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August 2, 2011

Dr. Burl W. Haar
Executive Secretary
Minnesota Public Utilities Commission
127 7th Place East, Suite 350
St. Paul, MN 55101-2147

RE: Application of Big Blue Wind Farm, LLC for a Large Wind Energy Conversion System Site Permit for the 36 Megawatt Big Blue Wind Farm in Faribault County. Docket No. IP-6851/WS-10-1238

Dear Dr. Haar:

Attached are the Comments and Recommendations of the Department of Commerce, Energy Facility Permitting (EFP) Staff for the issue: should the Commission grant a site permit to Big Blue Wind Farm, LLC for the 36 MW Big Blue Wind Farm?

Included in the Comments and Recommendations are proposed findings of fact and order, exhibit list, and proposed site permit.

The site permit application was filed on December 6, 2010 by:

Dustin Shively
Exergy Development Group of Idaho
802 W. Bannock, Suite 1200
Boise, Idaho 83702

EFP staff recommends granting a site permit with conditions as attached and is available to answer any questions the Commission may have.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ingrid Bjorklund', written in a cursive style.

Ingrid Bjorklund
EFP Staff

Attachment

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BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

**COMMENTS AND RECOMMENDATIONS OF THE
MINNESOTA DEPARTMENT OF COMMERCE
ENERGY FACILITY PERMITTING STAFF**

DOCKET NO. IP-6851/WS-10-1238

Meeting Date: August 11, 2011.....Agenda Item # 6

Company: **Big Blue Wind Farm, LLC**

Docket No. **IP-6851/WS-10-1238**

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

Issue(s): Should the Commission grant a site permit to Big Blue Wind Farm, LLC for
the 36 MW Big Blue Wind Farm?

DOC EFP Staff: Ingrid E. Bjorklund.....651-297-7039

Relevant Documents

Big Blue Wind Farm, LLC, Revised Site Permit Application.....January 24 - 25, 2011
Turbine Layout Map Sets.....June 20, 2011
Meteorological Tower Layout Map.....June 27, 2011
Site Control Maps.....June 16, 2011
Feeder Line Maps.....June 20, 2011
Eagle Nest Maps.....June 24, 2011
Public Comments.....May 19, 2011

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The enclosed materials are the work papers of the Minnesota Department of Commerce (DOC) Energy Facility Permitting Staff (EFP). They are intended for use by the Public Utilities Commission and are based on information already in the record unless otherwise noted.

Documents Attached

1. Proposed Findings of fact, Conclusions of Law, and Order
2. Proposed Exhibit List
3. Proposed Site Permit with Turbine Location and Layout Maps

See eDocket filings (10-1238) at <https://www.edockets.state.mn.us/EFiling/search.jsp>, or the Commission website at: <http://energyfacilities.puc.state.mn.us/Docket.html?Id=30587> for project related documents.

Statement of the Issues

Should the Commission grant a site permit to Big Blue Wind Farm, LLC for the 36 MW Big Blue Wind Farm?

Introduction and Background

Big Blue Wind Farm, LLC (Applicant or Big Blue Wind) submitted a site permit application to construct the proposed 36 megawatt (MW) Big Blue Wind Farm (Project) in Faribault County on December 6, 2010, which was accepted by the Commission on January 14, 2011. Big Blue Wind is a wholly owned subsidiary of Minnesota Wind Partners I, LLC, which is currently owned by Exergy Minnesota Holdings, LLC, which is owned by Exergy Development Group of Idaho, LLC.

Project Location

The proposed Project will be located in Jo Daviess Township in western Faribault County located approximately six miles west of the city of Blue Earth, as shown on the accompanying map. The Project site encompasses approximately 15,000 acres, of which 5,177 acres are under site control. Depending upon the turbine model selected and final layout, approximately 47 acres would be developed to accommodate turbines and associated infrastructure. The maps included in the proposed site permit show the Project boundary and turbine layouts for three of the turbine options.

Project Description

The Project for which a permit is being requested includes the following associated facilities:

1. A turbine layout consisting of up to 24 GE 1.5 MW or 22 GE 1.6 MW wind turbine generators with a rotor diameter of 270 feet (82.5 meters), 14 Nordex 2.5 MW turbines with a rotor diameter of 328 feet (100 meters), or 18 Gamesa 2.0 MW turbines with a rotor diameter of 318 feet (97 meters) on turbine towers that are 262.5 feet (80 meters);
2. Pad mounted step-up transformers

3. Gravel access roads;
4. Electrical collection system (collector and feeder lines);
5. Supervisory Control and Data Acquisition (SCADA) communication lines and building;
6. Two permanent meteorological towers; and
7. Project substation.

The Project would interconnect with the electrical grid at the proposed 161 kV bus of a proposed Faribault switching station, which is proposed by ITC. The Project substation will be located adjacent to the existing 161 kV Winnebago – WinnCo transmission line. The Applicant's goal is to complete the construction of the Project and achieve commercial operation in the fall of 2011.

Regulatory Process and Procedures

A site permit from the Commission is required to construct a Large Wind Energy Conversion System (LWECS), which is any combination of wind turbines and associated facilities with the capacity to generate five megawatts or more of electricity. This requirement became law in 1995. The Minnesota Wind Siting Act is found at Minnesota Statutes chapter 216F and rules to implement the permitting requirements are found in Minnesota Rules chapter 7854.

Certificate of Need Process

A site permit cannot be granted before a Certificate of Need (CN) is issued if a CN is required. Big Blue Wind noted in its application that a CN from the Commission for a large electric power generating plant is not required because the Project is less than 50 MW in size and, therefore, does not meet the definition of large energy facility in Minnesota Statutes section 216B.2421. In an order dated January 14, 2011, the Commission determined no CN is required for the Project based on the information in the record.

Site Permit Application and Acceptance

The Applicant filed a site permit application for the Project with the Commission on December 6, 2010. The Commission accepted the site permit application as complete on January 14, 2011.

Preliminary Determination on Draft Site Permit

On March 11, 2011, a Commission order made a preliminary determination that a draft site permit may be issued for the Big Blue Wind Farm. This allowed EFP staff to proceed with the notice requirements of Minnesota Rules 7854.0900. Notice of the April 19, 2011, public information meeting was published in *The Faribault County Register*, *Sentinel*, and *EQB Monitor* and also mailed to persons and government agencies required by rule.

Public Participation Process and Public Comments

The wind siting rules provide opportunities for the public to participate in deliberations on the LWECS site permit application. The public was advised of the submission of the site permit application after the site permit application was accepted. Public comments on information in the application and issues to be considered in development of a draft site permit were accepted through February 18, 2011. EFP staff received seven written comments. EFP staff submitted comments and recommendations to the Commission on issuance of the draft site permit and summarized the issues raised by the public and government officials.

A public meeting on the Project was held on April 19, 2011. Approximately 90 people attended the public meeting. The deadline for submitting comments on the draft site permit was May 6, 2011. EFP staff received 28 written comments from 25 individuals and 18 people spoke at the public meeting. Some comments were in support of the Project. Concerns raised in the comments include: impacts to property values, telecommunications, drain tile; impacts from noise, shadow flicker, turbine lighting/visual aesthetics, construction with regard to roads; decommissioning; and placing feeder lines underground or overhead.

Standard for Permit Issuance

The test for issuing a site permit for a LWECS is to determine whether a project is compatible with environmental preservation, sustainable development, and the efficient use of resources. Pursuant to Minnesota Statutes section 216F.02, certain sections of Minnesota Statutes chapter 216E (Minnesota Power Plant Siting Act) apply to siting LWECS, including section 216E.03, subdivision 7 (considerations in designating sites and routes). Minnesota Statutes section 216F.04(d) allows the Commission to place conditions in LWECS permits.

EFP Staff Analysis and Comments

The following analysis is summarized by issue: updated information submitted into the record since the comment period closed on May 6, 2011; comments from the Faribault County Board of Commissioners and a discussion of its ordinance; and agency and public comments. In addition to oral comments taken at the public meeting, EFP staff received 26 written comments.

Turbine Options

On May 2, 2011, the Applicant eFiled a letter changing its wind turbine options from the REpower 2.05 MW turbine and GE 1.5 and 1.6 MW turbines to the following: 22 GE 1.6 MW turbines, 15 Nordex 2.5 MW turbines, or 18 Gamesa 2.0 MW turbines. On June 20, 2011, the Applicant eFiled a letter clarifying that it would continue to keep the option of utilizing 24 GE 1.5 MW turbines. This letter explains that the GE 1.5 MW turbine has the same attributes as the GE 1.6 MW turbine except that the GE 1.6 MW turbine has a different control system. Site control maps and updated preliminary turbine layout maps were eFiled on June 16 and 20, 2011, respectively. A turbine layout map for the GE 1.5 MW turbine was not eFiled. As shown on the GE 1.5 MW site control map, the layout is identical to the GE 1.6 MW layout with the exception of two additional turbines located in sections 33 and 27. If the Nordex turbine was chosen, the Applicant would have to remove a turbine location because it can only develop a wind project up to 36 MW. The Applicant is in the process of developing additional alternate sites if it is necessary to move a turbine from a location on a preliminary layout as a result of geological or biological survey results. One alternate site has been chosen to replace a turbine near the Reinvest in Minnesota land in the northeast portion of the Project. Site control for this Project is scattered throughout the 15,000-acre Project site, which allows the Applicant some flexibility in the micro-siting process.

EFP Response: The Applicant's preferred turbine options (Gamesa, Nordex, and two GE options) are included in section one of the proposed site permit.

Met Tower Locations

On June 27, 2011, the Applicant eFiled a letter and map with its location options for two permanent meteorological towers.

EFP Response: Section 4.11 of the proposed site permit states that all permanent meteorological towers shall not be placed closer than 250 feet from the edge of the nearest public road right-of-way and the boundary of the permittee's site control or in compliance with the county ordinance regulating meteorological towers, whichever is more restrictive. Finding 27 concludes that the Faribault County ordinance (section 21) is more restrictive than the 250-foot setback in section 4.11 of the proposed site permit. The county ordinance requires a setback equal to the height of the tower plus 10 feet from the edge of a parcel or recorded easement boundary. Further, the ordinance does not allow towers in land designated as A-1 (Shoreland Ag District). Section 4.11 also requires that permanent meteorological towers be free standing (i.e., no guy wires). Findings 27 and 59 address meteorological towers.

Setback From Residences

The Applicant verbally requested that section 4.2 of the draft site permit be amended to reflect its plans of implementing a setback of 1,500 feet from residences of non-participating landowners and 1,000 feet from residences of participating landowners. Section 4.2 of the draft site permit required setback waivers from landowners who agree to have a turbine closer than 1,500 feet from their residence, but no closer than 1,000 feet. The draft site permit reflected the Applicant's intended setback as stated in its application.

EFP Response: A setback waiver was included in the lease agreements signed by the participating landowners. Therefore, participating landowners have already agreed to be closer than 1,500 feet from a turbine. The Applicant does not plan to seek setback waivers from non-participating landowners. For clarity, the proposed site permit requires a 1,500-foot setback from residences of non-participating landowners and a 1,000-foot setback from residences of participating landowners.

Wildlife Surveys and Bald Eagle Nest

The only significant wildlife issue found to date is the location of a bald eagle's nest within the Project area based on the results from the Wildlife Baselines Studies Interim Report, dated November 2010 to April 2011, and eFiled on June 20, 2011. This interim report was designed to provide an early warning of high wildlife use or if sensitive species are observed within the study area. The surveys included fixed-point bird use surveys, incidental wildlife observation and raptor nest surveys. The final report will be prepared after completion of the field surveys in mid-November 2011. Because the Applicant plans to start construction this summer, some surveys will be conducted during the construction period. A letter addressing the timeline of the surveys was eFiled on March 22, 2011.

During the course of conducting surveys, a bald eagle's nest was discovered in section 35 of the Project area and two raptor nests were documented outside the Project area, which are probably red-tailed hawk. No other state threatened, endangered, or species of special concern or federally listed species were observed. Fifty unique bird species were observed during the surveys, which is a typical observation for an agricultural landscape.

The bald eagle is federally protected under the Bald and Golden Eagle Protection Act (BGEPA). The BGEPA prohibits all take of eagles unless authorized by the U.S. Fish and Wildlife Service (USFWS). The bald eagle is also a state-listed species of special concern. A species of special concern means it is extremely uncommon in Minnesota or has unique or highly specific habitat

requirements and deserves careful monitoring of its status. The USFWS has the authority to issue permits that would authorize disturbance or a physical take of eagles.

A conference call was held on June 16, 2011, with the Applicant and its consultants, USFWS, the Minnesota Department of Natural Resources (DNR) and EFP staff to discuss the bald eagle's nest, specifically what was known to date and possible actions to avoid, minimize, and mitigate impacts to the eagles. The Applicant is in the process of determining the flight path of the eagles. Preliminary findings suggest the eagles are leaving the nest in the northeast direction, but coming back from all directions. Data collection will continue into July. Because the Applicant expects to begin construction as soon as possible, the Applicant is undergoing micro-siting at this time. However, more information regarding the eagle's nest is needed to inform micro-siting.

EFP Response: A special condition has been included in the proposed site permit at section 13.1 to require that the Avian and Bat Protection Plan, required under section 6.7, include an Eagle Protection Plan and a minimum of one year of post-construction eagle surveys. Survey plans and protocols for the post-construction surveys will be incorporated into the Avian and Bat Protection Plan, which will be developed in consultation with the Commission, DNR, and USFWS. According to the proposed site permit, the Applicant must submit its Avian and Bat Protection Plan at least 10 working days prior to the pre-construction meeting. The Avian and Bat Protection Plan may identify additional steps to avoid, minimize, and mitigate impacts to eagles, such as a setback from the nest or creating habitat elsewhere to alter the eagles' behavior. Findings 88 through 90 address wildlife surveys and the bald eagle nest.

Trumpeter Swans

The DNR expressed concern over a pair of state-listed threatened trumpeter swans nesting about half mile south of the Project site. The DNR stated that observations and fatalities should be immediately reported to the DNR.

EFP Response: The Avian and Bat Protection Plan, as discussed above and in section 6.7 of the proposed site permit, will address fatalities and can address observations of protected species. Findings 94 and 95 also address this issue.

Faribault County

Faribault County adopted a wind energy conversion system (WECS) ordinance on October 19, 2010. The ordinance states that its purpose is to "set forth a process for permitting wind energy facilities under Minnesota Statutes, Chapter 216F as amended." However, Faribault County Planning and Zoning submitted a letter during the first comment period stating that its ordinance was intended to address only those projects that were not otherwise subject to siting under Minnesota Statutes chapter 216F. The Applicant addressed Faribault County's zoning and comprehensive plans in its application, but did not address the recently adopted ordinance. Faribault County has not assumed authority to permit LWECS under Minnesota Statutes section 216F.08.

Certain standards adopted by ordinance by Faribault County are more stringent than the Commission's General Permit Standards as set forth in Docket No. E,G-999/M-07-1102. More stringent setbacks include: 1,000 feet from residences; 1.25 times the turbine height from participating property boundaries; the greater of 250 feet or 1.1 times the turbine height from public road rights-of-way; and 600 feet from certain wetlands. The county ordinance also

requires that feeder lines be buried. County ordinance requirements were not included as special conditions in the Draft Site Permit because Faribault County stated it did not intend for this ordinance to apply to LWECS and indicated it would provide additional comments after the draft site permit was issued.

After issuance of the draft site permit, the chair of the Faribault County Board of Commissioners submitted comments on behalf of the county stating that it supports the Project, but addressed three issues: 1) a preference by the county board to bury the feeder lines for consistency throughout the county; 2) reminding the Applicant to obtain local permits, including a utility permit, which may impose additional restrictions; and 3) a requirement imposed on the Applicant to enter into a development agreement with the county.

EFP Response: EFP staff recommends undergrounding the feeder lines and discusses this issue below under the heading “Feeder Lines.” Section 4.15 of the proposed site permit requires Big Blue Wind to obtain approval from local governments to place feeder lines in public rights-of-way and section 10.5 requires Big Blue Wind to obtain any other permits or authorizations that may be required to construction and operate a LWECS. Section 7.8 of the proposed site permit requires Big Blue Wind to make satisfactory arrangements with the appropriate governmental body with jurisdiction over roads, which would encompass a development agreement. Finding 69 addresses this issue.

Minnesota Statutes section 216F.081 requires a site permit to include more stringent standards for LWECS adopted by a county unless there is good cause not to apply those standards. A “good cause” analysis is not applicable in this case because the county did not intend for its WECS ordinance to apply to LWECS. Finding 42 addresses this issue.

Impacts to Dogs and Horses

EFP staff received comments from Jason and Laura Larsen during the first and second comment periods expressing concern that the Project would negatively affect their business of boarding dogs and training horses. Both dogs and horses spend much time outside on their property. The Applicant submitted a letter addressing this issue on June 14, 2011, stating that the nearest turbine would be more than 3,100 feet from their residence and 2,300 feet from their property line if the GE 1.6 MW turbine was used for the Project. Other turbine layouts are similarly located, but the Nordex and Gamesa turbine layouts only show one turbine near the Larsen property. The Applicant modeled the effects from noise and shadow flicker on the Larsen residence using the GE 1.6 MW turbine. The modeling showed that the Larsen residence is anticipated to receive two hours and four minutes of shadow flicker per year and the noise level would be approximately 34.6 decibels under the worst case wind conditions.

EFP Response: Noise and shadow flicker impacts are addressed through setbacks and the noise standard, which is based on impacts to humans. Section 4.1 of the proposed site permit requires a setback from non-participating property of three rotor diameters (RD) in non-prevailing wind directions and five RD in prevailing wind directions, which minimizes noise and shadow flicker impacts. If the GE 1.6 MW turbine was selected, a three RD setback of 807 feet and a five RD setback of 1,345 feet would apply to non-participating properties. Because the GE turbine has the smallest RD among all turbines under consideration, the required setback under section 4.1 of the permit would be greater for the Nordex and Gamesa turbines.

The Applicant's letter only analyzed impacts using the GE 1.6 MW turbine; therefore, if a different turbine is selected, the impacts from noise and shadow flicker may be greater or smaller. Longer durations of shadow flicker would be experienced if a different turbine was chosen with a bigger rotor diameter, but these turbines would be set back farther from homes and non-participating landowner's property. Noise may be louder or quieter on the Larsen property depending on the turbine model. As discussed in the Applicant's letter, the nearest turbine in the GE 1.6 MW layout to the Larsen's property line is 2,300 feet, which is a greater setback than what is required by the proposed site permit. The Minnesota Department of Health report titled "Public Health Impacts of Wind Turbines" (Health Dept. White Paper) found that noise, including low frequency noise, from a wind turbine is generally not an issue beyond ½ mile (2,640 feet) to humans.

The analysis in the Applicant's letter focused on the Larsen residence, but the attached maps show noise and shadow flicker impacts on the Larsen property. EFP staff notes that the shadow flicker map has some inaccuracies, but EFP staff evaluated shadow flicker impacts to the edge of the Larsen property using shadow flicker maps that were submitted for all turbine layouts on June 20, 2011. EFP staff estimates that impacts to the property would be less than 10 hours of shadow flicker per year with a likelihood of five to seven hours per year at the edge of the property, depending on turbine selection. EFP staff estimates that noise levels near the edge of the Larson property would be between 42.5 decibels and 38.75 decibels if the GE 1.6 MW turbine was selected.

Wind turbines typically emit sound in the frequency range between 63 Hz and 8,000 Hz when the turbines are operating at speeds greater than 10 meters per second (22 miles per hour) at a 10-meter height (33 feet). Cut-in speeds for wind turbines are generally around 7 miles per hour and sound is generated at the hub height, which is typically 80 meters (262 feet). Low-frequency sound is defined as sound at frequencies between 12.5 Hz and 200 Hz, and infrasound at frequencies below 20 Hz. The Health Dept. White Paper found that as one moves away from a noise source, the loudness at higher frequencies decreases more rapidly than at lower frequencies. In other words, lower frequencies could travel further.

