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August 9, 2019

VIA ELECTRONIC FILING

Daniel P. Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place E, Suite 350
St. Paul, MN 55101

Re: ***In the Matter of the Application of Buffalo Ridge Wind, LLC for a Certificate of Need for the 109 MW Large Wind Energy Conversion System in Lincoln and Pipestone Counties, Minnesota*, MPUC Docket No. IP7006/CN-19-309**

***In the Matter of the Application of Buffalo Ridge Wind, LLC for a Site Permit for the 109 MW Large Wind Energy Conversion System in Lincoln and Pipestone Counties, Minnesota*, MPUC Docket No. IP-7006/WS-19-394**

Dear Mr. Wolf:

Buffalo Ridge Wind, LLC ("BRW") hereby submits updates to BRW's Site Permit Application ("Site Permit Application") filed on July 17, 2019 in Docket No. IP-7006/WS-19-394, and BRW's Certificate of Need Application ("CON Application") filed on July 12, 2019 in Docket No. IP7006/CN-19-309. Specifically, BRW is updating the following portions of the applications:

- BRW Site Permit Application Sections 1, 4, 5, 6, 7, and 8;
- Site Permit Application Maps 1-24;
- Site Permit Application Appendix C – Sound Report;
- Site Permit Application Appendix D – Shadow Flicker Analysis;
- BRW CON Application Sections 1, 5, 6, 11, and 12; and
- CON Application – Appendix C

These updates represent BRW's refinement of its turbine array to optimize the sound levels of the BRW Wind Project ("Project") following input from the Minnesota Department of Commerce. The specific revisions made to the Project's array include:

(i) changing turbine technology at certain turbine locations[1];

(ii) eliminating two turbines (turbines 16 and 20 as filed in the initial Application);

(iii) revising alternate turbines (turbines 7, 23, and 30 in the initial Application have been made alternates – these turbines now are Alt2, Alt4, and Alt5, respectively); and

(iv) running certain turbines (turbines 29, Alt2, Alt4, and Alt5) with noise reduction capability.

With these revisions, the Project is now comprised of a total of 45 wind turbines (40 proposed turbines + 5 alternates) of which five are proposed to be GE 2.3-116 wind turbines, eight are proposed to be GE 2.52-127 wind turbines, and 32 are proposed to be GE 2.82-127 wind turbines. In addition, the turbines indicated above are proposed to run under a noise reduction operation, which involves operating a turbine at a reduced rotor speed and with an optimized blade pitch angle, thereby lowering the sound emitted by the wind turbine.

Since these Project modifications have corresponding effects on certain sections of BRW's Site Permit Application and CON Application, BRW is updating its full applications via these filings in the respective dockets. Therefore, both applications are being submitted in their full form, with a designation at the top of each page in which there have been changes to indicate that the page has been revised. Individual pages of the applications where revisions have been made are being provided with this filing separately in redlined format.

Copies of the filings are being served upon the persons on the official service list of record for the applicable docket, in accordance with the attached certificate of service.

Thank you for your attention to this filing. Please do not hesitate to contact me with any questions or concerns.

Respectfully submitted,

Stinson LLP

/s/ Brian M. Meloy

[1] Turbine 7, formerly turbine 8, is now a GE2.82 turbine; turbine 29 is now a GE 2.52 turbine; Alt2, formerly turbine 7, is now a GE2.52 turbine; Alt 4, formerly turbine 23, is now a GE2.52 turbine; Alt 5, formerly turbine 30, is now a GE2.52 turbine.

CC: Buffalo Ridge Wind, LLC
Danell Herzig, Project Director, Renewable Development

Application for Certificate of Need

Buffalo Ridge Wind, LLC

Large Wind Energy Conversion System

MPUC Docket Number: IP7006/CN-19-309

August 9, 2019

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APPENDICES

ACRONYM/TERM	DEFINITION
ABPP	avian bat protection plan
ADLS	aircraft detection lighting system
BRW or Applicant	Buffalo Ridge Wind, LLC
capacity	the capability of a system, circuit, or device for storing electronic charge
Commission	Minnesota Public Utilities Commission
CON	certificate of need
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CSAH	County State Aid Highway
distribution	relatively low-voltage lines that deliver electricity to a retail customer's home or business
FAA	Federal Aviation Administration
GE	General Electric
generator	a machine by which mechanical energy is changed into electrical energy
geotechnical	a science that deals with the application of geology to engineering
GRE	Great River Energy
hub	the central component of the wind turbine that connects the rotors to the generator
interconnection	location of project connection to the power grid
IPP	independent power producer
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour

ACRONYM/TERM	DEFINITION
LEGF	large electric generating facility
micrositing	the process in which the wind resources, potential environmentally sensitive areas, soil conditions, and other site factors, as identified by local, state and federal agencies, are evaluated to locate wind turbines and associated facilities
Minn. R.	Minnesota Rules
MISO	midcontinent independent transmission system operator
MNDNR	Minnesota Department of Natural Resources
MN/DOT	Minnesota Department of Transportation
MW	megawatt
MWh	megawatt-hour
NEER	NextEra Energy Resources, LLC
O&M	operation and maintenance
PPA	power purchase agreement
Project	BRW Project
PWP	Permanent Wetland Preserves
RES	Renewable Energy Standard
rotor	three blades mounted to a rotor hub
RD	rotor diameter; diameter of the rotor from the tip of a single blade to the tip of the opposite blade
SHPO	Minnesota State Historic Preservation Office
SPCC	spill prevention, control, and countermeasure
step-up transformer	a transformer that increases voltage
USFWS	U.S. Fish and Wildlife Service
WCS	wildlife conservation strategy

Rule	Required Information	Application Section(s)	Exemption
7849.0120	**Criteria – Probable result of denial would be an adverse effect upon the future adequacy, reliability, or efficiency of energy supply to the applicant, the applicant's customers, or to the people of Minnesota and neighboring states**	5.1	--
A(1)	Accuracy of the applicant's forecast	5.1, 7.0	No
A(2)	Effects of applicant's existing or expected conservation programs and state and federal conservation programs	5.1, 9.0	No
A(3)	Effects of promotional practices on demand	5.1, 6.3.1.11	No
A(4)	Ability of current and planned facilities, not requiring certificates of need, to meet future demand	5.1, 6.2.4.5	No
A(5)	Effect of proposed facility in making efficient use of resources	5.1	No
7849.0120	**Criteria – A more reasonable and prudent alternative has not been demonstrated**	5.2	--
B(1)	Appropriateness of size, type, and timing	5.2.1	No
B(2)	Cost of facility and its energy compared to costs of reasonable alternatives	5.2.2	No
B(3)	Effects of the facility upon natural and socioeconomic environments compared to the effects of reasonable alternatives	5.2.3	No
B(4)	Expected reliability compared to reasonable alternatives	5.2.4	No
7849.0120	**Criteria – Facility will provide benefits to society**	5.3	--
C(1)	Relationship of proposed facility to overall state energy needs	5.3.1	No
C(2)	Effects of facility upon the natural and socioeconomic environments compared to the effects of not building the facility	5.3.2	No
C(3)	Effects of facility in inducing future development	5.3.3	No
C(4)	Socially beneficial uses of the output of the facility, including to protect or enhance environmental quality	5.3.4	No
D	Facility or suitable modification will not fail to comply with relevant policies, rules, and regulations of other state and federal agencies and local governments	5.4	No
7849.0210	**Filing Fees and Payment Schedule**	2.0	No
7849.0240	**Need Summary and Additional Considerations**	4.0	--
Subp. 1	Need Summary – summary of major factors justifying need for facility	4.1	No
Subp. 2(A)	Additional Considerations – Socially beneficial uses of the output of the facility, including to protect or enhance environmental quality	4.2.1	No
Subp. 2(B)	Additional Considerations – Promotional activities that may have given rise to the demand for the facility	4.2.2	Partial

Rule	Required Information	Application Section(s)	Exemption
Subp. 2(C)	Additional Considerations – Effects of the facility in inducing future development	4.2.3	No
7849.0250	**Proposed LEGF and Alternatives Application**	6.0	--
A(1)	Description – Nominal generating capability and effects of economies of scale on facility size and timing	6.1.1	No
A(2)	Description – Anticipated operating cycle, including annual capacity factor	6.1.2	No
A(3)	Description – Type of fuel, reason for selection, projection of availability over life of facility, and alternative fuels	6.1.3	No
A(4)	Description – Anticipated heat rate	6.1.4	No
A(5)	Description – Anticipated areas where facility will be located	6.1.5	No
B(1)	Discussion of Alternatives – Purchased power	6.2.1	Yes
B(2)	Discussion of Alternatives – Increased efficiency of existing facilities	6.2.2	Partial
B(3)	Discussion of Alternatives – New transmission lines	6.2.3	Partial
B(4)	Discussion of Alternatives – New generating facilities of a different size and energy resource	6.2.4	Yes
B(5)	Discussion of Alternatives – Reasonable combination of alternatives	6.2.5	Partial
C	Proposed Facility and Alternatives	6.3	--
C(1)	Capacity cost in current dollars per kilowatt	6.3.1.1	Yes - Limited
C(2)	Service life	6.3.1.2	Yes - Limited
C(3)	Estimated average annual availability	6.3.1.3	Yes - Limited
C(4)	Fuel costs in current dollars per kilowatt hour	6.3.1.4	Yes - Limited
C(5)	Variable operating and maintenance costs in current dollars per kilowatt hour	6.3.1.5	Yes - Limited
C(6)	Total cost in current dollars of a kilowatt hour provided by it	6.3.1.6	Yes - Limited
C(7)	Estimate of its effect on rates system-wide and in Minnesota	6.3.1.7	Partial
C(8)	Efficiency, expressed for a generating facility as the estimated heat rate	6.3.1.8	Yes - Limited
C(9)	Majoring assumptions made in providing information in subitems (1) to (8), including projected escalation rates for fuel costs and operating and maintenance costs, as well as projected capacity factors	6.3.1.9	Yes - Limited
D	System Map	6.3.1.10	Yes
E	Other relevant information about the facility and alternatives that may be relevant to a determination of need	--	

Rule	Required Information	Application Section(s)	Exemption
7849.0270	**Peak Demand and Annual Consumption Forecast**	7.0	Partial
7849.0280	**System Capacity**	8.0	Partial
7849.0290	**Conservation Programs**	9.0	Yes
7849.0300	**Consequences of Delay**	10.0	Partial
7849.0310	**Environmental Information – Provide environmental data in response to part 7849.0250, Item C, or 7849.0260, Item C, and information as requested in part 7849.0320 to 7849.0340**	11.0	No
7849.0320	**Generating Facilities**	12.0	No
A	Estimated range of land requirements, including water storage, cooling systems, and solid waste storage	12.1	No
B	Estimated amount of vehicular, rail, and barge traffic generated by construction and operation of facility	12.2	No
C	Fossil-fuel facilities – Fuel	12.3.1	No
D	Fossil-fuel facilities – Emissions	12.3.2	No
E	Water Use for Alternate Cooling Systems	12.4	No
F	Sources and types of discharges to water	12.5	No
G	Radioactive releases	12.6	No
H	Types and quantities of solid wastes in tons/year	12.7	No
I	Sources and types of audible noise attributable to facility operation	12.8	No
J	Estimated work force required for facility construction and operation	12.9	No
K	Minimum number and size of transmission facilities required to provide a reliable outlet for the generating facility	12.10	No
7849.0330	**Transmission Facilities**	--	Yes
7849.0340	**No-Facility Alternative**	6.2.4.7	Partial

1.0 INTRODUCTION

Buffalo Ridge Wind, LLC (BRW or Applicant) respectfully submits this application for a certificate of need (CON) to the Minnesota Public Utilities Commission (Commission) in accordance with Minnesota Statutes (Minn. Stat.) § 216B.243 and Minnesota Rules (Minn. R.) Chapter 7849.

BRW is a wholly-owned indirect subsidiary of NextEra Energy Resources, LLC (NEER). NEER is a national renewable energy company that owns and operates over 23,500 megawatts (MW) of electric generating capacity in 36 states and Canada. NEER has ownership and financial interests in (1) the formerly operating 26.3 MW Buffalo Ridge Wind Energy Center in Lincoln County, which has been decommissioned; (2) the 98.2 MW Mower County wind facilities in Mower County; and (3) the to-be-repowered 102.8 MW Lake Benton II project in Pipestone County.

1.1 The Buffalo Ridge Wind Project

BRW respectfully requests that the Commission issue a CON for the approximately 109 MW Buffalo Ridge Wind Project (the Project).[1] The Project is a "large energy facility" as defined in Minn. Stat. § 216B.2421, subd. 2(1).

BRW is an independent power producer (IPP) that will develop, construct, own, and operate the Project. The Project includes turbines, a project collector substation, collection lines, an operation and maintenance (O&M) building, permanent meteorological tower(s), and gravel access roads. The Project site is located on 16,893 acres (26.4 square miles) primarily in Lincoln County in southwestern Minnesota, immediately east of the City of Lake Benton and west of the City of Tyler, Minnesota (Project Area). A small portion of the Project Area extends into Pipestone County. The Project will produce up to approximately 109 MW, supported by 31 General Electric (GE) 2.82 MW wind turbines, five GE 2.52 MW wind turbines, and four GE 2.3 MW turbines. The Project will be interconnected to the electric transmission grid at the existing Buffalo Ridge substation owned by Northern States Power Company, a subsidiary of Xcel Energy. BRW's anticipated commercial operations date for the Project is November 30, 2020.

There was previously a wind facility operating in the general vicinity of the Project Area, called the Buffalo Ridge Wind Farm. The original Buffalo Ridge Wind Farm was constructed in 1994 and consisted of 73 Kenetech turbines. The original wind farm was permitted by Lincoln County. The site was decommissioned in 2017.[2]

BRW has entered into a power purchase agreement (PPA) with Great River Energy (GRE). In the PPA, GRE agreed to purchase the full output of the Project for a 25-year term. The Project, as a

[1] BRW will also be requesting a Site Permit related to the Project.

