

**STATE OF MINNESOTA
BEFORE THE
PUBLIC UTILITIES COMMISSION**

Nancy Lange	Chair
Dan Lipschultz	Commissioner
Matthew Schuerger	Commissioner
John Tuma	Commissioner
Katie Sieben	Commissioner

**In the Matter of the Application of Freeborn
Wind Energy LLC for a Large Wind
Energy Conversion System Site Permit in
Freeborn County**

MPUC Docket No. IP-6946/WS-17-410;
OAH Docket No. 80-2500-34633

**FREEBORN WIND ENERGY LLC'S EXCEPTIONS TO THE FINDINGS OF FACT,
CONCLUSIONS OF LAW AND RECOMMENDATION OF THE
ADMINISTRATIVE LAW JUDGE**

I. INTRODUCTION.

Freeborn Wind Energy LLC ("Freeborn Wind") has diligently worked to site the up to 84 megawatt ("MW") wind project in Freeborn County, Minnesota, in a manner that is consistent with Minnesota law, the Minnesota Public Utilities Commission's ("Commission" or "MPUC") siting standards and Freeborn County's Wind Energy Ordinance, as well as reflective of agency and local concerns. Freeborn Wind's Site Permit Application seeks approval of a layout that incorporates multiple required and voluntary setbacks and places 42 of the Freeborn Wind Farm's 100 turbines in Minnesota. Freeborn Wind's willingness to move 58 wind turbines to Iowa is a prime example of its commitment to meeting existing regulatory requirements and responding to agency and local feedback. Freeborn Wind is proud of these efforts, but recognizes that community concerns remain. Freeborn Wind sponsored highly-qualified expert witnesses in this contested case proceeding, including two medical doctors, an acoustician, an appraiser, a telecommunications engineer, a wildlife permitting specialist, and the project

manager, to correct misinformation and build a record based on credible, scientific information regarding issues of concern.

On May 14, 2018, the Administrative Law Judge (“ALJ”) filed Findings of Fact, Conclusions of Law and Recommendation (“Report”) in this matter recommending that the Commission deny the site permit to Freeborn Wind for the Project, or, in the alternative, provide Freeborn Wind with a period of time to submit a plan demonstrating how it will comply with the ALJ’s interpretation of Minnesota’s Noise Standards at all times throughout the footprint of the Project.

There are two major issues with the Report. First, as described more fully in Section II, the ALJ misinterpreted the Noise Standards in a manner inconsistent with the statute, rule and past agency practice. Second, there are numerous sections of the Report that rely on anecdotal and unsubstantiated, non-expert assertions rather than sworn expert testimony to support factual findings, and these errors in fact result in recommendations that are inconsistent with the record of this proceeding.

Where the Report relies upon the credible, scientific evidence in the record, it reached appropriate conclusions, such as:

- Sound modeling was conducted using conservative assumptions.¹
- The record demonstrates that the Project, if built, will result in both short- and long-term benefits to the local economy.²
- The Project will generally contribute to public health by helping to reduce the emission of greenhouse gases in Minnesota.³
- The Project is designed to minimize impacts to wildlife.⁴

¹ Report at Finding No. 230.

² Report at Finding No. 271.

³ Report at Finding No. 275.

⁴ Report at Finding No. 464.

- The Project will not have a negative impact on water emissions, and will have a positive impact on air emissions.⁵
- The Project will not harm property values and the preponderance of the evidence demonstrates that proximity to a wind turbine does not negatively affect property values.⁶

Unfortunately, several areas of the Report rely on anecdotal, non-expert assertions provided by laypersons in comment letters instead of sworn expert testimony that was subject to cross-examination at the hearing. This issue is most prevalent in sections discussing noise, shadow flicker, purported health concerns, communication interference and winter weather conditions—topics raised as concerns by members of the public. In contrast to the unsubstantiated commentary, this record contains reliable evidence submitted through sworn testimony of qualified, credible experts. Using the best evidence leads to more reasoned, fact- and science-based recommendations for the site permit.

Freeborn Wind submits these exceptions to correct the errors of law and fact contained within the Report. A redline of the Report, appended as Attachment A to this filing, contains specific revisions as well as notes to indicate those sections that can be adopted with little or no modification.

II. THE REPORT INCORRECTLY INTERPRETS MINNESOTA’S NOISE STANDARDS AS A LIMIT ON TOTAL NOISE WITHOUT DISTINGUISHING BETWEEN PROJECT NOISE AND BACKGROUND NOISE.

The Report Finding Nos. 204, 206 and 245 suggest that Minnesota’s Noise Standards regulate “total noise” at a receptor such that noise from all sources cannot exceed a nighttime L₅₀ within the Noise Area Classification 1. This interpretation is inconsistent with Minn. Stat. §§ 116.07, subd. 2(c) and 116.06, subd. 15; guidance from the Minnesota Pollution Control Agency

⁵ Report at Finding No. 499.

⁶ Report at Finding No. 174.

(“MPCA”); and past practice of the MPCA and Commission. The correct interpretation limits project-related noise contributions to the limits established in the Noise Standards.

A. The Legislature Authorized MPCA to Regulate Man-Made Noise Sources.

The MPCA, like all state agencies, is a creature of statute, and its authority is limited to that granted by the Legislature.⁷ Minnesota law gives the MPCA authority to establish limits on sources of noise. Noise is defined as “any sound not occurring in the natural environment, including, but not limited to, sounds emanating from aircraft and highways, and industrial, commercial, and residential sources.”⁸ The limit on “noise” created by a “source” excludes “background, or ambient, noise” which is defined as “all noise sources other than the noise source of concern.”⁹ Accordingly, when the Commission requires, as a condition of a site permit, that a large wind energy conversion system (“LWECS”) comply with the Noise Standards, it is requiring that the wind project – the noise source of concern – not exceed the limits set forth in the Noise Standards.

The ALJ, however, misinterprets the Noise Standards as a limit on total noise, meaning that if ambient sound nears or exceeds the Noise Standards, no other source of noise would be permissible in that area. Not only is this interpretation inconsistent with the MPCA’s authority to regulate noise, as explained further below, it is also contrary to agency guidance and past practices applying the Noise Standards to wind projects and other man-made noise sources.

⁷ *In the Matter of the Denial of Certification of the Variance Granted to Robert W. Hubbard by the City of Lakeland*, 778 N.W.2d 313, 318 (Minn. 2010).

