

**BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION**

**DOCKET NO. EL19-003**

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

**DIRECT TESTIMONY OF DARREN KEARNEY  
ON BEHALF OF THE PUBLIC UTILITIES COMMISSION STAFF  
May 10, 2019**

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## **EXHIBITS**

Exhibit\_DK-1: Resume

Exhibit\_DK-2: Crowned Ridge Wind, LLC's Responses to Staff Data Requests

Exhibit\_DK-3: Intervenors' Responses to Staff Data Requests

Exhibit\_DK-4: South Dakota Department of Health Letter

Exhibit\_DK-5: Commission Staff Letter to SD DENR

Exhibit\_DK-6: SD DENR Response Letter to Commission Staff

Exhibit\_DK-7: Map of Crowned Ridge and Dakota Range Wind Turbines

Exhibit\_DK-8: Intervenors' Recommended Permit Conditions

1 I. **INTRODUCTION AND QUALIFICATIONS**

2  
3 **Q. State your name.**

4 A. Darren Kearney.

5  
6 **Q. State your employer and business address.**

7 A. South Dakota Public Utilities Commission, 500 E Capitol Ave, Pierre, SD, 57501.

8  
9 **Q. State your position with the South Dakota Public Utilities Commission.**

10 A. I am a Staff Analyst, which is also referred to as a Utility Analyst.

11  
12 **Q. What is your educational background?**

13 A. I hold a Bachelor of Science degree, majoring in Biology, from the University of  
14 Minnesota. I also hold a Master of Business Administration degree from the University  
15 of South Dakota.

16  
17 **Q. Please provide a brief explanation of your work experience.**

18 A. I began my career in the utility industry working as contract biologist for Xcel Energy,  
19 where I conducted biological studies around various power plants, performed statistical  
20 analysis on the data collected, and authored reports in order to meet National Pollutant  
21 Discharge Elimination System (NPDES) permit requirements.

22  
23 After two years of performing biological studies, I then transitioned into an environmental  
24 compliance function at Xcel Energy as a full-time employee of the company and became  
25 responsible for ensuring Xcel's facilities maintained compliance with the Oil Pollution Act  
26 of 1990. This involved writing Spill Prevention Control and Countermeasure (SPCC)  
27 plans and also ensuring Xcel's facilities maintained compliance with those plans. I was  
28 also responsible for the company's Environmental Incident Response Program, which  
29 involved training Xcel employees on spill reporting and response, managing spill  
30 cleanups, and mobilizing in-house and contract spill response resources.

31  
32 I was in that role for approximately three years and then I transitioned to a coal-fired  
33 power plant at Xcel and became responsible for environmental permitting and  
34 compliance for the plant. Briefly, my responsibilities involved ensuring that the facility

1 complied with all environmental permits at the plant, which included a Clean Air Act Title  
2 V Air Permit, a Clean Water Act NPDES permit, and a hazardous waste permit. I also  
3 drafted reports on the plant's operations for submission to various agencies as required  
4 by permit or law. After three years at the power plant, I left Xcel Energy to work for the  
5 South Dakota Public Utilities Commission (SD PUC).

6  
7 I have been at the SD PUC for over six years now. During my employment with the  
8 PUC, I worked on a variety of matters in the telecom, natural gas, and electric industries.  
9 The major dockets that I work on are energy conversion facility siting, transmission  
10 siting, pipeline siting, wind energy facility siting and energy efficiency programs. I also  
11 work on matters involving the Midcontinent Independent System Operator (MISO),  
12 specifically wholesale electricity market issues, transmission cost allocation and regional  
13 transmission planning. I also attended a number of trainings on public utility policy  
14 issues, electric grid operations, regional transmission planning, electric wholesale  
15 markets, and utility ratemaking.

16  
17 My resume is provided as Exhibit\_DK-1.

18  
19 **II. PURPOSE OF TESTIMONY**

20  
21 **Q. On whose behalf was this testimony prepared?**

22 A. This testimony was prepared on behalf of the Staff of the South Dakota Public Utilities  
23 Commission.

24  
25 **Q. What is the purpose of your direct testimony?**

26 A. The purpose of my direct testimony is to discuss the Application review performed by  
27 Commission Staff, identify any issues or concerns with the representations made in the  
28 Application or by the Applicant, identify any outstanding concerns Staff has with  
29 Application, and provide recommended permit conditions.

30  
31 **III. REVIEW OF THE APPLICATION**

32  
33 **Q. When did Crowned Ridge Wind, LLC file its Application for a permit to construct  
34 the wind energy facility?**

1 A. The Application was filed on January 30, 2019.

2

3 **Q. Did you review Crowned Ridge Wind, LLC's Application for a permit to construct**  
4 **the wind energy facility?**

5 A. Yes. I also reviewed the figures, appendixes, discovery responses produced by all  
6 parties, Crowned Ridge's direct and supplemental testimony and comments the PUC  
7 received from the public.

8

9 **Q. Were other Staff involved in the review of the Application?**

10 A. Yes. Staff Analysts Jon Thurber and Eric Paulson and Staff Attorneys Kristen Edwards  
11 and Amanda Reiss also assisted in reviewing the Application.

12

13 **Q. Explain, in your words, the main role of the SDPUC Staff in the Application**  
14 **proceedings.**

15 A. After receiving the Application filing, Staff completed a review of the contents of the  
16 Application as it relates to the Energy Facility Siting statutes, SDCL 49-41B, and Energy  
17 Facility Siting Rules, ARSD 20:10:22. Staff then identified information required by  
18 statute or rule that was either missing from the Application or unclear within the  
19 Application and requested Crowned Ridge to provide or clarify that information (see  
20 Exhibit\_DK-2). Once interested individuals were granted party status, Staff also issued  
21 discovery to the intervenors to understand what concerns they had with the project (see  
22 Exhibit\_DK-3).

23

24 Staff hired one consultant to assist with reviewing the Application. David Hessler has  
25 expertise on noise emitted from wind turbines and noise modeling. Mr. Hessler  
26 completed his review and authored his testimony as filed in this docket.