[2] The existing Buffalo Ridge wind facility stopped operation in late 2016 and was decommissioned in 2017.

generator of wind energy, qualifies as an "eligible energy technology" for the purposes of the Minnesota Renewable Energy Standard (RES), as set forth in Minn. Stat. § 216B.1691, and, therefore, will serve as a significant renewable generation addition to assist GRE in meeting and exceeding its RES requirements, in addition to its own voluntary renewable energy goals.

1.2 Project Contacts

The authorized representatives for the Applicant are:

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August 9, 2019

2.0 FEES AND PAYMENT SCHEDULE (MINN. R. 7849.0210)

Table 1. Certificate of Need Application Schedule of Payments

Fee Calculation	Amount
Fee Calculation Equation	$10,000 + ($50×MW)
Due with CON Application	$3,865
Due 45 Days after Application Submittal Date	$3,865
Due 90 Days after Application Submittal Date	$3,865
Due 135 Days after Application Submittal Date	$3,865
Total Calculated Fee	**$15,460**

3.0 FILING REQUIREMENT EXEMPTION REQUEST

Minn. R. Ch. 7849 permits applicants to request exemptions from filing requirements that are not applicable to a project. Specifically, an applicant may be exempted from providing certain information if the applicant requests an exemption in writing that shows that the data requirement is either unnecessary to determine the need for the proposed facility or may be satisfied by submitting another document. Minn. R. 7849.0200, subp. 6.

On May 7, 2019, BRW filed with the Commission a request for exemptions from certain CON filing requirements based on BRW's status as an IPP. This request is included with this application as **Appendix A**. On July 3, 2019, the Commission issued an Order (attached as **Appendix B**) granting the following requested exemptions from the CON filing requirements:

1. Granted exemptions to the following Minnesota Rules conditioned upon BRW providing equivalent data from GRE:

    - 7949.0240, subp. 2 (B): Promotional Activities;
    - 7849.0250 (B) (2), (3), and (5): Description of Certain Alternatives;
    - 7849.0250 (C) 7: Effect of Project on Rates Systemwide;
    - 7849.0270: Peak Demand and Annual Consumption Forecast;
    - 7849.0280: System Capacity;
    - 7849.0300: Consequences of Delay; and
    - 7849.0340: No-Facility Alternative.

2. Granted a partial exemption to the following Minnesota Rules such that the information to be provided is limited to renewable alternatives:

    - 7849.0250 (B) (4): Description of Certain Alternatives (New Generating Facilities of a Different Size or Source); and
    - 7849.0250 (C) (1) to (6), (8), and (9): Details Regarding Alternatives.

3. Approved the following exemptions as requested:
    - 7849.0250 (B) (1): Description of Certain Alternatives (Purchased Power);
    - 7849.0250 (D): Map of Applicant's System
    - 7849.0290: Conservation Programs; and
    - 7849.0330: Transmission Alternatives.

4.0 NEED SUMMARY AND ADDITIONAL CONSIDERATIONS (MINN. R. 7849.0240)

4.1 Need Summary (Minn. R. 7849.0240, subpart 1)

The Project is needed to assist in providing electricity for GRE's members and to further GRE's efforts to exceed the Minnesota RES and other clean energy requirements. As background, the Next Generation Energy Act of 2007 requires that utilities in Minnesota provide 25% of their total retail electric sales from eligible renewable resources by 2025.[3] Additionally, the Minnesota legislature has specified aggressive goals for the reduction of greenhouse gas emissions across all sectors, including the electric sector. The legislature's specific goal is to "reduce statewide greenhouse gas emissions across all sectors producing those emissions to a level at least 15 percent below 2005 levels by 2015, to a level at least 30 percent below 2005 levels by 2025, and to a level at least 80 percent below 2005 levels by 2050".[4] Between the RES and state greenhouse gas emission reduction goals, additional renewable resources will continue to be needed in Minnesota. Therefore, the Project will serve to meet this broader legislative need as well as the specific electricity and renewable energy needs of GRE.

4.2 Additional Considerations (Minn. R. 7849.0240, subpart 2)

4.2.1 Socially Beneficial Uses of the Output

The Project will produce affordable, clean, renewable energy that will help GRE to: (1) exceed its RES requirements; (2) meet the energy demands of its members; and (3) further the state's goals of reducing carbon emissions. The Project will produce enough clean, renewable energy to meet the full electrical needs of approximately 24,400 Minnesota households annually. In addition, as described in greater detail below, the local economy will benefit from the landowner lease payments for turbines, production taxes, the income from temporary and permanent jobs associated with the Project, and local spending.

4.2.2 Promotional Activities that May Have Given Rise to the Demand for the Facility

BRW was granted an exemption from the requirement of Minn. R. 7849.0240, subp. 2(B), conditioned on GRE providing equivalent data on its promotional activities. GRE, however, has indicated that it has conducted no promotional activities associated with the Project, and, therefore, there is no information to submit.

4.2.3 Effects of the Facility on Inducing Future Development

The Project is not expected to directly induce development in Lincoln County or Pipestone County. However, the Project will positively impact those counties by adding infrastructure, temporary and

[3] Minn. Stat. § 216B.1691.
[4] Minn. Stat. § 216H.02, subd. 1.

permanent jobs, increasing the counties' tax base, and providing lease payments to Project participants. For example, landowners involved in the Project will benefit from annual lease payments. The Project will also pay a Wind Energy Production Tax to the local units of government of $0.0012 per kilowatt-hour (kWh) of electricity produced. This would result in an annual Wind Energy Production Tax ranging from $500,000 in the first year and $600,000 annually after the first year in Lincoln County. During the first year, energy production taxes may not be maximized due to partial energy generation during the startup months when the facility is not running at optimal capacity and may also only include a partial calendar year of energy production.

In addition, communities near the Project are also expected to receive positive economic benefits as construction will necessitate the need for temporary and full-time positions. The Project anticipates creating approximately 200 temporary construction and approximately 7 to 12 full time O&M jobs. BRW plans to use local contractors and suppliers, where feasible, for portions of construction which will contribute to the overall economy of the region. The local and regional purchase of products such as fuel, equipment, services, and supplies necessary to construct and operate the facilities will benefit businesses in the counties as well as in the state. The benefits to the local economy may indirectly induce future development.

5.0 CERTIFICATE OF NEED CRITERIA (MINN. R. 7849.0120)

The Commission has established criteria to assess the need for a large electric generating facility (LEGF) in Minn. R. 7849.0120. The Commission must grant a CON to an applicant upon determining that:

> A. [T]he probable result of denial would be an adverse effect upon the future adequacy, reliability, or efficiency of energy supply to the applicant, to the applicant's customers, or to the people of Minnesota and neighboring states;
>
> B. [A] more reasonable and prudent alternative to the proposed facility has not been demonstrated by a preponderance of the evidence on the record;
>
> C. [B]y a preponderance of the evidence on the record, the proposed facility, or a suitable modification of the facility, will provide benefits to society in a manner compatible with protecting the natural and socioeconomic environments, including human health; and
>
> D. [T]he record does not demonstrate that the design, construction, or operation of the proposed facility, or a suitable modification of the facility, will fail to comply with relevant policies, rules, and regulations of other state and federal agencies and local governments.

5.1 The Probable Result of Denying the BRW CON Application Would Be an Adverse Effect on the Future Adequacy, Reliability, or Efficiency of Energy Supply (Minn. R. 7849.0120(A))

The Project is needed to help meet the electricity needs of GRE's members and assist GRE in its efforts to exceed the Minnesota RES and other clean energy requirements. Denying the application would deny GRE energy from a clean, low-cost renewable resource that would count toward exceeding its RES requirements and which GRE has contracted for under the PPA.

The Project is the result of BRW and GRE working together to bring additional renewable energy to GRE's member cooperatives. In its 2017 Integrated Resource Plan, GRE explained it was exploring the additional of renewable resources through PPAs with wind developers.[5] This exploration led to GRE's execution of the PPA with BRW in which GRE agreed to purchase the full output of the Project for a 25-year term. GRE's commitment to renewable energy and surpassing its RES requirements is supported by its 28 distribution cooperatives. These distribution cooperatives serve approximately 700,000 members across Minnesota and Wisconsin.[6] Denial of

[5] GRE 2018-2032 Integrated Resource Plan, Docket No. ET2/RP-17-286 at 8, 37-39 (April 28, 2017), *available at:* https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={4566B21C-DC09-4EFA-A66A-757736EDAD8A}&documentTitle=20174-131376-02.

[6] GRE 2018 Annual Report at 1, available at: https://greatriverenergy.com/wp-content/uploads/2019/04/GRE2018_AR_FINAL_5_Menu.pdf.

this application, therefore, would reduce the amount of renewable energy made available to GRE's members.

The Project's ability to reliably and efficiently deliver wind energy also advances the goal of adding zero-carbon generation resources to Minnesota's energy mix in keeping with the state's long-term plans to reduce greenhouse gas emissions, as discussed in **Section 4.1**.

Accordingly, the Project will improve the adequacy, reliability, and efficiency of renewable wind energy supply to GRE and its member utilities; assist GRE in exceeding its RES requirements; and advance Minnesota's long-term plans to reduce greenhouse gas emissions statewide. Without the Project, both GRE and electric customers in Minnesota would need to identify alternative renewable resources to meet these needs.

5.2 A More Reasonable and Prudent Alternative to the Project Has Not Been Demonstrated (Minn. R. 7849.0120(B))

Minn. R. 7849.0120(B) requires a CON applicant to examine possible project alternatives so that the Commission can determine whether a more reasonable and prudent alternative exists. Applying the factors set forth in Minn. R. 7849.0120(B), the Project has many advantages when compared to other renewable alternatives.

5.2.1 Size, Type, and Timing

The Project is intended to help satisfy the RES needs of GRE and the state's carbon reduction goals, which can only be satisfied by eligible energy technologies that will reduce carbon emissions. In recognition of this limitation, the Commission granted BRW an exemption from Minn. R. 7849.0250(B) with respect to evaluating fossil fuel alternatives because such alternatives do not meet the Project's objective of providing energy to GRE that will satisfy the RES and other clean energy standards. Of the remaining eligible technologies, wind energy is the most proven and low-cost resource at the size contemplated for the Project (approximately 109 MW), and a resource that can be in commercial operation by the fourth quarter of 2020. Therefore, the type of resource, a wind generation facility, is appropriate to help exceed GRE's RES requirements and the transition of the production of energy to zero-based emissions. Similarly, the size and timing of the development of the Project is congruent with GRE's stated needs over the planning period in its last resource plan and advances the clean energy goals of Minnesota.

5.2.2 Cost Analysis

The Project will provide renewable electricity to GRE at a cost that is likely lower than other renewable technologies. The PPA associated with BRW is the result of an arms-length negotiation

between GRE and BRW, and, thus, the price and other terms were attractive to GRE given its needs. Also, the Project will likely generate electricity at a lower cost per kilowatt hour than would other possible renewable energy options, such as solar and biomass. Therefore, the Project will provide competitively-priced wind energy at a lower-cost than other renewable energy resource alternatives.

5.2.3 Potential Natural and Socioeconomic Impacts

The Project's generation of a renewable form of energy will provide significant natural and societal benefits. As a zero-emission energy resource, the Project has significant positive attributes on the natural environment when compared to fossil generating plants. For example, the Project will not discharge air pollutants that can affect the environment, such as particulate matter, mercury, or carbon dioxide. During operations, the Project will also not need valuable water resources to generate electricity and will not release pollutants into any water body. The land area impacted by the Project is also significantly less than other renewable technologies such as solar. While the Project site encompasses approximately 17,000 acres, only an average 0.75 acres of land per turbine will be taken out of agricultural production for the siting of turbine pads and access road construction. Also, landowners may continue to plant crops near, and graze livestock up to, the turbine pads. In addition, as a renewable natural resource, wind power does not require the extraction, processing, or combustion of fuel as does a fossil fuel plant or biomass facility. BRW has sought input from the Minnesota Department of Natural Resources (MNDNR), the Minnesota State Historic Preservation Office (SHPO) and the U.S. Fish and Wildlife Service (USFWS) to assist with the design of the Project in order to minimize any potential impact on cultural resources, birds, bats, and wildlife habitat.

From a socioeconomic impact, the Project will provide benefits to participating landowners in the form of a supplementary source of income for easements to site wind turbines and obtain wind rights. Changes in agricultural equipment maneuvering routes around turbine structures will be required, but this maneuvering should only have a nominal effect on overall production.

The Project will create approximately 200 temporary construction and approximately 7 to 12 full time O&M jobs. Many of these jobs will be filled by local or regional sources. Wages and salaries paid to contractors and workers will contribute to the total personal income of the region. At least part of the wages paid to temporary and permanent Project workers will be circulated and recirculated within the counties and the state. Expenditures made by the Applicant for equipment, fuel, operating supplies, and other products and services will also benefit businesses in the counties and the state.

Also, as mentioned, the county's tax base will increase as a result of the Project approximately $500,000 and $600,000 annually after the first year in Lincoln County.

5.2.4 Reliability

The projected annual net capacity factor for the Project is approximately 48-52%. The projected average annual output of approximately 478,600 megawatt-hour (MWh) is anticipated for the Project.

5.3 The Project Will Provide Benefits to Society in a Manner Compatible with Protecting the Natural and Socioeconomic Environments (Minn. R. 7849.0120(C))

Minn. R. 7849.0120(C) requires a CON applicant to address whether the proposed project will benefit society in a manner that is compatible with protecting the natural and socioeconomic environments, including human health. The following application of the factors set forth in Minn. R. 7849.0120(C) shows the energy produced by the Project will provide significant societal benefits.

5.3.1 Overall State Energy Needs

As explained in **Section 5.1** above, the Project addresses two state energy needs: (1) the RES requirement and (2) the reduction in statewide carbon emissions. Thus, the Project is compatible with Minnesota's energy needs.

