

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

**AMBER CHRISTENSON,
LINDA LINDGREN AND
TIMOTHY LINDGREN
v.
CROWNED RIDGE WIND LLC**

* **PRE-FILED REBUTTAL TESTIMONY**
* **O F**
* **AMBER CHRISTENSON**
* **CE22-001**
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*

STATE OF SOUTH DAKOTA)
:SS
COUNTY OF CODINGTON)

Amber Christenson, being first duly sworn on her oath, deposes and states as follows:
My name is Amber Christenson. My address is 16217 466th Avenue, Strandburg, SD 57201. I live in the county of Codington. My home is on my property consisting of 21.02 acres which lies inside the industrial wind project area of Crowned Ridge Wind, owned by Crowned Ridge Wind, LLC. I was an intervenor during the application/permitting process of Crowned Ridge Wind Docket EL 19-003. My property has been included in the post construction sound studies performed on the behalf of Crowned Ridge Wind by Epsilon Associates, Inc. I hereby submit to the Commission my Rebuttal Testimony to the pre-filed testimonies of Crowned Ridge Wind, LLCs witnesses Stefan Martinsen and Richard Lampeter.

Stefen Martinsen, via his CV, claims to be ‘a Wind General Manager’ who oversees the operations of Crowned Ridge Wind, LLC (“Crowned Ridge”) and has “knowledge of the operational and maintenance characteristics of Crowned Ridge, including when and why the wind farm would have wind turbines curtailed or shut down.” Mr. Martinsen, nor Crowned Ridge make any claim that he was in charge, nor had direct knowledge of the Crowned Ridge wind project during the 2020 nor the 2021 sound study periods. The Complainants know nothing of this person, have ever been contacted by this person, nor is there any evidence he had any knowledge of the sound studies performed in the project area. I am waiting for clarification of his CV via my data request to Crowned Ridge regarding his responsibilities/position in relation to Crowned Ridge Wind, LLC in 2020-2021. If Mr. Martinsen was not the responsible party during the 2020 and 2021 sound studies, then who was? The response to the data request can be discussed during the hearing.

Mr. Martinsen on page 2, lines 20-21 of his testimony, makes a claim that WIOM software provides and “added benefit of reducing noise by adjusting the pitch of the blades.” Mr.

Martinsen has absolutely no evidence to back up his inflated claim. GE, the provider of the software, makes no claim of noise reduction, only increased power, as shown on Complainants' Exhibit AC4. Increased power on wind turbines increases noise. And in Exhibit AC5, you can read for yourselves that GE has no data to support a noise reduction. Crowned Ridge Wind and GE did not collaborate on a noise reduction study of WIOM during the 2021 sound study as you were lead to believe they would by Mr. Murphy, because there is nothing to collaborate on...there is no noise reduction benefit, GE does not claim one, and only Crowned Ridge employees: Mr. Martinsen, Mr. Murphy and Mr. Schumacher, make that claim. Mr. Martinsen, nor Crowned Ridge, provided any proof/exhibits to support Mr. Martinsen's inflated claim, only hyperbole. The few, limited minutes WIOM was engaged during the 2021 sound study, was during low power output, not high power output, such as the conditions that caused the massive exceedance in 2020, where Mr. Welder's sound pressure nearly doubled the allowable threshold permitted on a non-participants home. There is no shown benefit of WIOM reducing noise in the 2021 sound study. None.