⁸ Minn. Stat. § 116.06, subd. 15.

⁹ *See, e.g.*, “A Guide to Noise Control in Minnesota; Acoustical Properties, Measurement, Analysis and Regulation,” MPCA (November 2015) available at: <https://www.pca.state.mn.us/sites/default/files/p-gen6-01.pdf> (accessed May 21, 2018) [hereinafter “2015 MPCA Noise Guide”] at 11.

B. The Report Ignores Agency Guidance.

When interpreting the Noise Standards, the Report ignores guidance from the MPCA explaining how to apply the Noise Standards to regulated noise sources. The MPCA's most recent Guide to Noise Control, published in 2015, provides guidance on how to isolate the noise source of concern for measurement purposes.¹⁰ The 2015 MPCA Noise Guide discusses how to measure total noise and then separate the "source" noise from "background noise" to determine compliance.¹¹ It states:

In certain instances, when a single noise source is analyzed along with other noise sources, correction factors can be used to isolate the noise source being monitored and calculate its individual noise level. This is done by measuring and recording the total noise level of all sources. Next, the noise source to be isolated is turned off and a noise level reading is taken with all the other existing noise sources in operation. The background noise level is then subtracted from the total noise level. The result is used in conjunction with the following background noise correction chart (Figure 8) to find the approximate noise level of the source.

Figure 8 is a graph used to estimate the amount of background noise influencing a measurement. Based on the measured background noise it gives the corresponding decibel level to be subtracted from the total measurement to determine the decibel level of the noise source being monitored.

For example, if the total noise level is 74 dBA, and then falls to 70 dBA when the source of interest is turned off, the difference of four decibels between the total noise level and background noise indicates that two decibels should be subtracted from the total. This means that a 72 dBA noise level can be attributed to the monitored source in the absence of background noise.¹²

MPCA rules also provide measurement methodology specifying that measurements must not be made in sustained winds or in precipitation which results in a difference of less than 10 decibels between the background noise levels and the noise source being measured.¹³ If the

¹⁰ See 2015 MPCA Noise Guide.

¹¹ 2015 MPCA Noise Guide at 11-12.

¹² 2015 MPCA Noise Guide at 12. Figure 8 not included.

¹³ Minn. R. 7030.0060, subp. 4(C).

Noise Standards were intended to create a “total noise” level which could not be exceeded at any time collectively by all sources, as the Report suggests, there would be no need for the Rule or the MPCA to exclude background or ambient sound and establish explicit protocols for measuring and isolating the “noise source” from “background sound.”

Under the proper application of the Noise Standards, separate data sets for total sound, turbine-only noise, and background sound must be collected to determine if the wind turbine noise is the cause of an exceedance of the Noise Standards.¹⁴ Using the methodology described in the 2015 MPCA Noise Guide, wind projects measure total sound at the site with wind turbines operating, and then turn the wind turbines off while other conditions remain similar and measure the background sound, which is almost always primarily that of the wind blowing through nearby vegetation. If the total sound measurements indicate exceedances of the Noise Standards, background sound is then subtracted from total sound to determine whether wind turbine noise is the cause of the exceedance. If the turbine-only noise levels do not exceed the Noise Standards and background sound is the cause of the exceedance, the wind turbines are not in violation of the Noise Standards.

Not only is the above process of isolating turbine noise and background sound consistent with Minnesota law and agency guidance, it reflects the reality that background sound often approaches and exceeds the limits, particularly in windy areas of the state like Freeborn County where wind turbines are most efficiently sited, and that background sound fluctuates hour-to-hour and day-to-day.¹⁵ Ambient noise levels (one-hour L₅₀, dBA), are driven primarily by the

¹⁴ See Ex. EERA-9, Appendix A (2012 Noise Guidance); 2015 MPCA Noise Guide at 12.

¹⁵ See, e.g., Ex. FR-1, Appendix B at Table 4-2 and 31-40 (Noise Analysis) (Application). The average ambient L₅₀ sound levels measured in the Project Area range from 33 to 57 dBA under conditions during which the turbines would operate (“Critical” and “Full Power” turbine operations”). Ex. FR-18 at 2 and Table 1 (Hankard Affidavit

wind near ground level, which is almost always blowing to some degree during full Project operation. As a result, average ambient noise levels (one-hour L₅₀), based on measurements taken at the site under conditions for which the Project would be fully operating, range from about 33 to 57 dBA.¹⁶ Thus, sometimes the wind itself creates noise levels above the State's 50 dBA standard, and sometimes it does not.¹⁷ Interpreting the Noise Standards as an absolute limit on all sources would create an impractical regulatory scheme that would require parsing of multiple sources to determine which "source" is the cause of an exceedance, and would make it extremely difficult to develop anything (much less a wind project) that might emit sound in an area with high ambient noise levels.

C. The Report's New Interpretation is Contrary to MPCA and Commission Application of the Noise Standards.

While the MPCA has not submitted comments in this record to date describing its application of the Noise Standards or commenting on Freeborn Wind's Noise Analysis, the MPCA and Commission have applied the Noise Standards in numerous other proceedings of public record. In those cases, the agencies have applied a methodology and standard that isolates the noise source of concern from other sources of sound.

For example, the Commission has accepted the post-construction noise monitoring reports from other Minnesota wind farms that have documented project noise below the Noise

and Noise Tables). The average ambient L₁₀ sound levels measured in the Project Area range from 37 to 60 dBA under conditions during which the turbines would have operated. *Id.*

¹⁶ Ex. FR-18 at 2 and Table 1 (Hankard Affidavit and Noise Tables). The average ambient L₁₀ sound levels measured in the Project Area range from 37 to 60 dBA under conditions during which the turbines would operate. *Id.*

¹⁷ Ambient sound levels measured in other wind farms have exceeded the Noise Standards. *See, e.g., In the Matter of the Application of Palmer's Creek Wind Farm, LLC for a Large Wind Energy Conversion System Site Permit for the 44.6 MW Palmer's Creek Wind Project in Chippewa County, Minnesota*, MPUC Docket WS-17-265, Application, Appendix B (Noise Analysis) at 10 (April 11, 2017) (eDocket No. [20174-130706-03](#)) (Site Permit granted August 23, 2017); *In the Matter of the Application of Odell Wind Farm, LLC for a Site Permit for a 200 MW Large Wind Energy Conversion System for the Odell Wind Farm in Cottonwood, Jackson, Martin, and Watonwan Counties*, MPUC Docket WS-13-843, Application at 21 (eDocket No. [20139-91746-02](#)) (Site Permit issued July 14, 2014).

