BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF SOUTH DAKOTA

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IN THE MATTER OF THE APPLICATION BY CROWNED RIDGE WIND, LLC FOR A PERMIT OF A WIND ENERGY FACILITY IN GRANT AND CODINGTON COUNTIES Intervener, Kristi Mogen Response to CRW Response to Mogen Complaints Docket 19-003

Intervener, Kristi Mogen Response to CRW Response to 1st Complaint Concerning the LNTE blades and Crowned Ridge Wind, LLC Request for a Limited and Temporary Waiver Pertaining to Condition No. 2;

Intervener, Kristi Mogen Response to CRW Response to **1**st **Complaint Concerning the LNTE blades waiver request**; Concerning CRW Facility in Violation of the ORDER Granting Permit to Construct Facility (ORDER) by Intervener Kristi Mogen to Crowned Ridge Wind, LLC Request for a Limited and Temporary Waiver Pertaining to Condition No. 2;

On January 3, 2020, CRW/NextEra responded to Intervener, Kristi Mogen's complaints.

In paragraph 4, CRW/NextEra updated the sound study again. So far, in this Docket EL19-003, CRW/NextEra has presented at least 70-modeled sound studies. This new report shows only as-built turbines only. The theory is that this latest report shows a more realistic sound model to be used to show sound estimates for the next few months, until the LNTE attachments can be attached. This presents four issues: 1. There is an overwhelming number of varying sound reports over the timeframe of this project, which adds to the evidence that CRW/NextEra can and will manipulate the inputs to get the modeled results needed to satisfy the Commission. 2. Appendix H page 1 states "For Grant County the noise limit is 45 dBA at a distance of 25 feet from the perimeter of non-participating occupied structures and 50 dBA at participating occupied structures." EAPC does not do this, and uses the corner of the home, sometimes farthest away from the closest turbine (see-attached example using the UTM receptor coordinates provided in CRW/NextEra December 13, 2019 filing). 3. EAPC did not include the noise from the ground level transformers at each turbine location (see SDPUC 18-053 Hankard page 6 Sound Power Level 98dBA.) 4. The next few months in South Dakota will not experience a ground cover of mixed vegetation. Yet, CRW/NextEra continues to try and sell that a 0.5 ground factor attenuation should be used on sound studies relevant to this waiver request.

CRW/NextEra proclaims that the use of ground factor attenuation of 0.5 is appropriate and is supported by all sound studies on the record in this proceeding. That is not true. Appendix H on page 4 states this: "The analysis used the **ISO 9613-2** "Attenuation of sound during propagation outdoors, Part 2" sound calculation model with "General" ground attenuation and an attenuation factor of 0.5, which represents **typical mixed vegetation (i.e., prairie grass, weeds, brush) and crop cover**. Realistic sound pressure levels were calculated at 1.5 m AGL at the participating and non-participating existing occupied structures and occupied parcel boundaries (Codington County only). The term "realistic" in this case, means that some amount of ground attenuation is accounted for."

In CRW/NextEra Response to Intervener Complaints filed on January 3, 2020 Jay Haley Affidavit paragraph 3 "Intervener Mogen recommended that Crowned Ridge Wind use a ground attenuation factor of 0.0 for the sound study supporting the limited and temporary waiver of the installation of low noise tailing edge (LNTE) attachments. There is no technical basis to use a 0.0. ground attenuation factor to simulate wind conditions in South Dakota" This is not true and in fact the Commission has reviewed Wind Facility Applications with 0.0 ground factor. In addition, NextEra is aware of technical basis for 0.0 ground factor, in MN PUC dockets Mower (WS-06-91), Lake Benton II (WS-18-179), and dodge County Wind (WS-17-307).

