

**STATE OF VERMONT**  
**PUBLIC SERVICE BOARD**

Docket No. 7250

Petition of Deerfield Wind, LLC for a Certificate of Public Good )  
authorizing it to construct up to a 45 MW wind generation facility, )  
and associated transmission and interconnection facilities, )  
comprised of between 15 and 24 wind turbines on approximately 80 )  
acres in the Green Mountain National Forest, located in Searsburg )  
and Readsboro, with turbines to be placed both on the east side of )  
Route 8 on the same ridgeline as the existing GMP Searsburg wind )  
facility Eastern Project Area), and along the ridgeline to the west of )  
Route 8 in a northwesterly orientation (Western Project Area) )

**PREFILED SUPPLEMENTAL DIRECT TESTIMONY OF  
KENNETH KALISKI**

**ON BEHALF OF DEERFIELD WIND, LLC**

July 30, 2007

Summary:

Mr. Kaliski testifies regarding 10 V.S.A. § 248(b)(5). He discusses his evaluation of the Project's noise impacts based upon the revised project layout.

1 **Q. Please state your name.**

2 Response. Kenneth Kaliski

3

4 **Q. Have you previously submitted direct testimony in this matter?**

5 Response. Yes.

6

7 **Q. What is the purpose of your supplemental testimony?**

8 Response. The purpose of my testimony is to provide the results of noise modeling  
9 for the revised project layout and to update my resume with relevant projects.

10

11 **Q. What additional wind energy projects have you added to your resume?**

12 Response. I have updated my resume to include several projects. These include two  
13 projects in Kansas where we made sound measurements at an existing wind energy  
14 facility and modeled a total of 250 MW of proposed capacity. The revised resume is  
15 attached as ***Exhibit DFLD-KK-Rev1.***

16

17 **Q. Have you reviewed the revised project layout dated June 2007, consisting of 17  
18 turbines (10 on the western string and 7 on the eastern string)?**

19 Response. Yes.

20

21 **Q. Is the revised project layout within the Project area that you originally  
22 investigated?**

23 Response. Yes.

1

2 **Q. How do the sound levels of the turbine to be used in the revised project layout**  
3 **compare with the turbine that you used in your original assessment?**

4 Response. The Project currently proposes to use one of two wind turbines: the  
5 Gamesa G87 or the Suzlon S88. They are rated at 2 MW (Gamesa) and 2.1 MW  
6 (Suzlon) of electrical output compared with the previously modeled GE 1.5sl which  
7 is rated at 1.5 MW. The GE has a rated sound power level of no more than 106 dBA  
8 while both the Gamesa and Suzlon wind turbines have a rated sound power level of  
9 no more than 107.5 dBA. Note that these sound power levels are the maximum  
10 among all operating wind speeds and include a margin to account for uncertainty.

11

12 **Q. Does the sound data provided by the turbine manufacturer meet the**  
13 **International Electrotechnical Commission's (IEC) technical specifications**  
14 **for measuring noise from wind turbines and declaring sound power levels and**  
15 **tonality values from wind turbines?**

16 Response. Both Gamesa and Suzlon have provided information on the sound power  
17 levels from their turbines that was done in accordance with IEC technical  
18 specifications. In addition, Suzlon has provided tonality values for the S88 wind  
19 turbine. A request to Gamesa has been made for similar tonality data, but had not  
20 arrived at the time of this filing.

21

22 **Q. Based upon the turbine manufacturer's sound data, will the turbines produce**  
23 **audible tones?**

1        Response. The tonal audibility level ( $\Delta L_{a,k}$ ), as defined by the IEC 61400-11 standard,  
2        is the number of decibels a pure tone is above or below a set audibility criterion. A  
3        negative value indicates that the tone is not audible (it is below the criterion) and a  
4        positive number indicates the number of decibels the tone is above the criterion.  
5        The worst-case tonal audibility level for the Suzlon S88 is -2 dB, which indicates that  
6        the highest tones are two decibels below the “audibility criterion”.

