

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Beverly Jones Heydinger
Nancy Lange
Dan Lipschultz
Matthew Schuerger
John A. Tuma

Chair
Commissioner
Commissioner
Commissioner
Commissioner

In the Matter of the Site Permit Issued to
Wisconsin Power and Light Company for the
Bent Tree Project in Freeborn County

ISSUE DATE: August 24, 2016

DOCKET NO. ET-6657/WS-08-573

ORDER REQUIRING NOISE
MONITORING, NOISE STUDY,
AND FURTHER STUDY

PROCEDURAL HISTORY

On October 20, 2009, the Commission issued Wisconsin Power and Light (WPL) a large wind energy conversion system site permit for the approximately 200 MW Phase I of the Bent Tree wind project. The Bent Tree wind project is located in Freeborn County, approximately four miles north and west of the city of Albert Lea.

On February 7, 2011, the project commenced commercial operation.

Since 2010, in compliance with site permit conditions, WPL has submitted monthly complaint reports to the Commission documenting local area residents' concerns or allegations of site permit violations.

On March 14, 2011, the Commission approved WPL's Operational Sound Level Survey Test Protocol (Noise Monitoring Protocol), as proposed for Phase I of the Bent Tree Wind Project in Freeborn County pursuant to site permit condition III.F.2.

In April 2011, WPL conducted sound monitoring at locations within the project area and two locations offsite in accordance with the approved noise monitoring protocol for the Bent Tree project.

FINDINGS AND CONCLUSIONS

I. Background

A. Noise Monitoring Efforts at Bent Tree

On November 20, 2013, the Department of Commerce, Energy and Environmental Review and Analysis unit (EERA) filed a compliance review of the Bent Tree project filings and requested

WPL to reprocess the data collected during the April 2011 noise monitoring period using the new procedures outlined in its general guidance document, *Guidance for Large Wind Energy Conversion Systems Noise Study Protocol and Report*, released in October 2012 (EERA Noise Monitoring Guide).¹

In February 2014, WPL filed the reprocessed data and its analysis of the data.

In the fall of 2015 and early 2016, three landowners provided noise-related complaints regarding the Bent Tree project: Gwenneth Regehr, Cheryl Hagen, and Bernie Hagen.

On April 12, 2016, EERA filed a letter with the Commission about recent landowner noise complaints, describing the complaints as unresolved and substantial, and potentially violating Site Permit conditions. EERA recommended that the Commission initiate the complaint resolution process, outlined in Bent Tree's Site Permit's Complaint Handling Procedures.²

On April 18, 2016, WPL filed documentation of its efforts to investigate the landowners' noise-related complaints. WPL included an analysis from Hessler and Associates (WPL's noise consultant), which reviewed the 2011 operational sound measurement data obtained from locations near the Regehr and Hagen homes. The analysis concluded that the Bent Tree project sound levels are within permissible noise limits.

On April 25, 2016, the Commission sent a letter to WPL and the landowners initiating the Bent Tree project's complaint resolution process and requested written summaries of each landowner's position. The Commission also requested an analysis and recommendations from EERA staff.

In response to the Commission's request for information, WPL and the landowners documented efforts to investigate the complaints.

On May 24, 2016, the EERA recommended that the Commission require WPL to conduct additional noise monitoring at the Bent Tree project site.

On June 13, 2016, Dave Langrud filed a complaint with the Commission, reiterating claims he reported in a 2011 complaint regarding the Bent Tree project and updating his claims.

On July 29, 2016, the Commission met to consider the issues raised.

B. Landowner Complaints Regarding Bent Tree Project

1. Hagen/Regehr Complaints

Gwenneth Regehr, Cheryl Hagen, and Bernie Hagen raise various complaints regarding the operation of the turbines, including noise, shadow flicker, vibrations, and temporary loss of

¹ EERA Noise Monitoring Guide, *available at* <http://mn.gov/commerce/energyfacilities/documents/FINAL%20LWECs%20Guidance%20Noise%20Study%20Protocol%20JULY%209%202013.pdf>

² Section H of the Site Permit contains the Complaint Handling Procedures.

television and phone signals inside their residences. They claim they have suffered from health problems they associate with operation of the wind turbines, including ear pain and pressure, headaches, nausea, vertigo, and sleep loss. Gwenneth Regehr also stated that the noise from the wind turbines was disturbing the animals on her farm.