In paragraph 5, CRW/NextEra states that the Commission cannot rely on the recommendations of a layperson. Well, yes, I am a layperson, but thankfully, I study issues that will impact my family and property. *Wind Farm Noise Measurement, Assessment and Control* by Colin H Hansen, Con J Doolan, and Kristy L Hansen textbook series in Acoustics, Noise, and Vibration page 224 " For the ISO9613 method, the space between the source and the receiver is divided into three zones: source, middle and receiver zones." And "The acoustic properties of each zone are quantified using the parameter of G. This parameter has a value of 0.0 for hard ground, and 1.0 for soft ground (or porous) ground,..."

Currently the ground in the CRW/NextEra facility is hard frozen ground, the trees have no foliage, and the sound in our area is traveling farther and much louder than during the summer months. A personal example is when the train a mile and a half away from my home, goes through during the summer months; I rarely hear it. Now during the winter, with no leaves on trees, no crops or visible vegetation, frozen, icy hard ground, the train vibrations and noise wake me several times a week.

In addition to studying manuals written by engineers, scientists and the like, I have reviewed over 30 dockets and transcripts of proposed and established wind turbine facilities across the United States and Canada. One such docket is the MN PUC 16-777, I have included excerpts from a public document filed by MN attorney Carol Overland, clearly laying out the reasons why the ground factor 0.0 should be used when siting all wind turbine facilities, no matter the season.

Page 2 of the attached Overland document "A ground factor of 0.0 is to be used for wind modeling because the wind noise source is elevated high in the air, and ground conditions do not impede the direct path from a greatly elevated source to the "receptor." See attached testimony of Dr. Paul D. Schomer, (who was referenced in several of Chris Ollson's exhibits and McCunney reviews for this Docket EL19-003) and the testimony of Mike Hankard (see SDPUC 18-053 Hankard attachment). Page 4 of the Overland document demonstrates ISO9613-2, the very same that Jay Haley used for the CRW/NextEra noise modeling.

For Freeborn Wind, ground factor, a primary input assumption for noise modeling, was set at 0.0, and all evidence and testimony regarding the predictive modeling was based on this 0.0 ground factor. In an apparent admission that these many wind projects cannot comply with noise standards and cannot demonstrate compliance through modeling utilizing a 0.0 ground factor, the industry is now uniformly improperly utilizing a 0.5 or 0.7 ground factor. Why is this improper? Because wind turbines are elevated, and the sound goes directly to the "receptor" on the ground:



Ground factor represents conditions on the ground and things that can come **between** the noise source and the "receptor". See ISO 9613-2 (standards for noise modeling)

7.3 Ground effect (A_{gr})

7.3.1 General method of calculation

Ground attenuation, A_{gr} , is mainly the result of sound reflected by the ground surface interfering with the sound propagating directly from source to receiver.

From ISO 9613-2. Here's a depiction of how that works, from ground source to ground receptor:

U.5 Ground Factor Gound Absorption & Reflectivity Matters

Designed to model ground source to ground neceptor

Page 5, Mike Hankard testimony, line 8-11 "I mean, 0.5 ground factor is used in probably – well, with the exception perhaps of wind turbine projects which are different because the source is elevated..."

The South Dakota Commission has been presented with this information before:

In the SD PUC Docket 18-053 Appendix D, Pre-Construction Wind Turbine Noise Analysis for the proposed Deuel Harvest North Wind Farm, page 6, "Terrain and Ground Effect The terrain in the project area was modeled by importing digital elevation model (DEM) data from the U.S. Geological Survey National Elevation Dataset into SoundPLAN. The acoustical effect of the ground was modeled using the ISO 9613-2 General Method. This requires the selection of ground absorption factors for the ground near the source, near the receiver, and in between. Ground factors range from 0.0 to 1.0 and represent the proportion of sound that is absorbed or reflected when sound waves interact with the ground. A value of 0.0 represents completely reflective ground material such as pavement or flat water, and results in a higher level of sound reaching a receptor. A value of 1.0 represents absorptive material such as thick grass, crops, or fresh snow, and results in a lower level of sound reaching a receptor. For this project, we conservatively assumed a ground factor of 0.0 (completely reflective). Actual ground conditions could at times be 0.0 when the ground is completely frozen, but would generally be closer to 0.5 when the ground is covered with new snow or crops, or when the ground is bare and unfrozen."

