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STATE OF MINNESOTA
BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Nancy Lange
Dan Lipschulz
Matt Schuerger
Katie Sieben
John Tuma

Chair
Commissioner
Commissioner
Commissioner
Commissioner

IN THE MATTER OF WISCONSIN POWER AND LIGHT COMPANY'S SITE PERMIT APPLICATION FOR A LARGE WIND ENERGY CONVERSION SYSTEM	DOCKET NO. ET6657/WS-08-573
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WISCONSIN POWER AND LIGHT COMPANY'S RESPONSE TO ORDER TO SHOW CAUSE

COMES NOW, Wisconsin Power and Light Company ("WPL"), and hereby submits this response to the Minnesota Public Utilities Commission's ("Commission's") March 23, 2018 Order to Show Cause Requiring Further Review by the Department of Commerce and Continuing Curtailment ("March 23 Order") concerning WPL's Bent Tree Wind Project Phase I ("Bent Tree Wind Project").

Introduction and Summary

As more fully explained below, WPL does not believe that the record shows any exceedances caused by sound generated by the Bent Tree Wind Project ("Bent Tree") wind turbines. However, in order to resolve this matter without protracted litigation and further costs for all parties, WPL has entered into separate Confidential Settlement Agreements with Bernie and Cheryl Hagen (the "Hagens") and with David and Birgitt Langrud (the "Langruds") that include, among other terms: (1) the purchase by WPL of the residential properties owned by the Hagens (at 70286 290th Street, Hartland, MN

56042) (the “Hagens’ Property”) and owned by the Langruds (at 25887 705th Ave, Alden, MN 56009) (the “Langruds’ Property”); and (2) a release by the Hagens and the Langruds of all of their respective claims and complaints pertaining in any way to the Bent Tree Wind Project or the operation of the Bent Tree Wind Project.

WPL and the Hagens, and WPL and the Langruds, have also jointly filed, on April 19, 2018, a respective Notice of Confidential Settlement Agreement and Joint Recommendation and Request (collectively the “Joint Recommendations”). As more fully described in the Joint Recommendations (and below), each of the Confidential Settlement Agreements is subject to the Commission issuing an order that: (1) dismisses the show cause proceeding as to the Hagens and as to the Langruds; (2) dismisses all complaints by the Hagens and by the Langruds and determines that these complaints have been resolved within the meaning of the Bent Tree Wind Project Large Wind Energy Conversion System Permit (“Bent Tree Permit”);¹ (3) terminates the curtailments that have been in effect since February 8, 2018 with respect to the Hagens’ Property and with respect to the Langruds’ Property as of the date on which the respective Hagens’ and Langruds’ Properties are no longer occupied; (4) requires no other sound-monitoring based on the Phase 1 Report and Phase 2 Report prepared by DNV GL (collectively the “Phase 1 and 2 Reports”), and (5) acknowledges the Confidential Settlement Agreements are not precedential and are not admissions by any party.

¹ *In the Matter of the Application of Wisconsin Power and Light Company for a Site Permit for up to 400 MW of Wind Generation in Freeborn County*, DOCKET NO. ET-6657/WS-08-573 LWECS Site Permit for the 201.3 MW Bent Tree Wind Project Phase I to Wisconsin Power and Light, Section E (3) at p 9.

This Response by WPL summarizes WPL's concerns with the Phase 1 and 2 Reports in response to the March 23 Show Cause Order in the event that the Commission does not issue the order requested by the parties in each of the Joint Recommendations. To that end, this Response summarizes the procedural history pertaining to the issues currently under consideration in this proceeding, and explains why the Phase 1 and 2 Reports, individually or collectively, are insufficient to demonstrate any exceedance of Minnesota Pollution Control Agency (MPCA) noise standards by any Bent Tree turbines or provide any basis for any action pertaining to the Bent Tree Permit.

If the Commission issues the order requested in the Joint Recommendations, WPL is not asking that the Commission agree with or accept WPL's concerns regarding the Phase 1 and 2 Reports. Nor does WPL intend to suggest that either the Hagens or the Langruds agree with, or endorse, WPL's concerns with respect to the Phase 1 and 2 Reports. Rather, WPL's comments regarding the Phase 1 and 2 Reports provide an alternative basis for the Commission to determine that the Bent Tree Permit should not be suspended, modified or revoked, and that no further action should be taken with respect to the Bent Tree Permit even if the Commission does not issue the order requested in the Joint Recommendations.

I. THE PROCEDURAL HISTORY OF THIS MATTER DEMONSTRATES WPL'S GOOD FAITH EFFORTS TO COMPLY WITH THE COMMISSION'S ORDERS AND RESOLVE THE COMPLAINTS.