Standards but background sounds at or exceeding 50 dBA.¹⁸ Similarly, the MPCA has prepared numerous Environmental Assessment Worksheets for ethanol plants where it has been noted that the facility cannot contribute greater than a daytime (7:00 a.m. – 10:00 p.m.) noise level of 60 dBA and a nighttime noise level of 50 dBA.¹⁹ Indeed, in this case, DOC-EERA’s proposed Findings of Fact state “[d]ue to the conservative nature of the turbine-only noise modeled for the Project, it can be anticipated that the Project will comply with the Noise Standards once operational.”²⁰

The Report’s departure from past MPCA and MPUC interpretation and application of the Noise Standards is best highlighted by Report Finding No. 237. This finding restates Kristi Rosenquist’s submittal of a non-testifying lay person’s statement claiming that, if the Noise Standards are interpreted as a “‘50 dBA total’ not-to-exceed regulation standard under all conditions,” then a basic logarithmic math calculation means no facility could be designed such that project-only noise exceeds 41 dBA.²¹ The MPCA and MPUC have never interpreted the Noise Standards in this manner, and to do so now would be a clear departure from agency precedent and an unlawful extension of MPCA’s authority to regulate “noise” pursuant to the

¹⁸ See, e.g., *In the Matter of the Application of Prairie Rose Wind Farm for a LWECs Site Permit for the 200 MW Prairie Rose Wind Farm*, MPUC Docket No. IP6843/WS-10-425, Post-Construction Noise Study Report at 15-16 (November 2013) (eDocket No. [201312-94393-01](#)) (“As demonstrated during pre-construction noise measurement, existing sound levels in the Project area already exceeded MPCA noise limits. Therefore, determining the contribution of Project-related noise plays a large role in determining project compliance with MPCA.”); *In the Matter of the Application of Pleasant Valley Wind, LLC for a Site Permit for the 301MW Pleasant Valley Project in Dodge and Mower Counties*, MPUC Docket No. IP6828/WS-09-1197, Pleasant Valley Wind Farm Post-Construction Noise Assessment at 53 (January 13, 2017) (eDocket No. [20171-128078-01](#)) (“The analysis therefore indicates that the maximum facility contribution at M04 of 44.1 dBA, estimated as an Leq value which is closely equivalent to the L₅₀ for turbine sound, is well below the maximum permissible nighttime value of 50 dBA. This confirms that any exceedance of the MPCA limits would be largely attributed to sounds from the existing environment and not the facility.”).

¹⁹ See, e.g., Environmental Assessment Worksheet for the Agassiz Energy Ethanol Production Facility at 35 (November 30, 2007), <https://www.pca.state.mn.us/sites/default/files/agassiz-eaw.pdf>; Environmental Assessment Worksheet for the POET Biorefining – Glenville West (Ethanol Production Facility) at 29 (November 16, 2007), <https://www.pca.state.mn.us/sites/default/files/glenville-eaw.pdf>.

²⁰ EERA Proposed Findings at 28 (April 4, 2018) (eDocket No. [20184-141695-01](#)); see also, *id.* at 27.

²¹ Report at Finding No. 237.

Noise Standards. Again, this would have sweeping implications, not just within Minnesota's wind industry, for planned and operating projects, but on every noise-producing facility in the state.

As Wind on the Wires pointed out in its comments, applying such an interpretation of the Noise Standards “*would have a chilling effect on wind development in the State of Minnesota, thereby depriving the state of the benefits wind development can provide including landowner and local tax revenue payments over the life of the project, construction and operations/maintenance jobs, income to support farming families and many other indirect benefits that accrue to local communities.*”²² Operations of wind farms provide significant benefits to the environment and health of the regional community. For example, increased deployment of wind and other renewable resources with near-zero life-cycle greenhouse gas (“GHG”) emissions leads to a direct reduction in the use of fossil fuels like coal and natural gas.²³ Increased deployment of wind and other renewable resources is necessary to meet Minnesota's GHG emission reduction goals and to support the transition to a cleaner and healthier energy future.²⁴ Wind energy directly reduces harmful pollutants, which include mercury, sulfur dioxide, nitrogen oxide and particulate matter, and which have various human health impacts such as asthma, bronchitis, and cardiovascular disease.²⁵

²² Comment by Wind on the Wires (March 15, 2018) (eDocket No. [20183-141082-01](#)) (emphasis in original); *see, e.g.*, Ex. FR-4 at 11-13 (Litchfield Direct) and Public Hearing Tr. at 26 (Feb. 20, 2018) (Litchfield) (describing the direct benefits the Project is anticipated to bring to the local community, such as boosting the local economy; providing an estimated total of \$35 million in payments to landowners over the life of the Project; creating approximately 200 jobs during the construction phase and 10 permanent jobs during operation; and generating significant tax revenue for local governments).

²³ Comment by MCEA (March 9, 2018) (eDocket No. [20183-140900-01](#)).

²⁴ Comment by MCEA (March 9, 2018) (eDocket No. [20183-140900-01](#)); *see also* Ex. FR-1 at 56 (Application) and Ex. FR-4 at 10 (Litchfield Direct).

²⁵ Comment by MCEA (March 9, 2018) (eDocket No. [20183-140900-01](#)).

For all of these reasons, it is important that the Commission correct the Report's misinterpretation of the Noise Standards and instead follow the statute, rule, agency guidance, and past agency practices to apply the Noise Standards in a manner that limits the project-related noise, not total noise, to the thresholds set forth in the Noise Standards.

With all that said, if the Commission cannot reasonably conclude, on the basis of this record, that Freeborn Wind has demonstrated compliance with the Noise Standards, then Freeborn Wind requests, as suggested by the Report, that the Commission grant Freeborn Wind the opportunity to submit a plan demonstrating how it will comply with this new interpretation of Minnesota's Noise Standards.²⁶ Freeborn's preliminary analysis indicates that such a plan would require that at least 18 of the proposed turbines from Minnesota be moved to Iowa, and, at windy times, lower the energy output of the remaining Minnesota turbines.