Animals can be affected by wind turbines, but they appear to be more sensitive to sound above the typical frequency range of a wind turbine. cursory research by EFP staff indicates that humans are more affected by wind turbine noise than horses and dogs. According to an article on the Louisiana State University website titled "How Well Do Dogs and Other Animals Hear?", dogs hear frequencies between 67 Hz and 45,000 Hz and horses hear frequencies between 55 Hz and 33,500 Hz. For comparison, humans hear frequencies between 64 Hz and 23,000 Hz, according to the article. According to an article titled "Hearing in Horses" posted December 25, 2010, on The Equine Chronicle Online, horses can hear higher pitched noises than humans, but not as high as a dog or cat can hear. Because a horse's hearing is not that accurate, the article discusses that it may be possible that when a horse hears a sound, but cannot see what is making the sound, they may become nervous. This article quotes Dr. Brian Timney, a Professor of Psychology and Dean of Social Science at the University of Western Ontario who stated "...horses have greater sensitivity in the high frequency range and poorer sensitivity at lower frequencies, than humans." The journal, Equine Practice, published an article in March 1983 also concluded horses are "somewhat less sensitive" to low-frequency sounds than humans and are "clearly more sensitive" than humans above 8,000 Hz.

EFP staff did not find data demonstrating a relationship between animals and shadow flicker from wind turbines. Findings 49 and 52 address the impact of noise and shadow flicker on animals.

Impacts to Adjacent Property Owner

Jim Welchlin wrote a comment and spoke at the public meeting expressing concern over impacts to his property in Martin County, which is adjacent to the Project boundary. At the meeting, he specifically wanted to know the impacts of shadow flicker to his residence because he was not sure if shadow flicker data that will be provided prior to the pre-construction meeting will include his residence.

EFP Response: Section 6.2 of the proposed site permit requires the permittee to provide data, including anticipated duration, on shadow flicker for each residence of non-participating landowners and participating landowners and its effort to avoid, minimize, and mitigate shadow flicker impacts resulting from a turbine. These data are a compliance filing required prior to the pre-construction meeting. The Applicant provided information to EFP staff via email stating that the Welchlin residence is beyond the distance in which 0.015 hours per year of shadow flicker would be experienced if the GE turbine was used. Noise modeling found that his residence would experience less than 35 decibels, which is well under the noise standard pursuant to Minnesota Rules chapter 7030.

Feeder Lines

Many of the written and oral comments from the public meeting focused on feeder lines. Feeder lines are an associated facility of wind projects permitted by the Commission. Feeder lines are usually 34.5 kV lines that typically run along road rights-of-way on private land via easements or within road rights-of-way after the electricity has been collected through underground lines between turbines. Lines that carry power from each individual transformer at the wind turbine are required to be buried in site permits issued by the Commission primarily because they are out in the agricultural fields. Feeder lines are lines that carry power after some collection of power between turbines has occurred to a project substation or the point of interconnection on the transmission grid.

As discussed above, the Faribault County WECS ordinance requires that feeder lines equal to or less than 35 kV in capacity installed as part of a WECS be located in the right-of-way and buried where reasonably feasible (pursuant to section 35.I.4.a). The ordinance further states that feeder lines are not considered an essential service.

The chair of the Faribault County Board of Commissioners submitted a comment on behalf of the board stating the board prefers the feeder lines to be buried for consistency throughout the county. The Jo Daviess Township Board of Supervisors submitted a comment stating that its position is to bury any power lines associated with the Project based on the following: 1) the Faribault County ordinance, 2) a two-turbine project in the county has buried lines, 3) appearance and safety issues, and 4) it may costs more per acre to apply chemicals by airplanes near the Project and feeder lines, which would be detrimental for local farmers.

Public oral and written comments on whether the feeder lines should be buried were mixed. At the public meeting, people indicated through verbal communication that in the early stages of

project development, there was an understanding that the feeder lines located in public rights-of-way would be underground.

The Applicant submitted information into the record stating its preference for overhead feeder lines on April 22, 2011, and June 14, 2011. The Applicant stated that costs to construct the Project would increase approximately 7 percent if the feeder lines had to be buried. Big Blue Wind estimated that the approximate costs of overhead lines would be \$150,000 per mile and underground lines would be \$500,000 per mile, which would add approximately \$5,250,000 of costs to the Project and increase the Project budget by more than 7 percent. The Applicant argued that wind projects have very tight margins and Project viability would become an issue if feeder lines were required to be buried. The Applicant also raised other reasons to support overhead lines, such as reduced risk of damaging existing underground infrastructure during construction and reduced risk of damaging private tile lines. The Applicant submitted a letter prepared by its contractor, Fagen, Inc., which made similar arguments, but added that maintenance is easier on overhead lines and overhead lines are more common.

EFP Response: Recent permits issued by the Commission allow feeder lines to be either overhead or buried as long as locations are negotiated with the affected landowners through easement or lease agreements. Recent permits required that any overhead feeder lines that parallel public roads be placed within the public rights-of-way or on private land immediately adjacent to public roads. Further, any overhead feeder lines to be located within public rights-of-way must have the approval of the governmental unit responsible for the affected right-of-way. Recently permitted projects that are burying feeder lines include the 44 MW Oak Glen Wind Farm, 95 MW Paynesville Wind Farm, 20 MW Glacial Ridge Wind Farm, 205 MW Lakefield Wind Project, 41 MW Lake County Wind Energy Project, 400 MW Bent Tree Wind Farm, 201 MW Nobles Project, 200.5 MW Wapsipinicon Wind Project, 79.5 MW Chanarambie Wind Power Plant, and the 78 MW Goodhue Project. However, with the exception of the Goodhue Project, requiring underground feeder lines was not a permit condition for those projects. Further, it is not uncommon for a county to require feeder lines to be buried where feasible. An example of where burying feeder lines would not be feasible is shallow bedrock.

There are advantages and disadvantages to underground and overhead power lines. The costs for underground and overhead can vary, depending on the size of the project. The cost estimates for underground and overhead feeder lines supplied by the Applicant are within the range for a project of that size. In addition to a cost advantage, overhead lines can be constructed within a shorter timeframe, have less impact during construction, and have faster restoration times if an outage occurs. In contrast, underground lines have a lower outage frequency, are generally safer due to less public exposure, and do not have a visual impact. The difference in cost can be made up with fewer outages due to weather.

Of the 23 miles comprising the electrical collection system needed to deliver power, the Applicant stated in its application and comments that approximately 15 miles would be overhead. The Applicant eFiled maps of its overhead feeder line layouts for the Project based on the GE 1.6 MW turbine layout on June 20, 2011. As shown on the feeder line layout maps, there is an existing distribution line owned by Benco Electric Cooperative that would parallel the feeder lines for all but three miles of the proposed feeder line route. If overhead feeder lines are used, they cannot be co-located with the overhead distribution lines without permission from the utility and the Applicant does not have permission. Without co-location, if overhead feeder lines

are located in public rights-of-way (ROW), they must be located on the other side of the road as the distribution line. As a result, where the distribution line crosses the road, the Project's feeder line would also cross the road in the opposite direction. There are several of these crossings shown on the feeder lines layouts where the distribution line and the feeder line would cross over the road at approximately the same location, but in different directions and on different structures.

The Applicant stated in its application that the overhead feeder lines would parallel existing roads and utilize the county and township road ROW; however, it does not appear that the overhead lines can be accommodated in these ROWs. According to the Applicant, the needed width for its feeder lines is 21 feet (10.5 feet on each side of the poles), which includes clearance required by the National Electrical Safety Code 234-1 and 234-C1b and line blowout (the area that is affected by the sway of the line under wind and heat conditions). Available county and township ROW ranges from up to 16.5 feet to up to 30 feet on each side of the road when the width of the road surface is subtracted. Therefore, if a feeder line pole was centered in the ROW, it appears from these estimates that there would not be enough space for overhead feeder lines in all locations. Moreover, it is common for poles to be placed one or two feet from the outer edge of a ROW to accommodate drainage ditches along roadways among other things. Therefore, the owner of any transmission, distribution, or feeder line must secure private easements to accommodate the full width needed to accommodate the lines. The Applicant does not have private land agreements adjacent to public road ROW for feeder line placement. Private landowners adjacent to ROW have a right to develop their property as they wish, which may include planting trees where the branches could reach the edge of the public ROW or building structures. In order for Big Blue Wind to construct overhead feeder lines, it would need to secure permits from Faribault County and the Jo Daviess Township in addition to securing any private easements necessary to accommodate its lines. Based on the record and the Applicant's timeline for construction, it is unlikely that its feeder lines could be placed overhead. Lastly, the Applicant's cost argument for overhead lines is not persuasive primarily because it developed and designed the Project to necessitate the length of feeder lines it requires to deliver power to the Project substation.

Whether the feeder lines are overhead or underground, the Applicant will be required to secure local permits. Section 4.15 of the proposed site permit states "[a]ny feeder lines that parallel public roads shall be placed within the public rights-of-way or on private land immediately adjacent to public roads. If feeder lines are located within public rights-of-way, the Permittee shall obtain approval from the governmental unit responsible for the affected right-of-way." Further, section 10.5 states that the permittee is "responsible for acquiring any other federal, state, or local permits or authorizations that may be required to construct and operate a LWECs within the authorized site," which would include a utility permit.

Based on the record and the analysis above, EFP staff included a special permit condition in the proposed site permit, section 13.2, requiring feeder lines to be located in accordance with Faribault County's WECS ordinance. Findings 26 and 72 in addition to section 4.15 of the proposed site permit address the electrical collection system.

Telecommunications

Bevcomm, a wholly owned subsidiary of Rural Communications Holding Corporation, expressed concern that the Project's feeder lines could induce electrical interference to its

underground copper telephone cables rendering them unusable. Bevcomm is the local telecommunications provider for the area and has both copper and fiber optic cables underground in the rights-of-way throughout the Project area. Bevcomm noted electrical interference was discovered by Interstate Telecommunications Cooperative, Inc. in its facilities near Lake Benton, which is near numerous wind facilities.

EFP Response: Section 4.15 of the proposed site permit requires the permittee to comply with all Institute of Electrical and Electronics Engineers, Inc. (IEEE) standards, which should reduce any potential electrical interference to the existing copper telecommunication cables. EFP staff notes that there is no evidence that it makes a difference whether the feeder lines are overhead or underground. Section 6.4 prohibits the permittee from causing interference to telecommunications systems, in addition to other communication systems, and requires the permittee to take timely measures to correct any problems. Further, Bevcomm could submit a complaint in which the permittee would follow its compliant procedures pursuant to section 5.8 and attachments two and three of the proposed permit. A complaint regarding telecommunications interference would be considered a substantial complaint that could result in a permit modification or suspension. Finding 74 addresses potential interference to telecommunications in addition to television and radio.

Other Issues Raised in Comments

Other concerns raised in the comments include: impacts to property values, drain tile; impacts from noise, shadow flicker, turbine lighting/visual aesthetics, stray voltage, and construction with regard to roads; decommissioning; and underground/overhead feeder lines.

EFP Response: Many of these issues are addressed in the Findings of Fact. For example, Findings 45 - 50 address noise, Findings 51 - 53 address shadow flicker, Findings 64 – 65 address stray voltage, Findings 54 - 57 addresses turbine lighting and general aesthetics, Finding 82 addresses property values, Findings 67 – 70 address road impacts from construction, and Findings 104 – 107 discuss decommissioning. The issue of constructing overhead versus underground feeder lines is discussed above and in Findings 26 and 72. As stated in Finding 80, drain tile damage will be repaired according to the terms in the lease agreements.

Based on the record of this proceeding, EFP staff concludes that the Big Blue Wind Farm meets the procedural requirements and the considerations and standards for issuance of a site permit identified in Minnesota statutes and rules. The site permit application and the record have been reviewed pursuant to the requirements of Minnesota Statutes chapter 216F and Minnesota Rules chapter 7854.

EFP staff has prepared for Commission consideration proposed Findings of Fact, Conclusions of Law and Order (Attachment 1), an Exhibit List (Attachment 2), and a proposed Site Permit (Attachment 3) for the 36 MW Big Blue Wind Farm.

Proposed Findings of Fact

The proposed Findings of Fact address the procedural aspects the process followed, describe the Project, and address the environmental and other considerations of the Project. The proposed Findings of Fact

reflect some findings that were also made for other LWECS projects. The site considerations addressed in the proposed Findings of Fact (such as human settlement, public health and safety, noise, recreational resources, community benefits, effects on land based economies, archaeological and historical resources, wildlife, and surface water) track the factors described in the Commission’s rules for other types of power plants that are pertinent to wind projects. The following outline identifies the categories of the Findings of Fact.

<u>Category</u>	<u>Findings</u>
Background and Procedure	1 – 16
Certificate of Need	17
Permittee	18 – 19
Interconnection Agreement.....	20
Project Description.....	21 – 31
Site Location, Characteristics, Topography	32 – 33
Wind Resource Considerations.....	34 – 36
Wind Rights and Easement/Lease Agreements	37 – 38
Site Considerations	39
Human Settlement.....	40 – 44
Noise	45 – 50
Shadow Flicker	51 – 53
Visual Values	54 – 57
Public Health and Safety.....	58 – 66
Public Services and Infrastructure	67 – 75
Recreational Resources	76 – 78
Community Benefits	79
Effects on Land Based Economics	80 – 81
Property Values.....	82
Archaeological and historical Resources	83 – 85
Air and Water Emissions	86
Wildlife	87 – 92
Rare and Unique Natural Resources	93 – 95
Vegetation	96
Soils.....	97
Geologic and Ground Water Resources.....	98
Surface Water and Wetlands.....	99
Future Development and Expansion.....	100 – 102
Maintenance	103
Decommissioning and Restoration	104 – 107
Site Permit Conditions	108 – 110

Exhibit List

EFP staff has prepared an exhibit list of documents that are part of the record in this permit proceeding. See Attachment 3.

Proposed Site Permit

EFP staff has prepared a site permit for the Commission’s consideration. See Attachment 4. The conditions in this proposed site permit are consistent with conditions included in other LWECS site permits issued by the Commission. The proposed site permit is different from the draft site

permit issued by the Commission. Special conditions were added consistent with the findings for this Project.

Commission Decision Options

A. Big Blue Wind Farm Findings of Fact, Conclusions of Law, and Order

1. Adopt the attached Findings of Fact, Conclusions of Law, and Order prepared for the 36 MW Big Blue Wind Farm in Faribault County.
2. Amend the Findings of Fact, Conclusions of Law, and Order as deemed appropriate.
3. Make some other decision deemed more appropriate.

B. LWECS Site Permit for the 36 MW Big Blue Wind Farm

1. Issue the proposed LWECS Site Permit for the 36 MW Big Blue Wind Farm to Big Blue Wind Farm, LLC.
2. Amend the proposed LWECS Site Permit as deemed appropriate.
3. Deny the LWECS Site Permit.
4. Make some other decision deemed more appropriate.

EFP Staff Recommendation: The staff recommends options A1 and B1.

**STATE OF MINNESOTA
PUBLIC UTILITIES COMMISSION**

Ellen Anderson	Chair
David Boyd	Commissioner
J. Dennis O'Brien	Commissioner
Phyllis Reha	Commissioner
Betsy Wergin	Commissioner

In the Matter of the Application of
Big Blue Wind Farm, LLC for a Large
Wind Energy Conversion System
(LWECS) Site Permit for the 36 MW Big
Blue Wind Farm in Faribault County

ISSUE DATE:

**DOCKET NO.
IP-6851/WS-10-1238**

**FINDINGS OF FACT, CONCLUSIONS
OF LAW, AND ORDER ISSUING A
SITE PERMIT TO BIG BLUE WIND
FARM, LLC FOR THE BIG BLUE
WIND FARM**

The above-entitled matter came before the Minnesota Public Utilities Commission (Commission) on December 6, 2010, pursuant to an application submitted by Big Blue Wind Farm, LLC (Big Blue Wind or Applicant) for a site permit to construct, operate, maintain, and manage the Big Blue Wind Farm (Project), a 36 megawatt (MW) nameplate capacity Large Wind Energy Conversion System (LWECS), including associated facilities, in Faribault County.

A public meeting was held on April 19, 2011, in Blue Earth, Minnesota. The meeting was presided over by Department of Commerce (DOC) Energy Facility Permitting (EFP) staff. The meeting continued until all persons who desired to speak had done so. The public comment period closed on May 6, 2011.

STATEMENT OF ISSUE

Should the Applicant be granted a site permit under Minnesota Statutes section 216F.04 to construct a 36 MW LWECS in Faribault County?

Based upon the record created in this proceeding, the Public Utilities Commission makes the following findings:

FINDINGS OF FACT

Background and Procedure

1. On December 6, 2010, Big Blue Wind filed a LWECS site permit application with the Public Utilities Commission for up to 36 MW of nameplate wind power generating capacity identified as the Big Blue Wind Farm in Faribault County.
2. The Department of Commerce (DOC) Energy Facility Permitting (EFP) staff reviewed and determined that the application complied with the application requirements of Minnesota Rule 7854.0500.¹
3. On January 14, 2010, a Commission order was issued accepting the application for the Big Blue Wind Farm.²
4. On January 24 and 25, 2011, Big Blue Wind filed a revised LWECS site permit application to reflect corrections made to its application.³
5. On January 25, 2011, EFP staff issued a notice of application acceptance and scoping meeting.⁴ This notice was posted on eDockets and the Commission's website on January 26, 2011.
6. Published notice of site permit application acceptance and opportunity to comment on the permit application and issues to consider in the development of a draft site permit appeared in the *Sentinel* on January 17, 2011, and *The Faribault County Register* on February 7, 2011.⁵ The published notice provided: a) description of the proposed project; b) deadline for public comments on the application; c) description of the site permit review process; and d) identification of the public advisor. The *Sentinel* has a circulation in Faribault County and Martin County, which borders the Project. The notice published meets the requirements of Minnesota Rule 7854.0600, subpart 2.
7. On January 25, 2011, the Applicant distributed copies of the site permit application and notice of application acceptance to landowners within the project boundary and government agencies.⁶ The Applicant mailed the notice of application acceptance to Faribault County and each city council and township board in Faribault County.⁷ The notice and application distribution met the requirements of Minnesota Rules 7854.0600, subparts 2 and 3.

¹ Exhibit 2.

² Exhibit 3.

³ Exhibit 1.

⁴ Exhibit 4.

⁵ Exhibit 5.

⁶ Exhibit 6.

⁷ *Id.*

8. Public comments on the site permit application and issues to consider in the development of a draft site permit were accepted until February 18, 2011. EFP staff received seven written comments.⁸
9. On March 1, 2011, EFP staff recommended that a draft site permit be issued and distributed for public comment.⁹
10. On March 11, 2011, a Commission order made a preliminary determination that a draft site permit may be issued.¹⁰
11. On March 24, 2011, the Applicant eFiled updated turbine layout maps for the GE 1.5 MW turbine and the Repower 2.05 MW turbine.
12. On March 30, 2011, EFP staff issued a notice of availability of the draft site permit and public meeting.¹¹ This notice was posted on eDockets on April 1, 2011. The deadline for submitting comments on the draft site permit was May 6, 2011. The notice met the requirements of Minnesota Rule 7854.0900, subpart 1. This notice was posted on eDockets on April 1, 2011. Published notice of the availability of the draft site permit and public meeting in *The Faribault County Register* on April 11, 2011, the *Sentinel* on April 6, 2011, and the *EQB Monitor* on April 4, 2011, as required by Minnesota Rule 7854.0900, subpart 2.¹² Notice was sent to interested persons, landowners in the Project area, and government agencies.¹³ Distribution of the notice of availability of the draft site permit met the requirements in subpart 2.
13. A public meeting was held on the evening of April 19, 2011, in Blue Earth, Minnesota. Approximately 90 people attended the public hearing and 18 people offered testimony. A court reporter prepared a record of the public meeting.¹⁴
14. EFP staff received 28 written comments from 25 individuals on the Draft Site Permit.¹⁵
15. On May 2, 2011, the Applicant updated its turbines options to include the GE 1.6 MW turbine, Nordex 2.5 turbine, and the Gamesa 2.0 MW turbine.¹⁶ On June 20, 2011, the Applicant clarified that the GE 1.5 MW turbine model as described in its application is still under consideration and has virtually the same attributes as the GE 1.6 MW turbine model.¹⁷

⁸ Exhibit 7.

⁹ Exhibit 8.

¹⁰ Exhibit 9.

¹¹ Exhibit 10.

¹² Exhibits 11 and 12.

¹³ Exhibit 10.

¹⁴ Exhibit 13.

¹⁵ Exhibit 21.

¹⁶ Exhibit 16.

¹⁷ Exhibit 17.

