GREAT RIVER ENERGY

APPLICATION TO THE
MINNESOTA PUBLIC UTILITIES COMMISSION
FOR A ROUTE PERMIT

BULL MOOSE 115 KV PROJECT

DOCKET NO.
ET2/TL-15-628

August 7, 2015

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LIST OF ACRONYMS

ACRONYMS	
ACSR	Aluminum Conductor Steel Reinforced
ALJ	Administrative Law Judge
BMPs	Best Management Practices
BPA	Bonneville Power Administration
Commission	Minnesota Public Utilities Commission
dBA	Decibel – A weighted
DC	Direct Current
DNR	Minnesota Department of Natural Resources
EA	Environmental Assessment
EERA	Energy Environmental Review and Analysis
EF	Electric Fields
ELF	Extremely Low Frequency
EMF	Electromagnetic Fields
Enbridge	Enbridge Energy
EPA	United States Environmental Protection Agency
EQB	Minnesota Environmental Quality Board
G	Gauss
HVTL	High Voltage Transmission Line
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IEEE	Institute of Electrical and Electronic Engineers
IMDs	Implantable Medical Devices
kV	Kilovolt
kV/m	Kilovolts Per Meter
L3R	Line 3 Replacement
mA rms	MilliAmperes Root Mean Square
MF	Magnetic Fields
mG	Milligauss
MHS	Minnesota Historical Society
MISO	Midcontinent Independent System Operator
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MRO	Midwest Reliability Organization
MW	Megawatt
NAC	Noise Area Classifications
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NHIS	Natural Heritage Inventory System
NIEHS	National Institute of Environmental Health Sciences
NLEB	Northern Long-eared Bat
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory

ACRONYMS	
Project	Bull Moose 115 kV Project
PWI	Public Waters Inventory
ROW	Right-of-Way
SHPO	State Historic Preservation Office
SWPPP	Stormwater Pollution Prevention Plan
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
WHO	World Health Organization

Route Permit Application – Alternative Process Completeness Checklist

Authority	Required Information	Location in Application
Minn. Stat. § 216E.04, subd. 2(3)	**Alternative Review of Applications**. Alternative review is available for high voltage transmission lines of between 100 and 200 kV	§ 2.1
Minn. Stat. § 216E.04, subd. 4; Minn. R. 7850.2800, Subp. 1(C)	Subpart 1. **Eligible Projects**. An applicant for a site permit or a route permit for one of the following projects may elect to follow the procedures of parts 7850.2800 to 7850.3900 instead of the full permitting procedures in parts 7850.1700 to 7850.2700: **high voltage transmission lines of between 100 and 200 kV**	Appendix A
Minn. R. 7850.2800, Subp. 2.	Subpart 2. **Notice to PUC**. An applicant for a permit for one of the qualifying projects in subpart 1, who intends to follow the procedures of parts 7850.2800 to 7850.3700, shall notify the PUC of such intent, in writing, at least ten days before submitting an application for the project	Appendix A
Minn. R. 7850.3100	**Contents of Application** (alternative permitting process) The applicant shall include in the application the same information required in part 7850.1900, except the applicant need not propose any alternative sites or routes to the preferred site or route. If the applicant has rejected alternative sites or routes, the applicant shall include in the application the identity of the rejected sites or routes and an explanation of the reasons for rejecting them	This document.
Minn. R. 7850.1900, Subp. 2 (applicable per Minn. R. 7850.3100)	**Route Permit for HVTL** A. a statement of proposed ownership of the facility at the time of filing the application and after commercial operation	§ 3.1
	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	§ 3.1
	C. rejected alternative routes and the reasons for rejecting	§ 5.2
	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	§ 4.1; 4.2
	E. the environmental information required under 7850.1900, Subp. 3	Chapter 7
	F. identification of land uses and environmental conditions along the proposed routes	§§ 7.3; Chapter 7
	G. the names of each owner whose property is within any of the proposed routes for the high voltage transmission line	Appendix C
	H. United States Geological Survey topographical maps or other maps acceptable to the chair showing the entire length of the high voltage transmission line on all proposed routes	Figure 1-2; Appendix B

Authority	Required Information	Location in Application
	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 with the proposed line	§ 6.3
	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	§§ 4.2; 6.8
	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	§ 4.3
	L. a description of possible design options to accommodate expansion of the high voltage transmission line in the future	§ 6.2
	M. the procedures and practices proposed for the acquisition and restoration of the right-of-way, construction, and maintenance of the high voltage transmission line	§§ 6.4; 6.5; 6.6; 6.7
	N. a listing and brief description of federal, state, and local permits that may be required for the proposed high voltage transmission line	§ 2.4; Table 2-1
	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	§ 2.5
Minn. R. 7850.1900, Subp. 3	**Environmental Information** A. a description of the environmental setting for each site or route	§ 7.1
	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	§ 7.2
	C. a description of the effects of the facility on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining	§ 7.4
	D. a description of the effects of the facility on archaeological and historic resources	§ 7.5
	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	§ 7.6
	F. a description of the effects of the facility on rare and unique natural resources	§ 7.7
	G. identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route	Chapter 7
	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 mitigative measures	Chapter 7
Minn. R. 7850.2100, Subp. 2 (applicable per Minn. R. 7850.3300)	**Notice of Project** Notification to persons on PUC's general list, to local officials, and to property owners	To be provided

Authority	Required Information	Location in Application
Minn. R. 7850.2100, Subp 4	Publication of notice in a legal newspaper of general circulation in each county in which the route is proposed to be located.	To be published
Minn. R. 7850.2100. Subp. 5	Confirmation of notice by affidavits of mailing and publication with copies of the notices	Submit when available
Minn. R. 7850.4100	**Factors to be Considered in Permitting a HVTL** A. effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services	§ 7.2
	B. effects on public health and safety	§ 7.2
	C. effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining	§ 7.4
	D. effects on archaeological and historic resources	§ 7.5
	E. effects on the natural environment, including effects on air and water quality resources and flora and fauna	§ 7.6
	F. effects on rare and unique natural resources	§ 7.7
	G. application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity	§§ 4.2; 6.2
	H. use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries	§§ 4.2; 6.3
	I. use of existing large electric power generating plant sites	Not applicable
	J. use of existing transportation, pipeline, and electrical transmission systems or rights-of-way	§ 6.3
	K. electrical system reliability	§§ 8.1
	L. costs of constructing, operating, and maintaining the facility which are dependent on design and route	§ 4.3
	M. adverse human and natural environmental effects which cannot be avoided	Chapter 7
	N. irreversible and irretrievable commitments of resources	§ 7.9
Minn. R. 7850.4300, Subps. 1 and 2	Prohibited Routes **Wilderness areas**. No high voltage transmission line may be routed through state or national wilderness areas **Parks and natural areas**. No high voltage transmission line may be routed through state or national parks or state scientific and natural areas unless the transmission line would not materially damage or impair the purpose for which the area was designated and no feasible and prudent alternative exists. Economic considerations alone do not justify use of these areas for a high voltage transmission line	No wilderness areas or parks are crossed

Authority	Required Information	Location in Application
Minn. Stat. §216E.03, Subd.7 (applicable per Minn. Stat. §216E.04, Subd. 8)	**Considerations in designating sites and routes** (1) Evaluation of research and investigations relating to the effects on land, water and air resources of large electric power generating plants and high voltage transmission lines and the effects of water and air discharges and electric and magnetic fields resulting from such facilities on public health and welfare, vegetation, animals, materials and aesthetic values, including base line studies, predictive modeling, and evaluation of new or improved methods for minimizing adverse impacts of water and air discharges and other matters pertaining to the effects of power plants on the water and air environment	Chapter 7
	(2) Environmental evaluation of sites and routes proposed for future development and expansion and their relationship to the land, water, air and human resources of the state	§ 6.2
	(3) Evaluation of the effects of new electric power generation and transmission technologies and systems related to power plants designed to minimize adverse environmental effects	Not applicable
	(4) Evaluation of the potential for beneficial uses of waste energy from proposed large electric power generating plants	Not Applicable
	(5) Analysis of the direct and indirect economic impact of proposed sites and routes including, but not limited to, productive agricultural land lost or impaired	§ 7.3; 7.4
	(6) Evaluation of adverse direct and indirect environmental effects that cannot be avoided should the proposed site and route be accepted	Chapter 7
	(7) Evaluation of alternatives to the applicant's proposed site or route proposed pursuant to subdivisions 1 and 2	Chapter 5
	(8) Evaluation of potential routes that would use or parallel existing railroad and highway rights-of way	§ 6.3; Chapter 7
	(9) Evaluation of governmental survey lines and other natural division lines of agricultural land so as to minimize interference with agricultural operations	§§ 6.3; 7.4.1
	(10) Evaluation of the future needs for additional high voltage transmission lines in the same general area as any proposed route, and the advisability of ordering the construction of structures capable of expansion in transmission capacity through multiple circuiting or design modifications	§§ 6.2
	(11) Evaluation of irreversible and irretrievable commitments of resources should the proposed site or route be approved	Chapter 7
	(12) When appropriate, consideration of problems raised by other state and federal agencies and local entities	Not applicable

1 SUMMARY OF THE APPLICATION

1.1 Introduction

Great River Energy is applying to the Minnesota Public Utilities Commission (Commission) for a Route Permit to construct approximately 2.5 miles of new overhead 115 kilovolt (kV) transmission line in Cass County, Minnesota (Project) to serve the proposed Enbridge Energy (Enbridge) Backus Pump Station.

Great River Energy proposes to construct a new 115 kV transmission line between the existing Minnesota Power Badoura to Pine River 115 kV transmission line (#142 Line) and the proposed Enbridge Backus Substation associated with the proposed Enbridge Backus Pump Station. The substation and pump station are part of a separate permit application filed by Enbridge in April 2015.

Great River Energy anticipates start of construction in early 2017 and energization of the line in spring 2017.

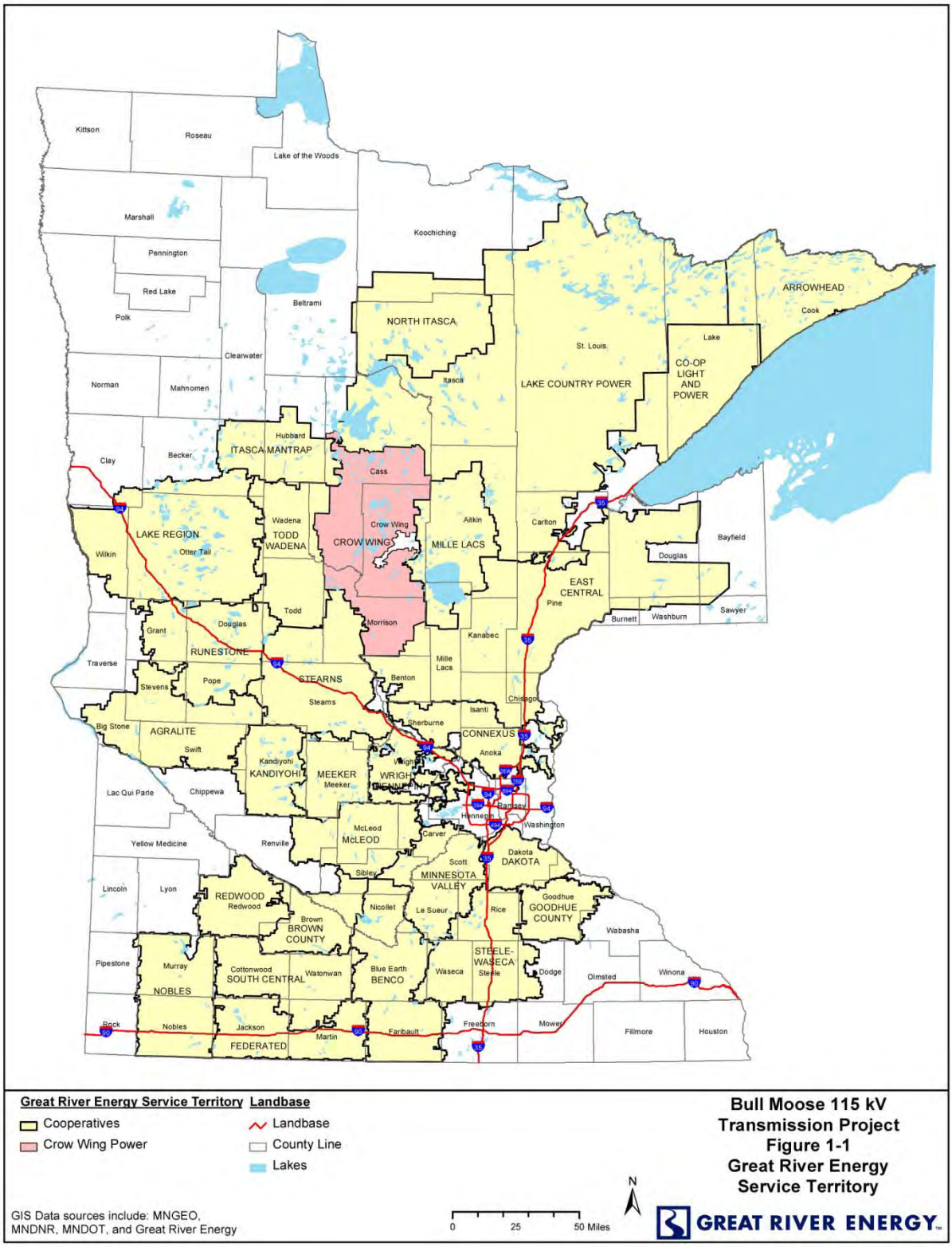
1.2 Great River Energy

Great River Energy is a not-for-profit generation and transmission cooperative based in Maple Grove, Minnesota. Great River Energy provides electrical energy and related services to 28 member cooperatives, including Crow Wing Power, the distribution cooperative serving the area in which the new transmission line would be located (**Figure 1-1**). Great River Energy's distribution cooperatives, in turn, supply electricity and related services to more than 650,000 residential, commercial, and industrial customers in Minnesota and Wisconsin. Crow Wing Power provides electricity and related services to approximately 42,000 residential, commercial and industrial customers in Minnesota.

Great River Energy's generation system includes a mix of baseload and peaking plants, including coal-fired, refuse-derived fuel, natural gas and oil plants as well as wind generators (a total of approximately 3,500 megawatts (MW)). Great River Energy owns over 4,500 miles of transmission line (69 kV or higher) in Minnesota, North Dakota, South Dakota, and Wisconsin.

Great River Energy's transmission network is interconnected with the regional transmission grid to promote reliability and Great River Energy is a member of the Midwest Reliability Organization (MRO) and the Midcontinent Independent System Operator (MISO).

Figure 1-1. Great River Energy Service Territory



1.3 Project Contact

The contact for the Bull Moose 115 kV Project is:

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1.4 Proposed Project

The proposed 2.5-mile overhead 115 kV transmission line will be located in Cass County, Minnesota. Single-pole wood structures with horizontal post insulators will be used for most of the transmission line. H-frame, 3-pole structures, laminated wood poles or steel poles may be required in some locations (to cross under an existing line, for angles poles, or in areas where soil conditions are poor and guying is not practical). Typical pole heights will range from 70 to 80 feet above ground and spans between poles will range from 350 to 400 feet.

Great River Energy is requesting approval of a 200-foot route width for the transmission line and a wider route width (400 feet) in the vicinity of the pump station to accommodate routing the line into the proposed Enbridge Backus Substation. Great River Energy will acquire easements for the new 115 kV transmission line. The proposed route is shown on **Figure 1-2.** The electric transmission system in the area is shown on **Figure 1-3**.

The Project will cost approximately $2.1 million dollars.

1.5 Project Need and Purpose

On April 24, 2015, Enbridge filed its Certificate of Need and Route Permit Application (Docket No. CN-14-916) for the Line 3 Replacement (L3R) Project, which is a maintenance and integrity driven pipeline project designed to replace the Enbridge's existing Line 3 pipeline in Minnesota. As proposed by Enbridge, the replacement pipeline would follow the Enbridge Mainline System from the North Dakota/Minnesota border in Kittson County to Enbridge's expanded Clearbrook Station in Clearwater County. The proposed replacement pipeline will then turn south and east to follow existing third-party pipelines, utilities and transportation corridors from Clearbrook to Wrenshall, Minnesota. From that point, the replacement project rejoins the Enbridge Mainline corridor to follow its Mainline System to the Wisconsin/Minnesota border in Carlton County. As part of the L3R Project, eight pump stations will be built. Four of the eight pump stations will be located west of Clearbrook at existing pump station sites, which Enbridge plans to expand to accommodate the installation of these facilities. The remaining four pump stations will be located east of Clearbrook at new station sites.

Figure 1-2. Proposed Project

Figure 1-3. Regional Transmission System

Enbridge has requested that Great River Energy, in partnership with its member retail distribution cooperatives, provide electric service to four pump stations associated with the L3R Project east of Clearbrook, including the Backus Pump Station near Backus, Minnesota, which is the subject of this application.

1.6 Proposed Route

The proposed transmission line (**Figure 1-2**) will interconnect with the existing Minnesota Power 115 kV transmission line (#142 Line) and then head northeast cross country for about 0.25 mile to the existing ±250 kV DC transmission line owned by Minnesota Power. The line will then head east paralleling the DC line (on the south side, immediately adjacent to but not overlapping the DC Line ROW) for approximately 2.25 miles. The line will then cross under the DC Line and terminate at the proposed Enbridge Backus Substation (located just west of 48th Ave. SW).

1.7 Potential Environmental Effects

Great River Energy analyzed the potential environmental effects from the proposed Project. No significant unavoidable impacts will result from construction of the new 115 kV transmission line.

No homeowners will be displaced by construction of the new transmission line. All agricultural land impacted during construction will be returned to its natural condition as nearly as possible and landowners will be compensated for any losses from construction. All water bodies will be protected during construction. The electric fields associated with the new line (1.36 kilovolts per meter) will be significantly less than the maximum levels permitted by state regulators (8 kilovolts per meter). No stray voltage issues are anticipated to affect farm animals along the route.

The Department of Commerce, Energy Environmental Review and Analysis (EERA) is responsible for environmental review of the Project. Upon application acceptance by the Commission, the Department of Commerce will prepare an Environmental Assessment (EA) for the Project that analyzes potential environmental impacts from the Project.

1.8 Public Involvement

The proposed Project crosses four parcels – the Minnesota Department of Natural Resources (DNR) Foot Hills State Forest, Cass County tax-forfeited land, and two private parcels. The DNR was notified of the Project on May 6, 2015, and Great River Energy will apply to the DNR for a license to cross Foot Hills State Forest. Great River Energy's land agent has discussed the process for crossing tax-forfeited land with Cass County, and has contacted the two private landowners and provided information on the Project. Although it is not anticipated at this time, it is possible that a fifth landowner might be affected on the east end of the Project, depending on how the transmission line is routed into proposed Enbridge Backus Substation.

The public will have an opportunity to review this application and submit comments to the Commission about the Project. A copy of the application will be available on the Commission

eDockets website at www.mn.gov/puc, on the EERA website at http://mn.gov/commerce/energyfacilities, and on the Great River Energy webpage at www.greatriverenergy.com. Additionally, a paper copy of this application will be available at the Backus City Hall for the public to review.

A scoping meeting will be conducted by EERA in the Project area within 60 days of the Commission's acceptance of this application as complete. The purpose of the scoping meeting is to inform the public regarding the proposed Project and associated permitting process, answer questions about the proposed Project and permitting process, and to solicit public comments and suggestions for matters to examine during environmental review. After the EA is issued, a public hearing will be held in the Project area. At this hearing, members of the public will be given an opportunity to ask questions and submit comments.