5.3.2 Potential Environmental and Socioeconomic Impacts Compared to No-Build Alternative

As explained in **Section 5.2.3**, the Project provides significant socioeconomic benefits while minimizing the impact on the natural environment. A no-build alternative would not provide these same socioeconomic benefits to the local community, and, also, would not provide the benefit of increasing the amount of renewable energy generation in the state. Therefore, the Project has significant socioeconomic and other benefits and minimal impact on the environment in comparison to a no-build alternative.

5.3.3 Inducing Future Development

The Project is not expected to directly induce development in Lincoln or Pipestone County. As described in **Section 5.2.3**, the Project will, however, provide significant benefits to the local economy and local landowners, which, in turn, may induce future development in these counties.

5.3.4 Socially Beneficial Uses of Output

The Project will produce affordable, clean renewable energy that will help GRE to meet its RES requirements and the energy demands of its members and will further the state's goals of reducing carbon emissions. The Project will produce enough energy to meet the energy needs for approximately 24,400 average Minnesota households annually. In addition, as described above, the local economy will benefit from the landowner lease payments for turbines, production taxes, income from the additional jobs created, and local spending.

5.4 The Project Complies with Relevant Policies, Rules, and Regulations of Other State and Federal Agencies and Local Governments (Minn. R. 7849.0120(D))

5.4.1 The Project Is Consistent with Minnesota Energy Policy

As explained, the Project is consistent with Minnesota's energy policies for the production of electricity, including the RES, preference for renewable energy sources, and goals to reduce carbon emissions. With respect to the reduction of carbon emissions, the state's goal is to reduce statewide greenhouse gas emissions across all sectors producing those emissions to a level at least 30% below 2005 levels by 2025 and to a level at least 80% below 2005 levels by 2050. Adding the Project is consistent with meeting these goals.

Irrespective of the change of U.S. presidential administrations in January 2017 and shifts in federal energy policy, Minnesota remains committed to achieving its renewable energy goals. Both former Governor Mark Dayton and Lieutenant Governor, now Senator, Tina Smith have publicly reflected that Minnesota will not reverse course on its clean energy goals or abandon the ambitions of the Next Generation Energy Act.[7]

Further support for the conclusion that the Project is consistent with state energy policy can be found in the favorable tax treatment for wind energy facilities. The state legislature has exempted all real and personal property of a wind energy conversion system from property taxes. A wind energy conversion system, as well as the materials used to manufacture, install, construct, repair, or replace the wind system are also exempt from state sales tax.

5.4.2 The Project Is Consistent with Applicable Minnesota Statutory Provisions

Minnesota law provides a preference for renewable resources. Minn. Stat. § 216B.243, subd. 3a provides a preference for renewable resources in CON proceedings. Additionally, Minn. Stat. § 216B.2422, subd. 4 requires a finding that a renewable energy resource is not in the public interest before approving a new or refurbished nonrenewable energy facility. The Project is consistent with Minnesota's preference for renewable energy and satisfies these statutory criteria by furthering available resources to meet this renewable energy preference.

5.4.2.1 Distributed Generation

Pursuant to Minnesota Statutes § 216B.2426, the Commission is required to "ensure opportunities for the installation of distributed generation" are considered in CON proceedings. Distributed

[7] Office of the Governor Newsroom, Statements from Governor Dayton, Lt. Governor Smith, and Commissioners on President Trump's Executive Order to Roll Back Progress on Climate Change, Clean Water (March 28, 2017) available at https://mn.gov/governor/newsroom/?id=1055-298010#/detail/appId/1/id/285412.

generation projects are less than 10 MW in size, and, therefore, do not offer the same economies of scale and efficiencies as a utility-scale facility like the Project. Thus, the Project is more appropriately sized to achieve the state's renewable energy policies efficiently and in a cost-effective manner.

5.4.2.2 Innovative Energy Preference

Minnesota also requires the Commission to consider an innovative energy project before authorizing construction or expansion of a fossil-fueled generation facility. Minn. Stat. § 216B.1694, subd. 2(a)(5). Because the Project is not a fossil-fuel facility, this requirement is not applicable.

5.4.2.3 Environmental Cost Planning

Minn. Stat. § 216B.243, subd. 3(12) requires the Commission to evaluate the extent to which an applicant has considered the risk of environmental costs and regulation. This statute, however, does not apply to renewable generation facilities such as the Project.[8]

5.4.2.4 Transmission Planning Compliance

Minn. Stat. § 216B.243, subd. 3(10) requires consideration of whether the entity seeking a CON is in compliance with applicable provisions of Minn. Stat. §§ 216B.1691 and 216B.2425, subd. 7. These statutes involve compliance with the state's renewable energy objectives and reporting requirements for owners of existing transmission and distribution. Neither statute is applicable to BRW. While the Project supports the state's renewable energy objective by providing renewable energy to a retail provider in the state, BRW, as an IPP, is not itself subject to these requirements since it does not own existing transmission and distribution infrastructure.

5.4.3 The Project Is Consistent with Federal Energy Policy

The Project is consistent with federal energy policy in that it provides a domestically produced form of carbon-free energy. In a July 2018 report, the Congressional Research Service recognized the decades-old overarching federal policy of reducing dependence on foreign sources of energy and embracing domestic sources of renewable forms of energy, stating as follows:[9]

> Recognition of the implications of dependence on foreign sources of energy, coupled with concerns over the volatility of prices driven by fluctuations in supply spurred by world events, prompted federal efforts to increase U.S. energy independence and reduce domestic consumption. A major result has been the establishment of a number of programs focused on energy efficiency and conservation of domestic resources and on research programs that target the

[8] *Elm Creek*, Docket No. IP6631/CN-07-789, Commission Order Granting Certificate of Need at 12 (Jan. 15, 2008).
[9] *Renewable Energy and Energy Efficiency Incentives: A Summary of Federal Programs*, Congressional Research Service (July 11, 2018), *available at: https://fas.org/sgp/crs/misc/R40913.pdf.*

development of renewable sources of energy. Many of these programs have roots going back almost 40 years and have been redesigned many times over that period.

Since 2005, Congress has enacted several major energy laws: (1) the Energy Policy Act of 2005; (2) the Energy Independence and Security Act of 2007; (3) the Energy Improvement and Extension Act, enacted as Division B of the Emergency Economic Stabilization Act; and (4) the American Recovery and Reinvestment Act. Each of those laws established, expanded, or modified energy efficiency and renewable energy research, development, demonstration, and deployment programs.[10] The Project advances these longstanding federal policy initiatives.

5.4.4 The Project Complies with Federal, State, and Local Environmental Regulation

The Project will meet or exceed the requirements of all applicable federal, state, and local environmental laws and regulations. **Table 2** lists the approvals the Project may need from applicable governmental entities. BRW is committed to obtaining all necessary environmental and other approvals required under federal, state, and local requirements.

Table 2. List of Approvals and Consultations

Regulatory Authority	Permit/Approval
FEDERAL	
Federal Energy Regulatory Commission	• Exempt Wholesale Generator Self Certificate • Authorization to sell wholesale power at Market Based Rates
Federal Aviation Administration (FAA)	• Form 7460-1 Notice of Proposed Construction or Alteration (Determination of No Hazard) • Form 7460-2 Notice of Actual Construction or Alteration
Federal Communications Commission (FCC)	• Non-Federally Licensed Microwave Study • National Telecommunications and Information Administration Communication Study
U.S. Army Corps of Engineers	• Clean Water Act Section 404 coordination (General, Individual, or Nationwide permit if required)
U.S. Fish and Wildlife Service	• Informal consultation under Section 7 of the Endangered Species Act
Environmental Protection Agency (Region 5) in Coordination with the Minnesota Pollution Control Agency	• Spill Prevention Control and Countermeasure (SPCC) Plan

[10] *See id.*

Regulatory Authority	Permit/Approval
U.S. Department of Agriculture	• Informal consultation if required for properties in Conservation / Grassland / Wetland Easement and/or Reserve Programs
Federal Emergency Management Agency	• Coordination of Flood Plain Designation
STATE	
Minnesota Public Utilities Commission	• Site Permit for Large Wind Energy Conversion System • Certificate of Need for Large Wind Energy Conversion System
Minnesota Department of Labor and Industry	• Electrical Plan Review, Permits, and Inspections
Minnesota State Historic Preservation Office (SHPO)	• Informal SHPO consultation for Cultural and Historical resources review including State and Natural Register of Historic Sites review
Minnesota Pollution Control Agency	• National Pollutant Discharge Elimination System/State Disposal System Permit – General Storm Water Permit for Construction Activity • License for a Very Small Quantity Generator of Hazardous Waste • SPCC Plan • Aboveground Storage Tank Notification Form • Clean Water Act Section 401 Water Quality Certification
Minnesota Department of Health	• Environmental Bore Hole approval for subsurface geotechnical studies • Plumbing Plan Review if required for O&M building • Water Well Permit if required for O&M building
Minnesota Department of Natural Resources	• Informal coordination for Endangered Species Statutes • Coordination on and/or approval of an Avian and Bat Protection Plan • General Permit for Water Appropriations, Dewatering • Wetlands/Waters coordination for Public Waters Work Permit and/or License to Cross Public Lands and Waters
Minnesota Department of Transportation	• Oversize/Overweight Permit for State Highways • Access Driveway Permits for MN/DOT Roads • Tall Structure Permit • Utility Access Permit

Regulatory Authority	Permit/Approval
LOCAL[11]	
Lincoln County (O&M and laydown only)	• Conditional Use Permit • Land Use Permit • Roadway Access Permit • Drainage Permit • Working in Right-of-Way Permit • Overweight/Over-Dimension Permit • Utility Permit
Lincoln County Soil and Water Conservation District	• Wetland Conservation Act Approvals
Townships	• Right-of-way permits, crossing permits, road access permits, and driveway permits for access roads and electrical collection system, as needed
OTHER	
Midcontinent Independent Transmission System Operator	• Turbine Change Study • Generator Interconnection Agreement

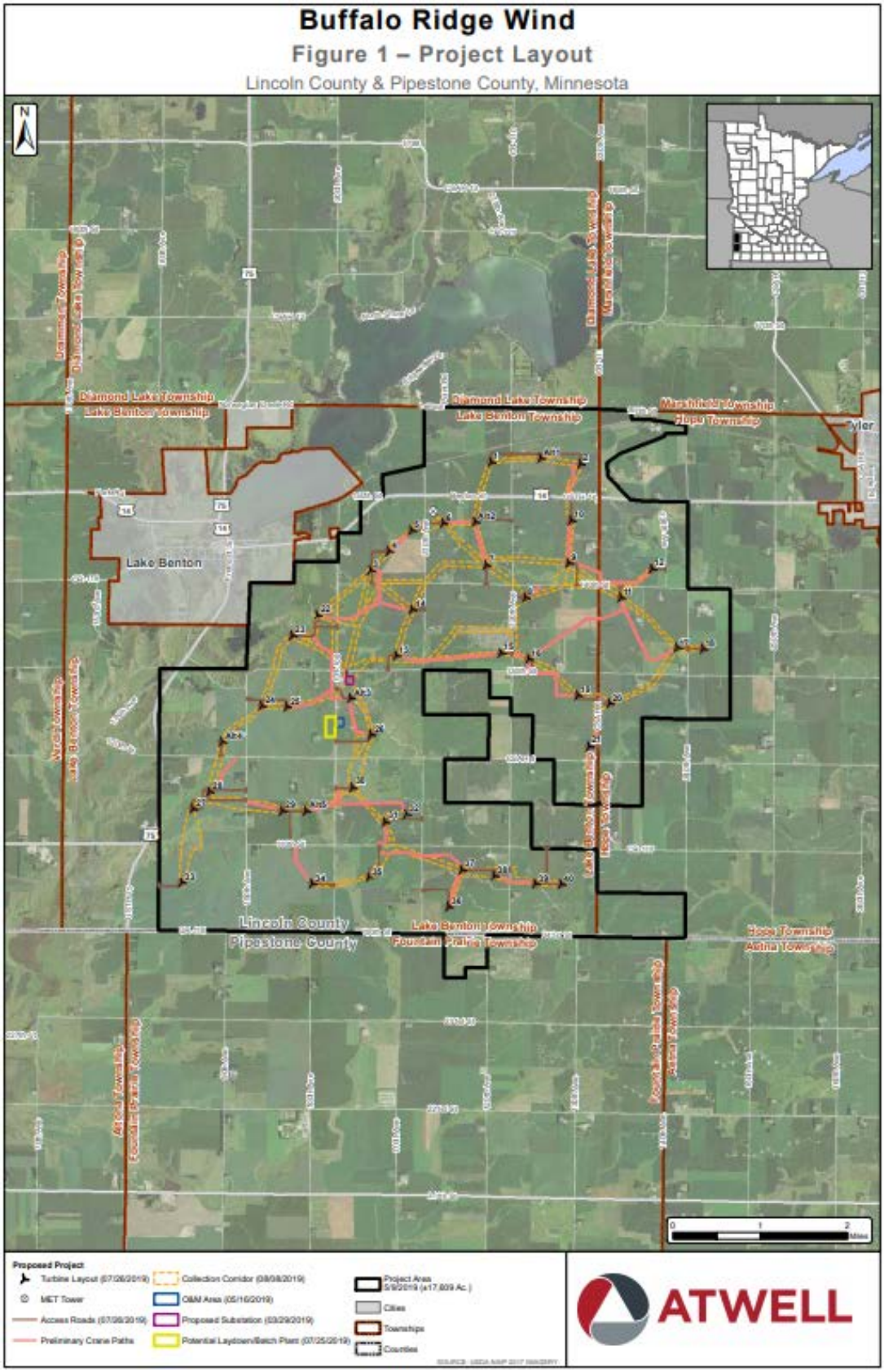
[11] Although a portion of the Project Area extends into Pipestone County, no local Pipestone County permits are required.

