

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

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

EL19-003

**APPLICANT’S RESPONSES TO
STAFF’S THIRD SET OF DATA
REQUESTS TO CROWNED
RIDGE WIND, LLC**

Attached, please find Applicant’s Responses to Staff’s Third Set of Data Requests to Crowned Ridge Wind, LLC (“Crowned Ridge” or “Company”).

3-1) Refer to the response to data request 2-41. Provide an update on the status of obtaining the remaining 1% of easements. If the remaining easements have not been obtained provide an estimate on when the remaining easements will be obtained.

Response:

Crowned Ridge Wind is continuing to work to obtain the remaining 1% of easements. The Applicant anticipates that all property rights necessary for the Project will be obtained by May 17, 2019.

Respondent: Tyler Wilhelm, Project Manager

3-2) Please provide a copy of the safety manual and operations manual for the GE 2.3-116 turbines that will be used for the project.

Response:

See Confidential Attachment 1.

Respondent: Mark Thompson, Manager of Wind Engineering

3-3) Referring to Crowned Ridge's response to data request 1-5 and Attachment 3-3 provided herein, please provide the following:

1. A sound study that provides the expected noise level at receptors (both participating and non-participating) that includes both Dakota Range I & II turbine locations and Crowned Ridge I turbine locations. Include in the study an analysis demonstrating compliance with county noise limits.

2. A shadow flicker study that provides the expected shadow flicker levels at receptors (both participating and non-participating) that includes both Dakota Range I&II turbine locations and Crowned Ridge I turbine locations. Include in the study an analysis demonstrating compliance with county shadow flicker limits, if any.

Response: The Sound Study, "Appendix H, Sound Level Modeling Report", submitted to the PUC on 1/30/19, along with the updated Appendices included in "Crowned Ridge, LLC's Letter Regarding Updated Appendices A through D for Appendix H", submitted 2/27/2019 demonstrate compliance with the county's noise limits. The updated appendices include the cumulative effects from both Crowned Ridge projects as well as the Dakota Range project. All receptors are below the required noise limits.

The Shadow Flicker Study, "Appendix I, Shadow Flicker Modeling Report", submitted to the PUC on 1/30/19, along with the updated Appendices included in "Crowned Ridge, LLC's Letter Regarding Updated Appendices A through D for Appendix I", submitted 2/27/2019 demonstrate compliance with the county's shadow flicker limits. The updated

appendices include the cumulative effects from both Crowned Ridge projects as well as the Dakota Range project. All receptors are below the required shadow flicker limits with the exception of receptor CR1-C61-NP, which has a significant shadow flicker contribution from a Dakota Range wind turbine.

Respondent: Jay Haley, Wind Engineer

3-4) Referring to Crowned Ridge's response to data request 1-5, please explain how Crowned Ridge intends to meet or exceed Codington County's shadow flicker limit of 30 hours per year for receptor CR1-C61-NP.

Response: Crowned Ridge Wind will consider multiple mitigation options moving forward to ensure that the shadow flicker levels for receptor CR1-C61-NP comply with Codington County's shadow flicker limit of 30 hours per year. Crowned Ridge Wind will communicate with the landowner living in CR1-C61-NP to understand if the landowner would be amenable to a setback waiver or to the Applicant planting trees (or other means to blocking shadow flicker) to alleviate impacts over 30 hours per year. In the event the landowner is not agreeable to a setback waiver or to the Applicant planting trees to alleviate potential impacts, the Applicant will utilize one of the Project's alternate turbine locations in place of this proposed location.

Respondent: Tyler Wilhelm, Project Manager

3-5) Provide a map that shows the proposed turbines within 2 miles from the residence of the following individuals. Please provide a map similar to Page 88 of 156 of Staff Exhibit_JT-1 in Docket EL18-003 for Ms. Teresa Kaaz (<http://puc.sd.gov/commission/dockets/electric/2018/EL18-003/exhibits/staff/s1.pdf>).

- a) Mr. Allen Robish;
- b) Ms. Amber Christenson;
- c) Ms. Kristi Mogen;
- d) Ms. Melissa Lynch; and
- e) Mr. Patrick Lynch.

Response: See Attachment 1 to 3-5.

