

**STATE OF MINNESOTA
PUBLIC UTILITIES COMMISSION**

David Boyd	Chair
J. Dennis O'Brien	Commissioner
Tom Pugh	Commissioner
Phyllis Reha	Commissioner
Betsy Wergin	Commissioner

In the Matter of the Application of Buffalo Ridge Power Partners, LLC, for a Site Permit for the Bitter Root Wind Farm Project, an up to 138-Megawatt Large Wind Energy Conversion System in Yellow Medicine and Lincoln Counties

ISSUE DATE:

DOCKET NO.

IP-6684/WS-08-1448

FINDINGS OF FACT, CONCLUSIONS OF LAW AND ORDER ISSUING A SITE PERMIT TO BUFFALO RIDGE POWER PARTNERS, LLC, FOR THE BITTER ROOT WIND FARM PROJECT

The above-entitled matter came before the Minnesota Public Utilities Commission (Commission) pursuant to an application submitted by Buffalo Ridge Power Partners, LLC, (BRPP or Applicant) for a site permit to construct, operate, maintain and manage a 138 Megawatt (MW) nameplate capacity Large Wind Energy Conversion System (LWECS) and associated facilities in Yellow Medicine and Lincoln counties.

All of the proposed wind turbines and associated facilities will be located in Yellow Medicine and Lincoln counties. Associated facilities will include pad mounted step-up transformers for each wind turbine, access roads, an electrical collection and feeder system, project substation, and one permanent meteorological tower. The energy from the proposed 138- MW project will be delivered from the project substation to the electrical grid at a point on Otter Tail Power Company's existing 115 kV transmission line.

STATEMENT OF ISSUE

Should BRPP be granted a site permit under Minnesota Statutes section 216F.04 to construct a 138 MW Large Wind Energy Conversion System in Yellow Medicine and Lincoln counties?

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

FINDINGS OF FACT

Background and Procedure

1. On October 13 2009, BRPP, filed a site permit application with the Public Utilities Commission for the 138 MW Bitter Root Wind Farm Project.¹
2. Office of Energy Security (OES) Energy Facility Permitting (EFP) staff reviewed and determined that the October 13, 2009, application complied with the application requirements of Minnesota Rules, part 7854.0500. In its comments and recommendations to the Commission, dated November 11, 2009, OES EFP staff recommended that the Commission accept the application.²
3. On November 13, 2009, a Commission Order accepted the application for the Bitter Root Wind Farm Project.³
4. Published notice of site permit application acceptance, and opportunity to comment on the permit application appeared in the *Canby News*, on November 18, 2009.⁴ The published notice provided: a) description of the proposed project; b) deadline for public comments on the application; c) description of the Commission site permit review process; and d) identification of the public advisor. The notice published meets the requirements of Minnesota Rules, Part 7854. 0600, subpart 2.
5. On November 12, 2009, BRPP distributed copies of the “Site Permit Application for the Bitter Root Wind Farm Project and Notice of Application Acceptance, to government agencies and landowners.⁵
6. Public comments on the site permit application were accepted until December 1, 2009. Two comment letters were received⁶ and they are summarized in the OES Comments and Recommendations presented to the Commission at its February 25, 2010, meeting in conjunction with the request for issuance of a “Draft Site Permit” for the Bitter Root Wind Farm Project.⁷
7. In EFP staff comments submitted on December 9, 2009, EFP staff requested that the Commission vary Minnesota Rules, part 7854.0800 in order for the Applicant to develop additional layout information regarding both the 1.5 and 3.0 MW turbines. On December 21, 2009, the Commission issued an Order granting a variance to Minnesota Rules, part 7854.0800 to extend the period for the Commission to make a preliminary determination on whether a permit may be issued or should be denied.⁸

¹ Exhibit 1

² Exhibit 2

³ Exhibit 3

⁴ Exhibit 4

⁵ Exhibits 5 & 6

⁶ Exhibit 7

⁷ Exhibit 8

⁸ Exhibit 9

8. On March 9, 2010, a Commission Order issued a “Draft Site Permit” for the Bitter Root Wind Farm Project.⁹ The Commission issued an erratum on March 30, 2010, correcting the order to reflect what the Commission approved at their meeting.¹⁰
9. On March 16, 2010, OES EFP staff issued a notice of application acceptance and public information meeting. The published notice provided: a) location and date of the public information meeting; b) description of the proposed project; c) deadline for public comments on the application and draft site permit; d) description of the Commission site permit review process; and e) identification of the public advisor. The notice meets the requirements of Minnesota Rules, Part 7854.0900 subp 1. This notice was posted on the EFP website and sent to interested persons and governmental agencies on March 22, 2010, as required by Minnesota Rules, Part 7854.0900, subp. 2.¹¹
10. Published notice of site permit application acceptance, and opportunity to comment on the permit application and draft site permit appeared in the *Canby News* and the *Hendricks Pioneer* on March 17, 2010, and in the *EQB Monitor* on March 22, 2010, as required by Minnesota Rules, Part 7854.0900, subp. 2.¹² The published notice contained all of the information required by Minnesota Rules part 7854.0900 subp. 1.
11. Administrative Law Judge Steve S. Mihalchick conducted a public hearing in Canby on March 30, 2010. The purpose of the meeting was to provide an overview of the Commission permitting process and to receive comments on the draft site permit and Certificate of Need. Approximately thirteen 13 people attended the hearing. EFP staff, Commission staff and representatives from BRPP were present. OES EFP staff provided an overview of the LWECs site permitting process, the draft site permit and responded to questions. OES EFP staff and BRPP representatives responded to project specific questions and general questions about wind energy. Project specific questions and comments were related to noise, aesthetics, role of local units of government in the review of the Project, availability of transmission capacity, need for the Project, turbine size, decommissioning, and impacts on plant and wildlife species.¹³
12. The deadline for submitting comments on the site permit application or draft site permit was April 21, 2010. There were 12 written comments received on the draft site permit.¹⁴ Several written comments expressed support for the Project. Other comments expressed concern with noise, aesthetic impacts, use of 3.0 MW turbines, involvement of local governments, training for emergency response personnel, the Yellow Medicine Coteau Macrosite, native prairie, avian impacts, and local wind ordinances. Issues related to both oral and written comments received during the comment period are addressed in Findings 15, 17, 19, 40-44, 46-48, 53-56, 63 – 64, 82-89, 98 – 100, and in Permit