III. THE REPORT ADOPTS "FACTS" FROM UNRELIABLE SOURCES AND IGNORES THE BEST SCIENTIFIC EVIDENCE IN THE RECORD.

Freeborn Wind takes exception to numerous Report findings that rely upon articles pulled from internet sites maintained by individuals and advocacy groups opposed to wind energy development as the foundation for factual findings. The ALJ properly concluded that such non-expert, non-testifying hearsay evidence is afforded less weight under the administrative and evidentiary rules governing these proceedings, and even excluded similar evidence in a pre-hearing order.²⁷ The Report nonetheless contains numerous citations to such unsubstantiated and unqualified material in support of substantive factual findings on technical issues such as infrasound, noise regulation, physics of ice throw, and other matters.²⁸

²⁶ Report at 2.

²⁷ See Order on Motions by DOC-EERA and Freeborn Wind to Exclude and Strike Testimony at 5-7 (Feb. 12, 2018) (eDocket No. [20182-140011-01](#)).

²⁸ See, e.g., Report at Finding Nos. 181, 182, 185, 190, 191, 192, 195, 196, 197, 207, 235, 237, 309.

The Commission referred this matter to the Office of Administrative Hearings for a contested case to resolve issues raised by the Application and best develop the specific facts related to those issues.²⁹ Even though the Association of Freeborn County Landowners (“AFCL”) raised a number of purported issues in its petition for a contested case, it did not sponsor any expert witnesses, and the ALJ appropriately excluded large portions of AFCL’s testimony because it was non-expert testimony that did not meet the standards within Minn. R. Evid. 701 and 702 because it “relies on ‘reasoning which can be mastered only [by] specialists in the field.’”³⁰ Even after properly excluding the unsupported opinions from AFCL’s lay witness testimony, the ALJ nonetheless improperly gave public comments attaching unsubstantiated internet misinformation equal or greater weight as sworn testimony from preeminently qualified medical doctors, acousticians, engineers and appraisers testifying on behalf of Freeborn Wind—witnesses who were subject to cross-examination and available to address any questions from the ALJ and other parties.³¹

²⁹ Order Finding Application Complete and Varying Time Limits; Notice and Order for Hearing at 4 (August 31, 2017) (eDocket No. [20178-135140-01](#)).

³⁰ Order on Motions by the Minnesota Department of Commerce and Freeborn Wind Energy LLC to Exclude and Strike Testimony at 6 (February 12, 2018) (eDocket No. [20182-140011-01](#)).

³¹ The expert qualifications of Freeborn Wind’s experts are undisputed. For example, Dr. Roberts’ expert opinion was supported by citation to corroborating studies representing reliable scientific knowledge, provided as schedules to his testimony. *See* Ex. FR-6, Schedules (Roberts Direct); *see also Protect our Communities Foundation v. Jewell*, Slip Copy, 2014 WL 1364453 at *11 (S.D. Cal. March 25, 2014) affirmed 825 F.3d 571 (9th Cir. 2016) (citing Dr. Roberts’ expert testimony to support BLM’s conclusion that infrasound and low frequency noise from wind turbines do not adversely impact human health, including his analysis calling into question the scientific validity of a hypothesis supported by nontraditional references such as newspaper articles and television interviews). In contrast, many of the sources the Report relies upon, such as the opinions of Richard James and Paul Schomer submitted as attachments to public comments, do not reflect a scientific method which demonstrates the type of “good science” which should form the basis for an expert witness’ knowledge, and consist primarily of unsupported conclusions which are not suitable to serve as a basis for scientific knowledge. *See Williams v. Invenergy, LLC*, Slip Copy, 2016 WL 1275990 at *8 (D. Oregon, April 28, 2016) (ruling that Richard James had failed to lay a foundation for his “expert” opinion when he failed to provide any data or scientific method supporting his assertions, and the documents upon which he relied were not published scientific papers subject to the scrutiny of the scientific community). The *Williams* Court also ruled that Paul Schomer’s statements describing Steven Cooper’s “Cape Bridgewater Acoustic Testing Program” case study and “proclaim[ing], with little explanation or additional reasoning, that the study conclusively proves the causal relationship between wind turbine operations and adverse health effects in humans,” lacked scientific reliability and were not proper foundations for “expert” opinions. *Id.* at

For example, Report Finding No. 294 states:

AFCL did not present any expert medical testimony. Instead, it relied on anecdotal reports of people’s negative responses to potentially living near wind turbines, along with articles by a variety of individuals, none of whom were presented to have their qualifications, methods, or conclusions subject to examination or cross-examination. Nor was expert witness foundation laid pursuant to Minn. R. Evid. 702 for any of the authors of the comments or articles. The majority of the comments from members of AFCL and the public came from people who have not yet experienced living near a wind turbine, but are anticipating being harmed by the experience.³²

As examples of “articles by a variety of individuals, none of whom were presented to have their qualifications, methods, or conclusions subject to examination or cross-examination,” and for whom expert witness foundation was never laid, the Report cites articles authored by Alec N. Salt and Michael Nissenbaum.³³ Nonetheless, the Report goes on to rely upon some of these same individuals for factual findings describing infrasound.³⁴

The Report’s conflicting views regarding non-expert, non-testifying evidence are also starkly displayed when comparing Finding No. 159 with Findings 203, 217, 218, 228, 237, 324. Finding 159 discusses Freeborn Witness Michael MaRous’ reliance on information from the landowner of a subject property, and it states:

The Administrative Law Judge gives little weight to the opinion of an expert witness that rests in large part upon the opinion of a non-expert, non-resident, participating landowner who was not subject to cross-examination.³⁵

*9. Any reliance on Paul Schomer is further undercut by that fact that Schomer stated that “he [Schomer] and the author of the Cape Bridgewater ATP are not holding out their conclusions as ‘medical conclusions.’” *Id.*

³² Citations omitted.

³³ Report at fn. 456.

³⁴ *See, e.g.*, Report at Finding Nos. 181, 182. For factual findings describing other aspects of noise, the Report similarly cites numerous other articles by individuals who were not presented to have their qualifications, methods, or conclusions subject to examination or cross examination and for whom expert witness foundation was never laid. *See, e.g.*, Report at Finding Nos. 181, 185, 191, 192, 207, 235, 237.