Respondent: Tyler Wilhelm, Project Manager

3-6) Provide the predicted sound levels from the Project and the estimated annual frequency of shadow flicker associated with the operation of the Project wind turbines at the intervenor residences below. In addition, provide the distance from the closest wind turbine to each residence.

- a) Mr. Allen Robish;
- b) Ms. Amber Christenson;
- c) Ms. Kristi Mogen;
- d) Ms. Melissa Lynch; and
- e) Mr. Patrick Lynch;

Response:

- a) Mr. Allen Robish; CR1-G70-NP: 42.1 dBA, 12:04 hr/yr, 1,955 ft
- b) Ms. Amber Christenson; CR1-C29-NP: 41.4 dBA, 6:54 hr/yr, 2,457 ft
- c) Ms. Kristi Mogen; No Receptor #: 28.6 dBA, 0:00 hr/yr, 13,166 ft
- d) Ms. Melissa Lynch; and
- e) Mr. Patrick Lynch. CR1-C27-NP: 40.0 dBA, 6:58 hr/yr, 2,549 ft

Respondent: Jay Haley, Wind Engineer for sound and shadow/flicker, and Tyler Wilhelm for the distance of the nearest turbine.

3-7) Please identify all non-participating residences within $\frac{3}{4}$ miles from a proposed turbine. For each residence identified, provide the name of the property owner, distance from closest turbine, and receptor identifier in the shadow flicker and noise studies.

Response: See table below.

Receptor #	First Name	Last Name	Distance to Nearest Turbine (ft)	Turbine #
CR1-C14-NP	BRADFORD J. & CHERI M.	HOWELL	1,880	CRI-95
CR1-C16-NP	PAUL	JOHNSON	2,736	CRI-Alt22
CR1-C27-NP	DOLORES	MEIS	2,549	CRI-79
CR1-C28-NP	SUSAN	MARTIN	2,831	CRI-68
CR1-C29-NP	A	CHRISTENSON	2,457	CRI-67
CR1-C31-NP	DAVID	STRANG ETUX	2,126	CRI-67
CR1-C32-NP	ROGER	MOHR ETUX	3,714	CRI-79
CR1-C34-NP	MARK ZEMLIKA, SHIRLEY &	ULLERICH ETUX	1,726	CRI-60
CR1-C38-NP	RODNEY TRUSTEES		3,474	CRI-53
CR1-C39-NP	LEON C	ZEMLIKA	2,605	CRI-53
CR1-C3-NP	RODNEY	HANSEN	3,294	CRI-98
CR1-C40-NP	ALLEN	GRIEPP	2,690	CRI-Alt45

CR1-C41-NP	ROBERT J	WELDER	2,359	CRI-44
CR1-C44-NP	LEWIS W & PATRICIA A TR	RADERSCHADT	2,155	CRI-37
CR1-C52-NP	VINCENT	KELLEN SCHROEDER	1,883	CRI-19
CR1-C60-NP	JEFFREY	ETUX	2,592	CRI-16
CR1-C61-NP	D	BOOZE	1,686	CRI-16
CR1-C62-NP	MARK S & NANCY F	LUECK	1,676	CRI-21
CR1-C63-NP	MILTON E & ALICE R	CARLSON	2,408	CRI-21
CR1-C65-NP	BRANDON L. & LAURIE A.	JOHNSON	3,884	CRI-26
CR1-C70-NP	BEVERLY	CARPENTER	3,540	CRI-75
CR1-C71-NP	BEVERLY	CARPENTER	3,448	CRI-75
CR1-C72-NP	BEVERLY	CARPENTER	3,776	CRI-75
CR1-C105-NP	NANCY	ADAIR	2,549	DR-A25 *
CR1-C105-NP	NANCY	ADAIR	3,743	CRI-5
CR1-C110-NP	JOHN	IRISH	2,910	DR-70 *
CR1-C110-NP	JOHN	IRISH	3,448	CRI-19
CR1-C111-NP	TONY & ALICIA	HUFFMAN	3,678	CRI-19
CR1-G13-NP	TIMOTHY D JR	NOWICK	3,576	CRI-99
CR1-G149-NP	SCHLEUSNER DAIRY		2,815	CRI-Alt7
CR1-G14-NP	ROBERT A	TUTTLE	3,940	CRI-100
CR1-G16-NP	MICHAEL D & SUSAN	MULHOLLAND	2,070	CRI-100
CR1-G23-NP	LANE PARKER	JOHNSON	2,185	CRI-109
CR1-G26-NP	JOHN L & SUSAN E	FOX	3,140	CRI-115
CR1-G34-NP	PAUL D & NORWEST	PETERSON	2,238	CRI-120
CR1-G42-NP	KEVIN	OWEN	3,819	CRI-121
CR1-G43-NP	CHAD & SUSAN	WISNEWSKI	1,909	CRI-3
CR1-G44-NP	STEPHEN V	KOWALSKI	3,123	CRI-3
CR1-G68-NP	CLAYTON & SUSAN	SPANGENBERG	2,113	CRI-114
CR1-G108-NP	MICHAEL J JR.	WOLLMAN	3,586	CRI-126
CR1-G109-NP	KARLA ETAL	RAMOS	2,152	CRI-129
CR1-G113-NP	ARLO	FISH	2,746	CRI-Alt12
CR1-G114-NP	J T H TRUST		2,205	CRI-Alt12
CR1-G115-NP	KELLY	FAETH	2,188	CRI-Alt16

