



Steve Thurston <thurston.steve@gmail.com>



Re: Record Hill Wind LLC - see attached documents

Steve Thurston <thurston.steve@gmail.com>

Thu, Jul 30, 2009 at 8:31 AM

To: Warren_Brown@umit.maine.edu

Cc: Beth.Callahan@maine.gov, Rick James <rickjames@e-coustic.com>, Charles Ebbing <cebbling1@gmail.com>

Bcc: Monique <sherwats2@wildblue.net>

Dear Warren,

I am writing to request that you pay careful attention to the testimony I submitted in May which documented the necessity of using line source in the prediction model for Record Hill Wind. In that testimony I also explained how the Mars Hill post construction monitoring study proves that turbine noise at Roxbury will exceed Maine's 45 dBA nighttime rural limit.

Your review of my February testimony ignored the portion of my testimony that was prepared by Richard James. I hope you address Rick's work in your final report to the DEP on RHW LLC since I paid for his expert opinion with the expectation that his work would be included in the finding of facts. Instead, it appears from the Rollins decision that only your peer review is mentioned in the decision, even though similar testimony was presented in that case. Since neither your peer review of the Clipper turbine noise study for RHW, and your peer review of the Rollins noise study even mention the term line source, important testimony is ignored by the DEP's decision. Since they are relying on you and only on you to advise them about noise, the thoroughness of your review becomes extremely important.

As someone who has spent 60 years on Roxbury Pond, experiencing the environment during all seasons, I can tell you with absolute certainty that noise from these turbines will be a constant factor at night. The basin that Roxbury Pond sits in, ringed by mountains, is dead quiet at night. There is no human activity, no highways, no nearby towns, nothing to create sound. The wind dies to dead calm almost every night. Yet we know from RSE's background sound assessment (removed from the application at your suggestion) that wind above the ridge will be sufficient for turbine operation at night when these conditions exist.

Warren, there are hundreds of residents who will be impacted by this noise, not just a few as in Mars Hill, (as if Mars Hill isn't bad enough) Random blade thump will permeate their homes. There is nothing between the turbines and the homes on Roxbury Pond to attenuate low frequencies. They did nothing to deserve this. They are not voters. As a group the camp owners association voted 50-4 at their annual meeting on July 10 to oppose this project. This is the only voice they have. They are ignored by the voters and town officials even though pond properties pay the majority of property taxes in the town. These turbines will be a source of torment, turning the lake community into the opposite of what people live for.

We realize that under the wind law there is nothing that can be done, thanks to Rob Gardiner's testimony to the Task Force 6 months after he installed met towers in Roxbury, about the visual impact of turbines. Eagles on Roxbury Pond are few in number so if they get killed or driven off it is an acceptable level of eagle mortality as far as MDIFW is concerned.

I know you are paid handsomely for your peer reviews. Many times more than we have paid Rickard James for his work. It is easy to understand why you would like to continue working with DEP on wind turbine applications. From my perspective your reviews have ignored evidence that proves that the Rollins project and the RHW project are not in compliance with Maine's noise regs. I hope you thoroughly review that evidence in your final review of the Record Hill Wind project, including testimony I submitted yesterday which is copied below. Please review carefully the information in the attachments to this message as it needs to be included in your final analysis of this project.

It is clear that turbines on ridges in line of sight to quiet rural communities, especially lake front communities that have exceptional sound characteristics because of the water surface, should not be permitted. Please take a stand with us against this project. I am sure you will be able to look back on your decision to do so with great peace of mind. If you approve of this project, I doubt very much if that will be the case

Thanks for your consideration,
Steve Thurston

Following is an excerpt concerning noise from my recent testimony to the DEP which you should get from Beth Callahan today:

The revised noise study for the Siemens turbines contains the following statement, "G. P. van den Berg reports that with coherence and synchronicity, amplitude modulation can up to $9\pm$ dBA and occurs as a function of the blade passage frequency or RPMs of the WTG. 2 Measurements of amplitude modulation from actual operations of Siemens 2.3 MW Mk II wind turbines have not been provided by the manufacturer. Therefore, RHW operations have the potential to result in the 6 dBA increase required to be SDR sounds as set forth in DEP 375.10."