On page 3 of Mr. Martinsen's testimony, lines 2 and 3, Mr. Martinsen says all CR turbines were upgraded with low noise trailing edge blades as a sound mitigation measure. To refresh the memory of the Commission:

1. LNTE blades were part of the original application and the permit was issued requiring them.
2. CR did not install LNTE blades on nearly 80% of the turbines before the initial start up of the project (nor did they install the required aircraft detection lighting). If my memory serves, 8 turbines of the 88 were initially built as permitted with LNTE blades. Thus, the project had sound study one ordered by the Commission with turbines curtailed to ensure the project did not exceed compliance limits while the remainder of the project's turbines were being retrofitted with LNTE blades.
3. The 2020 failed sound study, which failed compliance on 3 of the 6 locations studies (50%), was using LNTE blades on all turbines. Thus, sound study three was ordered by the Commission.
4. The only modification to the turbines applied to the third study (2021) to try to reduce the non-compliant noise issues, was the addition of WIOM software which CR misleadingly told the Commission and Complainants was a noise reduction software. We now know, via exhibits AC4 and AC5, that the software is for improved power in low power situations, there is no noise reduction cited by GE in the software's specifications.

Also on page 3 of Mr. Martinsen's testimony, in response to Complainant Christenson's claim that turbine 71 was offline for 18 hours for maintenance, Mr. Martinsen says CR did not 'manually' shut down the turbine. He does not dispute the turbine was offline in the 2021 study from Friday, November 12th at 6:09 p.m. until November 13th, at 12:23 p.m. He just wants to interject the word 'manually', like that makes any difference of the effect of reduced noise by the turbine because it was off for two days during the sound study.

Turbine 71 being offline 18 hours, in addition to all of the curtailments and missed shutdowns, is important. The Epsilon report on page 8-1 shows Location 8 at the top of the threshold [Exhibit AC10]:

Table 8-1 Evaluation of Crowned Ridge Wind Sound Levels

Location	Closest Wind Turbine	Wind Turbine Only L _{eq} Sound Levels (dBA) ¹	Regulatory Limit (dBA)
3A	21	28 to 44	45
6	38	32 to 42	45
7	33	25 to 45	50
8	81	27 to 44	45
9	26	31 to 45	45

Notes:

1. Range determined following a review of all wind turbine only sound levels. Periods were not excluded for low electrical output or if impacted by a MISO curtailment.

Turbine 71 is in the radius for noise effects for Location 8, as shown in this table from the Epsilon report on the 143rd page [Exhibit AC10]:

Attachment B

Table C-1 - Wind Turbines Shut Down for Background

Measurement Location:	3A	6	7	8	9
Wind Turbine w/in Radius:	13	27	25	70	20
	14	28	26	71	21
	20	29	31	73	22
	21	36	32	74	23
	22	37	33	75	25
	23	38	34	76	26
	24	51	35	77	27
	25	70	36	78	28
	26	73	39	79	29
	27	CRWII - 87	40	80	32
	28	CRWII - 88	41	81	33
	29		42	82	34
	37		43	83	35
			44	84	36
			47		37
			48		43
			49		44
			50		50
			51		51
			56		
			57		
			58		

On page 3 of Mr. Martinsen’s testimony, Crowned Ridge asks him, starting on line 18, about my testimony and CR asserts that throughout my testimony I claim that turbine shutdowns and curtailments were intentionally implemented to benefit Crowned Ridge in the sound study. The whole question is untrue. I do not assert CR manipulated the sound study in my testimony. I say

it is flawed because of curtailments and missed shutdowns and THOSE things are most definitely true.

Since Mr. Lampeter's testimony for Crowned Ridge in 2019, according to his CV, he has evolved from an associate to a principal in his company, Epsilon. Having a financial stake in the company of Epsilon could lead one to believe that finding a favorable outcome for his client could be to Mr. Lampeter's financial benefit. On Crowned Ridge's unmarked exhibit, Mr. Lampeter's CV, Mr. Lampeter lists 28 Noise Impact Assessment projects he has been involved with. NextEra (also formerly known as FPL), is the client 16 of the 28 projects listed. The first Project listed is Crowned Ridge, and I would like to clarify that Crowned Ridge is listed only ONCE, but that heading/item represents many contracts for that one heading. Epsilon was hired for three sound studies in Crowned Ridge Wind (CR1) and for testimony for the Crowned Ridge 2 project. NextEra/FPL is a recurring client who provides substantial income for Mr. Lampeter and the company of which he is a principal. Perhaps that is why, even after Mr. Hessler and the Commission found the second sound study to be out of compliance for noise, Mr. Lampeter still gaslights us in his testimony claiming compliance in 2020 where 3 of the six properties failed. We've all been taught to never bite the hand that feeds us, haven't we? The value of those contracts could be nearly a half million dollars for Crowned Ridge contracts alone, not including the other 15 headings/items listed there.