27

28 Finally, Staff assisted intervenors and affected landowners by providing responses to  
29 numerous questions on the windfarm, the siting process at the PUC and the  
30 opportunities available for these individuals to be heard by the Commission. If the  
31 landowners had specific concerns with the wind farm, Staff often recommended that  
32 those individuals file comments in the docket for the Commission's review. Where  
33 appropriate, Staff also included some of the landowners' questions or concerns in Staff's  
34 data requests sent to Crowned Ridge to have them address the issue.

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**Q. What is the purpose of Staff’s expert witness in this proceeding?**

A. Given that information submitted in the Application regarding noise modeling is technical in nature, Staff sought an expert in that field to assess the merits and deficiencies of the Application. Staff asked the expert to review the relevant portions of the Application, testimony, appendixes, data requests, and public comments that fall within his area of expertise and identify any concerns he had with the material submitted.

Ultimately, Staff requested that the expert address whether or not the information submitted by Crowned Ridge aligns with industry best practices and if he agreed with the conclusions Crowned Ridge made regarding potential impacts from the project.

**IV. STATE AGENCY CONSULTATION**

**Q. Did Staff reach out to any other State Agencies for input?**

A. Yes. Specifically for this docket, Staff reached out to the South Dakota Game, Fish, and Parks (SD GF&P), the State Historic Preservation Office (SHPO), and South Dakota Department of Transportation – Aeronautics Division (SD DOT – Aeronautics).

**Q. Did any of those agencies communicate concerns to PUC Staff specific to the Crowned Ridge Wind Farm?**

A. Since the SD GF&P (Mr. Tom Kirschenmann) and SHPO (Ms. Paige Olson) are witnesses in this proceeding, I will defer to their testimony as to what concerns, if any, they may have with the proposed project. The SD DOT – Aeronautics reviewed the turbine layout and didn’t have any comments or concerns with proposed project.

**Q. Has Commission Staff consulted with any other State Agencies for other wind energy facility permit applications in the past?**

A. Yes. For the Crocker Wind Farm (dockets EL17-028 and EL17-055) and other wind energy projects thereafter, Staff consulted with the South Dakota Department of Health (Department of Health). For the Deuel Harvest Wind Farm (docket EL18-053), Staff consulted with the South Dakota Department of Environment and Natural Resources (SD DENR).

1 **Q. Please explain the consultation between Staff and the Department of Health for**  
2 **wind energy facilities.**

3 A. SDCL 49-41B-22(3) requires the Applicant establish that the Crowned Ridge Wind Farm  
4 will not substantially impair the health, safety, or welfare of the inhabitants. At the Public  
5 Input Hearing and through written comments to the Commission, commenters have  
6 raised concerns regarding health impacts to inhabitants near wind facilities.  
7 Commission Staff believes the Department of Health is the appropriate State agency to  
8 assess the potential health impacts from wind farms.

9  
10 The Crocker Wind Farm was the first wind energy facility permit application reviewed by  
11 Staff in recent years. As such, Staff reached out to the Department of Health to  
12 determine if the agency had any concerns about the potential impact to human health  
13 from wind turbines. The Department of Health provided a letter (dated October 13,  
14 2017) in response, which I will discuss later in my testimony.

15  
16 Comments received by the Commission on health concerns for the Prevailing Wind Park  
17 project (docket EL18-026), as well as supporting information submitted with those  
18 comments, was also provided by Staff to the Department of Health for review. The  
19 Department of Health's position did not change based on the additional information Staff  
20 provided and indicated that the letter dated October 13, 2017 is generally applicable to  
21 any wind turbine project.

22  
23 **Q. What was the Department of Health's Response?**

24 A. The Department of Health provided Commission Staff with a letter (dated October 13,  
25 2017) stating that the Department of Health has not taken a formal position on the issue  
26 of wind turbines and human health. Further, they referenced the Massachusetts  
27 Department of Public Health and Minnesota Department of Health studies and identified  
28 those studies generally conclude that there is insufficient evidence to establish  
29 significant risk to human health.

30  
31 Since comments received for Crowned Ridge are similar to ones the Commission  
32 received in past wind farm dockets, I included the Department of Health's letter as  
33 Exhibit\_DK-4.

34

1 **Q. You also mentioned that Staff consulted with the SD DENR on Deuel Harvest Wind**  
2 **farm. Please explain that consultation.**

3 A. During the Deuel Harvest proceeding, intervenors brought up concerns about the impact  
4 wind turbine construction and operation may have on shallow aquifers and spring-fed  
5 streams. The main concerns raised were that wind turbines may cause pollution of the  
6 aquifers and springs due to spills and vibrations during operations. Staff reached out to  
7 the SD DENR to determine if the Agency had similar concerns and if they had any  
8 knowledge about wind turbine construction and operations adversely impacting aquifers  
9 or springs (Exhibit\_DK-5).

10

11 **Q. What was the SD DENR's Response?**

12 A. The SD DENR provided Commission Staff with a response letter (dated March 29, 2019)  
13 identifying that historical spills reported by wind turbines in South Dakota have been  
14 minor and were easily addressed. In addition, the SD DENR does not consider a  
15 concrete foundation to be a source of ground water contamination.

16

17 Based on the intervenors' responses to Staff data requests (Exhibit\_DK-3), it appears  
18 concerns similar to those in Deuel Harvest's proceeding are going to be raised in this  
19 docket and, therefore, I included the SD DENR's letter as Exhibit\_DK-6.

20

21 **V. APPLICATION COMPLETENESS**

22

23 **Q. Was Crowned Ridge Wind's Application considered complete at the time of filing?**

24 A. At the time of the filing, the application was generally complete. However, as identified  
25 earlier in my testimony, Staff requested further information, or clarification, from  
26 Crowned Ridge that Staff believed was necessary to satisfy the requirements of SDCL  
27 49-41B and ARSD 20:10:22. It is Staff's position that ARSD 20:10:22:04(5) allows for  
28 the applicant to provide additional information throughout the Commission's review  
29 period by stating:

30

31 "The truth and accuracy of the application shall be verified by the  
32 applicant. ***Each application shall be considered to be a continuing***  
33 ***application***, and the applicant must immediately notify the commission  
34 of any changes of facts or applicable law materially affecting the



1 application. This duty continues up to and includes the date on which  
2 the permit is issued or denied.” (ARSD 20:10:22:04(5)) **{emphasis**  
3 **added}**

4  
5 Finally, I would note that an applicant supplementing its original application with  
6 additional information as requested by Staff is not unusual for siting dockets.

