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PUBLIC SERVICE COMMISSION OF WISCONSIN

Application of Highland Wind Farm, LLC, for a Certificate of Public Convenience and Necessity to Construct a 102.5 Megawatt Wind Electric Generation Facility and Associated Electric Facilities, to be Located in the Towns of Forest and Cylon, St. Croix County, Wisconsin	2535-CE-100

FINAL DECISION ON REOPENING

On December 19, 2011, pursuant to Wis. Stat. § 196.491 and Wis. Admin. Code chs. PSC 4 and 111, Highland Wind Farm, LLC (Highland), filed with the Commission an application for a Certificate of Public Convenience and Necessity (CPCN) to construct a new wind electric generation facility, to be located in the towns of Forest and Cylon, St. Croix County, Wisconsin. The project includes construction of up to 44 wind electric generating turbines, depending on the turbine model selected, and associated facilities to interconnect with the existing Northern States Power Company-Wisconsin (NSPW) electric transmission system in the area.

The CPCN application is APPROVED subject to conditions and as modified by this Final Decision on Reopening.

Introduction

By Final Decision dated March 15, 2013, the Commission initially denied Highland's CPCN application. The Commission concluded, based upon the record evidence from the initial proceeding, that the design of the proposed project was not in the public interest, and would create undue adverse impacts on public health and welfare and individual hardships, because the available modeling in the record indicated that there were multiple non-participating residences where Highland had failed to demonstrate compliance with the Wis. Admin. Code

§ PSC 128.14(3) nighttime audible noise limit of 45 dBA (A-weighted decibels). (Final Decision at 3, 8, PSC REF#: 182254.) The Commission determined that Highland had not provided modeling using the most conservative modeling assumptions that demonstrated that under planned operating conditions the project could comply with a nighttime audible noise limit of 45 dBA. (*Id.*, at 10.)

The Commission indicated in its Final Decision that "Highland may either request reopening of the case under Wis. Stat. § 196.39, petition for rehearing under Wis. Stat. § 227.49, or file a new application under Wis. Stat. § 196.491 if and when it can demonstrate through sound modeling using a ground absorption coefficient of 0.0 that the project as designed and operated will not, based upon model results, have any non-participating residences that exceed the Wis. Admin. Code § PSC 128.14(3) nighttime audible noise limit of 45 dBA." (*Id.*)

On April 4, 2013, Highland filed a Petition to Reopen, or in the Alternative, for Rehearing (Petition). (PSC REF#: 183159.) By Order dated May 14, 2013, the Commission granted Highland's Petition and reopened the proceeding under Wis. Stat. § 196.39(1) for the limited purpose of determining if the project can comply with the noise standards in Wis. Admin. Code ch. PSC 128. (PSC REF#: 184812.) The Commission's Final Decision in this docket, dated March 15, 2013, describes the procedural history of the initial proceeding in this docket. (Final Decision at 2-3, PSC REF#: 182254.) Subsequent to the Commission's Order reopening the docket, a prehearing conference was held on May 13, 2013. Intervenors in the initial proceeding, Clean Wisconsin (Clean WI), Forest Voice, Inc. (Forest Voice), RENEW Wisconsin (RENEW), and the town of Forest (Forest), all continued to intervene in the reopened proceeding.

The Commission held technical and public hearing sessions in Madison on August 14 and 15, 2013. During the technical sessions, expert witnesses offered testimony and exhibits on behalf of Highland, Forest Voice, and Forest. The Commission conducted its reopened hearings as a Class 1 contested case proceeding. During the public hearing sessions, the Commission accepted both oral and written testimony from members of the public. All written public comments received in response to the Commission's Notice of Hearing in the reopened proceeding, including those received through the Commission's web comment form, written comments submitted by U.S. mail, and written comments submitted during the public hearing sessions, are included in the record before the Commission in this proceeding.

The issues for the reopened hearing, as listed in the Commission's Order to Modify Second Prehearing Conference Memorandum, were:

1. Can the project comply with the noise standards in Wis. Admin. Code ch. PSC 128?
2. Can the project achieve a 40 dBA nighttime noise standard at the six residences identified in the existing record as occupied by persons with special needs?
3. Will the proposed curtailment plan ensure compliance with the noise standards in Wis. Admin. Code ch. PSC 128 and a 40 dBA noise standard for (i) between the hours of 10 p.m. and 6 a.m., and (ii) for 24 hours (daytime and nighttime hours) at the six residences identified in the existing record as occupied by persons with special needs?
4. What post-construction sound testing protocols and compliance procedures are necessary to ensure ongoing compliance with the noise standards in Wis. Admin. Code ch. PSC 128 and a 40 dBA noise standard for (i) between the hours of 10 p.m. and 6 a.m., and (ii) for 24 hours (daytime and nighttime hours) at the six residences identified in the existing record as occupied by persons with special needs?

In addition, in briefs the parties were also directed to address the following:

1. Will the project, as modified to meet the noise standards described in Issues A.1 and A.2 remain within the scope of Commission jurisdiction under Wis. Stat. § 196.491(3)?

2. Does Wis. Admin. Code ch. PSC 128 allow curtailment: (i) as a design factor; (ii) only if the project is found to be out of compliance after it is built but not during the project planning phase; or (iii) at any time?

(Order to Modify Second Prehearing Conference Memorandum, PSC REF#: 186666.)

Initial and reply briefs in the reopened proceeding were filed on September 3 and September 10, 2013, respectively. Initial briefs in opposition to the project were filed by Forest Voice and Forest. Highland filed an initial brief in support of the project. Reply briefs were filed by Forest Voice, Forest, and Highland. The Commission discussed the record in this matter at its open meeting of September 26, 2013.

Findings of Fact

1. Highland is proposing to construct a merchant plant, as defined in Wis. Stat. § 196.491(1)(w). Highland will not provide retail electric service, nor is it a public utility or an affiliate of a public utility.

2. Determining whether energy conservation, renewable resources, or other energy priorities listed in Wis. Stat. §§ 1.12 and 196.025, or their combination, will be cost-effective alternatives to Highland's proposed facility is not required when the project under consideration is a merchant plant, because the CPCN applicant need not submit information about the cost of the proposed project. The proposed project is a wind energy electric generating facility, it fits within the second highest priority in the Energy Priorities Law, Wis. Stat. §§ 1.12 and 196.025(1), and there is no record evidence demonstrating that energy conservation or efficiency would be cost-effective alternatives.

3. It is reasonable to require that the proposed project comply with the noise limits set forth in Wis. Admin. Code § PSC 128.14(3) as modified by this Final Decision on Reopening.

4. In the reopened proceeding, Highland submitted sound level modeling and a proposed curtailment plan that demonstrates, using the most conservative modeling assumptions, that the proposed project will meet applicable noise limits, including the Wis. Admin. Code § PSC 128.14(3) nighttime audible noise limit of 45 dBA.

5. The Highland project, as modified by this Final Decision on Reopening, is reasonable and in the public interest after considering alternative locations, individual hardships, safety, reliability, and environmental factors.

6. The Highland project, as modified by this Final Decision on Reopening, will not have undue adverse impact on other environmental values such as, but not limited to, ecological balance, public health and welfare, historic sites, geological formations, the aesthetics of land and water, and recreational use.

7. The Highland project, as modified by this Final Decision on Reopening, will not unreasonably interfere with orderly land use and development plans for the area involved.

8. The Highland project, as modified by this Final Decision on Reopening, will not have a material adverse impact on competition in the relevant wholesale electric service market.

9. A brownfield site for the project is not practicable.

Conclusions of Law

1. The Commission has jurisdiction under Wis. Stat. §§ 1.11, 1.12, 44.40, 196.02, 196.025, 196.39, 196.395, and 196.491 to issue this Final Decision on Reopening.

2. The Commission must consider, under Wis. Stat. § 196.491(3)(dg) and Wis. Admin. Code § PSC 128.02(3), whether the Highland project is consistent with the standards set

forth in Wis. Admin. Code ch. PSC 128 when reviewing an application filed on or after March 1, 2011.

3. The Commission's Environmental Assessment (EA) and Supplemental EA comply with Wis. Stat. § 1.11.

Opinion

Project Description

Highland proposes to construct a new wind electric generation facility in the towns of Forest and Cylon, in northeast St. Croix County, Wisconsin. The project would include up to 44 wind turbines with an electric generating capacity of up to 102.5 megawatts (MW), depending on the turbine model selected. In its Petition, Highland agreed to eliminate the loudest of the three turbine models under consideration for the proposed project. (Petition at 19, PSC REF#: 183159.) Because of this, the project would include up to 44 wind turbines with an electric generating capacity of up to 101.2 MW, depending on the turbine model selected.

The proposed facility would consist of the wind turbines, access roads to the turbines, an underground 34.5 kilovolt (kV) cable system to collect the power produced at each turbine, a new interconnection substation to connect the facility to the existing electric transmission system, an operations and maintenance (O&M) building, and associated facilities. All of the wind turbines would be located in the town of Forest. A portion of the electric collector circuits and the interconnection substation would be located in the town of Cylon.

The project area consists of about 26,500 acres of predominately agricultural land. Highland holds agreements with landowners for about 6,200 acres within the project area upon

which project facilities could be located. The community of Forest lies in the southwestern corner of the project area.

Highland now proposes to use one of two turbine models for the project. The overall height of the turbines would be between 491 and 497 feet, depending on the turbine selected. The turbine models, generating capacity, number required, and total facility generating capacity are included in Table 1, below.

Table 1 Wind turbine models under consideration

Turbine Model	Turbine Nameplate Capacity	Required Number of Turbines	Project Nameplate Capacity
Nordex N117	2.4 MW	42	100.8 MW
Siemens SWT-2.3	2.3 MW	44	101.2 MW

Highland has identified 41 primary and 11 alternate sites in the project area capable of supporting wind turbine installations. Highland states that these sites have adequate wind resources and are acceptable considering environmental and other concerns.

In its CPCN application, Highland provided a proposed project layout consisting of the preferred turbine sites for each of the wind turbine models under consideration. In response to concerns expressed by residents of the project area at the public hearing during the initial proceeding, Highland provided revised project layouts, which use alternate turbine sites instead of some of Highland's original preferred sites. These revised project layouts include 42 and 44 turbines for the Nordex N117 and Siemens SWT-2.3 turbines, respectively. Highland made no changes to the layout of the proposed project during the reopened proceeding.