On page 3 of Mr. Lampeter's testimony, Crowned Ridge on lines 21 and 22, ask Mr. Lampeter to give a brief overview of the conclusions of the 2020 sound study. (The study which failed at 3 of the 6 properties tested.) Mr. Lampeter says "because the measured locations were selected due in part to higher modeled sound levels, it follows that participant and non-participant residences not specifically evaluated during this program will also be below the applicable SD PUC sound level thresholds." Perhaps Mr. Lampeter was not made aware by Crowned Ridge that there are a number of turbines in the project that were not built as cited in the application and permit, thus the sound modeling is not accurate. There could very well be other locations above the modeled noise predictions. Also, his premise is flawed that the other residences would not be over the permitted sound level because they were modeled lower than some of the tested properties. An example would be MY property, Location 6. My home was modeled at 38 dBA and the 2021 sound study has my sound reaching 42, if you go by the Epsilon report, and that is with curtailments, other shutdowns and missed shutdowns during the times of highest output. And I also remind the Commission, in the permitting docket for this project, EL 19-003, Crowned Ridge's expert, whose testimony you accepted, was that turbine sound traveled 20-25 miles and raised the turbine noise at Mr. Robish's property. That is the testimony that stands in this project, the testimony by which you permitted this project, and Mr. Haley could give, not did anyone else give, no other explanation to the rise in noise to Mr. Robish's property, other than the addition of the Dakota Range wind farm 20-25 miles away.

Mr. Lampeter's testimony, page 4, lines 5-14, Crowned Ridge asks Mr. Lampeter to address the 2020 sound study placement of equipment 85' from Location 2's 'residential structure' (Is this

not a 'home'?). Mr. Lampeter answers that the homeowner requested the equipment to be placed on a 'different side of the residence'. If the homeowner did not agree to the sound study protocols, why was the alternate for location 2 not used? The Conditions of the permit clearly state 25' from the residence. Location 2 was exceeded the permitted noise level even though the equipment *was placed 85', instead of 25'* from the 'residential structure'.

I am not certain why Crowned Ridge spends so much time questioning Mr. Lampeter about the 2020 sound study in his rebuttal testimony. Our complaint is about the 2021 sound study. The gaslighting by Crowned Ridge, trying to have the Commission re-hear the 2020 sound study and pretend it was in compliance is unnecessary. The study failed at 50% of the locations. An additional study was ordered. The additional sound study is the problem we are addressing, we are not re-litigating 2020. Even though ANSI S12.0 Part 3 was not applied to the 2020 sound study, the project still FAILED compliance.

On page 6 of Mr. Lampeter's testimony, Mr. Lampeter admits that the PUC's independent expert, the expert who is not a principal in the sound study testing company, found noise exceedences at 3 of the 6 locations. Does it matter if it was once or twice during a three week period? No, it does not. The noisiest part of the year is December through March, and a bit of April, for the turbines in the Crowned Ridge project. Exceeding permitted noise in October and November can lead anyone who looks at the issue without favor toward the wind company to conclude the turbines are out of compliance other times during the 49-50 weeks of the year, especially during heavy air periods, of which there are many in our area. Even if there is one exceedence in 14 days, as was in the 2020 study, that is *7% of the time*. Unacceptable.

Mr. Hessler found overages in 2020 *and* 2021, where Epsilon glossed over the issue, by saying Mr. Hessler evaluated 'additional periods'. Mr. Hessler was apparently much more thorough when combing through the data than the company hired by Crowned Ridge. Of course, he is not a principal in the testing company who is hired many times by Next Era (reminder: 20 of 28 according Crowned Ridge's unmarked exhibit).