7  
8 **Q. Based on your review of the Application, responses to Staff’s data requests and**  
9 **Crowned Ridge’s testimony, do you find the Application to be complete?**

10 A. Yes. In my opinion, Crowned Ridge has provided the information required in SDCL  
11 Chapter 49-41B and ARSD Chapter 20:10:22. Furthermore, the Commission stated at  
12 the motions hearing on May 9, 2019, that it found the Application was filed generally in  
13 the form and content required by law and rule.

14  
15 **VI. OUTSTANDING CONCERNS**

16  
17 **Q. Does Staff have any outstanding concerns at this time?**

18 A. Yes. Staff has concerns regarding the cumulative impacts of shadow flicker and noise  
19 that certain participants and non-participants may experience due to Crowned Ridge  
20 wind farm and Dakota Range I & II wind farm (Dakota Range) being sited adjacent to  
21 each other. Dakota Range will be located to the west and northwest of the proposed  
22 Crowned Ridge wind farm. I included Exhibit\_DK-7 with my testimony, which is a map I  
23 made of the turbine layout for both wind projects.

24  
25 It is Staff’s position that the Commission should consider the cumulative impacts to  
26 inhabitants in the area resulting from the development of multiple wind projects. This  
27 position is based on ARSD 20:10:22:13, which states in part:

28  
29 “The environmental effects shall be calculated to reveal and assess  
30 demonstrated or suspected hazards to the health and welfare of human,  
31 plant and animal communities which may be cumulative or synergistic  
32 consequences of siting the proposed facility in combination with any  
33 operating energy conversion facilities, existing or under construction.”  
34 (ARSD 20:10:22:13)

1 Dakota Range received a permit to construct from the Commission on July 23, 2018. In  
2 the *Final Decision and Order Granting Permit to Construct Wind Energy Facility; Notice*  
3 *of Entry* in docket EL18-003, finding of fact 18 identifies that Northern States Power  
4 Company, d/b/a Xcel Energy (Xcel) had entered into a Purchase and Sale Agreement  
5 with Apex Clean Energy to acquire the Dakota Range project. Since Xcel is going buy  
6 the Dakota Range project, it is Staff's position that there is a high probability of Dakota  
7 Range being constructed. Therefore, the additional impacts that Crowned Ridge could  
8 impose on inhabitants in the area near Dakota Range should be analyzed by the  
9 Commission.

10  
11 **Q. What is your concern regarding shadow flicker?**

12 A. I have two concerns. My first concern is that the shadow flicker study (Appendix I to the  
13 Application) does not identify that Dakota Range turbines were accounted for in the  
14 study. My second concern is the amount of shadow flicker that will occur at one non-  
15 participating receptor and one participating receptor.

16  
17 **Q. Please explain in detail your concern regarding the shadow flicker study.**

18 A. My concern is that the shadow flicker study does not clearly show that Dakota Range  
19 turbines were included in the model. Section 3 of the shadow flicker study states:

20  
21 "The Crowned Ridge II project is adjacent to the Crowned Ridge project.  
22 Because shadow flicker impacts are cumulative, there will be impacts  
23 from the Crowned Ridge II project that will be additive to the impacts  
24 from the Crowned Ridge project. The Crowned Ridge II wind turbine  
25 array was included in the model to capture the full shadow flicker impacts  
26 on the receptors, which are included in the tabular results; however, the  
27 shadow flicker iso-line maps only show the shadow flicker from the  
28 Crowned Ridge array." (Appendix I to the Application, pg. 6)

29  
30 The language above does not state Dakota Range turbines were included in the model.  
31 However, in response to Staff data request 1-5 (Exhibit\_DK-2, pg. 7 of 626) Crowned  
32 Ridge clarified that Dakota Range was in fact included in the model.

33  
34 Mr. Jay Haley attempted to further clarify this in his supplemental testimony and noted  
35 that Dakota Range turbines were included in the model. Comparing Exhibit 3 of Mr.

1 Haley's testimony to the original shadow flicker study results (Appendix I to the  
2 Application) indicates the Dakota Range turbines were added to the model used for  
3 creating Mr. Haley's Exhibit 3 since shadow flicker levels on certain receptors had  
4 increased from the original levels reported. Therefore, it is Staff's understanding that the  
5 expected shadow flicker duration at receptors provided in Exhibit 3 of Mr. Haley's  
6 supplemental testimony includes impacts from Dakota Range.

7  
8 The main concern I have is that the figures in Appendix D to the shadow flicker study  
9 (including any updated figures) are some-what misleading. As stated in the shadow  
10 flicker study (and cited above), the iso-line maps provided in the shadow flicker study  
11 only show the expected levels of shadow flicker from the Crowned Ridge project and do  
12 not include cumulative impacts from other projects. If one was to base their analysis  
13 simply on the iso-lines in the figures, then they would be misled about the total amount  
14 of expected shadow flicker on a receptor when accounting for all wind projects.

15  
16 Staff requests that Crowned Ridge, in its rebuttal testimony, provide updated figures for  
17 Appendix D of the shadow flicker study to clearly show the total expected levels of  
18 shadow flicker on receptors from all turbines casting a shadow, including Dakota Range.