A conservative assumption is 0.0 for a ground factor. The Hankard report also used "could be at times" which is the case during the wintertime of CRW/NextEra Waiver Request.

https://puc.sd.gov/commission/dockets/electric/2018/el18-053/appendixd.pdf

In SDPUC Docket 18-053 Intervenors Rebuttal a Professional Opinion By Robert Rand "9.5 In contrast to all other forms of power generation nuclear, gas, coal, oil, biomass, solar, and hydro as examples: wind turbine facilities are now elevated hundreds of feet into the air. Wind turbines operate more at aircraft height than ground height. Wind turbines must remain exposed to the wind: additional noise control at the source is not possible (confirmed by Vestas CEO, 2011). Similarly, due to the tremendous height of the wind turbine noise source, barrier walls are not feasible. And similarly, the predominantly low

frequency noise INFRASOUND RANGE (SENSATION) BELOW 20 HZ LOW FREQUENCIES 20-200 HZ emitted by wind turbines is not easily reduced by acoustic controls in homes; low frequency noise and "whump whump" pulsations from wind turbines penetrate and shake homes"

https://puc.sd.gov/commission/dockets/electric/2018/EL18-53/rebuttal/intervenors/kilby/rand.pd

In SDPUC Docket 18-026 Exhibit I1, lines 348-370 Pre-filed testimony of Richard James "Also, the model uses the formulas and protocols from ISO 9613-2 which states it is not applicable for noise sources that are more than 30 meters above the ground or receiver elevation. Even if the model was appropriate for wind turbine noise the model has known tolerances of ± 3 dBA. This should have also been applied as an adjustment to the Burns-McDonnell sound model. Given these two tolerances the predicted sound levels are as much as 5 dBA low. Further, the

values used for ground attenuation are not disclosed. The proper value for ground attenuation is "0" to turn off any calculations of ground effect. This is because the height of the wind turbines means that the sound emitted by them radiates directly from the blades to the homes without interaction with the ground. The ISO ground attenuation calculations are intended for ground-based noise sources where the sound radiates along a line from source to receiver just above the ground. Dr. Schomer has in the past, identified additional problems with wind turbine noise prediction using the ISO model methods. He was a member of the committee that developed the ISO 9613-2 standard and its ANSI equivalent (ANSI/ASA S12.62). He has repeatedly stated in hearings and conferences that the model does not properly predict the propagation of low frequency noise. The ISO model range for accuracy is focused on sound in the frequencies that are most important for other types of ground-based community noise sources. In testimony he gave for the White Pines project in Ontario he stated that the model is likely to underestimate the sound propagation from wind turbines by as much as 11 dBA. This is in addition to the issue of tolerances for the calculations. As I have stated above I have also measured wind turbines operating at levels 10 dBA Leg or more above the predicted sound levels."

https://puc.sd.gov/commission/dockets/electric/2018/EL18-026/I1.pdf

Therefore, the Commission is aware 0.0 ground factor is appropriate in South Dakota because 0.0-ground factor has been used in other SDPUC Wind Facility Dockets and presented by experts. NextEra is aware there is technical data to support 0.0 ground factor because the technical data has been presented in several NextEra Minnesota PUC Dockets.

At this point, the truthfulness of CRW/NextEra should be in question. Over the past year during legislation and contested evidentiary hearings, the public has been trying to tell the Commission, the Wind Facility Applicants are not passing the "smell test" in fact many members of the public would use the word deceptive. Please consider the information I, Kristi Mogen present as it is from experts.

