

January 25, 2018

ELECTRONIC FILING

Mr. Daniel P. Wolf, Executive Secretary
Minnesota Public Utilities Commission
127 Seventh Place East, Suite 350
Saint Paul, MN 55101-2147

RE: *Response of Big Blue Wind Farm, LLC to the Minnesota Public Utilities Commission's January 10, 2018 Request for Response to Alleged Site Permit Violations and to Show Cause*
In the Matter of Big Blue Wind Farm, LLC 36 Megawatt Large Wind Energy Conversion System (LWECS) in Faribault County, Minnesota
IP-66851/WS-10-1238

Dear Mr. Wolf:

On January 10, 2018, Minnesota Public Utilities Commission staff issued a Request for Response to Alleged Site Permit Violations and to Show Cause. In response, Big Blue Wind Farm, LLC provided a review of its previous submittals related to the post-construction noise monitoring requirements of its LWECS Site Permit and submitted a proposed protocol for post-construction noise analysis. Attached are the review and comments of the Minnesota Department of Commerce Energy Environmental Review and Analysis (EERA) staff on this submittal.

I am available to answer any questions the Commission might have.

Sincerely,

/s/ Louise I. Miltich

Louise Miltich
Environmental Review Manager

Enclosure

cc: Bret Eknes, Commission Staff
Tricia DeBleeckere, Commission Staff
John Wachtler, EERA Director

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BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

**ENERGY ENVIRONMENTAL REVIEW AND ANALYSIS
REVIEW AND COMMENTS ON BIG BLUE WIND FARM'S POST-
CONSTRUCTION NOISE ANALYSIS PROTOCOL**

IP-66851/WS-10-1238

Date: January 25, 2018

Staff: Louise Miltich | (651) 539-1853 | louise.miltich@state.mn.us

In the Matter of Big Blue Wind Farm, LLC 36 Megawatt Large Wind Energy Conversion System in Faribault County, Minnesota

Issues Addressed: Recommendations regarding Big Blue Wind Farm, LLC's proposed protocol for post-construction noise analysis submitted in response to the Minnesota Public Utilities Commission staff's January 10, 2018 Request for Response to Alleged Site Permit Violations and to Show Cause.

Figures and Attachments: Attachment A (Big Blue Wind Farm, LLC December 6, 2012 Protocol Submittal), Attachment B (Big Blue Wind Farm December 2012 Pre-operation Meeting Notes)

Additional documents and information, including the route permit application, can be found on eDockets by searching "10" for year and "1238" for number: <https://www.edockets.state.mn.us/EFiling/search.jsp> or the EERA webpage: <https://mn.gov/commerce/energyfacilities/Docket.html?Id=30587>.

This document can be made available in alternative formats, that is, large print or audio, by calling (651) 539-1530 (voice).

Introduction

Section 6.6 of Big Blue Wind Farm, LLC's Large Wind Energy Conversion System (LWECS) Site Permit requires the permittee to complete a post-construction noise monitoring study within 18 months of commercial operation, and to submit a monitoring protocol for approval by the Commission before the required monitoring is completed.¹ Typically, the Commission relies on Minnesota Department of

¹ August 17, 2011 Order issuing the proposed LWECS Site Permit as amended for the 36 MW Big Blue Wind Farm to Big Blue Wind Farm, LLC [20118-65487-01](#). Section 6.6 of the permit states: "The Permittee shall submit a proposal to the Commission at least ten (10) working days prior to the pre-operation compliance meeting for the conduct of a post-construction noise study. Upon the approval of the Commission, the Permittee shall carry out the study. The study shall be designed to determine the operating LWECS noise levels at different

Commerce Energy Environmental Review and Analysis (EERA) for a technical review and recommendation prior to making a decision on the approval of a noise monitoring protocol.

Background

On October 31, 2017 EERA staff submitted comments and recommendations related to noise complaints and noise compliance at the Big Blue Wind Farm.² EERA staff noted that the post-construction noise monitoring requirements in Section 6.6 of the Site Permit have not been met. EERA staff also recommended steps to address compliance with these requirements. EERA staff recommendations included (1) selection of a qualified contractor for approval by EERA and Minnesota Public Utilities Commission (Commission) staff, and (2) preparation of a protocol for post-construction noise monitoring using an “on-off” approach to isolate wind turbine contributions to overall noise, with submittal of the protocol for EERA and Commission staff approval.

