GERONIMO WIND ENERGY

PRAIRIE ROSE TRANSMISSION

PUBLIC UTILITIES COMMISSION

Route Permit Application
115 kV Transmission Line

Rock County, Minnesota

March 2011

Prepared for:

Prairie Rose Transmission, LLC
and
Geronimo Wind Energy, LLC

Prepared by:

HDR

HDR Engineering, Inc.
701 Xenia Ave. South, Ste. 600
Minneapolis, MN 55416

Table of Contents

List of Tables

List of Appendices

Completeness Checklist

The content requirements for an application with the Minnesota Public Utilities Commission under the Alternative Permitting Process are identified in Minnesota Rules 7850.2800–7850.3900. The submittal requirements are listed in Table 1 with cross references indicating where the information can be found in this Application.

Table 1. Completeness Checklist

Authority	Required Information	Where
Minnesota Statutes Section 216E.04, Subd. 3; Minnesota Rule 7850.3100	**Contents of Application (alternative permitting process)**	
	The Company shall include in the application the same information required in part 7850.1900, except the Company need not propose any alternative sites or routes to the preferred site or route. If the Company has rejected alternative sites or routes, the Company shall include in the application the identity of the rejected sites or routes and an explanation of the reasons for rejecting them.	Section 3.2 (See also 7850.1900, subp. 2 and 3 below).
Minnesota Rule 7850.1900, subp. 2	**Route Permit for High Voltage Transmission Line (HVTL)**	
A.	a statement of proposed ownership of the facility at the time of filing the application and after commercial operation	Section 1.2
B.	the precise name of any person or organization to be initially named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated	Section 0
C.	at least two proposed routes for the proposed high voltage transmission line and identification of the Company's preferred route and the reasons for the preference	Not applicable, per Minnesota Rule 7850.3100
D.	a description of the proposed high voltage transmission line and all associated facilities including the size and type of the high voltage transmission line	Section 1.1
E.	the environmental information required under subp. 3	See Minnesota R. 7850.1900, subp. 3 (A) – (H) below
F.	identification of land uses and environmental conditions along the proposed routes	Chapter 5.0 Environmental Information

Authority	Required Information	Where
G.	the names of each owner whose property is within any of the proposed routes for the high voltage transmission line	Appendix G
H.	United States Geological Survey topographical maps or other maps acceptable to the Commission showing the entire length of the high voltage transmission line on all proposed routes	Appendix C
I.	identification of existing utility and public rights-of-way along or parallel to the proposed routes that have the potential to share right-of-way (ROW), the land used by a public utility (as for a transmission line), with the proposed line	Section 4.2
J.	the engineering and operational design concepts for the proposed high voltage transmission line, including information on the electric and magnetic fields of the transmission line	Chapter 4.0 Engineering Design Construction and ROW Acquisition
K.	cost analysis of each route, including the costs of constructing, operating, and maintaining the high voltage transmission line that are dependent on design and route	Section 2.4
L.	a description of possible design options to accommodate expansion of the high voltage transmission line in the future	Section 3.3
M.	the procedures and practices proposed for the acquisition and restoration of the ROW, construction, and maintenance of the high voltage transmission line	Sections 4.3– 4.6
N.	a listing and brief description of federal, state, and local permits that may be required for the proposed high voltage transmission line	Section 6.4
O.	a copy of the Certificate of Need or the certified HVTL list containing the proposed high voltage transmission line or documentation that an application for a Certificate of Need has been submitted or is not required	Appendix A
Minnesota Rule 7850.1, subp. 3	**Environmental Information**	
A.	a description of the environmental setting for each site or route	Section 5.0
B.	a description of the effects of construction and operation of the facility on human settlement, including, but not limited to, public health and safety, displacement, noise, aesthetics, socioeconomic impacts, cultural values, recreation, and public services	Section 5.2
C.	a description of the effects of the facility on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining	Section 5.3

Authority	Required Information	Where
D.	a description of the effects of the facility on archaeological and historic resources	Section 5.4
E.	a description of the effects of the facility on the natural environment, including effects on air and water quality resources and flora and fauna	Section 5.5
F.	a description of the effects of the facility on rare and unique natural resources	Section 5.5.5
G.	identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route	See all of the effects described in Section 5.0.
H.	a description of measures that might be implemented to mitigate the potential human and environmental impacts identified in items A to G and the estimated costs of such mitigation measures	See all of the mitigation measures identified in each section

1.0 INTRODUCTION

1.1 PROJECT INTRODUCTION

Prairie Rose Transmission, LLC ("Prairie Rose Transmission" or "Applicant"), submits this application for a route permit to the Minnesota Public Utilities Commission (Commission) pursuant to Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850 (Application).

The Applicant requests a route permit to construct a 7-mile long (preferred) or a 5.5-mile long (alternate) 115,000 volt (115 kV) transmission line between the proposed substation for the Prairie Rose Wind Farm and the South Dakota border (the "Project"). The proposed transmission line begins at the Prairie Rose Wind Farm's project substation and ends at Xcel's Energy's Split Rock Substation (Split Rock substation) near Brandon, South Dakota. The "Project" defined in this Application consists of only the Minnesota portion of the overall approximately 24-mile long line that will service the Prairie Rose Wind Farm. The South Dakota portion of the transmission line is located in Minnehaha County, South Dakota and will be permitted under applicable South Dakota statutes and rules and Minnehaha County ordinances. The complete proposed route, including both the portion in Rock County, Minnesota and the portion in Minnehaha County, South Dakota is shown in Figure 1. The Minnesota portion of the route addressed in this route permit application, (the "Proposed Route") is shown in Figure 2.

The Applicant is requesting a route permit under the Alternative Permitting Process Minnesota Rule 7850.2800. Chapter 216E and the Commission rules provides an Alternative Permitting Process for certain qualifying facilities (Minnesota Statutes § 216E.04; Minnesota Rule 7850.2800). This Project qualifies for the Alternative Permitting Process because it meets the requirements of Minnesota Rule 7850.2800, subp. 1(C), which allows for permitting under the alternative process if the project is capable of operating between 100 and 200 kilovolts.

1.2 STATEMENT OF OWNERSHIP

Geronimo Wind Energy, LLC (GWE), a Minnesota limited liability company focused on building renewable energy projects in the Upper Midwest, is currently developing an up to 200 megawatt (MW) wind farm in Rock and Pipestone Counties that will be served by the Project. GWE has formed a wholly-owned subsidiary, Prairie Rose Wind, LLC ("Prairie Rose Wind"), to own the wind farm. In addition, GWE formed Prairie Rose Transmission, LLC, a wholly-owned subsidiary of Prairie Rose Wind, to own and operate the proposed Project. GWE and Prairie Rose Transmission reserve the right to sell or assign the Project to another qualified entity at any time before, during or after the Project is constructed, pending the appropriate PUC approvals.

1.3 PERMITTEE

The permittee for the Project will be:

Permittee: Prairie Rose Transmission, LLC
Contact: Patrick Smith
Address: 7650 Edinborough Way, Suite 725
Edina, MN 55435
Phone: (952) 988-9000
Email: patrick@geronimowind.com

1.4 CERTIFICATE OF NEED

A Certificate of Need (CON) is required for the Project. The process for obtaining a CON includes evaluating a proposed energy project's need as well as its relative environmental impact compared to other methods for meeting that need. Minnesota Statutes § 216B.243, subd. 2 states that no "large energy facility" shall be sited or constructed in Minnesota without the issuance of a CON by the Commission. The Project qualifies as a "large energy facility" under Minnesota Statutes Chapter 216B because it is crosses the Minnesota border into South Dakota. *See* Minnesota Statutes § 216B.2421, subd. 2(3). A CON, Notice Plan Approval Request, and Request for Variance for the proposed Project were filed on January 27, 2010 (Docket # ET6838/CN-10-134). In the CON docket, the Prairie Rose Wind Farm and proposed Project are being permitted together pursuant to Minnesota Statures § 216B.2421, subd. 2(1). A copy of the Commission's notice of application acceptance for Prairie Rose Wind's CON is included as Appendix A.

1.5 ROUTE PERMIT, ALTERNATIVE PERMITTING PROCESS

Minnesota Statutes §216E.03, subd. 2, provides that no person may construct a High Voltage Transmission Line (HVTL) without a route permit from the Commission. An HVTL is defined as a transmission line of 100 kV or more and greater than 1,500 feet in length. The 115 kV transmission line project proposed is an HVTL, and therefore a permit is required prior to construction.

The Commission rules provide for an Alternative Permitting Process for certain facilities (Minnesota Statutes §216E.04; Minnesota Rules 7850.2800, subp. 1). The Alternative Permitting Process is a slightly abbreviated process used for smaller transmission projects. Under the Alternative Permitting Process, a shorter Environmental Assessment, rather than an Environmental Impact Statement, and a public hearing, rather than contested case hearing, are required. In addition, the Alternative Review Process does not require identification of an alternative route. The proposed transmission line qualifies for the Alternative Permitting process because it is between 100 and 200 kV. Minnesota Statutes §216E.04, subd. 2(C) and Minnesota Rule 7850.2800, subp. 1(C). This Application is submitted pursuant to the Alternative Permitting

Process outlined in Minnesota Rules 7850.2800 to 7850.3900. A copy of the notice to the PUC of the Applicant's intent to file under Alternative Permitting Process is included in Appendix B.

1.6 NOTICE TO THE COMMISSION

The Applicant notified the Commission by letter dated February 4, 2010, that they intended to apply for a route permit for the Project under the Alternative Permitting Process. This letter complies with the requirement of Minnesota Rule 7580.2800, subp. 2, to notify the Commission at least 10 days prior to submitting an application for a route permit under the alternative process. A copy of this notice is attached as Appendix A.

2.0 PROJECT INFORMATION

2.1 PROJECT LOCATION

The Applicant seeks a route permit and proposes construction for a 7-mile (preferred) or 5.5-mile (alternate) Minnesota segment of an overall 24-mile 115 kV transmission line that will run from the Prairie Rose Wind Farm substation in Rock County, Minnesota, to the Split Rock Substation in Brandon, South Dakota. The preferred location of the Prairie Rose Wind Farm substation is in the southwest quarter of Section 26 of Rose Dell Township (104N, 46W) and an alternate location is sited in the northeast quarter of Section 34 of Rose Dell Township (104N, 46W). The Applicant requests the flexibility to consider both locations since landowner negotiations, final engineering of the Project, and final engineering of the Prairie Rose Wind Farm are still underway. This flexibility is requested by the Applicant because adjusting the length of the Proposed Route will ultimately allow the most economically efficient supply of power to Minnesota rate payers. The Proposed Route is located in Rose Dell Township in Rock County, Minnesota as shown in Figure 2. Table 2 below identifies the sections, townships, and ranges that define the Proposed Route.

Table 2. Proposed Route

County	Political Township	Township	Range	Sections
Rock	Rose Dell	104N	46W	26-35
Rock	Rose Dell	104N	47W	25, 26, 35, 36

2.2 PROJECT PROPOSAL

The Applicant proposes to construct the new single-circuit 115 kV transmission line in Rock County, Minnesota. The complete proposed transmission line will span approximately 24 miles and will include the Project, which consists of either 7 miles (preferred) or 5.5 miles (alternate) of transmission line in Minnesota. The Proposed Route will be sited along a combination of existing roadway ROW and private land adjacent to the public ROW in Minnesota. The Project will be constructed to transmit energy generated by the Prairie Rose Wind Farm, an up to 200 MW facility also located in Rock County, Minnesota, to the Split Rock Substation near Brandon, South Dakota. The Proposed Route would pass through a portion of Rose Dell Township, southeast of the town of Jasper, Minnesota, and directly west of the town of Hardwick, Minnesota. Maps showing the layout of the Project are shown in Figure 2.