6.0 DESCRIPTION OF LEGF AND ALTERNATIVES (MINN. R. 7849.0250)

6.1 Proposed Project (Minn. R. 7849.0250(A))

The Project will consist of an array of 40 wind turbines. The turbines will be located in Lincoln County in southwestern Minnesota, immediately east of the City of Lake Benton and west of the City of Tyler, Minnesota. There will be three different models of turbines used for the Project: 31 will be GE 2.82 MW wind turbines, five will be GE 2.52 MW wind turbines, and four will be GE 2.3 MW turbines. The GE 2.82 MW wind turbines will have a 127.2-meter rotor diameter (RD) with 89-meter towers, the GE 2.5 MW turbines will have a 127-meter RD with 89-meter towers, while GE 2.3 MW turbines will have a 116.5-meter RD with 80-meter towers. Power from each turbine will be fed to a pad-mounted step-up transformer, which steps the voltage up from 690 volts to 34.5 kilovolts (kV). The 34.5 kV collector lines run underground from each turbine to the BRW collector substation proposed for construction, where the voltage will be stepped up to 115 kV for interconnection. In all, the Project includes turbines, a project collector substation, collection lines, an O&M building, a permanent meteorological tower, and gravel access roads. A map showing the Project is provided below in **Figure 1**.

Figure 1. Project Layout



6.1.1 Nominal Generating Capacity and Effect of Economies of Scale (Minn. R. 7849.0250(A)(1))

The total nominal generating capacity of the Project is approximately 109 MW. The Project size produces economies of scale gains in procurement, construction, O&M, and interconnection costs compared to a smaller project. For example, mobilization costs for delivery of turbines and construction of the Project are lower on a per-turbine basis than they would be for a smaller wind project with fewer turbines. The result of gains in the economics of scale is a lower cost of production for electricity.

6.1.2 Annual Capacity Factor (Minn. R. 7849.0250(A)(2))

The projected annual net capacity factor for the Project is approximately 48-52% annually. The projected average annual output of approximately 478,600 MWh is anticipated for the Project.

6.1.3 Fuel (Minn. R. 7849.0250(A)(3))

The fuel for the Project is wind.

6.1.4 Anticipated Heat Rate (Minn. R. 7849.0250(A)(4))

Heat rates are specific to fossil generation, and, therefore, are not applicable to a wind generation facility.

6.1.5 Facility Location (Minn. R. 7849.0250(A)(5))

The Project's turbines will be located in in Lincoln County in southwestern Minnesota, immediately east of the City of Lake Benton and west of the City of Tyler, Minnesota. The estimated size of the Project Area is approximately 17,000 acres (~26 square miles) of mostly agricultural land. The substation equipment will be installed on concrete foundations and will consist of a graveled footprint area of up to approximately one (1) acre (0.4 hectares). Within this area, there will be a chain link perimeter fence and an outdoor lighting system. No new gates or fences will be constructed other than at the collector substation, which will have an eight (8)-foot high fence, locked gate, and its own access road. The O&M facility will be located adjacent to the substation where five (5) acres (2.0 hectares) will be purchased or leased in addition to the substation. The footprint of the O&M facility and associated parking area will be up to two (2) acres (0.8 hectares).

6.2 Availability of Alternatives (Minn. R. 7849.0250(B))

Consistent with the Commission-granted partial exemption, non-renewable energy sources have been excluded from this alternatives analysis. Thus, the criteria used in this analysis includes whether: (1) the energy source is cost-effective; (2) the energy source is commercially proven and reliable for the electrical generation output needed; and (3) the energy source is appropriate for the site selected.

Developing and operating generating sources that are cost-effective and use proven technology is particularly important to an IPP like BRW. BRW does not have access to ratepayer funds that could provide a resource for retirement of capital investments. In addition, as a seller of electricity within the terms of an agreed-upon PPA price, BRW must keep its prices – and, thus, its costs – low and competitive.

Commercial feasibility and reliability with respect to the generation output needed are important considerations in selling the power generated. Wind is a proven and reliable resource. Further, the site chosen for the Project is appropriate given the ability to achieve the approximately 48-52% capacity factor, while minimizing the impact to the environment and human settlement.

6.2.1 Purchased Power (Minn. R. 7849.0250(B)(1))

BRW is an IPP, and, therefore, does not purchase power. Instead, BRW will sell power to the GRE pursuant to a PPA. As such, this data requirement is not applicable, and the Commission granted BRW an exemption.

6.2.2 Upgrades to Existing Resources (Minn. R. 7849.0250(B)(2))

BRW has no existing facilities in Minnesota. Therefore, there is no facility for BRW to improve. However, consistent with BRW's request for certain CON exemptions, BRW agreed to provide equivalent data from the purchaser of the Project's output. Since GRE is in need of additional renewable energy, there is no potential upgrade to an existing GRE facility suitable to produce approximately 109 MW of wind energy.

6.2.3 New Transmission (Minn. R. 7849.0250(B)(3))

BRW has no plans to own or operate transmission voltage level lines for the interconnection of the Project. According to GRE, there are no transmission alternatives that would provide approximately 109 MW of wind energy, as only a wind generating plant can produce the approximately 109 MW of renewable energy contracted for in the PPA.

6.2.4 New Generating Facilities (Minn. R. 7849.0250(B)(4))

6.2.4.1 Solar Power

Solar is not an alternative to the Project. The cost and reliability of wind power continues to be more favorable than for solar power despite recent substantial reductions in cost for solar. Wind continues to be more cost-effective than solar-powered electricity and remains the lowest-cost new source of renewable energy. For example, the levelized total system cost for wind power in the EIA's Annual Energy Outlook 2019 was $48.8/MWh compared with $52.2/MWh for solar

photovoltaic.[12] Also, from a land-use perspective, a MW of solar requires that more land be temporarily used for the life of the project to achieve the same number of MW. Further, as explained, crop production with the Project will not be significantly impacted, whereas for a solar facility the acres used would be taken out of use for the life of the solar plant. Thus, the Project, as a wind generating facility, has benefits over a solar facility.

6.2.4.2 Hydropower

There has been very little increase in the use of hydropower in Minnesota over the last decade. The use of hydropower increased from 774,729 MWh in 2005 to 849,054 MWh in 2015, an increase of less than 10% over that 10-year period.[13] In that same time period, electricity generated from wind power increased more than 517%.[14] According to the 2016 Quad Report, the reason for the minimal investment in hydroelectric power is likely due to the "[c]osts of maintaining and operating dams compared to other sources of energy. . . as well as increased concern about the potential negative effect dams can have on Minnesota's river ecosystems." Finally, hydropower facilities of the same size as the Project do not qualify under the RES, and, thus, do not meet the objective of the Project. Therefore, hydropower is not an alternative to the Project.

6.2.4.3 Biomass

Minnesota communities do have accessible and low-value biomass feedstocks. However, the cost of these feedstocks vary widely, and the unsubsidized levelized cost of energy from biomass tends to be much greater than that of wind. Further, the environmental impacts of a biomass facility may be greater than the Project, due to both the facility itself and the machinery and equipment needed to gather and transport the biomass fuel. For these reasons, a biomass plant is not an alternative to the Project.

6.2.4.4 Emerging Technologies

Emerging renewable power technologies continue to be developed. These technologies are not sufficiently mature to provide the output needed or to be cost-effective and reliable.

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[12] U.S. Energy Information Administration, Levelized Cost and Levelized Avoided Cost of New Generation Resources in the Annual Energy Outlook 2019, *available at:* https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf.

[13] Minnesota Department of Commerce, Energy Policy and Conservation Quadrennial Report 2016 at 28 (the 2016 Quad Report) available at: http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwivscvd09jbAhWOrVkKHRYyDv8QFggnMAA&url=http%3A%2F%2Fmn.gov%2Fcommerce-stat%2Fpdfs%2Fquad-report-2016.pdf&usg=AOvVaw1esivJ8In3md_S5ubtiO_P

[14] *Id.*

Pumped Storage

The proposed site in Lincoln County is not suited to pumped storage, because of the need to store large amounts of water in an elevated reservoir. In addition, there is currently no net generation from pumped storage in Minnesota. Therefore, this technology is not an alternative to the Project.

Compressed Air

Highly specialized geological sites are needed to make use of compressed air technology. Such sites do exist, but are not located in the vicinity of the Project site. Also, this technology is not yet commercially-proven; accordingly, it is not an alternative to the Project.

Superconducting Magnets

This technology, which makes use of coils that can store electric energy, is not yet commercially-proven. Accordingly, it is not an alternative to the Project.

Hydrogen and Fuel Cells

While much research is being done regarding hydrogen and fuel cells, the technology is not yet available on a commercial scale. It is possible, however, that as research and commercial applications advance in years to come, this technology may be used to enhance other renewable technologies, such as the Project.

Table 3 provides comparative costs for the abovementioned technologies and compares them to the costs of wind generation.

Table 3. Renewable Energy Technology Costs[15]

Technology	Size (MW)	Total Overnight Cost (2018 $/kW)	Variable O&M (2018 $/MWh)	Fixed O&M (2018 $/kW/yr)
Fuel Cells	10	7,197	46.56	0.00
Biomass	50	3,900	5.70	114.39
Conventional Hydropower	500	2,948	1.36	40.85
Wind	100	1,624	0.00	48.42
Photovoltaic	150	1,969	0.00	22.46
Solar Thermal	100	4,291	0.00	72.84

6.2.4.5 Non-CON Facilities (Minn. R. 7849.0120(A)(4))

[15] The figures in this table are taken from a report of the U.S. Energy Information Administration, *Assumptions to the Annual Energy Outlook 2019: Electricity Market Module* (Apr. 2018), at 5, available at: https://www.eia.gov/outlooks/aeo/assumptions/pdf/electricity.pdf.

Under Minn. Stat. §§ 216B.2421 and 216B.243, subd. 2, and Minn. R. Ch. 7849, a CON is required for the Project because it is a "large energy facility," i.e., larger than 50 MW. As an IPP, BRW executed a PPA with GRE following an arms-length negotiation, with GRE determining that the Project was well-suited to meeting its renewable energy needs. Smaller facilities that do not require a CON would not be able to economically provide the amount of electricity that GRE is seeking, and, therefore, GRE chose the Project as the best solution for its needs. In addition, BRW has the advantages of economies of scale, which would not be available in a smaller project.

6.2.4.6 Reasonable Combinations of Alternatives (Minn. R. 7849.0120(B)(5))

There is no combination of the aforementioned renewable alternatives that would be appropriate to consider as a substitute for the Project, because, as compared to the proposed Project, those alternatives would not produce electric output more cost-effectively or reliably than the Project.

6.2.4.7 No Facility Alternative (Minn. R. 7849.0340)

Minn. R. 7849.0340 requires an applicant to submit data for the alternative of "no facility," including a discussion of the impact of this alternative on the applicant's generation and transmission facilities, system, and operations. This rule also requires an analysis of "equipment and measures that may be used to reduce the environmental impact of the alternative of no facility." Minn. R. 7849.0340(C). BRW does not have a "system," nor does it have other generation and transmission facilities in Minnesota, and, therefore, the Commission provided a partial exemption of this requirement, conditioned upon BRW providing equivalent data from GRE regarding a no build alternative. On this point, GRE represents that the "no-facility" alternative would have a detrimental impact to GRE in that the purpose of the Project is to help it address and exceed its RES requirements and provide carbon-free energy to its customers and the state. Therefore, consideration of the no facility alternative is not appropriate or warranted given the needs of GRE and the state.

6.2.4.8 Facility Information for Alternatives Involving Construction of a Large High-Voltage Transmission Line (Minn. R. 7849.0330)

Minn. R. 7849.0330 requires the applicant to provide certain data for each alternative that would involve construction of a large high-voltage transmission line. Transmission facilities are not true alternatives to the Project, since the purpose of the Project is to increase the supply of available renewable wind energy. Access to transmission facilities beyond the point of interconnection will be arranged by the grid operator, midcontinent independent transmission system operator (MISO), and GRE, as applicable. Thus, the electricity generated by the Project will be transmitted over transmission and distribution facilities owned or operated by others. For these reasons, Minn. R. 7849.0330 is not applicable, and the Commission granted BRW an exemption from this data request.

6.3 Discussion of Proposed Facility and Alternatives (Minn. R. 7849.0250(C))

The Commission granted BRW a partial exemption from Minn. R. 7849.0250(C)(1–6, 8, 9), which would require an analysis of various details pertaining to both the proposed facility and each of the alternatives discussed in response to Minn. R. 7849.0250(B). Consistent with the Commission granting BRW a partial exemption from the data requirements in Minn. R. 7849.0250(B), which limits the discussion required to only renewable alternatives, the Commission also limited the information required under this data requirement to only those renewable alternatives discussed in response to Minn. R. 7849.0250(B)(4) that could provide electric power at the asserted level of need. As explained above, there is no such alternative. Therefore, consistent with the partial exemption, only information regarding the Project is applicable.

6.3.1 Wind Facility

6.3.1.1 Capacity Cost (Min. R. 7448.0250 C (1))

Costs for wind energy facilities are typically not expressed in terms of capacity costs. Rather, the Project will deliver energy to GRE on an as-generated basis and will receive payment in the form of a $/kWh payment. BRW's estimated cost for the Project is $170 million, equating to $1556/kilowatt (kW).

6.3.1.2 Service Life (Minn. R. 7849.0250(C)(2))

The Project's service life of 25 years has been assumed to estimate annualized capital costs, which is based on the extensive experience of affiliates of BRW with other wind generating plants.

6.3.1.3 Estimated Average Annual Availability (Minn. R. 7849.0250(C)(3))

BRW estimates that the Project will be available approximately 80-90% of the year.

6.3.1.4 Fuel Costs (Minn. R. 7849.0250(C)(4))

The Project will be powered by wind, and, therefore, does not have fuel costs like fossil generation. BRW will make nominal purchases of emergency station service when the wind turbines are idle, and this station service may involve a generation mix that includes embedded fuel costs.