19  
20 **Q. Please explain in detail your concern regarding the expected shadow flicker levels**  
21 **at certain receptors.**

22 A. In the updated appendices to the shadow flicker study that were filed in Exhibit 3 to Mr.  
23 Haley's supplemental testimony, one non-participating receptor (CR1-C61-NP) is  
24 expected to have 49 hours and 6 minutes of shadow flicker per year. In response to  
25 Staff data request 3-4 (Exhibit\_DK-2, page 559 of 626), Crowned Ridge identifies that it  
26 will discuss mitigation options such as a setback waiver, tree planting, or other means to  
27 blocking shadow flicker with the property owner. If the property owner does not agree  
28 then Crowned Ridge will remove the offending turbine and use an alternate turbine  
29 location. It is Staff's position that if a setback waiver cannot be obtained, then the  
30 turbine should either be eliminated or automatically controlled through the turbine's  
31 control software so that the total duration of shadow flicker, from both Dakota Range and  
32 Crowned Ridge, does not exceed 30 hours/year. Staff is not supportive of any other  
33 mitigation strategies if the property owner does not sign a waiver.

34

1 In addition to the non-participating receptor, Staff has concerns about the duration of  
2 shadow flicker expected at one participating receptor (CR1-C106-P). This participant is  
3 expected to experience 50 hours and 20 minutes of shadow flicker per year (Exhibit 3 to  
4 Mr. Haley Supplemental Testimony). It is Staff's position that Crowned Ridge should  
5 take proactive actions with the property owner to mitigate the duration of shadow flicker  
6 and provide documentation to the Commission that the property owner is comfortable  
7 with the planned mitigation measures.

8  
9 In rebuttal testimony, Crowned Ridge should provide the company's final plan for limiting  
10 shadow flicker to 30 hours per year at the non-participating receptor (CR1-C61-NP) and  
11 provide the mitigation strategy to be used at the participating receptor (CR1-C106-P)  
12 with documentation showing the property owner agrees with that strategy.

13  
14 **Q. In your response above you reference limiting shadow flicker to 30 hours per year.  
15 Is Staff comfortable with that limit?**

16 A. Yes. The 30 hours per year is consistent with the limits established in Grant and  
17 Codrington counties. In addition, it is also consistent with the limit set forth in permit  
18 conditions issued for other wind projects by the Commission (see dockets EL17-055,  
19 EL18-003, and EL18-046). Staff is not aware of any studies demonstrating that shadow  
20 flicker at a specific duration could potentially impair the health, safety, or welfare of  
21 inhabitants in the project area. Therefore, Staff has no basis to propose an alternative  
22 shadow flicker limit and looked to the county requirements and past Commission  
23 decisions for guidance.

24  
25 **Q. What is your concern regarding noise?**

26 A. Staff has two concerns. First, Staff has concerns with the figures provided in Appendix  
27 D of the noise study. Second, Staff has concerns regarding certain turbine locations.

28  
29 **Q. Please explain in detail your concern regarding the noise study.**

30 A. Similar to the shadow flicker study discussed earlier, my concern is that the sound study  
31 does not clearly identify that Dakota Range turbines were included in the model. In Mr.  
32 Haley's supplemental testimony, it is identified that the tables provided in Exhibit 3 of his  
33 supplemental testimony account for Dakota Range. Comparing the noise levels in

1 Exhibit 3 to the noise levels in the original study (Appendix H to the Application), it  
2 appears that the tables in Exhibit 3 do include Dakota Range turbines.

3  
4 Even though the updated tables provide numerical sound levels that appear to factor in  
5 Dakota Range noise emissions, Staff would like to see updated figures for Appendix D to  
6 the sound study that provide the iso-lines for sound levels that account for the Crowned  
7 Ridge, Dakota Range, and Crowned Ridge II wind turbine arrays. The figures would  
8 only need to include turbines from the three wind projects that have an influence on the  
9 sound levels for receptors studied by Crowned Ridge. Justification for this request is  
10 transparency since individuals likely turn first to the figures to see the expected sound  
11 levels at their residences. These figures should be provided in Crowned Ridge's rebuttal  
12 testimony.

13  
14 **Q. Please explain in detail your concern regarding the location of certain turbines.**

15 A. Staff's noise expert, Mr. David Hessler, recommends the relocation of seventeen wind  
16 turbines to further minimize the noise levels at non-participants. I will defer to Mr.  
17 Hessler's testimony to further explain this concern.

18  
19 **VII. CONCERNS RAISED BY THE PUBLIC AND INTERVENORS**

20  
21 **Q. Did Staff consider concerns raised by the public and intervenors?**

22 A. Yes. The concerns raised during the public input hearing and by the intervenors are  
23 similar to concerns Staff has looked into for past wind energy dockets. Specifically, for  
24 intervenors, Staff asked them what conditions to the permit, if any, would address their  
25 concerns (see Exhibit\_DK-3). Due to the number of recommended permit conditions  
26 provided by the intervenors, I provided the Intervenors' requests with Staff's initial  
27 reaction to each condition in Exhibit\_DK-8. I state that this is Staff's initial reaction  
28 because, at this time, Staff has not seen supporting information for most of the  
29 recommended conditions and is not aware what experts the intervenors may call. Staff's  
30 initial reaction is provided so that the intervenors have an idea of what Staff's position is  
31 without additional support or explanation.

32  
33 I will not address each of the intervenors' recommended permit conditions in my  
34 testimony, however I will discuss a few of the main issues it appears their conditions are

1 intended to address. Further, I will address one comment made at the public input  
2 hearing.

3  
4 **a. County Permits**

5  
6 **Q. At the public input hearing held on March 20, 2019, Mr. Allen Robish questioned**  
7 **why the Commission was even reviewing the Application since a portion of the**  
8 **project does not have a Grant County permit and three lawsuits are pending at the**  
9 **local level. Do you recall this comment?**

10 **A.** Yes. It is my understanding that Mr. Robish was referring to the fact that a portion of the  
11 Crowned Ridge project area does not have a county permit. The affected area is in the  
12 northeast corner of the project and was formerly part of the Cattle Ridge wind farm being  
13 developed by Geronimo Energy. Cattle Ridge had acquired a permit from the county for  
14 the project, but the permit expired since construction did not begin before the deadline  
15 set forth in the permit. Crowned Ridge filed a new application for a Conditional Use  
16 Permit from Grant County, which is still pending at the county.