Van den Berg's well known and widely acknowledged research is reliable and RSE is wise to reference it. The entire RHW turbine string is line of sight to nearly all of the homes in Roxbury Pond, save for a few branches of trees directly behind homes. Many homes are equidistant from multiple turbines. Coherence of low frequency sound waves, when turbine operation is normal and blade speed is synchronized, will result in nearly identical sound waves from many turbines intersecting randomly at protected locations, compounding the amplitude modulation or "blade thump" that is the source of turbine noise complaints worldwide. Since the turbines in a string cannot be more than 60 degrees out of phase with each other (360 degrees divided by 3 blades), the possibility of noise canceling is eliminated. The interaction of sound from multiple turbines in the RHW project can only increase noise levels. In his attached report "Limitations in Modeling Assumptions" acoustical engineer Charles Ebbing has predicted that with the coherence of only 4 of the 22 turbines in the Record Hill string that are equidistant from a receiver, a 12 decibel increase in blade thump frequency can be expected. Many homes on Roxbury Pond are equidistant from multiple turbines, especially homes below Flathead Mountain. RSE's model does not account for the coherence of multiple sources. (Also attached are pdf files referenced in Mr. Ebbings report.)

Since RHW operations will produce SDR blade thump, 5 dB must be added to the prediction of 37 decibels at protected locations. This results in 42 dBA, and triggers the requirement for pre-development sound level assessment. This also precludes the applicant from claiming that this project will have a minor sound impact. Lacking this required submission, the application does not meet the requirements of this section and must be denied.

Variance from Sound Level Limits.

The law requires:

"(2) a finding by the Board that the proposed development will not have an unreasonable impact on protected locations."

Notwithstanding public comments by DEP staff that variances will not be issued for wind projects after the Mars Hill debacle, the record is replete with evidence, from interested persons as well as Warren Brown, that Maine's noise regulations are not well equipped to deal with the type of noise produced by wind turbines, and that the applicant's noise predictions do not include important elements such as line source, SDR penalty, stable atmospheric conditions and temperature inversions. Therefore no variance can reasonably be granted if sought by the applicant.

Additional Information

Attached to this email are numerous scientific studies of wind turbine noise. They are placed in the record as evidence that the DEP has not exercised sufficient diligence in its fact finding in the Rollins case, which is precedent setting for Record Hill Wind and therefore must be addressed. While it is encouraging to see a reference to van den Berg's work in the RSE revised study for RHW, there are many other important studies that have been ignored by RSE, the DEP and its 3rd party expert. At this pivotal stage of the wind industry's invasion of Maine's rural communities, it is crucial that the DEP make every effort to understand completely the complex issues surrounding turbine noise.

Also attached are notes taken by Becky Maddox during a conference call with DEP staff and Warren Brown and Dora Mills on 3/9/09. These notes show that Warren Brown attempted to educate the staff about the same issues that interested persons and experts have testified to in both the Rollins and RHW applications. His comments logically should have led to a decision that the noise study submitted by RSE on behalf of First Wind was flawed because it did not include either the SDR penalty, or a proper modeling of both point source and line source as Warren Brown states in the conference call is the correct procedure.

These same issues are of critical importance for Roxbury. The failure of RSE to use line source in the CADNA model proves one of two things. Either the CADNA model is not capable, as Warren Brown said in the conference call, of being used to accurately predict turbine noise, or RSE intentionally disregarded line source in order to force the model into compliance with Maine's noise regulations.

Without knowing the settings for the various parameters that influence the results of the model, the DEP is left without the ability to evaluate the results. Although the applicant says the model is set up for a "worst case scenario" the failure to use line source to account for the affect of multiple turbines creates a serious error in prediction.

Also the use of "moderate" ground attenuation neglects the fact that all of these turbines are on 80 meter towers, on ridges several hundred feet above the receivers below. There is no ground attenuation when noise is in a direct line of sight from such a high distance and relatively steep downward angle. This leads to further errors in prediction.