³⁵ Discussing Freeborn Witness Michael MaRous’ reliance on an individual landowner’s opinion regarding the value of property owned by that individual.

Mr. MaRous is an experienced appraiser who has the expertise to analyze and rely on fact and opinion presented by lay individuals on issues related to property values, especially with respect to the potential impact of a turbine on that landowner's own property. Nonetheless, the ALJ gives "little weight" to Mr. MaRous' reliance on this information.

Then, in a complete disregard of this criticism, the Report quotes from and adopts numerous unsupported assertions on technical topics such as infrasound, legal interpretation and application of the Noise Standards, and telephone interference supported almost entirely by statements made by Kristi Rosenquist, a non-expert, non-resident, non-witness, unsworn, lay commenter who is a long-time opponent of wind projects.³⁶ Given the Report's clear departures from evidentiary standards and internal inconsistencies regarding the weight to be provided to types of evidence, Freeborn Wind asks that the Commission view findings based on non-expert, non-testifying witnesses with skepticism and examine the underlying record evidence, including the transcript of the hearing, to independently assess the veracity and credibility of such information. The following sections further highlight these factual issues within the Report, and Attachment A provides alternative findings correcting these issues and revising the related recommendations.

A. Low Frequency Noise and Infrasound.

In addition to concerns over the Report's interpretation of the Noise Standards, Freeborn Wind also takes exception to the Report's heavy reliance on unsubstantiated articles and reports submitted through public comment that were not sponsored by experts and whose authors were not available for cross examination to describe human reactions to sound, specifically low frequency noise and infrasound. For example, when discussing infrasound, the Report cites

³⁶ See, e.g., Finding Nos. 203, 217, 218, 228, 237, 324.

extensively from articles authored by Keith Stelling, Michael Nissenbaum, Alec N. Salt, Jeffery Lichtenhan, Jerry Punch, Richard James, and Paul Schomer.³⁷ None of these individuals testified at the hearing, nor was their work relied upon by an expert witness. In fact, work produced by these individuals regularly appears in the library of documents promoted by anti-wind organizations such as National Wind Watch.³⁸ As discussed above, the ALJ, in other parts of the Report, recognizes that such information is inherently unreliable and should not be given undue weight as compared to sworn expert testimony.³⁹

The stronger, more credible scientific evidence was provided by Freeborn Wind witnesses Dr. Ellenbogen, Dr. Roberts and Mr. Hankard. In particular, Dr. Roberts submitted more than 25 reports prepared by or on behalf of public health agencies such as the Australian National Health and Medical Research Council, Council for Canadian Academies, Chief Medical Officer of Health Ontario, Public Service Commission of Wisconsin, Massachusetts Department of Environmental Protection and Public Health, Ministry of the Environment of Japan, French National Agency for Food Safety, Environment and Labor, Danish Energy Agency, Swiss Federal Office for the Environment, UK Health Protection Agency, Health Canada, Australian Medical Association, Vermont Department of Health, Minnesota Department of Health, Oregon Health Authority, Maine Department of Health, and others.⁴⁰

As the Report recognizes, Dr. Roberts, a medical doctor and a PhD epidemiologist, studied peer-reviewed scientific research involving health effects relating to noise, including infrasound, and concluded that “there is no peer-reviewed, scientific data to support a claim that

³⁷ See, e.g., Report at Finding Nos. 181, 182, 185, 191, 192, 195, 196, 207. See also footnote 34 above.

³⁸ See, e.g., <https://www.wind-watch.org/documents/author/?a>. “National Wind Watch® (NWW) is a coalition of groups and individuals working to save rural and wild places from heedless industrial wind energy development. Through its web site, NWW promotes awareness of and documents the negative impacts of industrial-scale wind turbines on the environment, economy, and quality of life.” <https://www.wind-watch.org/about.php>.

³⁹ See Section III.

⁴⁰ See Ex. FR-6, Schedules 2-31 (Roberts Direct).

wind turbines are causing diseases or specific health conditions.”⁴¹ Further, Dr. Roberts determined that the evidence supports the conclusion that there are no potential adverse health effects from sound produced by wind turbines, “because the levels of sound and infrasound from wind turbines are significantly lower than those that have been shown to cause harm.”⁴² Similarly, Dr. Ellenbogen, a Board certified⁴³ neurologist and expert in sleep disorders that led the panel that conducted the Massachusetts health impact study regarding wind turbines and public health, concluded that there is “no basis for a set of health effects from wind turbines” and “misapplied blame to wind turbines prevented [certain] individuals from seeking and obtaining much-needed medical treatment for their underlying conditions.”⁴⁴

Despite the overwhelming record evidence to the contrary, the Report concludes that “the preponderance of the evidence in the record demonstrates that current science supports a determination that people who live near wind turbines may experience annoyance, loss of sleep and headaches” and that while “these adverse effects of wind turbines are mild, in the sense that there is no evidence to show that they will lead to more serious illnesses or death,” the Report concludes that “it is not in the best interest of the local community where a wind farm is being located, or of the wind industry generally, to locate wind turbines in a manner that angers and alienates the people whose lives are most directly affected by the turbines.”⁴⁵

⁴¹ Report at Finding No. 285, quoting Ex. FR-6 at 16 (Roberts Direct) and Ex. FR-8 at 4, 6 (Corrected Ellenbogen Direct).

⁴² Report at Finding No. 285, citing Ex. FR-6 at 20 (Roberts Direct); *see also Protect our Communities Foundation v. Jewell*, 2014 WL 1364453 at *10 (“The EIS subsequently discusses exposure to ILFN above 85 dB, the accepted threshold for audibility, noting that excessive exposure at such levels ‘has been associated with a condition termed ‘vibro-acoustic disease’ (VAD), a thickening of cardiovascular structures, such as cardiac muscle and blood vessels.’ The EIS explains that risk of VAD is limited to rare situations, such as ‘military operations’ and ‘work carried out in connection with the Apollo space program,’ where infrasound levels can reach 125 dB, vastly exceeding the levels of infrasound produced by wind turbines.”) (internal citations omitted).

⁴³ Dr. Ellenbogen is Board certified in Neurology and Sleep Medicine by the American Board of Psychiatry and Neurology. Ex. FR-7, Sched. 1 at 6 (Corrected Ellenbogen Direct).