WPL has been cooperative and consistent in its efforts to resolve complaints from the Hagens and the Langruds pertaining to the operation of Bent Tree, and in responding to the Commission's orders. Indeed, despite the insufficient findings and

conclusions in the Phase 1 Report, WPL did not object to the Department of Commerce's recommendation for additional study. (Letter from Greg Kaelberer, WPL to Daniel Wolf, Oct. 10 2017). Further, upon release of the Phase 2 Report, WPL immediately curtailed the turbines referenced in the Phase 2 Report, (Letter from Brad Kulka, WPL, to Daniel Wolf, Feb. 8, 2018), notwithstanding WPL's belief that the conclusions of both of the Phase 1 and Phase 2 Reports were unsupported and did not, individually or collectively, show any noise exceedances in connection with Bent Tree. (Letter from Brad Kulka, WPL, to Daniel Wolf, Feb. 22, 2018). At the same time, WPL worked to achieve a settlement each with the Hagens and the Langruds that, subject to the Commission's feedback, will fully and finally resolve the issues addressed in the Phase 1 and 2 Reports. WPL's history of cooperation shows that it has sought to address concerns from the Hagens and the Langruds, and the Commission, and that WPL has worked to resolve any issues for the benefit of all parties involved.

A. August 24, 2016 Order Requiring Sound Monitoring

On August 24, 2016, the Commission ordered targeted sound monitoring to be conducted at Bent Tree in response to sound-related complaints from three residents, the Hagens, Mr. Langrud, and Ms. Gwyneth Regehr. (8/24/2016 Order, Ordering Clauses 1-3, at 5-6). In addition, the Commission ordered WPL to: (1) meet with the Hagens, Mr. Langrud, and Ms. Regehr with the purpose of finding an amicable resolution of the complaints; and (2) update the Commission on any progress toward reaching a resolution of the complaints. (8/24/2016 Order, Ordering Clause 5.D, at 6).

On October 18, 2016, WPL provided input to the Department of Commerce Energy Environmental Review and Analysis unit ("EERA") on the selection of the sound

monitoring consultant and proposed that EERA select either DNV-GL or HDR. (Letter from Matthew Cole, WPL, to John Wachtler, Sept. 30, 2016; Letter from Andrew Hanson, WPL, to Louise Miltich Segroves, Oct. 18, 2016). Similarly, the Hagens likewise recommended noise consultants for EERA's consideration. (Letter from Bernie and Cheryl Hagen to Louise Miltich Segroves, Oct. 31, 2016). On March 2, 2017, EERA and Commission staff selected DNV-GL to conduct the sound monitoring study. (Letter from Louise Miltich to Daniel Wolf, March 2, 2017). Thereafter, WPL, DNV-GL, and EERA entered into an MOU in which DNV-GL would report directly and exclusively to EERA on the work, and in which WPL would be responsible for payment of DNV-GL. Significantly, WPL provided no input (and had no opportunity for input) with respect to the manner in which the sound monitoring study would be conducted by DNV-GL.

B. WPL's Meetings with the Hagens and Mr. Langrud

As the sound study process was progressing, and consistent with the August 24, 2016 Order, WPL met with Mr. and Mrs. Hagen and with Mr. Langrud and their respective legal counsel on December 7, 2016.² Following those meetings, WPL provided to Mr. and Mrs. Hagen and to Mr. Langrud, through their counsel, separate written proposals for resolution of their complaints, with copies to the EERA. These written proposals were made subject to the Confidentiality Agreements executed at the December 7, 2016 meetings and to the Minnesota Government Data Practices Act.

² The meetings took place at the Freeborn County Government Center in Albert Lea, Minnesota and are described in more detail in WPL's December 12, 2016 Compliance Update filing. Further, as noted in that filing, WPL also reached out to Ms. Regehr to arrange a similar meeting but learned through that effort that Ms. Regehr no longer resided in her former residence of in the vicinity of the Bent Tree Wind Project. In its April 12, 2017 Order Revising Noise Monitoring Requirements, the Commission relieved WPL of its obligation to meet with Ms. Regehr and revised the noise monitoring requirements to exclude the property formerly owned by Ms. Regehr.

Subsequently, Mr. and Mrs. Hagen and Mr. Langrud responded to WPL in writing through their respective counsel. Despite the parties' good faith efforts, no settlement was reached at that time.

C. The Phase 1 Report

DNV-GL performed sound monitoring in June 2017 and, upon completion, EERA filed the Phase 1 Report with the Commission on September 28, 2017, recommending further sound monitoring. The data in the Phase 1 Report reflected ambient sound in the environment. The Phase 1 Report concluded that, at the Langruds' Property, there were a total of seven (7) hours of exceedance of the MPCA nighttime noise standard out of a total 254 hours analyzed at that location. (Phase 1 Report at 14, 23). The Phase 1 Report concluded that, at the Hagens' Property, there were a total of nine (9) hours of exceedance of the MPCA nighttime noise standard out of a total 251 hours analyzed at that location. (Phase 1 Report at 26, 35) The Phase 1 Report did not determine the source of the noise, or determine the attribution of the turbines to noise levels. Indeed, only very limited audio files – clips of a few seconds of sound at a time – were collected.