Jurisdiction

In the reopened proceeding, the Commission directed the parties to address whether the proposed project is within the scope of the Commission's jurisdiction under Wis. Stat. § 196.491(3). The Wisconsin Statutes require that a person obtain a CPCN before constructing a "large electric generating facility." Wis. Stat. §196.491(3)(a)1. A "large electric generating facility" is defined as "electric generating equipment and associated facilities designed for nominal operation at a capacity of 100 megawatts or more." Wis. Stat. § 196.491(1)(g).

Forest and Forest Voice challenge the Commission's jurisdiction based upon an assumption that permanent curtailment will reduce the effective capacity of the proposed project below 100 MW. The Commission finds these challenges to be without merit. The Commission has used nameplate capacity to determine the size of power plants for many years.[1] It is undisputed that the proposed project has a nameplate capacity greater than 100 MW. This practice is consistent with the plain language of the statute. While the statute does not use the term "nameplate" in defining the size of a large electric generating facility, the phrase "designed for nominal operation" indicates that it is not the actual level of operation that is relevant. Instead, it is what the project is "designed for" that controls. Further, the term "nominal operation" in effect means not real or actual operation, but rather the "approximate, rated" operation. Webster's Third New International Dictionary (unabridged) (1971), p. 1534. Webster's provides the following definitions of the term "nominal": "of, relating to, being, or consisting in a name;" "existing or being something in name or form but usually not in reality;

[1] Further, the Commission's own instructions to CPCN applicants is for them to provide the rated capacity of the proposed project. *See* Application Filing Requirements for Wind Energy Projects in Wisconsin, Version 5A, February 2012, at 1.0 (http://psc.wi.gov/utilityinfo/electric/construction/documents/windPower.pdf).

distinguished from *actual*;" and "approximate, rated." [Footnote omitted.] Thus the plain meaning of the statutory language anticipates jurisdiction based upon design values established by the facility's rating, not an estimate of power production based on assumptions of actual operation. The Commission has jurisdiction because regardless of which turbine model is used, it is undisputed that the proposed project is designed and rated to exceed 100 MW.

The Intervenors' challenge to the Commission's jurisdiction is also unavailing and unpersuasive because it is based upon a faulty factual premise. Intervenors assume that curtailment will be required and that any curtailment would be permanent. Based upon the modeling provided in the reopened proceeding, if the proposed project employs curtailment as a mitigation methodology, no curtailment will be required during the day because the modeling demonstrates that the project meets the 50 dBA daytime requirement. As such, during the day, the proposed project at full power will be over 100 MW in both rated capacity and actual operation. During the evening hours, the modeling suggests that some curtailment may be necessary and could reduce the actual generating facility output to below 100 MW. However, loss of jurisdiction for a plant designed to operate over 100 MW at full output except during limited curtailment periods is an absurd result. That is akin to a public utility taking the position that the Commission has no CPCN jurisdiction over a 100 MW combustion turbine peaking plant because it will not be operating at 100 MW all the time.

For these reasons, the Commission has jurisdiction over this project.

Energy Priorities Law

When reviewing a CPCN application, the Commission considers Wis. Stat. §§ 1.12 and 196.025(1), known as the Energy Priorities Law, which establishes the preferred means of meeting Wisconsin's energy demands. The Energy Priorities Law creates the following priorities:

> **1.12 State energy policy. (4)** PRIORITIES. In meeting energy demands, the policy of the state is that, to the extent cost-effective and technically feasible, options be considered based on the following priorities, in the order listed:
>
> (a) Energy conservation and efficiency.
> (b) Noncombustible renewable energy resources.
> (c) Combustible renewable energy resources.
> (d) Nonrenewable combustible energy resources, in the order listed:
> 1. Natural gas.
> 2. Oil or coal with a sulphur content of less than 1%.
> 3. All other carbon-based fuels.

In addition, Wis. Stat. § 196.025(1) declares, "To the extent cost-effective, technically feasible and environmentally sound, the commission shall implement the priorities under s. 1.12(4) in making all energy-related decisions . . . ."

The Commission implements the energy priorities by determining whether any higher priority alternatives to a CPCN project would be cost-effective, technically feasible, and environmentally sound. Highland, however, is not a public utility that sells electricity at retail, nor is it a public utility affiliate. It is a private entity, proposing to construct a wholesale merchant plant.[2] The Commission's review of CPCN applications for merchant plants is more limited than for public utility plants. Under Wis. Stat. § 196.491(3)(d)2. and 3., a merchant plant CPCN

[2] Wisconsin Stat. § 196.491(1)(w) states:

1. "Wholesale merchant plant" means, except as provided in subd. 2., electric generating equipment and associated facilities located in this state that do not provide service to any retail customer and that are owned and operated by any of the following:
   a. Subject to the approval of the commission under sub. (3m)(a), an affiliated interest of a public utility
   b. A person that is not a public utility.
2. "Wholesale merchant plant" does not include an electric generating facility or an improvement to an electric generating facility that is subject to a leased generation contract, as defined in s. 196.52(9)(a)3.

applicant need not demonstrate that its facility would meet the reasonable needs of the public for electricity, and the Commission may not consider alternative sources of supply or engineering or economic factors when evaluating the application. The Energy Priorities Law ranks energy conservation and efficiency as its highest priority, but without information about need and project cost, which the merchant plant applicant is not required to submit, the Commission cannot determine whether energy conservation would be a more cost-effective alternative. Accordingly, the Energy Priorities Law is arguably inapplicable to merchant plants.

Even if the Commission is required to implement the priorities under Wis. Stat. § 1.12(4) in decisions involving merchant plants, the Commission concludes that Highland's project complies with the Energy Priorities Law. The proposed electric facility fits within the second highest statutory priority, and there is no record evidence that suggests conservation or efficiency are viable alternatives. For these reasons the Commission concludes that the Highland project complies with the Energy Priorities Law.

Site Alternatives

Wisconsin Statute § 196.491(3)(d)3. requires the Commission to consider alternative locations when determining whether a proposed generating plant is in the public interest. Wisconsin Admin. Code § PSC 111.53(1)(e) and (f) require a CPCN application to describe the siting process, to identify the factors considered in choosing the alternative sites, and to include specific site-related information for each site. Highland's CPCN application complies with these requirements. It explains the "macro-siting" process used to screen areas in Wisconsin and the Midwest based upon the availability of sufficient wind resources, land area, and access to electric transmission infrastructure. It also describes how specific turbine locations were selected and how

Highland confirmed the suitability of these locations. The record examines each of the 41 initially-preferred turbine locations. In addition, Highland identified and provided information regarding 11 alternate turbine sites located on leased properties within the project area that meet all of its siting criteria for primary sites. As noted, Highland relocated some of the turbines from preferred sites to alternate sites in response to concerns expressed by residents of the project area.

The Commission's standard for reviewing proposed site alternatives is to determine whether each proposed site is "reasonable," *i.e.*, is a feasible location for the project that would not directly conflict with any of the statutory criteria for granting a CPCN, and whether the sites are sufficiently distinct to offer different packages of costs and benefits that present the Commission with a choice. The Wisconsin Supreme Court affirmed this standard in *Clean Wisconsin et al. v. Public Service Commission of Wisconsin and Wisconsin Department of Natural Resources*, 2005 WI 93, ¶¶ 66-70. In a previous docket concerning a wind farm,[3] the Commission found that the project applicant met the requirement to offer site alternatives by identifying 25 percent more turbine locations than it proposed to develop. On appeal, the Dodge County Circuit Court affirmed this method of offering site alternatives for a wind farm.[4]

The preferred and alternative sites that Highland has identified meet both of these standards. They provide differing environmental and landowner impacts, and the alternate sites offer more than 25 percent additional possible turbine locations. After review of the record

[3] *Application of Forward Energy LLC for a Certificate of Public Convenience and Necessity to Construct a Wind Electric Generation Facility and Associated High Voltage Electric Transmission Facilities, to be Located in Dodge and Fond du Lac Counties*, docket 9300-CE-100 (July 14, 2005).

[4] *Horicon Marsh Systems Advocates and Joe M. Breaden v. Public Service Commission of Wisconsin and Forward Energy LLC*, Dodge County Case No. 05-CV-539; "Memorandum Decision and Order" of Circuit Judge John R. Storck (March 23, 2006).

evidence and consideration of alternative locations, the Commission finds that the project is reasonable and in the public interest.

Brownfield Siting

Wisconsin Statute § 196.491(3)(d)8. declares that a CPCN generating project must be sited in a brownfield area "to the extent practicable." Highland evaluated the potential use of brownfield sites for the project, but Wisconsin does not have a single brownfield site, or set of contiguous sites, that would be of sufficient size and would meet the siting criteria of available wind resources, land, and electric infrastructure. The Commission therefore finds that Highland's project complies with Wis. Stat. § 196.491(3)(d)8.

Land Use and Planning

In the initial proceeding, Highland and Forest disagreed regarding the intent of the town's planning document, titled "Town of Forest Comprehensive Plan 2009-2030" (Comprehensive Plan). Highland stated that the proposed project would not interfere with orderly land use and development plans, and stated that its position is supported by several factors, including: the sparsely developed rural character of the project area; Forest's desire to maintain its rural, agricultural character; and the support for all types of renewable energy projects included in the town's Comprehensive Plan.

Forest stated that its Comprehensive Plan envisions: maintaining the rural character of the town; siting and designing large-scale businesses and developments to avoid conflicts with preserving the town's rural character; and limiting development, such as the proposed project to only the hamlet of Forest and along State Highway 64. Forest also stated that although the Comprehensive Plan supports renewable energy development in the town, it should be read to

mean small-scale renewable energy development, not development of the size and scope of the proposed project.

The testimony is conflicting and the Forest Comprehensive Plan does not expressly limit support for renewable energy to small-scale development. A wind project of this nature is typically placed in rural areas and is consistent with rural features and agricultural uses. In prior cases, the Commission has found that development of wind generation facilities in rural, agricultural project areas did not unreasonably interfere with the land use and development plans at issue in those proceedings.[5]

The Commission finds that the proposed project, as modified by this Final Decision on Reopening, will not unreasonably interfere with the orderly land use and development plans for the area involved. The Comprehensive Plan adopted by Forest expressly envisioned support for renewable energy projects. While Forest has asserted that the proposed project will have some interference with land use and development, Wis. Stat. § 196.491(3)(d)6. recognizes that a project may indeed have some interference, but requires only that such interference not be unreasonable. The Commission concludes any such interference with land use and development is not unreasonable. As a result, Highland's project is reasonable and in the public interest.