There are two options for citizens/landowners/interested persons to receive project information:

1. **Subscribe to the docket** (self-service, must subscribe for each docket of interest), receive email notifications when new documents are filed. Note - subscribing may result in a large number of emails.
    1. mn.gov/puc
    2. Select green box *Subscribe to a Docket*
    3. Type your e-mail address
    4. For *Type of Subscription*, select *Docket Number*
    5. For *Docket Number*, select *15* in the first box, type *628* in the second box
    6. Select *Add to List*
    7. Select *Save*
2. **Sign up for the project mailing list** – sign up to receive notices about project milestones and opportunities to participate (meetings, comment periods, etc.); may request email or US Mail (not self-service, must contact PUC staff to sign up). Contact docketing.puc@state.mn.us or 651-201-2234 with the docket number (*15-628*), your name, mailing address and email address.

State staff contact information is provided below.

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Cezar Panait, Staff Analyst
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mn.gov/commerce/energyfacilities

1.9 Conclusion

With regard to route selection for high voltage transmission lines, the applicable rules are found in Minnesota Rules Chapter 7850. This Project addresses the criteria for a route permit: the transmission line conserves resources, minimizes environmental impacts, and minimizes effects on human settlement and land-based economies by paralleling (immediately adjacent to) an existing transmission line right-of-way (ROW).

2 GENERAL PROJECT INFORMATION

2.1 Route Permit

Minnesota Statutes Section 216E.03, subdivision 2, provides that "[n]o person may construct a high voltage transmission line without a route permit from the commission." A high voltage transmission line (HVTL) is defined by Minnesota Statutes Section 216E.01, subdivision 4, as "a conductor of electric energy and associated facilities designed for and capable of operation at a nominal voltage of 100 kilovolts or more and is greater than 1,500 feet in length." Because the Project consists of a 115 kilovolt transmission line that is greater than 1,500 feet, a route permit is required.

The rules that apply to the review of route permit applications are found in Minnesota Rules Chapter 7850. Minnesota Rule 7850.1900, subparts 2 and 3, set forth the information that must be included in a route permit application.

Minnesota Statutes Section 216E.04, subdivision 2(3) provides for an Alternative Review Process for transmission lines between 100 and 200 kilovolts; therefore, this Project qualifies for alternative review. The permitting timeline for the Alternative Review Process is shorter than the timeline required for transmission lines over 200 kV. Great River Energy notified the Commission on June 29, 2015, pursuant to Minnesota Rule 7850.2800, subpart 2 of its intent to utilize the Alternative Review Process and file its Route Permit Application under Minnesota Rules 7850.2800 to 7850.3900. A copy of the notification letter is provided in **Appendix A**.

Under the Alternative Review Process, an applicant is not required to propose any alternative routes, but must disclose any other routes that were considered but rejected by the applicant (Minn. Stat. § 216E.04, subd. 3.). Further, an Environmental Impact Statement is not required under the Alternative Review Process. Instead, the Department of Commerce is required to prepare an EA (Minn. Stat. § 216E.04, subd. 5). Unlike the full route permit process for higher voltage lines, which requires a formal contested case hearing, the Commission has discretion to determine what kind of public hearing to conduct (Minn. Stat. § 216E.04, subd. 6). The Alternative Review Process procedures are discussed below **in Section 2.2**.

2.2 Regulatory Process

As a result of legislation passed in 2005, the Commission has jurisdiction over route permits (2005 Minn. Laws ch. 97, art. 3, § 17). Minnesota Statutes Section 216E.02, subdivision 2, states that "[t]he commission is hereby given the authority to provide for site and route selection for large electric power facilities." The legislature transferred these siting and routing responsibilities to the Commission to "ensure greater public participation in energy infrastructure approval proceedings and to better integrate and align state energy and environmental policy goals with economic decisions involving large energy infrastructure" (2005 Minn. Laws ch. 97, art. 3, § 17).

The regulatory process described in this section is the process that is followed to satisfy all the requirements under the alternative process route permit rules (Chapter 7850).

In accordance with Minnesota Statute Section 216E.04, subdivision 4, within 15 days of filing this Route Permit Application, Great River Energy will mail a notice of the filing to potentially affected landowners, to those persons who have registered their names with the Commission and expressed an interest in large energy projects, and to the area tribal government and local units of government whose jurisdictions are reasonably likely to be affected by the proposed Project. In addition, Great River Energy will publish notice in two local newspapers announcing the filing of this Application (Minn. Stat. § 216E.04, subd. 4; Minn. R. 7850.2100).

An electronic version of the Application will be available on eDockets in docket number 15-628 and the EERA project webpage. The Application will also be available on Great River Energy's transmission projects webpage (http://www.greatriverenergy.com/deliveringelectricity/currentprojects/) with a link to the Bull Moose 115 kV Project by clicking on Cass County on the map.

Upon acceptance of an application for a route permit as complete, the Department of Commerce, EERA conducts an environmental review of the project (Minn. R. 7850.3700). The environmental review provides an overview of the resources and potential impacts and mitigation measures associated with the proposed project.

The process EERA must follow in preparing the EA is set forth in Minnesota Rule 7850.3700. This process requires EERA to schedule at least one scoping meeting in the area of the proposed project. The purpose of the meeting is to advise the public of the Project, to solicit public input into the scope of the environmental review, and allow for public comment. Great River Energy and EERA will both have representatives at the public meeting to answer questions and provide information for the public. The public meeting will be held within 60 days after the Application is accepted and deemed complete.

Once the public meeting has been held, the commissioner of the Department of Commerce will issue a scoping decision describing the issues and alternatives that will be evaluated in the EA. EERA will prepare the EA based on the scoping decision. Upon completion of the EA, EERA will publish notice of its availability in the *EQB Monitor*, a bi-weekly publication of the Environmental Quality Board (EQB) that can be accessed on the EQB webpage, www.eqb.state.mn.us/monitor.html, and will send notice to persons who have placed their names on the project mailing list (see **Section 1.8)**. A copy of the EA will be available electronically through eDockets and the EERA webpage, and in paper copy at the Backus City Hall.

After the EA is issued, a public hearing will be held to again solicit public input and to create an administrative record. The Commission will select a person to preside at the hearing; it may be an administrative law judge (ALJ) from the Office of Administrative Hearings or another person acceptable to the Commission. The Commission will establish the procedures to be followed at the hearing (Minn. R. 7850.3800). The EA will become part of the record for consideration by the Commission. Interested persons will be notified of the date of the public hearing and will have an opportunity to participate in the proceeding.

Once the hearing is concluded, a report will be prepared based on the record. After the report is issued, the matter will come to the Commission for a decision. At that time, the Commission may afford interested persons an opportunity to provide additional comments.

A route permit under the Alternative Review Process can be issued in six months after the Commission's determination that the Application is complete (Minn. Stat. § 216E.04, subd. 7).

Great River Energy anticipates that a final decision on the route permit for this Project can be made by February 2016.

2.3 Landowner Coordination

The proposed Project crosses four parcels – the DNR Foot Hills State Forest, Cass County tax-forfeited land, and two private parcels. The DNR was notified of the Project on May 6, 2015, and Great River Energy will apply to the DNR for a license to cross Foot Hills State Forest. Great River Energy's land agent has met with Cass County and discussed the process for crossing tax-forfeited land, and has contacted the two private landowners and provided information on the Project. Although it is not anticipated at this time, it is possible that a fifth landowner might be affected on the east end of the Project, depending on how the transmission line is routed into the proposed Enbridge Backus Substation.

2.4 Other Permits/Approvals

In addition to the route permit sought in this Application, several other permits will be required to construct the Project depending on the actual route selected and the conditions encountered during construction. A list of the local, state and federal permits that may be required for this Project is provided in **Table 2-1**.

2.4.1 Local Approvals

Great River Energy will work with local units of government to address any concerns related to the following possible approvals.

Road Crossing/Right-of-Way Permits
These permits may be required to cross or occupy county or township road ROW.

Over width/Loads Permits
These permits may be required to move over width or heavy 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.

Table 2-1. List of Possible Permits

Permit	Jurisdiction
Local Approvals	
Road Crossing/ROW Permits	County, Township
Lands Permits, Building Permits	County, Township
Overwidth Loads Permits	County, Township
Driveway/Access Permits	County, Township
Minnesota State Approvals	
Endangered Species Consultation	Minnesota Department of Natural Resources – Ecological Services
Licenses to Cross Public Waters and Lands	Minnesota Department of Natural Resources – Lands and Minerals
Wetland Conservation Act	Board of Water and Soil Resources
National Pollutant Discharge Elimination System Permit	Minnesota Pollution Control Agency
Federal Approvals	
Section 404 Permit	US Army Corps of Engineers
Endangered Species Consultation	United States Fish and Wildlife Service
Other Approvals	
Crossing Permit	Other Utilities such as Pipelines

2.4.2 State of Minnesota Approvals

Endangered Species Consultation

The DNR Natural Heritage and Nongame Research Program collects, manages, and interprets information about nongame species. Consultation was requested from the DNR for the Project regarding rare and unique species. Great River Energy will work with the DNR to identify any areas that may require marking transmission line shield wires and/or to use alternate structures to reduce the likelihood of avian collisions.

License to Cross Public Lands and Waters

The DNR Division of Lands and Minerals regulates utility crossings over, under, or across 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 proposed transmission line does not cross any DNR Public Waters, therefore a license will not be required. Great River Energy will apply for a license to cross state lands for the Foot Hills State Forest.

Utility Permit

A permit from Cass County may be required if a crossing of 48th Ave. SW is necessary. If necessary, Great River Energy will file for this permit once the design of the transmission line is complete and will acquire the permit prior to construction.

Wetland Conservation Act

The Minnesota Board of Water and Soil Resources administers the state Wetland Conservation Act, under Minnesota Rules Chapter 8420. The proposed Project may require a permit under these rules if permanent impacts to wetlands are anticipated to result from construction. Great River Energy will apply for this permit (which is a joint application with the Section 404 permit) or for an exemption if applicable once design of the transmission line is complete.

NPDES Permit

A National Pollutant Discharge Elimination System (NPDES) permit from the Minnesota Pollution Control Agency (MPCA) is required for stormwater discharges associated with construction activities disturbing equal to or greater than one acre. A requirement of the permit is to develop and implement a stormwater pollution prevention plan (SWPPP), which includes Best Management Practices (BMPs) to minimize discharge of pollutants from the site. This permit will be acquired if construction of the transmission line will cause a disturbance of greater than one acre.

2.4.3 Federal Approvals

Section 404 Permit

A Section 404 permit is required from the United States Army Corps of Engineers (USACE) for discharges of dredged or fill material into waters of the United States. If impacts exceed the permitting threshold, Great River Energy will apply for this permit once design of the transmission line is complete.

United States Fish and Wildlife Service (USFWS)

Great River Energy requested USFWS review of the Project regarding federally-listed species or critical habitat. Great River Energy will work with the USFWS to identify any areas that may require marking transmission line shield wires and/or to use alternate structures to reduce the likelihood of avian collisions. Any eagle or other migratory bird nests discovered during survey of the line or in the land acquisition process will be reported to the USFWS and Great River Energy will adhere to guidance provided. Great River Energy will also adhere to guidance provided by the USFWS regarding the Northern long-eared bat.

2.4.4 Other Approvals

Great River Energy will work with Enbridge to make sure that any necessary permits are secured for possible crossings of new proposed pipelines (L3R and Sandpiper).

2.5 Certificate of Need Not Required

Minn. Stat. § 216B.243, Subd. 2 (2007), states that "[n]o large energy facility shall be sited or constructed in Minnesota without the issuance of a certificate of need by the Public Utilities Commission..." A large energy facility is defined as "any high-voltage transmission line with a capacity of 100 kilovolts or more with more than ten miles of its length in Minnesota or that crosses a state line."[1] The proposed Bull Moose 115 kV Project is less than ten miles in length and does not cross a state line; therefore a certificate of need is not required.

[1] Minn. Stat. § 216B.2421, subdiv. 2(3) (2006).

3 APPLICANT INFORMATION

3.1 Proposed Ownership

Great River Energy will own the approximately 2.5-mile 115 kV transmission line between the existing Minnesota Power Badoura to Pine River 115 kV transmission line (#142 Line) and the proposed Enbridge Backus Substation.

3.2 Organization and System Background

Great River Energy is a not-for-profit generation and transmission cooperative based in Maple Grove, Minnesota. Great River Energy provides electrical energy and related services to 28 member cooperatives, including Crow Wing Power, the distribution cooperative serving the area. Great River Energy's distribution cooperatives, in turn, supply electricity and related services to more than 650,000 residential, commercial and industrial customers in Minnesota and Wisconsin. Crow Wing Power provides electricity and related services to approximately 42,000 residential, commercial and industrial customers in Minnesota.

Great River Energy and its cooperatives' mission is to provide safe, reliable, competitively priced energy to those they serve.

Great River Energy's generation system includes a mix of baseload and peaking plants, including coal-fired, refuse-derived fuel, natural gas and oil plants as well as wind generators (a total of approximately 3,500 MW). Great River Energy owns over 4,500 miles of transmission line (69 kV or higher) in Minnesota, North Dakota, South Dakota, and Wisconsin.

Figure 1-1 shows Great River Energy's service territory and highlights the service area of Crow Wing Power. Great River Energy's electric system is interconnected directly with neighboring suppliers. Great River Energy is a member of the Midwest Reliability Organization (MRO) and the Midcontinent Independent System Operator (MISO).

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4 PROPOSED PROJECT

4.1 Project Description

The proposed Project is located entirely in Cass County, Minnesota (**Figure 4-1),** approximately 4 miles southwest of the City of Backus.

Great River Energy proposes to construct approximately 2.5 miles of new overhead 115 kV transmission line between the existing Minnesota Power Badoura to Pine River 115 kV transmission line (#142 Line) and the proposed Enbridge Backus Substation.

4.2 Transmission Line

Great River Energy is requesting approval of a 200-foot route width for the transmission line and a wider route width (400 feet) in the vicinity of the pump station to accommodate routing the line into the Enbridge Backus Substation. The proposed route is described below and detailed route maps (on aerial photo background) are provided in **Appendix B.**

Proposed Route

The proposed line will interconnect with the existing Minnesota Power 115 kV transmission line (#142 Line) and then head northeast cross country for about 0.25 mile to the existing ±250 kV DC transmission line owned by Minnesota Power. The line will then head east paralleling the DC line (on the south side, immediately adjacent to but not overlapping the DC Line ROW) for approximately 2.25 miles. The line will then cross under the DC Line and terminate at the proposed Enbridge Backus Substation (located just west of 48th Ave. SW).

Right-of-Way

Great River Energy has worked closely with the local, state and federal agencies and landowners regarding the Project. A 100-foot wide permanent ROW for the new transmission line (50 feet on each side of the transmission line centerline) will be acquired by Great River Energy. The easement may be slightly wider than 100 feet in some areas to accommodate guy wires and anchors. It is anticipated that there will be minimal, if any, overlap with the existing Minnesota Power DC transmission line (120 foot-wide) easement. Minnesota Power maintains a specific ROW for their transmission lines to ensure adequate separation and space for safety, operating, and maintenance considerations, and does not typically allow ROW sharing or overlapping between its existing transmission lines and new transmission line facilities (except under extenuating circumstances and where there is not a viable alternative). There will be 110 feet between the centerline of the existing DC line and the centerline of the new Great River Energy 115 kV transmission line.

Figure 4-1. Proposed Project

A 100-foot wide ROW is Great River Energy's standard for a 115 kV transmission line to maintain proper clearances to objects within the ROW, and to ensure that the conductor will not blow out past the ROW during high wind events and that vegetation is sufficiently cleared to safely operate and maintain the line.

Structures and Design Considerations

The majority of the new 115 kV line will consist of single circuit, single pole wood structures spaced approximately 350 to 400 feet apart. Transmission structures will typically range in height from 70 to 80 feet above ground, depending upon the terrain and environmental constraints (such as stream crossings and required angle structures). The average diameter of the wood structures at ground level is 20 inches.

A laminated wood switch structure will be installed approximately 2.5 miles west of the proposed Enbridge Backus Substation, where the new 115 kV transmission line will interconnect with the Minnesota Power 115 kV transmission line (#142 Line). The switch structure will be installed on the same alignment as the existing #142 Line structures. Existing structures on the #142 Line may also need to be changed out to grade the existing line into the new switch site, as the new switch structure will be taller than the existing #142 Line structures. Great River Energy will attempt to locate the switch structure such that the number of #142 Line structures that need to be replaced is minimized. A typical switch structure ranges in height from 80 to 100 feet above ground; however, height will depend upon terrain as well as design and pole height on the existing 115 kV transmission line (#142 Line). An outage on the #142 Line will be required to install the new switch structure.

H-Frame design structures may be used in areas with rugged topography and where longer spans are required to avoid or minimize impacts to wetlands or waterways. Span lengths average 600 to 800 feet, with 1,000-foot spans possible with certain topography. Structure heights typically range from 60 to 90 feet above ground, with taller structures required for exceptionally long spans and in circumstances requiring additional vertical clearance exceeding the National Electrical Safety Code (NESC) and other agency requirements. H-Frame and multi-pole structures may also be utilized where it is necessary to cross underneath an adjacent higher voltage transmission line.

The proposed route for the new 115 kV transmission line crosses underneath the Minnesota Power DC line near the proposed Enbridge Backus Substation. The crossing will be accomplished utilizing multi-pole (3-pole deadend) and/or H-frame structures. A deadend is a structure used to change direction and/or wire tension on a transmission line. Multi-pole and/or H-frame structures are designed in a horizontal configuration, which maintains the transmission line conductors parallel to the ground. The horizontal configuration allows the new 115 kV transmission line to be as low as possible at the crossing point, while still maintaining the required clearances set forth by the NESC.

However, it may also be necessary to permanently raise the Minnesota Power DC line and install new taller DC line structures to achieve required NESC clearances at the crossing. The new DC line structures would most likely be monopole steel structures set on a concrete pier foundation. If it is determined that the DC line needs to be raised, one or more outages would be necessary to

install the new DC line structures. One outage would be taken to install the concrete foundations and a second outage to raise the steel structures and finish construction. Additional information needs to be gathered and an engineering survey of the existing terrain and adjacent transmission lines must be completed before a determination can be made regarding precisely what will be required at the crossing.

All necessary outages will be coordinated through MISO business practices that are established and followed by all MISO members to meet personnel safety and North American Electric Reliability Corporation (NERC) transmission grid reliability requirements. Coordination is accomplished through well-defined outage scheduling procedures that utilize web-based tools, allow for study affirmation and ultimately approval of the submitted outage. Once approved, detailed switching orders are developed and shared with all parties involved using well-defined processes to ensure safety of personnel performing the work and transmission grid reliability.

Typical 115 kV structure types (single circuit, H-Frame, 3-pole deadend) are shown in **Figure 4-2** and **Figure 4-3**.

The new Enbridge Backus Substation will be equipped with breakers and relays located where the transmission line will connect to the substation. The protective equipment is designed to de-energize the transmission line should such an event occur.

Conductors

The single circuit structures will have three single conductor phase wires and one shield wire. It is anticipated that the phase wires will be 477 thousand circular mil aluminum conductor steel-reinforced (ACSR) with seven steel core strands and 26 outer aluminum strands.

The shield wire will be 0.528 optical ground wire.

Service Life

The service life of a transmission line is approximately 40 years, although based on experience, it is quite possible that the line and structures will last longer than 40 years.

Annual Availability

An average new 115 kV transmission line is expected to be available approximately 99.9 percent of the year. Great River Energy expects that this line should not be out of service for any extended period of time other than the rare times when scheduled maintenance is required or when a natural event, such as a tornado, thunderstorm, or ice storm causes an outage.