In WPL's initial comments on the Phase 1 Report, filed on October 10, 2017, WPL noted that the Report itself identified weather, leaves rustling, and wildlife activity (birds chirping during early morning hours) as contributors to the exceedances. (Letter from Greg Kaelberer, WPL to Daniel Wolf Oct. 10, 2017). Further, when appropriately reclassified and interpreted, the Phase 1 Report indicated that the compliance rate at the Langrud and Hagen sites, for the three turbines referenced in the report (Turbine Nos. T132, T397, and T362) was at, or very near, 100%. Notwithstanding the defects in the Phase 1 Report that did not support further sound monitoring, WPL stated that it

would not object to the further sound monitoring recommended in the Phase 1 Report at Hagens' and Langruds' Properties.

D. The Phase 2 Report

The Phase 2 sound monitoring was performed at the Hagens' and Langruds' Properties over an approximately two week period in November of 2017, and consisted of measuring outdoor sound during certain periods with the turbines on and during certain periods with the turbines off.

As with the Phase 1 monitoring protocol, the Phase 2 monitoring protocol did not collect and store continuously-recorded, calibrated digital audio files during the measurements. Continuously-recorded, calibrated digital audio recordings facilitate are needed for a reasonable determination of the noise sources that caused any exceedances of MPCA noise standards. Instead, the stored audio files from Phase 2 monitoring consisted of durations of a few seconds each hour. In addition, the Phase 2 monitoring was completed during a different season of the year (late November) than the Phase I monitoring (June). EERA filed the Phase 2 Report on February 7, 2018, which concluded that there were exceedances of night time L₅₀ standards in Minn. R. 7030.0030 under certain wind and weather conditions.

In response to the Phase 2 Report, WPL immediately implemented stringent interim curtailments of the operation of the three turbines referenced in the Phase 2 Report to prevent any alleged exceedance of night time noise standards in the Bent Tree Permit. (Letter from Brad Kulka, WPL, to Daniel Wolf, Feb. 8, 2018). Significantly, WPL's set its curtailment period from 7 p.m. to 7 a.m., despite that the MPCA nighttime noise standard only applies from 10 p.m. to 7 a.m. WPL implemented those stringent

curtailments pending WPL's further review of the Phase 2 Report and without accepting or admitting the conclusions reflected in the Phase 2 Report. (*Id.*) WPL also committed that the curtailments would remain in place until a further determination by the Commission. (*Id.*)

WPL's initial comments on Phase 2 Report, filed on February 22, 2018, explained that the data and methodology underlying the Phase 2 Report do not support a conclusion that noise from the three referenced Bent Tree turbines (T132, T397, and T362) caused exceedances of MPCA noise standards shown in the Phase 2 Report. (Letter from Brad Kulka, WPL, to Daniel Wolf, Feb. 22, 2018). The Phase 2 Report did not assess compliance with the MPCA noise standards by analyzing sound in one hour increments, which is necessary to determine whether the MPCA nighttime L₅₀ standard had been exceeded. (*Id.*) In addition, according to the Phase 2 Report, no audio files at sound levels below 60 dBA were retained from the Phase 2 Report, making it impossible to determine the source of the noise exceedances below 60 dBA. (*Id.*) (A subsequent review of the underlying data shows that the sound recordings were not triggered at the Hagens until 65 dBA, rather than 60 dBA as stated in the Phase 1 and 2 Reports.) And, the Phase 2 Report's conclusions that there are noise exceedances at the Hagens' Property was based on extrapolated, rather than measured, data. (*Id.*) As explained below, WPL's subsequent review fully supports WPL's preliminary conclusions regarding the inadequacy of the Phase 2 Report.

E. Motion for Show Cause Order by Hagens and Mr. Langrud

On February 19, 2018, the Hagens and Mr. Langrud filed a Motion for Order to Show Cause and Hearing asking that the Commission issue an Order to Show Cause

why the Bent Tree Permit should not be revoked and that the Commission should refer this matter to the Office of Administrative Hearings. In the interim, the Hagens and Mr. Langrud requested that turbines within 2,500 feet of their residences be immediately turned off pending resolution of this matter.

F. Commission March 1, 2018 meeting and March 23, 2018 Order

The Commission met on March 1, 2018 to determine what actions it should take in response to the Phase 2 Report. Following the hearing, the Commission issued an order on March 23 requiring, among other things, that WPL show cause, by April 30, 2018, why the Bent Tree Permit should not be suspended or revoked. (March 23 Order, Ordering Clause 1). The March 23 Order also required WPL to keep the interim curtailments in place until authorized by the Commission to terminate the curtailments, and to meet with EERA, the Hagens, and Mr. Langrud before April 30, 2018, to continue to discussing the issues identified in the March 23, 2018 Order. (*Id.*, Ordering Clauses 2, 5).

The March 23 Order further required EERA to review sufficiency of the interim curtailments by March 30. (March 23 Order Ordering Clause 4) In its Compliance Filing Review dated March 30, 2018, EERA determined that the interim curtailments were sufficient to prevent exceedances of the MPCA nighttime L₅₀ noise standard if limited to 10 pm to 7 a.m., rather than the more stringent 7 pm to 7 a.m. curtailment voluntarily adopted by WPL. (Letter from Louise Miltich to Daniel Wolf, March 30, 2018).