17  
18 Further, Mr. Robish is also concerned that the legal challenges to the currently effective  
19 Grant County and Codington County Conditional Use Permits could potentially invalidate  
20 them. It appears that Mr. Robish believes the PUC should not proceed with permitting  
21 the Crowned Ridge wind farm until all county permits are obtained and all legal  
22 challenges are resolved.

23  
24 **Q. Can a wind energy facility receive a state permit without having a county permit?**

25 **A.** Commission Staff would prefer that a county permit is obtained before the Commission  
26 makes a determination on a state permit. However, there is no requirement to obtain a  
27 county permit prior to obtaining a state permit. Crowned Ridge will need to comply with  
28 all applicable laws and rules (SDCL 49-41B-22(1)), including obtaining and complying  
29 with valid Grant County and Codington County Conditional Use Permits. To ensure  
30 compliance, Commission Staff recommends the Commission include the following  
31 condition if a permit is granted:

32 Applicant will obtain all governmental permits which reasonably may  
33 be required by any township, county, state or federal agency, or any  
34 other governmental unit for construction and operation activity of the

1 Project prior to engaging in the particular activity covered by that  
2 permit. Copies of any permits obtained by Applicant shall be filed  
3 with the Commission.

4  
5 The risk Crowned Ridge assumes when it requests a state permit without first obtaining  
6 the Grant County permit is the county may include a condition that materially changes  
7 how the Applicant constructs, operates, and maintains the Crowned Ridge Wind Farm  
8 from what is presented in the state proceeding. Any requests for material modifications  
9 to the state permit would need approval from the Commission, and the filing could be in  
10 the form of a permit amendment or require a new permit application. Commission Staff  
11 recommends the following conditions, if a permit is granted, to ensure the Applicant  
12 constructs, operates, and maintains the Crowned Ridge Wind Farm consistent with the  
13 representations made in this proceeding:

- 14 1) Applicant shall construct, operate, and maintain the Project in a  
15 manner consistent with (1) descriptions in the Application, (2)  
16 Application supplements, (3) responses to any data requests, (4)  
17 the Final Decision and Order Granting Permit to Construct Wind  
18 Energy Facility, Attachment A-Permit Conditions, (5) any  
19 applicable industry standards, (6) any permits issued by a  
20 federal, state, or local agency, and (7) evidence presented by  
21 Applicant at the evidentiary hearing.  
22
- 23 2) Except as otherwise provided in the Permit Conditions, Applicant  
24 shall comply with all mitigation measures set forth in the  
25 Application, Applicant's responses to data requests, and  
26 Applicant exhibits and testimony at the evidentiary hearing.  
27 Material modifications to the mitigation measures shall be  
28 subject to prior approval of the Commission.  
29

30  
31 **Q. Does Commission Staff know the timeline for Grant County Conditional Use**  
32 **Permit for the Cattle Ridge portion of the project?**

33 A. No, I do not. In response to Staff data request 2-1 (Exhibit\_DK-2, page 421 of 626),  
34 Crowned Ridge identified that Grant County would hear the Conditional Use Permit  
35 application on April 8, 2019. It is my understanding that the county deferred the hearing

1 to a later date. Commission Staff recommends the Applicant provide the status of  
2 county permitting in rebuttal testimony.

3  
4 ***b. Setbacks: Non-participating Residences and Waverly School***

5  
6 **Q. What are the intervenors' recommended setback from non-participating  
7 residences and Waverly School?**

8 A. Based on the intervenors' proposed permit condition, it appears they are asking the  
9 Commission to establish a setback of 2-miles from non-participating residences with a  
10 waiver option for residences under 2-miles. For the Waverly School, the intervenors  
11 propose a setback of 2-miles with no waiver option.

12  
13 **Q. What support did the intervenors provide for a 2-mile setback?**

14 A. The intervenors did not provide support for a 2-mile setback in response to Staff's  
15 discovery. They only state in the proposed permit conditions that:

- 16  
17 i) Citizens that are not participating with the project should not  
18 have to be exposed to the effects of the project. Although 2 miles  
19 will not prevent exposure from the project, it will create a more  
20 tolerable situation.
- 21  
22 ii) This will ensure children are protected from the disturbances of  
23 the project while in their learning environment.

24  
25 It is unclear to Staff what effects and disturbances the intervenors are referring to in their  
26 proposed condition.

27  
28 **Q. What are the setbacks from non-participating residences and schools in Grant  
29 and Codington County?**

30 A. Section 5.22 of Ordinance 68 in Codington County has the following setback  
31 requirements:



**Table 5.22.03.2  
WES Setbacks**

		Setback Distance*	
		Vertical Height of Tower 75' to 500'	Vertical Height of Tower Over 500'
Participating occupied residence, business, church, or school		550'	550' plus 2.5' feet for each additional vertical foot more than 500' in height
Municipal Boundaries at the time of Conditional Use Permit Application		5,280'	5,280'
Non-Participating occupied residence, business, church, or school	Town District	5,280'	5,280'
	All other Districts	1,500'	1,500' plus 2.5' feet for each additional vertical foot more than 500' in height
Distance from the Right-of-Way of Public Road		110% of the height of the wind turbine**	
Distance from Property Line		110% of the height of the wind turbine***	

- \* Setback distance to be measured from the wall line of the neighboring principal building to the base of the WES tower. The vertical height of the wind turbine is measured from the ground surface to the tip of the blade when in a fully vertical position.
- \*\* The horizontal setback shall be measured from the base of the tower to the public right-of-way.
- \*\*\* The horizontal setback shall be measured from the base of the tower to the adjoining property line unless wind easement has been obtained from adjoining property owner.