⁹ Exhibit 11

¹⁰ Exhibit 12

¹¹ Exhibits 13 and 14

¹² Exhibits 15 and 16

¹³ Exhibit 17

¹⁴ Exhibit 18

Conditions 4.2 – 4.3, 4.5 – 4.9, 5.2, 6.1, 6.6 – 6.7, 7.11, 7.15 – 7.16, 9.1 – 9.3, 10.5.2, and 13.1 – 13.3.

13. During the comment period, one request was made for a contested case hearing. EFP staff summarized the request and recommended against the hearing in comments filed on May 19, 2010.¹⁵ The Commission issued an order denying the request for a contested case hearing on June 11, 2010.¹⁶
14. Administrative Law Judge Bruce Johnson released a Summary of Public Comments and Recommendation on May 3, 2010.¹⁷

Certificate of Need

15. The Project is a large energy facility as defined by Minnesota Statutes section 216B.2421. BRPP applied for a certificate of need for the Project on April 27, 2009. The Commission granted the certificate of need in its order dated June 10, 2010.

Permittee

16. BRPP, has submitted a site permit application for the proposed 138 megawatt (MW) project in Yellow Medicine and Lincoln counties. BRPP is a joint venture of Acciona Wind Energy USA, LLC, and Global Wind Harvest, LLC. BRPP anticipates that the project will be owned and operated by Acciona Wind Energy upon construction. Neither BRPP, nor its corporate parents (Acciona Wind Energy USA, LLC, and Global Wind Harvest, LLC), own or operate any other LWECs in Minnesota.¹⁸

Interconnection Agreement

17. BRPP does not yet have an interconnection agreement for the Project.

Project Description

18. The Bitter Root Wind Farm Project is comprised of up to 92 1.5 MW or up to 46 3.0 MW wind turbine generators mounted on freestanding tubular towers and associated facilities. BRPP has not reached a final decision on turbine models, but anticipates using the ACCIONA Windpower AW-1500 1.5 MW turbine and/or the ACCIONA Windpower AW-3000 3.0 MW turbine in such number and combination as to reach a nameplate capacity of 138 MW.¹⁹ The Project's preliminary turbine locations and associated facilities are shown on maps filed on November 10, 2010.²⁰

¹⁵ Exhibit 20

¹⁶ Exhibit 21

¹⁷ Exhibit 19

¹⁸ Exhibit 1, at pp. 2-3

¹⁹ Exhibit 1, at pp. 13 – 15

²⁰ Exhibit 23

19. Hub height for the ACCIONA Windpower AW-1500 1.5 MW turbines would be 80 or 100 meters (262 or 328 feet) with a rotor diameter of 77 or 82 meters (253 or 269 feet), resulting in an overall height of the tower, nacelle and blade of approximately 390 - 463 feet when one blade is in the vertical position. The hub height for the ACCIONA Windpower AW-3000 3.0 MW turbine would be 100 meters (328 feet) with a rotor diameter of 100 or 109 meters (328 or 358 feet), resulting in an overall height of approximately 492 – 509 feet when one blade is in a vertical position.²¹
20. Towers for 1.5 MW turbines would be constructed of tubular steel and consist of three to four sections manufactured from certified steel plates. The steel tower would be connected by two stud races embedded in concrete. Towers for the 3.0 MW turbines constructed of five 20 meter precast concrete sections assembled on-site. The concrete sections would be connected by anchor bars embedded in the foundation and high quality grout.²² Each tower will be secured by a concrete foundation that will vary in size depending on the soil conditions, turbine tower load specification and cost considerations. The base portion of the foundation for a 1.5 MW turbine is generally an octagon of approximately 40 to 60 feet in diameter and eight feet in thickness. The base portion of the foundation for a 3.0 MW turbine is generally an octagon approximately 80 feet in diameter and 25 feet in thickness.²³
21. The project will also include an underground automated supervisory control and data acquisition system (SCADA) for real-time monitoring and control of turbine operations. Up to three (3) permanent free standing 80 meter meteorological towers will be used as part of the communication system. Other components of the project include a concrete and steel foundation for each tower, pad-mounted step-up transformers, all weather class 5 roads of gravel or similar material, an operation and maintenance (O&M) building, and an underground energy collection system and a project substation.
22. All turbine models under consideration are three bladed, upwind, active yaw, and active aerodynamic control regulated wind turbines with power/torque control capabilities. Each turbine is equipped with a wind direction sensor. The wind direction sensor communicates with the computer system, which evaluates the measured wind parameters, and within a specified time interval, activates the yaw drives to align the nacelle to the wind direction.
23. Each turbine is interconnected through an underground electrical collection system at 34.5 kV. All of the proposed feeder lines would connect to the proposed project substation within the site permit boundaries. BRPP anticipates that the Project Substation will be located in Section 28 of Fortier Township in Yellow Medicine County near the center of the Project Area;²⁴ final location of the substation will depend upon negotiations between BRPP and landowners. The Project Substation steps up the voltage from the 34.5 kV collection systems to the transmission system level. The Project will

²¹ Environmental Report, at pp. 5-6, Exhibit 23

²² Exhibit 1, at p. 17

²³ Exhibit 1, at p. 17

²⁴ Exhibit 23

interconnect with the electrical grid at a point along Otter Tail Power Company's existing 115 kV Canby to Toronto Transmission Line; the interconnection will be in accordance with Midwest System Operator Standards and consistent with the Large Generator Interconnection Agreement.