Figure 4-2. Typical Transmission Structure Types

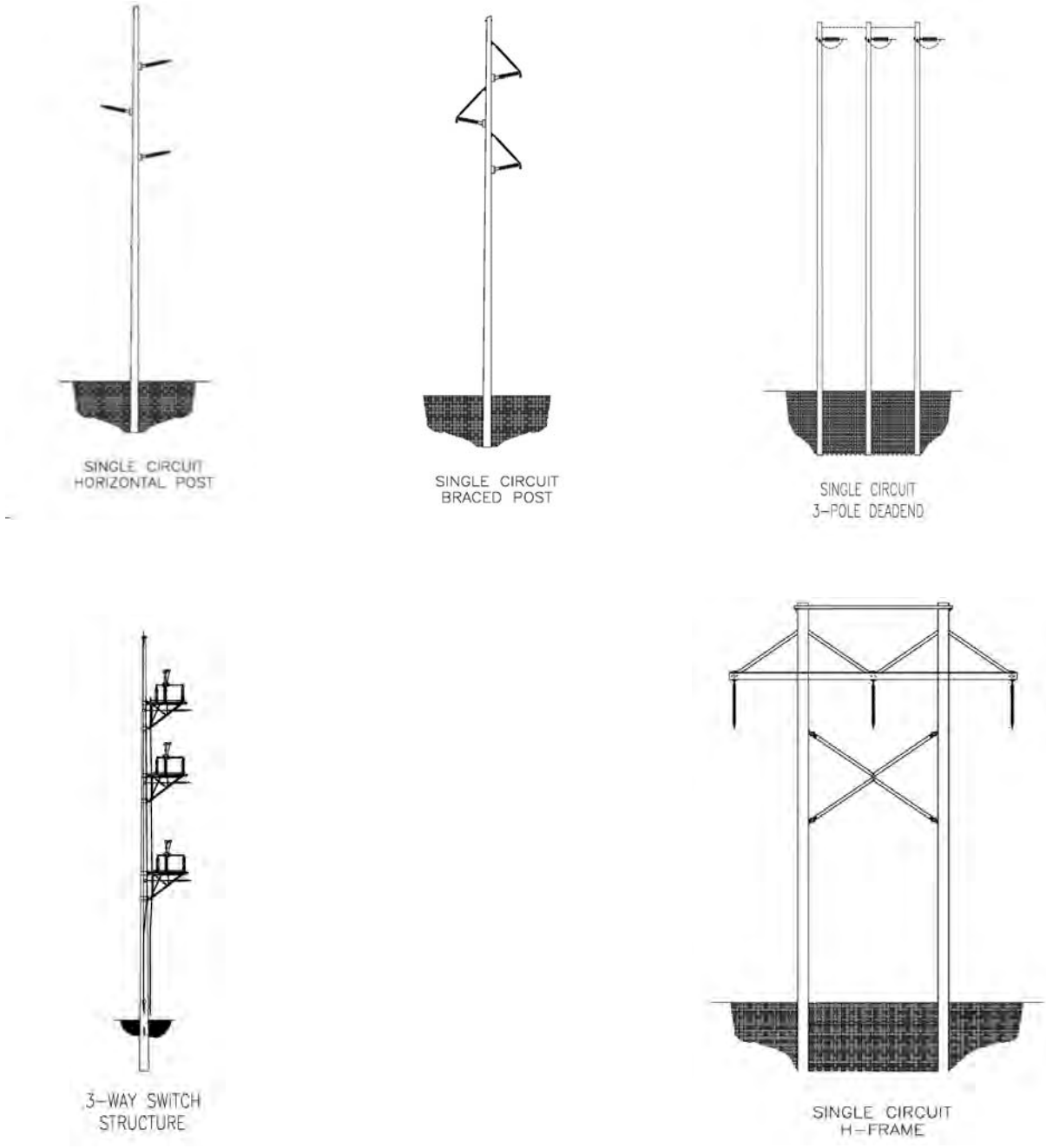


Figure 4-3. Photos of Typical 115 kV Transmission Structures

Single Circuit

Braced Post

3-Pole Deadend

Switch

H-Frame

4.3 Estimated Costs

Estimated costs for the proposed Project are divided into five phases. The tasks associated with each phase are outlined below and estimated costs for each phase are summarized in **Table 4-1**.

Planning
Siting and routing preliminary activities
Project presentation to the public
Route permit application development/state permitting process
Establishing centerline for survey

Land Acquisition/Miscellaneous Permits
Easements, ROW and environmental permits

Design
Line and structure design, survey and probes/soil borings

Procurement
Cost of all construction materials, i.e. poles, conductor and hardware

Construction
Staking for clearing and construction
ROW clearing and restoration
All construction labor and heavy equipment

Close Out
Remaining ROW restoration activities
Field verification surveys
Financial, engineering, and environmental close out activities

Table 4-1. Estimated Great River Energy Project Costs (2014 Dollars)

Project	Planning/ State Permitting	Land Acquisition/ Permits	Design	Procurement	Construction	Close Out	Total
Transmission Line	$133,535	$273,755	$118,294	$326,278	$700,719	$39,012	**$1,591,593**
Switches	$ 12,200	$ 10,200	$ 46,000	$ 146,000	$ 176,600	$ 9,000	**$ 400,000**
Meters	0	0	$ 20,825	$ 34,425	$ 28,475	$ 1,275	**$ 85,000**
Total	**$145,735**	**$283,955**	**$185,119**	**$506,703**	**$905,794**	**$49,287**	**$2,076,593**

All capital costs for the proposed 115 kV transmission line will be borne by Great River Energy.

4.3.1 Transmission Line Construction Costs

Single pole construction costs are approximately $498,000 per mile. H-Frame construction costs are approximately $550,000 per mile.

There may be areas where construction is more difficult (e.g. where there are access issues or where greater span lengths must be employed to avoid sensitive features). In these areas the use of wooden mats, the Dura-Base Composite Mat System, or specialized construction vehicles to minimize environmental impacts during line construction may be required and could increase costs by $50,000 or more per mile.

4.3.2 Operation and Maintenance Costs

The estimated annual cost of ROW maintenance and operation and maintenance of Great River Energy's transmission lines (69 kV to 500 kV) in Minnesota currently average about $2,000 per mile. Storm restoration, annual inspections and ordinary replacement costs are included in these annual operating and maintenance costs.

4.4 Project Schedule

Great River Energy plans to commence construction of the Project in 2017 if Enbridge has secured all permits related to the L3R Project. Great River Energy anticipates that construction will take approximately 4 months and that the entire Project will be energized in spring 2017.

4.5 Construction Practices

Great River Energy intends to employ normal practices in construction of the new transmission line. Construction practices to be followed are described in more detail in **Section 6.5**.

4.6 Operation and Maintenance Practices

Great River Energy will periodically use its transmission line ROW to perform inspections, maintain equipment, and repair damage. Regular maintenance and inspections will be performed over the life of the facility to ensure a reliable system. Annual inspections will be done by foot, snowmobile, All-Terrain Vehicle, pickup truck, or by aerial means. These inspections will be limited to the acquired ROW and areas where obstructions or terrain require access outside of the transmission line ROW but within the terms of the easement. If problems with the transmission line are found during inspection, repairs will be performed and landowners will be compensated for any losses incurred to their property.

Great River Energy's Transmission Construction & Maintenance Department will conduct vegetation surveys and remove vegetation that will interfere with the safe operation of the transmission line. A three to seven year cycle of vegetation maintenance is desirable. ROW practices include a combination of mechanical and hand clearing, along with an application of herbicides where allowed.

4.7 Work Force Required

It is estimated that 15 to 20 workers at a time will be employed during construction of the Project.

5 ALTERNATIVE ROUTES

5.1 Alternative Requirement

Minnesota Statutes Section 216E.04, subdivision 3 and Minnesota Rule 7850.3100 require an applicant to identify any alternative routes that were considered and rejected for the Project. Great River Energy did evaluate one alternative route (**Figure 5-1**) for the new transmission line. This alternative is described below, along with the reasons it was rejected.

5.2 Rejected Route Alternative

Great River Energy evaluated one alternative (approximately 3.75 miles) that followed a more southerly route between the proposed Enbridge Backus Substation and the existing Minnesota Power Badoura to Pine River 115 kV transmission line (#142 Line). This alternative exits the proposed Enbridge Backus Substation and heads east for 0.25 mile to 48th Ave. SW, follows south on 48th Ave. SW for about 0.25 mile to 8th St. SW, follows 8th St. SW for 0.5 mile, then turns south along 48th Ave. SW for approximately 2.5 miles, then turns west on 16th St. SW for 0.25 mile to the existing Minnesota Power Badoura to Pine River 115 kV transmission line (#142 Line).

This route was rejected because, in comparison to the proposed route, it:

1) would be considerably longer than the proposed Project (approximately 3.75 miles versus approximately 2.5 miles)

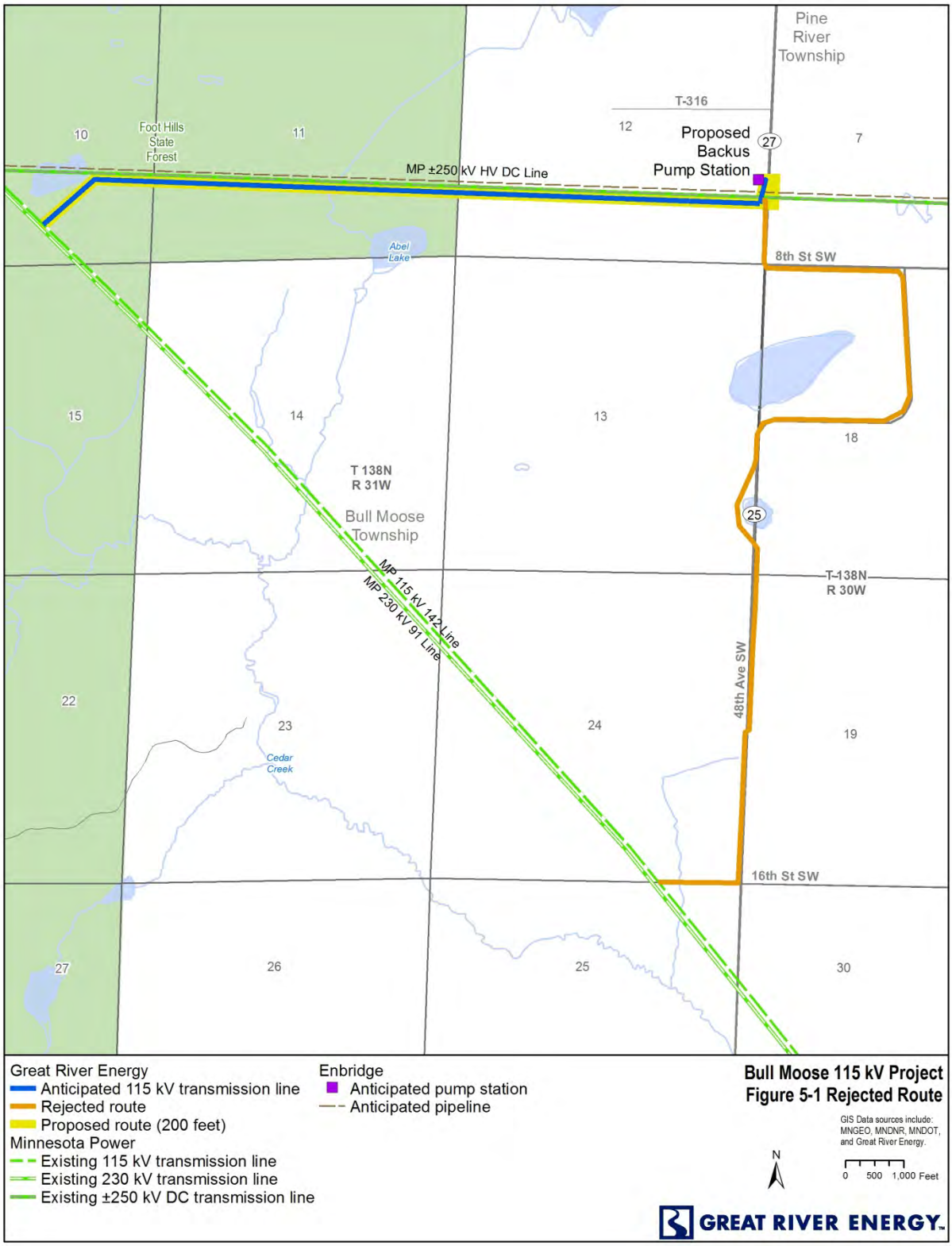
2) would result in more impacts to human settlement (it would affect more residences - 7 residences within 250 feet of centerline for the alternative route versus 0 residences within 250 feet of centerline for the proposed route)

3) would require more angle structures because there would be many turns versus the relatively straight proposed route

4) would not parallel an existing transmission line ROW

5) would be more costly (approximately $2.5 million versus $2.1 million).

Figure 5-1. Rejected Route



6 ENGINEERING, OPERATIONAL DESIGN, CONSTRUCTION AND RIGHT-OF-WAY ACQUISITION

6.1 Transmission Structure Design and Right-of-Way Requirements

Transmission structure design and the ROW requirements are discussed in **Section 4.2**. A schematic of typical structures is provided in **Figure 4-2**.

6.2 Design Options to Accommodate Future Expansion

Enbridge has indicated there is a possibility of future expansion at the Enbridge Backus Pump Station and an additional motor (7000 horse power) may be installed. The conductor used on the new 115 kV transmission line will be sized to accommodate the installation of the future motor.

6.3 Identification of Existing Utility and Public Rights-of-Way

The proposed transmission line alignment will parallel (immediately adjacent to but not overlapping) existing transmission line ROW (the Minnesota Power ± 250 kV DC Line) for the majority of its length.

6.4 Transmission Line Right-of-Way Acquisition Procedures

Great River Energy will obtain easements for the entire length of the Project.

It is possible that preliminary discussions with landowners would occur and easement options may be acquired prior to issuance of a route permit. If a permit is not deemed appropriate, then the easement acquisition process would not proceed.

Land rights acquisition includes acquisition of a permanent easement for the transmission line. As a general practice, landowners will be contacted in-person or by U.S. mail with a request to meet to discuss and provide information on the easement and share the Project details with the property owner(s).

During the acquisition phase of the Project, landowners are given a copy of the route permit (or a copy will be provided once available), the transmission line easement, offer of compensation, and information on the Project schedule, construction practices, vegetation removal, and damage settlement. Additional information may also be given to each landowner that shows preliminary pole placement (if available at that time), structure design or photos, and power line safety.

In addition to permanent easements necessary for the construction of the line, marshalling yard agreements may be obtained from certain landowners for temporary construction or staging areas for temporary storage of poles, vehicles, or other related items. Landowners will be notified in

the event site access for soil boring is required to determine soil suitability in areas where certain soil characteristics may require special transmission structure design.

If a negotiated agreement to an easement cannot be reached, Great River Energy has the power of eminent domain to obtain the necessary easement by Minnesota Statutes Chapter 117. In eminent domain, the landowner has the authority to have compensation for the easement determined by impartial commissioners through a court process that is initiated by Great River Energy.

6.5 Construction Procedures

Procedures to be used for construction of the transmission line are discussed below. Equipment used in the construction process includes backhoes, cranes, boom trucks and assorted small vehicles.

After land rights have been secured, landowners will be notified prior to the start of the construction phase of the Project, including an update on the Project schedule and other related construction activities.

The first phase of construction activities will involve survey staking of the transmission line centerline and/or pole locations, followed by removal of trees and other vegetation from the ROW. As a general practice, low-growing brush or tree species are allowable at the outer limits of the easement area. Taller tree species that endanger the safe and reliable operation of the transmission facility will be removed. In developed areas and to the extent practical, existing low-growing vegetation that will not pose a threat to the transmission facility or impede construction or maintenance may remain in the easement area, as agreed to during easement negotiations.

The National Electrical Safety Code (NESC) states that "vegetation that may damage ungrounded supply conductors should be pruned or removed." Trees beyond the easement area that are in danger of falling into the energized transmission line ("danger trees") will be removed or trimmed to eliminate the hazard as shown in **Figure 6-1**, as allowed by the terms in the easement that is acquired. Danger trees generally are those that are dead, diseased, weak or leaning towards the energized conductors. In special circumstances, tree trimming agreements may be possible to minimize tree removal based on negotiations with individual landowners.

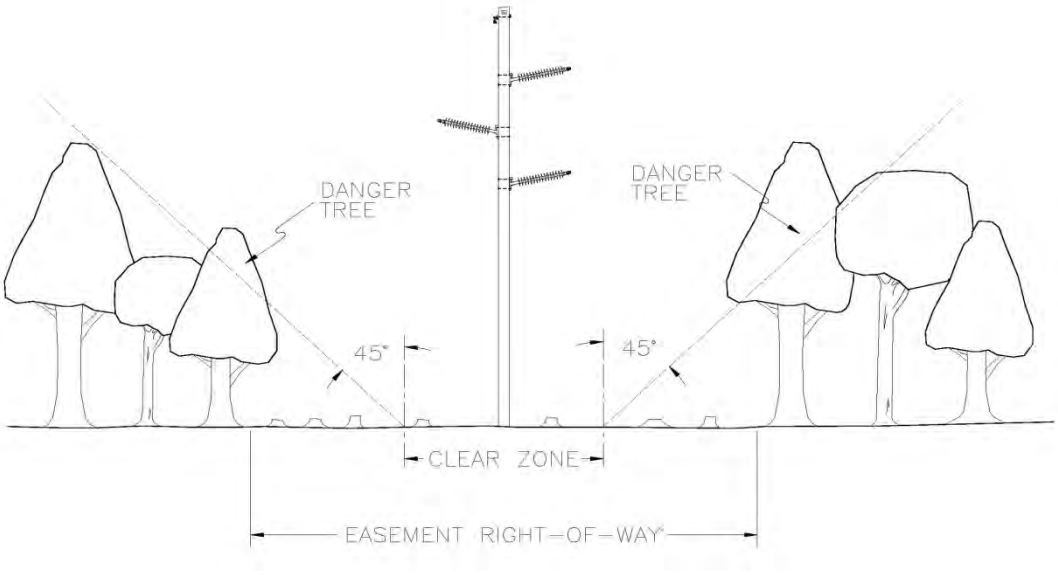
All materials resulting from clearing operations will either be chipped on site and spread on the ROW, stacked in the ROW for use by the property owner, or removed and disposed of otherwise as agreed to with the property owner during easement negotiations.

The final survey staking of pole locations may again occur after the vegetation has been removed and just prior to structure installation.

The second phase of construction will involve structure installation and stringing of conductor wire. During this phase, existing underground utilities are identified along the route through the required Gopher State One Call process.

If temporary removal or relocation of fences is necessary, installation of temporary or permanent gates would be coordinated with the landowner. Depending on the timing of construction, the ROW agent may work with the property owner for early harvest of crops, where possible, with compensation to be paid for any actual crop losses. During the construction process, it may be necessary for the property owner to remove or relocate equipment and livestock from the ROW. Compensation related to these activities will be discussed with the landowner during easement negotiations.

Figure 6-1. Standard Tree Removal Practices



Transmission line structures are generally designed for installation at existing grades. Therefore, structure sites will not be graded or leveled unless it is necessary to provide a reasonably level area for construction access and activities. For example, if vehicle or installation equipment cannot safely access or perform construction operations properly near the structure, minor grading of the immediate terrain may be necessary.

Great River Energy will employ standard construction and mitigation practices that were developed from experience with past projects as well as industry-specific Best Management Practices (BMPs). BMPs address ROW clearing, erecting transmission line structures and stringing transmission lines. BMPs for each specific project are based on the proposed schedules for activities, prohibitions, maintenance guidelines, inspection procedures and other practices. In some cases these activities, such as schedules, are modified to incorporate BMP installation that will assist in minimizing impacts to sensitive environments. Any contractors involved in construction of the transmission line will adhere to these BMP requirements.