16. On June 16 and June 20, 2011, the Applicant eFiled new turbine layout maps and site control maps for turbines under consideration.¹⁸ The GE 1.5 MW turbine layout is only reflected in the site control map.¹⁹ The layout for the GE 1.5 MW turbine is the same as the layout submitted for the GE 1.6 MW turbine with the exception that the GE 1.5 MW turbine has an additional two turbine locations in sections 33 and 27. These additional two turbines do not have noise and shadow flicker analyses, or any other analyses, associated with these sites. A map showing the location of two meteorological towers was eFiled on June 27, 2011.

Certificate of Need

17. The Applicant is not seeking a certificate of need because the Project is not a large energy facility as defined by Minnesota Statutes section 216B.2421.²⁰

Permittee

18. Big Blue Wind is a wholly owned subsidiary of Minnesota Wind Partners I, LLC, which is currently owned by Exergy Minnesota Holdings, LLC, which is owned by Exergy Development Group of Idaho, LLC.²¹ Exergy Minnesota Holdings, LLC will likely have multiple owners in the future due to its C-BED status.²²
19. Big Blue Wind has a power purchase agreement with Xcel Energy for the sale of the power to be generated by the Project.

Interconnection Agreement

20. Big Blue Wind has a generator interconnection agreement with the Midwest Independent Transmission System Operator, Inc. and Interstate Power and Light Company.

Project Description

21. The Project nameplate capacity will be 36 MW. The Project will be comprised of up to 24 GE 1.5 MW or 22 GE 1.6 MW wind turbine generators with a rotor diameter of 270 feet (82.5 meters), 14 Nordex 2.5 MW turbines with a rotor diameter of 328 feet (100 meters), or 18 Gamesa 2.0 MW turbines with a rotor diameter of 318 feet (97 meters) on 262.5 feet (80 meters) turbine towers.²³ The GE 1.5 MW turbine and the GE 1.6 MW turbine have the same attributes except for the control system.²⁴ Associated facilities will include pad mounted step-up transformers for each wind turbine, access roads, an electrical collection system (feeder and collector lines), two permanent meteorological tower, Supervisory Control and Data Acquisition (SCADA) communication lines and

¹⁸ Exhibits 19 - 22.

¹⁹ See exhibit 20.

²⁰ Exhibit 1 at 3.

²¹ *Id.* at 1.

²² *Id.*

²³ *Id.* at 9, exhibits 16 and 17.

²⁴ Exhibit 17.

building, and a Project substation. The Project's turbine locations and associated facilities are shown on maps posted on eDockets on June 16 and 20, 2011, and are attached to the site permit with the exception of the GE 1.5 MW turbine layout.²⁵ The layout for GE 1.5 MW turbine included in the application was updated on March 24, 2011, as reflected in Exhibit 10. The GE 1.5 MW turbine layout was updated again on June 16, 2011, and is currently only reflected in the site control map in Exhibit 20. See Finding 16 for more details.

22. The total height of the tower and blade in the vertical position will be: 397.5 feet for both the GE 1.5 MW and GE 1.6 MW wind turbines; 426.5 feet for the Nordex 2.5 MW turbines; or 421 feet for the Gamesa 2.0 MW turbines. Both GE turbines have a rotor swept area of 56,832 square feet, a rotor speed that varies from 10.1 to 18.7 revolutions per minute, a cut-in wind speed of 7.8 miles per hour, and a cut-out wind speed of 56 miles per hour.²⁶ The Nordex turbine has a rotor swept area of 84,540 square feet, a rotor speed that varies from 10.8 to 18.9 revolutions per minute, a cut-in wind speed of 6.7 miles per hour, and a cut-out wind speed of 56 miles per hour.²⁷ The Gamesa turbine has a rotor swept area of 79,534 square feet, a rotor speed that varies from 9 to 19 revolutions per minute, a cut-in wind speed of 6.7 miles per hour, and a cut-out wind speed of 56 miles per hour.²⁸ The GE, Nordex, and Gamesa turbines have a similar rotor and nacelle design. The rotor consists of three blades, composed of carbon fibers and fiberglass, mounted to the hub, which is attached to the nacelle that houses the main components of the wind turbine, including the gearbox, generator, and the main control panel. Electricity is produced by the generator and transmitted through insulated cables to the power conditioning unit known as a pad mount transformer located at the base of the tower.
23. Big Blue Wind anticipates it will select a turbine type prior to the deadlines associated with compliance filings required prior to the start of construction. The Applicant plans to begin construction as soon as possible after a site permit is issued.
24. The turbine towers will be 262.5 feet (80 meters) in height, which will be a tapered tubular steel tower.²⁹
25. Electricity from the Project will be delivered to the point of interconnection at the 161 kV bus of the proposed Faribault switching station from the Project substation, located immediately adjacent to the existing 161 kV Winnebago – WinnCo transmission line just south of 90th Street in section 26. The SCADA building will be located next to the Project substation.³⁰ The substation equipment will be installed on concrete foundations and consist of a graveled footprint of approximately two to four acres, a chain link perimeter fence, and an outdoor lighting system.³¹

²⁵ Exhibits 19 - 22.

²⁶ Exhibits 16 and 17.

²⁷ Exhibit 16.

²⁸ *Id.*

²⁹ *Id.* at 9.

³⁰ Exhibit 1 at 14.

³¹ *Id.* at 12.

26. The 34.5 kV electrical collection system will be 23 miles in length.³² Fifteen miles of the 34.5 kV electrical power lines will collect power from the turbine and transmit it to the Project substation.³³ Eight miles will connect turbines through underground cables installed in a trench approximately three to four feet deep.³⁴ A clean fill material such as sand or fine gravel will cover the cable before the native soil and rock are backfilled over the top.³⁵ The Applicant's preference is to construct 15 miles of the feeder lines overhead within the public road rights-of-way.³⁶ Section 4.15 of the site permit requires the Applicant to obtain approval from the government unit responsible for the affected rights-of-way. Faribault County and Jo Daviess Township have jurisdiction over the affected rights-of-way. Section 10.5 requires the Applicant to obtain any other federal, state, or local permits or authorizations that may be required, which would include a local utility permit. Section 13.2 requires the Applicant to bury all feeder lines located in public rights-of-way. See Finding 72 for additional information.
27. The Project will have two permanent meteorological towers, 262.5 feet tall (80 meters).³⁷ Preliminary locations for the meteorological towers are mapped in a letter eFiled on June 27, 2011.³⁸ Meteorological towers shall be marked as required by the Federal Aviation Administration (FAA). Section 4.11 of the site permit requires that all permanent towers for meteorological equipment shall be free standing (i.e., no guy wires) and not placed closer than 250 feet from the edge of the nearest public road right-of-way and the boundary of the Permittee's site control, or in compliance with the county ordinance regulating meteorological towers in the county the tower is built, whichever is more restrictive. Section 21 of Faribault County's ordinance requires all towers to have a minimum setback of the height of the tower plus 10 feet from the edge of the parcel or recorded easement boundary. Faribault County does not allow towers in land designated as A-1 (Shoreland Ag District). The Applicant will comply with the county ordinance regulating towers.
28. All turbines and the permanent meteorological towers will be interconnected with fiber optic communication cable that will be installed underground. The communication cables will run back to a central host computer, which will be located at the SCADA building (see Finding 23 for location of the SCADA building). Signals from transformers at each of the delivery points will also be fed to the central SCADA host computer. This computerized supervisory network will provide detailed operating and performance information for each wind turbine. The Applicant will maintain a computer program and database for tracking each wind turbine's maintenance history and energy production.

³² *Id.*

³³ *Id.*

³⁴ *Id.*

³⁵ Exhibit 1 at 15.

³⁶ Exhibit 23.

³⁷ Exhibit 1 at 16.

³⁸ Exhibit 28.

29. The Project will have eight miles of permanent miles of access roads.³⁹ Temporary access roads will be up to 40 feet wide and permanent access roads will be approximately 16 to 36 feet wide using crushed rock.⁴⁰
30. Big Blue Wind expects to begin commercial operation in the fall of 2011.
31. The estimated Project total installed cost is \$89 million and ongoing operations and maintenance are estimated to be \$1.8 million per year.⁴¹

Site Location, Characteristics and Topography

32. The proposed Project will be located in Faribault County in the Jo Daviess Township in sections 13-36.⁴² The Project area is located approximately six miles west of the city of Blue Earth. The Project site encompasses approximately 15,000 acres, which is primarily agricultural land.⁴³ The Project area is located within the Minnesota River Prairie Subsection with loamy ground moraine land that ranges from level to gentle sloping landscapes.⁴⁴ Ninety-three percent of the Project area is agricultural with row-crops as the dominant land cover and some pasture and hayland.⁴⁵ Elevation varies from 1,050 to 1,130 feet above mean sea level.⁴⁶ Wind turbine and access roads are sited to take into account the contours of the land to minimize impact.
33. Construction of the turbines sites and access roads will involve temporarily disturbing land within the Project area.

Wind Resource Considerations

34. Wind monitoring within the Project area indicates that the long-term annual predicted mean wind speed at 80 meters (262.5 feet) is 7.7 meters per second (17.2 miles per hour).⁴⁷ The prevailing wind directions are south-southeast and northwest.⁴⁸ In general, a higher percentage of the annual energy budget results from southerly winds, which are most frequent in the warmer weather months. The north and northwest winds typically occur in winter.
35. For this Project, turbines will be generally sited in small clusters within the site boundaries. Wind turbines are sited to have good exposure to winds from all directions with emphasis on exposure to the prevailing wind directions while considering site topography, natural resource features, setbacks and wind resources. The turbines are typically oriented west-southwest to north-northeast, which is roughly perpendicular to the prevailing southerly and northwest winds. Turbine placement, aside from other

³⁹ Exhibit 1 at 73.

⁴⁰ *Id.*

⁴¹ *Id.* at 79.

⁴² *Id.* at 6.

⁴³ *Id.* at 6 and 33.

⁴⁴ *Id.* at 46.

⁴⁵ *Id.* at 53.

⁴⁶ *Id.* at 46.

⁴⁷ Exhibit 1 at 66.

⁴⁸ *Id.* at 70.

resource features where setbacks or wind access buffers are required, will be designed to provide sufficient spacing between the turbines to minimize internal wake losses. Given the prevalence for southerly and northerly winds, the spacing is widest in the north-south direction. Greater or lesser spacing between the turbines or turbine strings may be used in areas where terrain dictates the spacing. Sufficient spacing between the turbines is utilized to minimize wake losses when the winds are blowing parallel to the turbines. Wake loss occurs when a turbine is spaced too close downwind of another turbine, and therefore, produces less energy and is less cost-effective. Section 4.10 of the site permit addresses turbine spacing.

36. According to the application, projected average net annual output will be approximately 100,000 MWh (megawatt hours) assuming net capacity factors of approximately 38.2 percent.⁴⁹

Wind Rights and Easement/Lease Agreements

37. In order to build a wind facility, a developer must secure leases or easement agreements to ensure access to the site for construction and operation of a proposed project. These lease or easement agreements also prohibit landowners from any activities that might interfere with the execution of the proposed Project. Land and wind rights will need to encompass the proposed Project, including all associated facilities such as access roads, meteorological towers, and electrical collection system. Section 10.1 of the site permit requires the Applicant to demonstrate it has obtained the wind rights necessary to construct and operate the Project at least 10 working days before the pre-construction meeting.
38. The Applicant stated it has executed lease agreements that grant Big Blue Wind the necessary wind rights for the construction and operation of the Project. Within the approximately 15,000 acres site, the Applicant has lease agreements for approximately 5,177 acres. Big Blue Wind also has a lease agreement for a parcel outside the Project area in section 7 north of section 18 in the northwest corner of the Project area, which is necessary to meet the wind access buffer in section 4.1 of the site permit.⁵⁰

Site Considerations

39. Minnesota Statutes chapter 216F and Minnesota Rules chapter 7854 apply to the siting of LWECS. The rules require an applicant to provide a substantial amount of information to allow the Commission to determine the potential environmental and human impacts of the proposed project and whether the project is compatible with environmental preservation, sustainable development, and the efficient use of resources.⁵¹ Pursuant to Minnesota Statutes section 216F.02, certain sections in Minnesota Statutes chapter 216E (Minnesota Power Plant Siting Act) apply to siting LWECS, including section 216E.03, subdivision 7 (considerations in designating sites and routes). The analysis of the environmental impacts required by Minnesota Rule 7854.0500, subpart 7, satisfies the

⁴⁹ *Id.* at 80.

⁵⁰ See exhibits 19 - 22.

⁵¹ Minn. Stat. § 216F.03 and Minn. R. 7854.0500.

environmental review requirements; no environmental assessment worksheet or environmental impact statement is required for a proposed LWECS project.⁵² Therefore, environmental review is based on the application and the record. The following analysis addresses the relevant considerations to be applied to a LWECS project.

Human Settlement

40. The site is in an area of relatively low population density, which is characteristic of rural areas throughout Minnesota. In 2009, Jo Daviess Township had a population of 249 with 98 households.⁵³ The population of the city of Blue Earth was 3,395 in 2008.⁵⁴ In 2010, Faribault County had an estimated population of 14,533.⁵⁵
41. Faribault County adopted a wind energy conversion system (WECS) ordinance on October 19, 2010. Faribault County has not assumed authority to permit LWECS under Minnesota Statutes section 216F.08. The Project area is located in an area zoned for agricultural use (A-1, shoreland agricultural) and A-2 (general agricultural).⁵⁶
42. Certain standards adopted by ordinance by Faribault County on October 19, 2010, for WECS are more stringent than the Commission's General Permit Standards as set forth in Docket No. E,G-999/M-07-1102. Minnesota Statutes section 216F.081 requires a site permit to include more stringent standards for LWECS adopted by a county unless there is good cause not to apply those standards. Exhibit 7 contains a letter, dated February 18, 2011, from Faribault County stating that its ordinance was not intended to address wind energy conversion systems equal or greater than 5 MW. Exhibit 15 contains a letter from Faribault County, dated May 3, 2011, requesting that the feeder lines be buried as required by its ordinance. Because the ordinance was intended for wind energy conversion system less than 5 MW, the Commission need not determine whether there is good cause not to apply the county's standards. Feeder lines are addressed in Findings 26 and 72.
43. The Applicant has committed to a setback of 1,500 feet to all residences of non-participating landowners and 1,000 feet to all residences of participating residences.⁵⁷ Preliminary turbine layouts on the Applicant's constraint maps show setbacks from residences at 1,000 feet and 1,500 feet (see exhibits 19-21 for the constraint and site control maps). Section 4.2 of the site permit incorporates this setback. Big Blue Wind will also be required to set back its turbines a minimum of five rotor diameters, which would be a minimum of 1,345 feet, on the prevailing wind axis from non-participating landowners' property lines and three rotor diameters, which would be a minimum of 807 feet, on the non-prevailing wind axis. This wind access buffer is found in section 4.1 of the site permit. Big Blue Wind's proposed Project design must comply with the Minnesota Pollution Control Agency (PCA) noise standards pursuant to Minnesota Rules

⁵² Minn. R. 7854.0500, subp. 7.

⁵³ Exhibit 1 at 19.

⁵⁴ *Id.*

⁵⁵ U.S. Census Bureau, state and county quick facts at <http://quickfacts.census.gov/qfd/states/27/27043.html>.

⁵⁶ Exhibit 1 at 20.

⁵⁷ *See id.* at 25 (this setback varies slightly from the application, but the concept is similar).

chapter 7030.

44. There will be no displacement of existing residences or structures in siting the wind turbines and associated facilities. The impact of the proposed Project on human settlement and public health and safety will be minimal.

Noise

45. Wind turbines generate sound or noise when in motion. The level of sound (noise) varies with the speed of the turbine, the distance of the listener or receptor from the turbine, and surface characteristics of the site. Operation and maintenance of wind turbines and associated facilities increases noise levels. However, increases in noise levels are expected to be minimal due to the noise levels produced by the wind itself. Background noise levels in the Project area are typical of those in a rural setting, where existing nighttime noise levels are commonly in the low to mid-30 dBA. The dBA scale represents A-weighted decibels based on the range of human hearing.
46. Noise impacts to nearby residents will be factored into the turbine micro-siting process. The Applicant must demonstrate the Project can meet the noise standard pursuant to Minnesota Rules chapter 7030 (site permit sections 4.2 and 4.3). Noise levels predicted by computer models were compared to the Minnesota Pollution Control Agency (PCA) Daytime and Nighttime L10 and L50 Limits as stated in Minnesota Rule 7030.0040. These standards describe the limiting levels of sound established on the basis of present knowledge for the preservation of public health and welfare. These standards are consistent with speech, sleep, annoyance, and hearing conversation requirements for receivers within areas grouped according to land activities by the Noise Area Classification (NAC) system established in Minnesota Rule 7030.0050. The NAC-1 was chosen for receivers in the Project Area since this classification includes farm houses as household units. Daytime and nighttime limits for classification are: (1) L50 limit of 60 dBA and L10 limit of 65 dBA in daytime and (2) L50 limit of 50 dBA and L10 limit of 55 dBA at nighttime. The nighttime L50 limit of 50 dBA is the most stringent limit.
47. The Applicant analyzed noise for its turbines under consideration: GE 1.5 MW or 1.6 MW turbines, Nordex 2.5 MW turbines, or Gamesa 2.0 MW turbines. The GE turbines were modeled using WindPro and the international rule DIN ISO 9613-2.⁵⁸ That model incorporated a 2 dB(A) uncertainty and results reflected this uncertainty.⁵⁹
48. Cumulative noise impacts resulting from multiple turbine clusters were analyzed and geographically represented in eFiled maps.⁶⁰ The noise modeling reflected geographically for the GE 1.6 MW turbine applies to the GE 1.5 MW turbine with the exception of the two additional turbines in sections 33 and 27 that are only in the GE 1.5 MW turbine layout. These two turbines have not been analyzed for noise impacts. In a letter⁶¹ eFiled on June 20, 2011, Big Blue Wind stated that the sound power level is the same for both the GE 1.5 MW turbine and GE 1.6 MW turbine; therefore, the sound

⁵⁸ Exhibit 1 at 22.

⁵⁹ *Id.* at 24.

⁶⁰ Exhibits 19, 21 and 22.

⁶¹ Exhibit 17.

modeling yielded the same results. The modeling conducted by the Applicant demonstrates that sound levels for all three turbine layouts are expected to be below 50 dB(A) at all receptors with the exception noted above. If the Applicant selects the GE 1.5 MW turbine, it will promptly submit a map reflecting noise impacts on residences for all turbine locations. In no case will the Applicant proceed with the pre-construction meeting prior to submitting all noise impact data.

49. Concern was expressed about the impact of noise on dogs and horses. Wind turbines typically emit sound in the frequency range between 63 Hz and 8,000 Hz when the turbines are operating at speeds greater than 10 meters per second (22 miles per hour) at a 10-meter height (33 feet). Research indicates that dogs and horses would hear wind turbines, but would not likely be more sensitive to turbine noise than humans.
50. Section 6.6 of the site permit requires Big Blue Wind to conduct a post-construction noise study. The noise study will determine the noise levels at different frequencies and at various distances from the turbines at various wind directions and speeds.

Shadow Flicker

51. Concerns regarding shadow flicker were raised during the comment period on the draft site permit.⁶² Shadow flicker is described as a moving shadow on the ground resulting in alternating changes in light intensity. Shadow flicker computer models simulate the path of the sun over the year and assess at regular time intervals the possible shadow flicker across a project area. The outputs of the model are useful in the design phase of a wind farm. Generally, shadow flicker occurs in the morning and evening hours when the sun is low in the horizon and the shadows are elongated. Shadow flicker does not occur when the turbine rotor is oriented parallel to the receptor or when the turbine is not operating. In addition, no shadow flicker will be present when the sun seen from a receptor is obscured by clouds, fog, or other obstacles already casting a shadow such as buildings and trees.
52. Shadow intensity, or how “light” or “dark” a shadow appears at a specific receptor, will vary with the distance from the turbine. Closer to a turbine, the blades will block out a larger portion of the sun’s rays and shadows will be wider and darker. Receptors located farther away from a turbine will experience much thinner and less distinct shadows since the blades will not block out as much sunlight. Shadow flicker will be greatly reduced or eliminated within a residence when buildings, trees, blinds, or curtains are located between the turbine and receptor. Shadow flicker consultants generally agree that flicker is not noticeable beyond about 10 rotor diameters from a wind turbine.⁶³ Evidence of health effects from shadow flicker is scant, suggesting that it is more of a nuisance issue. Shadow flicker impacts on animals are unknown. Minnesota has no published standards for shadow flicker and no examples of turbines causing photosensitivity related problems.

⁶² Exhibits 14 and 15.