The landowners also complained of problems they believe to be associated with inaudible noise levels arising from the project. They alleged that this low-frequency noise, or infrasound, at levels down to 0.5 Hertz, is negatively affecting their health. All complainants provided a complaint log documenting symptoms, wind speeds, and wind directions for several days throughout March 2016.

The landowners requested that the Bent Tree project cease using turbines within a one-mile radius of their homes. If that does not solve the problems alleged, they have each asked that Bent Tree buy their farms.

2. Dave Langrud Complaint

Dave Langrud's complaint detailed his efforts to alert the Bent Tree project about the problems he and his wife experienced from turbine noise commencing in February 2011. He stated that there are approximately 19 turbines from the Bent Tree project within one mile of his farm and five within one half mile. Mr. Langrud's complaint stated that both he and his wife have experienced difficulty sleeping and problems from shadow flicker. His complaint states that his wife suffers from severe headaches when the turbines are operating. Mr. Langrud stated that WPL arranged for new window blinds, but that the blinds have not resolved the flicker issues inside the house.

Mr. Langrud pointed to a New Zealand study describing the complexities inherent in measuring wind-turbine sound levels and expressed doubt that the noise studies conducted to date have accurately measured sound levels at his residence. He also raised concerns about low-frequency noise, stating that both the Minnesota Pollution Control Agency and the Minnesota Department of Health appear to have concluded that the issue merits further study. Mr. Langrud asked that Bent Tree pay for an independent consultant to perform an audible noise study, and a long-term low-frequency noise study inside his home.

II. Positions of the Parties

A. Wisconsin Power and Light

WPL summarized its interactions with the Hagan and Regehr complainants, and proposed to meet with them in the near term to discuss an amicable resolution to their concerns.

B. EERA

EERA's May 24, 2016 comments detailed the Bent Tree project's complaint history with regard to the Hagan/Regehr complaints. EERA recommended requiring WPL to conduct additional noise monitoring near the houses of the complainants to verify the previous study findings. EERA also recommended that further research and data collection be undertaken, including:

- A. Wisconsin Power and Light/Alliant should collect noise monitoring data at the two properties (the Hagan farm and the Regehr farm) as well as additional follow up monitoring at the properties to confirm the Bent Tree project is in compliance with state noise standards.
- B. The noise monitoring should follow the EERA Noise Monitoring Guide. Specifically:
 - Collect unweighted, A-weighted, and C-weighted data on an hourly basis.
 - Collect one-third octave-band analysis.
 - Collect data for a 14-day or more time period.
- C. Wisconsin Power and Light, Ms. Regehr, and the Hagens should be invited to provide input on selection of a noise consultant to complete this monitoring. Credentials of the consultant should be reviewed and approved by Commission staff and the EERA staff prior to the start of monitoring.
- D. Landowners should be invited to suggest specific locations to conduct noise monitoring. EERA and the selected noise consultant should review the locations recommended.³
- E. Wisconsin Power and Light should meet with Ms. Regehr and Mr. and Mrs. Hagen soon to seek an amicable resolution to the landowners' concerns. At least one meeting should occur after the noise monitoring study has been completed, and the results of the noise study summarized and discussed with complainants. EERA staff indicated it is available to attend these meetings. WPL should update the Commission on any progress made by the parties in addressing the complaints.

EERA comments also referred to an ongoing study being conducted at the University of Minnesota as a Renewable Development Fund (RDF) approved project -- *Wind Turbine Generated Sound: Targeted Research to Improve Measurement, Analysis, and Annoyance Thresholds Based on Measured Human Response*.⁴ The RDF Project is a joint effort between two University Departments: the St. Anthony Falls Laboratory and the Department of Speech-Language-Hearing Sciences.

