

November 15, 2019

By Hand Delivery and E-Mail

Ms. Judith Whitney, Clerk
Vermont Public Utility Commission
112 State Street, Drawer 20
Montpelier, VT 05620-2701

Re: Docket No. 7250 – Amended Petition of Deerfield Wind, LLC for a certificate of public good authorizing it to construct and operate a 15-turbine, 30 MW wind generation facility in Searsburg and Readsboro, Vermont.

Dear Ms. Whitney,

Enclosed please find CPG Holder Deerfield Wind, LLC's ("Deerfield") *Comments on the Spring 2019 Report Analysis and Shea Request for OINR Testing*.

Please do not hesitate to contact us with any questions. Thank you.

Sincerely,


Gillian Bergeron
Paralegal

Encl.

cc: Service List

**STATE OF VERMONT
PUBLIC UTILITY COMMISSION**

Amended Petition of Deerfield Wind, LLC for)
a certificate of public good authorizing it to)
construct and operate 15 turbine, 30 MW wind)
generation facility, and associated transmission)
and interconnection facilities, on approximately)
80 acres in the Green Mountain National)
Forest, located in Searsburg and Readsboro,)
Vermont, with 7 turbines to be placed on the)
east side of Route 8 on the same ridgeline as the)
existing GMP Searsburg wind facility (Eastern)
Project Area), and 8 turbines along the ridgeline)
to the west of Route 8 in the northwesterly)
orientation (Western Project Area))

Docket No. 7250

CERTIFICATE OF SERVICE

I, Gillian Bergeron, certify that on November 15, 2019, I forwarded copies of Deerfield Wind, LLC's *Comments on the Spring 2019 Report Analysis and Shea Request for OINR Testing* to the following service list by the delivery method noted:

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Dated at Burlington, Vermont, this 15th day of November, 2019.

By:



Gillian Bergeron
Paralegal

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PUBLIC UTILITY COMMISSION**

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Docket No. 7250

**DEERFIELD WIND, LLC'S COMMENTS ON THE SPRING 2019 SOUND
MONITORING REPORT AND SHEA REQUEST FOR OINR TESTING**

Pursuant to the Scheduling Order issued by the Vermont Public Utility Commission ("Commission") on October 16, 2019, CPG Holder Deerfield Wind, LLC ("Deerfield") respectfully submits comments on the Spring 2019 Sound Monitoring Compliance Report ("Spring 2019 Report")¹ concerning the Deerfield Wind Project ("Project"). Deerfield also supplemental its comments on Thomas Shea's ("Mr. Shea") March 21, 2019 request for outside to inside noise reduction testing ("OINR testing").

For the reasons discussed below, Deerfield respectfully submits that the Spring 2019 Report demonstrates the Project's compliance with the CPG's noise limits, notwithstanding a few methodological issues in the Spring Report's analysis of data that should be resolved and a revised report issued. With respect to Mr. Shea's request for an OINR test, the Spring 2019 Report concludes that Project-related exterior sound levels at the Shea residence are 38 dBA and thus below the 40 dBA threshold required for OINR testing. Likewise, the results of the Fall 2018 Sound Monitoring Report² do not meet the requirements for an OINR test, as discussed in Deerfield's prior filings.³

Procedural Background

On January 7, 2019, the Vermont Department of Public Service ("Department" or "DPS") filed the Fall 2018 sound monitoring compliance data.

¹ Deerfield Wind – Spring 2019 Sound Monitoring Compliance Report prepared by Cross-Spectrum Acoustics, Inc. ("CSA"), at 26 (filed Aug. 13, 2019) (revised Oct. 11, 2019).

² Deerfield Wind – Fall 2018 Sound Monitoring Compliance Report prepared by Cross-Spectrum Acoustics, Inc. (filed Jan. 7, 2019) (revised Oct. 11, 2019) ("Fall 2018 Report").

³ Deerfield Wind, LLC's Response to Shea Request for OINR Testing and Department of Public Service Request for Modification to Commission-Approved Sound Monitoring Protocol (Apr. 4, 2019).

On March 19, 2019, the Department filed a motion to modify the PUC-approved Sound Monitoring Protocol (January 2017, RSG) (“the Protocol”) with respect to Site C (Shea residence).