⁶³ Environmental Health Division, Minnesota Department of Health, *Public Health Impacts of Wind Turbines*, May 22, 2009, at 14, available at <http://energyfacilities.puc.state.mn.us/documents/Public%20Health%20Impacts%20of%20Wind%20Turbines,%205.22.09%20Revised.pdf>.

Several jurisdictions in other countries have established guidelines for acceptable levels of shadow flicker based on certain assumptions. The site permit does not contain shadow flicker limits.

53. There are approximately 69 residences within the Project area.⁶⁴ Big Blue Wind used WindPRO to determine the shadow flicker impact on residences, which is demonstrated on maps in the application and exhibits 19, 21, and 22. As Findings 16 and 48 discuss, there are two turbine locations for the GE 1.5 MW layout that have not been analyzed for shadow flicker and noise impacts. The model used weather data from the Minneapolis/St. Paul airport, which did not account for days that were partly cloudy.⁶⁵ Because the turbine selection and layouts have changed since the application was submitted, the table showing the worst-case scenario of shadow flicker in its application is not applicable. Section 6.2 of the site permit requires the Big Blue Wind to provide data on the duration of shadow flicker for each residence, noting whether the residence is on property that is participating in the Project, and documentation of efforts to avoid, minimize, and mitigate shadow flicker impacts. Section 4.2 of the site permit requires a setback from residences of non-participating landowners of 1,500 feet and 1,000 feet from residences of participating landowners.

Visual Values

54. The placement of up to 24 wind turbine generators for the Big Blue Wind Farm will affect the appearance of the area. The wind turbines will be mounted on tubular towers that are either approximately 262 feet (80 meters). The rotor blades will have a diameter between 270 and 328 feet and stand between 397.5 feet and 426.5 feet tall, depending on turbine selection. The turbine towers and rotor blades will be prominent features on the landscape. There will be intermittent, expansive views of the turbines to passing motorists on nearby roads. Further, the Project may be visible to residents of the city of Blue Earth and users of public lands (see Findings 76 to 78 for a discussion on recreational resources).
55. The visual impact of the wind turbines will be reduced by the use of a neutral paint color. The only lights will be those required by the Federal Aviation Administration (site permit section 7.18). All site permits issued by the Commission require the use of tubular towers; therefore, the turbine towers will be uniform in appearance. Blades used in the proposed Project will be white or grey. The turbines and associated facilities necessary to harvest the wind for energy are not inconsistent with existing agricultural practices.
56. Wind facilities can be perceived as a visual intrusion on the natural aesthetic value on the landscape or having their own aesthetic quality. Existing wind facilities have altered the landscape elsewhere in Minnesota from agricultural to wind plant/agricultural. This Project will modify the visual character of the area. Wind generation development is likely to continue in Faribault County.

⁶⁴ Exhibit 1 at 29.

⁶⁵ *Id.*

57. Visually, the Big Blue Wind Farm will be similar to other LWECS projects located elsewhere in the state.

Public Health and Safety

58. There are two public airports located within 20 miles of the Project area. A review of the AirNav, LLC database identified the Blue Earth Municipal Airport as the only airport within five miles of the Project, which is located three miles east of the Project. The Applicant has not yet reached out to the Blue Earth Municipal Airport, but will do so prior to the pre-construction meeting. The Fairmont Municipal Airport is located 10 miles west of the Project area. A review of the AirNav, LLC database showed several private airports, but none are located within 10 miles of the Project area. The Applicant has not yet been issued a “no hazard” determination from the Federal Aviation Administration (FAA) and has not yet pursued tall tower permits from the Minnesota Department of Transportation. Section 4.12 of the site permit requires the Applicant to avoid placing wind turbines or associated facilities in a location that could create an obstruction to navigable airspace to certain airports. The Applicant must comply with the requirements of the Minnesota Department of Transportation, Department of Aviation, and FAA (site permit sections 10.5.1 and 4.12).
59. The addition of up to 24 wind turbines in active croplands and two permanent free standing meteorological towers increase the potential for collisions with crop-dusting aircraft. The turbines would be visible from a distance and lighted according to FAA requirements (see section 7.18 of the site permit). The permanent meteorological towers will be free standing and have lighting consistent with the turbines. The Minnesota Aeronautical Chart produced by the Minnesota Department of Transportation is available and shows wind turbine locations throughout the state.
60. As with any large construction project, some risk of worker or public injury exists during construction. Big Blue Wind and its construction representatives and workers will prepare and implement work plans and specifications in accordance with applicable worker safety requirements during construction of the Project. Big Blue Wind will also control public access to the Project during construction and operation. Big Blue Wind will provide security during construction and operation of the project, including fencing, warning signs, and locks on equipment and facilities (site permit section 7.15).
61. Each turbine will be clearly labeled to identify each unit and a map of the site with the labeling system will be provided to local authorities as part of the emergency response plan (site permit sections 7.17 and 7.16).
62. Possible health effects associated with wind turbines and transmission of electricity generally include those from electric and magnetic fields (EMF). The term EMF refers to electric and magnetic fields that are present around electrical devices. Electric fields arise from the voltage or electrical charges and magnetic fields arise from the flow of electricity or current that travels along transmission lines, power collection (feeder) lines, substation transformers, house wiring and electrical appliances. The intensity of the

electric field is related to the voltage of the line and the intensity of the magnetic field is related to the current flow through the conductors (transmission line wire).

63. The Applicant believes that the Project will not add significantly to the minimal presence of EMFs that may already occur in the Project area.⁶⁶ While there is no conclusive evidence that EMFs from power lines and wind turbines pose a significant health impact, turbines will be installed no closer than 1,000 feet from residences, where EMFs are expected to be at background levels. Based on the most current research on EMFs, and the distance between any turbines or collector lines and homes, the proposed Project is not anticipated to have significant impact to public health and safety due to EMFs.
64. Concerns were raised regarding stray voltage impacts.⁶⁷ Stray voltage is an extraneous voltage that appears on grounded surfaces in buildings, barns and other structures. Stray voltage can be a problem for hospitals, manufacturing plants and farms. In hospitals and manufacturing plants, stray voltage may interfere with sensitive electronic equipment. On the farm, if this voltage reaches sufficient levels, animals coming into contact with grounded surfaces may receive a mild shock that can cause a behavioral response. Significant research on the effects of stray voltage on dairy cows has been conducted over the past 40 years. A comprehensive review of this research is presented in a report to the Ontario Energy Board (Literature Review and Synthesis of Research Findings on the Impact of Stray Voltage on Farm Operations, 2008, Prepared by Douglas J. Reinemann, Ph.D.). Stray voltage and its impact on dairy farms is normally an issue associated with electrical distribution lines and is a condition that can exist between the neutral wire of a service entrance and grounded objects in buildings. The source of stray voltage is a voltage that is developed on the grounded neutral wiring network of a farm and/or the electric power distribution system. The direct effect of animal contact with electrical voltage and the resulting current flowing through their bodies can range from mild behavioral reactions to intense behavioral responses indicative of pain. The indirect effects of these behaviors can vary considerably depending on the specifics of the contact location, level of current, pathway, frequency, and other factors related to the daily activities of the animals.
65. The quality of the farm wiring system has the largest single influence on voltage exposure levels. Stray voltage sources can be reduced in three fundamental ways: 1) reduce the current flow on the neutral system, 2) reduce the resistance of the neutral system, or 3) improve the grounding of the neutral system. The electrical collection system proposed for the Project is designed to be “a separately derived system” as defined in the National Electric Code. The system will have no direct electrical connection (including grounded circuit conductors) to conductors originating in another system. No transmission lines are associated with this Project.
66. In winter months ice may accumulate on the wind turbine blades when the turbines are stopped or operating very slowly. Furthermore, the anemometer may ice up at the same time, causing the turbine to shut down during any icing event. As weather conditions

⁶⁶ *Id.* at 40 - 41.

⁶⁷ Exhibits 14 and 15.

change, any ice will normally drop off the blades in relatively small pieces before the turbines resume operation. This is due to flexing of the blades and the blades' smooth surface. Although turbine icing is an infrequent event (2.5 days per year), it remains important that the turbines are not sited in areas where regular human activity is expected below the turbines during the winter months. The turbine setbacks from residences and roads will minimize impacts from ice throw (see sections 4.2 and 4.4 of the site permit).

Public Services and Infrastructure

67. The proposed Project is expected to have minimal effects on existing public infrastructure. The proposed Project would not generate an increase in traffic volumes or daily human activity, except for a short period of time during construction and occasionally during operation and maintenance activities. The construction contractor will repair any road damage that may occur during the construction of the Project (see site permit section 7.8).
68. Other than short-term impacts, no significant permanent changes in road traffic patterns or volume are expected. The busiest traffic would occur when the majority of the foundation and tower assembly is taking place. Township and county officials will receive advance notice of the construction schedule at the pre-construction meeting, including the timing of the delivery of towers and turbines and arrival of the crane to erect project equipment (site permit section 5.6). Big Blue Wind will work with all parties involved to address concerns related to roadway use, and adhere to state, county, and township requirements for transportation infrastructure.
69. Construction of the proposed Project requires the addition of access roads that will be located on private property. Access roads would be built adjacent to the turbine towers, allowing access both during and after construction. The access roads will be sited in consultation with local landowners and completed in accordance with specified design requirements, and will be located to facilitate both construction (e.g., cranes) and continued operation and maintenance. Siting roads in areas with unstable soil will be avoided wherever possible. Roads may include appropriate drainage and culverts while still allowing for the crossing of farm equipment. The permanent access roads would comprise approximately eight miles.⁶⁸ Permanent access roads will be approximately 16 to 36 feet wide.⁶⁹ Local requirements would be followed wherever access roads join state or local roadways. During construction only, temporary access roads will be approximately 40 feet wide to accommodate delivery of turbines, towers, and other related equipment.⁷⁰ Turbine components will be delivered by truck from Interstate 90.⁷¹ During construction, additional traffic will be generated on local roads. The Applicant will enter into a Development Agreement with Faribault County.⁷² Once construction is completed, roads will be re-graded, filled, and dressed as needed.

⁶⁸Exhibit 1 at 73.

⁶⁹ *Id.*

⁷⁰ *Id.*

⁷¹ *Id.* at 72.

⁷² *Id.* at 33.

70. If access roads are installed across streams or drainage ways, the Applicant, in consultation with Minnesota Department of Natural Resources, will design and locate the roads so the original water flow or drainage patterns are not altered. Any work required below the ordinary high water line, such as road crossings or culvert installation, will require a permit from Minnesota Department of Natural Resources. See section 10.5 of the site permit for a list of other permits that may be required.
71. There is a 161 kV high-voltage transmission lines that crosses the Project area.⁷³
72. The proposed Project will have approximately 23 miles of 34.5 kV electrical collector lines within the Project area.⁷⁴ The Applicant's preference is to construct 15 miles of feeder lines overhead within public road rights-of-way, which would require a 21-foot width to accommodate the poles (10.5 feet on each side of the pole), line blowout, and clearance required by the National Electric Safety Code.⁷⁵ The Applicant anticipated to underground the remaining 8 miles of collector lines that collect power from wind turbines.⁷⁶ The site permit contains a special condition that requires burial of the approximately 15 miles of feeder lines in public rights-of-way. As a result, the entire electrical collection system will be underground up to the Project substation unless it is not reasonably feasible. Placement of collector and feeder lines is addressed in the site permit at sections 4.15 and 13.2 in addition to Finding 26.
73. Prior to construction, Gopher State One Call will be contacted to locate underground facilities so they can be avoided. Further, section 7.15 of the site permit requires the Applicant to submit the location of all its underground cables and collector and feeder lines to Gopher State One Call. To the extent Project facilities cross or otherwise affect existing telephone lines or equipment, Big Blue Wind will make arrangements with applicable service providers to avoid interference with such facilities.
74. The presence or operation of the Project could potentially impact the quality of television and radio reception in the area. Previous analysis on television reception issues indicates that in some cases new antennas or relocation of existing antennas can restore television signal strength reception. Telecommunication copper cables could be affected by the presence of feeder lines associated with a wind facility. Telephone cables are mapped on the feeder line maps that were eFiled on June 20, 2011.⁷⁷ There are three microwave beam paths in the Project area.⁷⁸ The Applicant stated it will not site turbines within the worst case fresnel zone calculated in the microwave beam pathway study conducted by Comsearch.⁷⁹ The Applicant will not operate the wind farm so as to cause microwave, radio, telecommunications, television, or navigation interference in violation of Federal Communications Commission regulations or other applicable law (site permit section 6.4). If operation of the Project causes such interference, Big Blue Wind will take steps necessary to correct the problem in a timely manner (site permit section 6.4). Section 6.4

⁷³ See exhibits 19, 21, and 22 (layout maps showing existing infrastructure).

⁷⁴ *Id.* at 12.

⁷⁵ Exhibit 29.

⁷⁶ Exhibit 1 at 12.

⁷⁷ Exhibit 24.

⁷⁸ Exhibit 1 at 34.

⁷⁹ *Id.*

of the site permit requires the Applicant to submit a plan to conduct an assessment of television and radio signal reception, microwave signal patterns, and telecommunications in the Project area prior to construction. Section 4.15 of the site permit requires the Applicant to comply with all Institute of Electrical and Electronics Engineers, Inc. standards.

75. Construction, operation, and maintenance of the proposed Project will comply with all of the required federal, state, and local permit requirements. See section 10.5 of the site permit.

Recreational Resources

76. There is one Wildlife Management Areas (WMA) located within three miles of the Project, which is the Lake Guckeen WMA. WMAs are managed to provide wildlife habitat, improve wildlife production, and provide public hunting. Other WMAs have been identified within five miles of the Project on the Public Land, Recreation and RIM maps submitted with turbine layout maps on June 20, 2011, but are not labeled.⁸⁰ Section 4.5 of the site permit requires that a setback of three RD in non-prevailing wind directions and five RD in prevailing wind directions from all WMAs.
77. The Pilot Grove Lake Production Area (WPA) is located 1.5 miles south of the Project area.⁸¹ The WPAs are shown on the Public Land, Recreation and RIM maps at Exhibits 19, 21, and 22. WPAs are managed to protect habitat used for breeding, foraging, shelter, and migration for waterfowl. Section 4.5 of the site permit requires that a setback of three RD in non-prevailing wind directions and five RD in prevailing wind directions from all WPAs.
78. The Project area contains Reinvest in Minnesota (RIM) conservation easements in the northeast portion of the Project area.⁸² The RIM Reserve program is the primary land acquisition program for state-held conservation easements and restoration of wetlands and native grasslands on privately owned land in Minnesota. RIM easements are permanent conservation easements. No other conservation easements, such as Conservation Reserve Program (CRP) land, were identified within the Project area.⁸³ The Public Land, Recreation, and RIM maps submitted with the turbine layouts on June 20, 2011, show RIM easements within the Project area and those surrounding the Project area.⁸⁴ Section 6.1 of the site permit requires certain inventories to be conducted of potentially impacted land. Therefore, CRP or additional RIM land would be identified if potentially impacted.

⁸⁰ See exhibits 19, 21, and 22.

⁸¹ Exhibit 1 at 38.

⁸² *Id.* at 21.

⁸³ *Id.*

⁸⁴ Exhibits 19, 21, and 22.

Community Benefits

79. Big Blue Wind will pay a Wind Energy Production Tax to the county and townships each year, which is expected to be approximately \$43,000 per year.⁸⁵ Landowners with wind turbines on their property will also receive payments from the Applicant. The Project is expected to create new job opportunities within the local community, both during construction and operation. The Applicant anticipates that 20 jobs will be created during the construction phase and five permanent jobs will be created.⁸⁶

Effects on Land-Based Economies

80. The turbines and associated facilities are expected to occupy between 19 acres of agricultural land, which is 0.13 percent of the Project area.⁸⁷ A typical turbine will permanently displace approximately 0.5 to 1.0 acre of agricultural land. The Project substation will require between two to four acres of land.⁸⁸ The Applicant has stated it will repair drain tile damage in accordance with specific landowner agreements.⁸⁹ The application did not address the total number of acres that would be temporarily impacted due to construction activities associated with the Project (e.g., grading, soil compaction, access roads, turn around areas, and temporary construction staging areas). Overall, impact to agricultural lands as a result of the Project is anticipated to be short term, and is not expected to alter crop production. Once in operation, it may occasionally be necessary for Big Blue Wind to complete repairs or clear vegetation around a turbine or facility, which could result in additional temporary impacts to agricultural operations. These interruptions are expected to be infrequent and short term. Section 7 of the site permit addresses mitigation measures for agricultural lands.
81. The application did not identify any active gravel pits within the Project area. The proposed Project does not adversely affect any sand or gravel operations.

Property Values

82. Concerns were raised regarding potential impact of the Project on property values.⁹⁰ A study conducted by the Lawrence Berkley National Laboratory found an absence of negative impacts to property values from wind farms within a project view shed.⁹¹ On June 1, 2010, the Stearns County Assessor's Office prepared "A Study of Wind Energy Conversion System in Minnesota," which did not find any changes in property valuation to properties hosting a wind tower based on information provided by assessors from Dodge, Jackson, Lincoln, Martin, Mower, and Murray counties. However, the study acknowledged that there is insufficient data to allow for a reasonable analysis of the development of wind facilities on property values. The Stearns County study also cited studies completed by the Renewable Energy Policy Project, which analyzed 25,000 sales

⁸⁵ *Id.* at 44.

⁸⁶ *Id.* at 45.

⁸⁷ *Id.* at 43.

⁸⁸ *Id.* at 12.

⁸⁹ *Id.* at 43.

⁹⁰ Exhibits 14 and 15.

⁹¹ Ben Hoen et al., *The Impact of Wind Power Projects on Residential Property Values in the United States*, Lawrence Berkeley National Laboratory (Dec. 2009).

inside and outside of view sheds of a wind facility and concluded that property values appear not be affected, and a study conducted by the Royal Institute of Chartered Surveyors, which examined the impact of wind facilities on property values in the United Kingdom and found that almost 30 percent of the respondents reported a decrease in property values.

Archaeological and Historical Resources

83. A review of the Minnesota State Historic Preservation Office (SHPO) records found six archaeological sites within the study area, which include ceramics, late archaic, middle woodland, and projectile points and tools.⁹² These sites are mapped in the turbine layout maps submitted on June 20, 2011.⁹³
84. An archaeological survey is recommended for all the proposed turbine locations, access roads, junction boxes, and other areas of Project construction impact to document any previously unrecorded archaeological sites within the Project site. Section 6.3 of the site permit requires the Applicant to conduct an archaeological reconnaissance survey (Phase I or Phase IA). An archaeological reconnaissance survey is used to determine if archaeological sites exist within the area or are potentially affected by the Project through literature review and, if warranted, field review including visual inspection and sampling. Depending upon the results of the reconnaissance survey, more detailed work may be necessary.
85. If archaeological sites are found during the Phase I survey, their integrity and significance should be addressed in terms of the site's potential eligibility for placement on the National Register of Historic Places (NRHP). If such sites are found to be eligible for the NRHP, appropriate mitigative measures will need to be developed in consultation with the SHPO, the State Archaeologist, and consulting American Indian communities. Section 6.3 of the site permit also requires the Applicant to stop work and notify the SHPO and the Commission if any unrecorded cultural resources are found during construction.

Air and Water Emissions

86. No harmful air or water emissions are expected from the construction and operation of the Project.

Wildlife

87. More than 90 percent of the Project area is used for agricultural purposes.⁹⁴ The Guckeen WMA and Pilot Grove Lake WPA are located within five miles of the Project area. See Findings 76 and 77 for additional information on WMAs and WPAs. The Project area also contains RIM easements. See Finding 78 for additional information on the RIM Reserve Program. The Project will have direct and indirect impacts on birds,

⁹² Exhibit 1 at 36.

⁹³ Exhibits 19, 21, and 22.

⁹⁴ Exhibit 1 at 53.

bats, and other wildlife resources and their habitats. Direct impacts may result in dead or injured wildlife from turbines and related infrastructure. Indirect impacts may include displacement of birds and bats and other wildlife from their habitats, site avoidance, and behavioral modification.