⁴⁴ Report at Finding No. 286, citing Ex. FR-7 at 5, 8 (Ellenbogen Direct).

⁴⁵ Report at Finding Nos. 296-298.

Report Finding Nos. 296-298 are irreconcilable with the scientific, expert medical testimony provided in this docket and instead appear to reflect the opinion of the ALJ that wind turbines should not be placed in communities with local opposition. This view, however, is not supported by the record and is directly contrary to the Commission's charge to efficiently site LWECS in a manner compatible with environmental preservation, sustainable development, and the efficient use of resources.⁴⁶ To allow such an outcome only further perpetuates the misinformation Dr. Roberts and Dr. Ellenbogen warned of.

In fact, the Report acknowledges that contrary health claims from AFCL and members of the public were not "expert medical testimony" but instead "anecdotal reports of people's negative responses to potentially living near wind turbines, along with articles by a variety of individuals, none of whom were presented to have their qualifications, methods, or conclusions subject to examination or cross examination. Nor was expert witness foundation laid pursuant to Minn. R. Evid. 702 for any of the authors of the comments or articles."⁴⁷ Such information is unreliable, and the Commission should set aside such findings in favor of the expert testimony provided by Freeborn Wind that was not challenged by any witness at hearing.

Accordingly, Freeborn Wind recommends the Commission reject or significantly modify the Report Finding Nos. 177-247, 297, 298, 547, 552 and Conclusion Nos. 5, 9 and 10.

B. OTA Notice.

Freeborn Wind takes exception to the Report's recommended notice conditions related to potential Over-the-Air ("OTA") interference concerns because the recommended notice requirement is not supported by the evidence and is vastly out-of-proportion with the potential impacts identified in the record. For context, the Report correctly recognizes that:

⁴⁶ Minn. Stat. § 216F.03.

⁴⁷ Report at Finding No. 294.

- DOC-EERA is unaware of any unresolved OTA interference complaints for other LWECS projects;⁴⁸
- KAAL-TV, LLC (“KAAL”) witness Mr. Harbert confirmed that Freeborn Wind’s estimate of the percentage of KAAL viewers that rely on OTA TV was within the expected range based on data held by the television station;⁴⁹
- KAAL’s concerns regarding the consequences of OTA interference were overstated;⁵⁰
- KAAL provided no justification for extending the potentially “at risk” areas beyond the 10 km range identified in the methodology report relied upon by both parties;⁵¹
- KAAL’s suggested door-to-door survey to locate indifferent viewers is a poor use of resources;⁵²
- KAAL’s requested translator mitigation measures are “highly speculative;”⁵³ and
- Freeborn Wind’s proposed mitigation measures are reasonable.⁵⁴

The potential for OTA interference is small, and should any interference occur, Freeborn Wind will resolve the interference as it committed to do and as it will be required to do in accordance with the Site Permit.⁵⁵ At the hearing, and in an attempt to recognize KAAL’s concerns that some of its potentially affected viewers may be unaware of Freeborn Wind’s obligation to address interference caused by the wind farm, Freeborn Wind offered to extend the notice provided for under Section 5.1 of the Draft Site Permit.⁵⁶ The Report, however, recommends further extending this notice to include “at risk” areas of the five other stations that did not participate or comment in this docket. Additionally, the ALJ recommends extending the

⁴⁸ Report at Finding No. 375.

⁴⁹ Report at Finding Nos. 381 and 382 (providing Freeborn Wind’s 25 percent estimate as well as Mr. Harbert’s statements that OTA viewership could range from 18 to 28 percent).

⁵⁰ Report at Finding No. 386.

⁵¹ Report at Finding No. 372.

⁵² Report at Finding No. 384.

⁵³ Report at Finding No. 387.

⁵⁴ Report at Finding No. 545 (containing what we understand to be typo referring back to Finding No. 378).

⁵⁵ See Ex. FR-4 at 27-28 (Litchfield Direct) and Draft Site Permit at 11-12 (Jan. 30, 2018) (eDocket No. 20181-139549-01).

⁵⁶ See Report at Finding No. 402.

notice to nearby cities not identified within the “at risk” areas.⁵⁷ There is no record support for extending the notice to this wide area. While Freeborn Wind volunteered to extend notice to the approximately 605 “at-risk” households⁵⁸ within KAAL’s viewing area, in addition to the approximately 250 households in the project boundary, Freeborn Wind estimates that the ALJ’s inclusion of the additional at-risk areas plus nearby cities would add another approximately 10,000 mailing addresses. Such an extensive notice mailing is unprecedented and would become both an administrative and cost burden, particularly considering the limited nature of the expected substantive interference issues. While Freeborn Wind vigorously disputes that such an additional notice is warranted, if the Commission determines added notice should be required, Freeborn Wind respectfully requests that it be allowed to accomplish the notice through some combination of web and newspaper notice to reduce the administrative and cost burden of the otherwise extraordinary mass mailing requirement.

Finally, there is no record support for establishing additional special conditions regarding compliance with Condition 5.2.16 of the Draft Site Permit. The Report finds that KAAL’s OTA interference claims are overstated, and DOC-EERA’s testimony confirms that the Commission’s current complaint handling procedures have been sufficient to resolve the handful of complaints submitted across the state over the last 10 plus years. Accordingly, there is no record support for creating additional monthly reporting requirements and no need to otherwise clarify Freeborn Wind’s obligations under Condition 5.2.16.

C. Shadow Flicker.

Freeborn Wind witness Dan Litchfield provided testimony regarding Freeborn Wind’s efforts to reduce shadow flicker impacts. Additionally, Freeborn Wind agreed to comply with

⁵⁷ Report at Finding No. 405.