New structures, including the interconnecting switch structure, will be installed directly in the ground, by augering or excavating a hole typically 8 to 15 feet deep and 2 to 5 feet in diameter for each pole. Any excess soil from the excavation will be spread and leveled near the structure or removed from the site, if requested by the property owner or regulatory agency.

The new structures will then be set and the holes back-filled with the excavated material, native soil, or crushed rock. Based on typical soil types in Minnesota, it is anticipated that the average structure depth of a standard 70-foot long pole would be approximately 9 feet deep. In poor soil conditions (peat, marl, soft clay or loose sand), and on structures requiring increased foundation strength (such as laminated wood switch structures), a galvanized steel culvert is sometimes installed vertically with the structure set inside. Concrete foundations may be necessary in special cases. Drilled pier foundations may vary from 4 to 8 feet in diameter. Concrete trucks are normally used to bring the concrete in from a local concrete batch plant.

After a number of new structures have been erected, Great River Energy will begin to install the new static wire by establishing stringing setup areas within the ROW. These stringing setup areas are usually located every two miles along a project route and occupy approximately 15,000 square feet of land. Conductor stringing operations require brief access to each structure to secure the conductor wire and shield wire once the final sag is established. Temporary guard or clearance structures are installed, as needed, over existing distribution or communication lines, streets, roads, highways, railways or other obstructions after any necessary notifications are made or permits obtained. This ensures that conductors will not obstruct traffic or contact existing energized conductors or other cables. In addition, the conductors are protected from damage.

The proposed transmission line will cross a number of wetlands and will span the South Fork of the Pine River. Crossing of the wetlands and river will require particular attention during construction. Great River Energy will not allow construction equipment to be driven across the river except under special circumstances (such as if a landowner does not allow access) and only after discussion with the appropriate resource agency. Where the river must be crossed to pull in the new conductors and shield wires, workers may walk across or drive equipment across ice in the winter. In areas where construction occurs close to the river, BMPs help prevent soil erosion and ensure that equipment fueling and lubricating occur at a distance from the river.

6.6 Restoration Procedures

During construction, limited ground disturbance at the structure sites will occur. Marshalling yard agreements will be obtained from property owner(s) or agency(ies) for temporary storage of materials and equipment. Typically, a previously-disturbed or developed area is used, and includes sufficient space to lay down material and pre-assemble some structural components or hardware and store construction equipment. Portions of the ROW or property immediately adjacent to the ROW may be used for structure laydown and framing prior to structure installation. Additionally, stringing setup areas are used to store conductors and equipment necessary for stringing operations. Disturbed areas are restored to their original condition to the maximum extent practicable, or as negotiated with the landowner.

Post-construction reclamation activities will include removing and disposing of debris, removing all temporary facilities (including staging and laydown areas), employing appropriate erosion control measures, reseeding areas disturbed by construction activities with vegetation similar to that which was removed with a seed mixture certified as free of noxious or invasive weeds, and restoring the areas to their original condition to the extent possible. In cases where soil compaction has occurred, the construction crew or a restoration contractor uses various methods to alleviate the compaction, or as negotiated with landowners.

The ROW agent will contact landowners after construction is complete to determine if the clean-up measures have been to their satisfaction and if any other damage may have occurred. If damage has occurred to crops, fences or the property, Great River Energy will compensate the landowner. In some cases, an outside contractor may be hired to restore the damaged property as near as possible to its original condition.

6.7 Operation and Maintenance

Access to the ROW of a completed transmission line is required to perform periodic inspections, conduct maintenance and repair damage. Regular maintenance and inspections will be performed during the life of the transmission line to ensure its continued integrity. Generally, Great River Energy will inspect the transmission line once per year. Inspections will be limited to the ROW and to areas where off-ROW access is required due to ROW obstructions or terrain impediments. If problems are found during inspection, repairs will be performed and property restoration will occur or the landowner will be provided reasonable compensation for any damage to the property.

The ROW will be managed to remove vegetation that interferes with the operation and maintenance of the transmission line. Native shrubs that will not interfere with the safe operation or accessing and traversing the ROW of the transmission line will be allowed to reestablish in the ROW. Great River Energy's practice generally provides for the inspection of 115 kV transmission lines every two years to determine if clearing is required. ROW clearing practices include a combination of mechanical and hand clearing, along with herbicide application (where allowed), to remove or control vegetation growth.

The estimated annual cost of ROW maintenance and operation and maintenance of Great River Energy's transmission lines (69 kV to 500 kV) in Minnesota currently average about $2,000 per mile. Actual transmission line specific maintenance costs will depend on the environmental setting, the amount of vegetation management necessary, storm damage occurrences, structure types, age of the line, etc.

6.8 Electric and Magnetic Fields (EMF)

As it pertains to the Project, the term "EMF" refers to the extremely low frequency (ELF) decoupled electric and magnetic fields that are present around any electrical device or conductor and can occur indoors or outdoors. Electric fields are the result of electric charge, or voltage, on a conductor. The intensity of an electric field is related to the magnitude of the voltage on the conductor. Magnetic fields are the result of the flow of electricity, or current, traveling through a conductor. The intensity of a magnetic field is related to magnitude of the current flow through

the conductor. Electric and magnetic fields can be found in association with transmission lines, local distribution lines, substation transformers, household electrical wiring, and common household appliances.

Given the distance (110 feet) between the Minnesota Power DC Line and the proposed 115 kV transmission line that will be parallel to it, electric and magnetic field interactions between the two circuits should be negligible. Therefore, the electric and magnetic fields for the proposed 115 kV transmission line discussed in the sections below were evaluated independent of the DC Line. 115 kV transmission lines typically do not induce a current or charge on other metal objects outside of the ROW.

6.8.1 Electric Fields

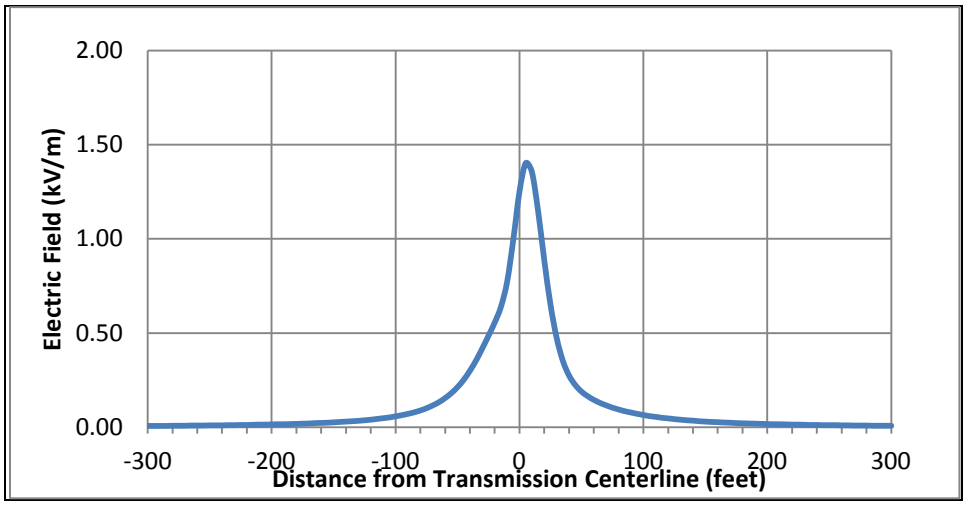
Voltage on a wire produces an electric field in the area surrounding the wire. The voltage on the conductors of a transmission line generates an electric field extending from the energized conductors. The intensity of transmission line electric fields is measured in kilovolts per meter (kV/m), and the magnitude of the electric field rapidly decreases with distance from the transmission line conductors. The presence of trees, buildings, or other solid structures in the path of the field can also significantly reduce the magnitude of the electric field. Because the magnitude of the voltage on a transmission line is near-constant (ideally within ±5 percent of nominal), the magnitude of the electric field will be near-constant regardless of the power flowing on the line.

Although there is no state or federal standard for transmission line electric field exposures, the Environmental Quality Board (EQB) developed a standard of a maximum electric field limit of 8 kV/m at one meter above ground. This standard has been adopted by the Commission. Great River Energy has calculated the approximate electric field for the Project's transmission configuration and estimates the peak magnitude of electric field density to be well below the EQB standard at approximately 1.36 kV/m underneath the conductors, one meter (3.28 feet) above ground. **Table 6-1** summarizes the electric fields calculated for the proposed single circuit transmission line. These electric field calculations are also shown graphically in **Figure 6-2**.

Table 6-1. Calculated Electric Fields (kV/M) for Proposed Transmission Line Design (One meter (3.28 feet) above ground)

Scenario	Max. Operating Voltage (kV)	Distance to Proposed Centerline										
		-300'	-200'	-100'	-50'	-25'	Max.	25'	50'	100'	200'	300'
115 kV Single Circuit (**Figure 6-2**)	121	0.01	0.02	0.06	0.22	0.49	1.36	0.67	0.20	0.07	0.02	0.01

Figure 6-2. 115 kV Single Circuit Line Electric Field Profile



Induced Voltage

When an electric field reaches a nearby conductive object, such as a vehicle or a metal fence, it can induce a voltage on the object. The magnitude of this voltage is dependent on many factors, including the object's capacitance, shape, size, orientation and location, resistance with respect to ground, and the weather conditions. If the object is insulated or semi-insulated from the ground and a person touches it, a small current could pass through the person's body to the ground. This might be accompanied by a spark discharge and mild shock, similar to what can occur when a person walks across a carpet and touches an object or person.

The main concern with induced voltage is not the magnitude of the voltage induced, but the current that would flow through a person to the ground should the person touch the object. To ensure the safety of persons in the proximity of high voltage transmission lines, the NESC requires that any discharge be less than five (5) milliAmperes root mean square (mA rms). Great River Energy would ensure that any fixed conductive object in close proximity or parallel to the Project, such as a fence or other permanent conductive fixture, would be grounded so any discharge would be less than the 5 mA rms NESC limit.

Implantable Medical Devices

High intensity EMF can have adverse impacts on the operation of implantable medical devices (IMDs) such as pacemakers and defibrillators. While research has shown that the magnetic fields associated with high voltage transmission lines do not reach levels at which they could cause interference with such devices, it is possible that the electric fields associated with some high voltage transmission lines could reach levels high enough to induce sufficient body currents to cause interference.

Modern "bipolar" cardiac devices are much less susceptible to interactions with electric fields. Medtronic and Guidant, manufacturers of pacemakers and other IMDs, have indicated that electric fields below 6 kV/m are unlikely to cause interactions affecting operation of most of

their devices. **Table 6-1** and **Figure 6-2** show that the electric fields for the Project are well below levels at which modern bipolar devices are susceptible to interaction with the fields.

The older "unipolar" designs of cardiac devices are more susceptible to interference from electric fields. Research from the early 1990s indicates that the earliest evidence of interference with these types of IMDs could occur in electric fields ranging from 1.2 to 1.7 kV/meter. For older style unipolar designs, the electric fields do exceed levels that research from the 1990s has indicated may produce interference. However, recent research conducted in 2005 concluded that the risk of interference to unipolar cardiac devices from high voltage power lines in everyday life is small. In 2007, Minnesota Power and Xcel Energy conducted studies with Medtronic, Inc. under 115 kV, 230 kV, 345 kV, and 500 kV transmission lines to confirm these 2005 findings. The analysis was based on real life public exposure levels under actual transmission lines in Minnesota and found no adverse interaction with pacemakers or IMDs. The analysis concluded that although interference may be possible in unique situations, device interference as a result of typical public exposure would be rare.[2]

In the unlikely event that a pacemaker is impacted, the effect is typically a temporary asynchronous pacing (commonly referred to as reversion mode or fixed rate pacing). The pacemaker would return to its normal operation when the person moves away from the source of the interference.

6.8.2 Magnetic Fields

Current passing through any conductor, including a wire, produces a magnetic field in the area around the wire. The current flowing through the conductors of a transmission line generates a magnetic field that, in similar fashion to the electric field, extends outward from the energized conductors. The intensity of the magnetic field associated with a transmission line is proportional to the amount of current flowing through the line's conductors, and the magnitude of the magnetic field rapidly decreases with the distance from the conductors. Unlike electric fields, magnetic fields are not significantly affected by the presence of trees, buildings, or other solid structures nearby. The value of the magnetic field density is expressed in the unit of gauss (G) or milligauss (mG).

There are no federal or Minnesota exposure standards for magnetic fields. The EQB and the Commission have recognized Florida (a 150-mG limit) and New York (a 200-mG limit) state standards. Both state standards are to be considered at the edge of ROW. Recent studies of the health effects from magnetic fields conclude that the evidence of health risk is weak.[3] The general standard is one of prudent avoidance.

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[2] 2007 Minnesota Power Systems Conference Proceedings (University of Minnesota), *Electromagnetic Compatibility of Active Implantable Medical Devices (AIMD) and Their Interaction with High Voltage Power Lines*, at 23.

[3] Minnesota Department of Health. *EMF White Paper on Electric and Magnetic Field* (EMF) Policy and Mitigation Options. 2002; National Research Council. *Possible Health Effects of Exposure to Residential Electric and Magnetic Fields*. 1997; www.niehs.nih.gov/health/topics/agents/emf/.

Magnetic field levels associated with some common electric appliances are provided in **Table 6-2.**

Table 6-2. Magnetic Fields of Common Electric Appliances (mG) [4]

Appliance	Distance from Source		
	6 inches	1 foot	2 feet
Hair Dryer	300	1	--
Electric Shaver	100	20	--
Can Opener	600	150	20
Electric Stove	30	8	2
Television	NA	7	2
Portable Heater	100	20	4
Vacuum Cleaner	300	60	10
Copy Machine	90	20	7
Computer	14	5	2

Table 6-3 summarizes the magnetic fields calculated for the proposed transmission line configuration with power flow at peak loading and at average loading. The peak load indicated includes the additional load that could occur if Enbridge installs another 7000 horsepower pump at a later date. The magnetic field calculations are also shown graphically in **Figure 6-3.** The maximum magnetic field under expected peak demand conditions is 12.55 mG, which is below most of the levels shown in **Table 6-2**.

Because the actual power flow on a transmission line could potentially vary throughout the day depending on electric demand, the actual magnetic field level could also vary widely from hour to hour. In any case, the typical magnitude of the magnetic field associated with the proposed transmission line is expected to be well below the calculated intensity at the expected peak loading.

6.9 Stray Voltage

"Stray voltage" is a condition that can occur on the electric service entrances to structures from distribution lines. More precisely, 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.

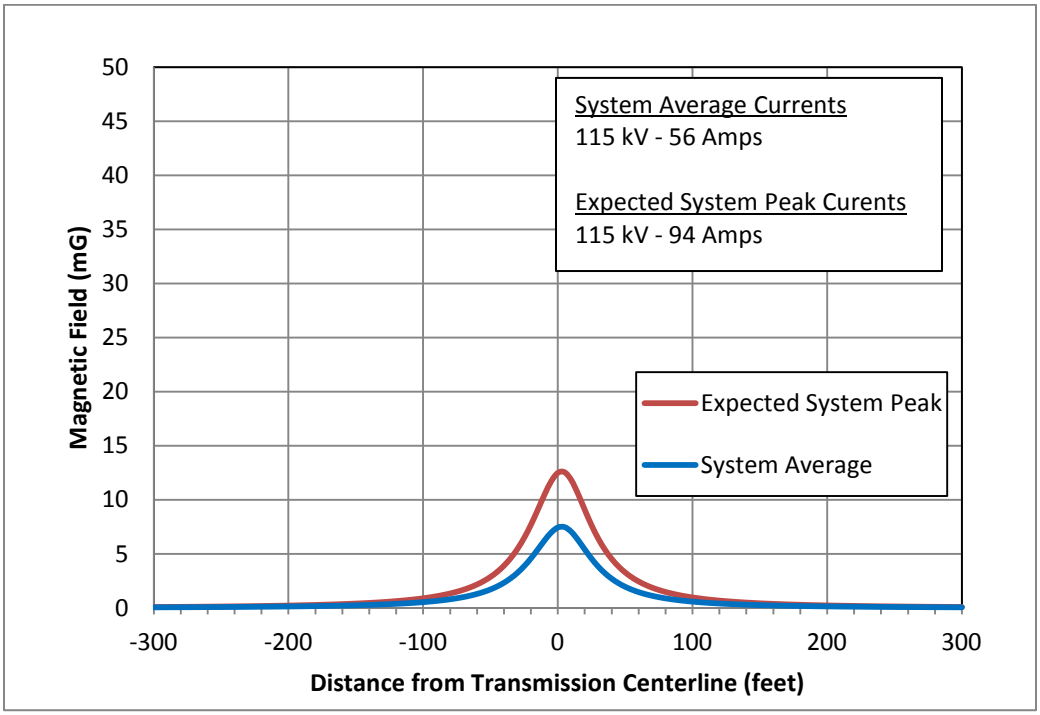
Transmission lines do not, by themselves, create stray voltage because they do not connect to businesses and residences. Transmission lines can, however, induce a current on a distribution circuit that is parallel and immediately under the transmission line. There are no distribution circuits in the vicinity of the Project. If a landowner has stray voltage concerns on their property, Great River Energy suggests they contact their electric service provider to discuss the situation with technical staff, including the possibility of an on-site investigation.

[4] *EMF In Your Environment* (EPA 1992)

Table 6-3. Calculated Magnetic Fields (mG) for Proposed Transmission Line Designs (One meter (3.28 feet) above ground)

Scenario	Max. Operating Voltage (kV)	Line Current (Amps)	Distance to Proposed Centerline										
			-300’	-200’	-100’	-50’	-25’	Max.	25’	50’	100’	200’	300’
115 kV Single Circuit Line Peak Load (**Figure 6-3**)	121	94	0.11	0.25	0.92	2.90	6.51	12.55	7.65	3.30	1.00	0.26	0.12
115 kV Single Circuit Line Average Load (**Figure 6-3**)	121	56	0.07	0.15	0.55	1.73	3.88	7.47	4.56	1.97	0.59.	0.16	0.07

Figure 6-3. 115 kV Single Circuit Line Magnetic Field Profile



6.10 Corona

Under certain conditions, the localized electric fields near an energized transmission line conductor can produce small electric discharges, ionizing nearby air. This is commonly referred to as the "corona" effect. Most often, corona formation is related to some sort of irregularities on the conductor, such as scratches or nicks, dust buildup, or water droplets. The air ionization caused by corona discharges can result in the formation of audible noise and radio frequency noise. If the discharges are excessive, the audible noise can reach annoyance levels and the radio frequency discharges can cause interference with radio and television reception. The potential for radio and television signal interference, however, is largely dependent on the magnitude of the corona-induced radio frequency noise *relative to* the strength of the broadcast signals.

Corona formation is a function of the conductor radius, surface condition, line geometry, weather condition, and most importantly, the line's operating voltage. Corona-induced audible noise and radio and television interference are typically not a concern for power lines with operating voltages below 161 kV, because the electric field intensity is too low to produce significant corona. The expected electric field intensity due to the proposed transmission line is provided in **Section 6.8.1**.

6.10.1 Radio and Television Interference

Because the likelihood of significant corona formation on the proposed 115 kV line is minimal, the likelihood of radio and television interference due to corona discharges associated with the Project is also minimal. Great River Energy is unaware of any complaints related to radio or television interference resulting from the operation of its existing 115 kV facilities and does not expect radio and television interference to be an issue along the proposed route.

6.10.2 Audible Noise

Transmission lines can cause audible noise due to corona discharges from the conductors. This noise, which resembles a crackling sound, is typically only within the threshold of human hearing during rainy or foggy conditions, and even then is largely imperceptible due to background noise. The impacts and mitigation of audible noise due to the Project are discussed further in **Section 7.2.3**.