88. The Applicant hired Western EcoSystems Technology, Inc. (WEST) to conduct its wildlife studies. The results from the Wildlife Baselines Studies Interim Report, dated November 2010 to April 2011, were eFiled on June 20, 2011.⁹⁵ WEST used fixed-point bird use surveys, incidental wildlife observation and raptor nest surveys for the interim report.⁹⁶ The final report will be prepared after completion of the field surveys in mid-November 2011.⁹⁷ Flights paths between natural features, such as WPAs and WPAs were not studied. Fifty unique bird species were observed during the surveys, which is a typical observation for an agricultural landscape.⁹⁸
89. Survey results yielded a discovery of a bald eagle's nest in section 35 of the Project area and two raptor nests were documented outside the Project area, which are probably red-tailed hawk.⁹⁹ The bald eagle is federally protected under the Bald and Golden Eagle Protection Act (BGEPA). No other state threatened, endangered, or species of special concern or federally listed species were observed.¹⁰⁰ The Applicant is in the process of determining the flight path of the eagles. Current nest monitoring will continue at least until fledging. Micro-siting of the turbines will consider data known about the eagles nesting in the area. Section 13.1 of the site permit requires the Avian and Bat Protection Plan, required under section 6.7, to include an Eagle Protection Plan and a minimum of one year of post-construction eagle surveys. See Findings 92 and 95 for additional information regarding the Avian and Bat Protection Plan.
90. The Applicant plans to continue its survey work during the construction of the Project. Bi-weekly surveys are scheduled for the summer and weekly surveys are scheduled for the fall migration.¹⁰¹ Two anabat units are scheduled to be deployed from May to October 2011 to determine base use of the area.¹⁰² These survey results will not be able to be utilized to inform micro-siting because construction is to begin before the results are collected and analyzed.
91. Recent studies indicate a broad range of avian and bat fatalities across the United States as a result of wind development, with the highest fatalities occurring in the eastern United States. In the Midwest, post-construction studies completed in Iowa, Minnesota, and Wisconsin confirm a broad range of fatalities. The highest bird and bat fatalities were found at the 145 MW Blue Sky Green Field wind facility in Wisconsin, which had bird fatalities at 12 birds per turbine per year and bat fatalities at 40 bats per turbine per

⁹⁵ Exhibit 26.

⁹⁶ *Id.*

⁹⁷ *Id.* and Exhibit 25.

⁹⁸ Exhibit 26.

⁹⁹ *Id.*

¹⁰⁰ *Id.*

¹⁰¹ Exhibit 25.

¹⁰² *Id.*

year.¹⁰³ Fatalities range from one to four birds per turbine per year and from one to eight bats per turbine per year across most of the upper Midwest. Avian and bat studies conducted at the Buffalo Ridge, Minnesota, found an average of one to four bird fatalities per turbine per year and one to three bat fatalities per turbine per year. Projects in areas with similar habitat and cover types would likely have similar fatality rates, depending on migration patterns, known resting and foraging areas, and potential for bat hibernacula. However, as wind facilities increase and move into areas or landscapes where migration or use patterns are less understood, it becomes increasingly difficult to make landscape level comparisons between facilities and predict the impacts on avian and bat populations.

92. Section 6.7 of the site permit requires the Applicant to prepare an Avian and Bat Protection Plan, submit quarterly avian and bat reports, and report dead or injured avian and bats species under certain conditions. Section 6.1 requires the Applicant to conduct pre-construction desktop and field inventories of potentially impacted native prairies, wetlands, and any other biologically sensitive areas within the site and assess the presence of state threatened, endangered, or species of special concern or federally listed species. Section 4.5 requires that turbines and associated facilities will not be constructed in wildlife management areas, waterfowl production areas, or parks and a setback of five rotor diameter in prevailing winds and three rotor diameter in non-prevailing winds is applied to such public lands, which would minimize impacts to wildlife that utilize those public lands.

Rare and Unique Natural Resources

93. According to Natural Heritage Information System (NHIS) data, there are no known recorded occurrences of special status species, plant communities, or other unique natural features within a one-mile radius of the Project area.¹⁰⁴ A federally protected bald eagle was discovered during a spring raptor nest survey. See Finding 89 for additional information.
94. The Department of Natural Resource has received reports of a pair of state-listed threatened trumpeter swans nesting approximately ½ mile south of the Project site.¹⁰⁵ Trumpeter swans will be addressed in the Avian and Bat Protection Plan required in section 6.7 of the site permit. See Findings 89 and 92 for additional information.
95. As discussed in Findings 89, 92, and 94, the Applicant will prepare an Avian and Bat Protection Plan, which will address rare and unique species. Further, Section 4.7 of the site permit requires a Prairie Protection and Management Plan if native prairie is identified in the surveys required under section 6.1 of the site permit.

¹⁰³ West, Inc., *Post-Construction Bat and Bird Fatality Study at the Blue Sky Green Field Wind Energy Center, Fond du Lac County, Wisconsin* (December 17, 2009).

¹⁰⁴ Exhibit 1 at 63.

¹⁰⁵ Exhibit 15.

Vegetation

96. No public waters, wetlands, or forested land are expected to be adversely affected by the Project. No groves of trees or shelterbelts will need to be removed to construct and operate the system. Native prairie will also be avoided. Section 4.7 of the site permit will require a Prairie Protection and Management Plan if native prairie is discovered in the biological and natural resource inventories required in section 6.1 of the site permit.

Soils

97. The site permit has requirements to implement sound water and soil conservation practices during construction and operation of the Project in order to protect topsoil and adjacent resources and to minimize soil erosion. The Project will be subject to the requirements of the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) stormwater permit for construction activity. An erosion and sediment control plan and Storm Water Pollution Prevention Plan (SWPPP) will also be prepared for the Project and the disturbed areas will be seeded after construction to stabilize the area (site permit section 7.11).

Geologic and Ground Water Resources

98. The Project area is relatively flat and mostly tilled farmland. Turbines will be located on topographically elevated uplands and are not expected to affect streams, surface water bodies or floodplains. The Project area is served by an extensive network roads, which will provide site access and egress. There are seven domestic wells within the Project area and over 10 wells that have not been resorted to the Minnesota Department of Health.¹⁰⁶ Impacts to geologic and groundwater resources are not anticipated.

Surface Water and Wetlands

99. Wind turbines and associated facilities will not be located in public water wetlands, except that collector and feeder lines may cross if authorized by the appropriate permitting agency (site permit section 4.6). The Applicant may cross wetlands.¹⁰⁷ A permit may be required if surface waters are impacted (see section 10.5.1 of the site permit). The Little Badger Creek and Judicial Ditch number 12 are the predominant surface waters in the vicinity of Project area.¹⁰⁸ There are a total of 5.56 acres of National Wetland Inventory (NWI) wetland types in the Project area.¹⁰⁹ Of the wetlands, 1.75 acres are seasonally flooded basin or floodplain, 0.20 acres are shallow marsh, 0.45 acres are deep marsh, and 3.16 acres are shrub swamp wetlands.¹¹⁰ A wetland delineation report will be completed to determine all wetland boundaries adjacent to areas of proposed turbine locations and the layout will be designed to avoid and minimize wetland impacts.¹¹¹ If wetland impacts cannot be avoided, the Applicant must apply for

¹⁰⁶ Exhibit 1 at 48.

¹⁰⁷ *Id.* at 52.

¹⁰⁸ *Id.* at 49.

¹⁰⁹ *Id.* at 51.

¹¹⁰ *Id.*

¹¹¹ *Id.*

the applicable permits from the U.S. Army Corps of Engineers (see section 10.5 of the site permit regarding other permits or requirements).

Future Development and Expansion

100. Current information suggests windy areas in this part of the state are large enough to accommodate more wind facilities. In addition to existing wind projects, the future will likely bring Faribault County and surrounding counties additional types and sizes of wind projects supplied by different vendors and installed at different times.
101. While large-scale projects have occurred elsewhere (Texas, Iowa, and California), little systematic study of the cumulative impact has occurred. Research on the total impact of many different projects in one area has not occurred. EFP staff will continue to monitor for impacts and issues related to wind energy development.
102. The Commission is responsible for siting of LWECS “in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources.”¹¹² Section 4.1 of the site permit provides for buffers between adjacent wind generation projects to protect wind production potential.

Maintenance

103. Maintenance of the turbines will be on a scheduled, rotating basis with one or more units normally off for maintenance each day, if necessary. Maintenance on the interconnection points will be scheduled for low wind periods. Big Blue Wind will have on-site service and maintenance activities, including routine inspections, regular preventive maintenance, unscheduled maintenance and repair, and routine minor maintenance on the wind turbines and associated facilities. The Applicant may construct an operations and maintenance facility, and if so, it will be permitted by Faribault County.

Decommissioning and Restoration

104. The existing easement agreements between the Applicant and landowners provide for decommissioning of turbines.¹¹³ Section 9.2 of the site permit requires removal of wind facilities to a depth of four feet and restoration and reclamation of the site to the extent feasible. Section 9.2 also requires the Project site be restored within 18 months after expiration.
105. Decommissioning activities will include: (1) removal of all wind turbine components and towers; (2) removal of all pad mounted transformers; (3) removal of overhead and underground cables and lines; (4) removal of foundations; and (5) removal of surface road material and restoration of the roads and turbine sites to previous conditions to the extent feasible.

¹¹² Minn. Stat. § 216F.03.

¹¹³ Exhibit 1 at 81.

106. The Applicant has committed to establishing a decommission fund of \$25,000 per wind turbine generator during the seventh year of Project operation.¹¹⁴
107. As provided in section 9.1 of the site permit, the Applicant will ensure that it carries out its obligations to provide for the resources necessary to fulfill its requirements to properly decommission the Project at the appropriate time. Section 9.1 requires the applicant to submit a Decommissioning Plan to the Commission prior to the pre-operation compliance meeting. In addition to any requirements under the site permit, each individual land lease requires proper decommissioning of turbines. The Applicant will be responsible for costs to decommission the Project and associated facilities.

Site Permit Conditions

108. All of the above findings pertain to the Applicant's requested permit for a 36 MW LWECS project.
109. Most of the conditions contained in the site permit were established as part of the site permit proceedings of other wind turbine projects permitted by the Environmental Quality Board and the Public Utilities Commission. Comments received by the Commission have been considered in development of the site permit. Minor changes and special condition additions that provide clarification or additional requirements have been made.
110. The site permit contains conditions that apply to site preparation, construction, cleanup, restoration, operation, maintenance, abandonment, decommissioning, and all other aspects of the Project.

Based on the foregoing findings, the Minnesota Public Utilities Commission makes the following:

CONCLUSIONS OF LAW

1. Any of the foregoing findings, which more properly should be designated as conclusions, are hereby adopted as such.
2. The Minnesota Public Utilities Commission has jurisdiction over this matter pursuant to Minnesota Statutes section 216F.04.
3. The Applicant has substantially complied with the procedural requirements of Minnesota Statutes chapter 216F and Minnesota Rules chapter 7854.
4. The Minnesota Public Utilities Commission has complied with all procedural requirements required of Minnesota Statutes chapter 216F and Minnesota Rules chapter 7854.

¹¹⁴ *Id.* at 81.

5. The Minnesota Public Utilities Commission has considered all the pertinent factors relative to its determination of whether a site permit should be approved.
6. The Big Blue Wind Farm is compatible with the policy of the state to site LWECS in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources under Minnesota Statutes section 216F.03.
7. The Minnesota Public Utilities Commission has the authority under section 216F.04 to place conditions in a permit and may deny, modify, suspend, or revoke a permit. The conditions in the site permit are reasonable and appropriate.

Based on the foregoing Findings of Fact and Conclusions of Law, the Minnesota Public Utilities Commission issues the following:

ORDER

A LWECS Site Permit is hereby issued to Big Blue Wind Farm, LLC to construct and operate the up to 36 MW Big Blue Wind Farm in Faribault County in accordance with the conditions contained in the site permit and in compliance with the requirements of Minnesota Statutes section 216F.04 and Minnesota Rules chapter 7854 for Public Utilities Commission Docket No. IP-6851/WS-10-1238.

The site permit is attached hereto, with maps showing the approved site and preliminary turbine layouts.

BY THE ORDER OF THE COMMISSION

Burl W. Haar
Executive Secretary

(S E A L)

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Exhibit List

In the Matter of the Application of Big Blue Wind Farm, LLC for a Site Permit for the Big Blue Wind Farm for up to a 36-Megawatt Large Wind Energy Conversion System in Faribault County.

PUC Docket No. IP-6851/WS-10-1238

EFP Exhibit No.	Exhibit	eDocket Date	eDocket Document Number
1	Revised LWECS Site Permit Application for Big Blue Wind Farm	1/25/11 1/24/11	20111-58844-01 20111-58786-01 20111-58786-02 20111-58786-03 20111-58786-04 20111-58786-05 20111-58786-06 20111-58786-07 20111-58786-08 20111-58786-09 20111-58786-10
2	EFP Comments and recommendations to the PUC on acceptance of Big Blue Wind's LWECS Site Permit Application	12/29/10	201012-57938-01
3	PUC Order accepting the Big Blue Wind Site Permit Application as complete and granting a variance to Minnesota Rule 7854.0800 to extend the period for the PUC to make a preliminary determination on whether a site permit may be issued.	1/14/11	20111-58529-01
4	Notice of Application Acceptance (with Affidavit of Service).	1/26/11	20111-58880-01

EFP Exhibit No.	Exhibit	eDocket Date	eDocket Document Number
5	Affidavits of Publication: Notice of Application Acceptance appearing in the <i>Sentinel</i> (1/27/11) and <i>The Faribault County Register</i> (2/7/11).	2/23/11 2/18/11	20112-59773-01 20112-59684-01
6	Affidavits of Service to affected landowners and government officials for Notice of Application Acceptance (mailed: 1/25/11).	2/18/11 2/23/11	20112-59683-01 20112-59785-01
7	Public and government agency comments on issues to consider in developing the draft site permit. Comment period closed 2/18/11.	2/22/11 2/22/11 2/23/11	20112-59771-01 20112-59771-02 20112-59791-01
8	EFP Comments and Recommendations to the PUC on issuance of the Draft Site Permit.	3/1/11	20113-60019-01
9	PUC Order issuing Draft Site Permit for public review and comment.	3/11/11	20113-60295-01
10	Cover letter and new turbine layout maps.	3/24/11	20113-60567-01 20113-60567-02
11	Notice of Availability of Draft Site Permit and Public Meeting (with Affidavit of Service and Mailing).	4/1/11	20114-60859-01
12	Affidavits of Publication: Notice of Draft Site Permit and Public Meeting appearing in the <i>Sentinel</i> (4/6/11) and <i>The Faribault County Register</i> (4/11/11).	4/13/11 4/18/11	20114-61264-01 20114-61422-01
13	Notice of Availability of Draft Site Permit and Public Meeting published 4/4/11 in <i>EQB Monitor</i> , Vol. 35, No. 7.	5/20/11	20115-62785-01
14	Record of Public Meeting oral comments held on April 19, 2011.	5/19/11	20115-62747-01
15	Public written comments on the Draft Site Permit.	5/19/11	20115-62748-01
16	Turbine update letter.	5/2/11	20114-62080-01

EFP Exhibit No.	Exhibit	eDocket Date	eDocket Document Number
17	Second turbine update letter.	6/20/11	20116-63790-01
18	Applicant letter regarding impacts to the Larsen property.	6/14/11	20116-63558-01
19	Site control and turbine layout map set for Nordex 2.5 MW turbine.	6/16/11 6/20/11	20116-63688-01 20116-63800-02
20	Site control map for GE 1.5 MW turbine.	6/16/11	20116-63688-03
21	Site control and turbine layout map set for Gamesa 2.0 MW turbine.	6/16/11 6/20/11	20116-63688-02 20116-63800-03
22	Site control and turbine layout map set for GE 1.6 MW turbine.	6/16/11 6/20/11	20116-63781-01 20116-63800-01
23	Applicant letter regarding feeder lines.	6/20/11	20116-63813-01
24	Feeder line maps for GE 1.6 MW turbine layout.	6/20/11	20116-63814-01
25	Applicant letter regarding plans for wildlife surveys (responding to USFWS comments).	3/24/11	20113-60568-01
26	Interim Wildlife Baseline Report.	6/20/11	20116-63839-01
27	Eagle nest maps.	6/24/11	20116-64037-02 20116-64037-01
28	Applicant letter regarding placement of met towers.	6/27/11	20116-64073-01
29	Applicant letter addressing ROW needed for feeder lines.	6/27/11	20116-64071-01

STATE OF MINNESOTA PUBLIC UTILITIES COMMISSION

**SITE PERMIT FOR A
LARGE WIND ENERGY CONVERSION SYSTEM**

IN FARIBAULT COUNTY

**ISSUED TO
BIG BLUE WIND FARM, LLC**

PUC DOCKET NO. IP-6851/WS-10-1238

In accordance with Minnesota Statutes section 216F.04 this site permit is hereby issued to:

Big Blue Wind Farm, LLC

Big Blue Wind Farm, LLC is authorized to construct and operate up to a 36 Megawatt Large Wind Energy Conversion System on the site identified in this site permit and in compliance with the conditions contained in this permit.

This permit shall expire thirty (30) years from the date of this approval.

Approved and adopted this _____ day of [month] 2011

BY ORDER OF THE COMMISSION

BURL W. HAAR
Executive Secretary

(S E A L)

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Table of Contents

1.	PROJECT DESCRIPTION	1
2.	DESIGNATED SITE	1
2.1	PROJECT BOUNDARY.....	1
2.2	TURBINE LAYOUT.....	1
3.	APPLICATION COMPLIANCE	2
4.	SETBACKS AND SITE LAYOUT RESTRICTIONS	2
4.1	WIND ACCESS BUFFER.....	2
4.2	RESIDENCES.....	2
4.3	NOISE.....	2
4.4	ROADS.....	3
4.5	PUBLIC LANDS.....	3
4.6	WETLANDS.....	3
4.7	NATIVE PRAIRIE.....	3
4.8	SAND AND GRAVEL OPERATIONS.....	3
4.9	WIND TURBINE TOWERS.....	4
4.10	TURBINE SPACING.....	4
4.11	METEOROLOGICAL TOWERS.....	4
4.12	AVIATION.....	4
4.13	FOOTPRINT MINIMIZATION.....	4
4.14	COMMUNICATION CABLES.....	5
4.15	ELECTRICAL COLLECTOR AND FEEDER LINES.....	5
5.	ADMINISTRATIVE COMPLIANCE PROCEDURES	5
5.1	SITE PLAN.....	6
5.2	NOTICE TO LOCAL RESIDENTS.....	6
5.3	NOTICE OF PERMIT CONDITIONS.....	6
5.4	FIELD REPRESENTATIVE.....	7
5.5	SITE MANAGER.....	7
5.6	PRE-CONSTRUCTION MEETING.....	7
5.7	PRE-OPERATION COMPLIANCE MEETING.....	7
5.8	COMPLAINTS.....	7
6.	SURVEYS AND REPORTING	7
6.1	BIOLOGICAL AND NATURAL RESOURCE INVENTORIES.....	7
6.2	SHADOW FLICKER.....	8
6.3	ARCHAEOLOGICAL RESOURCES.....	8
6.4	INTERFERENCE.....	9
6.5	WAKE LOSS STUDIES.....	9
6.6	NOISE.....	9
6.7	AVIAN AND BAT PROTECTION PLAN.....	9

6.8	PROJECT ENERGY PRODUCTION.....	10
6.9	WIND RESOURCE USE	10
6.10	EXTRAORDINARY EVENTS.....	11
7.	CONSTRUCTION AND OPERATION PRACTICES	
7.1	SITE CLEARANCE	11
7.2	TOPSOIL PROTECTION	11
7.3	SOIL COMPACTION	11
7.4	LIVESTOCK PROTECTION	11
7.5	FENCES.....	11
7.6	DRAINAGE TILES.....	11
7.7	EQUIPMENT STORAGE.....	12
7.8	ROADS	12
7.9	CLEANUP.....	12
7.10	TREE REMOVAL.....	13
7.11	SOIL EROSION AND SEDIMENT CONTROL.....	13
7.12	RESTORATION.....	13
7.13	HAZARDOUS WASTE	13
7.14	APPLICATION OF HERBICIDES.....	14
7.15	PUBLIC SAFETY	14
7.16	EMERGENCY RESPONSE	14
7.17	TOWER IDENTIFICATION	14
7.18	FEDERAL AVIATION ADMINISTRATION LIGHTING	14
8.	FINAL CONSTRUCTION	15
8.1	AS-BUILT PLANS AND SPECIFICATIONS	15
8.2	FINAL BOUNDARIES	15
8.3	EXPANSION OF SITE BOUNDARIES	15
9.	DECOMMISSIONING, RESTORATION, AND ABANDONMENT.....	15
9.1	DECOMMISSIONING PLAN	15
9.2	SITE RESTORATION	15
9.3	ABANDONED TURBINES.....	16
10.	AUTHORITY TO CONSTRUCT LWECS.....	16
10.1	WIND RIGHTS	16
10.2	POWER PURCHASE AGREEMENT	16
10.3	FAILURE TO COMMENCE CONSTRUCTION	16
10.4	PREEMPTION OF OTHER LAWS.....	17
10.5	OTHER PERMITS	17
11.	COMMISSION POST-ISSUANCE AUTHORITIES	17
11.1	PERIODIC REVIEW.....	17
11.2	MODIFICATION OF CONDITIONS.....	18
11.3	REVOCATION OR SUSPENSION OF PERMIT	18

11.4	MORE STRINGENT RULES	18
11.5	TRANSFER OF PERMIT	18
11.6	RIGHT OF ENTRY	19
11.7	PROPRIETARY INFORMATION	19
12.	EXPIRATION DATE	19
ATTACHMENT 1:	Site Permit Map	1
ATTACHMENT 1A:	GE 1.6 MW Turbine Layout.....	1
ATTACHMENT 1B:	Nordex 2.5 MW Turbine Layout	1
ATTACHMENT 1C:	Gamesa 2.0 MW Turbine Layout	1
ATTACHMENT 2:	Complaint and Handling Procedures for Large Wind Energy Conversion Systems	1-3
ATTACHMENT 3:	Compliance Filing Procedure for Permitted Energy Facilities	1
ATTACHMENT 4:	Permit Compliance Filings	1-3

SITE PERMIT

This **SITE PERMIT** for a Large Wind Energy Conversion System (LWECS) authorizes Big Blue Wind Farm, LLC (Permittee) to construct and operate the Big Blue Wind Farm (Project), up to a 36 Megawatt (MW) nameplate capacity LWECS and associated facilities in Faribault County, on a site of approximately 15,000 acres in accordance with the conditions contained in this permit.