[5] *See, e.g., Application of Wisconsin Electric Power Company for a Certificate of Public Convenience and Necessity to Construct Wind Electric Generation Facility and Associated Electric Facilities, to be located in the Towns of Randolph and Scott, Columbia County, Wisconsin*, docket 6630-CE-302, *Final Decision* (January 22, 2010) (PSC REF#: 126124); *Application of Forward Wind Energy LLC for Certificate of Public Convenience and Necessity to Construct Wind Electric Generation Facility and Associated High Voltage Electric Transmission Facilities, to be located in Dodge and Fond du Lac Counties, Wisconsin*, docket 9300-CE-100, *Final Decision* (July 14, 2005) (PSC REF#: 37618).

Noise

Applicable Noise Limits

In its Final Decision dated March 15, 2013, the Commission found that the proposed project should meet the 50 dBA daytime and 45 dBA nighttime audible noise limit included in Wis. Admin. Code § PSC 128.14(3). In addition, based on public comments received in the initial proceeding, the Commission identified six residences occupied by potentially sensitive individuals and identified as an issue for this reopened proceeding whether the project could achieve a 40 dBA nighttime noise standard at these six residences.[6] In its Petition, Highland agreed to limit, during the nighttime hours, to 40 dBA the sound attributable to the turbines at the six identified residences occupied by potentially sensitive individuals. (Petition at 19, PSC REF#: 183159.) In the reopened proceeding, Highland submitted sound level modeling and a proposed curtailment plan that demonstrates that the proposed project will meet applicable noise limits, including the Wis. Admin. Code § PSC 128.14(3) nighttime audible noise limit of 45 dBA. In addition, in its filings regarding the reopened proceeding, Highland provided sound modeling meeting a 40 dBA limit at the six residences.

In the reopened proceeding, a member of the public submitted a comment stating that she has a son diagnosed with autism. The commenter requested similar consideration to that afforded the six residences identified in the initial proceeding. Two other members of the public submitted comments during the reopened proceeding indicating that they have family members who may have heightened sensitivity to sounds. One testified regarding her daughter, the other testified regarding a granddaughter. The Commission notes that sound level modeling provided by Highland in the reopened proceeding shows estimated levels at or below 40 dBA for all three of

[6] *See* Order to Modify Second Prehearing Conference Memorandum, Issue 2, PSC REF#: 186666).

the commenters' residences identified in the reopened proceeding. Highland contended that curtailment to meet the 40 dBA limit at the six identified residences occupied by potentially sensitive individuals would provide no benefit and should apply only during the nighttime hours of 10:00 p.m. to 6:00 a.m. Highland stated that requiring Highland to meet a 40 dBA limit at all times at the six residences may affect the economic viability of the proposed project. Highland also requested that any Commission order approving the proposed project eliminate the 40 dBA limit at the six identified residences when the potentially sensitive residents no longer reside at their respective residences.

There is debate in the scientific community as to whether noise at certain levels from wind turbines causes or contributes to any health issues.[7] When the Commission established the noise limits in Wis. Admin. Code ch. PSC 128, it considered these alleged impacts and concluded that the established noise standards were protective of public health and welfare. As the Commission noted in its prior decision in this proceeding, the Commission is not convinced that a causal link between audible or inaudible noise at wind generating facilities and human health risks has been established to a reasonable degree of scientific certainty.

While the Commission, based upon the available scientific literature, may have doubts as to whether noise from the turbines, whether it be at 40 dBA, 45 dBA or 50 dBA can cause or worsen any of the self-reported conditions individuals living at the six occupied residences may have, the Commission has erred on the side of caution by requiring Highland to demonstrate in modeling using the most conservative assumptions that the project will comply with the applicable noise limits. In addition, the Commission, out of an abundance of caution, accepts Highland's voluntary agreement to obligate itself to a lower limit of 40 dBA for the six identified

[7] *See* EA, at 18-23, PSC REF#: 171104. *See also*, Final Decision, at 14-15, 20-22, PSC REF#: 182254.

residences, but the Commission is unwilling to require Highland to extend this accommodation to others—especially where, as here, the sound modeling submitted in this reopened proceeding demonstrates that the estimated levels are at or below 40 dBA for the commenters' residences identified in the reopened proceeding. As a result, the Commission finds that it is not necessary to extend the 40 dBA noise limit to the three additional affected residences identified in the reopened proceeding.

Further, the Commission concludes that it is unreasonable and unnecessary to require the application of a 40 dBA limit for 24 hours a day. The Commission is unable to find substantial evidence in the record to support the application of a 40 dBA limit generally or for applying this standard 24 hours a day. The Commission is requiring 40 dBA at certain residences during the nighttime hours because Highland has voluntarily agreed to this more stringent standard. Further, there is no evidence in the record that demonstrates how a 40 dBA limit may remedy any issues a wind turbine may allegedly create near the sensitive residences. Highland's agreement to the lower limit was only for the nighttime hours and that is reasonable. The Commission finds that the approach taken in Wis. Admin. Code ch. PSC 128, which allows higher noise limits during the day than at night is reasonable because its purpose is to avoid potential sleep disturbances associated with wind farm noise. A lower nighttime limit also recognizes the lower ambient or background noise at night. Given the uncertain causal relationship and the lack of record evidence establishing such a causal link between the conditions the individuals residing at the six sensitive residences have and noise, the Commission is not prepared to require Highland to do more than what they have agreed to, which is 40 dBA during the nighttime hours. Further, the Commission also finds little to no record support demonstrating what around-the-clock 40 dBA

noise limit gains in terms of risk protection compared to a nighttime-only 40 dBA limit. Accordingly, the Commission finds that the 40 dBA limit should only apply during the nighttime hours of 10:00 p.m. to 6:00 a.m.

In addition, the Commission finds it appropriate to eliminate the 40 dBA limit at any of the six identified residences when the potentially sensitive residents no longer reside at their respective residences. There is conflicting record evidence as to whether one of the potentially sensitive residents among the six previously identified still resides or spends any considerable time in the project area. If Highland obtains confirmation that this individual no longer resides in the project area, then the Commission concludes that it is not necessary to impose a 40 dBA nighttime limit for that residence.

The Commission has considered the individual hardships that commenters in this proceeding have identified. As Highland has demonstrated to the Commission's satisfaction, using the most conservative modeling assumptions, that the project will comply with the noise standards set forth in Wis. Admin. Code § PSC 128.14(3), and an even more stringent standard in connection with certain identified residences, the Commission concludes that the project is reasonable, in the public interest, and will not have an undue adverse impact on public health or welfare.

Ground Absorption Coefficient

As required by the Commission's *Measurement Protocol for Sound and Vibration Assessment of Proposed and Existing Wind Electric Generation Plants* (Noise Protocol), Highland provided noise modeling for the project as initially proposed. The sound contours were generated using the WindPRO computer modeling software, which implements International Organization for Standardization (ISO) Standard 9613-2. The sound contours provided in Highland's CPCN

application used a ground absorption coefficient setting of 0.0 in the WindPRO software. Commission staff's noise analysis of the project as initially proposed was completed solely on the modeling included in Highland's CPCN application. Highland later provided WindPRO modeling using a ground absorption coefficient of 0.5. As discussed previously, Highland provided revised project layouts to address concerns expressed by residents of the project area at the public hearing in the initial proceeding. These revised project layouts were developed using a ground absorption coefficient of 0.5.

In sound modeling, a ground absorption coefficient is used to characterize the ability of the ground to attenuate sounds. A ground absorption coefficient of 0.0 represents hard, acoustically reflective ground, while a value of 1.0 represents highly-absorptive conditions. A ground absorption coefficient of 0.5 represents semi-absorptive conditions. The lower the ground absorption coefficient value used, the higher the predicted sound level will be at residences represented in the model. Section 7.3 of ISO Standard 9613-2 specifies criteria for use of ground absorption coefficient values for various ground conditions. Wisconsin Admin. Code § PSC 128.14 does not address ground absorption. Use of a 0.0 ground absorption coefficient would result in the highest predicted sound levels from a proposed project.

In its Final Decision in the initial proceeding, the Commission found it is reasonable to use conservative assumptions regarding sound level modeling to reduce the risk of understating potential impacts to non-participating landowners. The Commission also found that sound modeling using a ground absorption coefficient of 0.0, calculated consistent with

ISO Standard 9613-2, is appropriate for the proposed project.[8] The Commission further found that it is reasonable to require Highland to show compliance with the Wis. Admin. Code § PSC 128.14(3) nighttime audible noise limit of 45 dBA using worst-case modeling assumptions, including a ground absorption coefficient of 0.0. In the reopened proceeding, Highland provided modeling showing compliance with applicable noise limits using a ground absorption coefficient of 0.0.

Highland's Proposed Curtailment Plan

Highland's compliance plan includes curtailment of certain turbines by operating them in reduced noise operation modes in order to meet applicable noise limits. To comply with the 45 dBA nighttime noise limit included in Wis. Admin. Code § PSC 128.14 and the 40 dBA noise limit at the six sensitive residences, Highland's proposed plan consists of:

- Computer modeling to determine which turbines are required to be operated in reduced noise operating modes in order to meet the noise requirements.
- Minimizing the amount of lost energy production from reduced noise operation by adjusting the levels of reduction based on wind direction and non-participating residence locations in relation to the wind turbines requiring curtailment. This analysis is referred to as the "directivity" analysis throughout the record in the reopened proceeding.
- Programming the turbines based on available reduced operating modes for each turbine model alternative and the directivity analysis. Throughout the reopened proceeding, this proposed programming strategy is referred to as "sector cutout function," "sector management capabilities," or "sector cutout management."
- Verification of compliance with applicable noise limits by post-construction noise monitoring.