2.3 PROJECT SCHEDULE

Construction for the Project is expected to occur sometime between Fall 2011 and Fall 2012, as determined by the general contractor's schedule. Construction for the Project is not anticipated to take more than two months. This schedule is based on information known as of the date of this filing and upon planning assumptions that balance the timing of implementation with the

availability of crews, material, and other practical considerations. This schedule may be subject to adjustment and revision as further information is developed.

2.4 PROJECT COSTS

The Applicant has prepared a preliminary cost estimate for the transmission line described in this Application. The estimated cost for the 24 miles of transmission line between the Prairie Rose Wind substation and the Split Rock Substation is $15 million. The portion of this cost relating to the Minnesota piece of the Project is estimated to be approximately $5 million.

Operation and maintenance costs for the transmission line will be nominal in the initial years of operations, since the line will be new and minimal vegetation maintenance is required. Typical annual operation and maintenance costs for a 115 kV transmission lines in the Upper Midwest are on the order of $300 to $500 per mile of transmission ROW. The principal operating and maintenance cost will be inspections, usually performed monthly either by ground via truck or by air via fixed-wing aircraft and annually by helicopter.

3.0 DETAILED FACILITY DESCRIPTION & ROUTE SELECTION RATIONALE

3.1 DETAILED ROUTE DESCRIPTION

The Proposed Route being requested by the Applicant will extend from the new Prairie Rose Wind Farm substation located in Rose Dell Township, Minnesota, to the Minnesota-South Dakota border. Figure 1 shows the entire wind energy project and the proposed transmission line for the Prairie Rose Wind Farm. The new single-circuit 115 kV transmission line would originate at the Prairie Rose Wind Farm substation and head west along County Highway 7 to County Highway 23. Here it will continue due west for approximately 2.5 miles along Township Road 72 to the Minnesota-South Dakota border. Once in South Dakota it will continue west and south to Split Rock Substation.

The Proposed Route follows existing ROW along Rock County Highway 7 and Rose Dell Township Road 72 for up to 7 miles. Along the entire length of this route, the ROW is free of any existing overhead electric lines along the side of the road. The Applicant proposes placing the structures on alternating sides of the roadway (*e.g.* north or south) to minimize impacts to residences, minimize other environmental impacts whenever possible, and to accommodate preferences and concerns of Rose Dell Township, the Rock County Highway Department, and the Minnesota Department of Transportation (Mn/DOT).

The Applicant requests a standard Proposed Route width of 180 feet, or 90 feet on either side of the road centerline. This width is based on the portion of the route that follows both Rock County Highway 7 and Rose Dell Township Road 72, which have approximately 50-foot- and 33-foot-wide right-of-ways, respectively. In areas where the proposed transmission line will be placed on private land, an additional 40 feet from the edge of the road ROW is required. Since the Applicant is requesting the consideration of both sides of the road, the total width (180 feet) is equal to the sum of the larger ROW (50 feet) plus 40 feet on each side (for a total of 180 feet) of the ROW. Where private easements are not available, the proposed transmission line will be constructed inside the public ROW. These requirements for the Project corridor are illustrated in Figures 3a and 3b.

The Proposed Route will cross the Burlington Northern Santa Fe (BNSF) railroad approximately one-half mile east of the Minnesota-South Dakota border. Per requirements of the railroad, overhead transmission lines should cross perpendicular to the alignment of the railroad. The Applicant requests a widening of the Project corridor by an additional 100 feet, for a total width of 280 feet, for one-half mile on either side of the railroad line (1 mile of the Proposed Route) for easement and engineering considerations in fulfilling the requirements of the railroad crossing.

3.2 ROUTE SELECTION PROCESS

The Proposed Route was developed by the Applicant through discussions with the community that took into account planning, design, construction, and environmental criteria. Two route alternatives were considered, including the Proposed Route. The Proposed Route was chosen because it:

(1) parallels existing right-of-way (ROW) on land leased by the Applicant,

(2) provides the shortest route between the Prairie Rose Wind substation and the Minnesota-South Dakota border,

(3) minimizes impacts to parcels identified as having ecological significance by the Minnesota Department of Natural Resources (DNR) in the agency's county biological survey;

(4) minimizes the number of residences impacted; and

(5) minimizes the total cost of energy from the Prairie Rose Wind Farm.

The alternate route initially considered would have originated 1 mile south of the Proposed Route, following Rose Dell Township Road T70-D and Rock County Highway 7 to the South Dakota border. The alternate route was dismissed for two reasons:

(1) There were a greater number of residences and it, therefore would have had a greater impact on the built environment; and

(2) There was a greater length to both the total transmission line and the wind farm collector system, needlessly driving up the total cost of the energy provided by the Prairie Rose Wind Farm.

3.3 DESIGN OPTIONS TO ACCOMMODATE FUTURE EXPANSION

At this time, the current design would support over 300 MW of electricity from wind generation. Given that the Prairie Rose Wind Farm is currently designed to be up to 200 MW, the outlet provided by Project allows for future expansion of generation in the area. This allowance appropriately capitalizes on the construction of the Project without needlessly increasing costs. Additionally, the Project could be added to the local and regional transmission and distribution network easily, potentially providing more outlet to a broader geographic area.

3.4 PROPOSED SUBSTATION DESCRIPTION

The two proposed locations for the Prairie Rose Wind substation are within the Prairie Rose Wind Farm project boundary, located two miles east of County Highway 6 on County Highway 7. The substation will be permitted under the Site Permit Application for a Large Wind Energy Conversion System for the Prairie Rose Wind Farm, which was filed separately under Docket No. ET6838/WS-10-425.

Underground collector lines from the Prairie Rose Wind Farm will deliver energy from the wind turbines to the Prairie Rose Wind substation. The collector system voltage then will be stepped up from 34.5 kV to 115 kV and transmitted on the proposed aboveground transmission line to the Split Rock Substation in South Dakota.

The final Prairie Rose Wind substation location has not yet been determined. Two locations, a primary and an alternate, are being considered. A typical site will require approximately 10 acres within the selected substation property.

4.0 ENGINEERING DESIGN, CONSTRUCTION & RIGHT-OF-WAY ACQUISITION

4.1 TRANSMISSION STRUCTURES AND RIGHT-OF-WAY DESIGN

The proposed transmission line will be designed to meet or surpass all relevant local and state codes, North American Electric Reliability Corporation standards, and the National Electric Safety Code (NESC). Appropriate standards will be met for construction and installation, and all applicable safety procedures will be followed during construction and operation of the transmission line.

4.1.1 TRANSMISSION LINE STRUCTURES

The Applicant proposes to construct the single-circuit transmission line on steel monopole structures. The structures will either be directly embedded or constructed with concrete foundations. Each location will require a 5 to 7 feet diameter hole to a depth of 10 to 12 feet for direct embedment and 20 to 30 feet for concrete foundations. Actual depths will depend on local soil conditions. The proposed transmission pole used will either be a vertical or delta structure as shown in Figure 4. The structures will be located approximately 600 feet apart when on private land and 350 to 400 feet apart when in the public ROW. Steel structures will be self-weathering or galvanized depending on final design, cost, and availability. The holes would be backfilled with the spoil or brought in material. All significant angle structures and structures needing additional stabilization because of ground conditions (typically related to grade and subsurface issues) will be steel poles placed on concrete foundations. The heights of the poles and the typical distance between each pole (span) are shown in Table 3. In some locations, near- and above-surface bedrock and other soil conditions may require special engineering techniques. The near- and above-surface bedrock design and construction would typically involve using specialized drilling equipment to bore a hole directly into the bedrock, which would be used as a foundation for the structure.

Final design and geotechnical investigations may warrant the use of special structures to avoid sensitive areas or to accommodate special engineering circumstances. The needs for angle structures will be determined once design is complete.

The phase conductor for the 115 kV line will be an 18-inch horizontal bundle of two 795 kcmil (thousand circular mils) "Drake" Aluminum Conductor Steel Reinforced (ACSR) 26/7 conductors with an outside diameter of 1.108 inches. Above the transmission circuit, one shield wire of three-eighths-inch Extra High Strength (EHS) seven-strand (0.375 inch diameter) will be employed. Table 3 summarizes the structure design for the line.

Table 3. Structure Design Summary

Project Component	Single-circuit 115 kV Transmission Line
Line Voltage	Designed/Operated at 115 kV
Structure Type	Tubular steel with davit arms
ROW Required	40 ft (adjacent to existing road ROW)
Conductor	795 kcmil 24/7 ACSR "Drake", double horizontal 18" bundle
Foundation	Direct Embed or Concrete Foundation
Average Span Length (feet)	600 Private land 350-400 Public ROW
Average Height (feet) Vertical Structures	75-80 Private land 70-75 Public ROW
Average Height (feet) Delta Structures	65-70 Private land 60-65 Public ROW

4.1.2 EXISTING UTILITY AND OTHER PUBLIC RIGHTS-OF-WAY

The Applicant is coordinating with Rock County and Sioux Valley Energy, a Touchstone Energy Cooperative, to avoid any conflicts with buried lines and regarding overhang into the public ROW. Additionally, the Applicant will work with the regional rural water supplier to ensure no conflicts with the existing rural water supply system.

The Project will be sited on private land adjacent to existing public ROW wherever feasible, though a mix of both private easements and public ROW may be required for the Project. Portions of the existing public ROW will be used for structures and/or overhang along the Proposed Route where private easements are not available or design warrants their use.

4.2 IDENTIFICATION OF EXISTING UTILITY AND PUBLIC RIGHT-OF-WAY

The Project will follow existing public ROW for portions of the Proposed Route where the use of private land is not available.

There are currently no overhead electrical transmission lines along the Proposed Route. A buried underground distribution line is present along the north side of County Highway 7 starting in the SE corner of Section 28 (T104N, R46W) and extending west into Sections 29 and 30 (T104N, R46W) and Sections 25 and 26 (T104N, R47W).

Blanket easements have been identified for several properties located along the north side of County Highway 7 beginning in the SE ¼ of Section 28 (T104N, R46W) and continuing west to the SE ¼ of Section 24 (T104N, 47W). This easement is held by Southwestern Minnesota Cooperative Electric.

4.3 RIGHT-OF-WAY EVALUATION AND ACQUISITION

The ROW evaluation and acquisition process began early in the planning and design process for the Project. The evaluation and acquisition process included environmental reviews (including the built environment of homes and other infrastructure), title examination, initial owner contacts, survey work, document preparation, and easement purchase. Each of these activities, particularly as it applies to easements for transmission line facilities, is described in more detail below.

The Applicant began the ROW acquisition process by identifying all persons and entities that may have a legal interest in the real estate upon which the facilities will be built. To compile this list, representatives of the Project and persons engaged by the Applicant completed a public records search of all land involved in the Project. A title report was then developed for each parcel to determine the legal description of the property and the owner(s) of record, and to gather information regarding easements, liens, restriction, encumbrances, and other conditions of record.

After Prairie Rose Transmission had identified the relevant owners, Prairie Rose held an open house to enable those along the route to visit, examine plans for the transmission line, and to discuss the route with company representatives. This open house was held on December 2, 2009, in Sherman, South Dakota. The Applicant invited property owners from Minnesota and South Dakota who could potentially be involved in the Project. After the open house a Prairie Rose representative personally contacted each property owner or the property owner's representative and described the purpose and need for the transmission facilities and how the Proposed Route may affect each parcel.