SECTION 1 PROJECT DESCRIPTION

The up to 36 MW nameplate capacity LWECS authorized to be constructed in this permit will be developed and constructed by the Permittee. The Project will consist of up to 24 General Electric (GE) 1.5 MW or 22 1.6 MW wind turbine generators on 262.5 foot (80 meter) towers with a rotor diameter of 269 feet (82 meters), 14 Nordex 2.5 MW turbines with a rotor diameter of 328 feet (100 meters) on 262.5 feet (80 meters) turbine towers, or 18 Gamesa 2.0 MW turbines with a rotor diameter of 318 feet (97 meters) on 262.5 feet (80 meters) turbine towers having a combined nominal nameplate capacity of approximately 36 MW. Associated facilities will include pad mounted step-up transformers for each wind turbine, access roads, an electrical collection system, feeder and collector lines, Supervisory Control and Data Acquisition (SCADA) communication lines and building, two permanent meteorological towers, and a Project substation. Power will ultimately be delivered to the proposed Faribault switching station.

SECTION 2 DESIGNATED SITE

2.1 PROJECT BOUNDARY

The Project boundary is shown on the map at Attachment 1. The Project is located in Faribault County in the Jo Daviess Township (sections 13-36).

2.2 TURBINE LAYOUT

Three preliminary wind turbine and associated facility layouts are shown on maps at Attachments 1A, 1B, and 1C. The layout for the GE 1.5 MW turbine is identical to the GE 1.6 MW layout at Attachment 1A except for the addition of two turbines in sections 33 and 27 and facilities associated with them. Each preliminary layout represents the approximate location of wind turbines and associated facilities within the Project boundary and identifies a layout that minimizes the overall potential human and environmental impacts, which were evaluated in the permitting process. The final layout depicting the location of each wind turbine and associated facility shall be located within the Project boundary. The Project boundary serves to provide the Permittee with the flexibility to do minor adjustments to the preliminary layout to accommodate landowner requests, unforeseen conditions encountered during the detailed engineering and design process, and federal and state agency requirements. Any modification of the location of a wind turbine and associated facility depicted in a preliminary layout shall be done in such a manner as to have comparable overall human and environmental impacts and shall be

specifically identified in the site plan pursuant to Section 5.1. The Permittee shall submit the final site layout in the site plan pursuant to Section 5.1.

SECTION 3 APPLICATION COMPLIANCE

The Permittee shall comply with those practices set forth in its revised site permit application, dated January 21, 2011, and the record of this proceeding unless this permit establishes a different requirement in which case this permit shall prevail.

Attachment 4 contains a summary of compliance filings required under this permit. Attachment 4 is provided solely for the convenience of the Permittee and shall not be construed as a substitute for the conditions contained in this permit.

SECTION 4 SETBACKS AND SITE LAYOUT RESTRICTIONS

4.1 WIND ACCESS BUFFER

Wind turbine towers shall not be placed less than five (5) rotor diameters (RD) on prevailing wind directions and three (3) RD on non-prevailing wind directions from the perimeter of the property where the Permittee does not hold the wind rights, without the approval of the Commission. This section does not apply to public roads and trails.

4.2 RESIDENCES

Wind turbine towers shall not be located closer than 1,500 feet from residences of non-participating property owner(s) or the distance required to comply with the noise standards pursuant to Minnesota Rule 7030.0040 established by the Minnesota Pollution Control Agency (PCA), whichever is greater. In no case shall a wind turbine be located closer than 1,000 feet to a residence.

4.3 NOISE

The wind turbine towers shall be placed such that the Permittee shall comply with noise standards established as of the date of this permit by the PCA at all times at all appropriate locations. The noise standards are found in Minnesota Rules chapter 7030. Turbine operation shall be modified or turbines shall be removed from service if necessary to comply with these noise standards. The Permittee or its contractor may install and operate turbines as close as the minimum setback required in this permit, but in all cases shall comply with PCA noise standards. The Permittee shall be required to comply with this condition with respect to all homes or other receptors in place as of the time of construction, but not with respect to such receptors built after construction of the towers.

4.4 ROADS

Wind turbine and meteorological towers shall not be located closer than 250 feet from the edge of the nearest public road right-of-way or from public trails.

4.5 PUBLIC LANDS

Wind turbines and associated facilities including foundations, access roads, underground cable and transformers, shall not be located in public lands, including Waterfowl Production Areas, Wildlife Management Areas, Scientific and Natural Areas or county parks, and wind turbine towers shall also comply with the setbacks of Section 4.1.

4.6 WETLANDS

Wind turbines and associated facilities including foundations, access roads, underground cable and transformers, shall not be placed in public waters wetlands, as defined in Minnesota Statutes section 103G.005, subdivision 15a, except that electric collector or feeder lines may cross or be placed in public waters or public waters wetlands subject to permits and approvals by the Minnesota Department of Natural Resources (DNR) and the United States Army Corps of Engineers (USACE).

4.7 NATIVE PRAIRIE

The Permittee shall, in consultation with the Commission and DNR, prepare a Prairie Protection and Management Plan and submit it to the Commission and DNR at least ten (10) working days prior to the pre-construction meeting if native prairie, as defined in Minnesota Statutes section 84.02, subdivision 5, is identified in any biological and natural resource inventories conducted pursuant to Section 6.1. The plan shall address steps taken to avoid impacts to native prairie and mitigation to unavoidable impacts of native prairie by restoration or management of other native prairie areas that are in degraded condition, by conveyance of conservation easements, or by other means agreed to by the Permittee and Commission. Wind turbines and associated facilities, including foundations, access roads, collector and feeder lines, underground cable, and transformers, shall not be placed in native prairie unless addressed in a Prairie Protection and Management Plan and shall not be located in areas enrolled in the Native Prairie Bank Program. Construction activities, as defined in Minnesota Statutes section 216E.01, shall not impact native prairie unless addressed in a Prairie Protection and Management Plan.

4.8 SAND AND GRAVEL OPERATIONS

Wind turbines and all associated facilities, including foundations, access roads, underground cable and transformers, shall not be located within active sand and gravel operations, unless otherwise negotiated with the landowner with notice given to the owner of the sand and gravel operation.

4.9 WIND TURBINE TOWERS

Structures for wind turbines shall be self-supporting tubular towers. The towers may be up to 80 meters (262.5 feet).

4.10 TURBINE SPACING

The turbine towers shall be constructed within the site boundary as shown in Attachment 1. The turbine towers shall be spaced no closer than three (3) RD in the non-prevailing wind directions and five (5) RD on the prevailing wind directions. If required during final micro-siting of the turbine towers to account for topographic conditions, up to 20 percent of the towers may be sited closer than the above spacing but the Permittee shall minimize the need to site the turbine towers closer.

4.11 METEOROLOGICAL TOWERS

Permanent towers for meteorological equipment shall be free standing. Permanent meteorological towers shall not be placed less than 250 feet from the edge of the nearest public road right-of-way and from the boundary of the Permittee's site control, or in compliance with the county ordinance regulating meteorological towers in the county the tower is built, whichever is more restrictive. Meteorological towers shall be placed on property the Permittee holds the wind or other development rights.

Meteorological towers shall be marked as required by the Federal Aviation Administration (FAA). There shall be no lights on the meteorological towers other than what is required by the FAA. This restriction shall not apply to infrared heating devices used to protect the wind monitoring equipment.

4.12 AVIATION

The Permittee shall not place wind turbines or associated facilities in a location that could create an obstruction to navigable airspace of public and licensed private airports (as defined in Minnesota Rule 8800.0100, subparts 24a and 24b) in Minnesota, adjacent states, or provinces. The Permittee shall apply the minimum obstruction clearance for licensed private airports pursuant to Minnesota Rule 8800.1900, subpart 5. Setbacks or other limitations shall be followed in accordance with the Minnesota Department of Transportation (DOT), Department of Aviation, and the FAA. The Permittee shall notify owners of all known airports within six (6) miles of the Project prior to construction.

4.13 FOOTPRINT MINIMIZATION

The Permittee shall design and construct the LWECs so as to minimize the amount of land that is impacted by the LWECs. Associated facilities in the vicinity of turbines such as electrical/electronic boxes, step-up transformers, and monitoring systems shall, to the greatest extent feasible, be mounted on the foundations used for turbine towers or inside the towers unless otherwise negotiated with the affected landowner(s).

4.14 COMMUNICATION CABLES

The Permittee shall place all supervisory control and data acquisition (SCADA) communication cables underground and within or adjacent to the land necessary for turbine access roads unless otherwise negotiated with the affected landowner(s).

4.15 ELECTRICAL COLLECTOR AND FEEDER LINES

Collector and feeder lines comprise the electrical collection system. Collector lines that carry electrical power from each individual transformer associated with a wind turbine to an internal project interconnection point shall be buried underground. Collector lines shall be placed within or adjacent to the land necessary for turbine access roads unless otherwise negotiated with the affected landowner(s).

Feeder lines that carry power from an internal project interconnection point to the Project substation or interconnection point on the electrical grid may be overhead or underground. Feeder line locations shall be negotiated with the affected landowner(s).

Any feeder lines that parallel public roads shall be placed within the public rights-of-way or on private land immediately adjacent to public roads. If feeder lines are located within public rights-of-way, the Permittee shall obtain approval from the governmental unit responsible for the affected right-of-way.

Collector and feeder line locations shall be located in such a manner as to minimize interference with agricultural operations including, but not limited to, existing drainage patterns, drain tile, future tiling plans, and ditches. Safety shields shall be placed on all guy wires associated with overhead feeder lines. The Permittee shall submit the engineering drawings of all collector and feeder lines in the site plan pursuant to Section 5.1.

The Permittee must fulfill, comply with, and satisfy all Institute of Electrical and Electronics Engineers, Inc. (IEEE) standards applicable to this Project including, but not limited to, IEEE 776 [Recommended Practice for Inductive Coordination of Electric Supply and Communication Lines], IEEE 519 [Harmonic Specifications], IEEE 367 [Recommended Practice for Determining the Electric Power Station Ground Potential Rise and Induced Voltage from a Power Fault], and IEEE 820 [Standard Telephone Loop Performance Characteristics] provided the telephone service provider(s) have complied with any obligations imposed on it pursuant to these standards. Upon request by the Commission, the Permittee shall report to the Commission on compliance with these standards.

SECTION 5 ADMINISTRATIVE COMPLIANCE PROCEDURES

The following administrative compliance procedures shall be executed in accordance with the Permit Compliance Filings at Attachments 3 and 4.

5.1 SITE PLAN

At least ten (10) working days prior to the pre-construction meeting, the Permittee shall submit to the Commission:

- (a) a site plan for all turbines, roads, electrical equipment, collector and feeder lines, and other associated facilities to be constructed;
- (b) engineering drawings for site preparation, construction of the facilities; and
- (c) a plan for restoration of the site due to construction.

Construction is defined under Minnesota Statutes section 216E.01. The Permittee may submit a site plan and engineering drawings for only a portion of the Project if the Permittee intends to commence construction on certain parts of the Project before completing the site plan and engineering drawings for other parts of the Project. The Permittee shall document, through GIS mapping, compliance with the setbacks and site layout restrictions required by this permit, including compliance with the noise standards pursuant to Minnesota Rules chapter 7030. In the event that previously unidentified environmental conditions are discovered during construction that by law or pursuant to conditions outlined in this permit would preclude the use of that site as a turbine site, the Permittee shall have the right to move or relocate turbine site. The Permittee shall notify the Commission of any turbines that are to be relocated before the turbine is constructed on the new site and demonstrate compliance with the setbacks and site layout restrictions required by this permit.

5.2 NOTICE TO LOCAL RESIDENTS

Within ten (10) working days of approval of this permit, the Permittee shall send a printed copy of the permit to the office of the auditor of each county in which the site is located and to the clerk of each city and township within the site boundaries. If applicable, the Permittee shall, within ten (10) working days of permit approval, send a printed copy of this permit to each regional development commission, local fire district, soil and water conservation district, watershed district, and watershed management district office with jurisdiction in the county where the site is located. Within thirty (30) days of approval of this permit, the Permittee shall send a printed copy of the permit to each landowner within the Project boundary. In no case shall the landowner receive this site permit and complaint procedure, developed pursuant to Section 5.8, less than five (5) days prior to the start of construction on their property.

5.3 NOTICE OF PERMIT CONDITIONS

Prior to the start of construction, the Permittee shall inform all employees, contractors, and other persons involved in the construction and ongoing operation of the Project of the terms and conditions of this permit.

5.4 FIELD REPRESENTATIVE

At least ten (10) working days prior to the pre-construction meeting and continuously throughout construction, including site restoration, the Permittee shall designate a field representative responsible for overseeing compliance with the conditions of this permit during the construction phase of this Project. This person (or a designee) shall be accessible by telephone during normal working hours. This person's address, phone number, and emergency phone number shall be provided to the Commission, which may make the number available to local residents and officials and other interested persons. The Permittee may change the field representative by notification to the Commission.

5.5 SITE MANAGER

The Permittee shall designate a site manager responsible for overseeing compliance with the conditions of this permit during the commercial operation and decommissioning phases of this Project. The Permittee shall provide the Commission with the name, address, and phone number, and emergency phone number of the site manager prior to placing any turbine into commercial operation. This information shall be maintained current by informing the Commission of any changes, as they become effective.

5.6 PRE-CONSTRUCTION MEETING

Prior to the start of any construction, the Permittee shall conduct a pre-construction meeting with the Field Representative and the State Permit Manager designated by the Commission to coordinate field monitoring of construction activities.

5.7 PRE-OPERATION COMPLIANCE MEETING

At least ten (10) working days prior to commercial operation, the Permittee shall conduct a pre-operation compliance meeting with the Site Manager and the State Permit Manager designated by the Commission to coordinate field monitoring of operation activities.

5.8 COMPLAINTS

At least ten (10) working days prior to the pre-construction meeting, the Permittee shall submit to the Commission the company's procedures to be used to receive and respond to complaints. The Permittee shall report to the Commission all complaints received concerning any part of the Project in accordance with the procedures provided in Attachments 2 and 3 of this permit.

SECTION 6 SURVEYS AND REPORTING

6.1 BIOLOGICAL AND NATURAL RESOURCE INVENTORIES

The Permittee, in consultation with the Commission and DNR, shall design and conduct pre-construction desktop and field inventories to identify potentially impacted native prairies, wetlands, and any other biologically sensitive areas within the site and assess the presence of

state threatened, endangered, or species of special concern or federally listed species. The results of any surveys shall be submitted to the Commission and DNR at least ten (10) working days prior to the pre-construction meeting to confirm compliance of conditions in this permit.

The Permittee shall provide to the Commission any biological surveys or studies conducted on this Project, including those not required under this permit.

6.2 SHADOW FLICKER

At least ten (10) working days prior to the pre-construction meeting, the Permittee shall provide data on shadow flicker for each residence of non-participating landowners and participating landowners. Information shall include the results of modeling used, assumptions made, and the anticipated duration of shadow flicker for each residence. The Permittee shall provide documentation on its efforts to avoid, minimize, and mitigate shadow flicker impacts.

6.3 ARCHAEOLOGICAL RESOURCES

The Permittee shall work with the State Historic Preservation Office (SHPO) and the State Archaeologist. The Permittee shall carry out a Phase 1 or 1A Archaeology survey for all proposed turbine locations, access roads, junction boxes, and other areas of Project construction impact to determine whether additional archaeological work is necessary for any part of the proposed Project. The Permittee shall contract with a qualified archaeologist to complete such surveys, and shall submit the results to the Commission, the SHPO, and the State Archaeologist at least ten (10) working days prior to the pre-construction meeting.

The SHPO and the State Archaeologist will make recommendations for the treatment of any significant archaeological sites which are identified. Any issues in the implementation of these recommendations will be resolved by the Commission in consultation with SHPO and the State Archaeologist. The Permittee shall not excavate at such locations until so authorized by the Commission in consultation with the SHPO and the State Archaeologist.

If human remains are encountered during construction, the Permittee shall immediately halt construction at that location and promptly notify local law enforcement authorities and the State Archaeologist. Construction at the human remains location shall not proceed until authorized by local law enforcement authorities or the State Archaeologist.

If any federal funding, permit, or license is involved or required, the Permittee shall notify the SHPO as soon as possible in the planning process to coordinate section 106 (36 C.F.R. part 800) review.

Prior to construction, construction workers shall be trained about the need to avoid cultural properties, how to identify cultural properties, and procedures to follow if undocumented cultural properties, including gravesites, are found during construction. If any archaeological sites are found during construction, the Permittee shall immediately stop work at the site and shall mark and preserve the site and notify the Commission, SHPO, and State Archaeologist about the discovery. The Commission and SHPO shall have three working days from the time the agency is notified to conduct an inspection of the site if either agency shall choose to do so. On the

fourth day after notification, the Permittee may begin work on the site unless the SHPO has directed that work shall cease. In such event, work shall not continue until the SHPO determines that construction can proceed.

6.4 INTERFERENCE

At least ten (10) working days prior to the pre-construction meeting, the Permittee shall submit to the Commission the results of an assessment of television and radio signal reception, microwave signal patterns, and telecommunications in the Project area. The assessment shall be designed to provide data that can be used in the future to determine whether the turbines and associated facilities are the cause of disruption or interference of television or radio reception, microwave patterns, or telecommunications in the event residents should complain about such disruption or interference after the turbines are placed in operation. The Permittee shall be responsible for alleviating any disruption or interference of these services caused by the turbines or any associated facilities.

The Permittee shall not operate the Project so as to cause microwave, television, radio, telecommunications, or navigation interference in violation of Federal Communications Commission regulations or other law. In the event the Project or its operations cause such interference, the Permittee shall take timely measures necessary to correct the problem.

6.5 WAKE LOSS STUDIES

At least ten (10) working days prior to the pre-construction meeting, the Permittee shall provide to the Commission the pre-construction micro-siting analysis leading to the final tower locations and an estimate of total Project wake losses. The Permittee shall provide to the Commission any operational wake loss studies conducted on this Project.

6.6 NOISE

The Permittee shall submit a proposal to the Commission at least ten (10) working days prior to the pre-operation compliance meeting for the conduct of a post-construction noise study. Upon the approval of the Commission, the Permittee shall carry out the study. The study shall be designed to determine the operating LWECs noise levels at different frequencies and at various distances from the turbines at various wind directions and speeds. The Permittee shall submit the study within eighteen (18) months after commercial operation.