* Dakota Range turbine

Respondents: Jay Haley, Wind Engineer for the receptor identifier in the shadow flicker and noise studies, and Tyler Wilhelm for identify all non-participating residences within ¾ miles from a proposed turbine and the distance of the nearest turbine.

3-8) Referring to Crowned Ridge's response to data request 2-18, the SD PUC has ordered two years of post-construction avian and bat mortality monitoring for other wind projects recently permitted. As such, would Crowned Ridge agree to the permit condition below if a permit is issued by the Commission? If not, explain why Crowned Ridge is not open to this condition.

Applicant agrees to undertake two years of independently-conducted post-construction avian and bat mortality monitoring for the Project, and to provide a copy of the report to the USFWS, SD GF&P, and the Commission. Based on the results of the monitoring, the need for and scope of an additional year of independently-conducted post-construction avian mortality monitoring will be determined in coordination with USFWS and SD GF&P.

Response: Applicant agrees to undertake two years of independently-conducted post-construction avian and bat mortality monitoring for the Project, and to provide a copy of the report to the United States Fish & Wildlife Service (USFWS), the South Dakota Game, Fish, and Parks (SD GF&P), and the Commission. The Applicant proposes to consider a third year of monitoring if results of the first two indicate results exceed other publicly available studies in the region in comparable habitats in coordination with the USFWS and SD GF&P. The Applicant believes it is important to clearly articulate the objective and rationale for a third year of post-construction mortality monitoring. In this case, the purpose of the first two years is to confirm the site is low risk compared to publicly available data in the region and in comparable habitats. If the site is not low risk, then the Applicant agrees to consider a third year of post-construction mortality monitoring in coordination with the wildlife agencies, unless another course of action or remedy is identified and can be addressed.

Respondent: Sarah Baer, Consultant and Sam Massey, Director of Renewable Development

3-9) Referring to Crowned Ridge's Response to data request 2-34, would the company agree to the decommissioning financial assurance permit condition provided below if a permit is issued by the Commission? If not, please explain why.

At least 60 days prior to commencement of commercial operation, Applicant shall file an escrow agreement with the Commission for Commission approval that provides a decommissioning escrow account. The escrow agreement shall incorporate the following requirements:

- a) The escrow account is funded by the turbine owner annually at a rate of \$5,000 per turbine per year for the first 30 years, commencing no later than the commercial operation date.
- b) Beginning in year ten following commercial operation of the project and each fifth year thereafter, the turbine owner shall submit to the Commission an estimated decommissioning date, if established, and estimated decommissioning costs and salvage values. Based on the verification of the information in the filing the Commission may require additional funding equal to the estimated amount needed for decommissioning.
- c) All revenues earned by the account shall remain in the account.
- d) An account statement shall be provided annually to the Commission and become a public record in this docket.
- e) The escrow account obligations will be those of Crowned Ridge I and the escrow agreement shall include terms providing that the agreement binds Crowned Ridge I's successors,

transferees, and assigns. A sale of project assets shall include the associated Permit that requires Commission approval per SDCL § 49-41B-29.