On March 21, 2019, Mr. Shea requested OINR testing at his residence in Searsburg, Vermont, based upon data from the Fall 2018 Report.

On March 31, 2019, Mr. Shea and WindAction Group (“WindAction”) filed an objection to the Department’s motion to modify the Protocol.

On April 4, 2019, Deerfield responded to Mr. Shea’s request for OINR testing and the Department’s request to modify the Protocol.

On April 15, 2019, the Department filed a reply to Mr. Shea’s and WindAction’s opposition to the motion to modify the Protocol.

On April 18, 2019, the Department responded to Deerfield’s comments regarding Mr. Shea’s Motion for outside to inside noise reduction.

On April 25, 2019, Commission issued an order granting the Department’s motion to modify the Protocol and deferring a decision on Mr. Shea’s request for OINR testing.

On October 11, 2019, the Department filed revised versions of the Fall 2018 Report and Spring 2019 Report.

I. The Spring 2019 Sound Monitoring Compliance Report complies with the CPG’s noise limits.

Deerfield and its sound expert RSG have reviewed the Spring 2019 Report, and note that the revisions made by CSA have addressed a number of issues raised in the Fall 2018 monitoring, and as such improved the quality of the spring monitoring program. These included providing one-minute wind-speed logs, graphs, or tables of invalid periods, providing the reason for eliminating those periods from the Spring 2019 measurements, and the exact times of the valid periods used to determine compliance.

In the Spring 2019 Report, CSA calculated exterior sound levels at the three monitoring sites as 40 dBA (exterior, L_{eq}) (1hr) or less, and thus comply with the CPG’s noise limit of 45 dBA (exterior, L_{eq}) (1 hr). At the same time, Deerfield’s sound expert, RSG, has identified three methodological issues in the Spring 2019 Report concerning the data analysis and inclusion/exclusion of certain data, as follows:

- (1) inclusion of contaminating, transient background sounds in the Turbine-On data set;
- (2) elimination of data for wind speeds under 5 m/s from the reporting period; and
- (3) use of background sound data from non-adjacent periods to calculate the 1 hour L_{eq} .

Deerfield and RSG believe that all three analytical issues could be properly addressed by CSA applying ANSI S12.9 Part 3 rather than Part 2, and revising its report accordingly. Although the Protocol is silent on the use of a particular ANSI testing standard, ANSI is the widely accepted source for the appropriate procedures to be used in sound monitoring. The particular ANSI standard to be used should be determined based upon the goals of the Protocol in determining whether the Project meets the CPG noise limits. ANSI S12.9 Part 3 provides procedures to measure the sound of a *specific source* at a *specific location*.⁴ In contrast, ANSI S12.9 Part 2 is to be used for long-term, time-average environmental sound measurements to determine average sound levels.⁵ As such, ANSI S12.9 Part 3 is the appropriate standard to calculate Project-only sound levels in a 1 hour L_{eq} unit of measurement, as required by the Protocol.

Whether CSA revises the Spring 2019 Report or not, addressing the three analytical issues below would not change the ultimate conclusions in the Spring 2019 Report, i.e., would not result in higher sound levels being reported. Each of the three issues is addressed in turn below.

1. All contaminating sound should be removed from the Turbine-On data set.

In both the Fall 2018 and Spring 2019 sound monitoring reports, sound levels that were contaminated by identified wind gusts remained in the data set and were treated as wind turbine sound. The dataset should only retain sounds that can be identified as wind turbine sound in the Turbine-On data. ANSI S12.9 Part 3 provides a template for correcting background contamination of the source specific sound measurement. In the ANSI S12.9 Part 3 standard, sound is defined as a combination of “continuous” background and “transient” background. Continuous background is removed by subtracting the background sound by the level of sound measured when the source (wind turbine, in this case) is turned on. Transient background sounds are sounds “associated with one or more sound events which occur infrequently during the basic measurement period.” Wind gusts that either induce noise in the vegetation or generate pseudo-noise in the microphone should be classified as “transient” sounds and removed from the Turbine-On data set.