Prior to the acquisition of easements, land value data was collected, and, based upon the impact of the easement to the market value of each parcel, the Applicant's representatives attempted to offer a fair market value for those who asked to participate in the transmission line project. The Prairie Rose representative also sought information from the landowner about any specific construction concerns.

The next step in the acquisition process is evaluation of the specific parcel. For this work, the Project representative will request permission from the owner for survey crews to enter the property to conduct preliminary survey work. Permission may also be requested to take soil borings to assess the soil conditions and determine appropriate foundation design and to perform other surveys that will help minimize the impact of the Project. Surveys are conducted to locate the ROW corridors, natural features, man-made features, and associated elevations for use during the detailed engineering of the line. The soil analysis would be performed by an experienced geotechnical testing laboratory.

During the final evaluation process, the location of the Proposed Route will be staked. This means that the survey crew locates the proposed final structure or pole location on the ground

and places a surveyor's stake to mark the structure's anticipated location. The Project representative will take this additional, final opportunity to review with the landowner and other interested parties the location of the structure and identify any concerns they may have about the location of the structure or the construction process and to identify resolutions to those concerns. The right-of-way agent will also delineate the boundaries of easement area required for safe operation of the lines.

The Applicant has and will continue to work with the landowners to address their concerns, develop an easement agreement for the Applicant's purchase of land rights, and identify the least intrusive poll locations. The Applicant prepares all of the documents required to complete each transaction. Some of the documents that may be required include: easement, purchase agreement or contract, mortgage and lease/easement subordination and deed. As part of the development process, the Applicant has and will continue to discuss with the owner of each parcel the construction schedule and construction requirements.

4.4 TRANSMISSION AND SUBSTATION CONSTRUCTION PROCEDURES

4.4.1 TRANSMISSION CONSTRUCTION

General Construction

Construction will begin after applicable federal, state, and local approvals have been obtained, property and ROW are acquired, soil conditions are established, and final design is completed. The precise timing of construction will take into account various requirements that may be in place due to permit conditions, system loading issues, and the availability of workforce and materials.

The Applicant plans to engage an experienced contractor to construct and maintain the transmission line in conjunction with the construction and operation of the Prairie Rose Wind Farm.

The actual construction will follow industry best practices. These best practices address transmission specific practices such as ROW clearing, staging, erecting transmission line structures, and stringing transmission lines, as well as general construction best practices including stormwater pollution prevention planning. Construction and mitigation practices to minimize impacts will be developed based on the proposed schedule for activities, permit requirements, prohibitions, maintenance guidelines, inspection procedures, terrain, and other practices. In some cases these activities, such as schedules, are modified to minimize impacts to sensitive environments.

Transmission line structures are generally designed for installation at existing grades. Typically, structure sites with 10 percent or less slope will not be graded or leveled. Sites with more than 10 percent slope will have working areas graded level or have fill brought in for working pads. If the landowner permits, it is preferred to leave the leveled areas and working pads in place for use in future maintenance activities, if any. If permission is not obtained, the site will be graded back

to its original condition, as much as possible, and all imported fill would be removed from the site.

Typical construction equipment used on a project consists of tree removal equipment, mowers, cranes, backhoes, digger-derrick line trucks, track-mounted drill rigs, dump trucks, front end loaders, bucket trucks, bulldozers, flatbed tractor-trailers, flatbed trucks, pickup trucks, concrete trucks, and various trailers. Many types of excavation equipment are set on wheeled or track-driven vehicles. Poles are transported on tractor-trailers.

Staging areas are usually established for the project. In the case of the proposed Project, the staging area will likely be at least partially shared with the associated Prairie Rose Wind Farm. Staging involves delivering the equipment and materials necessary to construct the new transmission line facilities. Structures are delivered to staging areas, sorted, and loaded onto structure trailers for delivery to the staked location. The materials are stored until they are needed for the project. In some cases, additional space (temporary laydown areas) may be required. These areas will be selected for their location, access, security, and ability to efficiently and safely warehouse supplies. The areas are chosen to minimize excavation and grading. The temporary laydown areas outside of the transmission line ROW will be obtained from affected landowners through rental agreements. Insulators and other hardware are attached to the structure while it is on the ground in the laydown area.

When it is time to install the poles, structures are moved from the staging areas, delivered to the staked location and placed within the ROW until the structure is set. Typically, access to the transmission line ROW corridor is made directly from existing roads or trails that run parallel or perpendicular to the transmission line ROW. In some situations, private field roads or trails are used. Permission from the property owner is obtained prior to accessing the transmission line corridor. Where necessary to accommodate the heavy equipment used in construction (including cranes, concrete cement trucks, and hole-drilling equipment) existing access roads may be upgraded or new roads may be constructed. New temporary access roads or field approaches may also be constructed when no current access is available or the existing access is inadequate to cross roadway ditches.

To place direct-embedded single poles in the ground, the spoils are removed from the ground. Temporary casing may be required if the hole does not stay open during the excavation process. The pole is set and backfilled with crushed rock. The spoils will be removed from site unless other arrangements are made with the landowner. For concrete foundations, the excavation process will use temporary steel casing. Rebar, concrete, and anchor bolts will be placed in the hole. The standard projection is one foot above grade. At this time the Applicant anticipates the predominant method for securing the poles for the Project to be direct-embedment.

Construction in Environmentally Sensitive Areas

Environmentally sensitive areas may require special construction techniques in some circumstances. During construction, the most effective way to minimize impacts to water

courses, such as streams and rivers, as well as many other features, will be to span them. The Applicant will not allow construction equipment to be driven across waterways except under special circumstances and only after consultation with and obtaining necessary approvals from the appropriate resource agency. Where waterways must be crossed to pull in the new conductors and shield wires, workers may use boats, or walk across or drive equipment across ice in the winter.

If impacts to wetlands occur, they will be minimized through construction practices. Construction crews will maintain sound water and soil conservation practices during construction and operation of the facilities to protect topsoil and adjacent water resources and minimize soil erosion. Practices may include containing excavated material, protecting exposed soil, and stabilizing restored soil. Crews will avoid major disturbance of individual wetlands and drainage systems during construction. This will be accomplished by strategically locating new access roads and spanning wetlands and drainage systems where possible. When it is not feasible to span the wetland, construction crews will rely on several options to minimize construction impacts:

- When possible, construction will be scheduled during frozen ground conditions.
- Crews will attempt to access the wetland with the least amount of physical impact to the wetland (i.e., shortest route).
- Structures will be assembled on upland areas before they are brought to the site for installation.
- When construction during winter is not possible, construction mats will be used where wetlands would be impacted.

4.5 RESTORATION PROCEDURES

The ground will be disturbed during the normal course of work (as is typical of most construction projects), which can take several weeks in any one location. The Applicant will take the steps necessary to lessen the impact of the Project on the surrounding environment by restoring areas disturbed by construction. This will begin with a preconstruction survey that will identify areas requiring special restoration procedures. During construction, crews will attempt to limit ground disturbance wherever possible. As construction on each parcel of land is completed, disturbed areas will be restored to their original condition to the maximum extent practicable. The Applicant or its contractor will contact each property owner after construction is completed to identify and address any damage that may have occurred as a result of the construction of the Project. If damage has occurred to crops, fences, or the property, the Applicant will fairly compensate the landowner for the damages sustained. In some cases, the Applicant may engage an outside contractor to restore damaged property to its original condition to the extent practicable. Portions of vegetation that are disturbed or removed during construction of transmission lines will be reestablished to predisturbance conditions. Resilient

species of common grasses and shrubs typically reestablish naturally with few problems after disturbance. Areas with significant soil compaction and disturbance from construction activities along the Proposed Route will require assistance in reestablishing the vegetation stratum and controlling soil erosion. Commonly used methods to control soil erosion and assist in reestablishing vegetation include, but are not limited to:

- erosion control blankets with embedded seeds,
- silt fences,
- hay bales,
- hydro seeding, and
- planting individual seeds or seedlings of native species.

4.6 MAINTENANCE PROCEDURES

Transmission lines are designed to operate for decades and require only moderate maintenance, particularly in the first few years of operation. The estimated service life of the proposed transmission line for accounting purposes is approximately 40 years. However, practically speaking, high voltage transmission lines are seldom completely retired. The Applicant anticipates that the line could potentially provide wider utility than just interconnecting the Prairie Rose Wind Farm into the electrical grid, and would likely be more broadly integrated into the transmission system over time.

Transmission infrastructure has very few mechanical elements and rarely fails. It is built to withstand most weather extremes, with the exception of severe weather such as tornadoes and heavy ice storms. Transmission lines are automatically taken out of service by the operation of protective relaying equipment when a fault is sensed on the system. Such interruptions are usually only momentary. Scheduled maintenance outages are also infrequent. As a result, the average annual availability of transmission infrastructure is very high, in excess of 99 percent.

The principal operating and maintenance cost for transmission facilities is the cost of inspections, typically performed monthly by air. Annual operation and maintenance costs for 115 kV transmission lines in Minnesota and the surrounding states are expected to be approximately $300 to $500 per mile. Actual line-specific maintenance costs depend on the setting, the amount of vegetation management necessary, storm damage occurrences, structure types, materials used, and the age of the line.

The Applicant will perform inspections, maintain equipment, and make repairs over the life of the substation.

4.7 ELECTRIC AND MAGNETIC FIELDS AND STRAY VOLTAGE

This section discusses electromagnetic fields (EMF) and stray voltage with respect to the proposed Project. An Electric and Magnetic Field Report was completed for the proposed Project and is included in Appendix D.

The term EMF refers to electric and magnetic fields that arise from the electrical potential (voltage) and the movement of an electrical charge (current) associated with the transmission and use of electricity. Electric and magnetic fields are invisible just like radio, television, and cellular phone signals, all of which are part of the electromagnetic spectrum. The frequency of transmission line EMF in the United States is 60 hertz and falls in the extremely low frequency (ELF) range of the electromagnetic spectrum (any frequency below 300 hertz). For the lower frequencies associated with power lines, the electric and magnetic fields are typically evaluated separately. The intensity of the electric field is related to the voltage of the line, while the intensity of the magnetic field is related to the current flow along the conductors.

Concerns about health effects of EMF from power lines were first raised in the late 1970s. Since then, considerable research has been conducted to determine if exposure to magnetic fields, such as those from high-voltage power lines, causes biological responses and health effects. Initial epidemiological studies done in the late 1970s showed a weak correlation between surrogate indicators of magnetic field exposure (such as wiring codes or distance from roads) and increased rates of childhood leukemia. (Wertheimer et al., 1979). More recent studies that used direct measurements of magnetic field exposure show either a very weak, or no, statistical correlation with adverse health affects (Savitz, et al. 1988). Toxicological and laboratory studies have not been able to show a biological mechanism between EMF and cancer or other adverse health effects.

While there are numerous pieces of literature devoted to EMF dangers (whether from power lines, cell phones, or radio frequency signals), the vast majority of experts believe that EMF from power lines does not cause leukemia or any other health problem. In part, these experts argue the physical impossibility of any health effect due to such low-frequency, low-energy magnetic fields.

Natural and human-made electromagnetic fields are, in fact, present everywhere in our environment. Natural electric fields in the atmosphere range from background static levels 10 to 120 volts per meter (V/m) to well over several kilovolts per meter (kV/m) produced by the build-up of electric charges in thunderstorms. The earth has a magnetic field that ranges from approximately 300 to 700 milligauss (mG). In addition to the presence of the earth's steady state electric field, an average home experiences additional magnetic fields of 0.5 mG to 4 mG which arise from the general wiring and appliances located in a typical home (National Cancer Institute, 2009).