G. The Confidential Settlement Agreements and Joint Recommendations to the Commission

As a result of ongoing discussions between WPL and the Hagens, WPL and Mr. Langrud, and WPL and EERA, on April 18, 2018 the Hagens and WPL entered into

a Confidential Settlement Agreement and Langruds and WPL have entered into a Confidential Settlement Agreement under which, among other provisions: (1) WPL will purchase the Hagens' Property and the Langruds' Property; (2) the Langruds and the Hagens shall each enter into a separate Neighbor Agreement and Easement that will be binding on any future owners of the Langruds' Property and the Hagens' Property, respectively; and (3) the Langruds and the Hagens will each release any and all past, present, and future claims against WPL. (See Letter from Andrew Hanson, WPL to Daniel Wolf, April 19, 2018). Each Confidential Settlement Agreement is contingent upon the Commission issuing a written order that includes, at a minimum, terms that after WPL takes possession of the property the Commission will not require any further curtailment of Bent Tree Turbine Nos. 362, 132 and 397 and will not require any further sound monitoring at any location pertaining to Bent Tree on the basis of the Phase 1 or Phase 2 Reports, as further provided in the Joint Recommendations. (*Id.*) The Langruds, the Hagens and WPL jointly agree, stipulate and respectfully recommend that the Commission issue a written order consistent the conditions identified in the Joint Recommendations to allow the parties fully implement the terms of the Confidential Settlement Agreements. (*Id.*)

II. THE PHASE 1 AND PHASE 2 REPORTS, ALONE OR IN COMBINATION, DO NOT SHOW ANY EXCEEDANCES AT BENT TREE AND PROVIDE NO BASIS FOR CONSIDERING ANY SUSPENSION, MODIFICATION, OR REVOCATION OF THE BENT TREE PERMIT.

The Phase 1 and 2 Reports, whether considered individually or in combination, do not attribute any measured noise exceedances of the MPCA noise standards to the Bent Tree turbines with any reasonable degree of certainty and do not provide a basis for any suspension, modification, or revocation of the Bent Tree Permit for several

reasons.³ WPL does not request that the Commission endorse or adopt WPL's criticisms of the Phase 1 and 2 Reports if the Commission issues the order requested in the Joint Recommendations. Rather, WPL present these comments in order to preserve its objections and criticisms of the Phase 1 and 2 Reports in the event the Commission elects not to issue the order requested in the Joint Recommendations.

There are several significant flaws in the Phase 1 and 2 Reports.

First, the Phase 1 and 2 Reports, in various respects, are inconsistent with Minnesota rules, which require measurement of actual sound in one hour increments as well as documentation of the noise source. Further, the Phase 1 and Phase 2 Reports provide do not provide a means of determining the cause of the noise exceedances because: 1) the measurement results merely quantify the sound levels and do not indicate what noise source(s) caused those sound levels; and 2) the measurement results did not include continuous audio files that would allow a review of the sound that occurred during the exceeding periods such that the cause of the exceedance could be determined. As such, the Phase 1 and 2 Reports should not be used, alone or in combination, to determine Bent Tree's compliance with Minnesota Pollution Control Agency (MPCA) noise limitations.

Second, the Phase 1 and 2 Reports are inconsistent with Department of Commerce Guidance for Large Wind Energy Conversion System Noise Study Protocol and Report (the "DOC Guidance")⁴, which calls for on/off monitoring during the same

³ This section provides a summary of some of the significant defects on the Phase 1 and Phase 2 Reports. It is not intended to present a full response to the Phase 1 and 2 Reports because the dispute from which the Phase 1 and 2 Reports arose will be moot in the event the Commission issues the order requested in the Joint Recommendations.

⁴ *Guidance for Large Wind Energy Conversion System Noise Study Protocol and Report*, Minnesota Department of Commerce, Energy Facilities Permitting (Oct. 2012), available at:

seasonal time period and collection of data in one hour increments for the purpose of assessing compliance with MPCA noise standards.

These fundamental flaws and inconsistencies, including the failure to store continuous audio files, make it impossible to conclude with any reasonable degree of certainty that Turbine Nos. T132, T362, and T392 referenced in the Phase 1 and 2 Reports caused any exceedances of the MPCA nighttime noise standards.

A. The Phase 1 and 2 Reports cannot be used to determine Bent Tree’s compliance with MPCA noise limitations because they do not provide evidence of attribution and do not conform to MPCA rules.