The Commission directed the parties to address whether Wis. Admin. Code ch. 128 allows curtailment: (i) as a design factor; (ii) only if the project is found to be out of compliance after it is

[8] The Commission maintains, however, that a ground absorption coefficient of 0.0 may not be appropriate in all cases. *See* Final Decision, at 17, PSC REF#: 182254. As a result, the Commission continues to encourage future applicants to present modeling using both a 0.0 and 0.5 ground absorption coefficient, and to submit both models to the Commission. Further, the Commission concludes that it is reasonable to modify the Noise Protocols to require submission of modeling using both factors.

built but not during the project planning phase; or (iii) at any time. Highland argued that the plain language of the Commission's rules which state that curtailment "shall" be a form of mitigation expressly permits the use of curtailment during both the operational and planning phases of the project. Wis. Admin. Code § PSC 128.14(4)(c). Highland also noted the Commission's own regulations allow a turbine that is operated to meet the 45 dBA standard at night to produce greater noise during the day, provided it does not exceed 50 dBA. Highland continued that for turbines which exceed the 45 dBA standard in the model runs, the only way to comply with the nighttime standard is through mitigation because a turbine designed to produce noise between 45 dBA and 50 dBA during the day in worst case conditions cannot meet 45 dBA at night in worst case conditions without changing something. Highland also observed that Wis. Admin. Code § PSC 128.14(2)(c) requires that a project be able to comply with the noise standards under "planned operating conditions."

Highland concluded that the only way to meet the nighttime standard is with curtailment, and therefore it would be a violation of Wis. Admin. Code § 128.14(2)(c) to design without curtailment factored into the design. To do otherwise would not be designing "under planned operating conditions." Highland also argued that any other interpretation of Wis. Admin. Code § PSC 128.14(3)(a) would require compliance with the nighttime 45 dBA standard at all times making the 50 dBA daytime standard superfluous—a result not supported by the rules of statutory and regulatory rule construction. *State ex rel. Kalal v. Circuit Court*, 2004 WI 58, ¶ 46, 271 Wis. 2d 633, 681 N.W.2d 110.

Intervenor Forest disagrees. Forest contended that curtailment as a mitigation strategy can only be used during operation and not as part of the planning phase. Forest asserted that the

Commission determined in its original Final Decision that curtailment may only be used as a mitigation tool. Forest selectively quoted the Final Decision for this position. However, a full reading of the Final Decision, along with the fact that this question was posed to the parties, shows, and the Commission confirms here, that no such determination was made. *See* Final Decision, at 8-10, PSC REF#: 182254. Forest also asserted that the Commission's Noise Protocol supports the proposition that curtailment can only be used during the operational phase. However, the portion of the Noise Protocol Forest cites does not support this assertion. While Highland may have the better legal argument, it is not necessary for the Commission to address this issue. Regardless of how one interprets Wis. Admin. Code § PSC 128.14, these provisions do not control a CPCN application. Under Wis. Admin. Code § 128.02(3), the Commission need only "consider" the Wind Siting Rules when evaluating a CPCN statute. Here, the Commission concludes that curtailment is an appropriate planning strategy without regard to the rules.

Computer Modeling

In the reopened proceeding, Highland provided sound modeling for the two turbine model alternatives currently proposed for the project, Nordex N117 and Siemens SWT-2.3. Highland used the sound level modeling capabilities of WindPro software to prepare these model runs. This sound level modeling conforms to ISO Standard 9613-2, and utilizes a ground absorption coefficient of 0.0.

In order to show no non-participating residences above applicable limits, Highland used reduced noise operation modes data supplied by the respective turbine manufacturers. Turbine manufacturers provide reduced noise operation modes data to the WindPro program vendor, and

this data is available within WindPro as a modeling parameter for each individual turbine site. Reduced noise operation modes work by controlling blade pitch, which lowers the rotational velocity of the wind turbine which, in turn, limits the wind turbine blade tip speed. Highland stated that reduced blade tip speed results in lower overall noise levels.

Highland stated that the proposed curtailment plan would allow the proposed project to meet applicable noise limits. Highland stated that the noise modeling in the reopened proceeding is based on the most conservative modeling assumptions, specifically ISO 9613-2 with a ground absorptivity coefficient of 0.0. These modeling results generally over-predict sound levels because the model assumes that all turbines are operating at the highest sound levels, that there is a light wind blowing from each turbine to each residence, and that a moderate temperature inversion is always present. Highland added that the turbine manufacturer's noise data used by the WindPro model is measured using International Electrotechnical Commission (IEC) Standard 61400-11, and represent the upper range of measured turbine sound levels. Using these modeling techniques, Highland stated that the modeling results would match the upper end of actual measured sound levels.

Intervenor Forest Voice contended that the difficulty with measuring and modeling of short-term sound levels from wind turbines is that both the emission levels and sound propagation path attenuation effects are dependent on time-varying wind speed, wind shear, and wind direction. These effects can vary by moment, hour, day, and season. To fully understand these variations, long-term monitoring of these parameters, such as a year or more, is required. Forest Voice continued that a factor of safety of no less than 5 dBA, and preferably 10 dBA, is appropriate to reflect these conditions.

Forest Voice also expressed concern regarding limitations of the ISO Standard 9613-2 for prediction of sound levels from wind turbines. Forest Voice listed concerns that are not considered in the ISO Standard 9613-2, including: complex and unsteady aerodynamic forces; meteorological conditions, including wind shear; effects from unsteady winds and wind turbulence; effects of upstream terrain; and effects of downstream wakes on other turbines. Forest Voice also analyzed uncertainties in Highland's modeling, and concluded that if WindPro modeling using the ISO Standard 9613-2 is used, the results should be assessed a penalty or safety factor of up to 6 dBA to account for those uncertainties.

Forest stated that Highland's noise modeling is not adequate because it does not account for relevant atmospheric conditions and does not include conservative assumptions. Forest continued that the ISO Standard 9613-2 may not be applicable to wind turbine operations and, as such, the results are unreliable. Forest added that data presented in the original proceeding by Clean WI witness David Hessler show that predicted sound levels modeled using ISO Standard 9613-2 should be increased by between 3 and 6 dBA to reflect nighttime conditions.

The Intervenors' arguments are not persuasive. The challenges to the WindPro modeling and the ISO 9613-2 standard are inconsistent with the previous positions Intervenors took in this case and are inconsistent with the Commission's reliance on WindPro modeling and the ISO standard in the initial Final Decision. The Commission also observes that the criticism leveled by some of Forest and Forest Voice's experts come from individuals who have little to no specific experience or expertise with WindPro or ISO 9613-2.

The applicant provided rebuttal testimony stating that its noise modeling for the proposed project is conservative in nature, and results in higher estimated sound levels than are likely to be

measured when the project is in operation. Further, modeling runs provided by the Intervenors using WindFarmer show less impact on non-participating residences than did the WindPro runs.

The Commission finds that Highland's sound modeling results, which were prepared using the WindPro modeling software that implements ISO Standard 9613-2, represents the higher end of likely sound levels from project facilities, considering the limitations and uncertainties included in the software and model. As such, the Commission finds the modeling is reasonable and these results predict that that proposed project will likely comply with applicable noise limits. As discussed more fully herein, the Commission will verify and confirm the modeling predictions through vigorous and robust post-construction sound monitoring and other reporting conditions.

Directivity Analysis

Highland stated that utilizing reduced noise operation modes may reduce electrical energy production from the turbines, the magnitude of which depends on how much the rotational velocity is limited. To minimize the amount of lost energy production from reduced noise operation, Highland prepared its directivity analysis. This analysis considers wind direction and non-participating residence locations in relation to the wind turbines requiring curtailment to develop individual turbine programming parameters that Highland states will allow it to meet noise limits while holding lost energy production to a minimum.

Instead of operating each turbine requiring curtailment in the modeled reduced noise operation mode all of the time, Highland proposes to use the results of its directivity analysis to program the turbines. Highland stated that both Nordex N117 and Siemens SWT-2.3 turbines are capable of being programmed with parameters that will allow them to meet applicable noise limits for the proposed project, yet minimize the amount of energy production lost due to curtailment.

Highland calculated tables with the required level of reduced operations that will be programmed into each turbine. Highland continued that, when operating, the turbines would continually adjust their operations to ensure full compliance with applicable noise limits. Highland described the methodology it used to develop its directivity analysis and stated that the analysis was conservative in nature.

Forest Voice countered that Highland's assumptions regarding directivity are not substantiated by the limited data available and would underestimate the predicted sound levels in the cross wind direction by 1 to 3 dBA. Forest Voice also expressed concern that Highland's directivity analysis was not based on data for the actual wind turbine models being considered for the proposed project. Forest Voice contended that Highland's directivity analysis used incorrect assumptions regarding the propagation of noise from a wind turbine.

Forest critiqued Highland's directivity analysis, stating that it has not been used previously for wind turbine noise assessment, is untested in practical use, and introduces a new form of average levels that could contribute to applicable noise limits not being met part of the time. Forest added that ISO Standard 9613-2 already takes directionality into account by requiring a downwind prediction in all directions, and stated that reducing predicted sound levels further with a directivity analysis makes the model less conservative. Forest continued that the rotor of a wind turbine is an extremely complex source of sound, which Highland's directivity analysis oversimplifies.

Highland provided evidence that its project will be in compliance even without considering directivity. Finally, if the use of directivity results in sound levels exceeding the limits, Highland

will be required to increase the amount of curtailment so that the proposed project complies with applicable noise limits.

Turbine Programming

Highland provided information supplied by the turbine manufacturers describing the "sector management capabilities" of the turbine models under consideration for the project. Highland also described the capabilities of the turbine models under consideration for the proposed project for controlling noise emissions by reducing the rotational velocity of the turbine rotor. Highland also provided sample calculations that would be used to develop parameters to be used to program the turbines.

Forest contended that to ensure compliance with the applicable noise limits, a new site-specific software would need to be developed using real-time noise data from each residence where applicable noise limits may be exceeded, and described how this additional software is typically developed.

The turbines proposed by Highland are designed and constructed to be operated in reduced noise modes.

The Commission finds that Highland's directivity analysis and turbine programming proposal is adequate to ensure compliance with applicable noise limits. The Commission further finds that it is appropriate to require Highland to provide a report demonstrating that the turbines have been programmed as proposed in its curtailment plan.

Post-Construction Noise Monitoring Plan

To demonstrate that the proposed project meets noise limits, Highland proposes to use a monitoring protocol that includes the following elements:

- Continuous measurements
- Measurement techniques
- Parameters measured
- Data analysis
- Reporting
- Complaint investigation
- Curtailment demonstration

Each element of the plan is discussed below.