4.7.1 ELECTRIC FIELDS

Voltage on any wire (conductor) produces an electric field in the area surrounding the wire. The electric field associated with a high voltage transmission line extends from the energized single-circuit, bundled 795 ACSR conductors to other nearby objects such as the ground, towers, vegetation, buildings, and vehicles. The electric field from a power line gets weaker as it moves

away from the line. Nearby trees and building material also greatly reduce the strength of power line electric fields.

The intensity of electric fields is associated with the voltage of the line and is measured in kilovolts per meter (kV/m). Power line electric fields near ground are designated by the difference in voltage between two points (usually 1 meter). Table 4 provides the electric fields at maximum 795 ACSR conductor voltage for the proposed 115 kV transmission line. Maximum 795 ACSR conductor voltage is defined as the nominal voltage plus five percent.

The proposed single-circuit transmission line operated at 115 kV will have a maximum electric field density of 2.27 kV/m at the centerline of the ROW using a vertical configuration, and the 1.21 kV/m at the centerline of the ROW using a delta configuration. The values of these configurations are significantly less than the maximum electric field density limit of the 8 kV/m that has been a route permit condition imposed by the Commission. The Commission standard was designed to prevent serious hazard from shocks when touching large objects, such as tractors, parked under high voltage transmission lines.

Table 4. Calculated Electric Fields (kV/M)*

Structure Type	Voltage	Distance to Proposed Centerline												
		Left						Right						
		100'	50'	20'	15'	10'	5'	0'	5'	10'	15'	20'	50'	100'
Single-circuit Horizontal Line Post 115 kV Transmission Line (Delta Configuration)	115 kV	0.13	0.59	1.43	1.41	1.25	1.07	1.21	1.64	1.95	1.98**	1.77	0.44	0.10
Single-circuit Horizontal Line Post 115 kV Transmission Line (Vertical Configuration)	115 kV	0.08	0.07	0.95	1.35	1.79	2.14	2.27	2.11	1.73	1.29	0.89	0.07	0.08

** - Calculated Electric Fields (kV/m) for Proposed Transmission Line Designs at 3.28 feet above ground*

***- Maximum field strength in corridor*

4.7.2 MAGNETIC FIELDS

Magnetic fields are present around any electrical device, and can occur indoors and outdoors. Magnetic fields are the result of the flow of electricity or current that travels along transmission lines, distribution (feeder) lines, substation transformers, house wiring, and household electrical appliances. The intensity of a magnetic field is related to the current flow through the 795 ACSR conductors (wire).

Considerable research has been conducted throughout the past three decades to determine whether exposure to power-frequency (60 hertz) electric and magnetic fields causes biological responses and health effects. Epidemiological and toxicological studies have shown no statistically significant association or weak associations between EMF exposure and health risks.

In 1999, the National Institute of Environmental Health Sciences (NIEHS) issued its final report on "Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields" in response to the Energy Policy Act of 1992. NIEHS concluded that the scientific evidence linking EMF exposures with health risks is weak and that this finding does not warrant aggressive regulatory concern. However, because of the weak scientific evidence that supports some association between EMF and health effects, and the common exposure to electricity in the United States, passive regulatory action, such as providing public education on reducing exposures, is warranted.

Minnesota, California, and Wisconsin have all recently conducted literature reviews or research to examine this issue. In 2002, Minnesota formed an Interagency Working Group to evaluate the body of research and develop policy recommendations to protect the public health from any potential problems resulting from high voltage transmission line EMF effects. The Working Group consisted of staff from various state agencies. The Working Group published its findings in a White Paper on EMF Policy and Mitigation Options in September 2002 (Minnesota Department of Health, 2002). The findings of the Working Group are summarized below.

> Research on the health effects of EMF has been carried out since the 1970s. Epidemiological studies have mixed results—some have shown no statistically significant association between exposure to EMF and health effects, some have shown a weak association. More recently, laboratory studies have failed to show such an association, or to establish a biological mechanism for how magnetic fields may cause cancer. A number of scientific panels convened by national and international health agencies and the United States Congress have reviewed the research carried out to date. Most researchers concluded that there is insufficient evidence to prove an association between EMF and health effects; however, many of them also concluded that there is insufficient evidence to prove that EMF exposure is safe.

The Commission, and the Minnesota Environmental Quality Board (EQB) before them, addressed the matter of EMF with respect to new transmission lines in a number of separate dockets over the past few years. In the Lakefield Junction to Split Rock 345 kV line routing proceedings, Docket No. 03-73-TR-XCEL, for example, the EQB made the following findings with regard to EMF:

> No significant impacts on human health and safety are anticipated from the Project. There is at present insufficient evidence to demonstrate a cause and effect relationship between EMF exposure and any adverse health effects. The Commission and the EQB have not established limits on magnetic field exposure and there are no Federal or Minnesota health-based exposure standards for magnetic fields. There is uncertainty, however, concerning long term health impacts and the Minnesota Department of Health and the EQB all recommend a "prudent avoidance" policy in which exposure is minimized.

The EQB made similar findings in Docket No. 04-84-TR-XCEL (Buffalo to White 115 kV line) and 04-81-TR-Air Lake-Empire (115 kV line in Dakota County). Documents from those matters are available on the Commission webpage: www.energyfacilities.puc.state.mn.us.

The calculated average and peak magnetic fields, Magnetic Flux Density, for the proposed 115 kV transmission line and structure designs (3.28 feet above ground) are shown below in Table 5. The assumptions for the calculated magnetic flux includes a worst case scenario (or peak) megavolt amp (MVA) of 300. The average scenario assumes a MVA of 132, which is 44 percent of the maximum scenario. The expected magnetic field for the proposed structure type and phase current has been calculated at various distances from the center of the structure in milligauss (mG). The proposed single-circuit transmission line operated at 115 kV will have a calculated magnetic flux density of 211.34 mG (vertical configuration) and 254.54 mG (delta configuration) during peak flows at the centerline of the structure.

Because the magnetic field produced by the transmission line is dependent on the current flowing on its conductors, the actual magnetic field when the Project is in service would typically be less than that shown in the Table 5. This is because the calculations in the figures represent the magnetic field with current flow at expected normal system peak conditions. Actual current flow on the transmission line would vary as magnetic field changes throughout the day and would be less than peak levels during most hours of the year.

There are no anticipated impacts attributed to EMF from the project, therefore, mitigation would not be needed. However, magnetic field exposure is directly related to distance from the transmission line. In the route selection process the Applicant selected a route in part to avoid residences to the greatest possible extent. As a result of this selection EMF exposure has been reduced, thus following the prudent avoidance policy cited by the Department of Health and EQB.

Table 5. Calculated Magnetic Flux Density (Milligauss)*

Structure Type	System Conditions	Current (Amps)	Distance to Proposed Centerline												
			Left						Right						
			100'	50'	20'	15'	10'	5'	0'	5'	10'	15'	20'	50'	100'
Single-circuit Horizontal Line Post (Vertical Configuration)	Peak	1506	18.25	55.70	140.88	163.94	186.69	204.39	211.34	204.75	187.189	164.45	141.29	55.74	28.25
	Average	663	7.67	23.41	59.22	68.91	78.47	85.91	88.83	86.05	78.68	69.12	59.39	23.43	7.67
Single-circuit Horizontal Line Post (Delta Configuration)	Peak	1506	18.08	61.09	169.30	196.53	222.14	242.65	254.54	254.50	240.63	214.85	183.12	59.49	17.39
	Average	663	7.60	25.68	71.16	82.61	93.37	101.99	106.99	106.97	101.14	90.31	76.97	25.00	7.31

** Calculated Electric Fields (kV/m) for Proposed Transmission Line Designs at 3.28 feet above ground*

4.7.3 STRAY VOLTAGE

Stray voltage can occur with electrical distribution lines to residences and high voltage transmission lines that parallel them. Stray voltage flows through the ground between electrical systems that, by code, must be grounded (i.e. connected to the earth) to ensure safety. This voltage may be felt by animals standing on the ground. Due to this, stray voltage has been raised as a concern on dairy farms because of its potential to impact dairy cattle and milk production.

Impacts from stray voltage are typically related to improper grounding of electrical service to the farm (distribution lines) or on-farm electrical wiring. Transmission lines do not, by themselves, create stray voltage because they do not connect to businesses or residences. However, transmission lines can induce stray voltage on a distribution circuit that is parallel to and immediately under the transmission line.

Appropriate measures will be taken to prevent stray voltage problems when the transmission lines proposed in this Project parallel or cross distribution lines. The Applicant would be required to remedy any stray voltage issues as a condition of a route permit.

5.0 ENVIRONMENTAL INFORMATION

This section provides a description of the environmental setting, potential impacts, and mitigation measures. The Applicant has proposed, where necessary, to minimize the impacts of siting, construction and operation the proposed Project.

5.1 ENVIRONMENTAL SETTING

The Project is located in the Inner Coteau subsection of the Ecological Classification System (DNR, 2010). Subsection boundaries delineate a significant regional change in geology, topography, and vegetation. The Inner Coteau subsection consists of highly dissected moraines of pre-Wisconsin drift. Bedrock is overlain with glacial till and capped with wind-blown silt (loess) deposits. The Project vicinity has broad, undulating to rolling ridge tops and hilly to steep valley sides that are generally narrow (NRCS, 2009).

The topography along the proposed route is characterized by gentle to moderate slopes rising from the Split Rock Creek Valley near the Minnesota-South Dakota border, to a gentle ridge top near the eastern end of the proposed transmission line. Elevations range between approximately 1,500 feet and 1,730 feet above sea level.

As a result of settlement in the mid-1800s, the area along the proposed transmission route was converted from grassland into farmland. During this process, wetland and prairie areas were frequently cropped, ditched, and drained. Only a small fraction of the original prairie and wetlands remain as relic habitats. Presently, agricultural fields, farmsteads, and gently rolling topography visually dominate the Proposed Route; the landscape is classified as rural open space.

5.2 HUMAN SETTLEMENT

The Project is located in Rock County, Minnesota, which has a 2009 estimated population of 9,483 (U.S. Census Bureau). This estimate is 2.4 percent less than the 2000 Rock County population. The town of Jasper (est. 2000 pop. 597) is located approximately 4.5 miles to the north of the proposed route and the town of Hardwick (est. 2000 pop. 222) is approximately 6.5 miles to its east (U.S. Census Bureau, 2000). Other municipalities are located near the proposed transmission line in South Dakota, but these are not discussed within this Application, as they do not pertain to the Minnesota portion of the Proposed Route. Outside of these municipalities, human settlement is lightly dispersed across the landscape where farmsteads have been established, generally located along section lines.

5.2.1 PUBLIC HEALTH AND SAFETY

The Project will be designed in compliance with local, state, and NESC standards regarding clearance to ground, clearance to utilities, clearance to buildings, strength of materials, and ROW widths. The Applicant's contracted crews will comply with local, state, and NESC standards regarding installation of facilities and standard construction practices. When stringing wire across

roads and railroads, proper signage and guard structures will be used. Guard structures can be temporary wood poles with a cross arm or line trucks with their booms used to protect the lanes of traffic.

The proposed transmission line will be equipped with protective devices, such as breakers and relays, to safeguard the public from the transmission line if a fall or other accident occurs. Breakers and relays are located where the line connects to the substation, and will de-energize the line In the event of an emergency. In addition to protective devices, proper signage will be posted warning the public of the safety risks associated with the energized equipment.

Airport Flight Safety

No airports or airstrips are located within 5 miles of the Project. The closest private use airstrip is known as the Dykstra Acreage, located approximately 8 miles to the northeast in Trosky, Minnesota. The closest public use airport is the Pipestone Airport located approximately 15 miles northeast of the Project.

Impacts

There are no impacts to health and safety anticipated as a result of the project.