24. Turbines will be uniform in color; either white or grey.²⁵ The blades will be equipped with lightning protection. The entire turbine is also grounded and shielded to protect against lightning.
25. A control panel that houses communication and electronic circuitry is placed in each tower. In addition, a step-up, pad-mounted transformer is necessary for each turbine to collect the power from the turbine and transfer it to a 34.5 kV collection system via underground cables.
26. All turbines and the permanent meteorological tower(s) 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 either at the project substation or at a facility where SCADA system will be located. Signals from the current and potential transformers at each of the delivery points will also be fed to the central SCADA host computer. The SCADA system will be able to give status indications of the individual wind turbines and the substation and allow for remote control of the wind turbines locally or from a remote computer. This computerized supervisory control and data acquisition network will provide detailed operating and performance information for each wind turbine. The Permittee will maintain a computer program and database for tracking each wind turbine's maintenance history and energy production.
27. Housed inside the fiberglass nacelle that sits on the top of the tower are the generator, brake system, yaw drive system and other miscellaneous components.
28. BRPP anticipates that construction of the Project will begin in 2012, with commercial operation expected by the end of 2012.²⁶

Site Location, Characteristics, and Topography

29. The Bitter Root Wind Farm Project will be located west and southwest of the city of Canby and has identified a Project area of approximately 22,500 acres located in Sections 3-10, 13-17, 19-30, and 32-36 of Fortier Township (T114, R46) in Yellow Medicine County, Sections 29-32 of Florida Township (T115, R46) in Yellow Medicine County and Sections 2,3, and 4 of Hansonville Township in Lincoln County.²⁷ The Project Area is zoned agricultural. Elevation varies from 400 to 531 feet above mean sea level. The landscape is characterized by agricultural (44 percent of landcover) and grassland (approximately 36 percent of landcover).²⁸ Corn and soybeans are the predominant crops

²⁵ Exhibit 1, at p. 29

²⁶ Exhibit 23

²⁷ Exhibit 1, at pp. 1-2

²⁸ Ibid., at p. 42

in the Project area; raising hogs and pigs is also a major source of income, and there are several feedlots located within the Project Area²⁹ use is agricultural, a mixture of corn, soybeans, hay and vegetables. There are several parcels of public lands (Wildlife Management Areas (WMAs) and Waterfowl Production Areas (WPAs)), Conservation Reserve Program and Reinvest in Minnesota easements located within the Project Area.³⁰

30. Construction of the turbines sites and access roads will involve temporarily disturbing approximately 300 acres for contractor staging and assembly areas, turbine foundations, access roads, electric collection lines, substation, and an operation and maintenance facility³¹. The Applicant anticipates construction of approximately 20 – 25 miles of access roads.³² During the construction phase, roads will be approximately 40 feet wide to allow for the large construction equipment; after construction roads will be reduced to approximately 16 feet wide and covered with gravel to allow permanent year-round access to turbine sites.³³ Depending upon final design, the Applicant anticipates that the Project would occupy approximately 120 acres.³⁴
31. Wind turbine and road access will be sited to take into account the contours of the land and prime farmland locations to minimize impact.³⁵ The Project will be subject to the requirements of the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Construction Stormwater Permit.³⁶ 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.³⁷

Wind Resource Considerations

32. Based on data obtained from three temporary meteorological stations within the Project Area, the Applicant calculated long-term monthly average wind speeds of between 7.2 and 9.1 meters/second, with a mean wind speed of 8.4 meters/second (18.8 miles per hour) within the Project Area.³⁸ Wind speeds are generally greater in the night and early morning hours and decline at midday. The prevailing wind directions in the Project Area are south, southeast and south, with significant wind energy from the west-northwest and north sectors. The strongest wind speeds occur during the months of April and May, while July and August typically have the lowest average wind speeds (7.4 and 7.0

²⁹ Yellow Medicine County Comprehensive Plan, April, 2006,

<http://yellowmedicine.govoffice.com/vertical/Sites/%7B39847866-8769-462C-ADF5-52507F76AD33%7D/uploads/%7B1FC9D1FF-7F2C-442A-B5B5-86343BFC4EA9%7D.PDF>

³⁰ Reference Exhibit 1 (Exhibits 8 and 12), is there something else?

³¹ Exhibit 1, at p. 43

³² Ibid., at p. 19

³³ Ibid.

³⁴ Ibid., at p. 43.

³⁵ Ibid., at pp. 48 (prime farmland) and 47 (topography)

³⁶ Ibid., at p. 48

³⁷ Ibid.