Continuous measurements – Highland proposes to take continuous sound level measurements at one location near an isolated turbine to better understand the noise produced by a single turbine; and at one location near the center of the proposed project where there are multiple turbines located in different directions.

For the first three years of operation, Highland proposes to take continuous measurements at each location for one month per quarter for four full months of data annually.[9] If, at any time, exceedances of the noise limits are found, the turbines would be immediately re-programmed to bring the project into compliance with applicable noise limits.

To respond to landowner complaints, Highland also proposes to take continuous measurements using a "roving" measurement setup that can be moved around to different locations.

If there are any non-compliance events in the first three years, Highland would conduct continuous measurements in the fourth year. Once Highland demonstrates compliance for a period of three consecutive years, it proposes that it no longer be required to conduct annual continuous

[9] Highland initially proposed to take continuous measurements for one month per quarter for the initial year of operation. In its Initial Brief, Highland states that measurements would be taken at each location for one month per quarter for a period of three years. (Initial Br. at 16, PSC REF#: 190282.)

measurements. Highland would continue to conduct measurements if a complaint is received, consistent with the requirements of Wis. Admin. Code § PSC 128.14.

Measurement techniques – Highland proposes to measure sound levels and ground wind speed and direction at each location. All measurement equipment would meet the applicable specifications of IEC Standard 61400-11, with the exception that no ground board would be used because of anticipated complications with rain and snow cover. Instead, Highland proposes to mount the microphone four to five feet above the ground and fit it with a minimum seven-inch diameter windscreen. All measurements would be conducted using ten-minute intervals, time-synchronized with the project Supervisory Control and Data Acquisition (SCADA) system.

Parameters measured – Highland proposes to measure one-third octave band levels of the L_{50}, L_{90}, and L_{eq}, as well as audio samples of at least one minute per interval for nighttime hours. Average ground wind speed and direction would be measured and time-synchronized with the other data.

Data analysis – Because the applicable noise limits for the proposed project are fixed values that correspond to "noise attributable to the wind energy system," the ten-minute measurements containing primarily turbine noise would be separated from those containing higher levels of ambient sounds. Highland proposes to achieve this by filtering the ten-minute measurements to identify intervals such as those when: the turbines are operating at or near maximum power; there is relatively low ground wind speed; wind direction is of particular interest at the time of the measurement; the spectral content of the measured level meet certain criteria; or, the measurements are taken at a certain time of day. Highland states that the exact filters to use would be determined after analysis of the first month of measurement data, and may be refined as

subsequent data is analyzed. The remaining ten-minute L_{eq} measurements, containing primarily turbine noise, would then be plotted and a regression calculated. Highland would thereby develop a range of turbine-only noise levels for each measurement location. The resulting database could also be used to determine the changes in noise levels with wind direction and speed.

Reporting – During the first year, one compliance report would be filed with the Commission each quarter. The report would provide all of the measured noise levels and ground wind data, and would describe in detail how the data was collected and analyzed. For each of the ten-minute samples that remain after the filtering process, the following SCADA information would be provided for the eight turbines closest to the measurement location: rotor speed, nacelle direction, hub-height wind speed, and noise reduction mode. A similar report would be filed with the Commission for any measurements conducted in years two and beyond.

Complaint investigation – Highland proposes to use a "roving" measurement system to measure at specific locations in the event of a complaint. The system could be deployed to the complainant's residence and left for a period of two weeks to one month. If analysis of the data shows that turbine related noise levels exceed the limit, the adjacent turbine or turbines would be immediately re-programmed and testing continued for another two weeks to a month until compliance is demonstrated.

Curtailment demonstration – As discussed earlier, Highland proposes to program the turbines to enter into reduced noise operation modes under certain wind speed and direction conditions. Each turbine would have its own program that would be developed prior to initial operation. The SCADA system associated with utility-scale turbine installations continuously logs all pertinent parameters every ten minutes, including noise reduction mode, wind speed, rotor

speed, nacelle direction, and others. Highland proposes to provide SCADA data necessary to ensure proper reduced power operations, including hub height wind speed, wind direction, and reduced noise operation mode with each noise measurement report submitted to the Commission.

To eliminate the possibility of the turbine operator attempting to override the curtailment programming, Highland proposes that Commission staff designate for each report the turbine location for which data would be provided. Highland states that Commission staff could then check to ensure that the turbines were operating in the correct reduced noise operation modes under the correct operating conditions. Highland proposes that this requirement be eliminated once Highland demonstrates compliance for three consecutive years.

As discussed earlier, Highland stated that its proposed compliance plan would ensure compliance with the 45 dBA nighttime noise limit included in Wis. Admin. Code § PSC 128.14 and the 40 dBA nighttime noise limit at the six sensitive residences. Highland added that the proposed post-construction noise monitoring plan proposed is very comprehensive and will demonstrate compliance over a wide range of atmospheric and seasonal conditions. Highland continued that the proposed post-construction noise monitoring plan greatly exceeds post-construction monitoring conducted on any other Wisconsin wind farm.

Forest Voice listed several criticisms of Highland's proposed post-construction noise monitoring plan, most notably that only two permanent sound level monitor systems are proposed. Forest Voice continued that more monitoring points are necessary to adequately characterize conditions in areas without monitors. Forest Voice suggested that because of the complexity of the meteorological factors that contribute to noise from wind turbines, as well as the differences in the terrain between each turbine and receptor, the proposal to monitor noise at only two fixed and one

roving location in the 26,000 acre footprint of the project is inadequate. Forest Voice expanded upon these concerns and suggested a possible method for determining the locations of monitoring points representative of the entire project area.

Forest also suggested that for Highland's proposed post-construction noise monitoring plan to work: it would be necessary for the turbine control system to operate properly; sound levels would need to be monitored on a real time basis; and new software would be necessary to monitor sound levels and adjust turbine operations to comply with noise limits.

Commission staff testified that it has observed significantly more frequent noise complaints during two periods annually: from late March through early May, and from late October through early December. As such, Commission staff suggested that the Commission require as a condition of any Commission order issued approving the proposed project, that those two periods be specifically identified as two of the four periods during which Highland collects month-long post construction noise measurements.

Commission staff suggested a condition that all post-construction noise measurements and reports prepared for Highland be made available to Commission staff. Access to these data could help improve Commission staff's understanding regarding why complaints seem to be more frequent during certain periods.

Commission staff also suggested that, for the proposed project, the Commission clarify in any order issued approving the proposed project the phrase "location relating to the complaint" included in Wis. Admin. Code § PSC 128.14(4)(b) to include the complaining non-participating residence or other occupied building. This clarification avoids use by the project operator of any recent report that shows the development to be in general compliance with noise limits, but which

does not include measurements at the complaining location from being used as a reason to avoid taking measurements in response to the complaint.

Finally, Commission staff recommended that, to ensure that the post-construction sound measurement protocol meets the Commission's needs, the Commission consider, as a condition of any Commission order issued approving the proposed project, that Highland consult with Commission staff prior to taking any post-construction noise measurements. Commission staff continued that consultation should include both the final design of the post-construction sound measurement protocol and the locations at which measurements would be collected.

Because of the project's size and the need for accurate sound levels, the Commission finds that Highland's proposed post-construction noise monitoring plan should be modified to add two additional fixed monitoring points, so that the plan includes a total of four fixed and one roving monitoring points within the project area. The Commission finds that these additional measurement locations within the project area are necessary to adequately establish compliance with applicable noise limits.

The Commission also finds that because Commission staff has noted significantly more frequent noise complaints during late March through early May, and from late October through early December, two of the four months during which Highland collects month-long post-construction noise measurements should fall during these periods. However, the Commission finds it reasonable to expand the periods during which these measurements are taken to include the entirety of the periods from mid-March to mid-May, and from mid-October to mid-December. In addition, all post-construction noise measurements and reports prepared for Highland shall be

made available to Commission staff. Highland shall also provide turbine operation SCADA data to Commission staff upon request.

The Commission further finds that, for the proposed project, the phrase "location relating to the complaint" included in Wis. Admin. Code § PSC 128.14(4)(b) is clarified to include the complaining non-participating residence or other occupied building. This clarification is intended to prevent the operator of the proposed project from using any recent report that shows the development in general compliance with noise limits, but which does not include measurements at the complaining location to avoid taking measurements in response to the complaint.

To ensure that the post-construction monitoring plan is adequate, the Commission finds that Highland shall consult with Commission staff, prior to taking any post-construction noise measurements, regarding both the final design of the post-construction sound measurement protocol and the locations at which measurements would be collected.

In addition, Highland agreed in its Petition to comply with any order condition requiring it to cooperate with the Commission and Commission staff to facilitate any third-party sound testing. (Petition at 19, PSC REF#: 183159.) This condition shall also apply to any testing for infrasound and low-frequency noise (ILFN).

The Commission concludes that the post-construction noise monitoring plan, as modified by this Final Decision on Reopening, is reasonable and will help ensure that the proposed project complies with the applicable noise limits.

Compliance Showing

Wisconsin Admin. Code § PSC 128.14(3)(a) provides that "an owner shall operate the wind energy system so that the noise attributable to the wind energy system does not exceed

50 dBA during the daytime hours and 45 dBA during the nighttime hours." The rule does not articulate the methodology that is to be used to measure compliance or what constitutes compliance with this absolute limit. Clean WI offered evidence in the initial proceeding that in order to meet an absolute limit 100 percent of the time, the design goal of the project would need to be up to 10 dBA below the noise limit. This would be necessary to avoid temporary excursions above the noise limit which Clean WI witness Mr. Hessler stated are unavoidable. Mr. Hessler also testified that if measured sound level is in compliance with the limit 95 percent of the time or more, he would consider the development to be in compliance.

The Commission finds that a showing of compliance by Highland at or above 95 percent of the time is adequate for the Commission to consider the proposed project in compliance with applicable noise limits. Highland shall work with Commission staff to finalize the post-construction testing methodology to be used consistent with a percentage-based standard. The Commission also concludes that it is reasonable to modify the Commission's Noise Protocol so that this protocol is consistent with the Commission's findings in this proceeding.

Turbine Model Alternatives

The Commission notes that, of the two remaining turbine models under consideration for the proposed project, the Siemens SWT-2.3 provides better noise performance according to the manufacturer's specifications. As such, the Commission finds it reasonable to limit the turbine model selected for the proposed project to the Siemens SWT-2.3, or another turbine model with equivalent noise specifications.