On page 7 of Mr. Lampeter's testimony, Crowned Ridge asks Mr. Lampeter to provide an overview of how the 2021 study was conducted; they want Mr. Lampeter to dismiss why I said the study was 'not conducted properly'. Again Crowned Ridge is trying to gaslight the Commission by saying I allege the study was not conducted properly. I never say that in my testimony. The study is flawed by curtailments and turbines off/down for maintenance, and missed shutdowns. Those are the facts. Those facts are all in the Epsilon report. Mr. Lampeter does not address the turbines being curtailed 10 of 14 days of the sound study in his answer on pages 7-8, but in the report it is cited many times by Mr. Lampeter that the curtailments *were* an issue and that *the project was not being operated as is typical*.

On page 8, when asked to provide a brief overview of the conclusions of the 2021 sound study, Mr. Lampeter says sound levels ranged from 25-45 dBA at the 5 'non-monitoring locations'. I

am not sure what he means by non-monitored locations, but also in his overview, he does not mention the missed shutdowns, the curtailments, or the turbines down for extended periods of time for repair/maintenance. He also does not mention that Mr. Hessler identified an exceedence at Location 9.

On page 8, beginning at line 25, Crowned Ridge tells Mr. Lampeter that I ‘claim’ the mitigation plan was not followed during the 2021 study because Crowned Ridge did not comply with the shutdown requirement. Mr. Lampeter answers listing the mitigation plan shutdown requirements. There is nothing to dispute there...*they missed shutdowns...shutdown times were spelled out and a requirement.* Read this excerpt from page 9 of Mr. Lampeter’s testimony, the shutdowns resemble Whack-A-Mole. On page 9, line 1, Mr. Lampeter seemingly misleads in his testimony by saying there were a total of 58 shutdowns by NEER. However, not all shutdowns were consistent at the whole of the locations. On page 7-2 of Exhibit AC10, Mr. Lampeter states Location 6 had 41 shutdowns. All of the missed shutdowns and curtailments skew the results of the two week study and the 41 *shutdowns did not include times required by the mitigation plan.* The missed shutdowns, missed for no apparent reason other than to hide the issue of the turbines running at the highest, or nearly the highest noise output, would have given us a comparison to the failed 2020 sound study conditions. Crowned Ridge failed to meet the requirements of the Order.

Crowned Ridge also fails to meet the requirement of the Order/Mitigation Plan by not coming to an agreement with the 2020 study Location 3A property owner, Mr. Welder. Mr. Welder is still waiting for his property to be made compliant so his home can be livable.

On the bottom of page 11 and top of page 12 of Mr. Lampeter’s testimony, he says the mitigation plan said to focus on time periods near wind turbine shutdowns. He goes on to say “the 2021 Sound Study did not evaluate all periods during high electrical output regardless of how many hours they were from the most recent shutdown’. However, they DID evaluate times further from the shutdown period when it was advantageous to Crowned Ridge to do so. Mr. Lampeter played on both sides of the fence during the evaluation of the study to the benefit of Crowned Ridge.

On page 12, Crowned Ridge addresses the November 11th ‘missed’ shutdown with Mr. Lampeter. (By ‘missed’, Crowned Ridge means the ignored, required shutdown. Crowned Ridge 2 complied with the order, but not Crowned Ridge 1.) Mr. Lampeter’s answer beginning on line 15 to the issue is that yes, there was a missed shutdown (violating the order) but they implemented an additional shutdown at 4 pm as a substitute. Conveniently for Crowned Ridge, the substituted shutdown wasn’t a suitable evaluation period because of changing weather conditions (precipitation and wind changes). He also refers to using the recorded audio at that time to identify that unusable shutdown as masked. I have personal observations noting the turbines being louder than the background noise. We all agreed at the Commission meeting when discussing Epsilon staying in the area for the sound study, that personal observations are superior to recordings.