Mitigation Measures

Because measures to avoid and minimize potential impacts to public safety are incorporated into the Project design, no further mitigation measures are proposed to address human health and safety.

5.2.2 COMMERCIAL, INDUSTRIAL, AND RESIDENTIAL LAND USE, DISPLACEMENT

Land use in the vicinity of the Proposed Route is dominated by agriculture production, typically associated with open fields used for crop production or pastureland. Commercial and industrial land uses are not present along the Project. Residential development is restricted to farmsteads which are mostly located along section lines in the area. These farmsteads are often characterized by windbreaks of deciduous trees and shrubs.

Rock County, Minnesota, has adopted a comprehensive land use plan, under which the area in the vicinity of the Project is zoned as a general agricultural district. Additionally, shoreland and floodplain zoning districts are present along Split Rock Creek (Hartman, personal communication, February 3, 2010).

NESC standards require certain clearances between transmission line facilities and buildings for safe operation of the transmission line. The Applicant acquires a ROW for transmission lines that is sufficient to maintain these clearances. Displacement can occur when an existing structure is located within the ROW for a new transmission facility.

Fifteen homes were identified within one-half mile of the Proposed Route. Two of the homes are located within 100 feet and another two within 200 feet of the Proposed Route centerline. The location of these farmsteads and their proximity to the Project are shown in Figure 5.

Impacts

No displacement is anticipated as a result of this Project. It is anticipated that the addition of the Project will not constitute a change in the land use type.

Mitigation Measures

The Project will minimize the impacts to the existing and planned land use. To the extent practical, the Applicant will maximize distances to homes along the Proposed Route.

Because no displacement is anticipated, no mitigation measures are proposed.

5.2.3 NOISE

Transmission 795 ACSR conductors produce noise under certain conditions. There is no additional noise generated by the tap structures during normal operation. The level of noise depends on 795 ACSR conductor conditions, voltage level, and weather conditions. Generally, activity-related noise levels during the operation and maintenance of substations and transmission lines are minimal.

Noise emission from a transmission line occurs during certain weather conditions. In foggy, damp, or rainy weather, power lines can create a crackling sound due to the small amount of electricity ionizing the moist air near the wires. During heavy rain the background noise level of the rain is usually greater than the noise from the transmission line. As a result, people do not normally hear noise from a transmission line during heavy rain. During light rain, dense fog, snow, and other times when there is moisture in the air, transmission lines can produce noise. Noise levels produced by a 115 kV transmission line are generally less than outdoor background levels and are therefore not usually audible. At substations, a humming noise can be created primarily by transformers.

Because human hearing is not equally sensitive to all frequencies of sound, the most noticeable frequencies of sound are given more "weight" in most measurement schemes. The A-weighted scale corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA, which is the A-weighted sound level recorded in units of decibels. A noise level change of 3 dBA is barely perceptible to human hearing. A 5 dBA change in noise level, however, is clearly noticeable. A 10 dBA change in noise level is perceived as a doubling of noise loudness, while a 20 dBA change is considered a dramatic change in loudness. Table 6 below shows noise levels associated with common, everyday sources.

Table 6. Common Noise Sources and Levels

Sound Pressure Level (dBA)	Noise Source
140	Jet Engine (at 25 meters)
130	Jet Aircraft (at 100 meters)
120	Rock and Roll Concert
110	Pneumatic Chipper
100	Jointer/Planer
90	Chainsaw
80	Heavy Truck Traffic
70	Business Office
60	Conversational Speech
50	Library
40	Bedroom
30	Secluded Woods
20	Whisper

Source: A Guide to Noise Control in Minnesota, MPCA (revised, 1999), http://www.pca.state.mn.us/programs/pubs/noise.pdf.

Impacts

In Minnesota, statistical sound levels (L Level Descriptors) are used to evaluate noise levels and identify noise impacts. The L_{50} is the noise level exceeded 50 percent of the time, or for 30 minutes in an hour.

Land areas, such as picnic areas, churches, or commercial spaces, are assigned to an activity category based on the type of activities or use occurring in the area. Activity categories are then categorized based on their sensitivity to traffic noise. The Noise Area Classification (NAC) is listed in the Minnesota Pollution Control Agency's (MPCA) noise regulations to distinguish the categories.

Table 7 identifies the established daytime and nighttime noise standards by NAC. The standards are expressed as a range of permissible dBA within a one hour period; L_{50} is the dBA that may be exceeded 50 percent of the time within an hour, while L_{10} is the dBA that may be exceeded 10 percent of the time within the hour.

Table 7. MPCA Noise Standards by Noise Area Classification

Noise Area Classification	Daytime		Nighttime	
	L_{50}	L_{10}	L_{50}	L_{10}
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

All residences fall within NAC 1. The Project was modeled using the Bonneville Power Administration CFI8X model to evaluate audible noise from HVTLs. Where possible, the model was executed as a worst-case scenario benchmark, to ensure that noise was not under-predicted. The noise generated by the proposed transmission line is not expected to exceed approximately 8 dBA, which is significantly below the noise standards established for NAC 1, and below background levels. The Applicant does not anticipate the transmission line structure proposed for the Project would be audible at any receptor location under normal operating conditions (Table 8).

Table 8. Calculated Audible Noise – L_{50} (DBA)*

Structure Type	Voltage	Distance to Proposed Centerline										
		0'	10'	20'	30'	40'	50'	60'	70'	80'	90'	100'
Single-circuit Horizontal Line Post 115 kV Transmission Line	115 kV	7.4	7.2	6.6	5.8	5.0	4.3	3.6	2.9	2.3	1.8	1.3

** Calculated audible noise for proposed transmission line at 3.28 feet above ground. Audible noise prediction methods do not apply to all line geometries, voltages, or weather conditions.*

Mitigation Measures

Minimal impacts are anticipated. Therefore, no mitigation measures are proposed.

5.2.4 RADIO AND TELEVISION INTERFERENCE

Corona from transmission line 795 ACSR conductors can generate electromagnetic "noise" at the same frequencies that radio and television signals are transmitted. This noise can cause interference with the reception of these signals depending on the frequency and strength of the radio and television signal. Tightening loose hardware on the transmission line usually resolves this problem.

Impacts

AM radio frequency interference typically occurs immediately under a transmission line and dissipates rapidly within the ROW to either side. FM radio receivers usually do not pick up

interference from transmission lines because Corona-generated radio frequency noise currents decrease in magnitude with increasing frequency and are quite small in the FM broadcast band (88-108 Megahertz). Also, the excellent interference rejection properties inherent in FM radio systems make them virtually immune to amplitude type disturbances.

A two-way mobile radio located immediately adjacent to and behind a large metallic structure (such as a steel tower) may experience interference because of signal-blocking effects.

Television interference is rare but may occur when a large transmission structure is aligned between the receiver and a weak distant signal, creating a shadow effect. Loose and/or damaged hardware may also cause television interference.

A search of telecommunication tower locations within one mile of the Proposed Route identified three private land mobile towers and one microwave tower.

Mitigation Measures

If radio interference from transmission line corona does occur, satisfactory reception from AM radio stations presently providing good reception can be obtained by appropriate modification of (or addition to) the receiving antenna system. If radio or television interference occurs because of the transmission line, the Applicant will work with the affected landowner to address the problem so that reception is restored to pre-Project levels. Movement of either mobile unit so that the metallic structure is not immediately between the two units should restore communications. This would generally require a movement of less than 50 feet by the mobile unit adjacent to a metallic tower. If television or radio interference is caused by or from the operation of the proposed facilities in those areas where good reception is presently obtained, the Applicant will inspect and repair any loose or damaged hardware in the transmission line, or take other necessary action to restore reception to the pre-Project level, including the appropriate modification of receiving antenna systems if deemed necessary.

5.2.5 AESTHETICS

The topography in the Project vicinity is generally flat and the vegetation cover is uniformly low, making the high topography vulnerable to visual disruptions. The settlements in Rock County are residences and farm buildings (inhabited and uninhabited) scattered along rural county roads. These structures are focal points in the dominant open space character of the Project vicinity.

Impacts

Although the Proposed Route will result in an alteration of the current landscape, the Applicant will mitigate visual disruptions in the rural landscape by siting the route along existing roadway corridors. The combination of these two linear features (the Project and the road) minimizes impacts to the viewshed from homes to the greatest extent practicable.

Mitigation Measures

Although the Proposed Route will result in an alteration of the current landscape, the Applicant will mitigate visual disruptions in the rural landscape by siting the route along existing roadway corridors, thereby avoiding negative impacts to the viewsheds from homes to the greatest extent practical.

5.2.6 SOCIOECONOMIC

Population and economic characteristics based on the 2010 U.S. Census are presented in Table 9. Current U.S. Census data for Rose Dell Township was not available for comparison.

Table 9. Population and Economic Characteristics

Location	Population	Minority Population (Percent)	Caucasian Population (Percent)	Median Household Income*	Percentage of Population Below Poverty Level*
State of Minnesota	5,266,214	14.2	84.8	$57,318	9.6
Rock County	9,483	5.1	94.8	$48,104	9.0

Source: Minnesota Department of Employment and Economic Development, 2010 U.S. Census: General Demographic Characteristics.
**Data reported in 2008*

According to the 2010 Census demographics, Rock County is 94.8 percent Caucasian. Minority groups in the area constitute a very small percentage of the total population and are lower than what is reflected in the overall state.

Median household incomes in Rock County are approximately 16 percent lower than those reported for the State. Economic activities along the Proposed Route by and large consist of crop and livestock agriculture.

Approximately 8 to 10 workers will be required by Applicant for transmission line construction. The transmission crews are expected to spend approximately 13 weeks constructing the entire transmission line; only a quarter of that time will be spent constructing the portion of the line located in Minnesota. During construction, there will be a small positive impact on the community due to the expenditures of the construction crews in the local community.

There will be short-term impacts to community services as a result of construction activity and an influx of contractor employees during construction of the various projects. Utility personnel or contractors will be used for all construction activities. The communities near the Proposed Route will likely experience short-term positive economic impacts through the use of the hotels, restaurants, and other services by the various workers.

Impacts

It is not expected that additional permanent jobs will be created; however, this line would enable over 300 MW of wind energy conversion systems (wind turbines) to be installed for the Prairie Rose Wind Farm. This will have a significant economic impact, which is discussed in the Prairie Rose Wind Site Permit Application prepared by Prairie Rose Wind, and the Environmental Report prepared by the State of Minnesota Office of Energy Security

Specific beneficial impacts related to the line construction will provide a seasonal influx of additional dollars into the community during the construction phase. Materials, such as concrete, may be purchased from local vendors where feasible. Long-term beneficial impacts from the proposed transmission lines and local tax base will result from the incremental increase in revenues from utility property taxes.

Socioeconomic impacts resulting from the Project will be primarily positive with an influx of wages and expenditures made at local businesses during Project construction. Because the economic activity along the Proposed Route is predominately land based agricultural activities, and very little will be taken out of production, no impact to economic activities along the Proposed Route is anticipated.

Mitigation Measures

No impacts are anticipated and therefore no mitigation measures are proposed.

5.2.7 CULTURAL VALUES

Cultural values can be described as shared community beliefs or attitudes, among a given area or population, which provide a framework for that area's or population's commonality. The communities in the vicinity of the Proposed Route primarily have cultural values tied to rural agriculture, light industry, and recreation. Agriculture and farm-related businesses remain important to the regional economy. The area has a diversified agricultural mix of crops including corn, soybeans, hay, and livestock production. See Section 6.3.1 for a more detailed discussion of agricultural land use in the Project vicinity.