6.7 AVIAN AND BAT PROTECTION PLAN

The Permittee shall prepare an Avian and Bat Protection Plan in consultation with the Commission, DNR, and the United States Fish and Wildlife Service (USFWS) and submit it to the Commission at least ten (10) working days prior to the pre-construction meeting. The plan shall address steps to be taken to identify and mitigate impacts to avian and bat species during the construction phase and the operation phase of the Project. The plan shall also include formal and informal monitoring, training, wildlife handling, documentation (e.g., photographs), and reporting protocols for each phase of the Project.

The Permittee shall submit quarterly avian and bat reports to the Commission. Quarterly reports are due by the 15th of each January, April, July, and October commencing the day following commercial operation and terminating upon the expiration of this permit. Each report shall identify any dead or injured avian and bat species, location of find by turbine number, and date of find for the reporting period in accordance with the reporting protocols. If a dead or injured avian or bat species is found, the report shall describe the potential cause of the occurrence and the steps taken to avoid future occurrences.

The Permittee shall notify the Commission, USFWS, and DNR within twenty-four (24) hours of the discovery of any of the following:

- (a) five or more dead or injured non-protected avian or bat species within a reporting period;
- (b) one or more dead or injured migratory avian or bat species;
- (c) one or more dead or injured state threatened, endangered, or species of special concern; or
- (d) one or more dead or injured federally listed species.

6.8 PROJECT ENERGY PRODUCTION

The Permittee shall submit a report no later than February 1st following each complete year of Project operation. The report shall include:

- (a) The rated nameplate capacity of the permitted Project;
- (b) The total monthly energy generated by the Project in MW hours;
- (c) The monthly capacity factor of the Project;
- (d) Yearly energy production and capacity factor for the Project;
- (e) The operational status of the Project and any major outages, major repairs, or turbine performance improvements occurring in the previous year; and
- (f) Any other information reasonably requested by the Commission.

This information shall be considered public and must be submitted electronically.

6.9 WIND RESOURCE USE

The Permittee shall, upon the request of the Commission, report to the Commission on the monthly energy production of the Project and the average monthly wind speed collected at one permanent meteorological tower selected by the Commission during the preceding year or partial year of operation. Section 11.7 shall apply to data provided pursuant to this section.

6.10 EXTRAORDINARY EVENTS

Within twenty-four (24) hours of an occurrence, the Permittee shall notify the Commission of any extraordinary event. Extraordinary events include but shall not be limited to: fires, tower collapse, thrown blade, collector or feeder line failure, and injured LWECS worker or private person. The Permittee shall, within thirty (30) days of the occurrence, submit a report to the Commission describing the cause of the occurrence and the steps taken to avoid future occurrences.

SECTION 7 CONSTRUCTION AND OPERATION PRACTICES

7.1 SITE CLEARANCE

The Permittee shall disturb or clear the site only to the extent necessary to assure suitable access for construction, safe operation, and maintenance of the Project.

7.2 TOPSOIL PROTECTION

The Permittee shall implement measures to protect and segregate topsoil from subsoil in cultivated lands unless otherwise negotiated with the affected landowner(s).

7.3 SOIL COMPACTION

The Permittee shall implement measures to minimize soil compaction of all lands during all phases of the Project's life and shall confine compaction to as small an area as practicable.

7.4 LIVESTOCK PROTECTION

The Permittee shall take precautions to protect livestock during all phases of the Project's life.

7.5 FENCES

The Permittee shall promptly replace or repair all fences and gates removed or damaged during all phases of the Project's life unless otherwise negotiated with the affected landowner(s). When the Permittee installs a gate where electric fences are present, the Permittee shall provide for continuity in the electric fence circuit.

7.6 DRAINAGE TILES

The Permittee shall take into account the location of drainage tiles during Project layout and construction. The Permittee shall promptly repair or replace all drainage tiles broken or damaged during all phases of the Project's life unless otherwise negotiated with the affected landowner(s).

7.7 EQUIPMENT STORAGE

The Permittee shall not locate temporary equipment staging areas on lands under its control unless negotiated with affected landowner(s). Temporary staging areas shall not be located in wetlands or native prairie as defined in Sections 4.6 and 4.7.

7.8 ROADS

7.8.1 PUBLIC ROADS

At least ten (10) working days prior to the pre-construction meeting, the Permittee shall identify all state, county, or township roads that will be used for the Project and shall notify the Commission and the state, county, or township governing body having jurisdiction over the roads to determine if the governmental body needs to inspect the roads prior to use of these roads. Where practical, existing roadways shall be used for all activities associated with the Project. Where practical, all-weather roads shall be used to deliver cement, turbines, towers, assembled nacelles, and all other heavy components to and from the turbine sites.

The Permittee shall, prior to the use of such roads, make satisfactory arrangements with the appropriate state, county, or township governmental body having jurisdiction over roads to be used for construction of the Project for maintenance and repair of roads that will be subject to extra wear and tear due to transportation of equipment and Project components. Upon request of the Commission, the Permittee shall notify the Commission of such arrangements.

7.8.2 TURBINE ACCESS ROADS

The Permittee shall construct the least number of turbine access roads it can. Access roads shall be low profile roads so that farming equipment can cross them and shall be covered with Class five gravel or similar material. Access roads shall not be constructed across streams and drainage ways without required permits and approvals from the DNR, USFWS, and/or USACE. When access roads are constructed across streams and drainage ways, the access roads shall be designed in a manner so runoff from the upper portions of the watershed can readily flow to the lower portion of the watershed. Access roads shall also be constructed in accordance with all necessary township, county, or state road requirements and permits.

7.8.3 PRIVATE ROADS

The Permittee shall promptly repair private roads or lanes damaged when moving equipment or when obtaining access to the site, unless otherwise negotiated with the affected landowner(s).

7.9 CLEANUP

The Permittee shall remove all waste and scrap that is the product of construction, operation, restoration, and maintenance from the site and properly dispose of it upon completion of each task. Personal litter, bottles, and paper deposited by site personnel shall be removed on a daily basis.

7.10 TREE REMOVAL

The Permittee shall minimize the removal of trees and the Permittee shall not remove groves of trees or shelter belts without notification to the Commission and the approval of the affected landowner(s).

7.11 SOIL EROSION AND SEDIMENT CONTROL

The Permittee shall develop a Soil Erosion and Sediment Control Plan and submit the Plan to the Commission at least ten (10) working days prior to the pre-construction meeting. This Plan may be the same as the Storm Water Pollution Prevention Plan (SWPPP) submitted to the PCA as part of the National Pollutant Discharge Elimination System (NPDES) permit application.

The Soil Erosion and Sediment Control Plan shall address what types of erosion control measures will be implemented during each Project phase and shall at a minimum identify: plans for grading, construction, and drainage of roads and turbine pads; necessary soil information; detailed design features to maintain downstream water quality; a comprehensive re-vegetation plan to maintain and ensure adequate erosion control and slope stability and to restore the site after temporary Project activities; and measures to minimize the area of surface disturbance. Other practices shall include containing excavated material, protecting exposed soil, and stabilizing restored material and removal of silt fences or barriers when the area is stabilized. The plan shall identify methods for disposal or storage of excavated material. Erosion and sedimentation control measures shall be implemented prior to construction and maintained throughout the Project's life.

The Permittee shall develop an invasive species prevention plan to prevent the introduction of invasive species on lands disturbed by project construction activities. This requirement may be included as an element of the Soil Erosion and Sediment Control Plan.

7.12 RESTORATION

The Permittee shall, as soon as practical following construction of each turbine, considering the weather and preferences of the affected landowner(s), restore the area affected by any Project activities to the condition that existed immediately before construction began, to the extent possible. The time period may be no longer than twelve (12) months after completion of construction of the turbine, unless otherwise negotiated with the affected landowner(s). Restoration shall be compatible with the safe operation, maintenance, and inspection of the Project.

7.13 HAZARDOUS WASTE

The Permittee shall be responsible for compliance with all laws applicable to the generation, storage, transportation, clean-up, and disposal of hazardous wastes generated during any phase of the Project's life.

7.14 APPLICATION OF HERBICIDES

The Permittee shall restrict herbicide use to those herbicides and methods of application approved by the Minnesota Department of Agriculture and the U.S. Environmental Protection Agency. Selective foliage or basal application shall be used when practicable. The Permittee shall contact the landowner or his designee to obtain approval for the use of herbicide prior to any application on their property. The landowner may request that there be no application of herbicides on any part of the site within the landowner's property. All herbicides shall be applied in a safe and cautious manner so as to not damage property, including crops, orchards, tree farms, or gardens. The Permittee shall also, at least ten (10) working days prior to the application, notify beekeepers with an active apiary within one mile of the proposed application site of the day the company intends to apply herbicide so that precautionary measures may be taken by the beekeeper.

7.15 PUBLIC SAFETY

The Permittee shall provide educational materials to landowners within the site boundary and, upon request, to interested persons about the Project and any restrictions or dangers associated with the Project. The Permittee shall also provide any necessary safety measures, such as warning signs and gates for traffic control or to restrict public access. The Permittee shall submit the location of all underground facilities, as defined in Minnesota Statutes section 216D.01, subdivision 11, to Gopher State One Call.

7.16 EMERGENCY RESPONSE

The Permittee shall prepare an emergency response plan (fire protection and medical emergency plan) in consultation with the emergency responders having jurisdiction over the area prior to Project construction. The Permittee shall submit a copy of the plan to the Commission at least ten (10) working days prior to the pre-construction meeting and a revised plan, if any, at least ten (10) working days prior to the pre-operation compliance meeting. The Permittee shall also register the Project with the local governments' emergency 911 services.

7.17 TOWER IDENTIFICATION

All turbine towers shall be marked with a visible identification number.

7.18 FEDERAL AVIATION ADMINISTRATION LIGHTING

Towers shall be marked as required by the FAA. There shall be no lights on the towers other than what is required by the FAA. This restriction shall not apply to infrared heating devices used to protect the wind monitoring equipment.

SECTION 8 FINAL CONSTRUCTION

8.1 AS-BUILT PLANS AND SPECIFICATIONS

Within sixty (60) days after completion of construction, the Permittee shall submit to the Commission a copy of the as-built plans and specifications. The Permittee must also submit this data in a GIS compatible format so that the Commission can place it into the Minnesota Geospatial Information Office's geographic data clearinghouse located in the Department of Administration.

8.2 FINAL BOUNDARIES

After completion of construction, the Commission shall determine the need to adjust the final boundaries of the site required for this Project. If done, this permit may be modified, after notice and opportunity for public hearing, to represent the actual site required by the Permittee to operate the Project authorized by this permit.

8.3 EXPANSION OF SITE BOUNDARIES

No expansion of the site boundaries described in this permit shall be authorized without the approval of the Commission. The Permittee may submit to the Commission a request for a change in the boundaries of the site for the Project. The Commission will respond to the requested change in accordance with applicable statutes and rules.

SECTION 9 DECOMMISSIONING, RESTORATION, AND ABANDONMENT

9.1 DECOMMISSIONING PLAN

At least ten (10) working days prior to the pre-operation compliance meeting, the Permittee shall submit to the Commission a Decommissioning Plan documenting the manner in which the Permittee anticipates decommissioning the Project in accordance with the requirements of Minnesota Rule 7854.0500, subpart 13. The Permittee shall ensure that it carries out its obligations to provide for the resources necessary to fulfill its requirements to properly decommission the Project at the appropriate time. The Commission may at any time request the Permittee to file a report with the Commission describing how the Permittee is fulfilling this obligation.

9.2 SITE RESTORATION

Upon expiration of this permit, or upon earlier termination of operation of the Project, or any turbine within the Project, the Permittee shall have the obligation to dismantle and remove from the site all towers, turbine generators, transformers, overhead and underground cables and lines, foundations, buildings, and ancillary equipment to a depth of four feet. To the extent feasible, the Permittee shall restore and reclaim the site to its pre-project topography and topsoil quality. All access roads shall be removed unless written approval is given by the affected landowner(s)

requesting that one or more roads, or portions thereof, be retained. Any agreement for removal to a lesser depth or no removal shall be recorded with the county and shall show the locations of all such foundations. All such agreements between the Permittee and the affected landowner(s) shall be submitted to the Commission prior to completion of restoration activities. The site shall be restored in accordance with the requirements of this condition within eighteen (18) months after expiration, or upon earlier termination of the Project, or any turbine within the Project.

9.3 ABANDONED TURBINES

The Permittee shall advise the Commission of any turbines that are abandoned prior to termination of operation of the Project. A Project, or any turbine within the Project, shall be considered abandoned after one (1) year without energy production and the land restored pursuant to Section 9.2 unless a plan is developed and submitted to the Commission outlining the steps and schedule for returning the Project, or any turbine within the Project, to service.

SECTION 10 AUTHORITY TO CONSTRUCT LWECS

10.1 WIND RIGHTS

At least ten (10) working days prior to the pre-construction meeting, the Permittee shall demonstrate that it has obtained the wind rights and any other rights necessary to construct and operate the Project within the boundaries of the LWECS authorized by this permit.

Nothing in this permit shall be construed to preclude any other person from seeking a permit to construct a WECS in any area within the boundaries of the Project covered by this permit if the Permittee does not hold exclusive wind rights for such areas.

10.2 POWER PURCHASE AGREEMENT

In the event the Permittee does not have a power purchase agreement or some other enforceable mechanism for sale of the electricity to be generated by the Project at the time this permit is issued, the Permittee shall provide notice to the Commission when it obtains a commitment for purchase of the power. This permit does not authorize construction of the Project until the Permittee has obtained a power purchase agreement or some other enforceable mechanism for sale of the electricity to be generated by the Project. In the event the Permittee does not obtain a power purchase agreement or some other enforceable mechanism for sale of the electricity to be generated by the Project within two years of the issuance of this permit, the Permittee must advise the Commission of the reason for not having such commitment. In such event, the Commission shall determine whether this permit should be amended or revoked. No amendment or revocation of this permit may be undertaken except in accordance with applicable statutes and rules, including Minnesota Rule 7854.1300.

10.3 FAILURE TO COMMENCE CONSTRUCTION

If the Permittee has not completed the pre-construction surveys required under this permit and commenced construction, as defined in Minnesota Statutes section 216E.01, of the Project within

two years of the issuance of this permit, the Permittee must advise the Commission of the reason construction has not commenced. In such event, the Commission shall make a determination as to whether this permit should be amended or revoked. No revocation of this permit may be undertaken except in accordance with applicable statutes and rules, including Minnesota Rule 7854.1300.

10.4 PREEMPTION OF OTHER LAWS

Pursuant to Minnesota Statutes section 216F.07, this site permit shall be the only site approval required for the location of this Project, and this permit shall supersede and preempt all zoning, building, and land use rules, regulations, and ordinances adopted by regional, county, local, and special purpose governments. Nothing in this permit shall release the Permittee from any obligation imposed by law that is not superseded or preempted by law.

10.5 OTHER PERMITS

The Permittee shall be responsible for acquiring any other federal, state, or local permits or authorizations that may be required to construct and operate a LWECs within the authorized site. The Permittee shall submit a copy of such permits and authorizations to the Commission upon request.

10.5.1 COMPLIANCE WITH FEDERAL AND STATE AGENCY PERMITS

The Permittee shall comply with all terms and conditions of permits or licenses issued by Federal, State, or Tribal authorities including but not limited to the requirements of the PCA (Section 401 Water Quality Certification, National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) stormwater permit for construction activity, and other site specific discharge approvals), DNR (License to Cross Public Lands and Water, Public Water Works Permit, and state protected species consultation), SHPO (Section 106 Historic Consultation Act), FAA determinations, and DOT (Utility Access Permit, Highway Access Permit, Oversize and Overweight Permit, and Aeronautics Airspace Obstruction Permit).

10.5.2 COMPLIANCE WITH COUNTY, CITY OR MUNICIPAL PERMITS

The Permittee shall comply with all terms and conditions of permits or licenses issued by the counties, cities, and municipalities affected by the Project that do not conflict with or are not preempted by federal or state permits and regulations.

SECTION 11 COMMISSION POST-ISSUANCE AUTHORITIES

11.1 PERIODIC REVIEW

The Commission shall initiate a review of this permit and the applicable conditions at least once every five (5) years. The purpose of the periodic review is to allow the Commission, the Permittee, and other interested persons an opportunity to consider modifications in the conditions

of this permit. No modification may be made except in accordance with applicable statutes and rules.

11.2 MODIFICATION OF CONDITIONS

After notice and opportunity for hearing, this permit may be modified or amended for cause, including but not limited to the following:

- (a) Violation of any condition in this permit;
- (b) Endangerment of human health or the environment by operation of the Project; or
- (c) Existence of other grounds established by rule.

11.3 REVOCATION OR SUSPENSION OF PERMIT

The Commission may take action to suspend or revoke this permit upon the grounds that:

- (a) A false statement was knowingly made in the application or in accompanying statements or studies required of the Permittee, and a true statement would have warranted a change in the Commission's findings;
- (b) There has been a failure to comply with material conditions of this permit, or there has been a failure to maintain health and safety standards; or
- (c) There has been a material violation of a provision of an applicable statute, rule, or an order of the Commission.

In the event the Commission determines that it is appropriate to consider revocation or suspension of this permit, the Commission shall proceed in accordance with the requirements of Minnesota Rule 7854.1300 to determine the appropriate action. Upon a finding of any of the above, the Commission may require the Permittee to undertake corrective measures in lieu of having this permit suspended or revoked.

11.4 MORE STRINGENT RULES

The Commission's issuance of this site permit does not prevent the future adoption by the Commission of rules or orders more stringent than those now in existence and does not prevent the enforcement of these more stringent rules and orders against the Permittee.

11.5 TRANSFER OF PERMIT

The Permittee may not transfer this permit without the approval of the Commission. If the Permittee desires to transfer this permit, the holder shall advise the Commission in writing of such desire. The Permittee shall provide the Commission with such information about the transfer as the Commission requires to reach a decision. The Commission may impose additional conditions on any new Permittee as part of the approval of the transfer.

11.6 RIGHT OF ENTRY

Upon reasonable notice, presentation of credentials, and at all times in compliance with the Permittee's site safety standards, the Permittee shall allow representatives of the Commission to perform the following:

- (a) To enter upon the facilities easement of the site property for the purpose of obtaining information, examining records, and conducting surveys or investigations;
- (b) To bring such equipment upon the facilities easement of the property as is necessary to conduct such surveys and investigations;
- (c) To sample and monitor upon the facilities easement of the property; and
- (d) To examine and copy any documents pertaining to compliance with the conditions of this permit.

11.7 PROPRIETARY INFORMATION

Certain information required to be submitted to the Commission under this permit, including energy production and wake loss data, may constitute trade secret information or other type of proprietary information under the Data Practices Act or other law and is not to be made available by the Commission. The Permittee must satisfy requirements of applicable law to obtain the protection afforded by the law.

SECTION 12 EXPIRATION DATE

This permit shall expire thirty (30) years after the date this permit was approved and adopted.

SECTION 13 SPECIAL CONDITIONS

Special conditions shall take precedence over any other permit conditions if there should be a conflict between the two.