1  
2  
3  
4  
5

Section 1211.04 of the Grant County Compiled Zoning Ordinances specifies the following setbacks:

**Table 1211-1  
WES Setbacks**

	Setback Distance*
Participating Residence, business, church, school, building owned and/or operated by a governmental entity	1,500 Feet**
Non-Participating Residence, business, church, school, building owned and/or operated by a governmental entity	1,500 Feet
Municipal Boundaries existing at the time of Conditional Use Permit Application	5,280 Feet
Distance from Public Right-of-Way	500 Feet or 110% of the vertical height of the wind turbine, whichever is greater***
Distance from Property Line	500 Feet or 110% of the vertical height of the wind turbine, whichever is greater ****

- \* Setback distance to be measured from the wall line of the neighboring principal building to the base of the WES tower. The vertical height of the wind turbine is measured from the ground surface to the tip of the blade when in a fully vertical position.
- \*\* No less than 110% of the vertical height of the wind turbine if agreed upon by participating entity
- \*\*\* The horizontal setback shall be measured from the base of the tower to the public right-of-way.
- \*\*\*\*The horizontal setback shall be measured from the base of the tower to the adjoining property line unless wind easement has been obtained from adjoining property owner.

6

1 **Q. Is the intervenors' 2-mile setback consistent with the county ordinances?**

2 A. No. Grant and Codington counties require a 1,500-foot setback from non-participating  
3 residences for the turbines to be used by Crowned Ridge. For wind turbines over 500  
4 feet tall, Codington County also requires an additional 2.5 feet beyond the 1,500-foot  
5 setback for each vertical foot the wind turbine is over 500 feet. The tallest wind turbine  
6 for Crowned Ridge will be approximately 486 feet and, thus, a 1,500-foot setback is  
7 required by both counties. Codington County's required setback from the school located  
8 in Waverly is 5,280 feet.

9

10 **Q. What is Staff's position on a 2-mile setback?**

11 A. Staff is not supportive of a 2-mile setback currently. This position is based upon review  
12 of the following: 1) Applicant's prefiled direct and supplemental testimony submitted by  
13 Mr. Jay Haley and Mr. Christopher Olson, 2) the sound study provided in the Application  
14 and as updated in the testimony of Mr. Haley, 3) the testimony of Staff's witness Mr.  
15 David Hessler, and 4) the letter Staff received from the SD Department of Health  
16 (Exhibit\_DK-4).

17

18 I should also note that the Commission has considered the request for a 2-mile setback  
19 in previous wind farm dockets (e.g. EL18-026) and found that a 2-mile setback was not  
20 supported by the evidence in the record for those dockets. Should the intervenors  
21 provide additional support for a 2-mile setback through an expert witness, Staff will  
22 respond to that new information in rebuttal testimony. However, at the time of writing  
23 this testimony, Staff's review has determined a 2-mile setback is not currently supported.

24

25 ***c. Setbacks: Public Rights-of-Way***

26

27 **Q. What is the intervenors' recommended setback from public rights-of-way?**

28 A. The intervenors recommend a setback of greater than 1.5 x (the diameter of the blades  
29 plus the height of the turbine). For this project, that would equal a right-of-way setback  
30 of approximately 1,014 feet (for the 90-meter hub height turbine) or approximately 965  
31 feet (for the 80-meter hub height turbine).

32

33 **Q. What support did the intervenors provide for this recommended setback**  
34 **distance?**

1 A. The intervenors proposed condition identifies that their recommended setback distance  
2 is outlined in the GE technical document number GER4262, titled “Ice Shedding and Ice  
3 Throw-Risk and Mitigation.”  
4

5 **Q. Has Staff reviewed the GE technical document referenced by the intervenors?**

6 A. No. Staff has not reviewed this specific technical document since a copy was not  
7 provided by the intervenors.  
8

9 **Q. Has Staff reviewed any other GE manuals or guidance documents provided by  
10 Crowned Ridge?**

11 A. Yes. Staff requested Crowned Ridge provide a copy of the safety and operating  
12 manuals for the proposed GE wind turbines in data request 3-2 (Exhibit\_DK-2). In  
13 response, Crowned Ridge only provided the operating manual (Exhibit\_DK-2, pages  
14 566-600). Staff will request through additional discovery that the safety manual be  
15 provided.  
16

17 **Q. What is Staff’s understanding of the support for the intervenors’ proposed  
18 setback from public rights-of-way?**

19 A. Based on the GE technical document referenced by the intervenors, Staff believes the  
20 intervenors are concerned about ice throw from wind turbines and that the setbacks from  
21 rights-of-way should account for ice throw. The equation the intervenors propose for  
22 calculating the setback from rights-of-way appears to have come from the GE technical  
23 document.  
24

25 **Q. Does Staff support establishing a setback from rights-of-way based on the  
26 equation recommended by the intervenors?**

27 A. Not forthright. Staff is supportive around the concept of establishing a setback distance  
28 from rights-of-way (and property lines) based on the wind turbine manufacturer’s  
29 recommendation. However, Staff is not sure whether the equation provided by the  
30 intervenors is appropriate since Staff has not yet reviewed the GE safety manual. Based  
31 on my experience on other wind farm dockets, an ice detector or ice detection system  
32 can also be used to prevent ice throw.  
33

1 Staff will continue to investigate ice throw and how Crowned Ridge intends to mitigate  
2 ice throw. I will update my testimony either through rebuttal testimony or at the  
3 evidentiary hearing once Staff receives all information needed to formulate a position.  
4

5 ***d. Noise Limits and Compliance Monitoring***  
6

7 **Q. Do the intervenors recommend any conditions on noise?**

8 A. Yes. The intervenors request the following noise conditions:  
9

- 10 i) Preconstruction noise, to include infrasound, analysis of non-  
11 participating properties, outside and inside the principle  
12 structure. Analysis to be conducted by a third party chosen and  
13 reported directly to the PUC.  
14
- 15 ii) Noise monitoring, to include infrasound, during construction,  
16 operation, maintenance, decommissioning to record the  
17 applicant is in compliance. Monitoring to be completed by a third  
18 party selected and reported directly to the PUC.  
19
- 20 iii) 40 db(A) L10 to be measured, by a third party every year outside  
21 and inside non-participating landowners' homes within 2 miles of  
22 the boundary footprint and the Waverly School. During even  
23 numbered years the measurement shall be in the spring and fall  
24 for 14 days 24 hours continuous. During the odd numbered  
25 years the measurement shall be in the summer and winter for 14  
26 days 24 hours continuously. The findings shall be reported to the  
27 PUC and published within 3 months of completion of the noise  
28 study in the following public publications, for the life of the  
29 project: Public Opinion newspaper in Watertown, SD, South  
30 Shore Gazette in South Shore, SD and the Grant County Review  
31 in Milbank, SD.  
32
- 33 iv) Noise not to exceed 40 db(A)L10 at the property line of a non-  
34 participating property, including but not limited to construction,  
35 maintenance, operation and decommissioning. This requirement  
36 shall be enforced in all areas within 2 miles of the project

1 boundary footprint and within 2 miles of any haul road for the life  
2 of the project, cradle to grave.