The Touch the Sky Unit of the Northern Tallgrass Prairie National Wildlife Refuge (NWR) and Blue Mound State Park are located 3 miles southeast and 7 miles southeast from the Project, respectively. These areas have been established to preserve tracts of remnant prairie, unique geological features, and cultural heritage. In particular, Touch the Sky Unit was established in partnership with the Brandenburg Prairie Foundation, a local conservation group, that demonstrates the high value many residents place on the conservation of remnant tallgrass prairie.

Impacts

No direct negative impacts are anticipated, as the project avoids Blue Mound State Park and the Touch the Sky Unit.

Mitigation Measures

Section 5.3.1 discusses agricultural mitigation which provides the detail on cultural values tied to rural agriculture.

5.2.8 RECREATION

No recreational facilities are located along the proposed route. The Buffalo Ridge Snowmobile Trail is located approximately 5 miles east of the Project. The Project will cross Split Rock Creek where possible recreational uses include fishing or canoeing; however, this creek is not designated as a state water trail.

Impacts

No direct impact to the identified recreational uses in the area is expected from the Project. The nearest point of the Project to the Buffalo Ridge Snowmobile Trail is approximately 4 miles. The Project will not likely be visible from that distance.

Mitigation Measures

Mitigation to recreational resources is not expected at this time. The Project will span Split Rock Creek, which will prevent conflicts resulting from the lines presence and the recreational uses within the creek.

5.2.9 PUBLIC SERVICES

Given the rural nature of the Proposed Route, public services are limited. The public road system in the area generally follows section lines and is managed by local and state agencies. The Rock County Rural Water District provides a centralized water distribution network for the rural residents of the county. Pipelines are generally co-located with road ROWs in the area. Rock County Heartland Express provides transportation services to residents with limited mobility across the county for a small fee.

Impacts

Impacts to public services are expected to be minimal, likely occurring during construction or during maintenance activities, and may temporarily disrupt service.

Mitigation Measures

Proper safety regulations and requirements will be followed along roadways, railroad, and existing utilities along the Proposed Route. The Applicant will work with MnDOT, Rock County, the relevant township(s), and the Rock County Rural Water District to coordinate any outages required when consolidating facilities.

The Applicant will work with MnDOT and the Rock County Highway Department to address potential temporary impacts associated with crossing State Highway 23 and with construction adjacent to County Highway 7 and Township Road 72.

5.3 LAND-BASED ECONOMICS

5.3.1 AGRICULTURE

Primary crops in the county are corn, grain, soybeans, oats, and hay. The agricultural land along the Proposed Route is predominantly planted in a rotation of corn, soybeans, and wheat. According to the 2009 Minnesota Agricultural Statistics Bulletin, 140,500 acres of corn were planted, 1,100 acres of oats were planted, and 112,000 acres of soybeans were planted in Rock County in 2008.

Impacts

Table 10 below summarizes the estimated temporary and permanent impacts to agricultural land by the proposed Project. Temporary impacts may include soil compaction and crop damages in the vicinity of each pole. The area calculated for temporary impact during construction assumes a 40-foot wide corridor spanning the length of the Proposed Route. Permanent impacts will occur due to the placement of the transmission line poles. The estimated permanent impacts from each pole foundation will be 19.6 square feet at the surface. The amount of poles for the proposed transmission lengths was calculated assuming 2 miles of the transmission line will be in the public ROW for the primary length and 1 mile for the alternate length.

Table 10. Temporary and Permanent Impacts

Project Length	Estimated # of Poles	Permanent Impacts	Temporary Impacts
7 miles (primary)	74	1,454 square feet (0.033 acres)	1,478,400 square feet (33.9 acres)
5.5 miles (alternate)	55	1,073 square feet (0.025 acres)	1,161,600 square feet (26.7 acres)

Mitigation Measures

The Applicant intends to place the poles as closely as feasible (approximately 2.5 feet) from the edge of the roadway ROW, and in some cases, within the road ROW to minimize loss of farmland and to ensure reasonable access to the land near the poles. The Applicant will work with landowners to identify appropriate locations for poles. The final spacing and location of poles will be done to accommodate the movement of farm equipment between and around their locations while still maintaining the safety and design standards. The Applicant has elected to provide wider spans than needed between the poles to minimize the number of poles. The Applicant will coordinate construction of the transmission line either before crops are planted or following harvest if possible. If this is not possible, the Applicant will compensate for any impact to crops including compaction that may result from the construction. Additionally, the Applicant will compensate for crop impacts resulting from the operation and maintenance of the Project.

5.3.2 FORESTRY

There is currently no data available for tree harvest areas along the Proposed Route. There are scattered areas of privately-owned wooded land which potentially could be affected by the line. Typical species associated with farmsteads that could be affected by the Proposed Route include eastern cottonwood, green ash, box elder, and American elm. For potential impacts to flora, please see Section 6.5.3.

Impacts

The Project may result in the removal or trimming of trees within and/or adjacent to the transmission line corridor to ensure the Proposed Route is clear of obstructions. Vegetation management is necessary for the safe operation of the transmission line; branches can cause stress and line outage risks, especially in areas with a strong wind resource which is typical of this area of the state.

Mitigation Measures

To the extent possible, the Applicant will try to minimize the need for trimming and removal of trees during construction and operation of the transmission line. Where trimming of trees is necessary, it will be performed by an arborist familiar with best practices for tree trimming, so as to minimize stress on the tree.

5.3.3 TOURISM

The Buffalo Ridge Snowmobile Trail, Blue Mound State Park, Split Rock Creek State Park, and Touch the Sky National Wildlife Refuge are the primary tourist attractions in the vicinity of the proposed route (DNR, 2008; DNR, 2010). Two small state Wildlife Management Areas are also in this vicinity. Table 11 below identifies the resource and miles from the centerline of the transmission line. The locations of these resources are also shown in Figure 6.

Table 11. Tourism Resources in the Vicinity of the Transmission Line

Resource	Distance from Project (miles)	Direction From Project
Buffalo Ridge Snowmobile Trail	4	E
Blue Mound State Park	7	SE
Split Rock Creek	7	N
Touch the Sky National Wildlife Refuge	3	SE

Impacts

These resources will not be impacted by the Project.

Mitigation Measures

No impacts are anticipated and therefore, no mitigation measures are proposed.

5.3.4 MINING

Mining resources in the vicinity of the Project include a mix of aggregate and bedrock mining. Active and inactive sand and gravel pits are scattered throughout this area. A thick belt of Sioux Quartzite covers this region and makes up the uppermost bedrock near the Proposed Route. Rock outcrops are present in areas throughout the county. The most productive portions of this belt extend from Jasper, Minnesota, southwest towards Sioux Falls, South Dakota. Sioux Quartzite is mined for a variety of uses which include silica, crushed rock for construction, and for monuments and similar purposes (SME, 2006).

According to the 2001 County Pit Map for Rock County, produced by MnDOT, there are two inactive gravel pits located more than 1 mile north of the Project. The closest rock quarry was identified approximately 5 miles northeast of the Project.

Impacts

These resources will not be impacted by the Project.

Mitigation Measures

No mitigation measures are proposed because the Project will not impact any mining operations.

5.4 ARCHAEOLOGICAL AND HISTORICAL RESOURCES

In February 2010 cultural resource records were reviewed at the State Historic Preservation Office (SHPO) to identify archaeological or architectural resources within 1 mile of the Proposed Route. The review identified no archaeological resources within 1 mile of the Proposed Route, but did identify two historic structures (RK-RSD-002 and RK-RSD-004). RK-RSD-002 and RK-RSD-004 are both bridges. RK-RSD-002 is listed on the National Register of Historic Places (NRHP) and RK-RSD-004 is not.

Impacts

The line will be built alongside County Highway 7 which decreases the likelihood that construction will affect significant archaeological or architectural resources. However, as with any project, construction of new facilities has the potential to disturb intact resources. Hence, areas related to construction should be reviewed.

As the Project is currently defined, no listed NRHP resource will be directly affected by the Project. However, RK-RSD-002 is located within a one-half mile of the Project Route and the Applicant will coordinate with SHPO to understand if the project action will have any impact on the listed resource.

The Proposed Route has not undergone formal systematic survey at the time of this Application and it is possible additional resources are present within the construction area. On September 9, 2009, SHPO responded to the Applicant with a letter (SHPO Number: 2009-3187) stating that due to the nature of a proposed wind energy project, the Applicant should complete an archaeological survey of the Proposed Route. The Applicant also received a letter from SHPO

on April 12, 2010 (SHPO Number: 2009-3187), stating that an archaeological survey of the Proposed Route is still applicable. This follow-up letter was sent by SHPO because on March 22, 2010, the Applicant sent an update letter to SHPO explaining that a 115 kV transmission line had been added to the Prairie Rose Wind Farm project. The Applicant will perform a survey of the Proposed Route to ensure resources are identified before construction.

Mitigation Measures

Two resources are located within 1 mile of the Proposed Route and it is possible that other resources exist within 1 mile of the Proposed Route. The Applicant will avoid impacts to identified resources to the extent possible. The Applicant will coordinate with SHPO concerning the possible indirect impact to resource RK-RSD-002 and will not exceed the weight limit of the bridge if it is needed to transport materials to the project location. The Applicant will also coordinate with SHPO concerning the surveying effort. Should a resource be identified that cannot be avoided, the Applicant will coordinate with SHPO on the nature of the impact and discuss treatment plans appropriate for the resource. Once the Applicant and SHPO understand the resource, define the impact, and have selected a treatment plan, further work as appropriate will be conducted on the resource. Treatment plans may include, but are not limited to, minimal impact measures, formal excavation, monitoring, or photo documentation.

5.5 NATURAL ENVIRONMENT

5.5.1 AIR QUALITY

Currently, both state and federal governments have regulations regarding permissible concentrations of ozone and oxides of nitrogen. The national standard is 0.08 parts per million (ppm) during an 8-hour averaging period. The state standard is 0.08 ppm based upon the fourth-highest 8-hour daily maximum average in one year.

Impacts

The only potential air emissions from a 115 kV transmission line result from corona and are limited. Corona consists of the breakdown or ionization of air in a few centimeters or less immediately surrounding 795 ACSR conductors, and can produce ozone and oxides of nitrogen in the air surrounding the 795 ACSR conductor. For a 115 kV transmission line operated at 69 kV or 115 kV, the 795 ACSR conductor gradient surface is usually below the air breakdown level. Typically, some imperfection, such as a scratch on the 795 ACSR conductor or a water droplet, is necessary to cause corona. Ozone is not only produced by corona, but also forms naturally in the lower atmosphere from lightning discharges and from reactions between solar ultraviolet radiation and air pollutants such as hydrocarbons from auto emissions. The natural production rate of ozone is directly proportional to temperature and sunlight and inversely proportional to humidity. Thus, humidity (or moisture), the same factor that increases corona discharges from transmission lines, inhibits the production of ozone. Ozone is a very reactive form of oxygen and combines readily with other elements and compounds in the atmosphere.

Because of its reactivity, it is relatively short-lived. The area near the Proposed Route presently meets all federal air quality standards.

During construction of the Project and substation, there will be limited emissions from vehicles and other construction equipment and fugitive dust from ROW clearing. Temporary air quality impacts caused by construction-related emissions are expected to occur during this phase of activity.

The magnitude of the construction emissions is influenced heavily by weather conditions and the specific construction activity occurring. Exhaust emissions, primarily from diesel equipment, will vary according to the phase of construction, but will be minimal and temporary. Adverse impacts to the surrounding environment will be minimal because of the short and intermittent nature of the emission and dust-producing construction phases.