6.10.3 Ozone and Nitrogen Oxide Emissions

In addition to potentially causing audible and radio frequency noise, corona can also produce ozone and oxides of nitrogen in the air surrounding the conductor. Ozone is a very reactive form of oxygen molecule that combines readily with other elements and compounds in the atmosphere, making it relatively short lived. Ozone 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 the conditions that are most likely to cause corona formation on a transmission line – humid, rainy, or foggy conditions – actually inhibit the production of ozone.

Like audible and radio frequency noise, corona-induced ozone and nitrogen oxides are typically not a concern for power lines with operating voltages below 161 kV, because the electric field intensity is too low to produce significant corona. Therefore, Great River Energy expects ozone and nitrogen oxide concentrations associated with the Project to be negligible, and well below all federal standards (nitrogen dioxide – 100 parts per billion as one hour average, 53 parts per billion as annual average; ozone 75 parts per billion as 8-hour average).

7 ENVIRONMENTAL ANALYSIS OF ROUTES

This portion of the Application provides a description of the land use and environmental resources in the Project area, potential impacts, and proposed mitigative measures.

The name of each owner whose property is within the proposed route is provided in **Appendix C.**

The Project has been reviewed by a number of state and federal agencies. All environmental review correspondence related to the proposed Project is provided in **Appendix D.**

7.1 Environmental Setting

The Project lies in the Pine Moraines and Outwash Plains Subsection of the Laurentian Mixed Forest Province, according to the DNR Ecological Classification System.
The Laurentian Mixed Forest Province is characterized by broad areas of conifer forest, mixed hardwood and conifer forests, and conifer bogs and swamps. The landscape ranges from rugged lake-dotted terrain with thin glacial deposits over bedrock, to hummocky or undulating plains with deep glacial drift, to large, flat, poorly drained peatlands.
The Pine Moraines and Outwash Plains Subsection is a mix of outwash plains, end moraines, till plains, and drumlin fields.

The environmental setting of the Project area (within a couple miles of the proposed route) includes hydrologic features such as rivers, creeks, lakes, wetlands and riparian areas. The physiographic features (topography, soils, geology and farmland) are typical of this area and do not preclude development of this Project. Wildlife habitat exists in pockets throughout the Project area.

Land use along the proposed route is primarily forest and shrub land, with some areas of agricultural land/grassland, wetlands and one rural residence. The closest communities to the Project include the cities of Backus and Pine River.

There are three existing Minnesota Power transmission lines within the Project area. The line furthest to the west is the Minnesota Power 230 kV #91 Line, with an average height above ground of 74 feet and an average span length of 856 feet. No modifications to this line are anticipated as a result of the proposed Project. The Minnesota Power 115 kV #142 Line is just east of the #91 Line within the same transmission line corridor. The average height above ground is 61 feet and average span length is 709 feet. The Bull Moose 115 kV transmission line will interconnect with this line. The proposed route for the Bull Moose 115 kV transmission line will parallel (immediately adjacent to) the Minnesota Power ±250 kV DC line. The DC Line average height above ground is 73 feet and average span length is 717 feet.

7.2 Human Settlement

7.2.1 Public Health and Safety

Proper safeguards would be implemented for construction and operation of the transmission facilities. The Project will be designed in compliance with local, state, NESC, and Great River Energy standards regarding clearance to the ground, clearance to crossing utilities, strength of materials and ROW widths. Construction crews and/or contract crews will comply with local, state, and NESC standards regarding installation of facilities and standard construction practices. Great River Energy's established safety procedures, as well as industry safety procedures, will be followed during and after installation of the transmission line, including clear signage during all construction activities.

The new Enbridge Backus Substation will be equipped with breakers and relays located where the transmission line will connect to the substation. The protective equipment is designed to de-energize the transmission line should such an event occur.

Electric and Magnetic Fields

Considerable research has been conducted since the 1970s to determine whether exposure to power-frequency, commonly referred to as "extremely-low frequency" or "ELF" (60 hertz), electric fields (EF) and magnetic fields (MF) can cause biological responses and adverse health effects. The multitude of epidemiological and toxicological studies has shown, at most, a weak association (*i.e.*, no statistically significant association) between ELF-MF exposure and health risks and no association between ELF-EF 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. In the report, the 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, in light of the weak scientific evidence supporting some association between EMF and health effects and the fact that exposure to electricity is common in the United States, the NIEHS stated that passive regulatory action, such as providing public education on reducing exposures, is warranted.[5]

The United States Environmental Protection Agency (EPA) seems to have come to a similar conclusion about the link between adverse health effects, specifically childhood leukemia, and power-frequency EMF exposure. On its website, the EPA states:

> Many people are concerned about potential adverse health effects. Much of the research about power lines and potential health effects is inconclusive. Despite more than two decades of research to determine whether elevated EMF exposure, principally to magnetic fields, is related to an increased risk of childhood leukemia, there is still no definitive answer. The general scientific consensus is

[5] Report is available at http://www.niehs.nih.gov/health/topics/agents/emf/

> that, thus far, the evidence available is weak and is not sufficient to establish a definitive cause-effect relationship.[6]

Minnesota, California, and Wisconsin have each conducted their own literature reviews or research to examine this issue. In 2002, Minnesota formed an Interagency Working Group to evaluate the research and develop policy recommendations to protect the public health from any potential problems arising from EMF effects associated with HVTLs. The Minnesota Department of Health published the Working Group's findings in *A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options*. The Working Group summarized its findings as follows:

> 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.[7]

In 2007, the World Health Organization (WHO) conducted an intensive review of the health implications of ELF-MFs. WHO concluded that "virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF magnetic fields and changes in biological function or disease status."[8] Based on its review, WHO did not recommend exposure limits but provided that "[t]he best source of guidance for both exposure levels and the principles of scientific review are international guidelines."[9] The guidelines referred to by WHO are those of the International Commission on Non-Ionizing Radiation Protection (ICNIRP)[10] and the Institute of Electrical and Electronic Engineers (IEEE) exposure limit guidelines.[11] At the time WHO completed its review, the ICNIRP continuous general public exposure guideline was 833 mG and the IEEE continuous general public exposure guideline was 9,040 mG. In 2010, ICNIRP revised its continuous general public exposure guideline to 2,000 mG. The WHO has not provided any analysis of the 2010 ICNIRP continuous general public exposure guideline to date.

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[6] http://www.epa.gov/radtown/power-lines.html

[7] Minnesota Department of Health. 2002. *A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options*

[8] World Health Organization. 2007. *Environmental Health Criteria Volume No. 238 on Extremely Low Frequency Fields* at 12.

[9] *Id.* at 12-13.

[10] ICNIRP is a non-governmental organization in formal relations with WHO.

[11] *Id.*

Based on findings like those of the Working Group and NIEHS, the Commission has consistently found that "there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects."[12] This conclusion was further justified in the Route Permit proceedings for the Brookings County – Hampton 345 kV Project ("Brookings Project"). In the Brookings Project Route Permit proceedings, the Applicants (Great River Energy and Xcel Energy) and one of the intervening parties both provided expert evidence on the potential impacts of ELF-EF and ELF-MF, including the WHO findings. The ALJ in that proceeding evaluated written submissions and a day-and-a-half of testimony from the two expert witnesses. The ALJ concluded: "there is no demonstrated impact on human health and safety that is not adequately addressed by the existing State standards for [EF and MF] exposure."[13] The Commission adopted this finding on July 15, 2010.[14]

Impacts and Mitigation

No impacts to public health and safety are anticipated as a result of the Project. The Project will be designed in compliance with local, state, NESC, and Great River Energy standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, and right-of-way widths. The new Enbridge substation will be equipped with breakers and relays located where the transmission line will connect to the substation. The protective equipment is designed to de-energize the transmission line should such an event occur.

Great River Energy will ensure that safety requirements are met during construction and operation of the facilities. Additionally, when crossing roads or railroads during stringing operations, guard structures will be utilized to eliminate traffic delays and provide safeguards for the public. With implementation of these safeguards and protective measures, no additional mitigation is proposed.

7.2.2 Displacement/Proximity of Project to Businesses and Residences

No displacement of residential homes, structures or businesses will occur as a result of this Project. The NESC and Great River Energy standards require certain clearances between transmission line structures and buildings or structures within the ROW for safe operation of the proposed transmission line. Displacement of residential homes, structures or businesses in the ROW would occur only if a transmission line alignment and design could not accomplish these necessary clearances. Great River Energy believes the proposed Project route provides sufficient

[12] See, for example, *In the Matter of the Application for a HVTL Route Permit for the Tower Transmission Line Project,* Docket No. ET-2, E015/TL-06-1624, Findings of Fact, Conclusions of Law and Order Issuing a Route Permit to Minnesota Power and Great River Energy for the Tower Transmission Line Project and Associated Facilities (August 1, 2007)

[13] *In the Matter of the Route Permit Application by Great River Energy and Xcel Energy for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota,* Docket No. ET-2/TL-08-1474, ALJ Findings of Fact, Conclusions and Recommendation at Finding 216 (April 22, 2010 and amended April 30, 2010)

[14] *In the Matter of the Route Permit Application by Great River Energy and Xcel Energy for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota*, Docket No. ET-2/TL-08-1474, Order Granting Route Permit (September 14, 2010)

design flexibility and distances from existing homes and structures for a transmission line design that achieves the requisite clearances.

There is only one residence in the vicinity of the proposed transmission line, a house and associated agricultural outbuildings approximately 1,100 feet from the centerline (see detailed route maps in **Appendix B)**.

Impacts and Mitigation

No residences or businesses will be displaced by the Project. The Project will be designed in compliance with local, state, NESC, and Great River Energy standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, and right-of-way widths.

Great River Energy will work with landowners to address alignment adjustments or pole placement, as necessary.

7.2.3 Noise

There will be some noise associated with the construction phase of the Project, and from operation of the transmission line.

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 7-1** shows noise levels associated with common, everyday sources.

Table 7-1. 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: Minnesota Pollution Control Agency (2008)

The MPCA established daytime and nighttime noise standards by Noise Area Classifications (NAC) are provided in **Table 7-2**. 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 (30 minutes) within an hour, while L_{10} is the dBA that may be exceeded 10 percent of the time (6 minutes) within the hour.

Table 7-2. MPCA Noise Limits by Noise Area Classification (dBA)

Noise Area Classification	Daytime		Nighttime	
	L_{50}	L_{10}	L_{50}	L_{10}
1 Residential-type Land Use Activities	60	65	50	55
2 Commercial-type Land Use Activities	65	70	65	70
3 Industrial-type Land Use Activities	75	80	75	80

Land areas, such as picnic areas, churches, or commercial spaces, are assigned a NAC based on the type of activities or use occurring in the area and the sensitivity of the activities to noises. The NAC is listed in the MPCA noise regulations to distinguish the categories. Residential areas, churches, and similar type land use activities are included in NAC 1; commercial-type land use activities are included in NAC 2; and industrial-type land use activities are included in NAC 3.

Typically the most noise-sensitive receptors along transmission line routes include residences, businesses, churches, and schools. Current average noise levels in these areas are typically in the 30 to 40 dBA range and are considered acceptable for residential land use activities. Ambient noise in rural areas is commonly made up of rustling vegetation and infrequent vehicle pass-bys. Higher ambient noise levels, typically 50 to 60 dBA, will be expected near roadways, urban areas and commercial and industrial properties.

Noise Related to Construction

Construction noise is expected to occur during daytime hours as the result of heavy equipment operation and increased vehicle traffic associated with the transport of construction personnel and materials to and from the work area.

Noise Related to Transmission Lines

Operational noise levels produced by a 115 kV transmission line are generally less than outdoor background levels and are therefore not usually perceivable. Proper design and construction of the transmission line in accordance with industry standards will help to ensure that noise impacts are not problematic. Noise associated with operation of the transmission facilities is discussed further below.

Transmission lines can generate a small amount of sound energy during corona activity where a small electrical discharge caused by the localized electric field near energized components and conductors ionizes the surrounding air molecules. Corona is the physical manifestation of energy loss and can transform discharge energy into very small amounts of sound, radio noise, heat, and chemical reactions of the air components. Several factors, including conductor voltage, shape and diameter, and surface irregularities such as scratches, nicks, dust, or water drops can affect a conductor's electrical surface gradient and its corona performance.

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.

The industry standard for utilities is calculated based on L_{50} and L_5 for audible noise emissions. The worst-case scenario is when the transmission line is exposed to heavy rain conditions (one inch per hour). Anticipated noise levels for heavy rain conditions for a typical 115 kV line based on the results from the Bonneville Power Administration Corona and Field Effects Program version 3 (U.S. Department of Energy, Bonneville Power Administration (BPA), Undated) are listed in **Table 7-3**.

Table 7-3. Anticipated Transmission Line Noise Levels with Heavy Rain

L_5	L_{50}	Location
17.7 dBA	14.2 dBA	edge of right-of-way
18.8 dBA	15.3 dBA	directly under line

Impacts and Mitigation

Noise associated with construction of the Project will be temporary in nature. To mitigate noise impacts associated with construction activities, work will be limited to daytime hours between 7 a.m. and 10 p.m. weekdays. Occasionally there may be construction outside of those hours mentioned or on a weekend if Great River Energy has to work around customer schedules, line outages, or if the schedule has been significantly impacted due to permitting delays or other factors. Heavy equipment will also be equipped with sound attenuation devices such as mufflers to minimize the daytime noise levels.

Operational noise levels are expected to be well below the state noise limits, therefore no mitigation is proposed.

7.2.4 Aesthetics

The transmission line will be a new feature visible along the route; however, there is already considerable utility infrastructure in the area (the line will parallel an existing ±250 kV DC transmission line, and will interconnect with an existing 115 kV transmission line that is adjacent to a 230 kV transmission line). The majority of the structures will be wood poles approximately 70 to 80 feet above ground with spans between poles ranging from 350 to 400 feet. A maximum span will be used between the structures as necessary while still keeping the conductor within the ROW under maximum blowout conditions. The typical ROW required for a 115 kV transmission line is 100 feet wide.

The new infrastructure will be visible in the general area of the Project. The landscape in the Project area is a mix of rural residential, forested land, agricultural land, recreation areas, open space, and utility infrastructure. The visual effect will depend largely on the perceptions of the observers across these various landscapes. The visual contrast added by the transmission structures and lines may be perceived as a visual disruption or as points of visual interest. The transmission lines that already exist in the vicinity of the proposed Project will limit the extent to which the new infrastructure is viewed as a disruption to the area's scenic integrity.

Impacts and Mitigation

To minimize impacts to the aesthetics and visual character of the Project area, Great River Energy identified a proposed route that is immediately adjacent to (but not overlapping) an existing transmission line ROW and avoids residences and businesses.

Great River Energy will work with landowners to identify concerns related to the transmission line and aesthetics. In general, mitigation includes enhancing positive effects as well as minimizing or eliminating negative effects. Potential mitigation measures include:

- Location of structures, ROW, and other disturbed areas will be determined by considering input from landowners or land management agencies to minimize visual impacts.

- Care shall be used to preserve the natural landscape. Construction and operation shall be conducted to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the work.

- Landowners will be compensated for the removal of trees and vegetation during easement negotiations.

- Structures will be placed at the maximum feasible distance from road, trail, and water crossings, within limits of structure design.

7.2.5 Socioeconomic

The Project is located in Cass County in north central Minnesota.

The socioeconomic setting of the proposed Project area was evaluated on a regional basis, comparing data for the City of Backus and Bull Moose Township with average data for Cass County and the State of Minnesota. Data compiled from the 2000 and 2010 U.S. Census are summarized in **Table 7-4**.

Table 7-4. Socioeconomic Characteristics within the Project Area

LOCATION	POPULATION 2000	POPULATION 2010	CHANGE (%)	MEDIAN HOUSEHOLD INCOME	POPULATION BELOW POVERTY LEVEL (%)
State of Minnesota	4,919,479	5,303,925	7.8%	$59,836 (2009-2013)	11.5 (2009-2013)
Cass County	27,150	28,567	5.2%	$45,045 (2009-2013)	16.4 (2009-2013)
City of Backus	312	250	-19.8%	$33,958 (2009-2013)	39.5 (2009-2013)
Bull Moose Township, Cass County	107	133	24%	$31,563 (2000)	9.8 (2000)

Impacts and Mitigation

Impacts to social services would be unlikely because of the short-term nature of the construction project. During construction, there will be short-term positive impacts to the nearby communities. Revenue will likely increase for some local businesses, such as hotels, grocery stores, gas stations and restaurants to support utility personnel and contractors. Some materials may be purchased locally.

Long term benefits of the Project will result from the new utility infrastructure, which supports local economies and the proposed Enbridge pump station.

Because impacts to socioeconomics will be generally short-term and beneficial, no mitigation is proposed.

7.2.6 Cultural Values

Cultural values include those perceived community beliefs or attitudes in a given area, which provide a framework for community unity. The population of Cass County derives from a diverse ethnic heritage, with (according to Wikipedia), the majority (57 percent) of the reported ethnic backgrounds of European origin (German, Norwegian, Swedish, and Irish).

Cass County is home of the Cass County Museum and Historical Society, 4th of July traditional Pow Wows, the Lake Bluegrass Festival, and the Eel Pout Festival.

Cultural representation in community events appears to be more closely tied to geographic features, seasonal events, national holidays, and municipal events than to those based in ethnic heritage.

Impacts and Mitigation

Construction of the proposed Project is not expected to conflict with the cultural values of the area, therefore no mitigation is proposed.

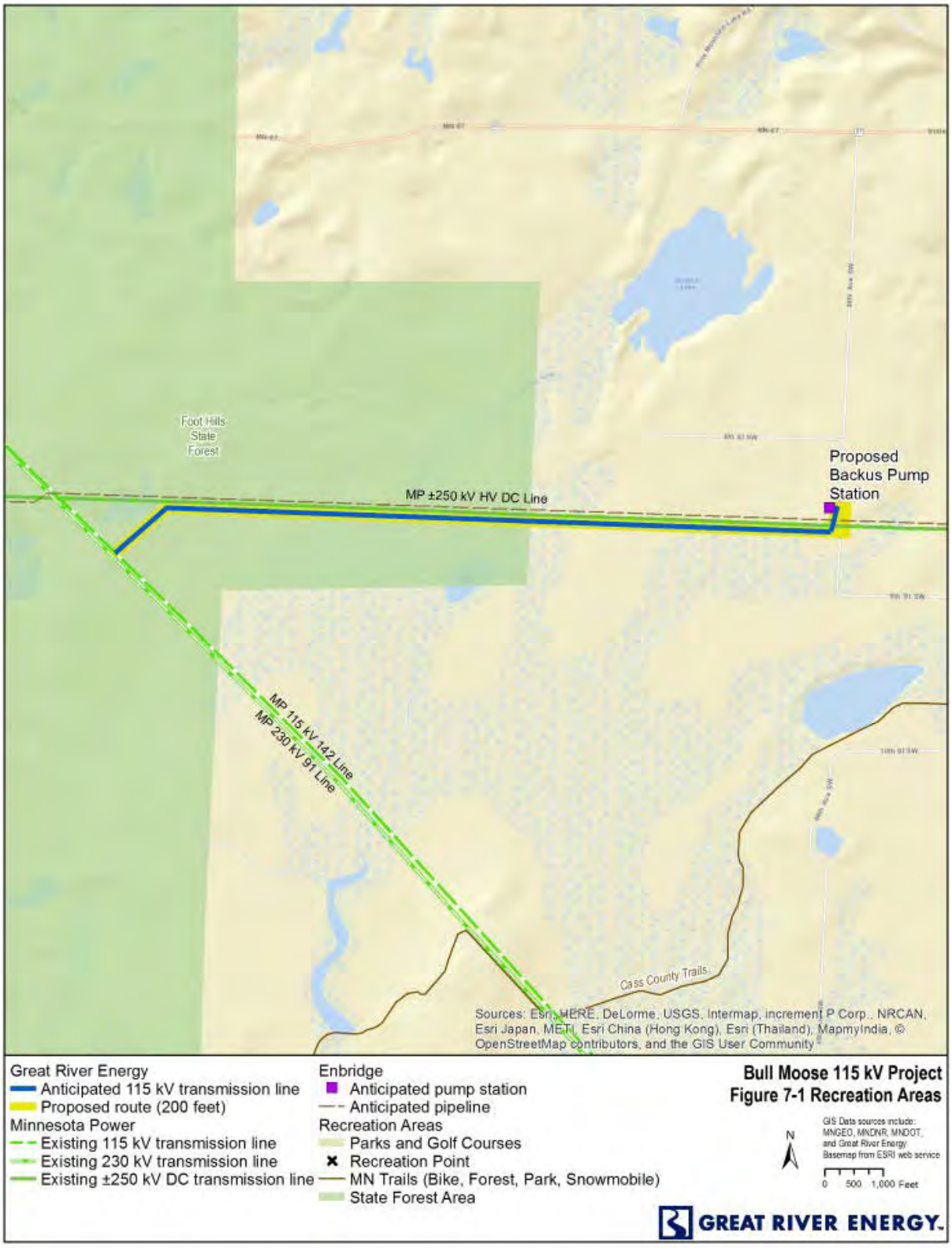
7.2.7 Recreation

There are a number of existing recreational resources within a couple miles of the proposed route, including state forest, trails, rivers, and lakes. Popular activities in Cass County include camping, fishing, hunting, bird watching, canoeing/kayaking, boating, swimming, biking, hiking, cross country skiing and riding ATVs and snowmobiles.