Mr. Lampeter's answer to Crowned Ridge's question about curtailments on the bottom of page 12, beginning at line 30 and continuing to page 13, is that he agrees with me. "MISO curtailments impacted the operation of the wind turbines." He also says the "impacts were limited to periods when curtailments occurred." Of course, that is certainly the case. However, it doesn't matter if MISO curtailed the turbines, or if Crowned Ridge curtailed the turbines, *the turbines were curtailed*, and curtailment affects the power output, thus reducing the noise from the turbine. To quote the Commission as to how the curtailment affected the noise output, "*We don't know what we don't know.*" However, *according to Crowned Ridge's expert, curtailments affected the sound study.* Reminder to the Commission here...the first sound study had turbines curtailed to reduce the noise while the project was being retrofitted with LNTE blades. Curtailment=noise reduction.

On page 13 of Mr. Lampeter's testimony, Crowned Ridge accuses me of saying that 'actions were taken to manipulate the data collection process.' I do not allege that in my testimony. And I certainly never accused Mr. Lampeter or Clint of manipulating data collection. Furthermore, I assume Mr. Lampeter would have no knowledge of Crowned Ridge manipulating data. Mr. Lampeter only knows information that is provided to him. If Crowned Ridge provided him with no knowledge of any manipulation, of course his answer would be 'no'.

On page 14, lines 15 through 24, of Mr. Lampeter's testimony, he says 19% of the sound level measurements at Location 6 were during a curtailment. **19%!** Add to that the missed shutdowns and we have an even higher ratio of incomplete and flawed data in this sound study. On page 14, Crowned Ridge asks Mr. Lampeter about me saying that Epsilon, in the sound study report, said Crowned Ridge was running abnormally. Crowned Ridge is fond of semantics. Let me help with synonyms of abnormal: irregular, nonstandard, uncharacteristic, atypical, anomalous, unusual, strange, odd. To me, abnormal fits with what Mr. Lampeter cites in his report on page 6-7 of Exhibit AC10:

Midcontinent Independent System Operator (MISO). The MISO curtailments limited the electrical output of the site as a whole and substantially impacted the typical operations of the wind turbines when these curtailments occurred. It is Epsilon's understanding that the curtailments

If curtailments impacted the "typical operations", it follows that atypical operations are also correctly called 'abnormal', a synonym to atypical. Atypical=the opposite of typical. Please read the highlighted portion of the above portion of the Epsilon report again...**SUBSTANTIALLY impacted the typical operations**...

On page 17, Mr. Lampeter agrees with me that ANSI S12.9, Part 3 should have been applied to this study by admitting 'this standard pertains to short-term attended measurements' and goes on to say this program was *mostly* unattended (thus, at times attended). Let me rephrase that for everyone, this standard should have been applied to this study because it applies to short-term attended measurements, which this study included. I contend that not only would it have been

appropriate to apply these ANSI standards, but failing to do so tainted the results in the favor of Crowned Ridge, not the residents of South Dakota who live in the project area. As for the aforementioned standard and ANSI standard S12.100-2014, I will discuss those further at the hearing when I receive the actual standards from Mr. Lampeter as requested in Data Request 6, answers I have not yet received.

On page 18 of Mr. Lampeter's testimony, he answers Crowned Ridge's question and lists "MISO curtailments occurred(ing) during potential evaluation periods before or after the shutdown periods listed below". He then lists 18 issues near 8 shutdowns. 18 issues involving the MISO curtailments adjacent to, or during my 41 shutdowns. That is a whopping 19.5% ladies and gentlemen! **19.5%! 20% of the shutdown periods were affected by curtailment in this one location alone!**

On page 19, line 9 of Mr. Lampeter's testimony, he states that when turbine noise is masked that that means wind turbines are completely inaudible. As we have discussed with the Commission during past meetings/hearings, we do not hear in averages. Unless the wind is very, very strong, we, residents living in the project, hear the turbines above the background sound. The project did not complete a preconstruction sound study, unfortunately, or we would have the opportunity to point out to the commission just how quiet our neighborhood used to be.