1. The Phase 1 Report did not determine attribution of the sound levels.

The Phase 1 Report concluded that, during most of the total of 16 hours of the MPCA nighttime noise standard exceedance at both the Hagens and the Langruds, “bird sounds and/or wind induced sound on vegetation and leaves appear to be the primary contributor to the exceedances.” (Phase 1 Report at 38). Specifically, “[b]irds are chirping and singing in several of the recordings at the beginning of most exceedance periods starting between the hours of 4:00 am and 6:00 am.” (*Id.*) The Phase 1 Report states, at most, that “[w]ind turbine sound appears to be audible in the recordings during some of the exceedance periods.” (*Id.*) (Emphasis added). However, the Phase 1 Report did not determine whether the Bent Trees caused or contributed to the noise exceedances. Instead, and notwithstanding the very limited evidence that the Bent Tree turbines contributed to the sound levels, the Phase 1 Report recommended further study on that question. (*Id.*) Because the Phase 1 Report did not determine the

<https://mn.gov/commerce/energyfacilities/documents/FINAL%20LWECS%20Guidance%20Noise%20Study%20Protocol%20JULY%2009%202013.pdf>.

cause of the exceedances, it should not be used as the basis for concluding that sound from the Bent Tree turbines caused or contributed to those exceedances.

2. The Phase 2 Report did not measure sound in one hour increments.

Any determination of whether the turbines at Bent Tree have exceeded MPCA noise standards requires a comparison of data collected to those noise limitations.⁵ Those noise limitations are measured in terms of “L₁₀” and “L₅₀.” L₁₀ is defined as “the sound level, expressed as dB(A), which is exceeded ten percent of the time for a one hour survey.” (Emphasis added). (Minn. Rule 7030.0020, subp. 7). The L₅₀ is defined as “the sound level, expressed as dB(A), which is exceeded fifty percent of the time for a one hour survey.” (Emphasis added).

Despite the requirement for a one hour survey, the Phase 2 Report is based on a “number of 10 second samples ... for periods with the turbines on (*i.e.* “total” noise) and off (*i.e.* ambient background sound ...).” (Phase 2 Report at 15). The 10-second measurement results were correlated with simultaneous measurements of wind speed at the turbine hub. In an effort to determine how measured sound levels change when hub height wind speed changes, those 10 second samples were then sorted according to how fast the wind was blowing (wind speed) at the turbine hub height. (*Id.* at 14). However, the Phase 2 Report does not identify whether the nighttime noise limitation was exceeded for 30 minutes in any single hour. At most, the Phase 2 Report measures sound levels as hub-height wind speeds change; it does not measure compliance with MPCA noise limitations in a single hour. As a result, the Phase 2 Report cannot be used to determine compliance with MPCA noise standards.

⁵ Section E(3) of the Bent Tree Permit incorporates by reference the MPCA noise limitations at Minn. Rule 7030.0020.

3. The Phase 2 Report did not measure actual sound in concluding that there were exceedances at the Hagens.

MPCA rules require measurement of actual sound levels. Minn. Rule 7030.0060. Yet, in conflict with that requirement, the Phase 2 Report acknowledges that any contribution to any alleged exceedances from the two turbines near the Hagens' Property (T132 and T397) "was not specifically measured." (Phase 2 Report at 19). As such, the Phase 2 Report contains no measured instances of any alleged exceedances at the Hagen residence. The highest measurement of actual sound in the Report indicated that the noise contribution from operation of Turbines was 46 dBA, which is below the 50 dBA nighttime noise limitation. (*Id.* Table 3-2 at 19). The Report also noted that turbine sound was not a "significant contributor" at the Hagen's Property. (*Id.* at 17).

To the extent the Report alleges nighttime noise exceedances at the Hagens' Property, such an allegation appears to be based on "extrapolated results" (*id.* at 19), rather than any measured result. Even those "extrapolated" estimates barely exceed the noise limitation, if at all. (See Phase 2 Report at 19, indicating 50 dBA Turbine Contribution (of a total of 50 dBA) and 51 dBA Turbine Contribution (of a total of 51 dBA)). Indeed, the Phase 2 Report acknowledges the lower reliability of extrapolated results.⁶ As a result, the Phase 2 Report cannot be used to conclude that the Bent Tree turbines caused any exceedances of MPCA noise standard at the Hagens' Property.

⁶ The Phase 2 Report at 19 reads in part: "Preliminary analysis indicates that the turbine contribution may exceed 50 dBA at higher hub height wind speeds, and be considered a significant contributor to exceedances under the assumptions of this report. However, this was not specifically measured. The extrapolated results show the turbine is a significant contributor above 12 m/s, but there is increased uncertainty in the extrapolation process when compared to noise measurements." (Emphasis added.)

Importantly, the Phase 2 Report did measure low frequency sound. However, the Phase 2 Report found that low frequency sound at the property was measurable regardless of whether the turbines were operating, which, according to the Phase 2 Report, indicates that there may be another source of low frequency sound at the Hagens' Property. Specifically:

The A-weighted data demonstrates a concentration of acoustic energy between 100-200 Hz regardless of whether the turbines were operational or not, which resulted in high measured sound levels. There were minor differences between the turbine on and turbine off levels for this night, with some turbine off binned data being louder than turbine on data. This indicates that the turbines were not the significant contributor for the night, and indicates a possibility that when winds are from the south-southwest, there is a strong predominance of low frequency sound on the property which does not originate from the wind turbines.

