

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA**

IN THE MATTER OF THE)	
APPLICATION OF CROWNED)	
RIDGE WIND, LLC FOR A)	MOTION FOR APPROVAL
PERMIT OF A WIND ENERGY)	OF MITIGATION PLAN
FACILITY IN GRANT)	
AND CODINGTON COUNTIES)	

EL-19-003

**MOTION OF
CROWNED RIDGE WIND, LLC**

I. Introduction

Crowned Ridge Wind, LLC (“Crowned Ridge”) hereby moves for an order approving a Mitigation Plan, as further described herein, which involves: (1) executing waivers of Condition No. 26 with the landowners at Position 1-3 in exchange for mutually agreed on compensation; (2) the use of General Electric’s (“GE”) winter ice operation mode (“WIOM”); and (3) a commitment to conduct a follow-up sound study in the Fall of 2021 in order to verify compliance under a modified sound study protocol. Crowned Ridge further moves that the Commission determine that with the approval of the Mitigation Plan, no additional Commission action is needed to address the limited and unusual sound threshold exceedances observed in October 2020. In support of the motion, Crowned Ridge submits as follows:

II. Commission’s Sound Thresholds

A. Background

In the Final Order, the Commission adopted Condition No. 26, which approved sound thresholds for non-participants and for participants:

The Project, exclusive of all unrelated background noise, shall not generate a sound pressure level (10-minute equivalent continuous sound level, Leq) of more than 45 dBA as measured within 25 feet of any non-participating residence unless the owner of the residence has signed a waiver, or more than 50 dBA (10-minute equivalent continuous sound level, Leq) within 25 feet of any participating residence unless the owner of the residence has signed a waiver.

As the plain language indicates non-participants and participants can waive Condition No.

26. The Condition also sets forth certain protocols for a post-construction sound study, including: (1) following the American National Standard Institute (“ANSI”) methods; (2) measuring sound over a continuous 14 day period; (3) measuring sound at 4-6 locations including non-participants and participants at the highest expected sound levels; and (4) requirements on the set up of sound measuring equipment and the analysis of sound data. The protocol further specifies that there should be a comparison of turbine-only sound levels to the 45 and 50 dBA limits, and “[c]ompliance shall be demonstrated if all samples are less than the limits.”

On September 21, 2020, at the Commission’s direction, Crowned Ridge submitted detailed sound study protocols to conduct a post-construction sound study in the Fall of 2020. The protocols, among other things, established that the evaluation periods, identified the locations at which to measure sound, and that the evaluation of turbine-only sound would occur when electrical output of the wind turbines was at its highest output of 2,300 kilowatts. On October 2, 2020, the Commission approved the sound protocols.

B. Sound Study Reports

On January 15, 2021, the Sound Study Report of Epsilon Associates, Inc. (“Epsilon Report”) was submitted showing that under the Commission-approved protocol Crowned Ridge was compliant with the Commission’s sound thresholds set forth in Condition No. 26 of the final order. Specifically, Epsilon concluded:

The results of this post-construction measurement program show that sound pressure levels due to the wind turbines under wind speed and operational conditions identified as conditions resulting in maximum sound power levels, meet the sound level limits set forth in the SD PUC Final Decision for CRW at each of the monitoring locations. As presented in Table 8-1, the wind turbine only 10-minute Leq sound levels range from 34 to 44 at the five (5) non-participating monitoring locations and from 42 to 49 at the one (1) participating monitoring location. The results of this sound level compliance assessment show (1) that CRW is in compliance with the SD PUC sound thresholds at the measured locations; and (2) because the measured locations were selected due in part to higher modeled sound levels, it follows that participant and nonparticipant residences not specifically evaluated during this program will also be below the applicable sound level limit.

Epsilon Report at 1-1.

On February 16, 2021, Commission Staff submitted David Hessler's Sound Study Report ("Hessler Report"). While the Hessler Report agrees that Crowned Ridge is compliant with the Commission-approved sound thresholds measured per the Commission-approved sound protocols, the Hessler Report made the following observation on data that is outside the scope of the Commission-approved sound protocols:

. . . . the wind gradient and general atmospheric conditions appear to have been highly conducive to the propagation of project sound during the 17 hour period from about 1 p.m. on 10/22/20 until about 6 a.m. on 10/23/20 and it can be concluded with considerable certainty from the behavior of the measured sound levels through the shutdowns that occurred during this period, and from a review of audio files before, during and after these shutdowns, that the Leq(10 min) sound levels measured 1 to 5 dBA above the permitted limits where driven by the project rather than background sound. . . . During the remainder of the survey at those test locations and throughout the entire survey at Positions 4 through 6 there is no evidence of non-compliance and, in fact, every reason to believe the project's sound emissions are below the applicable maxima. Because the overages occurred only once at only three of the six test positions during this unusually long three week survey period and because wind turbine noise is unavoidably variable with changing atmospheric conditions, we would conclude that the project has been appropriately designed and is meeting, in good faith, the intent of the permit noise limits. In essence, our analysis indicates that the project sound level was compliant with the stipulated noise limits at Positions 1-3 for 96% of survey period and for 100% at the remaining positions.

Sound Report at 33.