³⁸ Ibid., at p. 8

meters/second respectively).³⁹

33. For this project, turbines will be sited so as to have good exposure to winds from all directions with emphasis on exposure to the prevailing southerly and northwesterly wind directions. The turbine spacing, according to BRPP's application, maximizes use of the available wind and minimizes wake and array losses within the topographical context of the site. The turbines are typically oriented east to west, which is roughly perpendicular to the prevailing southerly and northwest winds. Turbine placement, aside from other 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. As addressed in Section 4.10 of the site permit, greater or lesser spacing between the turbines or turbine strings may be used in areas where the terrain dictates the spacing. Sufficient spacing between the turbines is utilized to minimize wake losses when the winds are blowing parallel to the turbines.
34. Assuming net capacity factor of 38 - 41 percent, projected average annual output from the Project will be approximately 459,400 - 495,600 MWh per year or approximately per turbine is estimated to be approximately 5,000 to 6,000 MWh (megawatt hours) per year. The base energy calculation presented assumes a normal or average wind year.

Wind Rights and Easement/Lease Agreements

35. In order to build a wind facility, a developer must secure site leases and 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 wind farm and all associated facilities, including but not limited to wind and buffer easements, wind turbines, access roads, meteorological towers, and the electrical collection system.
36. BRPP controls approximately 11,100 acres within the project site boundary under Option to Lease Agreements with 51 landowners. BRPP has options, leases or easement on the land and wind rights necessary within the site to build the Project. Section 10.1 of the site permit requires BRPP to demonstrate that it has obtained the wind rights necessary to construct and operate the Project at least 10 working days before the pre-construction meeting.

Site Considerations

37. 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

³⁹ Ibid.

preservation, sustainable development, and the efficient use of resources.⁴⁰ 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 site and routes). The analysis of the environmental impacts required by Minnesota Rule 7854.0500, subpart 7 satisfies the environmental review requirements; no environmental assessment worksheet or environmental impact statement is required for a proposed LWECS project. Therefore, environmental review is based on the application and the record. The following analysis addresses the relevant criteria that are to be applied to a LWECS project.

Human Settlement

38. The site is in an area of relatively low population density, characteristic of rural areas throughout southern Minnesota. BRPP's turbine locations will be at least 1,000 feet from all residences.⁴¹ BRPP will also maintain a set back of five rotor diameters (1260 – 1780 feet) on the prevailing wind axis from non-participating landowner's property lines and three rotor diameters (760 – 1,070 feet) on the non-prevailing wind axis.⁴² BRPP's proposed project design will comply with the Minnesota Pollution Control Agency (PCA) noise standards. As a result, the Project's impact on human settlement, public health and safety will be minimal. The site permit, at sections 4.2 and 4.4 has conditions for setbacks from residences and roads. The proposed wind turbine layout will meet or exceed those requirements. The proposed project is not expected to affect any water wells (used, unused or unsealed) or any rural water system that services the area.
39. There will be no displacement of existing residences or structures in siting the wind turbines and associated facilities.

Zoning and Land Use

40. At the time that the Draft Site Permit was approved for distribution, both Lincoln and Yellow Medicine counties had passed resolutions assuming permitting authority for Wind Energy Conversion Systems (WECS) projects under 25 MW, pursuant to MS 216F.08. As allowed in MS 216F.081, the counties have adopted some setbacks more stringent than the General Permit Standards adopted by the Commission in January 2008. This statute direct the Commission to consider and apply the more stringent standards to LWECS issued by the Commission, unless the Commission finds good cause not to do so.
41. The Draft Site Permit identified these more stringent setbacks in a Special Condition to allow for public to comment on whether these more stringent standards were appropriate for the site permit. In summary, Lincoln County had adopted more stringent standards related to setbacks from: (1) roads, recreational trails, power lines, and other rights of way; (2) structures other than homes or dwellings; and (3) other project boundaries. The Lincoln County ordinance also precludes turbines from being placed within a Shoreland

⁴⁰ Minn. Stat. § 216F.03 and Minn. R. 7854.0500

⁴¹ Exhibit 1, at p. 27

⁴² Environmental Report, see Table 1

District. Yellow Medicine County had adopted more stringent standards requiring setbacks from roads and certain wetlands.

42. In their comment letter of April 21, 2010, BRPP recommended that the Commission revise and clarify language in the special condition. To support their recommendation, BRPP provided information on the Lincoln County and Yellow Medicine County ordinances, and letter from the Lincoln County Administrator clarifying the County's interpretation of their ordinance.
43. Based on the information provided by the Lincoln County Administrator, through BRPP's April 21, 2010, letter, the site permit clarifies the setback requirements from roads, trails and power lines, and other rights-of-way recorded with the County, structures other than homes or dwellings, and Shoreland Districts. Because there are no other wind projects in the area of the Project, reference to setbacks from other project boundaries is removed.
44. On March 23, 2010, the Yellow Medicine County Board passed a resolution rescinding its decision to permit WECS under 25 MW but made no changes to the WECS Zoning Ordinance. On August 10, 2010, the County Board adopted a new renewable energy ordinance which removed the wetland setbacks identified in the Draft Site Permit.⁴³ The site permit, at Section 13.1.2 incorporates the road setbacks from the renewable energy ordinance; reference to setbacks from wetlands has been removed.

Property Values

45. 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.⁴⁴ On July 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 a studies completed by the Renewable Energy Policy Project, which analyzed 25,000 sales 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 facility on property values in the United Kingdom and found that almost 30 percent of the respondents reported a decrease in property values.