In a January 10, 2018 Request for Response to Alleged Site Permit Violations and to Show Cause (Request), Commission staff requested that Big Blue Wind Farm, LLC “summarize by January 31, 2018 any actions taken to date in relation to compliance with post construction noise monitoring requirements of the Big Blue Wind Farm Site Permit Conditions and the recommendation made by the DOC EERA.”³ In its response to the Request (Response), Big Blue Wind Farm, LLC provided a review of previous submittals related to post-construction noise monitoring requirements of the Big Blue Wind Farm LWECS Site Permit and submitted a proposed protocol for post-construction noise analysis.⁴

EERA comments and recommendations on the previous submittals as well as the proposed protocol are provided below.

EERA Analysis and Comments

Previous Submittals related to Post-Construction Noise Monitoring

2012-2013

As noted in Big Blue Wind Farm, LLC’s Response, they submitted their original noise protocol to the Commission on December 6, 2012.⁵ The December 6, 2012 submittal states “this technical memorandum presents the proposed Noise Study Protocol for the Big Blue LWECS installation. The purpose of the proposed protocol is to satisfy the requirements of Section 6.6 (Noise) of the Site’s Public Utilities Commission permit.” The submittal is an approximately one page bulleted list generally outlining the anticipated tasks and features of the study (see Attachment A).

frequencies and at various distances from the turbines at various wind directions and speeds. The Permittee shall submit the study within eighteen (18) months after commercial operation.”

² Minnesota Department of Commerce (October 31, 2017) Comments and Recommendations on Noise Complaint and Noise Compliance, e- Dockets No. [201710-137030-01](#)

³ Minnesota Public Utilities Commission (January 10, 2018) Request for Response to Alleged Site Permit Violations and to Show Cause, e-Dockets No. [20181-138768-01](#)

⁴ Big Blue Wind Farm, LLC (January 18, 2018) Response to Request for Response to Alleged Site Permit Violations and to Show Cause, e-Dockets No. [20181-139089-01](#)

⁵ Wenck Associates, Inc. (December 6, 2012) Big Blue Noise Study Protocol, e-Dockets No. [201212-81485-02](#)

EERA records indicate that a pre-operation meeting was held on December 14, 2012 at EERA's offices and that the December 6, 2012 noise study protocol submittal was reviewed during that meeting. Meeting notes (Attachment B) indicate that the Department of Commerce, Energy Facility Permitting's LWECS Noise Study Protocol and Report Guidance⁶ was discussed in the meeting. The LWECS Noise Study Protocol and Report Guidance was available in October of 2012 and the December 6, 2012 submittal is noticeably lacking relative to the requirements of that guidance. Meeting notes indicate that Big Blue Wind Farm, LLC was directed to modify their study protocol using an example protocol submitted during a similar time-period as a point of reference.

Based on a review of EERA files, files in the docket, and Big Blue Wind Farm, LLC's Response it does not appear that Big Blue ever revised or re-submitted their December 6, 2012 protocol based on the feedback provided at the pre-operation meeting. As noted above, typically the Commission relies on EERA for a technical review and recommendation prior to making a decision on the approval of the protocol. It is common practice for EERA to work with project proposers to establish a protocol that meets the technical requirements and that EERA can recommend for approval prior to bringing the matter in front of the Commission. So, in this case, in the absence of an adequate protocol, it appears that EERA did not advance the matter.

As indicated in Big Blue Wind Farm, LLC's Response, on August 6, 2013, the Department of Commerce filed its Annual Compliance Review⁷ stating that "the e-filed noise study protocol for the project is under review. Comments on that protocol will be provided separately." The Department noted in its August 6, 2013 Annual Compliance Review, it was "implementing a new compliance tracking system for these permits." Nonetheless, the pre-operation meeting notes are clear - feedback had been provided and documented at the time of the compliance review. EERA staff maintains that the 2012 submittal was not and is not a valid protocol for post-construction monitoring.

2017

In July of 2017, Big Blue Wind Farm, LLC responded to a June 29, 2017 information request from Commission staff⁸ requesting that Big Blue submit the results of any previously conducted noise monitoring data. Big Blue Wind Farm, LLC's response to this information request included, among other things, a noise monitoring report detailing the results of noise monitoring conducted in late June to early July of 2017.⁹ Notwithstanding Big Blue Wind Farm, LLC's later claim that the study was flawed,¹⁰ the report produced by their noise consultant identifies several hours during the monitoring period in which both daytime and nighttime L₁₀ and L₅₀ limits were exceeded at monitoring sites within the project area. The report indicates that noise standard exceedances may be attributable to Big Blue Wind Farm turbines.