CRW/NextEra filing on January 3, 2020, Paragraph 1, "CRW is in compliance with the Final Order." For some reason CRW/NextEra insists on only needing to comply with conditions related to noise and flicker even though the December 13, 2019 CRW/NextEra filing was for a Limited and Temporary waiver of Condition No.2. Please read Condition No. 2. On December 30, 2019, CRW admitted it constructed 2.7 MW turbines, but on January 3, 2020 changed their stance and tried to excuse away photos from Intervener, Kristi Mogen clearly showing the serial numbers and 2.7 MW taken of the actual turbines on the construction site. Has anyone asked why GE would send such a letter? How beneficial is NextEra's business to GE? CRW admitted in data responses and testimony of NextEra employees representing CRW, CRW has no funds. Who received the accounts payable invoice for the Turbines?

In the CRW Application to the SD PUC for a Wind Facility, Appendix H and Exhibit A1-H and Exhibit A8, Modeled Sound Study tables, the turbines were GE 1.7 103RD 80HH r4 1.75 MAX, GE 2.1 116 RD 80 HH rev2. mad and GE2.3 116RD 90 HH r2.madE models not the ones in the photos showing unit configuration 2.7 116 LWS + Pitch System REH. Condition No.2 requires CRW/NextEra shall construct, operate, and maintain the Project in a manner consistent with (1) descriptions in the Application (2) Application supplements and corrections..." CRW/NextEra did not construct the wind turbines CRW/NextEra presented in the SDPUC Application. (Nor did CRW/NextEra construct the wind turbines CRW/NextEra presented in the local agency CUP Applications Condition No2. (6).

CRW asked for a Temporary and Limited Waiver to Condition No. 2. CRW/NextEra "shall construct, operate, and maintain the Project in a manner consistent with (1) descriptions in the Application...," CRW/NextEra did not construct the Facility in compliance with the final order and therefore cannot **operate or maintain** the Facility in a manner required in Condition No. 2. At the December 30^o 2019 special meeting the PUC staff were surprised to learn about the 2.7 MW turbines that were used in the project. CRW changed turbines, therefore has not and cannot meet Condition No. 2, the CRW Waiver Request should not be approved.

Please refer to Condition 41. Did CRW/NextEra file a request with the Commission 30 days prior to Commencement of construction work? 30 days prior would have been on July 29, 2019. Did the Commission know 3 days after the evidentiary hearing that CRW/NextEra would only construct 87 turbines, reducing the Facility by a third, changing the turbine size, height, location, and the noise and flicker without informing the Counties, Intervenors or the public (b,c)?

Regardless of reason or penalty (because of CRW/NextEra/NSP/Xcel private contract), CRW/NextEra constructed 87 turbines without LNTE **Blades** as described in the Application and Data Requests. CRW/NextEra OMITTED key information during the permitting process. CRW January 3, 2020, response to

complaints Paragraph 2. "it could have been offered at the evidentiary hearing" or in the application- nothing would ever indicate that CRW/NextEra would use glued on LNTE "attachments" instead of LNTE blades. NOTHING, and that is an OMISSION of key information in which the Commission, staff and Intervenors had the right to know and question, if LNTE "attachments" would be affixed by the COD and the right to question the safety of glued on attachments spinning at 150-200 mph with varying climate changes. CRW/NextEra presented **LNTE Blades** not "attachments" this is clearly an OMISSION.

The Commission should enforce Condition No. 2 CRW/NextEra "shall construct, operate and maintain the project in a manner consistent with (1) descriptions in the Application, (2) Application supplements and corrections (3) commitments made by the Applicant in response to data requests (4) the Final Decision and Order Granting Permit to Construct Facility, and attached Permit Conditions (5) all applicable industry standards (6) all applicable permits issued by a federal, state or local agency with jurisdiction over the project (7) evidence presented by Applicant at the evidentiary hearing.

CRW/NextEra has not and cannot meet many requirements of Condition No.2 of the Final Order. The Commission should tell CRW/NextEra enough with the deceptions and lawlessness. The Commission should deny the CRW Waiver Request, Sanction CRW for violations, Initiate an Onsite Compliance Investigation by a Third Party (approved by the Intervenors) and in Accordance with SDCL 49-41B-4 and SDCL 49-41B-33 Revocation of the Order filed on July 26, 2019.