3  
4 **Q. Does Staff agree with a noise limit of 40 db(A)L<sub>10</sub> at the property line of a non-**  
5 **participating property?**

6 A. No. At this time, Staff does not support all three parts of the intervenors' requested  
7 noise limit. The three parts I am referring to are: 1) the noise limit of 40 db(A), 2) the  
8 measurement statistic (L<sub>10</sub>), and 3) the location the limit is set at.

9  
10 First, regarding the 40 db(A) part of the limit, Staff acknowledges that 40 db(A) is Mr.  
11 Hessler's ideal design goal for wind projects. However, Mr. Hessler also finds that 45  
12 db(A) is a fair regulatory limit. I will defer to Mr. Hessler for further explanation of  
13 applying his ideal design goal to this project and the proper noise limit to set in a permit  
14 condition.

15  
16 Second, regarding the L<sub>10</sub> measurement statistic, Staff will advocate for a limit with a L<sub>eq</sub>.  
17 It appears to Staff that the intervenors' requested L<sub>10</sub> is derived from the Prevailing Wind  
18 Park permit condition (see docket EL18-026). While the Commission's past precedent is  
19 informative, and Staff uses that for direction when reviewing siting dockets, Staff stands  
20 by Mr. Hessler's recommended L<sub>eq</sub>. I will defer to Mr. Hessler to explain why the L<sub>eq</sub> is  
21 the better measurement statistic to use.

22  
23 Finally, regarding setting a noise limit at the property line, Staff disagrees and believes  
24 that the proper location to set a noise limit is at the residence. The purpose of setting a  
25 noise limit is to protect inhabitants in the project area from excessive unwanted sound  
26 (i.e. noise) that could lead to annoyance. The Commission is charged by the Legislature  
27 to determine whether or not the project will "substantially impair the health, safety, or  
28 welfare of the inhabitants" (SDCL 49-41B-22(3)). Based on review of the Application,  
29 Applicant's testimony, and the letter from the SD Department of Health, Staff finds that  
30 the main concern with noise, that could potentially rise to the threshold of "substantial"  
31 as contemplated in SDCL 49-41B-22(3), is the impact noise has on sleep. The  
32 Applicant's witness Mr. Ollson testifies that "[t]he critical effect from a health perspective  
33 in setting any nighttime sound source standard is to ensure that it is protective of sleep"

1 (Ollson Supplemental Testimony, page 5). Therefore, Staff believes that it is reasonable  
2 to set a limit at the residence, where individuals sleep.

3  
4 Should evidence be presented identifying noise levels of 40db(A) could substantially  
5 impair the health, safety, or welfare of inhabitants regardless of the time of day or  
6 duration of exposure, Staff will reconsider our position and I will update my testimony if  
7 needed.

8  
9 **Q. Does Staff agree with a preconstruction noise analysis?**

10 A. No. Staff does not agree with the preconstruction noise analysis as contemplated by the  
11 intervenors. Mr. Hessler does fault the noise study for failing to perform a baseline  
12 sound survey of the existing environment and then assessing the project's potential  
13 noise impact on the community. However, I do not think this is the type of survey the  
14 intervenors contemplated based on the way their requested condition is written. I will  
15 defer to Mr. Hessler for further explanation on his review of the Applicant's sound study.

16  
17 **Q. Does Staff agree with ongoing noise monitoring during construction, operation,  
18 maintenance, and decommissioning of the project?**

19 A. No. Staff does not agree with ongoing noise monitoring through all phases of the project  
20 life. First, noise limits are not typically set for the construction and decommissioning  
21 phase of the project or during maintenance. Noise limits are set for ongoing operations.  
22 Second, in Staff's opinion ongoing compliance monitoring as contemplated in the  
23 intervenors requested condition would be costly and overly burdensome without much  
24 benefit. A properly conducted noise survey is able to accurately represent the noise  
25 being emitted from the turbines during operations.

26  
27 Staff does support a compliance survey be conducted post-construction and upon  
28 complaint. As such, Staff will advocate for the following language to be included in a  
29 permit condition:

30  
31 Applicant shall, upon Commission formal request, conduct field surveys  
32 or provide post-construction monitoring data verifying compliance with  
33 specified noise level limits using applicable American National Standards  
34 Institute (ANSI) methods. Sound monitoring will not be repeated in a

1 representative area during any five-year period unless operational or  
2 maintenance changes result in a reasonable assumption of higher  
3 turbine sound levels. Verification of compliance with the sound level  
4 requirement at the residences of the intervenors shall be submitted to the  
5 Commission within 60 days of commencement of full operation.  
6

7 **Q. Does Staff agree with conducting a noise study every year to verify the project is**  
8 **compliant with the noise limit the Commission sets?**

9 A. No. Staff does not agree with an annual sound study and will be advocating for the  
10 compliance testing requirement as specified in the permit condition language provided in  
11 my response to the previous question.  
12

### 13 **VIII. STAFF'S RECOMMENDED PERMIT CONDITIONS**

14

15 **Q. What permit conditions does Staff recommend?**

16 A. Staff will be working with Crowned Ridge to develop permit conditions that Staff believes  
17 are reasonable and supported by information submitted in the docket. These conditions  
18 will be presented to the Commission at the evidentiary hearing. However, I will address  
19 a decommissioning condition and also a grouse lek monitoring condition at this time.  
20 The grouse lek monitoring condition would be unique to this project, as the Commission  
21 has not required a similar condition in past wind farm permits.  
22