⁶ Minnesota Department of Commerce, Energy Facilities Permitting. October 8, 2012. Guidance for Large wind Energy Conversion System Noise Study Protocol and Report. <https://mn.gov/commerce/energyfacilities/documents/FINAL%20LWECS%20Guidance%20Noise%20Study%20Protocol%20OCT%208%202012.pdf>

⁷ Minnesota Department of Commerce (August 6, 2013) Annual Compliance Review, e- Dockets No. [20138-89976-01](#)

⁸ Minnesota Public Utilities Commission (June 29, 2017) PUC Information Requests IR 1-5, e- Dockets No. [20176-133262-01](#)

⁹ Minnesota Department of Commerce (October 31, 2017) Comments and Recommendations on Noise Complaint and Noise Compliance, e- Dockets No. [201710-137030-01](#) (see Attachment)

¹⁰ Big Blue Wind Farm, LLC (January 18, 2018) Response to Request to alleged site permit violations and to show cause, e-Dockets No. [20181-139089-01](#)

New Proposed Post-Construction Noise Study Methodology

Big Blue Wind Farm, LLC has now submitted a new proposed protocol for post-construction noise monitoring, included as Appendix B to their Response. The protocol outlines their proposed methodology for post-construction noise monitoring using an “on/off” method to isolate the contribution of the wind turbines to overall noise levels.

An “on/off” approach is consistent with Appendix A of the LWECS Noise Study Protocol and Report Guidance, which indicates that when noise limit exceedances are recorded, it is necessary to determine the increment due to the turbine noise through completion of an “on/off” monitoring campaign to properly isolate wind turbine sound from total measured sound. Further, the “on/off” approach is consistent with EERA’s October 31st recommendation that the Commission request preparation of an on/off noise monitoring protocol to address (1) the requirements of Section 6.6 of the LWECS site permit and (2) the need to isolate the wind turbine contribution to overall sound as exceedances of noise standards were identified in the June-July 2017 noise monitoring submittal.

Big Blue’s proposed protocol was prepared by their consultant WSB. WSB’s summary of qualifications and experience is included in Appendix B of the Response. The summary of qualifications and experience indicates that WSB has general experience with noise projects and residential noise complaints. The statement of qualifications identifies WSB’s experience with the relevant noise monitoring equipment and highlights project experience including some wind farms and a host of highway construction projects.

The proposed protocol indicates the general objectives of the monitoring including the following:

- To confirm the validity of the noise modeling conducted prior to permit issuance or prior to construction;
- To assess the modeling as a predictor of probable compliance with Minnesota noise standards;
- To determine the noise levels at different frequencies and at various distances from the turbines
- at various wind directions and speeds; and
- To verify noise compliance at complainant’s property line; and
- To satisfy EERA recommendations.

The proposed protocol provides justification for the selection of four “onsite” monitoring locations and one “offsite” location. Consistent with EERA’s October 31 recommendation, the proposed “onsite” monitoring locations include a monitor at the property line of the complainant (Mr. Moore) and the protocol indicates that if permission is granted the monitor will be located instead on the property of the complainant.

The monitoring is proposed to extend over a 20-day period with turbines on for 15 of the 20 days and turbines off for 5 of the 20 days. The protocol outlines instrumentation, monitoring methodology, data processing, and presentation of results that is consistent with the specific requirements of the LWECS noise monitoring guidance. Monitoring methods, data processing and data analysis specific to the “on/off” approach are addressed briefly.

The protocol notes that during the preconstruction phase of the Project, predictive noise modeling was completed using noise sources that do not represent the Gamesa G97 noise output. It notes that due to

the lack of an accurate predictive noise model, any validation efforts associated with the Post Construction Noise Analysis would not be accurate and could skew the results of the report.

EERA Comments

EERA staff believes that the most appropriate and efficient path forward is for Big Blue, EERA and Commission staff to work toward implementation of the proposed “on/off” monitoring. For reasons outlined below, EERA staff believes that further coordination is needed to give EERA staff confidence that the “on/off” campaign will be effectively implemented and will produce sound, actionable results.

EERA understands that conducting “on/off” monitoring and performing the data analysis necessary to isolate wind turbine noise contributions is complex and requires specialized expertise. After reviewing Big Blue’s submittal in Appendix B of their Response, including both the contractor qualifications and the proposed protocol, EERA staff believes additional detail would be helpful.