Wind gusts have an outsized effect on the reported sound levels because the continuous equivalent sound level (“ L_{eq} ”) weighs the gust sounds higher than the continuous sounds of the turbine operating. When a wind gust is included in a dataset, the infrequent and transient background noise with a heavier reporting weight would cause a distorted value of the sound levels associated with the actual turbine noise. Including sound that is unassociated with the wind turbine sound increases the L_{eq} disproportionately. As a result, the calculated Turbine-On sound level included a disproportionately higher level of sound in the reported L_{eq} . To correct this, any identifiable transient sounds should be removed prior to calculating the Turbine-On sound level.

2. Data for winds under 5 m/s should be included in the sound monitoring report.

In the Spring 2019 Report, CSA removed data from entire 10-minute blocks of data even if only one minute of data within the block showed wind speeds above 5 m/s. As part of the Commission-approved modification to the Sound Monitoring Protocol for the spring 2019 testing,

⁴ ANSI S12.9 Part 3, Short-term Measurements with an Observer Present (2013).

⁵ ANSI S12.9 Part 2, Measurement of Long-Term, Wide-Area Sound, (1992) (Reaffirmed 2018).

wind data was collected at one-minute logging intervals rather than 10-minute logging intervals as done in the Fall 2018 monitoring period. The logging interval changed because transient wind gusts in the Fall 2018 reporting period were consistently above 5 m/s, and the Protocol requires removal of data reported above 5 m/s.⁶ Including shorter logging intervals allowed CSA the opportunity to include data for recorded winds under 5 m/s even when periods of high wind events occur during the 10-minute interval.

Consistent with ANSI S12.3 Part 3, CSA can look at the shorter logging intervals and remove individual blocks of one-minute intervals to remove contaminated data (i.e, transient events of wind gusts). By removing entire 10-minute blocks of data when only one minute in the data showed wind speeds over 5 m/s, potentially good data was unnecessarily removed during the reporting period. Instead of removing the entire 10-minute block, CSA should eliminate 1-minute interval blocks when the reported data in the block showed wind gusts above 5 m/s. Removing 1-minute intervals instead of 10-minute intervals would provide a more accurate L_{eq} because more data would be included in the overall reporting period and transient events would not disproportionately increase the L_{eq} .

3. Subtraction of background sound should be done between adjacent Turbine-On and Turbine-Off periods.

CSA relied on ANSI S12.9 Part 2 to calculate Project-specific sounds in the Spring Report. As a result, CSA combined data from non-adjacent curtailment periods to create an average of the background sounds from several Turbine-On and Turbine-Off periods. As noted above, ANSI S12.9 Part 2 is not the appropriate procedure for this monitoring program because it averages all of the background noise from disparate curtailments on different days. ANSI S12.9 Part 2 methodology uses discontinuous measurements, which may create large gaps in the periods of time between when the background noise and the source noise data is collected. Averaging the different periods of data and subtracting the averages of all background noise collects an average of the environmental sound, but it fails to accurately measure the levels of sound from the specific source, in this case the wind turbines.

ANSI S12.9 Part 3 is the appropriate procedure for this monitoring program because it measures the levels of sound from the specific source by removing the background noise that occurs when the source sound is being measured. ANSI S12.9 Part 3, Section 5.2 states:

⁶ As noted in our comments on the Fall 2018 sound monitoring report, CSA kept 10-minute periods in the Turbine-On data set even where the maximum wind gust during that period exceeded 5 m/s, if the 10-minute average wind speed was under 5 m/s. This is an incorrect interpretation of the protocol, which required these periods to be eliminated. Our intent of recommending shortening the wind measurement period from 10 minutes to 1 minute in the spring monitoring, was such that short-term wind gusts greater than 5 m/s would only require the elimination of a single 1-minute period. We continue to assert that this is the correct methodology. See Deerfield Wind, LLC's Response to Shea Request for OINR Testing and Department of Public Service Request for Modification to Commission-Approved Sound Monitoring Protocol (Apr. 4, 2019) (includes CSA comments on the Fall 2018 sound monitoring report data); see also Deerfield Revised Proposed Sound Monitoring Protocol, at 9 Sec. 3.0, *Data Processing* (June 28, 2017)(identifying the removal requirements for wind gusts over 5 m/s).

Background sound affects measurements by directly adding extraneous sound energy to the sound produced by the specific source or sources under measurements. For the purpose of this standard the background sound of concern is that which exists *during the time when the sound from a source is being measured*, and is sufficiently loud to materially affect the measurement, where materially depends on the measurement precision required.