23 **Q. Please explain the decommissioning condition.**

24 A. A decommissioning condition has not yet been agreed upon. In response to Staff data  
25 request 3-9 (Exhibit\_DK-2, page 562 of 626), Crowned Ridged agreed to a  
26 decommissioning financial assurance condition that requires the creation of an escrow  
27 account that will be funded at \$5,000 per turbine per year. This is consistent with past  
28 financial assurance requirements ordered by the Commission for other wind projects.  
29 There is, however, one material change that Crowned Ridge requests for the condition.  
30

31 **Q. What is the material change Crowned Ridge proposes for the decommissioning**  
32 **condition?**

33 A. Crowned Ridge proposes the following change to the condition:  
34

1 At least ~~60~~ 30 days prior to commencement of commercial operation,  
2 Applicant shall file an escrow agreement with the Commission for  
3 Commission approval that provides a decommissioning escrow account  
4 or provide proof that an escrow meeting these requirements has been  
5 established pursuant to applicable county requirements.  
6

7 **Q. What is your understanding for this change?**

8 A. Through its zoning ordinance, Grant County may require an escrow account as a  
9 decommissioning financial assurance for wind energy systems. The ordinance states:

10  
11 Financial Assurance. The Board shall require a performance bond,  
12 surety bond, escrow account, letter of credit, corporate guarantee or  
13 other form of financial assurance that is acceptable to the Board to cover  
14 the anticipated costs of decommissioning the WES facility. The financial  
15 assurance plan is subject to the following provisions:

16  
17 i. A decommissioning account is to be funded by the turbine  
18 owner annually at a rate of five thousand dollars (\$5,000) per  
19 turbine for a period of thirty (30) years.

20  
21 ii. The Board may allow a decreased annual payment, if the  
22 Board determines the full rate as identified in the financial  
23 assurance plan is not necessary to cover costs of  
24 decommissioning.

25  
26 iii. All interest earned by any financial assurance account  
27 remains in the account.

28  
29 iv. A financial assurances statement is to be provided upon  
30 request to the administrative official.

31  
32 v. The financial assurance plan follows ownership of the wind  
33 turbines.

34  
35 vi. The financial assurances are not subject to foreclosure, lien,  
36 judgment, or bankruptcy.  
37



1                   vii. Beginning in year ten (10) following the beginning of  
2                   operation and each fifth year thereafter, the turbine owner shall  
3                   submit to the Board an estimated decommissioning date, if  
4                   established, and estimated decommissioning costs and salvage  
5                   values. Based on the verification of the information in this filing  
6                   the Board may change the annual financial assurance funding  
7                   rate to more closely match the estimated amount needed for  
8                   decommissioning.

9  
10                   viii. Funds from the financial assurances are to be paid to the  
11                   turbine owner at the time of decommissioning. Said funds are to  
12                   be paid as decommissioning costs are incurred and paid for by  
13                   the turbine owner.

14  
15                   ix. If the turbine owner fails to execute the decommissioning  
16                   requirement, the funds are payable to the landowner as the  
17                   landowner incurs and pays decommissioning costs.

18                   [Grant County Zoning Ordinance, Section 1211.04(10)(c)]  
19

20                   It is my understanding that if Grant County requires an escrow account be set up for the  
21                   Crowned Ridge project, Crowned Ridge does not want to be put in the position of  
22                   funding two different escrow accounts for the same purpose.  
23

24                   **Q.     What is Staff's position on this change?**

25                   A.     Staff agrees that Crowned Ridge should not be required to fund two different escrow  
26                   accounts to cover future decommissioning costs. However, the requirements tied to the  
27                   escrow account in the Grant County ordinance are different, in part, to the requirements  
28                   the Commission has required for escrow accounts in other wind farm dockets. Staff is  
29                   concerned that deferring to Grant County's escrow agreement may not include all  
30                   requirements in the escrow agreement that the Commission desires and may not be  
31                   subject to any protections created by recent decommissioning legislation (see Senate  
32                   Bill 16 of Ninety-Fourth Session Legislative Assembly, 2019).  
33

34                   In addition, Codington County's zoning ordinance does not specifically contemplate the  
35                   use of an escrow account for decommissioning financial assurance. The county may  
36                   determine that an escrow agreement is an acceptable form of financial assurance,

1 however that determination is unknown at this time. This leads to another concern Staff  
2 has, where wind turbines located in different counties may be subject to different escrow  
3 agreements. The wind turbines in Grant County would be subject to the county's escrow  
4 agreement and the wind turbines in Codington County would be subject to an escrow  
5 agreement established by the Commission.

6  
7 Given Staff's concerns above, it may be prudent for the Commission to require one  
8 escrow account be established subject to the terms the Commission desires for the  
9 entire project. Grant and Codington counties could then accept the escrow account  
10 established by the Commission if it adequately protects their interests, or, the counties  
11 have the option to require additional financial assurance if desired.

12  
13 **Q. What is the grouse lek monitoring condition Staff proposes?**

14 A. Staff proposes the following condition:

15  
16 Applicant shall conduct two years of post-construction grouse lek  
17 monitoring of confirmed leks within 1 mile of wind turbine locations. The  
18 survey shall be completed in accordance with a methodology developed  
19 between the Applicant and SD GF&P. After each monitoring year, the  
20 Applicant shall file a report with the SD GF&P and Commission.

21  
22 **Q. What is Staff's justification for requiring a grouse lek monitoring condition?**

23 A. The proposed condition comes from a recommendation made by the SD GF&P in Mr.  
24 Tom Kirschenmann's testimony. I will defer to Mr. Kirschenmann for further justification.  
25 It should be noted, however, that Figure 6 of the Application identifies seven leks within  
26 1 mile of a proposed turbine location.

27  
28 **Q. Does this conclude your testimony?**

29 A. Yes. However, I reserve the right to amend my testimony through rebuttal testimony or  
30 at the evidentiary hearing if needed.

31