⁵⁸ Ex. FR-17 at 2 (Jimeno Affidavit).

the Freeborn County Wind Ordinance’s more stringent standards for shadow flicker mitigation (limiting shadow flicker impacts to 30 hours per year), despite the lack of peer-reviewed scientific evidence supporting any adverse health effects from shadow flicker.⁵⁹ The Report recommends further extending these commitments to require shadow flicker monitoring systems at any household modeled to experience 27 hours or more of shadow flicker under Freeborn Wind’s realistic case model.⁶⁰

Freeborn Wind notes that there is no record support for the 10% tolerance band that the ALJ has applied to this mitigation measure. While there are relatively few homes expected to experience 27-30 hours of flicker,⁶¹ Freeborn Wind takes exception to this recommendation because it has no record basis and arbitrarily creates a threshold that departs from the County Ordinance. It seems, instead, that the ALJ mistakes the conservatism employed in the model as uncertainty. Contrary to what its name may imply, the “Realistic” model still included several levels of conservative assumptions, namely that each home had windows on all sides and there were no visual obstructions that would block the homes from viewing the turbine, and, thus, the flicker, which means the actual flicker impacts at these residences is expected to be lower than predicted in modeling.⁶²

Freeborn Wind has revised the second paragraph of Section 7.2, the shadow flicker condition, to more accurately reflect Freeborn Wind’s commitment to utilizing turbine control

⁵⁹ See, e.g., Ex. FR-6, Sched. 2 at 6 (Roberts Direct) Ex. FR-6, Sched. 5 at 8-9 (Roberts Direct); Ex. FR-6, Sched. 16 at 127 (Roberts Direct); Ex. FR-6, Sched. 25 at 4 (Roberts Direct); Ex. FR-6, Sched. 26 at 16 (Roberts Direct); EERA Comments and Recommendations on Draft Site Permit at 18 (December 5, 2017) (eDocket No. [201712-137950-01](#)) (“Some of the comments indicated that non-participants should not experience more than 30 hours of shadow flicker per year. 30 hours of flicker per year was a suggested standard in a couple sources of information reviewed by EERA, but those sources do not provide supporting scientific data that would suggest there is a link between shadow flicker in excess of 30 hours per year of exposure and negative human health impacts.”)

⁶⁰ Report at Finding Nos. 261, 546.

⁶¹ Report at Finding 261.

⁶² See Ex. FR-1 at 38-39 (Application) and Ex. FR-11, Sched. 1 (Litchfield Rebuttal).

software to limit shadow flicker exposure to 30 hours per year and to ensure that the proper terminology is used to describe the technology and procedure.

The Commission has never before required shadow flicker mitigation for a designated amount (here 30 hours annually) of flicker. Nonetheless, Freeborn Wind recognizes that the County Ordinance sets a 30-hour limit, and in recognition of this community priority, Freeborn Wind adopted that measure. Without a basis in fact, it is unreasonable to further extend this requirement to arbitrarily include homes expected to experience more than 27 hours of shadow flicker annually.

D. Ice Throw.

Freeborn Wind takes exception to Report Finding Nos. 309-311 regarding ice throw. Here, again, the Report relies on individual, anecdotal, non-expert, non-testifying comments and articles to propose an onerous and unworkable mitigation measure whereby on-site personnel would have to monitor all turbines located within 1,200 feet of a road, trail or structure during conditions when icing is possible.⁶³ The ALJ relies on second-hand accounts of a single alleged incident of ice throw and a 2006 report involving different technology – a GE turbine – as the basis for the recommended condition.⁶⁴

More credible record evidence was provided by DOC-EERA and Freeborn Wind on this matter. First, Freeborn Wind plans to use Vestas, not GE, turbines. These modern Vestas turbines have technology that remotely monitors the turbines for icing conditions and shuts down the turbines in situations where significant ice accumulation causes an imbalance on the turbine blades.⁶⁵ Additionally, DOC-EERA reviewed public comments, including a comment that

⁶³ Report at fn. 474 - 476.

⁶⁴ *Id.*

⁶⁵ Ex. FR-1 at 101 (Application).

mentioned a Swiss report, submitted during the scoping period, and concluded that the risk of ice throw was remote, particularly at the distances the Freeborn Wind turbines are setback from roads, trails and structures.⁶⁶ Accordingly, the record does not support the Report's recommended ice throw condition, and Freeborn Wind requests that the Commission reject all related findings.

E. 1,500-foot Setback From Non-Participating Residences.

Freeborn Wind's proposed setbacks comply with Freeborn County's Wind Ordinance and meet the requirements of the Commission's 2008 Order Establishing General Wind Permit Standards. Imposing a 1,500-foot residential setback, as recommended in the Report, is a misapplication of the Commission's General Permit Standards and is unsupported by the record. The Commission has consistently and correctly interpreted its own language setting forth the residential setback in its Order Establishing General Permit Standards (“[a]t least 500 ft. and sufficient distance to meet state noise standards”) to mean that “[w]ind turbine towers shall not be located closer than 500 feet [or 1,000 feet if so proposed by the applicant] from all residences *or* the distance required to comply with the noise standards pursuant to Minn. R. 7030.0040, established by the Minnesota Pollution Control Agency, *whichever is greater.*”⁶⁷ The Draft Site

⁶⁶ Ex. EERA-8 at 15-16 (Comments and Recommendations on a Preliminary Draft Site Permit); Comment by Sue Madson (Oct. 9, 2017) (eDocket No. 201710-136275-01). Of note, the Swiss Report relied upon by Ms. Madson was designed to examine the potential for ice throw from a 14 year old turbine model at the high altitude of Swiss ski slopes (2,300 m above sea level). Even under these extreme conditions, the greatest distance they observed ice fragments was 92 m (302 ft).

⁶⁷ See *In the Matter of the Large Wind Energy Conversion System Site Permit Issued to Lake Benton Power Partners LLC for a Wind Farm in Lincoln County*, MPUC Docket WS-13-294, Order Issuing Amended Site Permit at Site Permit § 4.2 (November 1, 2017) (eDocket No. [201711-137066-01](#)) (“Wind turbine towers shall not be located closer than 500 feet from all residences or the distance required to comply with the noise standards pursuant to Minn. R. 7030.0040, established by the Minnesota Pollution Control Agency, whichever is greater.”); *In the Matter of the Application of Red Pine Wind Farm, LLC for a Site Permit for the 200.1 Megawatt Red Pine Wind Project in Lincoln County, Minnesota*, MPUC Docket WS-16-618, Order Issuing Site Permit for Large Wind Energy Conversion System at Site Permit § 4.2 (June 27, 2017) (eDocket No. [20176-133173-01](#)) (“Wind turbine towers shall not be located closer than 1,000 feet from all residences or the distance required to comply with the noise standards pursuant to Minn. R. 7030.0040, established by the Minnesota Pollution Control Agency, whichever is

Permit issued by the Commission in this matter reflected this longstanding and correct interpretation of the residential setback in the General Permit Standards: “Wind turbine towers shall not be located closer than 1,000 feet from all residences *or* the distance required to comply with the noise standards pursuant to Minn. R. 7030.0040, established by the Minnesota Pollution Control Agency, *whichever is greater.*”⁶⁸ The Project will adhere to a 1,000-foot residential setback. The Report’s misinterpretation of this standard as requiring 500 feet to be *added* to the distance necessary to comply with the Noise Standards is entirely inconsistent with the Commission’s interpretation and implementation of this standard.