⁴³ <http://yellowmedicine.govoffice.com/vertical/Sites/%7B39847866-8769-462C-ADF5-52507F76AD33%7D/uploads/%7BC0BC1476-2066-4264-ADF4-DC1948C52184%7D.PDF>

⁴⁴ "The Impact of Wind Power Projects on Residential Property Values in the United States" (Dec. 2009),

Noise

46. Wind turbines, when in motion, do generate sound or noise. Transformers installed at the Project Substation also produce noise. The level of sound (noise) varies with the speed of the turbine, the distance of the listener or receptor from the turbine, and the surface characteristics of the site. Operation and maintenance of wind turbines and associated facilities will increase 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 dBA⁴⁵. The dBA scale represents A-weighted decibels based on the range of human hearing. Higher levels exist near roads and other areas of human activity.
47. 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 Daytime and Nighttime L10 and L50 Limits as stated in Minn. 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 Minn. 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 this 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.
48. Based on noise levels stated by manufacturers and third party noise assessments for the turbine models under consideration for the Project, ACCIONA Windpower 1.5 MW and 3.0 MW wind turbines, BRPP has incorporated setbacks of at least 1,000 feet from residences in developing the proposed project layout. Noise modeling submitted by BRPP shows that the preliminary layouts for both the 1.5 MW and 3.0 MW turbines meet PCA's 50 dBA noise standard.⁴⁶ The location of the Project Substation must also meet PCA's 50 dBA noise standard. See site permit at sections 4.2 and 4.3.
49. Section 6.6 of the site permit requires BRPP 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. The purpose of the post-construction noise study is to confirm the PCA noise standards have been met.

⁴⁵ Exhibit 1, at p. 24

⁴⁶ Exhibit 23, Noise Map 1.5 MW Layout and 3.0 MW Layout

Shadow Flicker

50. 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. Other than within approximately two rotor diameters from the base of a turbine, shadow flicker usually 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.
51. 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.⁴⁷ Evidence of health effects from shadow flicker is scant, suggesting that it is more of a nuisance issue. Minnesota has no published standards for shadow flicker and no examples of turbines causing photosensitivity related problems. 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.
52. Section 6.2 of the site permit requires BRPP to provide data on the duration of shadow flicker on each residence and noting whether the residence is on property that is participating in the Project. BRPP will use computer modeling to simulate the path of the sun over the year and assess the possible shadow flicker across the Project Area at regular time intervals. The model will use actual data from the Project, such as coordinates of receptors, digital elevation data to account for topography and the physical characteristics of the selected wind turbine. BRPP will use the results of the modeling in developing a final layout to minimize impacts to residents.

Visual Values

53. The placement of up to 92 turbines for the Bitter Root Wind Farm Project, will affect the appearance of the area. The wind turbines will be mounted on tubular towers that are 262 to 328 feet tall. The rotor blades will have a diameter of 253 to 358 feet, with a total

⁴⁷ 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>.

height of up to 509 feet when one blade is fully extended.⁴⁸ 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 State Highway 68 and local roads. Motorists and drivers may travel within 250 feet of some turbines. Additionally, elements of the Project will be visible to users of public lands within and adjacent to the Project.

54. 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 at 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 wind turbines in this project, while prominent on the landscape, also blend in with the surrounding area. The project site will retain its rural character. The turbines and associated facilities necessary to harvest the wind for energy are not inconsistent with existing agricultural practices.
55. 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 plants have altered the landscape elsewhere in Minnesota from agricultural to wind plant/agricultural. This project will modify the visual character of the area. Because wind generation development is likely to continue in southern Minnesota, this visual presence will continue to increase as wind development occurs.
56. Visually, the Bitter Root Wind Farm Project will be similar to other LWECS projects located on Buffalo Ridge and southeastern Minnesota.

Health and Safety

57. The Canby Municipal Airport is the nearest airport, located approximately 5.4 miles northeast of the Project boundary and one mile north of the City of Canby. The Sioux Valley Hospital, located in Canby has a heliport for transporting patients. Mulder Field, Inc. Airport is located approximately 12 miles southeast of the Project Area near Ivanhoe, Minnesota. A publicly-owned airport is also located approximately 18 miles northwest of the Project, near Clear Lake, South Dakota.⁴⁹ The Applicant has not yet been issued a “no hazard” determination from the Federal Aviation Administration (FAA). Section 4.12 of the site permit requires the Permittee to avoid placing wind turbines or associated facilities in a location that could create an obstruction to navigable airspace to certain airports. The Permittee 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).
58. The addition of up to 92 wind turbines and three permanent meteorological towers could introduce the possibility of collisions with crop-dusting aircraft. The turbines would be

⁴⁸ Environmental Report, at Table 1; Exhibit 23

⁴⁹ Exhibit 1, at 38

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.

59. 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). Once energized, the proposed Project will generate electromagnetic fields.⁵⁰
60. The Applicant believes that the Project will not have any impact on public health and safety due to EMFs.⁵¹ While there is no conclusive evidence that EMFs from power lines and wind turbines pose a significant health impact, the turbines will be installed no closer than 1000 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.
61. 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. In addition, stray voltage may result from a damaged, corroded, or poorly connected wiring or damaged insulation (contact voltage).
62. 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

⁵⁰ Exhibit 1 at 38.

⁵¹ Ibid. at 40.

location, level of current, pathway, frequency, and other factors related to the daily activities of the animals. 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.

63. As with any large construction project, some risk of worker or public injury exists during construction. BRPP 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. BRPP will also provide security during construction and operation of the project, including fencing, warning signs, and locks on equipment and facilities. The Permittee will also provide landowners and interested persons with safety information about the project and its facilities. See site permit at section 7.15. BRPP has agreed to work with the local first responders (Fire, EMS, Law Enforcement) to provide training and information about how to best respond to incidents at the Project; the nature and extent of this training will be determined in coordination with the O&M staff and the first responders in development of the Emergency Response Plan required under section 7.16 of the site permit.
64. 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. See site permit at sections 7.16 and 7.17.
65. 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 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, it remains important that the turbines are not sited in areas where regular human activity is expected below the turbines during the winter months.