f) The escrow account agent shall have an office located in South Dakota.

g) The escrow agreement shall be subject to the laws of South Dakota and any disputes regarding the agreement shall be venued in South Dakota.

h) To minimize the risk that the escrow account would be subject to foreclosure, lien, judgment, or bankruptcy, the escrow agreement will be structured to reflect the follow factors:

1) That Crowned Ridge I agreed to the creation of the escrow account;

2) Crowned Ridge I exercises no (or the least amount possible of) control over the escrow;

3) The initial source of the escrow;

4) The nature of the funds put into the escrow;

5) The recipient of its remainder (if any);

6) The target of all its benefit; and

7) The purpose and its creation.

i) Account funds are to be paid to the project owner at the time of decommissioning, to be paid out as decommissioning costs are incurred and paid.

j) If the project owner fails to execute the decommissioning requirement found in section XX of the Conditions, the account is payable to the landowner who owns the land on which associated project facilities are located as the landowner incurs and pays decommissioning costs.

Response: Crowned Ridge Wind is willing to agree to the above condition, with the edits below to the first paragraph of the condition:

At least ~~60~~ 30 days prior to commencement of commercial operation, Applicant shall file an escrow agreement with the Commission for Commission approval that provides a decommissioning escrow account or provide proof that an escrow meeting these requirements has been established pursuant to applicable county requirements.

Respondent: Tyler Wilhelm, Project Manager

3-10) Please provide Figures 2, 9a, 9b, 10, 11, 12, and 13 that also include the proposed layout of the turbines, access roads, and collector lines.

Response: See Attachment 1 to 3-10.

Respondent: Sarah Baer, Consultant

3-11) Referring to page 1 of Appendix H attached to the original application, please confirm that Crowned Ridge will use Low Noise Trailing Edge Blades as was modeled.

Response: Confirmed.

Respondent: Tyler Wilhelm, Project Manager

3-12) Referring to page 77 of the Application, please provide how Crowned Ridge interprets “including constructive interference” in the Grant County noise limit. Further, was constructive interference accounted for in the sound study? If so, please explain how the study accounted for it. If not, please explain how the modeling demonstrates the project will comply with the county noise limit once operational.

Response: Crowned Ridge Wind believes the county intended “including constructive interference” to mean that the cumulative and additive noise impacts from all turbines at a receptor should be calculated and included in the results of the study.

In the case of the Crowned Ridge Wind project, all wind turbines were assumed to be operating simultaneously at maximum sound emission levels, and downwind of each receptor. The wind turbine sound emissions were conservatively increased by 2 dBA and then combined to get the cumulative results. More specifically, constructive interference occurs when two or more coherent sound sources are present. In order to be coherent, the sources must have exactly the same frequency and must also be in phase with one another. This implies that the sound being emitted is a pure tone and of a single narrow band frequency. The Crowned Ridge Wind turbines do not emit pure tones, but, rather, sound over a broad range of frequencies. It is extremely unlikely, if not impossible, for there to be multiple sources of wind turbine pure tones or other tonal sound sources that are exactly the same frequency and in phase with one another at the same time, so the addition of coherent sound sources and constructive interference is not considered in the analysis. This would require the use of a certain mathematical method for combining the cumulative sound pressure levels from the multiple sources, which is not applicable in this case.

In the analysis for the Crowned Ridge project, the multiple sound sources are combined as incoherent sources, meaning that the sources are not exactly the same, not pure tones, and are out of phase with one another so there is no constructive interference. This requires using a method for combining the sound pressure levels from the multiple sources that is different than that used for combining coherent sources. Combining as incoherent sources is the standard approach used for environmental noise studies.

In the case of the Crowned Ridge Wind project, all turbines were assumed to be operating simultaneously at maximum sound emission levels, and downwind of each receptor. The wind turbine sound emissions were also conservatively increased by 2 dBA and then combined to get the cumulative results.

The results of the study indicate that all occupied structures in both Grant and Codington

Counties are below the required sound pressure levels. Additionally, the sound pressure levels at all non-participating property boundaries are below the required limits for occupied land parcels in Codrington County.

Respondent: Jay Haley, Wind Engineer