Design and Operation to Comply with the Wind Siting Rules, Wis. Admin. Code ch, PSC 128

Provisions of Wis. Admin. Code ch. PSC 128 with which Highland has Committed to and Shall Comply

In its Petition, Highland states that it will comply with the following Wis. Admin. Code ch. PSC 128 provisions: 128.13(1), Siting criteria (setbacks); 128.14, Noise criteria except as modified by this Final Decision on Reopening; 128.15, Shadow flicker; 128.16, Signal interference; 128.17, Stray voltage (as discussed below); 128.18(1)(f) and (g), 128.18(4)(a) and (b), Construction and operation; 128.19, Decommissioning except as modified by this Final Decision on Reopening; 128.33(3), Monetary compensation of good neighbor payments, as discussed in this Final Decision on Reopening; 128.40, Complaint process; 128.41, Monitoring committee; and, 128.42, Notice to property owners and residences.

The Commission finds it reasonable to require Highland to comply with the above-stated rule conditions. Because the project will comply with the setback and safety requirements of Wis. Admin. Code ch. PSC 128, the Commission finds that the project is reasonable, in the public interest, and will not create undue adverse impacts to public health and welfare.

Decommissioning Requirements

In its Petition, Highland requested that the Commission modify some requirements of Wis. Admin. Code § PSC 128.19 regarding decommissioning. Highland requested that Commission staff act in lieu of Forest in determining the decommissioning cost estimators and to address any complaints that may arise in the future regarding decommissioning requirements. Highland stated that if the Commission requires the applicants to work with Forest to identify decommissioning cost estimators, Highland and Forest be given 30 days to mutually agree on the estimators. If Highland and Forest are unable to reach agreement within 30 days, and if Highland can

demonstrate to Commission staff's satisfaction that it participated in good faith in an effort to reach agreement, then Commission staff should supervise the process of collecting decommissioning cost estimates. (Petition at 19, PSC REF#: 183159.)

The Commission finds that Highland's proposed modifications to Wis. Admin. Code § PSC 128.19 requirements regarding decommissioning are reasonable, except that Highland and Forest be given 60 days to mutually agree on the estimators.

Good Neighbor Payments

In its Petition, Highland agreed to provide good neighbor payments consistent with Wis. Admin. Code § PSC 128.33(3). (Petition at 19, PSC REF#: 183159.) The Commission finds that it is reasonable to require Highland to provide good neighbor payments consistent with Wis. Admin. Code § PSC 128.33(3). The Commission also clarifies that Highland shall comply with the escalation and disclosure provisions of Wis. Admin. Code § PSC 128.33(3).

Underground Collector Circuits

In its Petition, Highland agreed to and the Commission requires that it install all collector circuits underground. (Petition at 19, PSC REF#: 183159.)

Siting Conditions and Individual Hardships

Property Values

Highland provided a study of the property value impact for the proposed project. Based on this study, Highland concludes that construction and operation of the proposed project will not substantially injure or diminish the value of property surrounding or proximate to the proposed project.

Forest Voice provided testimony that the proposed project would have a negative impact on property value. Forest Voice suggests that the Commission require Highland to guarantee property values by providing a payment at the time of sale equal to the difference between the sales price and that of non-influenced comparable sales. Several members of the public provided comments regarding possible negative effects of the proposed project on property values.

Based on Highland's evidence, the record does not demonstrate that the project will have a clear, direct or substantial impact on property values. The Commission finds that it is not necessary for Highland to guarantee property values by providing a payment at the time of sale equal to the difference between the sales price and that of non-influenced comparable sales.

Local Roads

A member of the public submitted comments in the initial proceeding regarding financial responsibility for damage to local roads caused by heavy and oversized vehicles used during construction.

Highland stated that, prior to commencement of construction, it will perform a survey of county and local road conditions within the project boundary. The roads will be videotaped before and after construction by an independent consultant acceptable to Highland, St. Croix County, and the towns of Cylon and Forest. Highland stated that direct damage resulting from the proposed project will be repaired and returned to conditions mutually agreed upon by the affected jurisdictions, not to exceed pre-construction conditions as determined by the pre-construction survey. Alternatively, Highland and the affected jurisdictions may agree on a rate of compensation for damage directly caused and related to traffic from the proposed project. In its Petition,

Highland agreed to comply with an order condition requiring it to coordinate necessary road repairs with the respective towns. (Petition at 19, PSC REF#: 183159.)

The Commission finds it reasonable to require Highland to work with affected jurisdictions regarding a plan to repair or compensate the jurisdictions for damage to county and local roads resulting from construction of the proposed project.

After consideration of the siting conditions and individual hardships, the Commission concludes that the project is reasonable and in the public interest.

Stray Voltage

Wisconsin Admin. Code § PSC 128.17 states:

> **PSC 128.17 Stray voltage.** (1) TESTING REQUIRED. (a) An owner shall work with the local electric distribution company to test for stray voltage at all dairy and confined animal operations within 0.5 mile of a wind energy system facility pursuant to the stray voltage protocol established by the commission before any wind energy system construction activity that may interfere with testing commences and again after construction of the wind energy system is completed, except as otherwise specified by commission staff under par. (b).
> (b) Before any testing under par. (a) begins, an owner shall work with commission staff to determine the manner in which stray voltage testing will be conducted and on which properties. The electric distribution company serving a dairy or confined animal operation where testing is required under par. (a) shall conduct or arrange to conduct all required testing at the expense of the owner.
> (2) RESULTS OF TESTING. An owner and the electric distribution company shall provide to commission staff the results of all stray voltage testing in writing.
> (3) REQUIREMENT TO RECTIFY PROBLEMS. An owner shall work with the electric distribution company and farm owner to rectify any stray voltage problems attributable to the construction and operation of the wind energy system, in compliance with the commission's stray voltage protocol.

Some members of the public provided comments expressing concern that the proposed project could cause stray voltage problems. The Commission normally includes, as a standard order condition for any wind electric generation facility, a requirement that wind developers work with local electric distribution companies to test for stray voltage at all dairy operations within

one-half mile of any project facility, prior to construction and again after the project is completed. This standard order condition is consistent with the requirements of Wis. Admin. Code § PSC 128.17.

The Commission finds it is reasonable to require Highland to work with local electric distribution companies to test for stray voltage consistent with the requirements of Wis. Admin. Code § PSC 128.17.

Siting Flexibility

Any large construction project may encounter an unforeseeable condition that requires some siting flexibility. Such flexibility may be needed in order to resolve unforeseen problems that could arise during the construction process, such as unanticipated sub-surface conditions, to accommodate governmental requests, to address concerns that a landowner may have during the course of construction, to mitigate environmental impacts, and to take advantage of opportunities to minimize construction costs or improve the levels of electric generation. In other dockets, the Commission has granted CPCN project developers the ability to propose a minor siting modification, subject to review and approval of Commission staff.[10]

The Commission finds it reasonable to grant siting flexibility to Highland in this docket. The Commission authorizes Highland to use up to 44 specific sites for the construction of its turbines and associated facilities as otherwise consistent with this Final Decision on Reopening.

[10] *See*, for example, the Commission's "Final Decision" in *Application of Wisconsin Electric Power Company for a Certificate of Public Convenience and Necessity to Construct a Wind Electric Generation Facility and Associated Electric Facilities, to be Located in the Towns of Randolph and Scott, Columbia County, Wisconsin*, docket 6630-CE-302 at 38-40, and *Application of Wisconsin Electric Power Company for a Certificate of Public Convenience and Necessity to Construct a Wind Electric Generation Facility and Associated Electric Facilities, to be Located in Fond du Lac County*, docket 6630-CE-294, at 26-28.

Highland may also adjust the location of its preferred and alternative turbine sites and associated facilities. Highland may make these "minor siting modifications" only if the change affects resources or causes impacts the Commission has already evaluated, results in no significant changes in impacts to non-host landowners, meets Highland's own siting criteria, and otherwise complies with the requirements of this Final Decision on Reopening. Highland shall notify Commission staff of any proposed minor siting modifications.

Prior to making more substantial changes than those defined as minor siting modifications by this Final Decision on Reopening, Highland must receive approval from Commission staff. Highland shall submit a formal letter describing:

1. The nature of the requested change.
2. The reason for the requested change.
3. The incremental difference in any environmental impacts.
4. Highland's communications with the potentially-affect landowner.

The requests will be reviewed by Commission staff knowledgeable about the project, and Commission staff will decide whether to grant or deny the change.

All siting flexibility is conditioned upon the receipt of all necessary environmental permits, compliance with all local requirements, compliance with all of the landowner agreements, avoidance of any part of the project area that the Commission finds unacceptable, compliance with Highland's own siting criteria, compliance with all commitments identified by Highland in its application, and all conditions of this Final Decision on Reopening.

The Commission finds that it is reasonable that the applicants be granted minor routing flexibility. The Commission also finds that Highland shall follow the described process.

Material Adverse Impacts to Wholesale Competition

Under Wis. Stat. § 196.491(3)(d)7., the Commission may only issue a CPCN for a project that "will not have a material adverse impact on competition in the relevant wholesale electric service market." Highland proposes to interconnect its new wind electric generation facility to transmission facilities owned by NSPW. Because the transmission system in the area is owned by NSPW and is under the operational control of the Midcontinent Independent System Operator, Inc., Highland as a generation facility owner and operator cannot manipulate the transmission system to benefit its own generating plants. Finally, the addition of new generating supply into the market promotes wholesale competition. For these reasons, the Commission finds that proposed project will have no material adverse impact on competition in the wholesale electric service market.

Environmental Factors

Bird and Bat Mortality Studies

The Wisconsin Department of Natural Resources (DNR) recommended that a post-construction bird and bat mortality study be conducted and that the study duration be at least one year. DNR also recommended that bat activity monitoring occur during the same period, and that both DNR and Commission staff review and approve the scope and methodology to be used in the study.

DNR also recommended that, at the end of the one-year period, Commission and DNR staff reconvene with Highland to determine if the study methods, scope, and results allow reasonable conclusions to be made regarding the nature and extent of bat fatalities at the project site, and whether measures are needed to address those impacts. DNR continued that if the results

are inconclusive in these respects, then the option should remain to consider whether an additional year of study will improve the conclusions. In its Petition, Highland agreed to comply with an order condition requiring an additional year of bat mortality study, if deemed necessary by Commission and DNR staff. (Petition at 19, PSC REF#: 183159.)