Further, nothing in the record supports imposing a 1,500-foot residential setback. Section 26-51 of the Freeborn County Ordinance requires turbines have a 1,000-foot setback from a dwelling. As correctly noted in Finding 139, the Project exceeds this requirement. There is no

greater.”); *In the Matter of the Application of Blazing Star Wind Farm, LLC for a Site Permit for the up to 200 Megawatt Blazing Star Wind Project in Lincoln County*, MPUC Docket WS-16-686, Order Issuing Site Permit for Large Wind Energy Conversion System at Site Permit § 4.2 (August 3, 2017) (eDocket No. [20178-134485-01](#)); *In the Matter of the Application of Prairie Rose Wind, LLC for a Site Permit for a 200 Megawatt Large Wind Energy Conversion System in Rock and Pipestone Counties*, MPUC Docket WS-10-425, Order Approving Findings of Fact and Issuing Permit at Site Permit § 4.2 (September 16, 2011) (eDocket No. [20119-66430-01](#)); *In the Matter of the Application of Odell Wind Farm, LLC for a Site Permit for a 200 MW Large Wind Energy Conversion System for the Odell Wind Farm in Cottonwood, Jackson, Martin, and Watonwan Counties*, MPUC Docket WS-13-843, Order Issuing Site Permit at Site Permit § 4.2 (July 17, 2014) (eDocket No. [20147-101580-01](#)); *In the Matter of the Application of Heartland Wind, LLC, for Large Wind Energy Conversion System Site Permit for the 150 MW Elm Creek II Wind Project in Jackson and Martin Counties*, MPUC Docket WS-09-553, Order at Site Permit Condition III.C.2. (February 25, 2010) (eDocket No. [20102-47467-01](#)); *In the Matter of the Site Permit Application for a 42-Megawatt Large Wind Energy Conversion System in Stearns County*, MPUC Docket WS-10-1240, Order Amending Site Permit at Site Permit § 4.2 (November 18, 2014) (eDocket No. [201411-104720-01](#)); *In the Matter of the Site Permit Application for a 40-Megawatt Large Wind Energy Conversion System in Stearns County*, MPUC Docket WS-11-831, Order Amending Site Permit at Site Permit § 4.2 (November 18, 2014) (eDocket No. [201411-104725-01](#)).

⁶⁸ DSP at Condition 4.2 (emphasis added); *see also In the Matter of the Application of Red Pine Wind Farm, LLC for a Site Permit for the 200.1 Megawatt Red Pine Wind Project in Lincoln County, Minnesota*, MPUC Docket WS-16-618, Order Issuing Site Permit for Large Wind Energy Conversion System at Site Permit § 4.2 (June 27, 2017) (eDocket No. [20176-133173-01](#)); *In the Matter of the Application of Prairie Rose Wind, LLC for a Site Permit for a 200 Megawatt Large Wind Energy Conversion System in Rock and Pipestone Counties*, MPUC Docket WS-10-425, Order Approving Findings of Fact and Issuing Permit at Site Permit § 4.2 (September 16, 2011) (eDocket No. [20119-66430-01](#)).

scientific justification for requiring a residential setback distance greater than 1,000 feet.⁶⁹ AFCL presented no evidence to support such a setback.

F. Decommissioning.

The Report makes several recommendations related to the decommissioning plan for the Project, including:

- Freeborn Wind should demonstrate that it has the capacity to guarantee it can fund the decommissioning and restoration of its Project prior to commencing construction;⁷⁰
- the Commission should provide public notice of Freeborn Wind’s submission that it can guarantee the resources needed for decommissioning following the provisions in Minn. R. 7854.0900;⁷¹ and
- the Commission should clarify that any successors or assigns of Freeborn Wind be obligated to bear the costs of decommissioning to the same extent that Freeborn Wind is, unless Freeborn Wind retains those obligations for itself.⁷²

While Freeborn Wind believes that the provisions in the Draft Site Permit related to decommissioning sufficiently address the issue without additional special conditions, Freeborn Wind recognizes that decommissioning concerns were raised at the public hearing, and Freeborn Wind has no objection to providing a pre-construction submittal documenting that it will have resources available to fund decommissioning and restoration obligations. Freeborn Wind respectfully requests that, if the Commission determines that notice of the decommissioning funding submittal is required, Freeborn Wind be allowed to utilize the notice provisions in Condition 5.1 of the permit to complete that notice. To the extent the Report correctly identifies

⁶⁹ See Ex. EERA-8 at 15 (Comments and Recommendations on a Preliminary Draft Site Permit) (stating that EERA “does not consider 1,300 feet, 1,500 feet, ½ mile, one mile, or 10 times the turbine tip height to be justified distances for turbine setbacks from residences.”); Ex. FR-4 at 21 (Litchfield Direct).

⁷⁰ Report at Finding No. 527.

⁷¹ Report at Finding No. 529.

⁷² Report at Finding No. 528.

that notice of this information is most important to those landowners directly affected,⁷³ the notice under Condition 5.1 ensures all affected landowners and local officials receive the information and avoids what could otherwise be duplicative or overlapping notice requirements.

Freeborn Wind does not believe, however, any further action is necessary to ensure that any future successors or assigns are obligated to bear decommissioning costs since Minn. R. 7854.1400 requires Commission approval of a transfer of the site permit and requires that requests for transfer include information that will allow the Commission to determine whether the new permittee can comply with the conditions of the permit.

IV. CONCLUSION.

Freeborn Wind respectfully requests that the Commission:

1. Issue to Freeborn Wind Energy LLC a Site Permit for the up to 84 MW portion of the Freeborn Wind Farm located in Freeborn County, Minnesota.
2. Adopt the attached Findings of Fact and Conclusions of Law, which modify the May 14, 2018 ALJ Report.

Dated: June 8, 2018

Respectfully submitted,

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⁷³ See Report at Finding No. 508.