6.3.1.5 Variable Operating and Maintenance Costs (Minn. R. 7849.0250(C)(5))

General costs associated with project operation, maintenance, initial spare parts, operating equipment, and operating supplies will be $140,000 the first year and average approximately $3.3 million per year over the following 24 years. An advantage of a wind energy facility the size of the Project is that it typically does not require a complete plant outage for maintenance. Individual turbines can be serviced, while the rest of the facility continues to deliver energy.

6.3.1.6 Total Cost (Minn. R. 7849.0250(C)(6))

The capital expenditure for the wind component of the Project is estimated to be $170 million. This includes all costs associated with development, design, and construction. General costs associated with project O&M, initial spare parts, operating equipment and operating supplies will be $140,000 the first year and $3.3 million over 24 years.

6.3.1.7 Effect of Project on Rates System-Wide (Minn. R. 7849.0250(C)(7))

The Commission provided a partial exemption of Minn. R. 7849.0250(C)(7), that would otherwise require BRW to seek information on the effect of the Project on rates system-wide from the purchaser. GRE represents that it is too early to state a positive or negative impact on rates due to the relative value of the project depending on MISO market prices, but GRE expects the addition of a competitively-priced renewable energy resource to be a benefit to its membership.

6.3.1.8 Efficiency (Minn. R. 7849.0250(C)(8))

No fuel is burned in the production of energy at the Project, and, therefore, there is no information to provide on this subject.

6.3.1.9 Assumptions (Minn. R. 7849.0250(C)(9))

There are no specific assumptions other than those already identified that impacted the provision of information in response to Minn. R. 7849.0250(C)(1–8).

6.3.1.10 Map of System (Minn. R. 7849.0250(D))

The Commission granted BRW an exemption from Minn. R. 7849.0250(D), which requires an applicant to include a map showing the applicant's system.[16] As an IPP, BRW does not have a "system." In lieu of a system map, BRW is providing with this application maps showing proposed site of the Project in **Appendix C (Wind Maps)**.

6.3.1.11 Promotional Activities (Minn. R. 7849.0240(B))

The Commission granted BRW a partial exemption from Minn. R. 7849.0240, subp. 2 (B), requiring that it request the purchaser, GRE, to provide equivalent data on promotional activities. According to GRE, it has not conducted any promotional activities associated with the Project.

[16] *Id.*

7.0 PEAK DEMAND AND ANNUAL CONSUMPTION FORECAST (MINN. R. 7849.0270)

The Commission granted BRW an exemption from Minn. R. 7849.0270, subps. 1-6, which require the applicant to provide "data concerning peak demand and annual electrical consumption within the applicant's service area and system." BRW does not have a "service area" or "system" and, as such, the requested data is inapplicable to BRW. The Commission, however, required BRW to provide a general overview of the purchaser's system and future renewable resource needs.

GRE's most recent IRP was filed with the Minnesota Public Utilities Commission on April 28, 2017. According to that document, GRE indicated its expectation that a compounded annual growth rate of 1.3% in energy, and a growth rate of 1.0% in demand over the 2018–2032 planning period.[17]

[17] GRE 2018-2032 Integrated Resource Plan, Docket No. ET2/RP-17-286 at 1 (April 28, 2017), *available at:* https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={4566B21C-DC09-4EFA-A66A-757736EDAD8A}&documentTitle=20174-131376-02.

8.0 SYSTEM CAPACITY (MINN. R. 7849.0280)

Minn. R. 7849.0280 requires a CON applicant to provide information on the ability of its existing system to meet the forecasted demand. As an IPP, BRW does not have a "system" as defined by Minn. R. 7849.0280. Accordingly, the Commission granted BRW an exemption from this requirement, with the understanding that BRW would provide a general overview of the purchaser's system and future renewable resource needs.

GRE's generation resources include 10 power plants and purchased power from several wind farms and other generating facilities, resulting in more than 3,300 MW of generation capability. The GRE resource portfolio is a diverse mix of coal, hydroelectric, natural gas, fuel oil, biogas, wind, and solar sources.[18]

[18] GRE 2018–2032 Integrated Resource Plan at 5.

9.0 CONSERVATION PROGRAMS (MINN. R. 7849.0290)

BRW is not a utility, and does not have a system or retail customers, nor does BRW maintain a conservation program. The Commission thus granted BRW an exemption from Minn. R. 7849.0290, which requires an applicant to describe its energy and conservation plans, including load management, and the effect of conservation in reducing the applicant's need for new generation and transmission facilities.

10.0 CONSEQUENCES OF DELAY (MINN. R. 7849.0300)

The Commission granted a partial exemption of this requirement with the understanding that BRW would seek equivalent data from the purchaser, GRE. According to GRE, delay of the Project would detrimentally impact GRE's ability to address the RES requirements and would likely result in the cancellation of the PPA. Delay would also likely result in a lost opportunity to provide GRE and the state with clean, cost-effective renewable energy. Delay of the Project could also nullify the environmental, policy, and socioeconomic benefits of the Project set forth herein, including the creation of jobs and the advancement of the greenhouse gas emissions reduction goals.

11.0 ENVIRONMENTAL INFORMATION FOR PROPOSED PROJECT AND ALTERNATIVES (MINN. R. 7849.0310)

A Site Permit application will be submitted by BRW in addition to this application. The following is a summary the environmental information that will be set forth in detail in the Site Permit application.

11.1 Wind Facility

11.1.1 Impacts to Visual Resources

The main visual focal points within the vicinity of the Project are aspects of an agricultural landscape, which are broken up by residences, buildings, shelter belts, and small wood lots. Viewsheds in the area are generally long and open with only small scattered areas where the view from a location would be blocked by vegetation, topography, or existing structures.

There are no other wind turbines currently within the Project Area. However, the Lake Benton II Wind Farm and the Ruthton Wind Farm are located within one mile of the Project Area. A total of 2 turbines from the planned Lake Benton II project that is currently under construction and a total of 24 turbines from Ruthton Wind Farm are located within one mile of the Project Area. These wind facilities contain turbines of various heights and rotor diameters. An additional eight wind farms are located within 10 miles (16.1 kilometers) of the Project Area. Meteorological towers associated with these wind facilities may also be present on the landscape. Generally, wind energy conversion systems within and adjacent to the Project Area contain slightly smaller sized turbine models than those proposed for the Project, with total heights ranging from approximately 300 feet to approximately 400 feet.

There are four transmission lines running approximately 14.2 miles (22.9 kilometers) within the Project Area. An additional approximately 7.6 miles (12.2 kilometers) of existing transmission lines are located within one mile (1.6 kilometers) of the Project Area. No new transmission lines are proposed for this Project.

The FCC Antenna Structure Registration database identifies three antenna structures within the Project Area, and 15 existing antenna structures within 10 miles (16.1 kilometers) of the Project Area, creating existing visual impacts to the Project Area viewshed.

Three turbine models, the GE 2.82 MW, GE 2.52 MW, and GE 2.3 MW, are proposed for the Project. The three models will be similar in appearance, with three blades, a hub, and a monopole. Both the GE 2.82 MW and GE 2.52 turbine models have a 127-meter (416.7-foot) RD and an 89-meter (292-foot) hub height. The GE 2.3 MW turbine model has a 116-meter (380.6-foot) RD and a hub height of 80 meters (262.5 feet). Refer to **Table 4** below. In general, the larger the RD, the fewer turbines are required to produce the same energy output, creating less of a visual impact.

The GE 2.82 MW turbine model has a capacity of 2,820 kW; the GE 2.52 MW turbine model has a capacity of 2,520 kW; and the GE 2.3 MW turbine model has a capacity of 2,300 kW.

Table 4. Rotor Diameter and Number of Turbines

Turbine Model	Rotor Diameter (meters/feet)	Rotor Tip Height (meters/feet)	Ground Clearance (meters/feet)	Number of Turbines	Number of Alternate Turbines
GE 2.3 MW	116/380.6	138.3/453.7	22/72.2	4	1
GE 2.52 MW	127/ 416.7	152.1/499	25/82	5	3
GE 2.82 MW	127/ 416.7	152.1/499	25/82	31	1

The Project will be visible to permanent observers (residents) and temporary observers (motorists, tourists, or recreationalists passing by or using the area intermittently). Visual impacts may also be noticeable to users of public lands and public snowmobile trails within and within the vicinity of the Project Area. However, the Project will not be introducing a new feature type to the landscape because existing wind turbines and other power related infrastructure are prevalent within and in the vicinity of the Project Area.

Turbines will likely be viewed in one of three perspectives:

- As a visual disruption;
- As generally compatible with the rural agricultural heritage of the area, which includes existing wind turbines; or
- As adding a positive aesthetic quality to the landscape.

The topography in the vicinity of the Project Area is rolling and the vegetation is low, and the Project will be visible to residents of the area and to people traveling north and south along US Hwy 75 and County State Aid Highway (CSAH) 7, east and west along US Hwy 14 and CSAH 6. However, the Project will not create a new feature type within the landscape because several wind farms and other power related infrastructure occur within Project Area or its immediate vicinity.

Additionally, alterations of the land with temporary impacts related to construction activities, such as temporary land use associated with equipment staging and laydown areas, crane paths, and installation of underground collection lines would be short-term and converted back to cropland or replanted with grasses and vegetation native to the area following the completion of construction. Visual impacts from an increase in traffic and human activity within the Project Area during construction would also be short-term. The long-term operation of the Project is not anticipated to increase visual impacts associated with human activity or traffic within the Project Area.

BRW will implement mitigation measures to reduce the visual impact of the Project. The turbines will be uniform in color and painted with a non-reflective/off-white color designed to minimize visual impacts. The towers and blades will be of a color, design, operation, and appearance consistent with other turbines in the area. No advertising or graphics will be placed on any part of the tower or blades; however, the turbines will be clearly numbered for identification and emergency response. The towers will not be illuminated except as required by the FAA. The FAA requires obstruction lighting or marking of structures over 200 feet (61 meters) above mean sea level because they have the potential to obstruct air navigation. The Project will utilize a full-coverage aircraft detection lighting system (ADLS). The ADLS units will be positioned to provide full 360-degree surveillance of the airspace around the wind farm in order to provide advance detection of approaching aircraft and automatic activation of the wind farm obstruction lighting at sufficient ranges for operational safety in compliance with FAA regulations. The system will turn off the obstruction lighting when aircraft have cleared the control zone around the wind farm or at altitudes above the wind farm regulatory minimums. BRW will request FAA approval of a lighting plan that is compliant with FAA requirements. Furthermore, electrical collection lines will be buried to minimize above-ground structures within the Project Area. Existing roads will be used for construction and maintenance, as appropriate, to minimize the number of new roads constructed. Lastly, temporarily disturbed areas will be converted back to cropland or otherwise reseeded with seed mixes appropriate for the region.

11.1.2 Shadow Flicker Impacts

With respect to wind turbines, shadow flicker can be defined as an intermittent change in the intensity of light in a given area resulting from the operation of a wind turbine due to its interaction with the sun. While indoors, an observer experiences repeated changes in the brightness of the room as shadows cast from the wind turbine blades briefly pass by windows as the blades rotate. In order for this to occur, the wind turbine must be operating, the sun must be shining, and the window must be within the shadow region of the wind turbine – otherwise there is no shadow flicker indoors. An idle wind turbine only generates a stationary shadow similar to any other structure.

A Project-specific shadow flicker analysis was conducted using the software package, WindPRO. The WindPRO modeling was further refined by incorporating sunshine probabilities and wind turbine operational estimates by wind direction over the course of a year. The values produced by this further refinement are known as the “expected” shadow flicker. The results of the shadow flicker analysis will be included as an appendix to BRW’s Site Permit application and will include details regarding the methodology and results of the assessment including calculated annual hours of shadow flicker at identified receptors based upon a worst-case scenario and an expected case scenario.

The predicted expected annual shadow flicker duration ranged from 0 hours, 0 minutes per year to 37 hours, 29 minutes per year. The maximum expected flicker was at a participating receptor

(#141). The maximum expected flicker at a non-participating receptor (#154) was 30 hours, 35 minutes. The majority of the receptors (294) were predicted to experience no annual shadow flicker. Sixty-three locations were predicted to experience some shadow flicker but less than 10 hours per year. The modeling results showed that 38 locations would be expected to have 10 to 30 hours of shadow flicker per year. Six receptors are expected to have over 30 hours of flicker per year, one of which is a non-participating receptor. The modeling results are conservative in that modeling receptors were treated as "greenhouses" (i.e., having windows on all sides) and the surrounding area was assumed to be without vegetation or structures ("bare earth").

The Project was designed to minimize shadow flicker exposure of the residences in the area. BRW will use site-specific mitigation measures to address shadow flicker impact, as appropriate, including the following:

- Meet with the homeowner to determine the specifics of their complaint;
- Investigate the cause of the complaint; and
- Provide the homeowner with reasonable mitigation alternatives including shades, blinds, awnings or plantings.

11.1.3 Impacts to Land Use

The Project is consistent with the Lincoln County's Comprehensive Plan and the Pipestone County's zoning requirements and Comprehensive Plan. BRW will coordinate with the Lincoln and Pipestone Counties to ensure compliance with all zoning regulations and acquire all appropriate permits.

The Project is not likely to impact future zoning and expansion of incorporated areas near the Project Area. Development of the Project will allow continued agricultural use within the Project Area, while helping to strengthen the local economy through annual payments to landowners with Project infrastructure on their property, potential use of local contractors and suppliers, potential temporary jobs for local workers, and tax benefits to local governments.

Temporary and permanent impacts to current land use are anticipated to occur from the construction of the Project. Since the Project is primarily located within the Rural Preservation Management District of Lincoln County and partially within the Agriculture District of Pipestone County, land use primarily consists of agricultural activity, including row cropping and livestock production. Temporary and permanent impacts to agricultural activities will include the removal of land from row crop production and pasture during the construction and operation of the Project. Additionally, temporary and permanent impacts to pastureland are expected to be minimal and restricted to removing small amounts of land from use.