Public Services and Infrastructure

66. The Project is expected to have minimal effects on existing public infrastructure. Except for a short period of time during construction and occasionally during operation and maintenance activities, the Project will not generate an increase in traffic volumes or daily human activity. The construction contractor will repair any road damage that may occur during the construction of the Project. See site permit at section 7.8.
67. State Highway 68 crosses the far northwestern portion of the Project Area. Yellow Medicine County Roads 30 and 36 provide east-west passage through the Project Area.

The Project Area is also crossed by a number of township roads. The project will require the use of public roads to deliver construction supplies and materials to the work site, resulting in wear and tear on roads. 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 and 7.8.1). BRPP will work with all parties involved to address concerns related to roadway use, and adhere to state, county, and township requirements for transportation infrastructure.

68. Construction of the Project requires the addition of approximately 20-25 miles of access roads that will be located on private property.⁵² The access roads will be built adjacent to turbine towers, allowing access both during and after construction. The access roads will be sited in consultation with 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 agricultural equipment. The typical access road will be approximately 40 feet wide during the construction phase of the Project to accommodate large cranes required for installation. Following construction, the roads would be reduced to approximately 16 feet in width and covered in Class 5 gravel (or similar material).⁵³ Access roads shall be constructed in accordance with all necessary township, county or state road requirements and permits (site permit section 7.8.2). During operation and maintenance of the wind plant, operation and maintenance crews, while inspecting and servicing the wind turbines, will use access roads. Periodic grading and maintenance activities will be used to maintain road integrity. The Permittee may do this work or contract it out.
69. If access roads are installed across streams or drainage ways, the Permittee in consultation with the Minnesota Department of Natural Resources will design, shape and locate the road so as not to alter the original water flow or drainage patterns. Any work required below the ordinary high water line, such as road crossings or culvert installation, will require a permit from the Minnesota Department of Natural Resources. See site permit at 4.6 and 7.8.2.
70. The Permittees will bury all SCADA communications cables within or adjacent to land necessary for turbine access roads. See site permit at section 4.14.
71. The proposed project will have approximately 13 miles of cables for the collector lines on private property within the wind farm. Collector lines carrying electrical power from turbines to electrical interconnection points will be buried underground and placed within or adjacent to turbine access roads unless otherwise negotiated with affected landowners.

⁵² Ibid., at 19

⁵³ Ibid.

Feeder lines carrying power from internal project interconnection points to the Project substation may be overhead or underground as negotiated with individual landowners (site permit section 4.15). Most of the underground electric circuits will parallel existing turbine maintenance roads or public road rights-of-way. The Applicant anticipates that feeder lines will also be buried; if conditions exist that would prevent the feeder lines from being buried, feeder lines will be installed overhead on single pole structures with heights of 25 to 40 feet. The Project is expected to have a minimal effect on the existing infrastructure.

72. The proposed wind farm will not affect water supplies, railroads, electric transmission, telecommunication facilities, and radio reception. To the extent Project facilities cross or otherwise affect existing telephone lines or equipment BRPP will make arrangements with applicable service providers to avoid interference with such facilities. The Permittee must satisfy all Institute of Electrical and Electronics Engineers, Inc. (IEEE) standards applicable to the Project. See site permit at section 4.15. Microwave beam path analysis work will avoid conflicts with the Fresnel zones. BRPP will also place towers so as to avoid interfering with land mobile facilities. The presence or operation of the wind plant could potentially impact the quality of television reception in the area. Previous work on television reception issues indicates that in some cases new antennas or relocation of existing antennas can restore television signal strength reception. The Permittee will address the concerns of residents in the area of the project site before and after project construction to document and mitigate any television, radio, telecommunications, microwave, or navigation reception impacts that might occur. See site permit at section 6.4.
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 Permittee to submit the location of underground cables, collector, and feeder lines to Gopher State Once Call.

Recreational Resources

74. Recreational opportunities in Yellow Medicine and Lincoln counties include hiking, biking, boating, fishing, golfing, camping, swimming, horseback riding, snowmobiling, hunting, and nature viewing. The Project Area contains five wildlife management areas (WMAs), three additional three WMAs are located immediately adjacent to the Project Area.⁵⁴ No formally designated county or state parks are located within the Project Area, although the State Line Wayside Park is located in the northwestern portion of the Project Area. There are no Scientific and Natural Areas (SNAs) within the Project Area; the nearest SNW is the Yellow Bank Hills SNA, located approximately 21 miles north of the Project Area. The USFWS manages Wildlife Protection Areas. There are no documented snowmobile or all terrain vehicle trails within the Project Area.

⁵⁴ Exhibit 23

Community Benefits

75. The Bitter Root Wind Farm Project will pay an annual Wind Energy Production Tax to Yellow Medicine and Lincoln counties and Fortier, Florida and Hansonville townships. Landowners with turbine(s) and/or wind easements on their property will also receive payments from the Permittee.
76. To the extent that local workers and local contractors are capable, qualified, and available, BRPP will seek to hire them to construct the proposed project. The hiring of local people will expand employment opportunities in this area of the state and keep money in the local economy. Once constructed, the Project will be staffed with site technicians.

Effects on Land-Based Economies

77. The Applicants anticipate that approximately 120 acres of agricultural land will be permanently displaced. Construction activities (e.g. grading, soil compaction, access roads, turnaround areas, temporary construction staging areas) are anticipated to temporarily impact approximately 300 acres of agricultural land. 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 BRPP to complete repairs, or clear vegetation around a turbine or facility, which could result in additional temporary impact 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.
78. The proposed project does not adversely affect any sand or gravel operations.

