuation factor of 0 to see what the results are and have this in hand in case there is a lot of discussion on noise impacts from concerned residents.
- Distance from turbines to receptors should be shown in report (have values in Windpro output)
- Addenda states that ten (10) minute L90 sound levels were extracted in order to compare with the 10 minute wind speed measurements. Raw data set was given to us but the data sets chosen are not identified. What was basis for picking the 10 sets of data? More explanation of this is needed in the report.
- The immersion height (height at which the noise enters the receptor) is set at 1.5 meters. It probably doesn't make a difference in the final analysis but 2<sup>nd</sup> story window of a house is at a higher elevation. Again it would be advisable to know the answer to this question should it be raised.

### Shadow Flicker

- Distances from receptors to nearest turbines should be tabulated in the report.

- Explanation on how the four receptor locations were selected is needed. Confirm that they are representative of the area e.g. that there is not an adjacent residence to the receptor located at a higher elevation.
- The Zone of Visual Influence map output from Windpro 9Wirh obstructions inputted as noted below) would be very useful to add to this report to show all of the residences that would be affected by the turbines.
- Report addresses criteria of 30 hours shadow/flicker per year as an acceptable standard which is OK. Report should also identify receptors/locations where shadow/flicker exceeds 30 mins/day as noted in the information contained in the appendix.
- The estimated shadow flicker results are based on an assumed reduction factor of 30 percent for receptors C&D and 75 percent for receptors A&B. The rationale and basis for these gross assumptions needs to be explained and supported in greater detail especially since these factors bring the receptors mostly into compliance with the 30 hour standard. Rather than applying these gross assumptions it would be more appropriate and defensible to use Windpro to its full capability. The Windpro sheets indicate that no obstructions were inputted. We would suggest inputting the wooded areas using average tree height and also inputting any significant buildings or structures and then seeing what the results show.
- The receptor locations are input with an eye height of only 1.5 m. This would not adequately address shadow/flicker affecting a 2<sup>nd</sup> story bedroom window. How much information was input for each receptor e.g. was the greenhouse function used or was the receptor identified and specific window information input into the model? Or was the analysis done assuming a person standing at each location?

#### Photo simulations

- As noted in the report, Windpro does a nice job of generating these photo simulations and they should be reasonably accurate since the program can accept coordinate information for each location as well as the digital information from the photo file with regard to details of the focal length. The simulations themselves are subjective in nature and a matter of individual preference and opinion as to their impact or benefit.