C. Compliance with Commission-Approved Sound Thresholds

The Epsilon Report and Hessler Report are in complete agreement that Crowned Ridge is compliant with the Commission-approved sound thresholds under the Commission-approved sound protocols. As mentioned, one of the primary requirements of the Commission-approved sound protocols is that the turbine-only sound be measured when the wind turbines are at full output. Further, although the Hessler Report makes observations that at lower wind turbine output the data showed limited and unusual sound threshold exceedances, the Report concludes that the Commission should find Crowned Ridge compliant. Indeed, the Hessler Report shows that at the same time there were limited and unusual exceedances at Locations 1-3, Locations 4-6 were fully compliant. Furthermore, all locations were fully compliant during the Spring of 2020 sound study period submitted in this docket on September 21, 2020. In addition, as pointed out in Crowned Ridge's March 3, 2021 response, under the ANSI standards and the Commission's protocols periods of precipitation are not to be used to measure compliance, which further eliminates some of the observed exceedances in Location 1-3. See Attachment 1 (Crowned Ridge's March 3, 2021 Response).

Although there is complete agreement regarding Crowned Ridge's compliance with the sound thresholds between the Epsilon and Hessler Reports using the Commission-approved sound protocols, Crowned Ridge has decided to implement a multi-tiered Mitigation Plan to address the unusual and limited sound threshold exceedances observed at less than full wind turbine output.

Based on analyses and discussions with Epsilon, NextEra Energy Resources, LLC's experts, and GE (the turbine manufacturer), Crowned Ridge believes that sound threshold exceedances observed in the Hessler Report resulted from the formation of frost on the blades due to a prolonged cold mist, which resulted in the pitching of the blades from ten degrees to near zero.

More specifically, it is believed the sound threshold exceedances resulted from a combination of: (1) the frost on the wind turbine blades; (2) the decreasing pitch angle of the wind turbine blades; and (3) a possible stalling action of the wind turbines.

At the time of the sound study, WIOM was not enabled. Operationally, WIOM stabilizes blade pitch and works to prevent wind turbine stalling when there is a material amount of frost, ice,¹ or dust on the blades. WIOM has been enabled for Crowned Ridge since February of 2021, which will prevent the unusual pitching of the blades and possible stalling action that was experienced in October of 2020. Thus, the convergence of weather and operational events that occurred in October 2020 will not reoccur in the future, and, therefore, there should be no further sound threshold exceedances.

D. Mitigation Plan

Crowned Ridge's three-tiered Mitigation Plan includes: (1) the execution of mutually agreed on waivers of Condition No. 26 from the landowners at Locations 1-3; (2) the use of WIOM; and (3) a commitment to conduct a follow-up sound study. Crowned Ridge submits that the Mitigation Plan appropriately addresses the unusual and limited exceedances identified in the Hessler Report, and, requests that the Commission approve the Mitigation Plan.

1. Affected Landowners

Crowned Ridge has executed waivers of Condition No. 26 with the landowners at Locations 1 and 2 in exchange for compensation.² A sample of the agreement is attached at

¹ Although WIOM, in part, is designed to allow the wind turbine to operate during icing events, Crowned Ridge's use of WIOM will not override Crowned Ridge's existing operational protocol to shutdown wind turbines to prevent ice throw as required by Condition 35.

² Crowned Ridge has received no sound complaints related to the sound measurement period that had the limited sound threshold exceedances, including no complaints from the landowners at Locations 1-3.

Attachment 2. Crowned Ridge will continue to work with Location 3 to come to a mutually acceptable waiver of Condition No. 26. If a waiver is executed for Location 3, Crowned Ridge will notify the Commission.

2. Use of WIOM for Crowned Ridge

Crowned Ridge will continue to use WIOM to stabilize blade pitch and work to prevent wind turbine stalling.

3. Additional Sound Study

To verify compliance under the modified sound study protocol, Crowned Ridge will have Epsilon conduct a sound study in the Fall of 2021 for the wind energy facility under conditions which resulted in limited sound threshold exceedances. Epsilon will conduct the sound study at three locations near Locations 1-3³ for receptors that are modelled to be close the Commission-approved sound thresholds. The sound study will use the protocols approved by the Commission on October 2, 2020, with the following changes: (1) perform the study at three locations; (2) require that the study and report focus on time periods near wind turbine shutdowns; (3) modify the wind turbine shutdown procedure to perform four shutdowns daily at 1:00 a.m., 7:00 a.m., 1:00 p.m., and 7:00 p.m. for wind turbines within 1.75 miles of a measurement location shutdown, which is sufficient to conduct sound measurements at the three locations, and, which, also, can be modified, as requested, by the Epsilon acoustical consultant; (4) perform the study in the Fall of 2021 during similar weather patterns and wind turbine output ranges that were present in October of 2020; and (5) require that an acoustical consultant from Epsilon remain in Watertown, South Dakota for the duration of the sound level measurement to allow for frequent personal observations

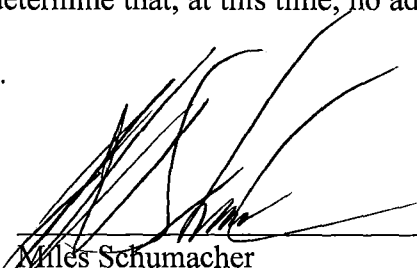
³ If Location 3 executes a mutually agreed on waiver, then an alternative location will be studied. If Location 3 does not execute a waiver, Epsilon will include that Location in the study, provided the landowner is amendable.

during the performance of the sound study. Epsilon and Crowned Ridge will also collaborate on what weather, wind, and other data needs should be collected and analyzed to facilitate the evaluation of the sound study measurements and increase the value of the sound study. The results of the sound study will be filed with the Commission. If there are any sound threshold exceedances from wind turbine only sound, Crowned Ridge will also file a specific Mitigation Plan to address those sound threshold exceedances.

III. Conclusion

For the foregoing reasons, Crowned Ridge respectfully moves that the Commission approve the Mitigation Plan as an appropriate response to the limited and unusual exceedances observed in the Hessler Report, and, also, determine that, at this time, no additional Commission action is needed to address the exceedances.

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