Recreational resources near the proposed route are shown on **Figure 7-1.** The primary recreational resource in the Project area is Foot Hills State Forest[15]. The DNR manages 40 percent of the area, Cass County manages 25 percent, and 35 percent of land within forest boundaries is privately owned. More than 5,000 cords of wood are harvested annually from the publicly-owned forest. The DNR also protects the forest and surrounding areas from wildfires. Hundreds of small lakes and potholes scattered throughout the forest are evidence of the great ice movement that occurred in the region during the glacial era. The terrain in the forest varies from level in the southwest to rolling to steep in the remainder of the area. Timber harvesting, reforestation, wildlife habitat improvement, and recreational development occur in the forest.

[15]http://www.dnr.state.mn.us/state_forests/sft00019/about.html

Figure 7-1. Recreation Areas



Impacts and Mitigation

The proposed transmission line will cross approximately 1.5 miles of the Foot Hills State Forest (**Figure 7-1**).

Clearing vegetation underneath the utility line may decrease the wildlife habitat within the immediate vicinity, potentially impacting viewing opportunities for the short term. Permanent disturbance of wildlife habitat will be minimal and should not affect hunting and wildlife observation.

Great River Energy will coordinate with the DNR, USFWS, and other resource agencies to ensure utility line construction will not significantly impact the surrounding natural resources.

No impacts to local recreational activities are expected. Because no impacts to recreation are anticipated, no mitigation is proposed.

7.2.8 Public Services and Transportation

The Project is located in a rural area with typical public services (police, fire protection, waste collection, natural gas, wells, septic systems, cable television, electricity, telephone, etc.).

Other existing utilities, such as gas/oil pipelines and electric distribution lines, and site improvements, such as septic systems and wells, will be identified during survey activities.

The proposed route parallels (adjacent to but not overlapping the ROW) an existing transmission line for nearly the entire route. The majority of the proposed transmission line and poles will not be located inside existing electric utility easements.

The proposed Project is over 3 miles from the Backus Municipal Airport and approximately 8 miles from the Pine River Regional Airport.

The Minnesota Department of Transportation (MnDOT) Office of Aeronautics was contacted[16] requesting information on the possible effects of the proposed Project on airports or airstrips in the Project area. In an email[17] dated July 9, 2015 (**Appendix D**), MnDOT indicated that the Project will not have any impacts to operations at either the Backus Airport or the Pine River Regional Airport.

Impacts and Mitigation

Based on the location of other existing utilities and site improvements that are identified during survey activities, the transmission line will be designed to meet or exceed required clearances and pole locations will be designed to be outside of existing electric utility easements. Because the route parallels existing electric utility ROW, no impacts to public services are anticipated and therefore no mitigation is proposed.

[16] Letter from Carole Schmidt, Great River Energy to Don Berre, MnDOT. 6 May 2015. *See* Appendix D.
[17] Email from Donald Berre-MnDOT Aeronautics, to Carole Schmidt, Great River Energy. 9 July 2015. *See* Appendix D.

Temporary access for construction of the transmission line would be along the transmission line ROW. If necessary, temporary guard structures would be used to string conductor over the existing road. The structures typically consist of directly-imbedded poles with a horizontal cross piece to support the conductor at sufficient height above traffic. Temporary traffic impacts associated with equipment are material delivery and worker transportation.

Short-term localized traffic delays are anticipated. Impacts resulting from construction and operation of the proposed transmission line would be minimal for transportation.

When appropriate, pilot vehicles will accompany the movement of heavy equipment. Traffic control barriers and warning devices will be used when appropriate. All necessary provisions will be made to conform to safety requirements for maintaining the flow of public traffic. Construction operations will be conducted to offer the least possible obstruction and inconvenience to the traveling public. The construction contractor would be required to plan and execute delivery of heavy equipment in such a manner that would avoid traffic congestion and reduce likelihood of dangerous situations along local roadways.

7.3 Land Use/Zoning

The Project area consists of a variety of land use patterns in a rural environment. Land use along the proposed route is a mix of forest, shrubland, agricultural/grassland, and wetlands (**Figure 7-2**).

Zoning information for the Project area is provided in **Figure 7-3**. The Project is located in the State-Administered Lands, Tax-Forfeited Real Estate, and Agricultural zoning classifications of Cass County.

Impacts and Mitigation

Impacts to land use as a result of the Project are expected to be minimal, and construction of the line would not change the possible land uses for any area. The transmission line ROW will parallel (immediately adjacent to) an existing ±250 kV DC line; the major land use impacts will be tree clearing and minor agricultural impacts. No impacts to residential or commercial/industrial land uses are anticipated; therefore no mitigation is proposed.

7.4 Land-based Economies

7.4.1 Agriculture

According to the 2012 United States Department of Agriculture (USDA) Census of Agriculture, Cass County has 546 individual farms with an average farm size of 288 acres, and farmland covers 157,215 acres in the county. Over $38 million was generated from both crop and livestock sales in 2012.

Agricultural lands within the proposed route consist primarily of pastureland/grassland with some land that is tilled (**Figure 7-2**). The transmission line would cross about 0.5 mile of agricultural land (primarily pasture, approximately 5.9 acres with a 100-foot ROW).

Figure 7-2. Land Use

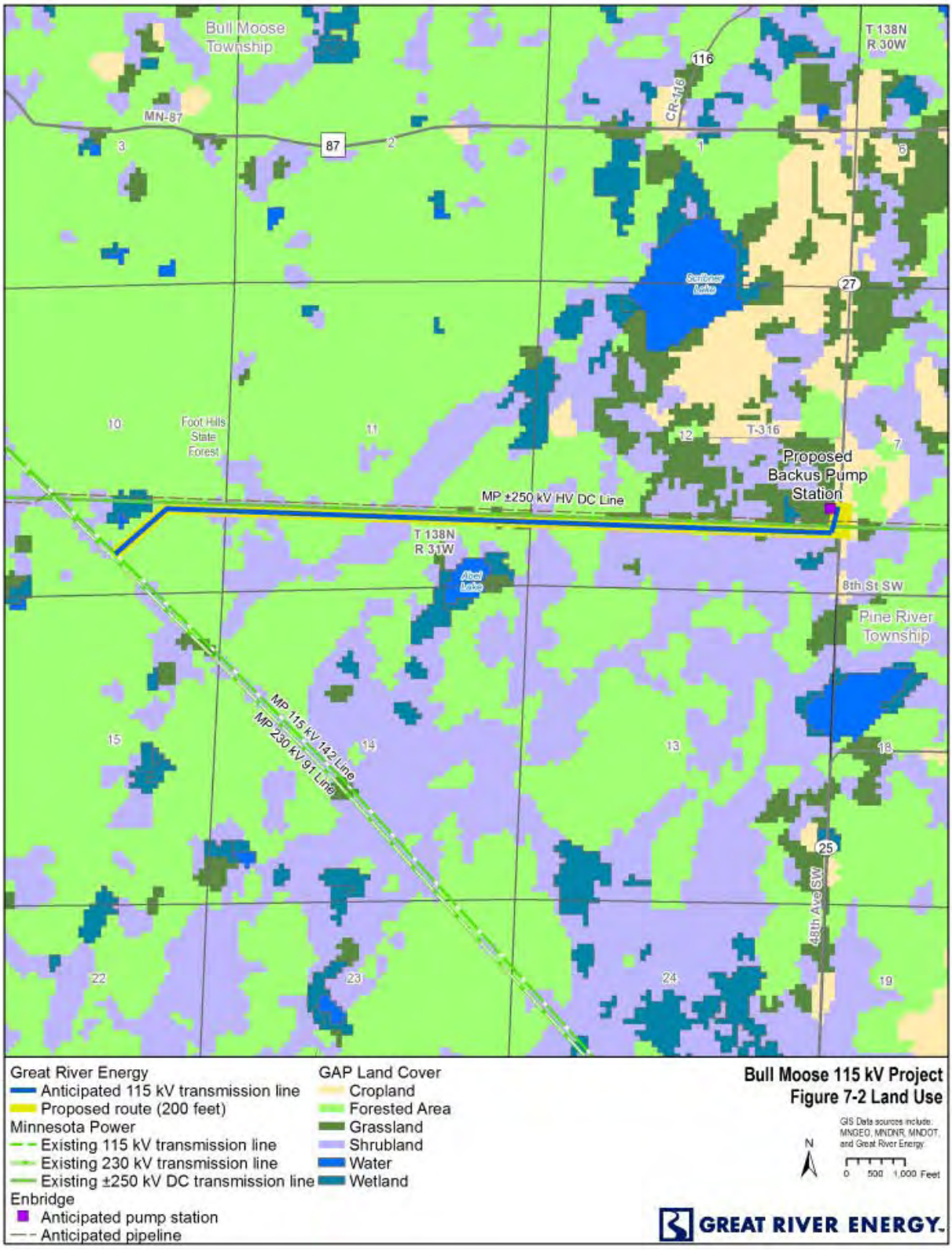
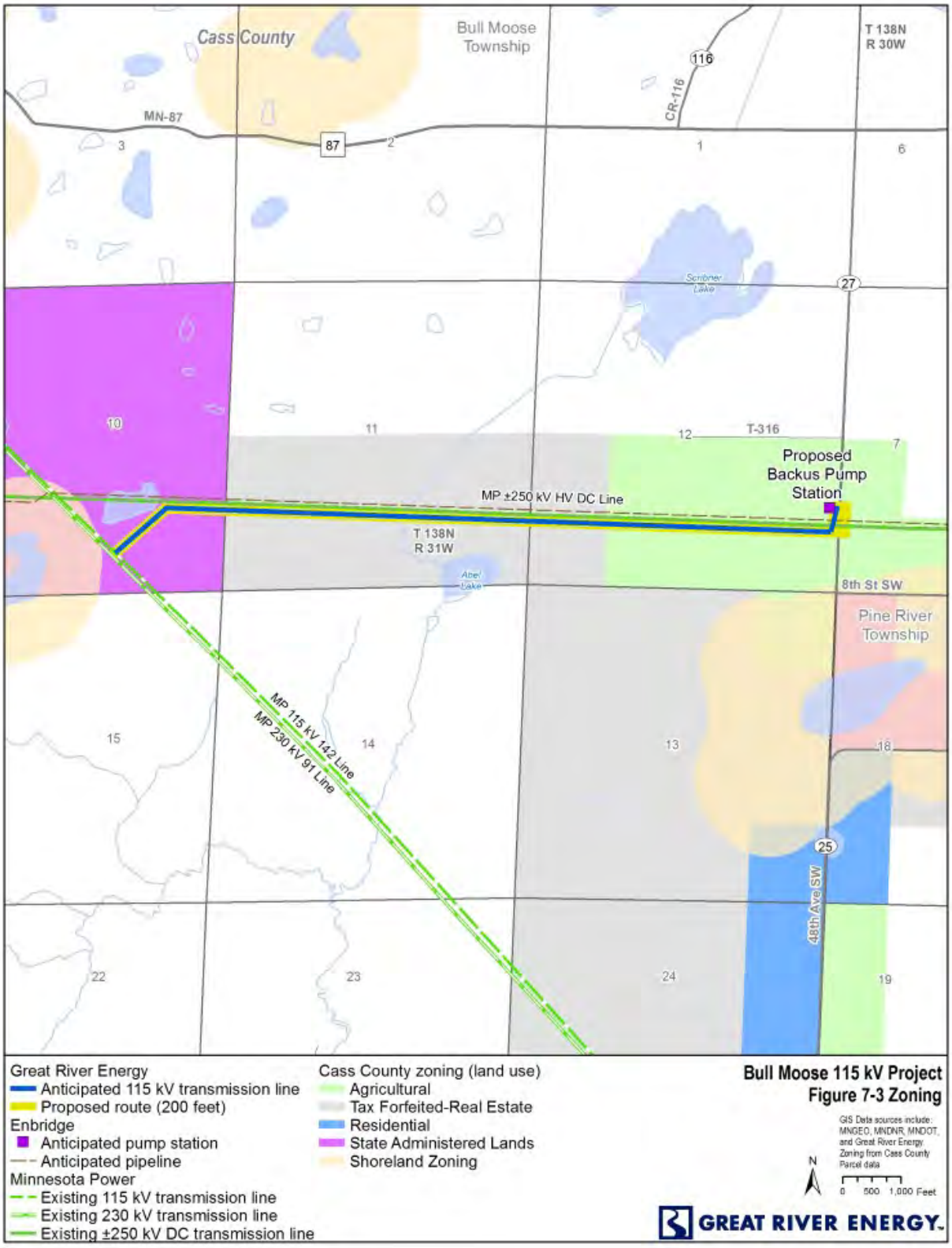


Figure 7-3. Zoning



Impacts and Mitigation

Some agricultural land may be temporarily removed from production during transmission line construction, but permanent agricultural land conversion associated with the transmission line poles will be minimal.

Determination of temporary agricultural impacts that will result from construction is dependent upon final engineering design. The acreage anticipated to be included in temporary construction access points is comprised of primarily pastureland in the vicinity of the proposed route. Construction of new transmission structures will require repeated access to structure locations to install the structures and to string conductor. Equipment used in the construction process includes backhoes, cranes, boom trucks and assorted small vehicles. Operation of these vehicles on adjoining farm fields can cause rutting and compaction, particularly during springtime and otherwise wet conditions.

Permanent agricultural impacts will be the footprint of the pole and the area immediately surrounding it. There are three types of poles that may be used to construct the transmission line: single wood pole, 3-pole and/or H-frame structures, and single steel pole on concrete piers (new taller DC line structures). As discussed in **Section 4.2**, the proposed route for the new 115 kV transmission line crosses underneath the Minnesota Power DC line near the proposed Enbridge substation. This crossing will be accomplished utilizing multi-pole (3-pole deadend) and/or H-frame structures. If it is necessary to permanently raise the MP DC line and install new taller DC line structures to achieve required NESC clearances at the crossing, the new DC structures would most likely be monopole steel structures set on a concrete pier foundation.

It is estimated that there will be six tangent wood structures (approximately 4 square feet of impact per pole), one 3-pole guyed deadend structure (about 1350 square feet of impact with guys) and/or a guyed H-frame structure (about 650 square feet of impact with guys), and two steel poles on concrete piers (about 25 square feet of impact per pole). Total permanent agricultural impacts will vary depending on the structures used to cross under the DC line, but would be up to 2074 square feet (0.05 acre). The larger impact structures (3-pole and/or H-Frame and the concrete piers) would all be in the pastured area of the Project, not the tilled portion, and should have little impact on grazing operations. The majority of the ROW easement would be available for agricultural activities.

Great River Energy will work with landowners to minimize impacts to all agricultural activities along the route and will compensate landowners for any crop damage and soil compaction that may occur during construction. Areas disturbed during construction will be repaired and restored to pre-construction contours as required so that all surfaces drain naturally, blend with the natural terrain and are left in a condition that will facilitate natural revegetation, provide for proper drainage and prevent erosion.

Specific mitigation measures to be implemented include:

- Movement of crews and equipment will be limited to the ROW to the greatest extent possible, including access to the route. Contractors employed by Great River Energy will limit movement on the ROW to minimize damage to grazing land or property. If

movement outside of the ROW is necessary during construction, permission will be obtained and any damage will be paid to the landowner.

- Construction will be scheduled during periods when agricultural activities will be minimally affected to the extent possible or the landowner will be compensated accordingly.

- When weather and ground conditions permit, ruts that are hazardous to agricultural operations will be repaired or compensation will be provided as an alternative if the landowner desires. Such ruts will be leveled, filled and graded or otherwise eliminated in an approved manner. In the pasture area, compacted soils will be loosened and ruts will be leveled by scarifying, harrowing, disking, or by other approved methods. Damage to ditches, terraces, roads, and other features of the land will be corrected using approved methods and indigenous plants where necessary. The land and facilities will be restored as nearly as practicable to their original conditions.

- ROW easements will be purchased through negotiations with each landowner affected by the Project. Restoration or compensation will subsequently be made for reasonable crop damages or other property damage that occurs during construction or maintenance as negotiated.

- Fences, gates and similar improvements that are removed or damaged will be promptly repaired or replaced.

Some temporary construction space will be needed for the Project. For temporary marshalling yards, which will provide space to store material and equipment, Great River Energy will lease the space by agreement with the respective landowner(s), remove and properly dispose of all material and debris, and repair all damages and perform restoration, as necessary. It is anticipated that minimal temporary construction space on property immediately adjacent to the ROW and on private property will be needed, with the exception of limited equipment access.

7.4.2 Forestry

Cass County is about 66 percent commercial forested land, with about 23 percent conifers and 66 percent hardwoods.

Forested areas in the Project area are shown on **Figure 7-2.** The transmission line will cross approximately 2.0 miles of forested land (about 12.9 acres with a 100-foot ROW). Forests in the Project area have routinely been logged for the forest industry and personal use, such as for firewood for heating, and it is expected that this practice will continue into the future.

Impacts and Mitigation

The entire width of the 100-foot ROW would need to be cleared of vegetation to ensure the safe and reliable operation of the transmission line. Mitigation measures for potential impacts to forest resources would be as follows:

- Compensation for the removal of vegetation in the ROW will be offered to landowners during easement negotiations.

- Landowners will be given the option to keep the timber cut within the easement area.

7.4.3 Tourism

Tourist destinations near the proposed route include the Foot Hills State Forest, trails, rivers, and lakes. Popular activities include camping, fishing, hunting, bird watching, canoeing/kayaking, boating, swimming, biking, hiking, golfing, skiing, riding ATVs and snowmobiles. The state forest within the Project area provides opportunities for viewing wildlife and intact ecosystems. Historic areas provide the chance to learn about the regional and local history.

Impacts and Mitigation

The proposed route avoids many of the areas that would be considered tourist destinations, and the Project would not preclude tourism activities or appreciably diminish the use or experience at tourist destinations. Although some tree clearing will be required, it will be adjacent to existing ROWs and should not affect wildlife viewing opportunities.

As no impacts on tourism are anticipated, no mitigation is proposed.

7.4.4 Mining

There are no known gravel pits or other mining activity in the vicinity of the Project. As no impacts on mining are anticipated, no mitigation is proposed.