III. Commission Action

After hearing the concerns raised by complainants, it appears that the thrust of their recent complaints is audible noise as well as the low-frequency noise level or infrasound generated by operation of the Bent Tree Wind Farm.

From the data collected thus far, it does not appear that the Bent Tree project is violating current audible noise state standards for wind projects. And Minnesota does not have any current standards for low-frequency noise levels. Nor are any restrictions on low-frequency noise levels

³ EERA cautioned that noise monitors cannot be put directly next to buildings due to noise reflections. Monitoring locations should represent areas of frequent outdoor use.

⁴ 4th Quarter Progress and Status Report -- Project RD-4-12, Docket No. E-002/M-12-1278 (August 2, 2016).

set forth in the Bent Tree project's permit. The Minnesota Pollution Control Agency noise standard was not promulgated to address low-frequency noise or infrasound.

Accordingly, the Commission will follow the recommendations of the EERA to take interim steps to collect more information and work toward an appropriate resolution of the complaints filed in this matter. The Commission will require Wisconsin Power and Light to collect noise monitoring data at the three properties to confirm that the Bent Tree Wind project is in compliance with state noise standards, and follows the protocols set forth in the ordering paragraphs below. Further, the Commission will require Wisconsin Power and Light to contract for a noise consultant selected by the Commission and EERA staff. All contracts and work terms are first to be approved by Commission and EERA staff.

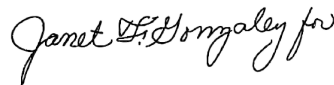
Finally, EERA's recommendations made reference to studies currently underway at the University of Minnesota regarding wind turbine-generated noise. The Commission will ask its staff and EERA staff to confer with the University of Minnesota to determine whether the concerns raised by the complainants can be incorporated into the University's ongoing study of low-frequency sound and infrasound on human health, or, if not, into an additional phase of the study addressing this issue.

ORDER

1. Wisconsin Power and Light shall conduct additional noise monitoring at the Bent Tree Wind Farm.
2. The noise study design to be conducted at the Bent Tree Wind Farm shall follow the parameters set forth below:
 - A. Wisconsin Power and Light/Alliant shall collect noise monitoring data at the three properties (the Hagan, Regehr, and Langrud properties) as well as additional follow up monitoring at the properties to confirm the Bent Tree project is in compliance with state noise standards.
 - B. The noise monitoring shall follow the October 2012 "Guidance for Large Wind Energy Conversion System Noise Study Protocol and Report" issued by the Minnesota Department of Commerce. Specifically:
 - Collect unweighted, A-weighted, and C-weighted data on an hourly basis.
 - Collect one-third octave-band analysis.
 - Collect data for a 14-day or more time period.
 - C. The specific monitoring locations may be suggested by residents but need to be reviewed by EERA and the selected noise consultant. The monitors cannot be put directly next to buildings due to noise reflections. Monitoring locations should represent areas of frequent outdoor use.

- D. Wisconsin Power and Light shall meet with Ms. Regehr, Mr. and Mrs. Hagen, and Mr. Langrud in the near term with the purpose of finding an amicable resolution to their concerns. At least one meeting shall occur after the noise monitoring study has been completed, and the results of the noise study should be summarized and discussed with complainants. EERA staff will also make itself available to attend these meetings. WPL shall update the Commission on any progress made by the parties in addressing the complaints.
3. Wisconsin Power and Light shall contract for a noise consultant selected by Commission and EERA staff. Suggestions by Wisconsin Power and Light, Ms. Regehr, the Hagens, and Mr. Langrud on the noise consultant will be permitted. The scope of work will be approved by Commission and EERA staff. The contractor shall follow the approved scope of work and file its independent work directly with the Commission through the Commission's e-filing system. All contracts and work terms shall be approved by the Commission and EERA staff.
 4. Commission and EERA staff shall confer with the University of Minnesota to determine whether concerns raised by the complainants can be incorporated into the ongoing University study of low-frequency sound and infrasound on human health, or, if not, into an additional phase of the study addressing this issue.
 5. This order shall become effective immediately.

BY ORDER OF THE COMMISSION



Daniel P. Wolf
Executive Secretary



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