13.1 AVIAN AND BAT PROTECTION PLAN SPECIAL PROVISION

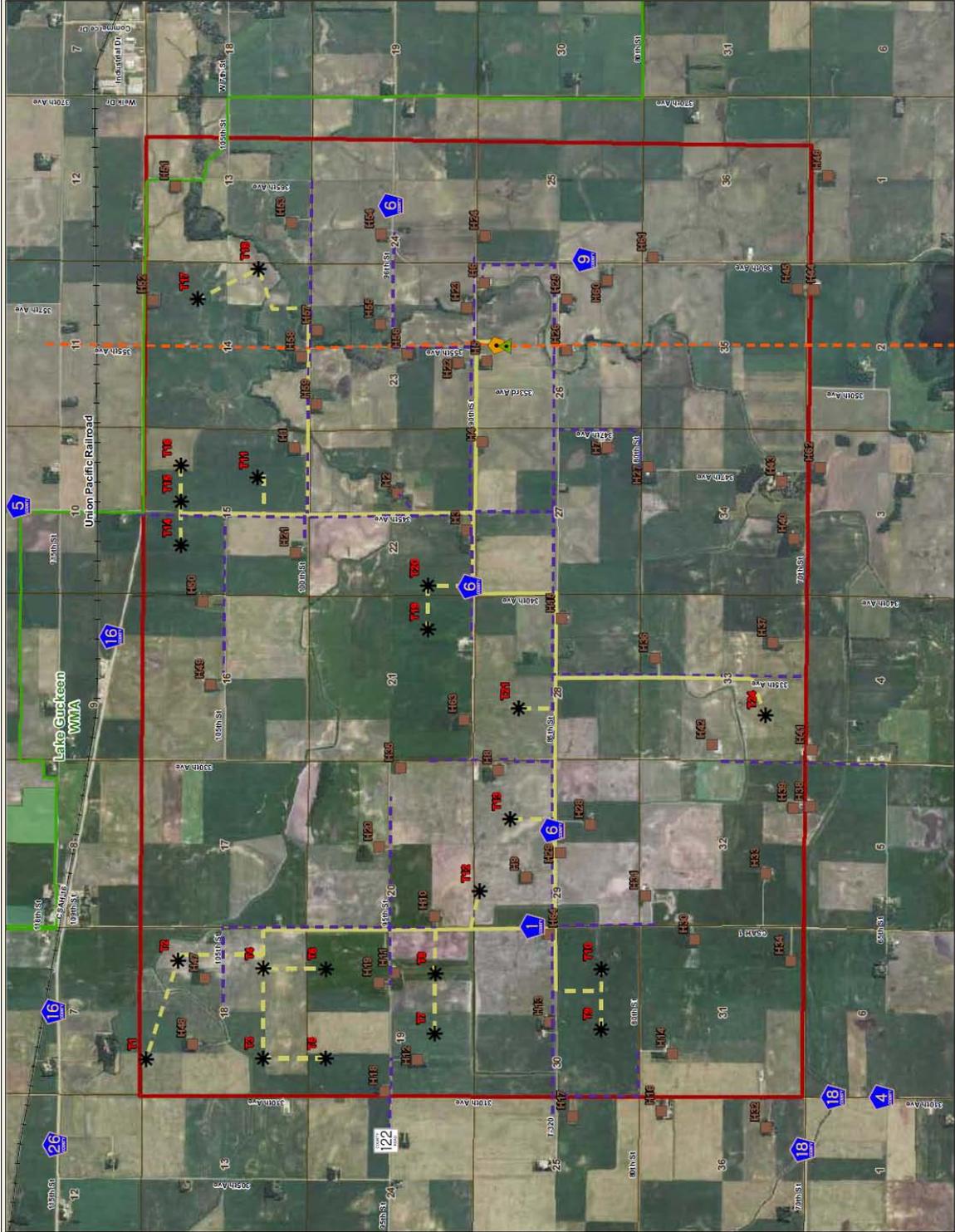
The Avian and Bat Protection Plan in Section 6.7 shall include an Eagle Protection Plan and survey plans and protocols to conduct post-construction bald eagle surveys. The post-construction bald eagle surveys shall be conducted for a minimum of one year. The results of the post-construction bald eagle surveys shall be submitted to the Commission. Based on those results, the Commission may modify conditions in this permit pursuant to Section 11.2.

13.2 APPLICATION OF COUNTY STANDARDS

The Permittee shall site all associated facilities consistent with the following section of the Faribault County Wind Energy Conversion System Ordinance adopted by Faribault County:

Section 35.I.4.a: Feeder lines, including communication that are equal to or less than 35 kV in capacity, installed as part of a wind energy conversion system shall be located in the right of way, and buried [where reasonably feasible]. These shall not be considered an essential service.

Proposed Siting Layout
22 – GE 1.6-82.5 WTG Option
Map 2-B



Legend

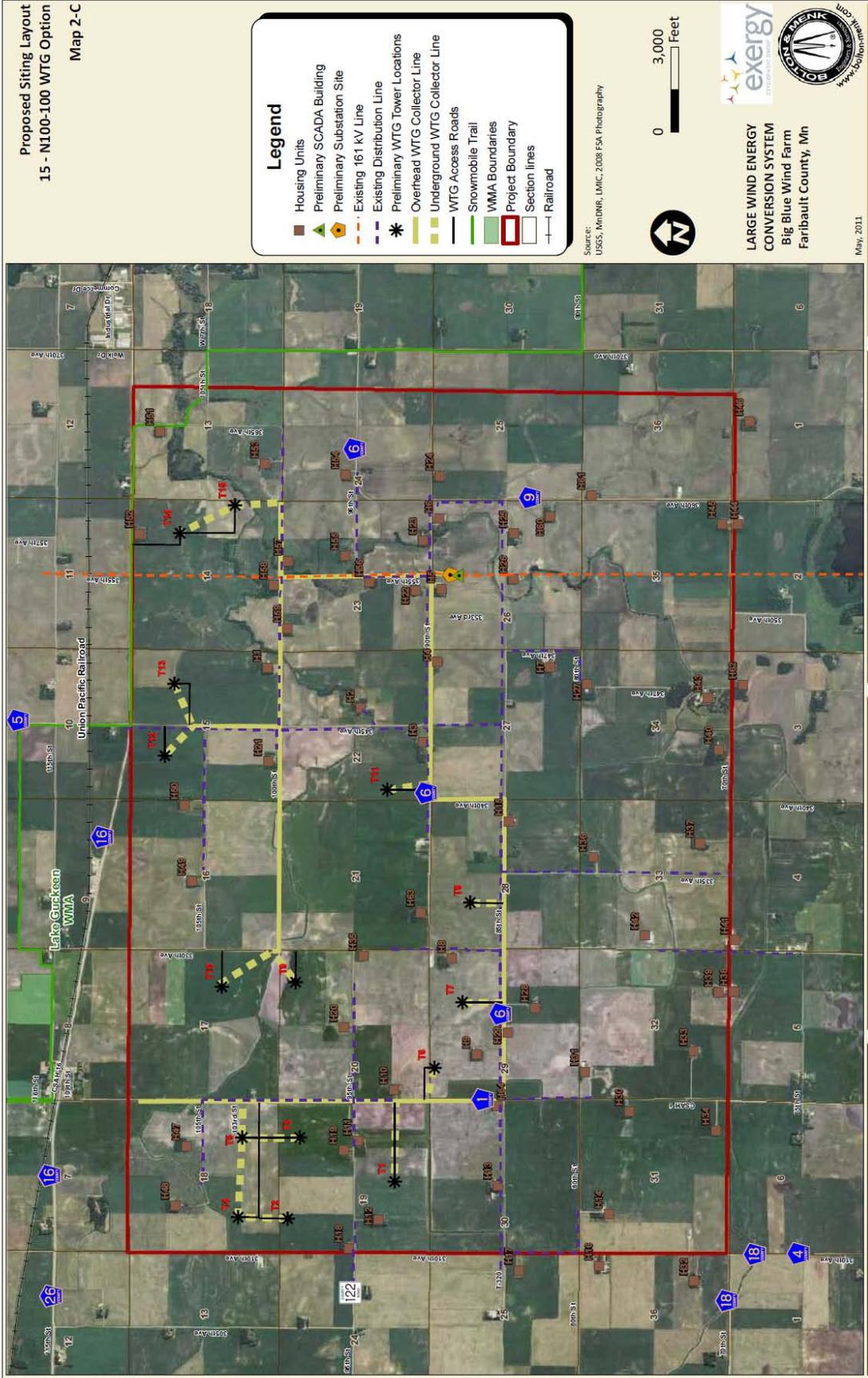
- Housing Units
- Preliminary SCADA Building
- Preliminary Substation Site
- Preliminary WTG Tower Locations
- Existing 161 KV Line
- Existing Distribution Line
- Snowmobile Trail
- Overhead WTG Collector Line
- Underground WTG Collector Line
- WTG Access Roads
- WMA Boundaries
- Project Boundary
- Section lines
- Railroad

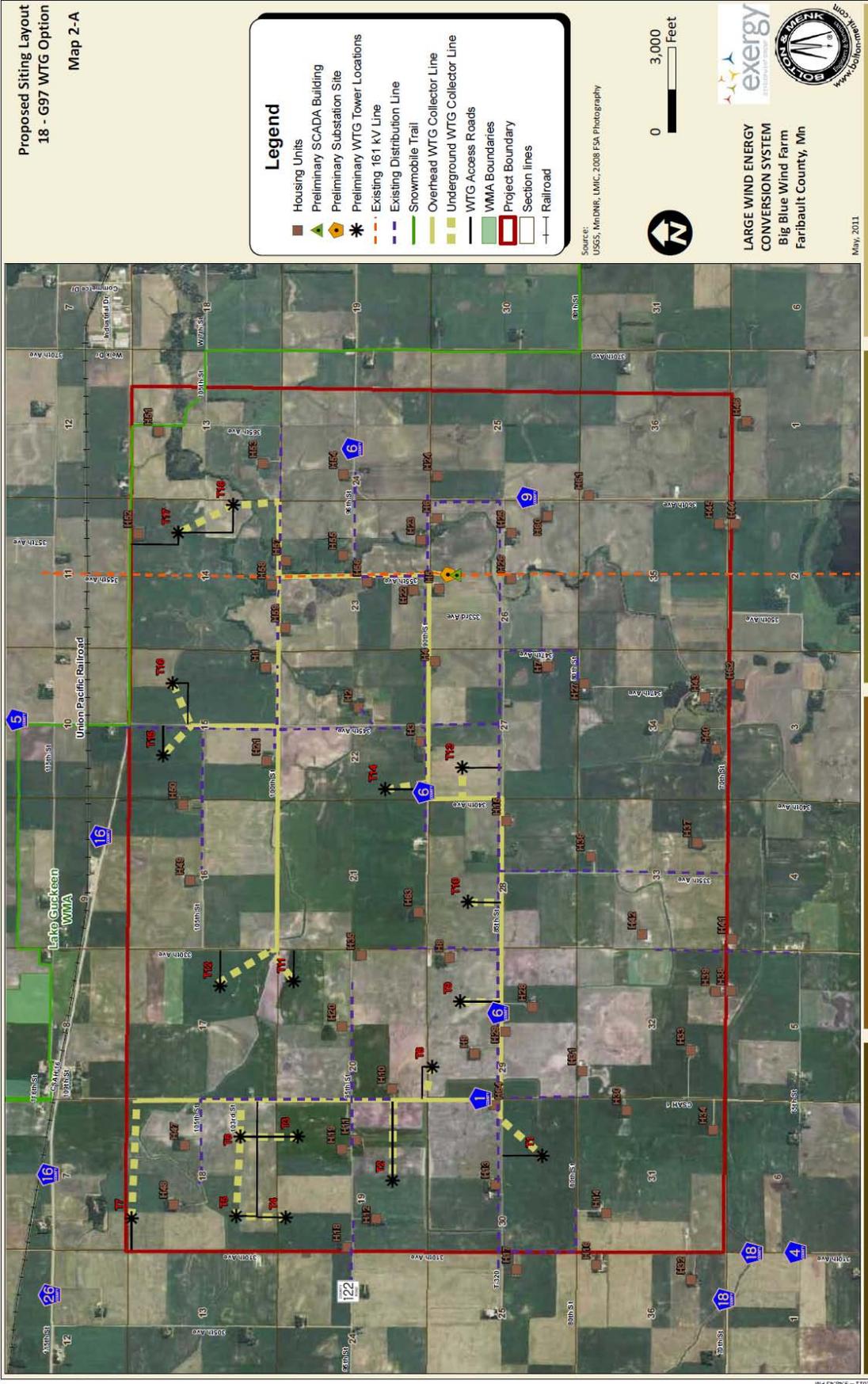
Source: USGS, MNDNR, LMIC, 2008 FSA Photography



LARGE WIND ENERGY
CONVERSION SYSTEM
Big Blue Wind Farm
Faribault County, Mn

June, 2011





**MINNESOTA PUBLIC UTILITIES COMMISSION
COMPLAINT HANDLING PROCEDURES
FOR
LARGE WIND ENERGY CONVERSION SYSTEMS**

A. Purpose:

To establish a uniform and timely method of reporting complaints received by the Permittee concerning Permit conditions for site preparation, construction, cleanup and restoration, operation, and resolution of such complaints.

B. Scope:

This document describes Complaint reporting procedures and frequency.

C. Applicability:

The procedures shall be used for all complaints received by the Permittee and all complaints received by the Commission under Minn. Rule 7829.1500 or 7829.1700 relevant to this Permit.

D. Definitions:

Complaint: A verbal or written statement presented to the Permittee by a person expressing dissatisfaction or concern regarding site preparation, cleanup or restoration, or other LWECS and associated facilities site permit conditions. Complaints do not include requests, inquiries, questions, or general comments.

Substantial Complaint: A written Complaint alleging a violation of a specific Site Permit condition that, if substantiated, could result in Permit modification or suspension pursuant to the applicable regulations.

Unresolved Complaint: A Complaint which, despite the good faith efforts of the permittee and a person(s), remains to both or one of the parties unresolved or unsatisfactorily resolved.

Person: An individual, partnership, joint venture, private or public corporation, association, firm, public service company, cooperative, political subdivision, municipal corporation, government agency, public utility district, or any other entity, public or private, however organized.

E. Complaint Documentation and Processing:

1. The Permittee shall document all Complaints by maintaining a record of all applicable information concerning the Complaint, including the following:

- a. Name of complainant, address, phone number, and e-mail address.
 - b. Precise property description or parcel number.
 - c. Name of Permittee representative receiving Complaint and date of receipt.
 - d. Nature of Complaint and the applicable Site Permit conditions(s).
 - e. Activities undertaken to resolve the Complaint.
 - f. Final disposition of the Complaint.
2. The Permittee shall designate an individual to summarize Complaints to the Commission. This person's name, phone number and e-mail address shall accompany all complaint submittals.
 3. A Person presenting the Complaint should to the extent possible, include the following information in their communications:
 - a. Name, address, phone number, and e-mail address.
 - b. Date
 - c. Tract or parcel
 - d. Whether the complaint relates to (1) a Site Permit matter, (2) a LWECS and associated facility issue, or (3) a compliance issue.

F. Reporting Requirements:

The Permittee shall report all complaints to the Commission according to the following schedule:

Immediate Reports: All substantial complaints shall be reported to the Commission the same day received, or on the following working day for complaints received after working hours. Such reports are to be directed to Wind Permit Compliance, 1-800-657-3794, or by e-mail to: DOC.energypermitcompliance@state.mn.us. Voice messages are acceptable.

Monthly Reports: By the 15th of each month, a summary of all complaints, including substantial complaints received or resolved during the preceding month, shall be eFiled to Dr. Burl W. Haar, Executive Secretary, Public Utilities Commission, using the Minnesota Department of Commerce eDocket system (see eFiling instructions attached to this permit).

If no Complaints were received during the preceding month, the permittee shall submit (eFile) a summary indicating that no complaints were received.

G. Complaints Received by the Commission or Department of Commerce:

Complaints received directly by the Commission from aggrieved persons regarding site preparation, construction, cleanup, restoration, operation and maintenance shall be promptly sent to the Permittee.

H. Commission Process for Unresolved Complaints:

Initial Screening: Commission staff shall perform an initial evaluation of unresolved Complaints submitted to the Commission. Complaints raising substantial LWECS Site Permit issues shall be processed and resolved by the Commission. Staff shall notify Permittee and appropriate person(s) if it determines that the Complaint is a Substantial Complaint. With respect to such Complaints, each party shall submit a written summary of its position to the Commission no later than ten (10) days after receipt of the Staff notification. Staff shall present Briefing Papers to the Commission, which shall resolve the Complaint within twenty days of submission of the Briefing Papers.

I. Permittee Contacts for Complaints:

Mailing Address: Complaints filed by mail shall be sent to the address below:

Dustin Shively
Energy Systems Engineer
Exergy Development Group of Idaho
802 W. Bannock, Suite 1200
Boise, Idaho 83702

Tel: 208.336.9793

Email: dshively@exergydevelopment.com

**MINNESOTA PUBLIC UTILITIES COMMISSION
COMPLIANCE FILING PROCEDURE
FOR PERMITTED ENERGY FACILITIES**

1. Purpose

To establish a uniform and timely method of submitting information required by the Commission energy facility permits.

2. Scope and Applicability

This procedure encompasses all compliance filings required by permit.

3. Definitions

Compliance Filing – A filing of required information to the Commission pursuant to a site or route permit.

4. Responsibilities

A) The permittee shall eFile all compliance filings with Dr. Burl Haar, Executive Secretary, Public Utilities Commission, through the Department of Commerce (DOC) eDocket system. The system is located on the DOC website:
<https://www.edockets.state.mn.us/EFiling/home.jsp>

General instructions are provided on the website. Permittees must register on the website to eFile documents.

B) All filings must have a cover sheet that includes:

- 1) Date
- 2) Name of submitter / permittee
- 3) Type of Permit (Site or Route)
- 4) Project Location
- 5) Project Docket Number
- 6) Permit Section Under Which the Filing is Made
- 7) Short Description of the Filing

C) Filings that are graphic intensive (e.g., maps, plan and profile) must, in addition to being eFiled, be submitted as paper copies and on CD. Copies and CDs should be sent to: 1) Dr. Burl W. Haar, Executive Secretary, Minnesota Public Utilities Commission, 121 7th Place East, Suite 350, St. Paul, MN, 55101-2147, and 2) Department of Commerce, Energy Facility Permitting, 85 7th Place East, Suite 500, St. Paul, MN, 55101-2198. Additionally, the Commission may request a paper copy of any eFiled document.

SUMMARY OF PERMIT COMPLIANCE FILINGS¹

PERMITTEE: Big Blue Wind Farm, LLC
PERMIT TYPE: LWECS Site Permit
PROJECT LOCATION: Faribault County
COMMISSION DOCKET NUMBER: IP-6851/WS-10-1238

PRE-CONSTRUCTION MEETING

Permit Section	Description	Due Date	Notes	eDocket Doc. ID	Date Filed
4.7	Native Prairie Protection Plan	10 working days prior to pre-construction meeting, if required.	Develop in consultation with Commission and DNR.		
5.1	Site Plan	10 working days prior to pre-construction meeting.			
5.4	Field Representative	10 working days prior to pre-construction meeting.			
5.8	Complaint Reporting Procedures	10 working days prior to pre-construction meeting.			
6.1	Biological & Natural Resource Inventories	30 days prior to pre-construction Meeting.	Results may trigger need for a Native Prairie Protection Plan.		
6.2	Shadow Flicker Analysis	10 working days prior to pre-construction meeting.			
6.3	Archaeological Resources	10 working days prior to pre-construction meeting and as recommended by the State Historic Preservation Office.			
6.4	Interference	10 working days prior to pre-construction Meeting.			
6.5	Wake Loss	10 working days prior to pre-construction meeting.			

¹ This compilation of permit compliance filings is provided for the convenience of the permittee and the Commission. However, it is not a substitute for the permit; the language of the permit controls.

PRE-CONSTRUCTION MEETING

Permit Section	Description	Due Date	Notes	eDocket Doc. ID	Date Filed
6.7	Avian and Bat Protection Plan	10 days prior to pre-construction meeting.	Develop in consultation with Commission and DNR.		
7.8	Road Identification	10 working days prior to pre-construction meeting.			
7.11	Soil Erosion & Sediment Control Plan	10 working days prior to pre-construction.	May be the same as NPDES SWPPP.		
7.16	Emergency Response	10 working days prior to pre-construction meeting. Must register in 911 Program.			
10.1	Wind Rights	10 working days prior to pre-construction meeting.			

PRE-OPERATION COMPLIANCE MEETING

Permit Section	Description	Due Date	Notes	eDocket Doc. ID	Date Filed
5.7	Pre-operation compliance meeting	10 working days prior to commercial operation.			
6.6	Noise Study Protocol	10 working days prior to pre-operation meeting.			
9.1 & 9.3	Decommissioning Plan	10 working days prior to commercial operation.			

OTHER REQUIREMENTS

Permit Section	Description	Due Date	Notes	eDocket Doc. ID	Date Filed
5.2	Notice to Landowners & Government Units	Within 30 working days of permit issuance.			
5.5	Site Manager	10 working days prior to prior to commercial operation.	Update contact information as necessary.		
5.8	Complaints	Complaint submittals on the 15 th of each month or within 24 hours.	Must eFile report even if no complaints.		
6.6	Noise Study Results	Within 18 months of Commercial Operation.			
6.7	Avian and Bat Reporting Requirements	Quarterly reports due and within 24 hours of discovery of certain species.			
6.8	Project Energy Production	Due 2/1 each year.			
6.9	Wind Resource Use	Upon request of the Commission.			
6.10	Extraordinary Events	Within 24 hours and report on occurrence of event within 30 days.			
8.1	As Builts	Within 60 days of completion of construction.			
10.2	PPA or Enforceable Mechanism	Within 2 years of permit issuance.	If no PPA or other enforceable mechanism at time of permit issuance.		
10.3	Failure to Start Construction	Within 2 years of permit issuance.			