First, while the proposed monitoring protocol adheres to the recommendations in the LWECS noise monitoring guidance, the proposed protocol lacks detail regarding the planning and coordination required for adequate data collection in an “on/off” campaign. EERA acknowledges that the LWECS guidance does not offer specific recommendations for conducting “on/off” monitoring. However, based on recent experience, EERA has found that it can be challenging to collect the requisite data across wind speeds in both “off” and “on” conditions to allow a good comparison and reliable calculation of the wind turbine contribution. Because of this, EERA believes additional detail on certain items would give all parties better confidence that the goals of the campaign will be achieved. For example, EERA believes it would be helpful to work together with Big Blue Wind Farm, LLC and their contractor to discuss shorter lead time planning for off periods, wind-speed “binning” in the data collection and data analysis, methods for analysis of turbine only contribution, and tailored approaches for presentation of “on/off” results. International standards (eg. IEC 61400-11) have guided other contractors in design and implementation of “on/off” monitoring campaigns and EERA believes these standards could be useful in fleshing out the protocol.

Second, the contractor qualifications in Appendix B provide a broad overview of WSB’s experience with noise monitoring and noise compliance, but do not specifically address experience relevant to design and execution of an “on/off” campaign at a wind farm. Based on recent experience, EERA has found that the coordination and troubleshooting required during an “on/off” campaign to ensure adequate data collection and credible data analysis is non-trivial. Additional detail regarding WSB’s resources, expertise and experience specific to this sort of monitoring campaign would assist in determining whether WSB is the appropriate contractor and would help to provide confidence in the implementation and outcomes of the campaign.

As a separate matter, EERA is concerned that the proposed protocol does not include an comparison with pre-construction noise modeling results. One of the benefits of comparing noise monitoring to modeling results is that it can provide some confidence in noise compliance across the site, without monitoring at every receptor location. For example, if modeling showed noise levels below MPCA limits at relevant receptors and monitoring results are consistent with the modeling results, compliance can reasonably be assumed without monitoring at each receptor. In the absence of comparable pre-construction modeling, EERA believes updated modeling, considering the outcomes of the on/off monitoring would be helpful in demonstrating compliance. However, EERA acknowledges that there

may be alternative remedies for the lack of relevant pre-construction modeling and is open to other insights and suggestions that an experienced contractor could likely provide.

In addition to the items identified above, there are various other aspects of the proposed protocol that EERA believes should be discussed prior to finalization. For example, prior to final site selection EERA would like to better understand the selection rationale and why certain other sites were not chosen (eg. residence in the north-west portion of the project site in center of T2 – T7 cluster). Similarly, EERA would like to be involved in the re-location of M1 onto the Moore property, if permission can be obtained. In addition, EERA would like to further confirm that weather stations would be capable of collecting wind-direction measurements, discuss rationale for shutting down all turbines during the “off” period vs. just turbines within 1.5 miles, and work with Big Blue and their contractor on number of other similar details.

EERA Conclusions and Recommendations

EERA staff believes that further coordination on the proposed protocol is needed to give EERA staff confidence that the “on/off” campaign will be effectively implemented and will produce sound, actionable results. EERA staff believes that additional detail and clarification is needed prior to finalization of the protocol and that direct coordination between Big Blue, their contractor, EERA and Commission staff is likely the most efficient path forward.

EERA staff recommends at this time that the commission not approve the proposed contractor or proposed protocol. EERA staff recommends that the Commission instead request that Big Blue Wind Farm and their proposed contractor coordinate directly with EERA and Commission staff to work toward final contractor approval and a final protocol that satisfies the needs of both EERA and the Commission. EERA suggests that, in the interest of timely implementation of the monitoring, the Commission might consider delegating approval of the final protocol to commission staff. EERA recommends that a final protocol that meets with EERA and Commission staff approval should be filed in the docket, and that monitoring should proceed following the submittal of the final protocol.

Attachment A

Big Blue Wind Farm, LLC December 6, 2012 Protocol Submittal

TECHNICAL MEMORANDUM

TO: Dave Plagge
Fagen Engineering, LLC

FROM: Tim Colliton, PE, CIH, Wenck Associates, Inc.

DATE: December 5, 2012

SUBJECT: Big Blue Noise Study Protocol
Wenck Project No. 2759-02

This technical memorandum presents the proposed Noise Study Protocol for the Big Blue LWECs installation. The purpose of the proposed protocol is to satisfy the requirements of Section 6.6 (Noise) of the Site's Public Utilities Commission permit.