The locations of two Conservation Reserve Enhancement Program (CREP) and one Permanent Wetland Preserves (PWP) easements within the Project Area have been incorporated into Project planning so that these locations will be avoided and not disturbed by Project activities. No Project

infrastructure or construction activities will be located in CREP or PWP areas. Conservation Reserve Program (CRP) easements will be located in coordination with participating landowners. If CRP easements are determined to be present, the locations will be incorporated into Project planning as it relates to turbine and road layout, and any other associated construction activities, and these lands will be avoided to the maximum extent practicable. If the Project requires the placement of permanent infrastructure within CRP land, BRW will work with the landowner to remove the land from the CRP program and will cover the costs of any penalties incurred due to the removal of the easement from the program.

BRW does not propose any mitigation measures based on the comprehensive plans, land use planning, and local zoning, as negative impacts are not anticipated. Impacts to conservation easements are not expected. CREP and PWP lands will be avoided and BRW will verify whether any CRP easements are located within areas where infrastructure is planned. If CRP easements are unavoidable, BRW will work with the appropriate agency, as well as the landowner, to remove the impacted portion of the parcel from the conservation program and BRW will cover the costs of any penalties incurred due to the removal of the parcel from the conservation program.

11.1.4 Impacts to Wildlife

The *U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines* were issued on March 23, 2012 to provide a structured and scientific approach to wildlife concerns at all stages of land-based wind energy development (USFWS 2012). The guidelines use a tiered approach of collecting information, with each tier increasing in the detail of research and information. The tiered approach provides the opportunity for evaluation and decision-making at each step of the Project to enable the developer to abandon or proceed with development, or to collect additional information.

Since this site was developed previously, a modified Tier 1 and Tier 2 site assessment was completed for the Project Area during preparation of the comprehensive wildlife conservation strategy (WCS), which also addresses Minnesota's requirement for an avian and bat protection plan (ABPP). Information for documenting responses to the Tier 1 and Tier 2 questions in the WCS/ABPP was gathered through MNDNR and USFWS database research, and other publicly available resources. Tier 1 questions help determine potential environmental risk at the landscape scale, while Tier 2 questions help to determine potential environmental risk at the project scale (USFWS 2012). Tier 2 assessments were based on observations during the Tier 3 studies and one site visit on November 20, 2019, prior to snow cover, to evaluate the presence or absence of native grasslands.

Field and desktop studies indicate that wildlife in the Project Area is comparable to that documented at other wind energy conversion systems sited in agricultural areas of the Midwest. Impacts to wildlife and wildlife habitat are expected to be minimal because grasslands, wooded areas, shrublands and other areas identified as important to wildlife will be avoided whenever

possible. Additionally, these important wildlife features occur in relatively small amounts within the Project Area. The micrositing process will allow BRW to identify, avoid, and minimize impacts to important wildlife habitat resources. Additionally, minor impacts to grasslands, shrublands and wetlands that may occur during Project construction will be temporary in nature. Construction and operation of the Project is not expected to change land use within, or adjacent to the Project.

Impacts to wildlife would primarily occur to avian and bat populations. There is a likelihood that bird and bat fatalities will occur at the Project, but these fatalities are unlikely to affect populations of most species (Erickson et al. 2014), including species of a conservation concern. Direct impacts to birds and bats because of Project construction and operation are not expected to differ markedly from those reported by other previous studies in agricultural settings within Minnesota.

BRW has carefully sited the Project so as to avoid sensitive areas identified. BRW will continue to maintain communication with USFWS and MNDNR regarding appropriate mitigation measures for wildlife impacts. Further description of efforts to study and preserve wildlife will be provided in BRW's Site Permit application.

12.0 FACILITY INFORMATION FOR PROPOSED PROJECT AND ALTERNATIVES INVOLVING CONSTRUCTION OF AN LEGF (MINN. R. 7849.0320)

12.1 Land Requirements (Minn. R. 7849.0320(A))

The Project is located on land that is zoned for agricultural use. The Project will require approximately 0.75 acre per turbine for the turbine pad, transformer, access road, and associated infrastructure. The land requirements for the Project are consistent with the requirements for wind projects of a similar size. No relocation of people or businesses will be necessary for the Project.

12.1.1 Land Requirements for Water Storage

The Project will not require any land for water storage.

12.1.2 Land Requirements for Cooling System

The Project will not require any land for a cooling system.

12.1.3 Land Requirements for Solid Waste Storage

The Project will require minimal space for maintenance of the facilities, and will be used for the storage of used oil and other lubricants, as well as for spare parts and tools.

12.2 Traffic (Minn. R. 7849.0320(B))

Temporary impacts are expected to public roads during the construction phase of development as materials, personnel, and equipment will be brought in via existing U.S. Highways, county roads, and township roads. US Highway 75, US Highway 14, State Highway 23, County State Aid Highway 9, County State Aid Highway 6, County Road 118, County Road 108, County Road 104, Township Road 168, Township Road 100, Township Road 96, and Township Road 94 are the haul routes into the Project Area and would likely be used as routes to bring materials and equipment to the Project Area; however, the exact routes will be determined closer to construction and in coordination with local jurisdictions as appropriate. The maximum amount of construction traffic is expected to be approximately 500 trips per day during peak construction. Local roads can accommodate this traffic as the functional capacity of a two-lane paved rural highway is in excess of 5,000 vehicles per day. However, some minor, short-term traffic delays within and near the Project Area may occur during turbine and equipment delivery and construction activities. Most of the roads to be affected have minimal daily traffic, and road and/or lane closures should not have significant impacts on local traffic. There may be some traffic impacts at the crossings of US Highway 14, US Highway 75, and State Highway 23.

The Project will temporarily increase traffic congestion within the Project Area and surrounding areas. However, due to the rural setting and generally low traffic present within a majority of the

routes, this temporary increase is not anticipated to have a significant impact on local traffic. Rail and barge impacts are not expected.

12.3 Information Pertaining to Fossil-Fueled Activities (Minn. R. 7849.0320(C–D))

12.3.1 Fuel

The Project is not a fossil-fueled facility.

12.3.2 Emissions

The Project is not a fossil-fueled facility and will not release any emissions from the power generation process.

12.4 Water Usage for Alternate Cooling Systems (Minn. R. 7849.0320(E))

Wind power plants do not utilize cooling systems. Water requirements therefore are limited to potable water needs for Project personnel. The water requirements of the O&M building will be met through the local rural water service or the installation of a well in accordance with applicable regulations.

12.5 Water Discharges (Minn. R. 7849.0320(F))

No wastewater discharges will occur as a result of the construction or operation of the Project except for domestic-type sewage discharges of Project personnel. Temporary sanitary facilities will be provided during construction, and the O&M building may require a septic system, which will be installed in accordance with applicable regulations.

12.6 Radioactive Releases (Minn. R. 7849.0320(G))

The Project will not produce any radioactive releases.

12.7 Solid Waste (Minn. R. 7849.0320(H))

Hazardous materials used and stored within the Project Area during construction may consist of fuel, lubricating oil, hydraulic oil, propylene glycol, and other materials. Additionally, during operation of the wind farm, hazardous materials, such as hydraulic oil, lube oil, grease, and cleaning solvents will be used and stored on-site as they are necessary to maintain wind turbines and other equipment. Also, pad-mounted and grounding transformers required for the operation of the Project contain large quantities of cooling fluids, typically consisting of mineral oil.

Due to the presence of hazardous materials during Project construction and operations, there is the potential for Project spills and/or leaks to occur. The primary concerns associated with these potential spills and/or leaks are the potential impacts to surface and ground water resources and the potential for soil contamination within the Project Area. To avoid potential impacts to water and soil resources, hazardous materials stored outdoors will be stored within secondary

containment. Secondary containment will prevent impacts and will ensure that leaks, if they occur, will be contained. Additionally, a spill prevention, control, and countermeasure (SPCC) plan will be developed for both the construction and operational phases of the Project. The SPCC will detail the appropriate storage, cleanup, and disposal of hazardous wastes to ensure potential impacts are avoided.

12.8 Noise (Minn. R. 7849.0320(I))

Sound levels attributable to the Project do not reach or exceed 50 dBA at modeling receptors, even under the predicted worst-case scenario. However, there is currently an exceedance in the Project Area attributable to other turbines, or "existing Non-Project" turbines. Therefore, the predicted worst-case sound level from the combination of the Project wind turbines, the existing non-Project wind turbines, and the future non-Project wind turbines (Project + Existing Non-Project + Future Non-Project) is below the 50 dBA limit at all modeled NAC 1 receptors except for at one (1) receptor. Existing non-Project only sound levels are highest at receptor #44, exceeding the MPCA limit of 50 dBA (Existing Non-Project only sound level at receptor #44 is 51 dBA). The Project Only sound level at this receptor is 40 dBA. The second highest modeled L_{50} sound level from the Project + Existing Non-Project + Future Non-Project scenario is 48 dBA and occurs at two (2) locations (one participating and one non-participating). Moreover, the highest predicted worst-case Project Only L_{50} sound level at a modeling receptor is 47 dBA. Further details of the sound monitoring study will be provided in BRW's Site Permit application.

BRW has designed the wind project to meet the MPCA state noise standards and to minimize the sound levels due to the wind turbines at the homes in the community as much as possible, while also meeting the other constraints of the project design and regulatory requirements.

12.9 Work Force for Construction and Operation (Minn. R. 7849.0320(J))

Approximately 200 temporary construction and approximately 7 to 12 full time O&M jobs are expected as part of this Project.

12.10 Number and Size of Transmission Facilities (Minn. R. 7849.0320(K))

The Project will interconnect to a 115 kV substation located on a parcel adjacent to the existing Buffalo Ridge substation owned by Northern States Power, a subsidiary of Xcel Energy. This substation is located within the Project Area and the Project substation is currently planned for an adjacent parcel. As such, no overhead transmission line is currently proposed for the Project.

13.0 REFERENCES

Erickson WP, Wolfe MM, Bay KJ, Johnson DH, Gehring JL. 2014. A Comprehensive Analysis of Small-Passerine Fatalities from Collision with Turbines at Wind Energy Facilities. PLoS ONE. 9(9):e107491. doi:10.1371/journal.pone.0107491.

USFWS. 2012. U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines. U.S. Fish and Wildlife Service.

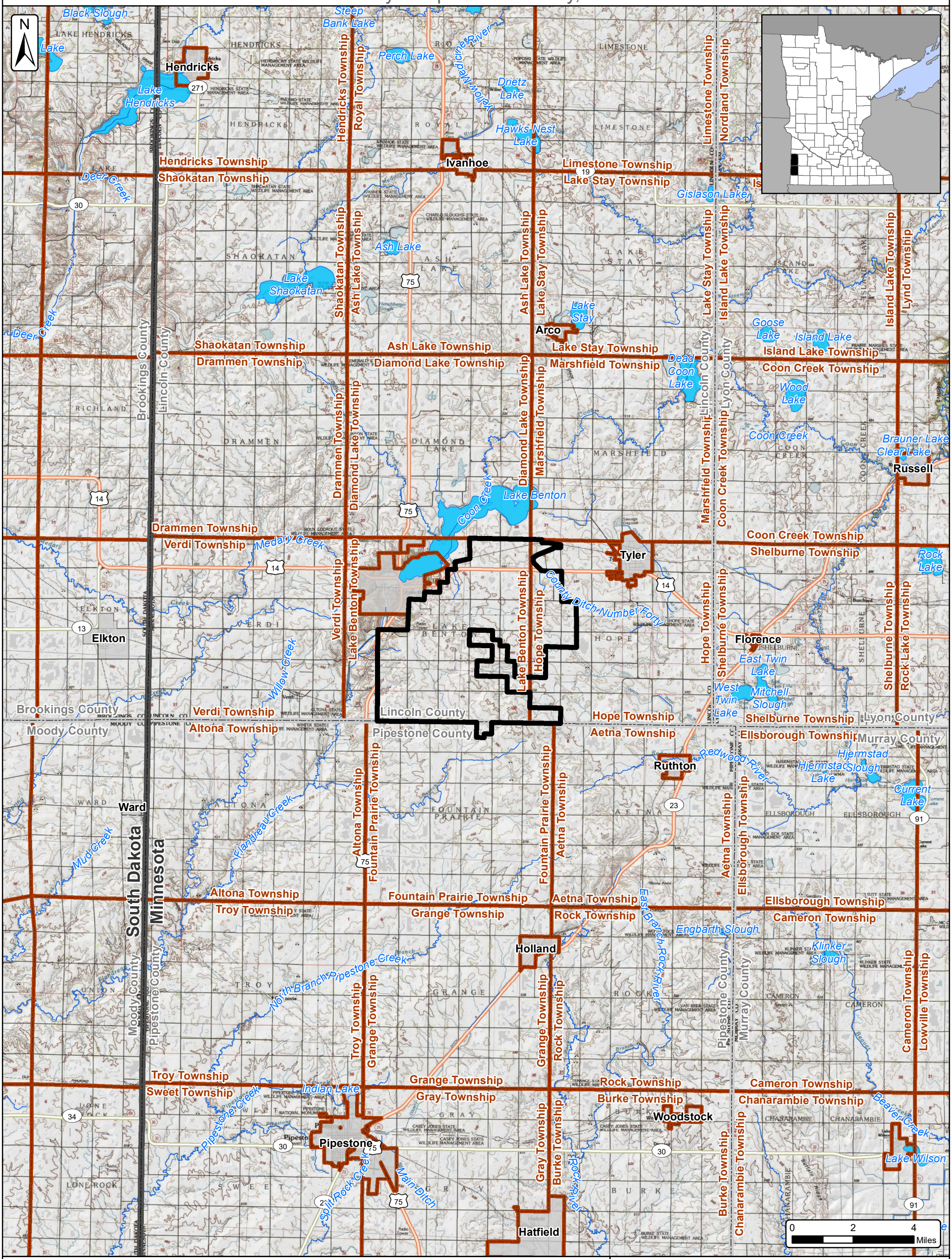
Wind Turbine Guidelines Advisory Committee. 2010. Preamble to the Committee Recommendations; Committee Policy Recommendations; Committee Recommended Guidelines. U.S. Fish and Wildlife Service Wind Turbine Guideline Advisory Committee.