7.5 Archaeological and Historic Resources

A cultural resource literature review of the proposed transmission line and a one-mile buffer was conducted online and at the Minnesota State Historic Preservation Office (SHPO) located at the Minnesota History Center in St. Paul, Minnesota by Merjent. Current topographic maps and aerial photographs, historic maps and documents, original land survey maps and original land patent records were examined. The archaeological and architectural site files were examined to obtain a list of all previously recorded archaeological sites and architectural properties in the Project's study area, defined as a one mile buffer around the route.

There are no previously recorded archaeological sites and no previously recorded standing historic structures within the study area (see Merjent letter in **Appendix D**). Merjent concluded that there will be no adverse impact on known or suspected cultural resources as a result of the Project.

The Minnesota Historical Society (MHS) was contacted[18] requesting information on the possible effects of the proposed Project on historic properties in the Project area. In a letter dated June 10, 2015[19], MHS concurred with Merjent's conclusion (**Appendix D**).

Impacts and Mitigation

Because no impacts to cultural resources are anticipated, no mitigation is proposed.

If any archaeological sites are identified during placement of the poles along the permitted route, construction work will be stopped and MHS staff consulted as to how to proceed. If human remains are encountered during construction activities, all ground disturbing activity will cease and local law enforcement will be notified per MN 307.08.

7.6 Natural Environment

7.6.1 Air Quality

The only potential air emissions from a transmission line result from corona, which may produce ozone and oxides of nitrogen. This can occur when the electric field intensity exceeds the breakdown strength of the air. For a 115 kV transmission line, the conductor surface gradient is typically below the air breakdown level. As such, it is unlikely that any measurable emissions would occur from the conductor surface.

Impacts and Mitigation

No impacts to air quality are anticipated due to the operation of the transmission line.

Temporary and localized air quality impacts caused by construction vehicle emissions and fugitive dust from ROW clearing and construction are expected to occur. Exhaust emissions from diesel equipment will vary during construction, but will be minimal and temporary. The magnitude of emissions is influenced heavily by weather conditions and the specific construction activity taking place. Appropriate dust control measures will be implemented.

7.6.2 Water Resources

Hydrologic features in the Project area and along the proposed route are shown in **Figure 7-4**. Hydrologic features, such as wetlands, lakes, rivers and floodplains perform several important functions within a landscape, including flood attenuation, groundwater recharge, water quality protection and wildlife habitat production.

The Project lies within the Pine River watershed, in the north central portion of the Upper Mississippi River Basin.[20]

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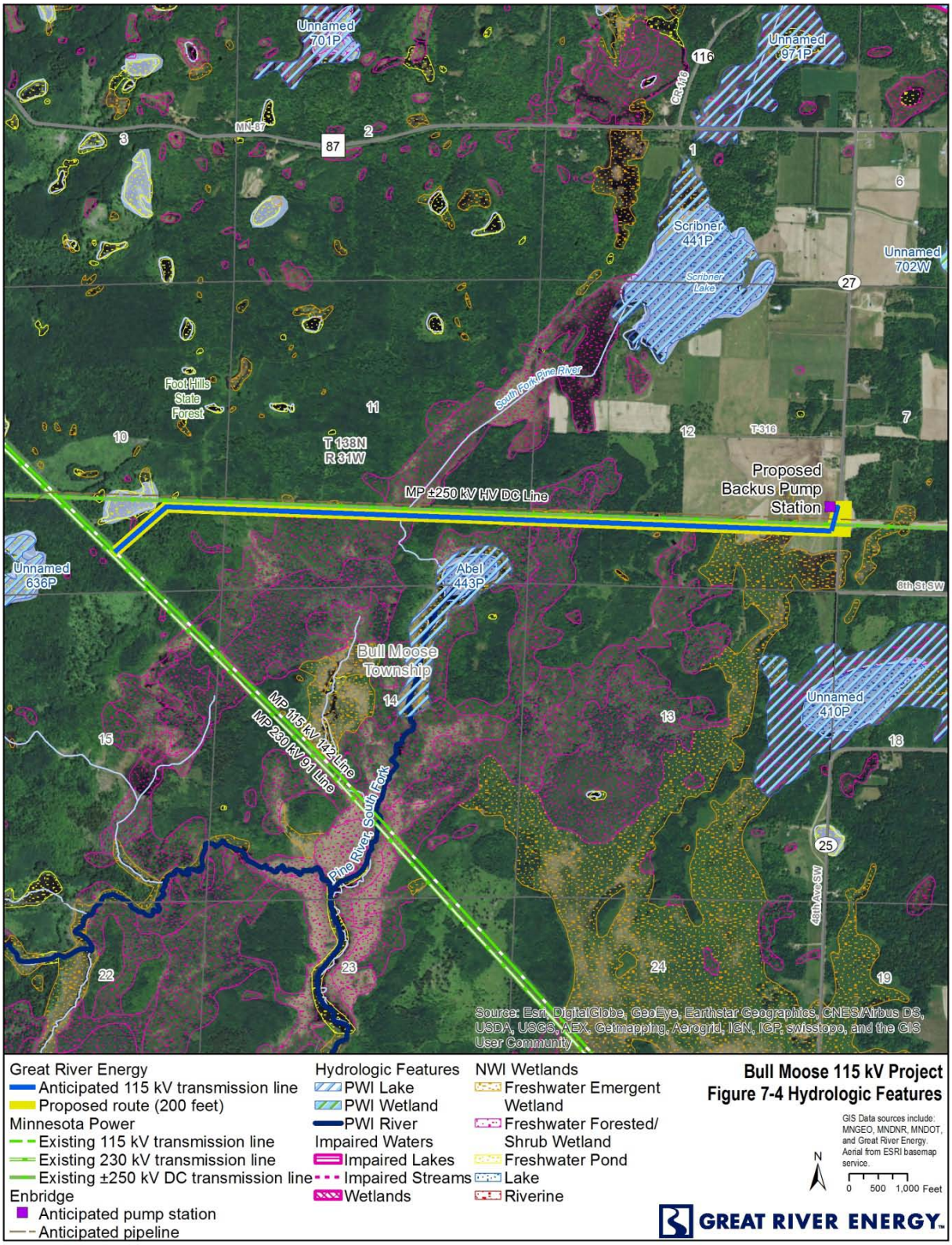
[18] Letter from Carole Schmidt, Great River Energy to Sarah Beimers, MHS. 7 May 2015. Appendix D.

[19] Letter from Sarah Beimers, MHS to Carole Schmidt, Great River Energy. 10 June 2015. Appendix D.

[20] http://www.pca.state.mn.us/water/basins/Lake Superior/index.html (2010)

Figure 7-4. Hydrologic Features



Ground Water

The DNR divides Minnesota into six groundwater provinces. Cass County is in the Central Province, which is described as sand aquifers in generally thick sandy and clayey glacial drift overlying Precambrian and Cretaceous bedrock.[21]

Lakes

Lakes near the proposed route include Abel Lake (11 acres) and Scribner Lake (82 acres)[22] (**Figure 7-4**). The route is closest to Abel Lake, about 380 feet from open water.

Rivers and Streams

Rivers and streams near the proposed route include the South Fork of the Pine River (**Figure 7-4**). The proposed transmission line will cross the South Fork of the Pine River.

Public Waters

Public Waters are wetlands, water basins and watercourses of significant recreational or natural resource value in Minnesota as defined in Minnesota Statutes Section 103G.005. The DNR has regulatory jurisdiction over these waters, which are identified on the DNR Public Waters Inventory (PWI) maps[23].

Although the proposed transmission line will cross the South Fork of the Pine River, it is not designated as a DNR Public Water at that location. The proposed transmission line will not cross any DNR Public Waters.

Impaired Waters

Section 303(D) of the Federal Clean Water Act requires states to publish, every two years, a list of streams and lakes that are not meeting their designated uses because of excess pollutants (impaired waters). The list, known as the 303(d) list, is based on violations of water quality standards. In Minnesota, the MPCA has jurisdiction over determining 303(d) waters. These waters are described as "impaired." There are no impaired waters in the vicinity of the Project (**Figure 7-4**).

Wetlands

Wetlands are important resources for flood abatement, wildlife habitat, and water quality. Wetlands that are hydrologically connected to the nation's navigable rivers are protected

[21] http://files.dnr.state.mn.us/natural_resources/water/groundwater/provinces/gwprov.pdf (2010)

[22] http://www.dnr.state.mn.us/lakefind/index.html; http://www.dnr.state.mn.us/maps/compass.html (2010)

[23] MNDNR: *Public Waters Inventory Maps.*
http://files.dnr.state.mn.us/waters/watermgmt_section/pwi/CARL1OF1.pdf (2010)
http://files.dnr.state.mn.us/waters/watermgmt_section/pwi/STLO1OF7.pdf (2010)

federally under Section 404 of the Clean Water Act. In Minnesota, wetlands are also protected under the Wetland Conservation Act.

The USFWS produced maps of wetlands based on aerial photographs and Natural Resources Conservation Service (NRCS) soil surveys starting in the 1970s. These wetlands are known as the National Wetland Inventory (NWI). Wetlands listed on the NWI may be inconsistent with current wetland conditions; however, NWIs are the most accurate and readily available database of wetland resources within the Project area and were therefore used to identify wetlands in proposed ROW.

Information on wetlands within the proposed ROW is provided in **Table 7-5.**

There are 7 wetland basins (4 are forested or scrub-shrub) and approximately 6.21 acres of wetland (4.21 acres are forested or scrub-shrub) within the Project ROW. The transmission line will only affect some of these basins, depending on the final alignment.

Table 7-5. Wetland Types within the ROW (NWI)

Cowardin Type1	No. of Basins	Wetlands in ROW (Acres)	Percent of Wetland Type within Proposed ROW
PEMC	3	2.00	6.6%
PFO1C	1	0.00	0.0%
PFO2B	1	0.94	3.1%
PSS1C	2	3.27	10.8%
Total	**7**	**6.21**	**20.5%**

[1]Cowardin et. al. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. US Department of the Interior, USFWS, Washington D.C.

The wetland type was classified using the Cowardin system that defines the habitat system, vegetative and sediment class and water regime. The wetland classification system is hierarchical, with wetlands and deepwater habitats divided among five major systems at the broadest level. The five systems include Marine (open ocean and associated coastline), Estuarine (salt marshes and brackish tidal water), Riverine (rivers, creeks, and streams), Lacustrine (lakes and deep ponds), and Palustrine (shallow ponds, marshes, swamps, sloughs). Systems are further subdivided into subsystems that reflect hydrologic conditions. Below the subsystem is the class, which describes the appearance of the wetland in terms of vegetation or substrate. Each class is further subdivided into subclasses; vegetated subclasses are described in terms of life form, and substrate subclasses in terms of composition. The classification system also includes modifiers to describe hydrology (water regime), soils, water chemistry (pH and salinity), and special modifiers relating to man's activities (e.g., impounded, partly drained).

Some common symbols used in the wetland classification system include:

SYSTEM:	P - Palustrine	L - Lacustrine
CLASS:	RB - Rock Bottom	UB - Unconsolidated Bottom
	EM - Emergent	SS - Scrub-Shrub
	FO – Forested	OW - Open Water
	1- Broad-leaved deciduous	
	2- Needle-leaved deciduous	
MODIFIERS:	A - Temporarily flooded	B - Saturated
	C - Seasonally flooded	D - Seasonally well drained
	E - Seasonally saturated	F - Semipermanently flooded
	G - Intermittently flooded	H - Permanently flooded
SPECIAL MODIFIERS:	b - beaver	d - partially drained/ditched
	f - farmed	s - spoil
	x - excavated	

Impacts and Mitigation

No impacts to groundwater in the Project area are anticipated. Given the proposed winter construction timeframe, dewatering (i.e., during pole embedding) will likely not be necessary. Any effects on water tables would be localized and short term and would not affect hydrologic resources.

The transmission line will cross the South Fork of the Pine River, but will not cross any lakes. No navigable waters will be affected by the Project.

Once the Project is completed, there would be no significant impact on surface water quality because wetland impacts will be minimized and mitigated, disturbed soil will be restored to previous conditions or better, and the amount of land area converted to an impervious (will not allow fluid to pass through) surface will be small.

The Project should have no impact on the impairment status of the waters in the Project area. There is potential to increase turbidity due to sedimentation from construction activities; however, appropriate erosion and sediment control measures will be implemented to avoid or minimize such impacts.

Temporary impacts to wetlands may occur if they need to be crossed during construction of the transmission line. No staging or stringing setup areas will be placed within or adjacent to water resources, as practicable. Wetland impact avoidance measures that will be implemented during design and construction of the transmission lines include spacing and placing the power poles at variable distances to span and avoid wetlands, where possible. When it is not possible to span the wetland, several measures will be utilized to minimize impacts during construction:

- When possible, construction will be scheduled during frozen ground conditions.
- Construction crews will attempt to access the wetland with the least amount of physical impact to the wetlands.

- The structures will be assembled on upland areas before they are brought to the site for installation, when practicable.
- When construction during winter is not possible, construction mats (wooden mats or the Dura-Base Composite Mat System) will be used to protect wetland vegetation. Additionally, all-terrain construction vehicles may be used, which are designed to minimize impact to soils in damp areas.

Permanent impacts to wetlands would occur where structures must be located within wetland boundaries (approximately 20 square feet of permanent impact per structure). Wetland vegetation would be restored in the disturbed areas following construction.

A Regional General Permit under Section 404 of the Clean Water Act from the USACE may be required for the Project. The USACE was contacted[24] requesting information on the possible effects of the proposed Project on wetlands in the Project area. In a letter dated June 15, 2015[25], the USACE responded providing general information regarding their regulatory program, but they cannot provide detailed comments until a permit application has been submitted. Great River Energy will apply for a permit if required once design details are available, restore the wetlands as required by the USACE, and comply with the requirements of the Wetland Conservation Act.

Vegetation maintenance procedures under transmission lines prohibit trees from establishing. Existing trees must be removed throughout the entire ROW, including forested wetlands. These forested wetlands would undergo permanent vegetative changes within the ROW, and mitigation for the conversion of forested wetlands to emergent and scrub/shrub wetlands may be required by the USACE.

In the event that impacts to hydrologic features are unavoidable, Great River Energy will work with the jurisdictional agencies to determine the best ways to minimize the impacts and create appropriate mitigation measures.

7.6.3 Flora and Fauna

Flora

Presettlement vegetation in the area consisted of jack pine, northern pin oak, aspen-birch and mixed red and white pine. Vegetation in the area currently includes white and red pine, jack pine barrens, jack pine woodlands, black spruce, tamarack, white cedar and black ash. The primary present day land uses in the Project area are forest management, agriculture, and recreation and tourism.

Foot Hills State Forest is managed partly by the DNR and partly by Cass County, and provides potential habitat for wildlife and rare and unique resources.

[24] Letter from Carole Schmidt, Great River Energy to Bill Baer, USACE. 6 May 2015. Appendix D.
[25] Letter from Tom Hingsberger, USACE to Carole Schmidt, Great River Energy. 15 June 2015. Appendix D.

There are no DNR Wildlife Management Areas, DNR Scientific and Natural Areas, or USFWS Waterfowl Production Areas in the Project area.

Fauna

Wildlife species in Cass County include ruffed grouse, sharptail grouse, partridge, rabbits, squirrels, red and gray fox, raccoon, deer, bear, muskrat, mink, beaver, migratory waterfowl (geese, ducks, trumpeter swans, herons) and various birds (meadowlark, field sparrow, thrush, woodpeckers, shore birds) [26].

The USFWS website[27] for threatened and endangered species in Cass County includes the Canada lynx (threatened), the Gray wolf (threatened) and the Northern long-eared bat (threatened).

The USFWS was contacted by letter[28], and in their email response of June 15, 2015[29], they indicated that there are no known records for federally listed or proposed species and/or designated or proposed critical habitat within the action area.

Impacts and Mitigation

Minimal impacts to native vegetation are anticipated. The proposed transmission line will parallel existing utility ROW, minimizing impacts to previously undisturbed vegetation in that area.

There is minimal potential for the displacement of wildlife and loss of habitat from construction of the Project. Wildlife that inhabit natural areas could be impacted in the short-term within the immediate area of construction. The distance that animals will be displaced will depend on the species. Additionally, these animals will be typical of those found in agricultural and forested settings and should not incur population level effects due to construction.

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 lines. Waterfowl are typically more susceptible to transmission line collision, especially if the transmission line is placed between agricultural fields that serve as feeding areas, or between wetlands and open water, which serve as resting areas.

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[26] Cass County Soil Survey
http://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/minnesota/MN057/0/cass_MN.pdf

[27] US Fish and Wildlife Webpage Endangered Species. http://www.fws.gov/Midwest/Endangered/LISTS/minnesot-cty.html

[28] Letter from Carole Schmidt, Great River Energy to Andrew Horton, US Fish and Wildlife Service. 6 May 2015. *See* Appendix D.

[29] Email from Andrew Horton, US Fish and Wildlife Service to Carole Schmidt, Great River Energy. 15 June 2015. *See* Appendix D.

Great River Energy will address avian issues by working with the DNR and USFWS to identify any areas that may require marking transmission line shield wires and/or to use alternate structures to reduce the likelihood of collisions.

The Northern long-eared bat (NLEB) is discussed in more detail in **Section 7.7**.

7.6.4 Invasive Species Management

The movement of construction equipment to, from, and between various work sites has the potential to introduce and/or spread invasive species. Such species include reed canary grass, common buckthorn, purple loosestrife, and leafy spurge, in addition to various invasive aquatic species.