The Commission finds it reasonable to require that Highland conduct one year of post-construction bird and bat monitoring. In addition, the Commission finds it reasonable for Highland to conduct an additional year of bat mortality study if Commission and DNR staff determine that it would substantially improve the estimate of bat fatalities or improve methods used to reduce bat fatalities.

Bald Eagles

Two active bald eagle nests have been located in the project area. A third likely nest site was also identified. Bald eagles are federally protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Highland is working with the U.S. Fish and Wildlife Service (USFWS) to evaluate the potential impact of the proposed project on bald eagles, and that evaluation is still ongoing. Highland has indicated that it may request a voluntary permit from USFWS to allow a certain amount of take of eagles as determined by USFWS in the course of conducting lawful operation of the proposed project. It is possible that some project changes, such as moving or eliminating certain turbine locations, may result from USFWS recommendations to minimize potential bald eagle impacts. In its Petition, Highland agreed to comply with an order condition requiring it to report to Commission staff any modifications to the proposed project undertaken to accommodate USFWS permit requirements. (Petition at 19, PSC REF#: 183159.)

The Commission finds it reasonable to require that Highland report to the Commission any project modifications implemented to reduce potential bald eagle impacts.

After consideration of environmental factors, the Commission concludes that the project is reasonable and in the public interest.

Compliance with the Wisconsin Environmental Protection Act

Wisconsin Stat. § 1.11 requires all state agencies to consider the environmental impacts of "major actions" that could significantly affect the quality of the human environment. In Wis. Admin. Code ch. PSC 4, the Commission has created three tables that categorize the types of actions it undertakes for purposes of complying with this statute. Table 1 identifies proposed projects that qualify as major actions, for which an environmental impact statement (EIS) is always needed; Table 2 lists proposals with the potential to significantly affect the quality of the human environment, for which the Commission will produce an environmental assessment (EA) in order to determine whether an EIS is needed; and Table 3 describes actions that normally require neither an EIS nor an EA. The Highland project fits within Table 2, item br., as a new wind-powered electric generating facility larger than 10 MW.

An EA dated July 18, 2012, was prepared by Commission staff in consultation with DNR. Based on the detailed environmental review of this project, a determination was initially made that the potential impacts of the project would not have a significant effect on the human environment, and therefore preparation of an EIS for the proposed project was not required.

By Order dated December 3, 2012, the Commission modified and approved the supplemental intervenor compensation application of Clean WI and Forest Voice for measurement of ILFN at the Shirley Wind Farm (Shirley). A team of acoustic experts obtained ILFN

measurements at three residences near Shirley during the period December 4 through 7, 2012. This team of experts submitted to the Commission a report of its findings (Shirley Report).

Subsequently, after the Shirley Report was filed, the Commission prepared a Supplemental EA focusing solely on the information provided in the report. A Preliminary Determination that no EIS was necessary was issued on January 24, 2013. Comments on the Preliminary Determination were collected through February 8, 2013. Based on the additional review presented in the Supplemental EA, the initial determination was affirmed that the potential impacts of the project would not have a significant effect on the human environment.

In the reopened proceeding, because the locations of the facilities for the proposed project were not changed from those included in the Supplemental EA, nor was the project modified, there is no need to prepare a second Supplemental EA.

The Commission finds that the EA and Supplemental EA comply with the requirements of Wis. Stat. § 1.11 and Wis. Admin. Code ch. PSC 4. The Commission further finds that based upon the EA, Supplemental EA and other record evidence that the project will not have undue adverse impacts on environmental values such as ecological balance, historic sites, geologic formation, aesthetics of land, water and recreational use.

Third Party Ownership, Successors and Assigns

In the record, the possibility of Highland's sale of the project to a third-party was raised. Highland stated that it would commit to agree that any agreement for the sale of the project would include as a condition of the sale that the purchasing third-party (and any subsequent successors or assigns) would agree to be bound by any and all conditions of approval of Highland's CPCN. To ensure that the Commission continues to have regulatory oversight of the operation of this project,

regardless of whether the operator is Highland, a merchant, or a public utility, the Commission requires as a condition of approval that the conditions of approval set forth in this Final Decision on Reopening shall be binding upon any agents, contractors, successors, assigns, corporate affiliates, or any future owners or operators of the project. Further, in any agreement for the sale of the project, Highland shall include a specific provision that the purchasing third-party (and any subsequent successors or assigns) will agree to be bound by any and all conditions of approval of Highland's CPCN.

Certificate

For the reasons set forth in this Final Decision on Reopening and the other record evidence in this proceeding, the Commission finds that the project is reasonable and in the public interest after considering alternative locations, individual hardships, safety, and environmental factors. Additionally, the Commission also finds, for the reasons set forth in this Final Decision on Reopening and the other record evidence in this proceeding, that the project will not have undue adverse impacts on other environmental factors such as ecological balance, public health and welfare, historic sites, geologic formation, aesthetics of land water and recreational use. The Commission therefore grants Highland a CPCN for construction of the proposed Highland Wind Farm, as described in its application, and modified by this Final Decision on Reopening.

Order

1. Highland may construct and operate its project in conformance with the design specified in its application and subject to the conditions specified in this Final Decision on Reopening.

2. All commitments made by Highland in this proceeding and conditions of this Final Decision on Reopening shall apply to Highland, any agents, contractors, successors, assigns, corporate affiliates, or any future owners or operators of the project. In any agreement for the sale of the project, Highland shall include a specific provision whereby the purchasing third-party (and any subsequent successors or assigns) agree to be bound by all commitments made by Highland in this proceeding and conditions of this Final Decision on Reopening.

3. This authorization is for the specific project as described in the CPCN application. Should the scope, design, or location of the project change significantly, Highland shall promptly notify the Commission as soon as it becomes aware of the possible change and shall obtain Commission review and approval.

4. Beginning with the quarter ending December 31, 2013, and within 30 days of the end of each quarter thereafter and continuing until the facilities are fully operational, Highland shall submit quarterly progress reports to the Commission that include all of the following:

a. The date that construction commences.

b. Major construction and environmental milestones, including permits obtained, by agency, subject, and date.

c. Summaries of the status of construction, the anticipated in-service date, and the overall percent of physical completion.

d. The date that the facilities are placed in service.

5. Highland shall file with the Commission geographic information systems (GIS) data reflecting any modifications to the project design necessary to comply with this Final Decision on Reopening prior to commencement of construction.

6. Highland shall provide the Commission with as-built GIS data location information for every turbine site and other project facilities when it determines their final location. This data shall be compatible with state government standards.

7. Except as specifically modified by this Final Decision on Reopening, the project shall comply with the noise limits set forth in Wis. Admin. Code § PSC 128.14(3).

8. The 40 dBA limit shall only apply during the nighttime hours of 10:00 p.m. to 6:00 a.m. at the six identified residences with sensitive individuals, provided however that the 40 dBA limit shall not apply to one of the six identified residences if Highland confirms that the occupant with the sensitive condition no longer resides or spends significant time at the residence.

9. Highland may eliminate the 40 dBA limit at any of the six identified residences when the resident with special needs no longer resides at the residence.

10. Highland shall submit a report to the Commission documenting that it has programmed each turbine requiring curtailment for Highland to comply with applicable noise limits consistent with its curtailment plan prior to commencing operation of the proposed project.

11. Highland shall give Commission staff confidential access to SCADA information to verify that the turbines are appropriately operating in reduced noise operating modes when conditions exist that could cause an exceedance of applicable noise limits.

12. Highland's proposed post-construction noise monitoring plan shall include four fixed and one roving monitoring points within the project area. Highland shall work with Commission staff regarding the appropriate locations for the monitoring points.

13. Highland shall include the entirety of the periods from mid-March to mid-May, and from mid-October to mid-December, as two of the four periods annually during which Highland

collects post-construction noise measurements. These two periods shall be included in each of the first three years of monitoring. Highland shall work with Commission staff regarding the scheduling of the two remaining month-long periods. In addition, all post-construction noise measurements and reports prepared by or for Highland shall be made available to Commission staff.

14. Highland shall consult with Commission staff, prior to taking any post-construction noise measurements, regarding both the final design of the post-construction sound measurement protocol and the locations at which measurements will be collected.

15. Highland shall cooperate with the Commission and Commission staff to facilitate any third-party sound testing at the site of the proposed project.

16. The proposed project shall be considered to be in compliance with applicable noise limits if post-construction noise measurements show compliance at least 95 percent of the time. Highland shall work with Commission staff to finalize the post-construction testing methodology to be used consistent with this percentage-based standard.

17. Highland shall limit the turbine model selected for the proposed project to the Siemens SWT-2.3, or another turbine model with equivalent noise specifications.

18. Highland shall comply with the following Wis. Admin. Code ch. PSC 128 provisions: 128.13(1), Siting criteria (setbacks); 128.14, Noise criteria except as modified by this Final Decision on Reopening; 128.15, Shadow flicker; 128.16, Signal interference; 128.17, Stray voltage as discussed in this Final Decision on Reopening; 128.18(1)(f) and (g), 128.18(4)(a) and (b), Construction and operation; 128.19, Decommissioning except as modified by this Final Decision on Reopening; 128.33(3), Monetary compensation of good neighbor payments, as

discussed in this Final Decision on Reopening; 128.40, Complaint process; 128.41, Monitoring committee; and, 128.42, Notice to property owners and residences.

19. Highland shall work with Forest to comply with the requirements of Wis. Admin. Code § PSC 128.19 regarding decommissioning. If Highland and Forest cannot agree upon decommissioning cost estimators within 60 days, and if Highland can demonstrate to Commission staff's satisfaction that it participated in good faith in an effort to reach agreement, then Commission staff shall supervise the process of collecting decommissioning cost estimates.

20. Highland shall provide good neighbor payments consistent with Wis. Admin. Code § PSC 128.33(3), including the related escalation and disclosure provisions.

21. Highland shall construct all collector circuits for the proposed project using underground configurations.

22. Highland shall construct, maintain, and operate all project facilities in a manner that complies with the National Electrical Safety Code and Wis. Admin. Code ch. PSC 114.

23. Highland shall work with affected jurisdictions regarding a plan to repair or compensate the jurisdictions for damage to county and local roads resulting from construction of the proposed project.