APPENDIX C

Buffalo Ridge Wind

Map 1- Project Location Map

Lincoln County & Pipestone County, Minnesota



Main Watercourses (NHD)

Main Waterbodies (NHD)

Project Area
5/9/2019 (±17,609 Ac.)

Cities

Townships

Counties

States

SOURCE: USGS TOPOGRAPHIC QUADRANGLES 1:24,000

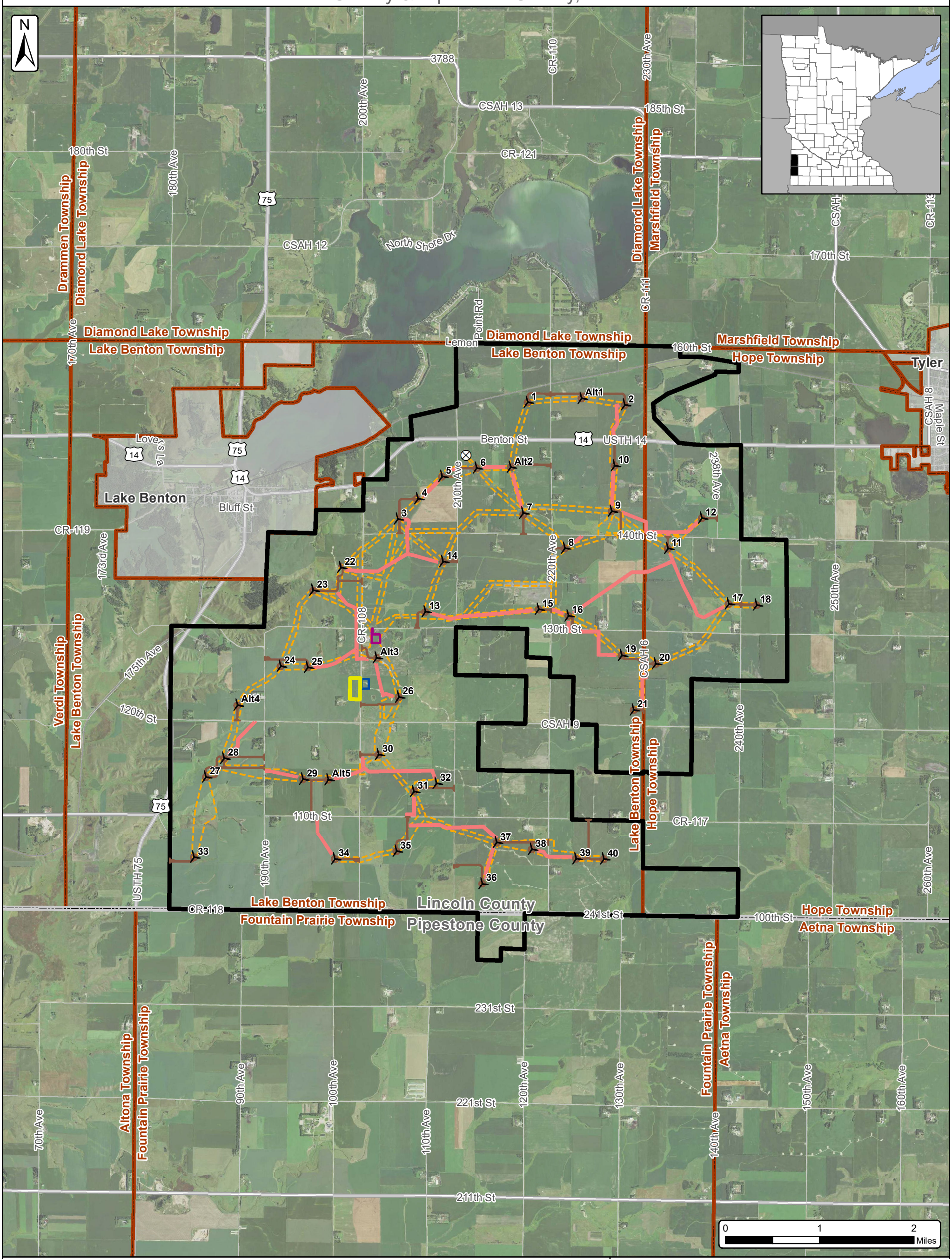
ATWELL

8/8/2019

Buffalo Ridge Wind

Map 2 - Project Area and Facilities Map

Lincoln County & Pipestone County, Minnesota



- Turbine Layout (07/26/2019)
- MET Tower
- Access Roads (07/26/2019)
- Preliminary Crane Paths
- Collection Corridor (08/08/2019)
- O&M Area (05/16/2019)
- Proposed Substation (03/29/2019)
- Potential Laydown/Batch Plant (07/25/2019)
- Project Area 5/9/2019 (±17,609 Ac.)
- Cities
- Townships
- Counties

SOURCE: USDA NAIP 2017 IMAGERY

ATWELL

8/8/2019

ATTACHMENT – REDLINE CHANGES TO APPLICATION

1.0 INTRODUCTION

Buffalo Ridge Wind, LLC (BRW or Applicant) respectfully submits this application for a certificate of need (CON) to the Minnesota Public Utilities Commission (Commission) in accordance with Minnesota Statutes (Minn. Stat.) § 216B.243 and Minnesota Rules (Minn. R.) Chapter 7849.

BRW is a wholly-owned indirect subsidiary of NextEra Energy Resources, LLC (NEER). NEER is a national renewable energy company that owns and operates over 23,500 megawatts (MW) of electric generating capacity in 36 states and Canada. NEER has ownership and financial interests in (1) the formerly operating 26.3 MW Buffalo Ridge Wind Energy Center in Lincoln County, which has been decommissioned; (2) the 98.2 MW Mower County wind facilities in Mower County; and (3) the to-be-repowered 102.8 MW Lake Benton II project in Pipestone County.

1.1 The Buffalo Ridge Wind Project

BRW respectfully requests that the Commission issue a CON for the approximately 109~~.2~~ MW Buffalo Ridge Wind Project (the Project).[1] The Project is a "large energy facility" as defined in Minn. Stat. § 216B.2421, subd. 2(1).

BRW is an independent power producer (IPP) that will develop, construct, own, and operate the Project. The Project includes turbines, a project collector substation, collection lines, an operation and maintenance (O&M) building, permanent meteorological tower(s), and gravel access roads. The Project site is located on 16,893 acres (26.4 square miles) primarily in Lincoln County in southwestern Minnesota, immediately east of the City of Lake Benton and west of the City of Tyler, Minnesota (Project Area). A small portion of the Project Area extends into Pipestone County. The Project will produce up to approximately 109~~.2~~ MW, supported by 31 General Electric (GE) 2.82 MW wind turbines, five GE 2.52 MW wind turbines, and four GE 2.3 MW turbines. The Project will be interconnected to the electric transmission grid at the existing Buffalo Ridge substation owned by Northern States Power Company, a subsidiary of Xcel Energy. BRW's anticipated commercial operations date for the Project is November 30, 2020.

There was previously a wind facility operating in the general vicinity of the Project Area, called the Buffalo Ridge Wind Farm. The original Buffalo Ridge Wind Farm was constructed in 1994 and consisted of 73 Kenetech turbines. The original wind farm was permitted by Lincoln County. The site was decommissioned in 2017.[2]

BRW has entered into a power purchase agreement (PPA) with Great River Energy (GRE). In the PPA, GRE agreed to purchase the full output of the Project for a 25-year term. The Project, as a

[1] BRW will also be requesting a Site Permit related to the Project.

[2] The existing Buffalo Ridge wind facility stopped operation in late 2016 and was decommissioned in 2017.

generator of wind energy, qualifies as an "eligible energy technology" for the purposes of the Minnesota Renewable Energy Standard (RES), as set forth in Minn. Stat. § 216B.1691, and, therefore, will serve as a significant renewable generation addition to assist GRE in meeting and exceeding its RES requirements, in addition to its own voluntary renewable energy goals.

1.2 Project Contacts

The authorized representatives for the Applicant are:

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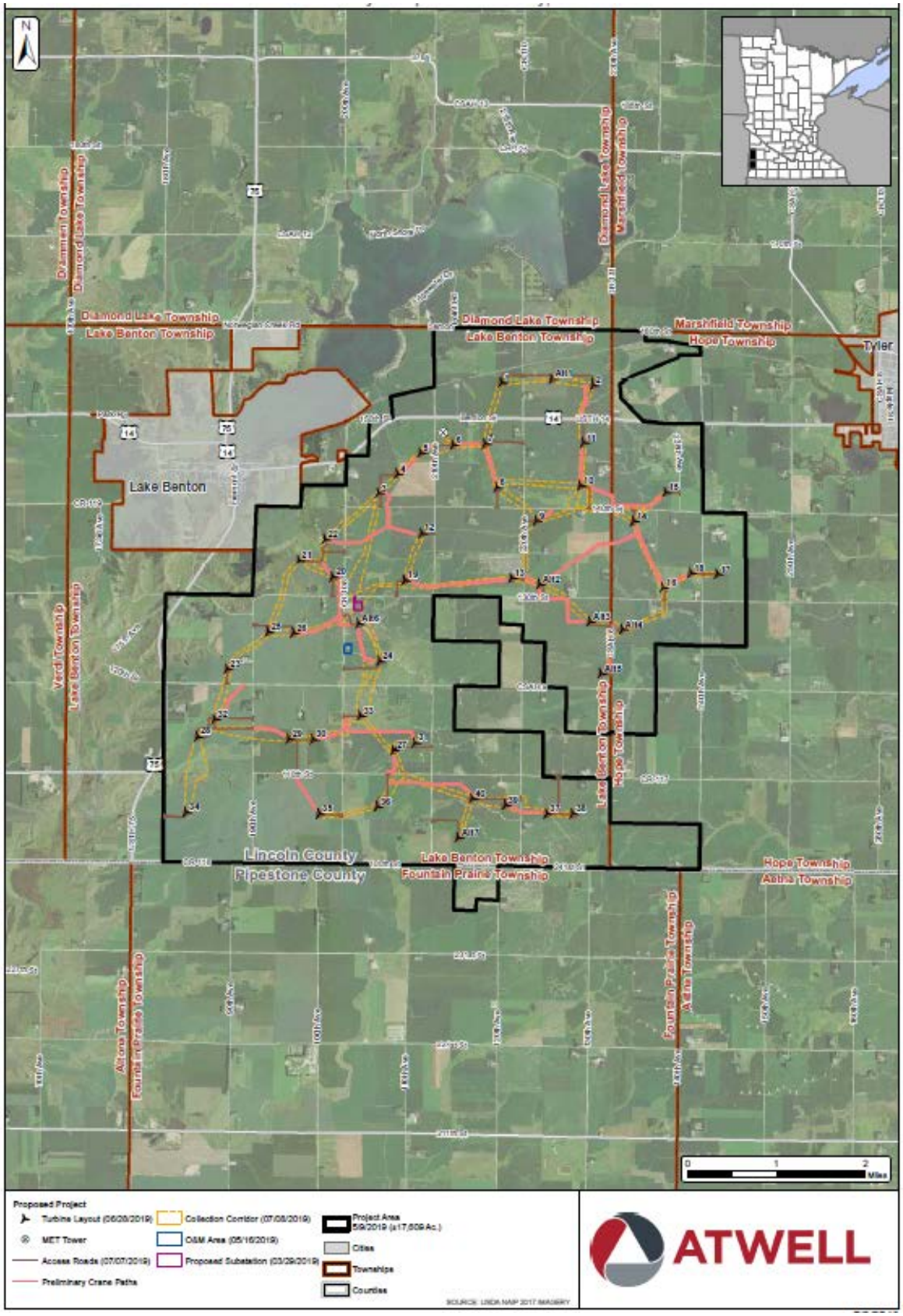
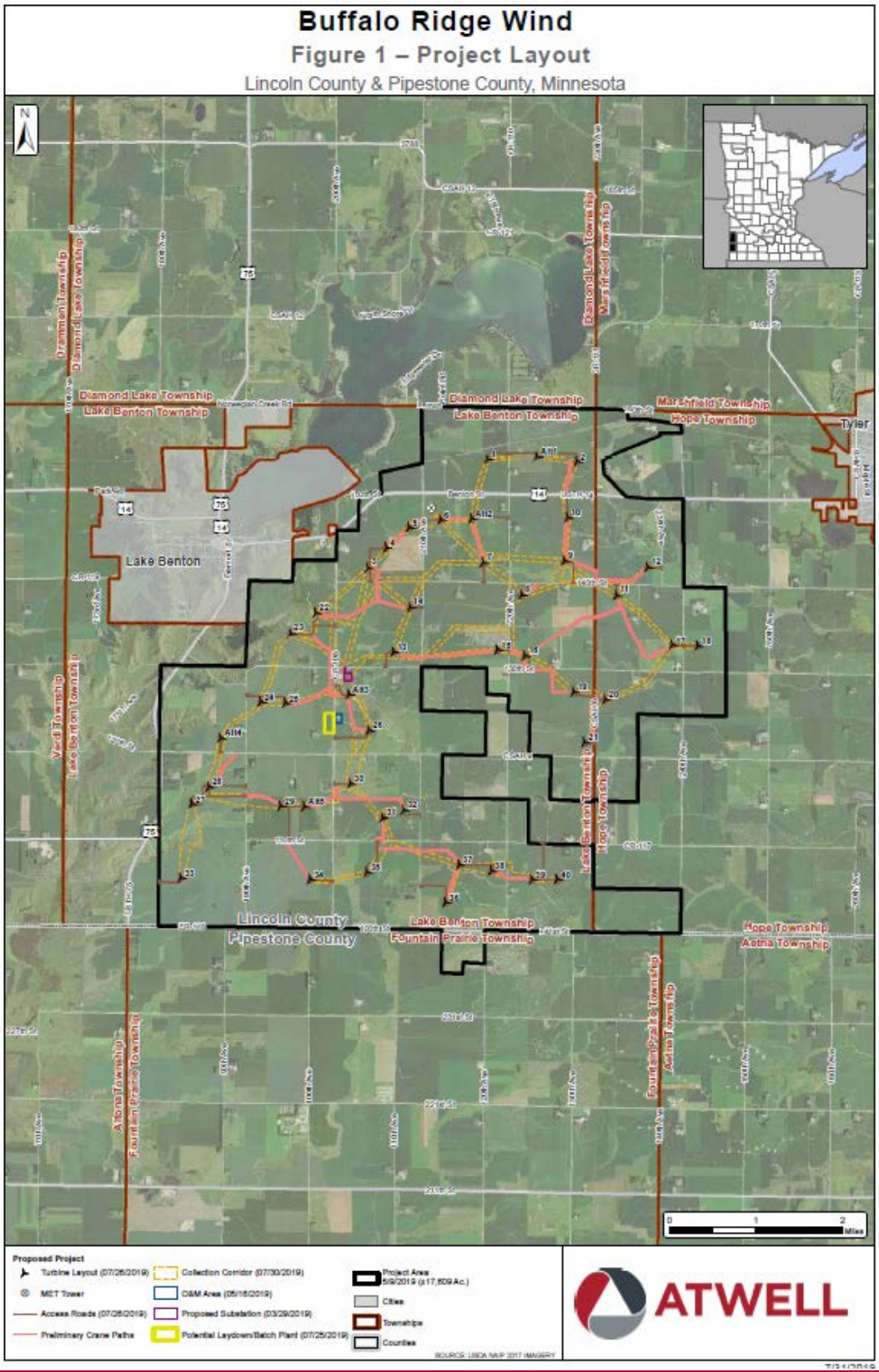
Figure 1. Project Layout