(*Id.* at 17 (emphasis added)). This is consistent with the Phase 2 Report's conclusion that "under some conditions, there is significant noise in the area not caused by turbine operations" and that noise was greater at the Hagens' Property when the turbines were off than when they were on. (*Id.* at 21). Thus, the Phase 2 Report should not be interpreted to suggest in any way that WPL's operations have contributed to sound – whether low frequency or audible sound - at the Hagens' Property.

4. The Phase 1 and 2 Reports did not document the noise source through continuous audio files and thus do not provide reasonable evidence of attribution.

The Phase 1 and Phase 2 reports do not meet the basic data collection and documentation requirements for noise measurements in Minn. Rule 7030.0060. These requirements are aimed at identifying and documenting the source of sound being measured:

Subpt 1. **Measurement location.** Measurement of sound must be made at or within the applicable [noise area classification] at the point of human activity which is nearest to the noise source.

Subpt. 4. **Measurement procedures.** The following procedures must be used to obtain representative sound level measurements:

C. Measurements must not be made in sustained winds or in precipitation which results in a difference of less than ten decibels between the background noise level and the noise source being measured.

Subp. 5. **Data documentation.** A summary sheet for all sound level measurements shall be completed and signed by the person making the measurements. At a minimum, the summary sheet shall include:

...

D. noise source

...

Minn. Rule 7030.0060. (Emphasis added)

Despite the requirement that the source of sound be documented during measurement periods, the Phase 1 and Phase 2 Reports did not collect continuous audio files during those periods. Rather, the Phase 1 and Phase 2 Reports note that only those sound events louder than 60 dBA were recorded for analysis and possible filtering. (Phase 1 Report at 9; Phase 2 Report at 14). (As explained above, the actual threshold for recording was 65 dBA.) The absence of continuous audio files makes it impossible to determine, with any degree of confidence, the source of the noise, let alone the cause of any exceedance of the relevant MPCA noise standard.

Continuously-recorded, calibrated digital audio recordings are needed for a reasonable determination of the noise sources that caused any exceedances of MPCA noise standards. However, the Phase 1 and 2 Reports only included stored audio files with durations of a few seconds each hour. These incomplete audio records prevent

conclusive determinations of attribution during hours where MPCA noise standards were exceeded.

For example, the Phase 2 measurement results from the Langruds' Property show that the sound level meter stored a four (4) second audio snapshot every thirty (30) minutes for the duration of the noise measurements. Considering that MPCA noise standards are based on one hour of measurement data, these 4 second snapshots are insufficient to determine attribution. Additionally, the digital audio files were apparently not stored on the two days when most of the exceedances occurred.

At the Hagens' Property, the Phase 2 measurement results included only a seven (7) second snapshot whenever the sound level went above 65 dBA (incorrectly stated as 60 dBA in the Phase 2 Report). This would likely not capture an entire "pass-by" event for the slow-moving agricultural equipment common to the area and does not capture the loudest point of other noise events. Furthermore, the 65 dBA trigger means that no audio recordings were made during the majority of exceeding hours, since the levels during those hours were generally just above the L₅₀ and L₁₀ nighttime limits of 50 dBA and 55 dBA, respectively.

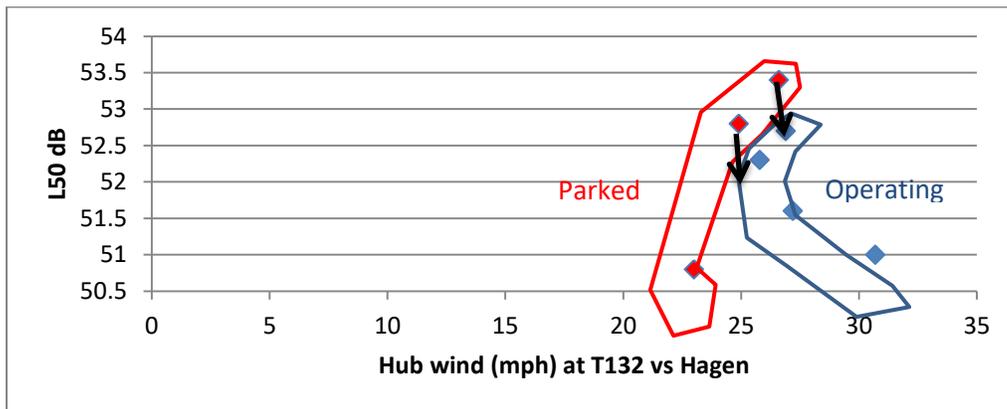
Without continuous audio files, the Phase 1 Report, in essence, assumed that the turbines contributed to those exceedances and recommended further study "to isolate wind turbine sound from total measured sound." (Phase 1 Report at 38). Yet, the Phase 2 Report found that sound levels at the Hagens' Property was higher with the Bent Tree turbines off than with the Bent Tree turbines on:

Measured exceedances of total noise at the Hagen property occurred with the turbines off and turbines on. During the first night of the measurements with turbines parked, turbine off levels were louder than turbine on levels.