Archaeological and Historical Resources

79. The Applicant conducted a review of records at the Minnesota State Historic Preservation Office (SHPO) for the Project area. The review of records identified six historic architectural properties and eight archaeological sites located within one mile of the Project area.⁵⁵ In a September 5, 2008 letter to the Applicant⁵⁶ the Minnesota State Historic Preservation Office (SHPO) recommended that an archaeological survey be completed for the Project. Section 6.3 of the site permit requires the Permittee 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 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.
80. If any 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

⁵⁵ Exhibit 1, at 35

⁵⁶ Ibid., at Appendix E

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 Permittee to stop work and notify the Commission, SHPO, and the State Archaeologist if any unrecorded cultural resources are found during construction.

Air and Water Emissions

81. No harmful air or water emissions are expected from the construction and operation of the LWECS.

Wildlife and Vegetation

82. Landcover within the Project boundary is comprised mainly of cultivated land (approximately 44 percent) and grasslands (approximately 36 percent). Five WMAs are located within the Project area, and four additional WMAs are located within two miles of the Project boundary. Native Prairie is likely to be present within the Project Area.⁵⁷ Wildlife species found within the Project area include both resident and migratory species of Minnesota game and no-game wildlife that are associated with croplands, grasslands, wetlands, and riparian woodlands.⁵⁸
83. Based on studies of existing wind power projects in the United States and Europe, impacts to avian and bat populations are typically the areas of greatest concern. The project will have direct and indirect impacts on birds, bats, and other wildlife resources and their habitats. Direct impacts may include strike fatality from turbine blades, power lines, and related infrastructure. Indirect impacts may include displacement of birds and bats and other wildlife from their habitats, site avoidance, and behavioral modification (National Wind Coordinating Committee, Spring 2010).
84. The United States Fish and Wildlife Service (USFWS) has developed Draft Guidelines for Wind Turbine Siting (2010) in collaboration with the Wind Turbine Guidelines Advisory Committee. The Guidelines are intended to provide wind developers and regulatory agencies with the information needed to identify, assess, and monitor the potentially adverse impacts of wind energy projects on wildlife and their habitats, particularly migratory birds and bats. The guidelines focus on a tiered approach to gathering information on a site and potential risks to wildlife and wildlife habitat. Depending on the results obtained from each tier, pre-and/or post-construction survey work is indicated along with associated mitigative measures.
85. Recent studies indicate a broad range in 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 wide range of fatality rates. The highest bird and bat fatalities were

⁵⁷ Ibid., at 55

⁵⁸ Ibid., at 57

found at the 145 MW Blue Sky Green Field wind facility in Wisconsin, with bird fatalities at 12 birds/turbine/year and bat fatalities at 40 bats/turbine/year (Gruver et al. 2009). Fatalities range from 1 to 4 birds/turbine/year and from 1 to 8 bats/turbine/year across most of the upper Midwest. Avian and bat studies conducted at the Buffalo Ridge, Minnesota (Johnson et al 2000), found an average of 1-4 bird fatalities/turbine/year and 1-3 bat fatalities/turbine/yr. 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 and turbines 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.

86. BRPP contracted with biologists to perform wildlife studies in the Project area to evaluate the spatial and temporal use of the Project area by wildlife. The wildlife studies were carried out between March and October, 2008.⁵⁹ The study included fixed-point bird use surveys, transect surveys for grassland bird species, raptor nest surveys, Prairie Grouse Lek surveys, bat surveys, and incidental wildlife observations. Overall raptor use of the Project Area was low, and impact to raptors from the Project would be expected to be low as a result. Survey results found higher bird use of the Project Area during spring and fall migration periods, primarily driven by high waterfowl use during these time periods. Based on the findings from other studies of avian impacts from wind project, waterfowl do not appear especially vulnerable to turbine collisions. The surveys also identified migrant and resident passerines (songbirds) in the Project Area. Based on existing literature, passerines would be expected to comprise the majority of bird fatalities resulting from the Project. The surveys did identify high bat activity within the Project Area, compared to activity at other wind projects in the United States; because of the level of bat activity, bat mortality resulting from the Project would be equal to or greater than the 10.2 bat fatalities/turbine/year reported at the Top of Iowa Wind Farm in Iowa, but lower than the 38 fatalities/turbine/year reported at Mountaineer, West Virginia.
87. The DNR letter of April 21, 2010 identified a number of concerns with the Project. Areas of concern were related to the presence of native prairie and the Yellow Medicine Coteau Macrosite, a large area of significant prairies and a matrix of connecting grasslands, which overlaps a portion of the Project area. The DNR's concerns are related to the potential for turbines sited within these areas to act as a habitat barrier or cause avoidance behavior for wildlife using this landscape feature. The DNR's comments also noted the abundance of bird and bat habitat and expressed concern for flight barrier or collision risk as birds fly between habitats. The DNR comments recommended that the Project avoid siting turbines within the Yellow Medicine Coteau Macrosite or native prairie and that BRPP be required to perform additional pre-construction avian and bat surveys.
88. On November 4, 2010, BRPP filed a letter summarized their efforts to minimize impacts to sensitive habitats and species to the extent practicable and responding the issues

⁵⁹ Ibid., at 57 and Appendix F

identified in the DNR letter of April 21, 2010.⁶⁰ In the letter, BRPP discussed the development of avian survey protocols in response to identify use of the Project Area by sensitive grassland nesting species. BRPP responded that, given the findings resulting from the number and variety of avian surveys already performed, they do not believe that additional preconstruction avian surveys are warranted. BRPP did acknowledge that, given the high level of bat activity identified in the surveys, additional preconstruction bat surveys are warranted. BRPP stated its willingness to work with the USFWS and DNR to design and implement additional preconstruction bat surveys. BRPP acknowledged the conservation strategy of limiting development with the Yellow Medicine Coteau Macrosite, but pointed out that the area is comprised of a heterogeneous mixture of grasslands that vary in conservation value, as well as regularly disturbed areas of tilled agriculture. BRPP has committed to avoiding areas of native prairie when siting turbines. With respect to the Yellow Medicine Coteau Macrosite, BRPP proposed to minimize siting within the macrosite and, for sites located within the macrosite, use information gathered from preconstruction biological and cultural surveys to site in a manner that minimizes impacts to the function of the macrosite.