We also do not know what parameters are used for humidity and temperature, which can have a significant impact on dBA measurements when higher humidity and temperature ranges are used. Higher frequencies are attenuated by the atmosphere much more than lower frequencies. Adjusting these parameters can cause A weighted levels to decrease while low frequencies remain unattenuated, effectively understating the degree of low frequency blade thump that can be expected.

Health Effects of Wind Turbine Noise.

From Chapter 375 Noise:

A. Preamble. The Board recognizes that the construction, operation and maintenance of developments may cause excessive noise that could degrade the health and welfare of nearby neighbors. It is the intent of the Board to require adequate provision for the control of excessive environmental noise from developments proposed after the effective date of this regulation.

This is one of only three references in the noise regulations to human health effects of noise, and there are no criteria in the regulations for evaluating or regulating health effects of noise other than decibel levels. Nevertheless, the DEP has solicited testimony from MCDC director Dora Mills about the health effects of turbines and her testimony figures prominently in the Rollins decision. Inasmuch as Dr. Mills does not find support in the literature for health effects from exposure to turbine noise that rise above "annoyance", I am attaching several comprehensive studies that describe the symptoms reported by people from around the world who live near turbines. It is clear from the literature, which includes substantial corroborating anecdotal evidence

as well as scientific studies, that wind turbines cause, or exacerbate, health problems including sleep deprivation, headaches, uncomfortable physical sensations, stress, and depression among others.

Noise Easements.

The applicant states:









Landowner agreements are expected at protected locations closer to the wind turbines than the nearest receiver points (see Figures 3-1S and 5-4S). Under these agreements no sound level limits will apply at these properties (ref. DEP 375.10, Section C 5.s).


Several homes on RT 120 near Partridge Peak are the same distance or closer than homes at Mars Hill that have measured turbine noise levels above 50 decibels in the post construction study conducted by RSE, which I thoroughly discussed in previous testimony. How can the DEP accept as credible that the homes on RT 120 will not experience similar noise? They are line of sight to several turbines. Clearly the model cannot be relied upon if it is predicting compliance at these locations. These properties must agree to noise easements. There have been no easements for excessive sound levels submitted by the applicant. The project is therefore not in compliance with the law.

The applicant sent a letter to the residents of Roxbury on 7-15-09 (attached) that references a post construction noise study at Stetson I and claims the study proves that turbine noise predictions for RHW are accurate. This preliminary draft of a yet to completed be study (attached) raises more questions than it answers, but clearly shows that low frequency noise exceeds NC-25 outdoor thresholds at protected locations, which is a significant red flag for blade thump impacts. Some of the questions unanswered by the study are whether fast response settings were used to capture SDR sounds, whether the turbines were generating electricity into the grid or were "free spinning" (turbines under load will be significantly louder than free spinning turbines) whether there was significant vegetation between the turbines and the microphones. It would be best if this study was not relied upon by the DEP for its decision on RHW if it has been submitted as evidence by the applicant. If so, we request an opportunity to review the complete study and have any questions about it answered.

End

10 attachments

-  **Public Health Impacts of Wind Turbines (2)[1]Dept of Public Health.pdf**
856K
-  **3-6-09 Conference Call W Brown D Mills.pdf**
554K
-  **maekawa lp falloff line and area sources.pdf**
514K
-  **Letter 7-15-09.pdf**
165K
-  **Response to Item 2 RSG Info Rqst 6-21-09.pdf**
1101K
-  **Limitations in modeling assumptions final word 97-2003.doc**
371K
-  **van den Berg thesis.pdf**
4753K
-  **Wind.Turbine.Acoustics.by.Harvey.pdf**
2254K

 **Accuracy of Model Predictions and the Effects of Atmospheric Stability on Wind Turbine Noise at the Maple Ridge Wind Power Facility, Lowville, NY - 2007.pdf**
1660K

 **C Schneider Internoise 2009 Report.pdf**
584K