7                Gamesa has not yet provided tonal audibility data. However, we have  
8        obtained from them 1/3 octave band sound power levels for reference wind speeds  
9        from 3 m/s to 10 m/s. While we cannot calculate a tonal audibility level, this data  
10       can be used as an indicator as to whether tones may exist. This data shows that the  
11       highest any 1/3 octave band rises above both adjacent bands is 0.6 dB. This level is  
12       not indicative of strong pure tones. As a point of reference, the Gamesa G87 wind  
13       turbine would meet both Massachusetts and Connecticut tonality standards, which  
14       are based on octave and third octave spectra, respectively.

15

16    **Q.    Have you performed any additional work in connection with the revised**  
17    **project layout?**

18        Response. Yes. I revised the sound modeling based on the new turbines and  
19        turbine configuration. In addition, we added to the model the proposed substation.

20

21    **Q.    What are the results of your revised noise modeling?**

22        Response. Based on the standard ISO 9613-2 modeling procedure, the model shows  
23        that the highest modeled sound level from the proposed Deerfield project increases

1 slightly from 41 to 42 dBA. This would occur at a single residence east of the  
2 Project on Route 8. Three other residences would have sound levels from 40 to 41  
3 dBA while all other modeled receptors would have levels at or below 39 dBA. With  
4 the proposed Deerfield project and the existing Searsburg project operating  
5 concurrently, the combined modeled sound level is 45 dBA at that same residence.  
6 This is the same level as forecast in our previous testimony for the Project. Note  
7 that these sound levels are based on the maximum sound output from the wind  
8 turbines – the mean reference sound power level plus the confidence interval  
9 provided by the manufacturers. Noise contour maps showing the modeling results  
10 for the “Deerfield Only” and “Deerfield with Searsburg” cases are attached as  
11 ***Exhibits DFLD-JZ-Rev19a*** and ***-Rev19b***.

12  
13 **Q. How often would you estimate that these sound levels would occur at the**  
14 **modeled receptors?**

15 Response. The contours shown in the exhibits cited above assume a moderate  
16 nighttime inversion with winds blowing from the source to the receiver. With more  
17 detailed modeling using 8760 hours (one full year) of 2005 meteorological data from  
18 the ridgetop meteorological towers, we were able to calculate under what conditions  
19 and how frequently these worst-case conditions would occur at the worst-case  
20 receiver cited above. Using similar meteorological adjustments to that described in  
21 Section 7.2.3 of our December, 2006 report (***Exhibit DFLD-KK-3***), we found that  
22 the highest sound levels for the combined Searsburg/Deerfield scenario would occur  
23 under neutral to strong inversions with southerly winds. Given that prevailing winds

1 are from the west, the worst-case meteorological condition did not persist over an  
2 entire night. As a result, the highest modeled 8-hour average nighttime sound level  
3 was 43 dBA. The Project thus complies with the WHO's recommended nighttime  
4 guideline for protection against sleep disturbance of 45 dBA averaged over an 8-hour  
5 night.

6

7 **Q. Do the changes to the layout and turbines alter your original conclusion that**  
8 **Project-related noise will not result in undue adverse impacts on aesthetics or**  
9 **human health? Please explain.**

10 Response. No, it does not alter my original conclusion. While the sound power  
11 level of the turbines increased from our original testimony, the number of turbines  
12 decreased from 24 to 17. As a result, we found that the overall combined impacts of  
13 the Project, even when including existing sound levels from Searsburg, remain the  
14 same as previously forecast. As a result, our conclusion that the Project will not  
15 result in undue adverse impacts on aesthetics or human health does not change.

16

17 **Q. Are there any methods by which the sound levels of the wind turbines can be**  
18 **measured after the Project is constructed in order for the Public Service Board**  
19 **to confirm compliance with appropriate noise standards?**

20 Response. Yes. Deerfield Wind can set out sound level recording devices at various  
21 points around the Project to measure noise after it is constructed. While it is most  
22 advantageous to set these monitors at neighboring residences, Deerfield Wind  
23 cannot do so without their permission. If the PSB requires sound monitoring, then

1           we can provide a more detailed scope at a later date, in cooperation with  
2           participating landowners and other interested parties.

3

4   **Q.   Does this conclude your testimony at this time?**

5           Response. Yes, it does.

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