89. The site permit requires a number of mitigation measures to minimize impacts to sensitive habitats and species: Section 6.1 requires a pre-construction inventory of existing biological resources, native prairie, state listed and threatened species and wetlands in the project area; Section 4.5 requires that turbines and associated facilities will not be constructed in wildlife management areas, recreation and state scientific and natural areas or parks or within a 5 by 3 rotor diameter setback from these areas; Section 4.7 requires development of a Prairie Protection and Management Plan; Section 13.2 requires the Prairie Protection and Management Plan to identify efforts to avoid and minimize impacts to the Yellow Medicine Coteau Macrosite; Section 6.7 requires the development of an Avian and Bat Protection Plan; Section 7.11 requires development of a Soil Erosion and Sediment Control Plan and an Invasive Species Prevention Plan; Section (7) preconstruction bat monitoring (Section 13.3); and (8) post construction avian and bat monitoring (Section 13.4).
90. 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.

Soils

91. Construction of the wind turbines and access roads in farmland increases the potential for erosion during construction. Section 7.11 of the site permit requires a Soil Erosion and Sediment Control Plan. The project will also require a NPDES/SPS permit from the PCA.

⁶⁰ Exhibit 22

Surface Water and Wetlands

92. Access roads or utility lines will not be located in surface water or wetlands, unless authorized by the appropriate permitting agency. See site permit at 4.6 and 10.5.1.
93. The DNR letter of April 21, 2010, noted that calcareous Fens are located within the Project area, and appear to be avoided by the turbines. The DNR requested that BRPP submit information about any unreported calcareous fens to DNR, so that the information may be incorporated into the Natural Heritage Information System. The site permit, at 6.1, requires that BRPP perform a biological survey of the potentially impacted areas and report those results to the Commission and to DNR prior to construction.

Future Development and Expansion

94. Current information suggests windy areas in this part of the state are large enough to accommodate more wind facilities. In the future, wind turbines used in Yellow Medicine, Lincoln, and surrounding counties will consist of several types and sizes supplied by different vendors and installed at different times.
95. 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. OES EFP staff will continue to monitor for impacts and issues related to wind energy development.
96. The Commission is responsible for siting of LWECS “in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources.”⁶¹ Section 4.1 of the site permit provides for buffers between adjacent wind generation projects to protect production potential.

Maintenance

97. Maintenance of the turbines will be on a scheduled, rotating basis. Maintenance on the interconnection point will be scheduled for low wind periods. The Bitter Root Wind Farm Project will be staffed with wind technicians as necessary. An Operations and Maintenance facility is planned for the Project. Once a site is selected, the O&M facility will be permitted by the appropriate local unit of government.

Decommissioning and Restoration

98. BRPP expects that the life of the Project will be no less than 20 – 30 years and reserves the right to re-apply for a LWECS site permit and continue operation of the Project. LWECS site permit renewal may be under a new long-term power purchase agreement (PPA), merchant operation of the Project, or replacement and re-powering of the Project.

⁶¹ Minn. Stat. § 215F.03.

99. Decommissioning activities will include (1) removal of all wind turbine components and towers; (2) removal of all pad mounted transformers; (3) removal of all above-ground distribution facilities; (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.
100. As provided in section 9.1 of the site permit, the Permittee must submit a Decommissioning Plan to the Commission prior to the pre-operation compliance meeting. The Decommissioning Plan will document the manner in which BRPP 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. The site permit addresses site restoration at Section 9.2; turbines abandoned prior to termination of operation of the Project area addressed at Section 9.3 of the site permit.

Site Permit Conditions

101. All of the above findings pertain to the Applicant's requested permit for a 138 megawatt wind project.
102. Most of the conditions contained in this 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 additions that provide for clarifications of the draft site permit conditions have been made.
103. 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 the site permit applied for by Buffalo Ridge Power Partners, LLC, for the 138 megawatt Bitter Root Wind Farm Project pursuant to Minnesota Statute 216F.04.
3. Buffalo Ridge Power Partners, LLC, 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.
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 Bitter Root Wind Farm Project 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 Minnesota Statutes section 216F.04 to place conditions in a permit and may deny, modify, suspend, or revoke a permit. The conditions contained in the site permit issued to Buffalo Ridge Power Partners, LLC, for the Bitter Root Wind Farm Project 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 Buffalo Ridge Power Partners, LLC, to construct and operate the 138 megawatt Bitter Root Wind Farm Project in Yellow Medicine and Lincoln counties in accordance with the conditions contained in the site permit and in compliance with the requirements of Minnesota Statute 216F.04 and Minnesota Rules Chapter 7854 for PUC Docket No. IP6684/WS-08-1448.

The site permit is attached hereto, with a map showing the approved site.

BY THE ORDER OF THE COMMISSION

Burl W. Haar
Executive Secretary

(S E A L)

This document can be made available in alternative formats (i.e., large print or audio tape) by calling 651.201.2202 (Voice). Persons with hearing or speech disabilities may call us through Minnesota Relay at 1.800.627.3529 or by dialing 711.