This demonstrates that under some conditions, there is significant noise in the area not caused by turbine operations.

(Phase 2 Report at 21) (emphasis added). This is demonstrated by the graph below, which shows that, under similar wind speeds during the turbines on and off periods, noise at the Hagens' Property was lower with the turbines off.

**Turbines on and off results at Hagens' Property
Night of 11/23 – 11/24/2017**



This result – higher noise levels with the turbines off – can be simply explained by the wide range and variability of sound in rural areas, including agricultural and other machinery, which would have been apparent had the Phase 2 Report collected continuous audio recordings.

The importance of documenting noise sources through collection of continuous audio files is further demonstrated by the fact that, for the Langruds' Property, the wind conditions observed during the turbine-off periods were not representative of the wind conditions observed during any exceeding periods. As shown in Table 1, below, during the first turbines-parked period with no exceedances, microphone-height wind speeds were low while hub-height wind speeds were high. During the second turbines-parked period with no exceedances, the opposite was true. However, during the turbines-on

periods with exceedances, both the microphone-height and hub-height wind speeds were high.

**Table 1.
Phase 2 Average Hourly Microphone and Hub Height Wind Speeds (Langrud)**

Period	Hours	Average Hourly Mic Wind (mph)	Average Hourly Hub Wind (mph)	Average Hourly L₁₀ (dBA)	Average Hourly L₅₀ (dBA)
1 st Turbines Parked	11/23 10:00 pm- 11/24 4:00 am	2.7	24.8	42.6	40.1
2 nd Turbines Parked	11/25, 12:00 am- 11/25 6:00 am	5.8	18.8	44.4	41.9
Turbines On & Exceeding	11/27 10:00 pm; 11/29 10:00 pm- 11/30 2:00 am; 11/30 4:00 am	6.5	26.7	55.5	52.4

The above data suggests that ambient, background wind-induced noise, rather than turbine noise, could have caused the alleged exceedances. But without continuous audio files, it is simply impossible to know.

In sum, the only process by which a reasonable determination can be made of whether wind turbines are the cause of measured exceedances is to have continuous audio recordings during the measurement periods in accordance with Minn. R. 7030.0060 Subpt. 5.⁷ There is no reasonable basis to conclude that Bent Tree is responsible for any noise exceedances in the absence of continuous audio recordings that would shed light on whether the Bent Tree turbines are actually responsible for any such exceedances. Noise measurement results showing exceedances, without

⁷ The use of full period sound-recordings is not novel, unreasonable, or overly-costly practice. Full sound recordings have been routinely used for almost 10 years by HDR, an international consulting firm that regularly provides sound analysis in connection with wind generating facilities.

continuous audio recordings, can only prove an exceedance was measured; they cannot attribute the exceedance to a wind turbine.

B. The Phase 1 and 2 Reports did not conform to the DOC Guidance on assessing compliance with MPCA noise standards at large wind generating facilities.

In addition to being inconsistent with MPCA noise regulations, the Phase 1 and 2 Reports cannot be used to determine Bent Tree's compliance with MPCA noise standards because they do not conform to the DOC Guidance.

The purpose of the DOC Guidance is to "aid wind developers in the preparation and use of a noise study protocol that standardizes sound monitoring methodologies, analysis and presentation" in order to "quantify sound generating by an operational (LWECS at receptors...." (DOC Guidance at 4). The DOC Guidance identifies the monitoring conditions to be employed using the same methods and the same monitoring locations within the project site. Specifically, a wind developer is to monitor sound with the project's turbines present but not operating, and then during turbine operation ("turbines off, turbines on"). (*Id.* at 4-5, ¶¶ 1, 3). All monitoring with turbines on and off under the guidance must be conducted during the same seasonal time period in order to avoid differences in the landscape and other seasonal weather-related factors. (*Id.* at 5, ¶ 5). All sound must be measured on an hourly basis, consistent with Minn. R. 7030.0020. (*Id.* at 7, ¶ 20, Appendix A ("The L₁₀ and L₅₀ noise standards are correctly stated with a corresponding one hour time interval.")). The DOC Guidance describes the chart that should be created for the turbines off periods and another for the turbines on periods, each plotting hourly increments on the "x" axis and dBA on the "y" axis. The purpose of the chart is to assess compliance with MPCA noise standards during the

turbines on and turbines off periods. (*Id.* at 8, ¶¶ 26, 29). The DOC Guidance also requires an aerial map showing the turbines, residences, and the location of significant local sound sources such as concentrations of agricultural activity (*e.g.*, feedlots) or human activity (*e.g.*, traffic). (*Id.* at 9, ¶ 30).