Mitigation Measures

According to the Applicant, Best Management Practices (BMPs) will be used to minimize or avoid temporary impacts from fugitive dust and other construction-related emissions. These BMPs may include the following practices:

- Oil and other petroleum derivatives will not be used for dust control. Speed limits will be enforced, based on road conditions, to reduce dust problems.
- Equipment and vehicles that show excessive emissions of exhaust gases due to poor engine adjustments, or other inefficient operating conditions, will not be operated until repairs or adjustments are made.
- Burning or burying waste materials in the ROW will not be permitted and all waste materials shall be disposed at permitted waste disposal areas or landfills.
- The emission of dust into the atmosphere during construction will be minimized to the extent practical during the manufacturing, handling, and storage of concrete aggregate. Methods and equipment will be used as necessary for the collection and disposal or prevention of dust during these operations. The methods of storing and handling cement and cement additives will also include means of minimizing atmospheric discharges of dust.

5.5.2 WATER QUALITY

Split Rock Creek is the only named, perennial wet waterway located along the Proposed Route and is identified in the Public Waters Inventory (PWI). This creek generally flows southwest and is crossed by the route, approximately three-fourths of a mile east of the state border. An unnamed, intermittent PWI stream is also crossed approximately 750 feet west of the intersection between County Road 7 and Township Road 106. Five additional, unnamed non-PWI streams are located along the route, which are included in the MnDOT 24k Streams database.

The emergent and riverine National Wetlands Inventory (NWI) identified wetlands along the Proposed Route are largely associated with Split Rock Creek. The Proposed Route does not contain mapped 100-year floodplain (FEMA, 1988), although a floodplain likely exists along Split Rock Creek. The Rock County Zoning Administration has established a floodplain zone in this area (Hartman, personal communication, February 3, 2010). No DNR PWI basins are located along the Proposed Route.

Impacts

Surface waters may be impacted from ground disturbing activities such as excavation, grading, and construction traffic associated with construction. These activities may generate stormwater which could impact surface water quality.

Mitigation Measures

The Applicant will follow standard erosion control measures identified in the MPCA's Stormwater Best Management Practices Manual, such as using silt fencing to minimize impacts to adjacent water resources. A license to cross public waters will be required for the Project. During construction, the Applicant will control construction operations to prevent materials from falling into the water. If material does enter a stream, the material will promptly be removed and disposed of properly.

During construction there is the possibility of sediment reaching surface waters as the ground is disturbed by excavation, grading, and construction traffic. Once the Project is complete it will have no impact on surface water quality. The Applicant will minimize impacts to public waters and public water wetlands to the extent possible. Wetland impacts will be avoided by placing poles in adjacent uplands and spanning the wetlands.

5.5.3 FLORA

The flora along the Proposed Route is primarily agricultural or associated with remnant grasslands in the area. Agricultural landscapes are dominated by mono-typic plots of corn, soy, or oats. For a discussion on impacts to agriculture, please see Section 5.3.1. Remnant grasslands along the route are typically present because surficial bedrock is too close to the soil surface to allow for tilling. These areas are dominated by native and non-native grasses, and some have been identified by the Minnesota County Biological Survey (MCBS) as having moderate or high biodiversity significance. This is often due to the rare communities which can congregate where surficial bedrock forms shallow pools, to create mini-ecosystems. These mini-ecosystems often host state-listed threatened or endangered plant species (DNR, 2010).

Common woodland species along the Proposed Route are Eastern cottonwood (*Populus deltoides*), white ash (*Fraxinus americanai*), and elm (*Ulmus spp*). Typical primary vegetation in emergent wetlands consists of reed canarygrass (*Phalaris arundinacea*), cattails (*Typpha spp.*), bulrush (*Scirpus spp.*), and other wetland vegetation, such as arrowhead (*Saggitaria spp.*) and smartweed (*Polygonum spp.*)

Impacts

The Project will result in temporary and permanent impacts to vegetation along the Proposed Route. Remnant grasslands and MCBS areas have been identified in the area and have the potential to be impacted.

Mitigation Measures

To minimize impacts to remnant prairie and/or state-listed species, the road edge with lower biological significance will be followed. Impacts to these areas (MCBS sites ranked as moderate or high) will be spanned, and avoided during construction. The Applicant will only remove trees located in the ROW for the transmission line. Trees outside the ROW that would need to be removed include trees that are leaning and could potentially fall into the transmission facilities.

5.5.4 FAUNA

There is a potential for temporary displacement of wildlife during construction and the loss of small amounts of habitat from the Project. Wildlife that inhabit trees that would be removed for the Project and organisms that inhabit grassland areas or agricultural areas will likely be displaced. Comparable habitat is adjacent to the Proposed Route for all habitat types, and it is likely that these organisms would only be displaced a short distance. A list of common mammal, avian, amphibian, and reptile species in the Proposed Route is included as Appendix D.

Fallow farm fields, fencerows, and woodlots in cultivated areas also provide cover for organisms within the Proposed Route.

Raptors, waterfowl, and other bird species may be affected by the construction and placement of the transmission lines. Avian collisions are a possibility after the completion of the transmission line in areas where there are agricultural fields that serve as feeding areas, wetlands, and open water. Electrocution is commonly a concern with electrical facilities. The electrocution of large birds, such as raptors, is more commonly associated with distribution lines. Electrocution occurs when birds with large wingspans come in contact with two 795 ACSR conductors or a 795 ACSR conductor and a grounding device. The Applicant's transmission line design standards provide adequate spacing to eliminate the risk of raptor electrocution, so there are few concerns about avian electrocution as a result of the Project.

Impacts

There is a potential for temporary displacement of wildlife due to the proposed construction. Permanent impacts to wildlife habitat are expected to be minimal due to the small amount of habitat that would be permanently removed for the Project.

Mitigation Measures

Displacement of fauna is anticipated to be temporary. No long term population-level effects are anticipated; therefore, no mitigation is proposed.

The Applicant has been working with various state and federal agencies to address avian issues.

In cooperation with MnDNR and the U.S. Fish and Wildlife Service (USFWS), the Applicant will identify areas where installation of flight diverters (FD) on the shield wire may be warranted. In most cases, the shield wire of an overhead transmission line is the most difficult part of the structure for a bird to see. Utilities have had success in reducing collisions on transmission lines by marking the shield wires with FDs. FDs are preformed, spiral shaped devices made of polyvinyl chloride that are wrapped around the shield wire and are designed to increase its visibility. In its April 21, 2010, letter to the Applicant, the USFWS recommended that flight diverters be installed at the Split Rock Creek crossing and where the line crosses a grassland area in Sections 28, 29, 32 and 33.

5.5.5 RARE AND UNIQUE NATURAL RESOURCES

The USFWS lists three threatened or endangered species that occur within Rock County: Topeka shiner (*Notropis topeka*), Prairie bush clover (*Lespedeza leptostachya*), and the Western prairie fringed orchid (*Platanthera praeclara*). There is also listed critical habitat in Rock County for the Topeka shiner. While records indicate that all of these species are present in the area, the closest (Topeka shiner) is located approximately 1 mile to the north.

The DNR was contacted to obtain identified known occurrences of rare and unique resources that would be affected by the Project. The DNR identified these records in a correspondence to GWE identified as Rock County Correspondence #20090193. In follow-up letter, dated April 30, 2010, DNR staff stated that due occurrences of state-listed species in the project vicinity, DNR should be consulted once final alignments have been developed to ensure sensitive resources are avoided (Appendix E).

Impacts

The USFWS submitted a letter (FWS TAILS # 32410-2009-FA-0117), dated April 21, 2010, regarding impacts of the Prairie Rose Wind Farm. The letter included concerns regarding compliance with the Migratory Bird Treaty Act and the placement of turbines within one-half mile of federally held conservation easements. The letter also stated that because the proposed wind farm is within one-half mile of Touch the Sky the USFWS requested avian surveys be conducted in these areas. This application is for the transmission line project associated with the wind farm. The transmission line route is 3 miles away from the Touch the Sky NWR. The Applicant will work with the USFWS to ensure that any additional concerns raised by the USFWS are incorporated into the Project.

The DNR identified one record of a state endangered vascular plant is located within the 400-foot-wide route, although no known occurrences of any listed species are within the preferred ROW. Several additional state-listed species observations are located in the vicinity of the HVTL, most of which are vascular plants. These occurrences are generally located in habitats identified by the MCBS Identified rare and natural features described in this section are shown in Figure 7.

Mitigation Measures

Where practicable, the Proposed Route would avoid areas having moderate or high biological significance (MCBS) by locating the transmission line on the opposite side of county and township roads where these sensitive areas are present. If the Proposed Route must cross a moderate or high biological significance MCBS site or known occurrence of listed species, the sensitive areas will be avoided during construction and spanned to eliminate any permanent impacts. No additional specific mitigation measures are proposed.

6.0 AGENCY INVOLVEMENT, PUBLIC PARTICIPATION AND REQUIRED PERMITS AND APPROVALS

6.1 AGENCY CONTACTS

6.1.1 U.S. FISH AND WILDLIFE SERVICE

The USFWS was contacted on March 10, 2010 to review the Proposed Route for federally threatened and endangered species. In the USFWS's response dated April 21, 2010, the Service noted that there are records of the federally endangered Topeka shiner (*Notropis topeka*) in streams within the project vicinity, and listed precautions that should be taken to avoid impacts to this species during construction. The Service must be notified when any type of site preparation, construction, or land clearing will take place within 300 feet of a Critical Habitat stream. The Service also recommended that bird diverters be placed on the transmission line where it crosses Split Rock Creek and where it will cross a grassland area in Sections 28, 29, 32 and 33 in Township 104N, Range 46W.

6.1.2 U.S. ARMY CORPS OF ENGINEERS

The U.S. Army Corps of Engineers (USACE) was contacted on August 6, 2009, to comment on the proposed wind farm and transmission line. In the USACE's response dated August 27, 2009, they described activities that are subject to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Waters Act. A second letter was sent to the USACE on March 8, 2011 requesting comment on the updated wind farm boundary and 115kV transmission line; no response has yet been received.

6.1.3 MINNESOTA DEPARTMENT OF NATURAL RESOURCES

The DNR Natural Heritage and Non-game Research Program was contacted on March 10, 2010, to review the Proposed Route for state-threatened and endangered species and rare natural features. In the DNR's response, dated April 30, 2010, DNR concurred that, based on review, there are occurrences of rare species or native plant communities in the project vicinity. (A full list of Special Concern and Threatened and Endangered species is included in Appendix E): Species listed by the State of Minnesota as threatened or endangered in the project vicinity are

- Blanding's turtle (*Emydoidea blandingii*)
- Burrowing owl (*Athene cunicularia*)
- Pigmy weed (*Crassula aquatic*)
- Short-pointed umbrella-sedge (*Cyperus acuminatus*)
- Mud plantain (*Heteranthera limosa*)
- Blackfoot quillwort (*Isoetes melanopoda*)
- Hairy water clover (*Marsilea vestita*)
- Slender plantain (*Plantago elongate*)
- Western prairie fringed orchid (*Platanthera praeclara*)

The DNR expressed concern regarding impacts to areas identified in the Minnesota County Biological Survey, lands enrolled in the Conservation Reserve Program, and impacts to wetlands and waterways. Appropriate design considerations and permits will have to be acquired when working in these areas. The Applicant will span sensitive areas wherever practicable.

Two other responses from the DNR Ecological Services Division were received, the first on August 3, 2009, and the second on April 30, 2010, which reiterated many of the concerns identified in the Natural Heritage Information Service (NHIS) letter, and expressed interest in providing additional site specific comment once the wind farm and transmission line locations are determined.