24. Highland shall work with local electric distribution companies to test for stray voltage prior to construction and again after construction is complete, consistent with the requirements of Wis. Admin. Code § PSC 128.17.

25. The Commission grants Highland the ability to use up to 44 of the 52 specific sites Highland has proposed for its turbines and associated facilities, as otherwise consistent with this Final Decision on Reopening. The Commission grants Highland the ability to move turbines or

facilities to any of Highland's proposed alternate sites on its own volition, as otherwise consistent with this Final Decision on Reopening.

26. The Commission grants Highland the ability to make minor siting modifications, as defined in this Final Decision on Reopening, if it provides advance notice to and receives approval from Commission staff. Highland shall submit a formal letter for Commission staff review and approval that describes the nature of the proposed change, the reason for it, the incremental environmental impact differences based on the approved facilities location, and Highland's communications with all affected landowners.

27. Highland shall conduct one year of post-construction bird and bat mortality monitoring. In addition, Highland shall conduct an additional year of bat mortality study if Commission and DNR staff determine that it would substantially improve the estimate of bat fatalities or improve methods used to reduce bat fatalities.

28. Highland shall report to the Commission any project modifications implemented to reduce potential bald eagle impacts.

29. This authorization is valid only if construction commences no later than one year after the date this Final Decision on Reopening is served.

30. This Final Decision on Reopening supersedes the Final Decision dated March 15, 2013, and is effective one day after the date of service.

31. Jurisdiction is retained.

Docket 2535-CE-100

Dissent

Commissioner Nowak dissents and writes separately (see attached).

Dated at Madison, Wisconsin, this 25th day of October, 2013.

By the Commission:

Sandra J. Paske
Secretary to the Commission

SJP:JAL:jlt:DL: 00868198

See attached Notice of Rights

Docket 2535-CE-100

PUBLIC SERVICE COMMISSION OF WISCONSIN
610 North Whitney Way
P.O. Box 7854
Madison, Wisconsin 53707-7854

NOTICE OF RIGHTS FOR REHEARING OR JUDICIAL REVIEW, THE TIMES ALLOWED FOR EACH, AND THE IDENTIFICATION OF THE PARTY TO BE NAMED AS RESPONDENT

The following notice is served on you as part of the Commission's written decision. This general notice is for the purpose of ensuring compliance with Wis. Stat. § 227.48(2), and does not constitute a conclusion or admission that any particular party or person is necessarily aggrieved or that any particular decision or order is final or judicially reviewable.

PETITION FOR REHEARING

If this decision is an order following a contested case proceeding as defined in Wis. Stat. § 227.01(3), a person aggrieved by the decision has a right to petition the Commission for rehearing within 20 days of the date of service of this decision, as provided in Wis. Stat. § 227.49. The date of service is shown on the first page. If there is no date on the first page, the date of service is shown immediately above the signature line. The petition for rehearing must be filed with the Public Service Commission of Wisconsin and served on the parties. An appeal of this decision may also be taken directly to circuit court through the filing of a petition for judicial review. It is not necessary to first petition for rehearing.

PETITION FOR JUDICIAL REVIEW

A person aggrieved by this decision has a right to petition for judicial review as provided in Wis. Stat. § 227.53. In a contested case, the petition must be filed in circuit court and served upon the Public Service Commission of Wisconsin within 30 days of the date of service of this decision if there has been no petition for rehearing. If a timely petition for rehearing has been filed, the petition for judicial review must be filed within 30 days of the date of service of the order finally disposing of the petition for rehearing, or within 30 days after the final disposition of the petition for rehearing by operation of law pursuant to Wis. Stat. § 227.49(5), whichever is sooner. If an *untimely* petition for rehearing is filed, the 30-day period to petition for judicial review commences the date the Commission serves its original decision.[11] The Public Service Commission of Wisconsin must be named as respondent in the petition for judicial review.

If this decision is an order denying rehearing, a person aggrieved who wishes to appeal must seek judicial review rather than rehearing. A second petition for rehearing is not permitted.

Revised: March 27, 2013

[11] *See State v. Currier*, 2006 WI App 12, 288 Wis. 2d 693, 709 N.W.2d 520.

PUBLIC SERVICE COMMISSION OF WISCONSIN

Application of Highland Wind Farm, LLC, for a Certificate of Public Convenience and Necessity to Construct a 102.5 Megawatt Wind Electric Generation Facility and Associated Electric Facilities, to be Located in the Towns of Forest and Cylon, St. Croix County, Wisconsin	2535-CE-100

DISSENT OF COMMISSIONER ELLEN NOWAK

I dissent from the Commission's order granting a Certificate of Public Convenience and Necessity (CPCN) to Highland Wind Farm, LLC (Highland), for the construction of a new 101.2 megawatt (MW) wind electric generation facility.[1] The project includes construction of up to 44 wind electric generating turbines, depending on turbine model selected, and associated facilities to interconnect with the existing Northern States Power Company-Wisconsin (NSPW) electric transmission system in the towns of Forest and Cylon, in northeast St. Croix County, Wisconsin.

I previously joined the majority in the decision not to grant a CPCN for Highland on the basis that Highland failed to demonstrate compliance with the noise standards in Wis. Admin. Code § PSC 128.14. I also voted against reopening the proceeding to allow Highland to submit what I contend was an application for a redesigned project, in an attempt to make the project meet the noise standards in Wis. Admin. Code § PSC 128.14. (PSC REF#: 182254.)

In the reopened proceeding, Highland submitted a plan that requires curtailment in order to meet the sound limits in Wis. Admin. Code § PSC 128.14. While the Commission did not

[1] In its Petition, Highland agreed to eliminate the loudest of the three turbine models under consideration for the proposed project. (Petition at 19, PSC REF#: 183159.) Prior to the elimination of that turbine, the electric generating capacity of the project was 102.5 MW.

explicitly decide the issue, I am not convinced that Wis. Admin. Code ch. PSC 128 contemplated the type of curtailment plan proposed by Highland as a method for permanent compliance with sound limits. I think the use of curtailment in the manner proposed by Highland undermines the sound limits that were discussed at length and vetted by the Wind Siting Council.

Assuming that a curtailment plan such as the one submitted by Highland is allowable, I was not convinced that the modeling in the record would ensure compliance with the noise standards in Wis. Admin. Code § PSC 128.14. For the reasons explained below, I believe that Highland failed to meet its burden to show that its proposal is in the public interest and that the project will not cause undue adverse impact.

Highland argued that its modeling was the "most conservative" because it used a ground absorption coefficient of 0.0 and followed the criteria in International Organization for Standardization (ISO) Standard 9613-2. However, use of those two criteria does not render the modeling the "most conservative." While I agree with Highland that the use of a 0.0 ground attenuation factor is the most conservative value for *that* factor, I disagree with its assertion that the use of a 0.0 factor renders the entire model the "most conservative" and negates the need to account for other factors that impact noise.

I was also not persuaded by Highland's argument that a 0.0 factor is extreme and will almost never occur. To the contrary, credible evidence was submitted showing that a 0.0 factor will occur in the case of hard, bare ground in the winter, ice covered snow, or a concrete driveway in front of a house. These conditions are hardly extreme and are certain to occur in northwest Wisconsin in the long winter months, at the least.

Also, Highland's failure to include a factor of safety in its modeling renders the results unreliable. Indeed, Highland's modeling omitted several other conditions that are too important to ignore. For example, ISO Standard 9613-2 does not consider the effects of temperature variations, directivity, atmospheric turbulence and other conditions affecting sound propagation. As a result, Highland's modeling was too uncertain to make it reliable. Uncertainty can be mitigated with a factor of safety built into the design, but Highland chose not to do so, and in turn, its modeling was not sufficient to ensure that noise levels would always be below the allowable limits. In sum, there is not enough in the record to substantiate Highland's claim that use of a 0.0 ground attenuation factor obviates the need to consider other factors that impact noise or build in a factor of safety.

Highland argued that on the whole, its modeling is conservative, but Highland seems to concur that there are points in time where the modeling may not be accurate. It is these points in time when the sound levels will likely be exceeded under the current design. The Commission recognized that temporary excursions above the allowable noise limits should be minimized,[2] and without a factor of safety built in, there will more exceedances than is acceptable in my mind.

The conditions imposed in the Certificate of Public Convenience and Necessity by the majority do not compensate for the shortcomings in Highland's modeling. Specifically, the failure to impose a 24-hour 40 dBA (A-weighted decibels) limit at the sensitive residences is a mistake. The different standards in Wis. Admin. Code ch. PSC 128 account for the affects turbine noise can have on sleep. Sleep disturbance, however, is not the issue here. The identified individuals have specific conditions that exist 24 hours a day. Those individuals

[2] Final Decision, PSC REF#: 182254, pages 18-19.

should be able to be in their homes 24 hours a day. The majority should not discount the fact that there are factors other than, or in addition to, sleep disturbance that need to be addressed. I would have imposed a 24-hour dBA standard to ensure the health and safety of the individuals at the sensitive residences.

Highland has submitted evidence on the effect of a 24-hour dBA standard on power generation, but that is irrelevant. Highland originally suggested making special accommodations for these more sensitive individuals, so to later claim that it cannot do so because it will negatively affect power production is disingenuous.

The post-construction monitoring imposed by the majority also falls short. The majority failed to ensure that there will be sufficient monitoring at the project site. The footprint of the project is approximately 26,000 acres. While the majority did increase the number of permanent/fixed monitors from two to four, they failed to require more than one roving monitor. I would have included at least one more roving monitor to address situations where there are simultaneous complaints and an affected homeowner is denied testing because a monitor is currently in use at another location. One roving monitor is insufficient to establish compliance with the applicable noise limits.

Highland and intervenors disagree on what denial of this application means for the future of wind energy in Wisconsin. The record in this case contained information about the effects of other wind projects in Wisconsin. Some residents in those areas testified about health difficulties and attribute a lot of it to the wind farm. Before a wind farm is built, the Commission should make sure that it has done all it can to protect the residents of that area. If a project, like this one, is built without full, complete, and accurate analysis, it has the potential to cause even more

problems, and result in even more scrutiny or skepticism of future projects. The best thing this Commission can do for the future of wind energy in Wisconsin is to ensure that a full and thorough analysis is done before approving such a project. Here, the majority failed to ensure that safeguards are in place, and that modeling and testing was exhaustive and accurate.

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