(emphasis added). The duration between background and source-on measurements should be minimized. Section 7.3.3 of Part 3 requires background sound level measurements “just before and just after,” “within the hour before or within the hour after,” “within the 1–3 h before or within the 1–3 h after,” or “within 1–30 days before or within 1–30 days after” the source-on measurement.⁷ The difference between these four requirements is that the standard specifies that the background sound be measured as close as possible to the source on measurements and some sources *can* only be turned off at particular intervals. Since turbine shutdown periods were arranged particularly for this test, the closest shutdowns to a source-on period should be used for the background measurement.

The Department critiques the use of the ANSI S12.9 Part 3 standard in its April 18, 2019 filing, arguing that it requires an observer to be present.⁸ However, the sound monitoring under the Protocol provides for a combination of attended and unattended data collection, and uses real-time audio recordings to capture the unattended sound data. The audio recording is later observed by an operator who monitors the sound level measurements of the specific source. This measuring technique—using audio recordings to observe short-term, sound level measurements—is standard practice among sound engineering consultants for the implementation of ANSI 12.9 Part 3.

As noted above, notwithstanding these three methodological issues with the Spring 2019 report analysis, the conclusions drawn by CSA remain valid—that the Project complies with the CPG noise limits. Even if the ANSI S12.9 Part 3 standard were applied to the Spring 2019 data set, the results would still demonstrate compliance with the CPG.

II. The only valid sound monitoring data demonstrates that Project-only sound levels are not 40 dBA (L_{eq}) (1hr) or higher at the Shea residence, and therefore OINR testing is not required.

Mr. Shea made his request for OINR testing pursuant to Section 2.6 of the Protocol, which states in relevant part:

OINR testing should be offered to all homeowners whose residence meets one of the following criteria: (1) the preconstruction sound model shows Deerfield Project sound levels of 40 dBA or higher at that location; or (2) *sound monitoring (post-construction) shows Deerfield Project sound levels of 40 dBA(L_{eq})(1 hour) or higher at the location.*

(emphasis added).

⁷ ANSI S12.9 Part 3, Sec. 7.3.3a–d.

⁸ Department of Public Service Response to Deerfield Comments Regarding Shea Motion for Outside to Inside Noise Reduction Testing, at 3, *Amended Petition of Deerfield Wind, LLC, for a certificate of public good authorizing it to construct and operate a 15-turbine, 30 MW wind generation facility*, Docket 7250 (filed Apr. 18, 2019).

Given that the Project is operational, under the above-cited provision it is the sound monitoring data that must establish whether Project-only exterior sound levels are 40 dBA (L_{eq})(1 hr) or higher at the Shea residence. The results of the Spring 2019 Report show that the Protocol's pre-requisite has not been met. The Spring 2019 Report concludes that Project-only sound levels are 38 dBA (exterior, L_{eq})(1 hr) at Site C, which is the Shea residence.⁹

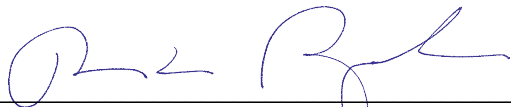
With respect to the Fall 2018 Report, as Deerfield previously stated in its prior filing,¹⁰ support for OINR testing cannot be determined from the Fall 2018 data because the data analysis used an averaging of sound data from three different shutdown periods. As discussed above, this method would not provide results consistent with the appropriate sound testing standard, ANSI S12.9 Part 3. Only a total of 48 minutes of valid data was collected at Site C, the data collected was sourced from different shutdown periods, and no single shutdown period had sufficient valid data (30 minutes out of a 60-minute period). As a result, the one-hour continuous sound level (L_{eq})(1 hr) cannot be determined from the Fall 2018 data, and thus cannot be relied upon to support the OINR request.

III. Conclusion

For the reasons stated above, the Commission should request CSA to revise the Spring Report using ANSI S12.9 Part 3, which would resolve the methodological issues. In addition, the Commission should utilize the data in the Spring 2019 Report to conclude that the Protocol's pre-requisite for OINR testing has not been met.

Dated at Burlington, Vermont, this 15th day of November, 2019.

DEERFIELD WIND, LLC



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⁹ Spring 2019 Report at 26.

¹⁰ Deerfield's Apr. 4, 2019 filing at 2-3.