The Phase 1 and 2 Reports, alone or in combination, do not conform to the DOC Guidance in several respects. First, the Phase 1 Report did not conduct turbines off/turbines on monitoring, as required by the DOC Guidance. Instead, the Phase 1 Report simply collected total noise data in the ambient environment; it did not assess attribution of the source of the noise through on/off monitoring, except to note that “bird sounds and/or wind induced sound on vegetation and leaves appear to be the primary contributor to the exceedances” and to propose further study to determine turbine noise contribution. (Phase 1 Report at 38).

Second, while the Phase 2 Report purported to conduct the on/off monitoring called for by the DOC Guidance, it failed to measure the data in one-hour increments, as noted above. In fact, there are no measured exceedances at the Hagens’ Property at all, whether measured in one-hour increments or otherwise; the alleged exceedances at the Hagens’ Property are merely the product of extrapolation. (Phase 2 Report at 21).

Third, while the Phase 1 monitoring was conducted in June, 2017, the Phase 2 monitoring was conducted during November 2017, in contradiction to the DOC Guidance requirement that monitoring be “conducted in the same seasonal time period, in order to avoid differences in the landscape and other seasonal weather-related factors.” (DOC Guidance, at 5, ¶5). It is these seasonal differences that make it difficult

and impractical to combine the Phase 1 and 2 Reports into a single compliance assessment, or to draw any relationship between the Phase 1 and Phase 2 Reports.

Fourth, and finally, because the Phase 1 Report did not measure sound during periods with the turbines off and then with the turbines on, it did not include the charts required to be used to assess compliance with MPCA rules under the DOC Guidance. (*Id.* at 8, ¶¶26, 29). And, because Phase 2 data was not measured in one-hour increments, the Phase 2 Report likewise did not include the required charts. Thus, neither Report standing alone can be used to assess Bent Tree's compliance with MPCA noise standards, nor can the two Reports be combined together to represent a valid compliance assessment under the DOC Guidance.

In sum, the Department of Commerce has established guidance for measuring sound from LWECS like Bent Tree, but the protocols underlying the Phase 1 and 2 Reports did not use that guidance to assess Bent Tree's compliance with MPCA noise standards. Instead, the Phase 1 and 2 Reports are based on protocols that did not conform to the guidance and generated results that cannot be used to demonstrate that Bent Tree has exceeded any noise limitations. Given these flaws, there is similarly no reasonable basis to revoke, suspend, or modify the Bent Tree Permit.

III. SUBJECT TO FURTHER ACTION BY THE COMMISSION, THE CONFIDENTIAL SETTLEMENT AGREEMENTS RESOLVE ALL OPEN MATTERS RELATED TO THE PHASE 1 AND 2 REPORTS AND THE HAGEN AND LANGRUD COMPLAINTS.

Given WPL's concerns with the Phase 1 and 2 Reports, entering into a settlement and amicable resolution of the Hagens and Langruds' complaints at this early stage of the proceeding represents a significant accommodation by WPL. Accordingly, WPL's willingness to enter into the Confidential Settlement Agreements

and the prompt and amicable resolution of this matter rest on: (1) complete and strict confidentiality concerning the terms and conditions of the Confidential Settlement Agreements, except as described in the Joint Recommendations; (2) the Commission's termination of the curtailments adopted by WPL in its February 8, 2018 letter and a finding that no further sound monitoring will be required at Bent Tree as a result of the Phase 1 and Phase 2 Reports; and (3) a finding by the Commission that the Confidential Settlement Agreements do not represent any admission by any party with respect to the current or any possible future complaints involving Bent Tree.

If the Commission issues the order requested in the Joint Recommendations, then WPL's concerns with the Phase 1 and Phase 2 Reports will become moot for purposes of this proceeding, and the parties will have achieved a full and complete resolution of the now longstanding issues and concerns as well as address the issues presented by the Phase 1 and 2 Reports. Such an action by the Commission would ensure a fair, reasonable, and comprehensive settlement that addresses the landowner concerns, sufficiently protects WPL, and eliminates a serious dispute regarding the protocols underlying the Phase 1 and Phase 2 Reports that could result in protracted litigation. Further, the Confidential Settlements fully and completely respond to the Commission's March 23 Order and demonstrate that there is no basis on which to revoke, suspend, or modify the Bent Tree Permit.

IV. CONCLUSION

For the reasons explained above, WPL respectfully requests that the Commission issue an order that allows the WPL and the Hagens, and WPL and the Langruds, to avoid further litigation and give full effect to the Confidential Settlement

Agreements. Specifically, the parties specifically request that the Commission issue an order: (1) dismissing the show cause proceeding as to the Hagens and as to the Langruds; (2) dismissing all complaints by the Hagens and by the Langruds and determining that these complaints have been resolved within the meaning of the Bent Tree Permit; (3) terminating the curtailments that have been in effect since February 8, 2018 with respect to the Hagens' Property and with respect to the Langruds' Property as of the date on which the Hagens and the Langruds no longer occupy those properties; (4) requiring no other sound-monitoring based on the Phase 1 and Phase 2 Reports; and (5) acknowledging that the Confidential Settlement Agreements are not precedential and are not admissions by any party.

Respectfully submitted this 30th day of April, 2018.

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