6.1.4 MINNESOTA DEPARTMENT OF TRANSPORTATION

MnDOT provided a letter of comment on the draft site permit for the Prairie Rose Wind Farm on August 17, 2010. In its letter, MnDOT noted its policy for accommodating the placement of utilities in public road ROW, but expressed uncertainty whether the Applicant qualifies as an entity that qualifies to do so. MnDOT also reiterated that the Applicant must obtain relevant permits from all road authorities to transport oversized load and materials over public roads or to use public road ROW.

6.1.5 MINNESOTA POLLUTION CONTROL AGENCY

The MPCA sent a letter on February 16, 2010, regarding the certificate of need for the Project. The MPCA noted that Split Rock Creek is listed as impaired water and therefore construction in the vicinity of this water will require additional stormwater treatment measures during construction and increased permanent treatment postconstruction.

6.1.6 MINNESOTA SHPO

In response to an August 4, 2009, letter to SHPO requesting comments on the proposed wind farm, the Applicant received a September 9, 2009, reply (SHPO Number: 2009-3187) stating that due to the nature of a proposed wind energy project, the Applicant should complete an archaeological survey of the wind farm project area. When the wind farm project boundary was expanded, a second letter was sent to SHPO on March 22, 2010, to explain the boundary expansion and to request comment on the proposed transmission line. The Applicant received a reply on April 12, 2010, (SHPO Number: 2009-3187), stating that an archaeological survey of the Proposed Route is still applicable.

6.1.7 ROCK COUNTY

Acting on behalf of the Prairie Rose Wind and Transmission projects, GWE has frequently met with Rock County Commissioners and staff over the past two years to discuss the wind farm and transmission projects, identify concerns, and to inform the community on the plans. GWE has appeared before the board at least five separate times.

6.1.8 SOUTHWEST REGIONAL DEVELOPMENT COMMISSION

The applicant received a project review from the Southwest Regional Development Commission (SWRDC) on September 9, 2010. The Commission noted that the project is located within the Casey Jones Trail Corridor, per Minnesota Statute 85.015. Although this trail has not yet been developed and therefore no setbacks can be identified, the SWRDC encourages the Applicant to coordinate with the DNR as the trail is developed and the wind farm project expanded.

6.2 IDENTIFICATION OF LAND OWNERS

A list of all the landowners is in Appendix G. There are 14 residences along the Proposed Route.

6.3 PUBLIC PARTICIPATION

Acting on behalf of Prairie Rose Transmission, GWE held an open house prior to identifying a final Proposed Route and developing this Application. The purpose of this meeting was to inform landowners and public officials of the Project and solicit input to be used in route selection. A discussion of these meetings follows.

The meeting was held on December 2, 2009, at the American Legion in the city of Garretson, South Dakota, to inform landowners in the area of the Project and to gather input early in the route selection process. The city of Garretson was selected because of its accessibility and because a significant portion of the line is in South Dakota. The maps presented at the first public meeting showed the general project area, existing transmission line facilities, and substation locations. Approximately 40 landowners and interested persons attended the meeting and discussed the project with company representatives.

6.4 REQUIRED PERMITS AND APPROVALS

The table below summarizes the potential required permits for the Project.

Table 12. Potential Required Permits

Permit	Jurisdiction
Federal Approvals	
Section 404 Clean Water Act	U.S. Army Corps of Engineers
Farmland Conversion Form AD-1006	U.S. Department of Agriculture
State of Minnesota Approvals	
License to Cross Public Waters	MnDNR Division of Lands and Minerals
Application for utility permit (long form)	MnDOT
National Pollutant Discharge Elimination System	Minnesota Pollution Control Agency
Local Approvals	
Road Crossing Permits	County, Township, City
Lands Permits	County, Township, City
Over-width Loads Permits	County, Township, City
Driveway/Access Permits	County, Township, City

6.4.1 FEDERAL PERMITS

Section 404 Clean Water Act

USACE has jurisdiction over waters of the U.S. under authority of Section 404 of the Clean Water Act. Any filling, dredging, or excavation within regulated waters or wetlands must have the USACE approval, either under general or individual permits. No impacts to regulated waters are anticipated, but the Applicant will notify USACE and apply for a permit if impacts cannot be avoided by spanning wetlands/waters.

Farmland Conversion Form AD-1006

Farmland Protection Policy Act (FPPA)—Subtitle I of Title XV, Section 1539-1549 is intended to minimize the conversion of farmland to nonagricultural uses. The Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture oversees the protection of this act if proposed activities fall under the FPPA requirements. If applicable, the applicant will coordinate with the NRCS for this permit.

6.4.2 STATE OF MINNESOTA PERMITS

In addition to the Certificate of Need and Route Permit sought by this Application, the Project will also potentially require the state permits identified above in Table 12.

License to Cross Public Waters

The MnDNR Division of Lands and Minerals regulates utility crossings on, over, or under any state land or public water identified on the Public Waters and Wetlands Maps. A license to cross public waters is required under Minnesota Statutes Section 84.415 and Minnesota Rules, Chapter

6135. The Applicant works closely with the MnDNR on these permits and will file for them once the line design is complete.

Minnesota Department of Transportation

MnDOT requires the Application for Utility Permit on County Highways Right-of-Way form for the majority of utility placements and relocations. Utility owners use this form to request permission to place, construct, and reconstruct utilities within trunk highway ROW, whether longitudinal, oblique, or perpendicular to the centerline of the highway.

National Pollutant Discharge Elimination System

The MPCA oversees the National Pollutant Discharge Elimination System (NPDES) program in Minnesota, which regulates stormwater discharges from construction activities that result in grading of more than 1 acre of land. Prior to construction, the Applicant will develop a Stormwater Pollution Prevention Plan (SWPPP) that will outline the specific commitments to meet the conditions of the NPDES permit.

6.4.3 LOCAL PERMITS

Once the Commission issues a route permit, zoning, building and land use regulations and rules are preempted per Minnesota Statutes Section 216E.10, subdivision 1. Therefore no local construction permits will be required. Below is a summary of potential local required permits.

Road Crossing Permits

These permits may be required to cross or occupy county, township, and city road ROW.

Lands Permits

These permits may be required to occupy county, township, and city lands such as park lands, watershed districts, and other properties owned by these entities.

Over-Width Loads Permits

These permits may be required to move over-width loads on county, township, or city roads.

Driveway/Access Permits

These permits may be required to construct access roads or driveways from county, township, or city roadways.

7.0 ACRONYMS

Following are a list of acronyms used in this Application.

Table 13. List of Acronyms

Acronym	Meaning
ACSR	Aluminum Conductor Steel Reinforced
APP	Avian Protection Plans
CSAH	County State Aid Highway
dBA	A-Weighted Decibel
EHS	Extra High Strength
EQB	Environmental Quality Board
FD	Flight Diverter
GWE	Geronimo Wind Energy, LLC
HVTL	High Voltage Transmission Line
kcmil	Thousand Circular Mils
kV/m	Kilovolts Per Meter
mG	Milligauss
MnDNR	Minnesota Department of Natural Resources
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MPUC	Minnesota Public Utilities Commission
MVA	Megavolt-Ampere
NAC	Noise Area Classification
NESC	National Electric Safety Code
NIEHS	National Institute of Environmental Health Sciences
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWA	National Wildlife Refuge
ppm	Parts Per Million
PWI	Public Waters Inventory
ROW	Right-Of-Way
SHPO	State Historic Preservation Office
SWRDC	Southwest Regional Development Commission
SWPPP	Stormwater Pollution Prevention Plan
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

8.0 REFERENCES

Federal Emergency Management Agency (FEMA). 1988. Flood Hazard Boundary Map H – 01-28 Rock County, MN. Accessed 02/02/10. http://www.msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1

Hartman, E. 2010. Rock County Zoning Administrator. Personal Communication, 02/03/10.

Minnesota Department of Agriculture. 2009. 2009 Minnesota Agricultural Statistics. http://www.leg.state.mn.us/docs/2009/other/091063.pdf

Minnesota Department of Natural Resources (DNR). 2008. Minnesota Snowmobile Trails. Minnesota Department of Natural Resources: Division of Trails and Waters

Minnesota Pollution Control Agency (MPCA). A Guide to Noise Control in Minnesota, MPCA (revised, 1999), *http://www.pca.state.mn.us/programs/pubs/noise.pdf.*

DNR. 2010. The Minnesota Department of Natural Resources Web Site (online). Accessed 2010-2-2 at http://www.dnr.state.mn.us/sitetools/copyright.htmlNRCS. 2009. Major Land Resource Regions Custom Report. Data Source: USDA Agriculture Handbook 296 (2006). Retrieved July 20, 2009. http://www.cei.psu.edu/mlra/

Society for Mining, Metallurgy, and Exploration (SME). 2006. Industrial minerals & Rocks: commodities, markets, and uses. 7th edition.

U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, Census of Population and Housing, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits, Consolidated Federal Funds Report. Last Revised: Tuesday, 17-Nov-2009 12:17:23 EST.

Wertheimer, N. Leeper, E. Electrical wiring configurations and childhood cancer. 1979. Am J Epidermiol. Mar, 109(3):279-84.

9.0 DEFINITIONS

Avian	Of or relating to birds.
Breaker	Device for opening a circuit
Conductor	A material or object that permits an electric current to flow easily.
Corona	The breakdown or ionization of air in a few centimeters or less immediately surrounding conductors.
Excavation	A cavity formed by cutting, digging, or scooping.
Fauna	The collective animals of any place or time that live in mutual association.
Flora	The collective plants of any place or time that live in mutual association.
Grading	To level off to a smooth horizontal or sloping surface.
Grounding	To connect electrically with a ground.
Habitat	The place or environment where a plant or animal naturally or normally lives and grows.
High Voltage Transmission Lines (HVTL)	Overhead and underground conducting lines of either copper or aluminum used to transmit electric power over relatively long distances, usually from a central generating station to main substations. They are also used for electric power transmission from one central station to another for load sharing. High voltage transmission lines typically have a voltage of 115 kV or more.
Hydrocarbons	Compounds that contain carbon and hydrogen, found in fossil fuels.
Ionization	Removal of an electron from an atom or molecule.
Mitigate	To lessen the severity of or alleviate the effects of.
Oxide	A compound of oxygen with one other more positive element or radical.
Ozone	A very reactive form of oxygen that combines readily with other elements and compounds in the atmosphere.
Raptor	A member of the order *Falconiformes*, which contains the diurnal birds of prey, such as the hawks, harriers, eagles, and falcons.
Sediment	Material deposited by water, wind, or glaciers.

Stray Voltage	A condition that can occur on the electric service entrances to structures from distribution lines. Stray voltage is a voltage that exists between the neutral wire of the service entrance and grounded objects in buildings such as barns and milking parlors.
Substation	A substation is a high voltage electric system facility. It is used to switch generators, equipment, and circuits or lines in and out of a system. It also is used to change AC voltages from one level to another. Some substations are small with little more than a transformer and associated switches. Others are very large with several transformers and dozens of switches and other equipment.
Voltage	A unit of electrical pressure, electric potential or potential difference expressed in volts.
Waterfowl	A bird that frequents water; especially: a swimming game bird (as a duck or goose) as distinguished from an upland game bird or shorebird.
Wetland	Wetlands are areas that are periodically or permanently inundated by surface or ground water and support vegetation adapted for life in saturated soil. Wetlands include swamps, marshes, bogs, and similar areas.

Appendix A
Certificate of Need Notice of Application Acceptance

Appendix B-
Notice to PUC of Intent to File Application under Alternative Permitting Process

Appendix C
Figures

Appendix D
Electric and Magnetic Field Report

Appendix E
List of Common Mammal, Avian, and Amphibian and Reptile Species

Appendix F
Agency Correspondence

Appendix G
Landowner List