Buffalo Ridge Wind
Figure 1 – Project Layout
Lincoln County & Pipestone County, Minnesota
N
Diamond Lake Township
Lake Benton Township
Marshfield Township
Hope Township
Tyler
Lake Benton
Verdi Township
Lincoln County
Pipestone County
Fountain Prairie Township
Aetna Township
Proposed Project
Turbine Layout (07/26/2019)
MET Tower
Access Roads (07/26/2019)
Preliminary Crane Paths
Collection Corridor (07/30/2019)
O&M Area (05/16/2019)
Proposed Substation (03/29/2019)
Potential Laydown/Batch Plant (07/25/2019)
Project Area
Cities
Townships
Counties
ATWELL

6.1.1 Nominal Generating Capacity and Effect of Economies of Scale (Minn. R. 7849.0250(A)(1))

The total nominal generating capacity of the Project is approximately 109~~.2~~ MW. The Project size produces economies of scale gains in procurement, construction, O&M, and interconnection costs compared to a smaller project. For example, mobilization costs for delivery of turbines and construction of the Project are lower on a per-turbine basis than they would be for a smaller wind project with fewer turbines. The result of gains in the economics of scale is a lower cost of production for electricity.

6.1.2 Annual Capacity Factor (Minn. R. 7849.0250(A)(2))

The projected annual net capacity factor for the Project is approximately 48-52% annually. The projected average annual output of approximately 478,600 MWh is anticipated for the Project.

6.1.3 Fuel (Minn. R. 7849.0250(A)(3))

The fuel for the Project is wind.

6.1.4 Anticipated Heat Rate (Minn. R. 7849.0250(A)(4))

Heat rates are specific to fossil generation, and, therefore, are not applicable to a wind generation facility.

6.1.5 Facility Location (Minn. R. 7849.0250(A)(5))

The Project's turbines will be located in in Lincoln County in southwestern Minnesota, immediately east of the City of Lake Benton and west of the City of Tyler, Minnesota. The estimated size of the Project Area is approximately 17,000 acres (~26 square miles) of mostly agricultural land. The substation equipment will be installed on concrete foundations and will consist of a graveled footprint area of up to approximately one (1) acre (0.4 hectares). Within this area, there will be a chain link perimeter fence and an outdoor lighting system. No new gates or fences will be constructed other than at the collector substation, which will have an eight (8)-foot high fence, locked gate, and its own access road. The O&M facility will be located adjacent to the substation where five (5) acres (2.0 hectares) will be purchased or leased in addition to the substation. The footprint of the O&M facility and associated parking area will be up to two (2) acres (0.8 hectares).

6.2 Availability of Alternatives (Minn. R. 7849.0250(B))

Consistent with the Commission-granted partial exemption, non-renewable energy sources have been excluded from this alternatives analysis. Thus, the criteria used in this analysis includes whether: (1) the energy source is cost-effective; (2) the energy source is commercially proven and reliable for the electrical generation output needed; and (3) the energy source is appropriate for the site selected.

Developing and operating generating sources that are cost-effective and use proven technology is particularly important to an IPP like BRW. BRW does not have access to ratepayer funds that could provide a resource for retirement of capital investments. In addition, as a seller of electricity within the terms of an agreed-upon PPA price, BRW must keep its prices – and, thus, its costs – low and competitive.

Commercial feasibility and reliability with respect to the generation output needed are important considerations in selling the power generated. Wind is a proven and reliable resource. Further, the site chosen for the Project is appropriate given the ability to achieve the approximately 48-52% capacity factor, while minimizing the impact to the environment and human settlement.

6.2.1 Purchased Power (Minn. R. 7849.0250(B)(1))

BRW is an IPP, and, therefore, does not purchase power. Instead, BRW will sell power to the GRE pursuant to a PPA. As such, this data requirement is not applicable, and the Commission granted BRW an exemption.

6.2.2 Upgrades to Existing Resources (Minn. R. 7849.0250(B)(2))

BRW has no existing facilities in Minnesota. Therefore, there is no facility for BRW to improve. However, consistent with BRW's request for certain CON exemptions, BRW agreed to provide equivalent data from the purchaser of the Project's output. Since GRE is in need of additional renewable energy, there is no potential upgrade to an existing GRE facility suitable to produce approximately 109~~.2~~ MW of wind energy.

6.2.3 New Transmission (Minn. R. 7849.0250(B)(3))

BRW has no plans to own or operate transmission voltage level lines for the interconnection of the Project. According to GRE, there are no transmission alternatives that would provide approximately 109~~.2~~ MW of wind energy, as only a wind generating plant can produce the approximately 109~~.2~~ MW of renewable energy contracted for in the PPA.

6.2.4 New Generating Facilities (Minn. R. 7849.0250(B)(4))

6.2.4.1 Solar Power

Solar is not an alternative to the Project. The cost and reliability of wind power continues to be more favorable than for solar power despite recent substantial reductions in cost for solar. Wind continues to be more cost-effective than solar-powered electricity and remains the lowest-cost new source of renewable energy. For example, the levelized total system cost for wind power in the EIA's Annual Energy Outlook 2019 was $48.8/MWh compared with $52.2/MWh for solar

The GE 2.82 MW turbine model has a capacity of 2,820 kW; the GE 2.52 MW turbine model has a capacity of 2,520 kW; and the GE 2.3 MW turbine model has a capacity of 2,300 kW.

Table 4. Rotor Diameter and Number of Turbines

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GE 2.52 MW	127/ 416.7	152.1/499	25/82	5	~~0~~3
GE 2.82 MW	127/ 416.7	152.1/499	25/82	31	~~6~~1

The Project will be visible to permanent observers (residents) and temporary observers (motorists, tourists, or recreationalists passing by or using the area intermittently). Visual impacts may also be noticeable to users of public lands and public snowmobile trails within and within the vicinity of the Project Area. However, the Project will not be introducing a new feature type to the landscape because existing wind turbines and other power related infrastructure are prevalent within and in the vicinity of the Project Area.

Turbines will likely be viewed in one of three perspectives:

- As a visual disruption;
- As generally compatible with the rural agricultural heritage of the area, which includes existing wind turbines; or
- As adding a positive aesthetic quality to the landscape.

The topography in the vicinity of the Project Area is rolling and the vegetation is low, and the Project will be visible to residents of the area and to people traveling north and south along US Hwy 75 and County State Aid Highway (CSAH) 7, east and west along US Hwy 14 and CSAH 6. However, the Project will not create a new feature type within the landscape because several wind farms and other power related infrastructure occur within Project Area or its immediate vicinity.

Additionally, alterations of the land with temporary impacts related to construction activities, such as temporary land use associated with equipment staging and laydown areas, crane paths, and installation of underground collection lines would be short-term and converted back to cropland or replanted with grasses and vegetation native to the area following the completion of construction. Visual impacts from an increase in traffic and human activity within the Project Area during construction would also be short-term. The long-term operation of the Project is not anticipated to increase visual impacts associated with human activity or traffic within the Project Area.

(#141). The maximum expected flicker at a non-participating receptor (#154) was 30 hours, 35 minutes. The majority of the receptors (294) were predicted to experience no annual shadow flicker. Sixty-~~nine~~three locations were predicted to experience some shadow flicker but less than 10 hours per year. The modeling results showed that ~~40~~38 locations would be expected to have 10 to 30 hours of shadow flicker per year. ~~Eight~~Six receptors are expected to have over 30 hours of flicker per year, one of which is a non-participating receptor. The modeling results are conservative in that modeling receptors were treated as "greenhouses" (i.e., having windows on all sides) and the surrounding area was assumed to be without vegetation or structures ("bare earth").

The Project was designed to minimize shadow flicker exposure of the residences in the area. BRW will use site-specific mitigation measures to address shadow flicker impact, as appropriate, including the following:

- Meet with the homeowner to determine the specifics of their complaint;
- Investigate the cause of the complaint; and
- Provide the homeowner with reasonable mitigation alternatives including shades, blinds, awnings or plantings.

11.1.3 Impacts to Land Use

The Project is consistent with the Lincoln County's Comprehensive Plan and the Pipestone County's zoning requirements and Comprehensive Plan. BRW will coordinate with the Lincoln and Pipestone Counties to ensure compliance with all zoning regulations and acquire all appropriate permits.

The Project is not likely to impact future zoning and expansion of incorporated areas near the Project Area. Development of the Project will allow continued agricultural use within the Project Area, while helping to strengthen the local economy through annual payments to landowners with Project infrastructure on their property, potential use of local contractors and suppliers, potential temporary jobs for local workers, and tax benefits to local governments.

Temporary and permanent impacts to current land use are anticipated to occur from the construction of the Project. Since the Project is primarily located within the Rural Preservation Management District of Lincoln County and partially within the Agriculture District of Pipestone County, land use primarily consists of agricultural activity, including row cropping and livestock production. Temporary and permanent impacts to agricultural activities will include the removal of land from row crop production and pasture during the construction and operation of the Project. Additionally, temporary and permanent impacts to pastureland are expected to be minimal and restricted to removing small amounts of land from use.

The locations of two Conservation Reserve Enhancement Program (CREP) and one Permanent Wetland Preserves (PWP) easements within the Project Area have been incorporated into Project

containment. Secondary containment will prevent impacts and will ensure that leaks, if they occur, will be contained. Additionally, a spill prevention, control, and countermeasure (SPCC) plan will be developed for both the construction and operational phases of the Project. The SPCC will detail the appropriate storage, cleanup, and disposal of hazardous wastes to ensure potential impacts are avoided.

12.8 Noise (Minn. R. 7849.0320(I))

~~No wind turbines associated with~~Sound levels attributable to the Project do not reach or exceed 50 dBA at modeling receptors, even under the predicted worst-case scenario. However, there is currently an exceedance in the Project Area attributable to other turbines, or "existing Non-Project" turbines. Therefore, the predicted worst-case sound level from the combination of the Project wind turbines, the existing non-Project wind turbines, and the future non-Project wind turbines (Project + Existing Non-Project + Future Non-Project) is below the 50 dBA limit at all modeled NAC 1 receptors except for at one (1) receptor. Existing non-Project only sound levels are highest at receptor #44, exceeding the MPCA limit of 50 dBA (Existing Non-Project only sound level at receptor #44 is 51 dBA). The Project Only sound level at this receptor is ~~41~~40 dBA. The second highest modeled L_{50} sound level from the Project + Existing Non-Project + Future Non-Project scenario is ~~49~~48 dBA and occurs at ~~three (3)~~two (2) locations (one participating ~~locations. The~~and one non-participating). Moreover, the highest predicted worst-case Project Only L_{50} sound level at a modeling receptor is ~~49 dBA, and therefore meets the most restrictive Minnesota sound limit of 50~~47 dBA. Further details of the sound monitoring study will be provided in BRW's Site Permit application.

BRW has designed the wind project to meet the MPCA state noise standards and to minimize the sound levels due to the wind turbines at the homes in the community as much as possible, while also meeting the other constraints of the project design and regulatory requirements.

12.9 Work Force for Construction and Operation (Minn. R. 7849.0320(J))

Approximately 200 temporary construction and approximately 7 to 12 full time O&M jobs are expected as part of this Project.

12.10 Number and Size of Transmission Facilities (Minn. R. 7849.0320(K))

The Project will interconnect to a 115 kV substation located on a parcel adjacent to the existing Buffalo Ridge substation owned by Northern States Power, a subsidiary of Xcel Energy. This substation is located within the Project Area and the Project substation is currently planned for an adjacent parcel. As such, no overhead transmission line is currently proposed for the Project.

STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION

In the Matter of the Application of Buffalo Ridge Wind, LLC for a Certificate of Need for the Buffalo Ridge Wind Project and Associated Facilities in Lincoln County, Minnesota	)	**Docket No. IP-7006/CN-19-309**
		CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of **Buffalo Ridge Wind, LLC's update to its Application for Certificate of Need,** has been served today by e-mail and/or U.S. Mail to the following:

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Dated this 9th day of August, 2019

/s/ Joshua M. Feit
Joshua M. Feit