I respond to the question and answer on page 19 beginning at line 14, that I didn't say the measuring equipment was faulty because it was on the east side of my house. During the initial placement of the equipment for the 2021 sound study, I showed Rich and Clint where I typically take my measurements, and it is 25' from the northeastern corner of my house, somewhat close to where they placed their equipment. I also say that it is noisy on the west side of my house, there is something of a 'wind alley' there. I approved where Epsilon initially placed the equipment and would have requested the west side had it been conducive to place equipment in that area 25' from my home, but it was not the best placement there. And as for me requesting to have the equipment moved after the initial placement, that is not exactly how the moving of the equipment transpired. I approved the initial placement, then Mr. Riniker emailed me and said staff said the equipment was 39' from my house, not 25' and asked if I would like it moved and I said, that would probably be best so that it complied with the Condition and Mitigation Plan. I believe when the equipment was initially placed, it measured 25' from the corner of the deck, not the home structure per se. That would be my understanding of why I was contacted about having it moved.

Addressing page 20, Mr. Lampeter's answer beginning on line 3, I appreciate that Mr. Lampeter willingly tells us about the project in New Hampshire requiring a winter study. I have always advocated the need for a winter study in our project area and still do. Sound studies are done in cold climates. I have never said there would not be or could not be challenges, but NextEra chose to build in a cold climate and the residents deserve to have the project be in compliance, whether it is cold or not. I have issued a data request to Crowned Ridge, specifically to Mr. Lampeter,

asking if sound testing equipment would be insured against any damage. I am confident we can come up with a mitigation plan to address cold weather delays and issues. He mentions the testing in New Hampshire being delayed one week because of very cold temperatures, we have made adjustments on sound studies here as well, such as extending the 2020 sound study an additional week because of the noise exceedences. I also contend that if Epsilon does not wish to be a part of winter study, there are other companies who would jump at the chance for the contract, especially in this economy. It is their choice to accept the contract, or not. It is my understanding there is equipment that can be used in extremely cold temperatures and warming boxes to protect equipment.

I noticed that throughout Mr. Lampeter's entire testimony, he never addresses the noise exceedance found by Mr. Hessler at Location 9. Since Mr. Hessler will not be testifying during our hearing, no one, including Mr. Hessler, staff, nor Crowned Ridge's two witnesses, is disputing the fact that the project was OVER the permitted noise condition at Location 9 and Mr. Hessler averaged two 10 minute periods to try to dodge the fact that the project is out of compliance at Location 9 during the 2021 sound study. Location 9 is on the same section as Location 3A that had the disastrous overages in the 2020 sound study...over 50 dBA for a non-participant. It is unfortunate that staff has not made Mr. Hessler available as a witness in our complaint hearing as they told the Commission they would. His analysis found the exceedance in the 2021 sound study and his analysis found the exceedances in the 2020 sound study. Epsilon, the company hired by the wind company found compliance in both...go figure...

I remind the Commission that NextEra will be back in front of you for other permits. Setting a precedent of 'letting them by' by rounding the corners of the permit conditions does the citizens of South Dakota, especially those sentenced to live in the project area, a great injustice.

I reserve the right supplement my testimony and exhibits as discovery and further information becomes available. At the time of the submission of my rebuttal testimony, there are two outstanding data requests for which I am anxiously awaiting Crowned Ridge's responses. I have had difficulty with Crowned Ridge and PUC staff providing appropriate answers to my data requests.

I thank the Commission for the opportunity to submit my testimony in writing. You were right, it was very helpful.

This concludes my pre-filed rebuttal testimony.


Amber Christenson

Subscribed and sworn before me this 6th day of September, 2023.


Notary Public South Dakota
My Commission Expires: December 5, 2025