The anticipated tasks for and features of the noise study include:

- Sound level measurements at up to six locations near the perimeter of the site. The preferred locations will be on public lands or rights of way. Locations near residences will be selected if possible.
- The line of sight distances from measurement location to operating turbines will vary from about 500 to 1,500 meters as may be practical.
- The measurement instrumentation is expected to be battery operated data logging audio dosimeters. The instruments will be selected to log the sound level on the 'A' scale (fast response) as well as the sound pressure levels in the octave bands from 31.5 Hz to 8,000 Hz.
- The measurement duration at each location will be about 22 hours. After each measurement period, the logged data will be collected and the instrument battery replaced/recharged for the next measurement.
- The requirements for measurement conditions contained in the Minnesota Pollution Control Agency (MPCA) publication "A Guide to Noise Control in Minnesota" will be followed to the extent practical.

Technical Memo

Dave Plagge

Fagen Engineering, LLC

December 5, 2012

- The meteorological information (wind speed, direction, temperature and relative humidity) is expected to be available from and provided by the site owner/operator.
- Sound measurements will not be made during periods of precipitation or if precipitation is forecast within 24 hours.
- The collected octave band and 'A' scale sound level data will be summarized in a brief technical report. The 'A' scale sound level data will be analyzed according the MPCA procedures and compared with the sound level limits in Minnesota Rules §7030.

All study activities will be conducted either by me or by Wenck personnel under my direction. Attached is a copy of my resume for your reference.

Attachment B

Big Blue Wind Farm December 2012 Pre-operation Meeting Notes

Big Blue Wind DOC/PUC Pre-Operational Compliance Meeting Notes
12/14/12

DOC Offices, St. Paul, MN.

Attendees: Larry Hartman, Minnesota DOC Permit Manager
Sam Ewald, Fagen Inc. – Big Blue Wind Corporate Contact
Charlie Hoemberg – Big Blue Wind Site Manager
Dave Plagge – Fagen Engineering, LLC

4:00 Meeting started

Introductions

Went section by section, through the PUC Site Permit – with comments on specific sections.

Section 1.0

- Talked about general aspects of the project: 18 Gamesa G97 2.0 Turbines on 78m towers.
- Project Boundary okay.

Section 4.1

- Discussed Wind Access Buffer and general layout parameters of Big Blue.
- During the meeting we went into great detail on wind access buffer. Mentioned 3 x 5 RD

Section 4.3

- Discussed Noise issues
- Hessler developed the Protocol Guidance document
- We can monitor off-site instead of shutting turbines down.
- We should modify our study protocol- it must be approved by the commission.
- We will get a copy of a recent noise study protocol from HDR and compare it to ours.

Section 4.4

- Discussed project roads and county/township roads.
- Landowners have requested increased road radiuses to remain after completion.
- County would require max of 50 feet for turning purposes.
- We will get approval from county and addendum for Development Agreement/Road Use Agreement.
- Submit as-built drawings and documents through e-file and only at 9.5mb per a file only.

Section 4.9

- Larry requested a copy of the turbine certification for Minnesota.

Section 4.11

- We have one permanent met tower on site. Instruments are at hub height.

Section 4.14

- DOC wants all electrical as-builts.

Section 4.15

- We have joined with Gopher State One Call and have forwarded them our utility layouts.
- There are approximately 23 miles of underground collector/feeder lines.

Section 5.5

- Charlie Hoemberg will be the Site Manager
- Mentioned Gamesa doing maintenance on site.

Section 5.8

- We have developed a complaint procedure.

Section 6.6

- Noise proposal must be approved by the commission.

- Study to be completed by Spring of 2014.
- We have 18 months to do this. Spring is the best time.

Section 6.7

- Larry requested a copy of the avian/bat impact training outline.
- We will get that from our consultant.
- Training was held during construction.

Section 6.8

- Submit Energy Production Report in format provided on the website.

Section 6.9

- Wind Resource Use report is not required unless requested from the commission.
- May have to be submitted monthly.

Section 6.10

Notify DOC of extra-ordinary events within 24 hours

Section 7.12

- We must eFile the anticipated Restoration Date (Spring 2013)

Section 7.17

- Temporary identification signage is posted. Permanent signs are being made.

Section 8.1

- Larry requested a list of data layers in the as-built plans.

Section 9.1

- Decommissioning Plan is complete.
- Estimate based off actual costs recorded in Timberline Software

Section 10.2

- The PPA is good for 20 years. The Permit is good for 30 years.

Section 11.1

- Periodic reviews do happen

Note: Wherever the permit says “provide”, it means “eFile”.

5:20 Questions?

5:30 Meeting adjourned.