Impacts and Mitigation

Great River Energy anticipates a construction schedule that would allow for stringing of conductor during winter months over the ice. To minimize the potential for the introduction or spread of invasive species, Great River Energy proposes to follow BMPs during Project construction:

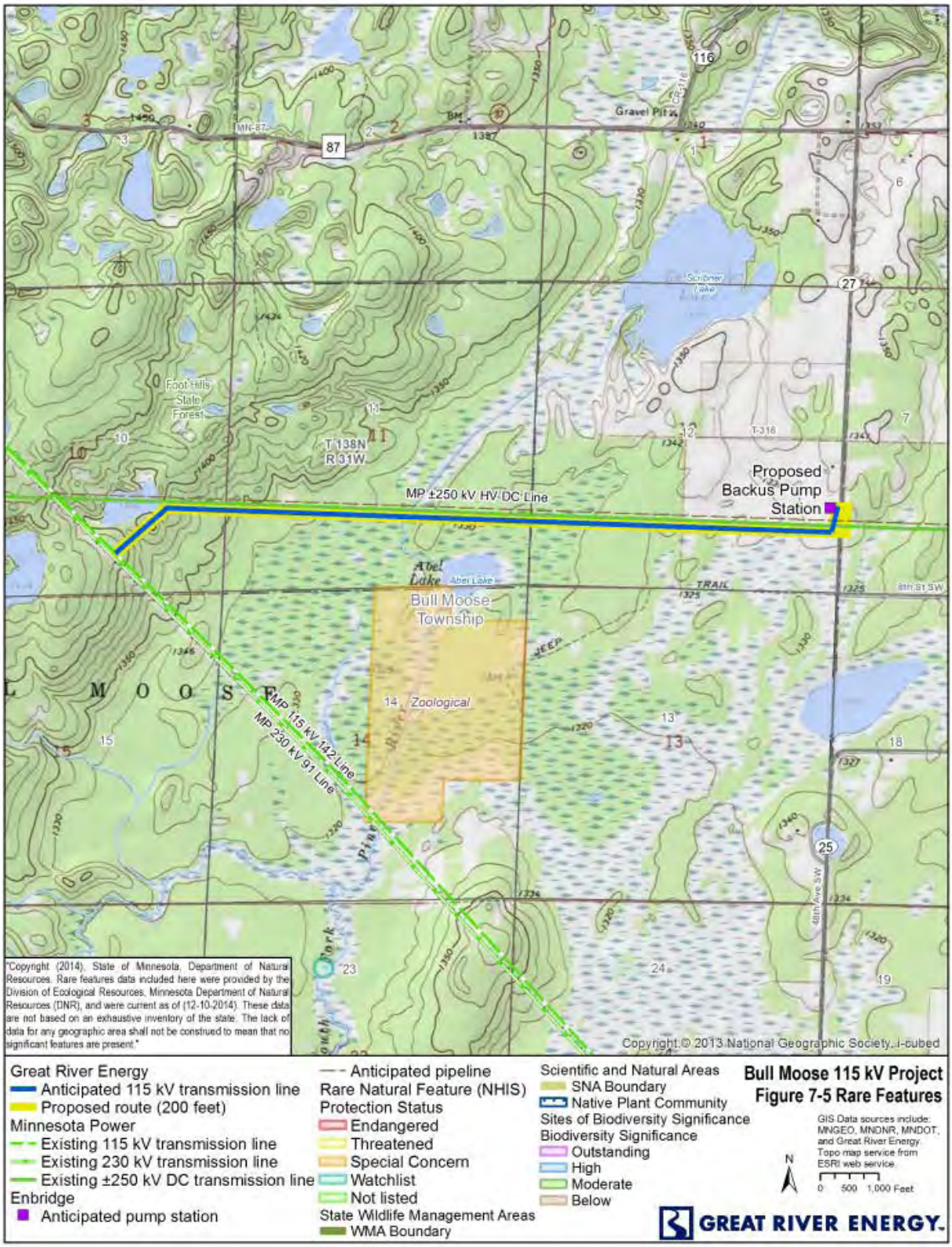
- All disturbed areas will be revegetated using weed-free seed mixes. If practicable, native plant species will be used to revegetate disturbed areas. Weed-free straw or weed-free hay will be used for erosion control;
- Herbicidal or manual vegetation removal may be implemented to minimize the spread of invasive species where such removal is consistent with easement conditions or landowner restrictions;
- Construction vehicles will be cleaned and inspected to remove dirt, mud, plants, and debris from vehicles and equipment prior to arriving at, and leaving from, construction sites; and
- The Construction Field Representative will oversee BMP installation and effectiveness.

After detailed design for the Project is complete, Great River Energy will coordinate with the DNR to determine if any additional invasive species mitigation measures are required on DNR lands.

7.7 Rare and Unique Natural Resources

A desktop review of the Natural Heritage Inventory System (NHIS) records provided by the DNR indicates no rare features within the proposed route and only one threatened species (trumpeter swan, *Cygnus buccinator*) within one mile of the proposed route (**Figure 7-5**). There is a colonial waterbird nesting area about 1.5 miles southwest of the proposed transmission line.

Figure 7-5. Rare Features



The DNR was contacted[30] requesting information on the possible effects of the proposed Project on rare and unique features in the Project area. In a letter dated July 9, 2015[31], the DNR noted the following:

- Trumpeter swans, a state-listed species of special concern, have been documented nesting in the vicinity of the proposed project. These birds may be at risk for collision or electrocution due to overhead transmission lines. The DNR recommends that bird diverters be place in overhead lines near lakes or rivers, or other areas that may attract large concentrations of waterfowl.

- The proposed line crosses a Northern Mesic Hardwood Forest within the Foot Hills State Forest in Section 10, T138N, R31W. This type of native plant community is uncommon but not rare in Minnesota.

- The northern long-eared bat, a state-listed species of special concern, can be found throughout Minnesota. During the winter this species hibernates in caves and mines, and during the active season (approximately April-October) it roosts underneath bark, in cavities, or in crevices of both live and dead trees. Activities that may impact this species include any disturbance to hibernacula and destruction/degradation of habitat (including tree removal). The NHIS does not contain any known occurrences of northern long-eared bat roosts or hibernacula within an approximate one-mile radius of the proposed project.

In addition to being a state-listed species of special concern, the NLEB was recently listed as threatened by the USFWS.

Enbridge conducted NLEB surveys in their proposed pipeline corridor in 2014. Enbridge used desktop analysis to identify areas of potentially suitable NLEB habitat along its preferred pipeline route both west and east of Clearbrook, MN. Data from this analysis were used to select survey target sites, which were reviewed and approved by the USFWS prior to survey. Enbridge conducted presence/absence acoustic surveys in proximity to the Backus Pump Station/Bull Moose transmission line Project area between June 2 and August 9, 2014. There were no acoustic positives within 5 miles of linear survey in either direction of the Backus Pump Station/Bull Moose transmission line Project area. The nearest NLEB acoustic detection was approximately 9.5 miles to the east of the Backus Pump Station/Bull Moose transmission line Project area, in Crow Wing County. A companion mist net survey conducted on August 4-5, 2014 was negative at this location.

In their email response of June 15, 2015 (**Appendix D**), the USFWS recommended any tree removal at this location be conducted outside the summer roost period of the NLEB (April 1-September 30). Between the months of October through March, the NLEB is not anticipated to be present in the action area.

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[30] Letter from Carole Schmidt, Great River Energy to Lisa Joyal, Minnesota Department of Natural Resources. 6 May 2015. *See* Appendix D.

[31] Letter from Lisa Joyal, Minnesota Department of Natural Resources to Carole Schmidt, Great River Energy. 9 July 2015. *See* Appendix D.

The USFWS also recommended that habitat disturbance occur before May 1 or after August 30 to minimize potential impacts to migratory birds.

Impacts and Mitigation

Constructing adjacent to an existing utility ROW will minimize impacts to habitat in this area. Great River Energy will continue to coordinate with the DNR and USFWS to ensure that sensitive species near the proposed route are not impacted by construction of the Project.

The following general measures will be used to help avoid or minimize impacts to area wildlife and rare natural resources during and after the completion of the proposed transmission line:

- Minimize tree felling and shrub removal that are important to area wildlife. Tree clearing is currently scheduled for winter months when the NLEB is not anticipated to be present in the area.

- Utilize BMPs to prevent erosion of the soils in the areas of impact.

- Implement sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent water resources and minimize soil erosion. Practices may include containing excavated material, protecting exposed soil, and stabilizing restored soil.

- Re-vegetate disturbed areas with native species and wildlife conservation species where applicable.

- Implement raptor protection measures, including placement of bird flight diverters on the line at water crossings after consultation with local wildlife management staff.

Great River Energy will contact the DNR Regional Assessment Ecologist for regional input on recommended placement of bird diverters. Once a route has been defined and detailed design of the line is available, Great River Energy will coordinate with the DNR to ensure their concerns are addressed.

If an USACE permit is required for the Project, informal consultation between the USACE and the USFWS will be required regarding the NLEB. The current Project construction schedule calls for tree clearing during winter months, when the NLEB is not anticipated to be present in the area. If an USACE permit is not required for the Project, the Project would be covered under the USFWS Interim 4(d) Rule, in which an incidental take of the NLEB would not be prohibited provided conservation measures (activities occur more than ¼ mile from a known, occupied hibernacula; known, occupied roost trees not removed from June 1-July 31; clearcuts within ¼ mile of known, occupied roost trees avoided from June 1-July 31) are followed.

7.8 Physiographic Features

7.8.1 Topography

The proposed Project lies within the Pine Moraines and Outwash Plains Subsection of the Laurentian Mixed Forest Province under the DNR Ecological Classification System.

The Laurentian Mixed Forest Province is characterized by broad areas of conifer forest, mixed hardwood and conifer forests, and conifer bogs and swamps. The landscape ranges from rugged lake-dotted terrain with thin glacial deposits over bedrock, to hummocky or undulating plains with deep glacial drift, to large, flat, poorly drained peatlands.

The Pine Moraines and Outwash Plains Subsection is a mix of outwash plains, end moraines, till plains, and drumlin fields. The topography of the proposed route is nearly level to rolling.

Impacts and Mitigation

Construction of the Project will not alter the topography along the route; therefore, no mitigation is proposed.

7.8.2 Geology

Depth of glacial drift over bedrock in the Pine Moraines and Outwash Plains Subsection varies from 200 to over 600 feet, with the greatest depths in the southwestern portion of the subsection. Underlying bedrock is a variety of Precambrian rock. There are some localized cretaceous marine shale, sandstone and variegated shale in the southwestern portion of the subsection.

Impacts and Mitigation

Few geological constraints on design, construction, or operation are anticipated in the Project area. Given the proposed winter construction timeframe, dewatering (i.e., during pole embedding) will likely not be necessary. Any effects on water tables would be localized and short term and would not affect geologic resources.

Construction of the Project will not alter the geology along the routes; therefore, no mitigation is proposed.

7.8.3 Soils

USDA data[32] were reviewed to describe soil resources in the vicinity of the Project. Soils are generally grouped into categories known as "associations." A soil association has a distinctive pattern of soils, relief and drainage, and is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. There are two soil associations along the proposed route. These soil associations are listed in **Table 7-6** and shown in **Figure 7-6**.

[32] https://soilseries.sc.egov.usda.gov/OSD_Docs/.html

Table 7-6. Soil Associations in the Vicinity of the Project

Soil Association	General Description
Menahga-Chetek-Bergkeller	**Menahga-Chetek-Bergkeller** are very deep, nearly level to hilly, excessively to well drained soils (loamy sands and sandy loams) that formed in sandy glacial outwash or loamy alluvium/till; found on outwash plains, stream terraces, moraines and drumlins.
Mahtomedi-DeMontreville-Cushing	**Mahtomedi-DeMontreville-Cushing** are very deep, nearly level to hilly, excessively drained to well drained soils (loamy sands, loamy fine sands, fine sandy loams) that formed in sandy outwash or glacial till; found on moraines and outwash plains.

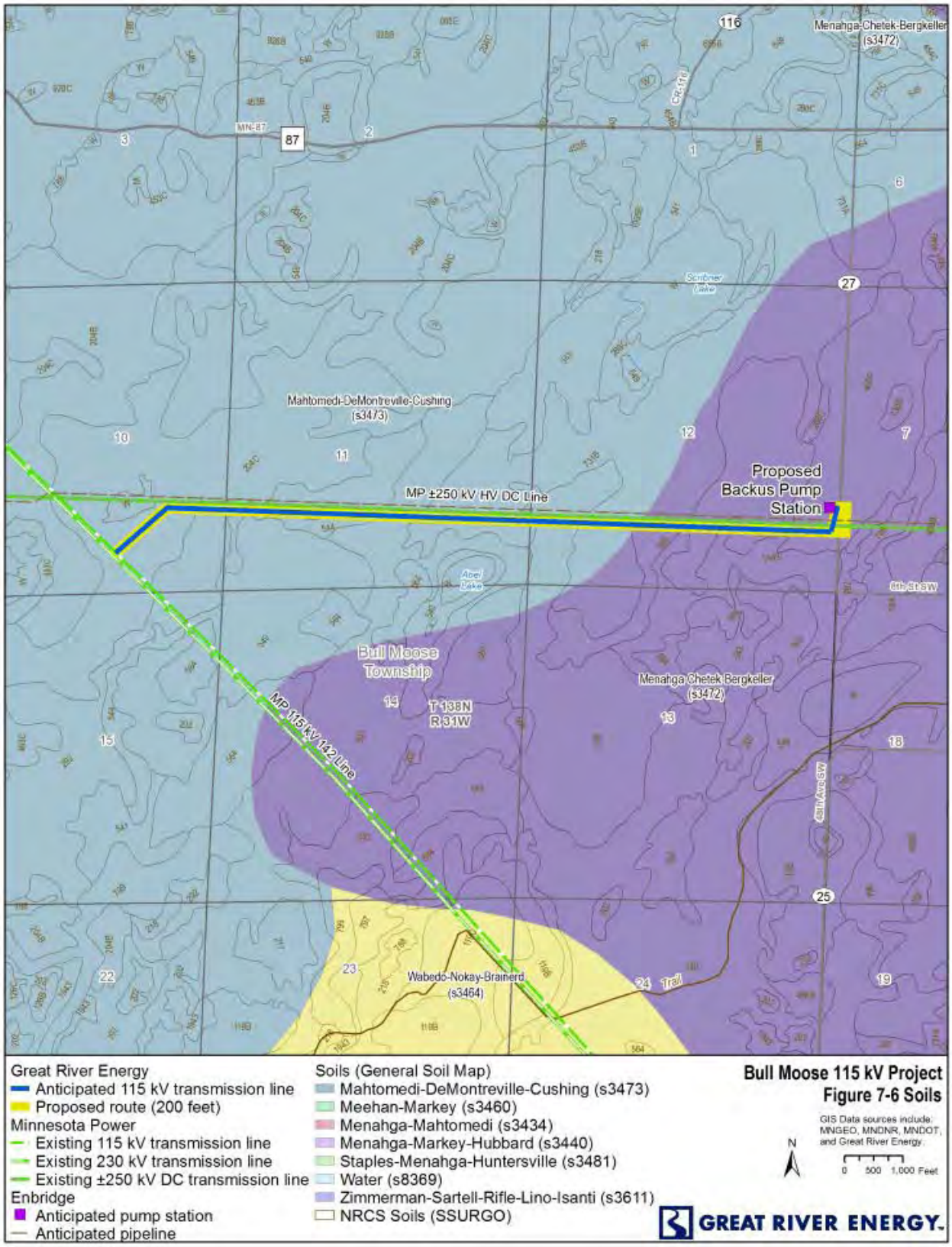
Impacts and Mitigation

Potential impacts of construction are compaction of the soil and exposing the soils to wind and water erosion. Impacts to physiographic features should be minimal during and after installation of the transmission line structures, and these impacts will be short term. There should be no long-term impacts resulting from this Project.

Soils will be revegetated as soon as possible to minimize erosion.

If over an acre of soil will be disturbed during the construction of the transmission line, Great River Energy will obtain a NPDES construction stormwater permit from the MPCA and will prepare a SWPPP. Erosion control methods and BMPs will be utilized to minimize runoff during line construction.

Figure 7-6. Soils



7.9 Unavoidable Impacts

Construction of the Bull Moose 115 kV Project will have nominal unavoidable impacts.

The Project will require only minimal commitments of resources that are irreversible and irretrievable. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources have on future generations. Irreversible commitments of resources are those that result from the use or destruction of a specific resource that cannot be replaced within a reasonable timeframe. Irretrievable resource commitments are those that result from the loss in value of a resource that cannot be restored after the action.

Those commitments that do exist are primarily related to construction. Construction resources include aggregate resources, concrete, steel, and hydrocarbon fuel. During construction, vehicles necessary for these activities would be deployed on site and would need to travel to and from the construction area, consuming hydrocarbon fuels. Other resources would be used in pole construction, pole placement, and other construction activities.

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8 APPLICATION OF RULE CRITERIA

8.1 Route Permit

According to Minnesota Statutes Section 216E.02, subd. 1, it is the policy of the state of Minnesota to locate high voltage transmission lines in an orderly manner that minimizes adverse human and environmental impacts and ensures continuing electric power system reliability and integrity. The Commission has promulgated standards and criteria for issuing route permits (Minn. R. 7850.4000). That rule provides that the Commission shall issue route permits for high voltage transmission lines that are consistent with state goals to conserve resources, minimize environmental impacts and impacts to human settlement, minimize land use conflicts, and ensure the state's electric energy security through efficient, cost-effective transmission infrastructure.

The 115 kV transmission proposed for the Bull Moose Project addresses all the criteria that are applied in evaluating a new transmission line project. Following an existing transmission line corridor conserves resources and minimizes environmental impacts and other impacts. Constructing the line at 115 kV capability helps ensure a reliable and secure power source for the Backus Pump Station.

For all the reasons described in this Application, the Commission should issue a Route Permit for the Bull Moose 115 kV Project.

8.2 Conclusion

Great River Energy respectfully requests that the Commission issue a Route Permit that designates the route for the Bull Moose 115 kV transmission line. Great River Energy requests that the Commission designate a slightly wider route than the necessary ROW for the Project, to allow flexibility in determining the precise location of the transmission centerline and structures.

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APPENDIX A

Notice of Intent to File Under Alternative Permitting Process

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12300 Elm Creek Blvd ☐ Maple Grove, Minnesota 55369-4718 ☐ 763-445-5000 ☐ Fax 763-445-5050 ☐ www.greatriverenergy.com

June 29, 2015

VIA ELECTRONIC FILING

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

RE: Notice of Intent by Great River Energy to Submit a Route Permit Application under the Alternative Permitting Process
Bull Moose 115 kV Project

Dear Mr. Wolf:

In accordance with Minnesota Rules 7850.2800 subp. 2, Great River Energy submits this notice of its intent to submit a Route Permit Application under the Alternative Permitting Process for the approximately 2.5-mile long Bull Moose 115 kilovolt (kV) Project ("Project"). The proposed Project is needed to provide power to a new petroleum pump station (Backus Station) being proposed by Enbridge Energy, Limited Partnership ("Enbridge"). Great River Energy intends to submit the route permit application in late July 2015.

On April 24, 2015, Enbridge filed its Certificate of Need and Route Permit Application (Docket No. CN-14-916) for the Line 3 Replacement Project ("L3R"), which is a maintenance and integrity driven pipeline project designed to replace the Enbridge's existing Line 3 pipeline in Minnesota. The replacement pipeline will follow the Enbridge Mainline System from the North Dakota/Minnesota border in Kittson County to Enbridge's expanded Clearbrook Station in Clearwater County. The proposed replacement pipeline will then turn south and east to follow existing third-party pipelines, utilities and transportation corridors from Clearbrook to Wrenshall, Minnesota. From that point, the replacement project rejoins the Enbridge Mainline corridor to follow its Mainline System to the Wisconsin/Minnesota border in Carlton County. As part of the L3R Project, eight pump stations will be built. Four of the eight pump stations will be located west of Clearbrook at existing pump station sites, which Enbridge plans to expand to accommodate the installation of these facilities. The remaining four pump stations will be located east of Clearbrook at greenfield station sites.

Enbridge has requested that Great River Energy, in partnership with its member retail distribution cooperatives, provide electric service to four pump stations associated with the L3R Project east of Clearbrook, including the Backus Pump Station near Backus, Minnesota, which is the subject of this letter.

Please feel free to give me a call at 763-445-5214 if you have any questions regarding this filing.

Respectfully Submitted,

GREAT RIVER ENERGY

Carole L. Schmidt

Carole L. Schmidt
Supervisor, Transmission Permitting and Compliance

cc: Ray Kirsch, Minnesota Department of Commerce-EERA

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APPENDIX B

Detailed Route Maps

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Great River Energy
- Anticipated 115 kV transmission line
- Proposed route (200 feet)

Minnesota Power
- Existing 115 kV transmission line
- Existing 230 kV transmission line
- Existing ±250 kV DC transmission line
- Anticipated pipeline

Bull Moose 115 kV Project
Appendix B - Detailed Route Maps
Map Sheet 1 of 5

N

0 50 100 200 Feet

GIS Data sources include:
MNGEO, MNDNR, MNDOT, and Great River Energy.

GREAT RIVER ENERGY

Great River Energy
- Anticipated 115 kV transmission line
- Proposed route (200 feet)

Minnesota Power
- Existing ±250 kV DC transmission line
- Anticipated pipeline

Bull Moose 115 kV Project
Appendix B - Detailed Route Maps
Map Sheet 2 of 5

N

0 50 100 200 Feet

GIS Data sources include:
MNGEO, MNDNR, MNDOT, and Great River Energy.

GREAT RIVER ENERGY

Great River Energy
- Anticipated 115 kV transmission line
- Proposed route (200 feet)

Minnesota Power
- Existing ±250 kV DC transmission line
- Anticipated pipeline

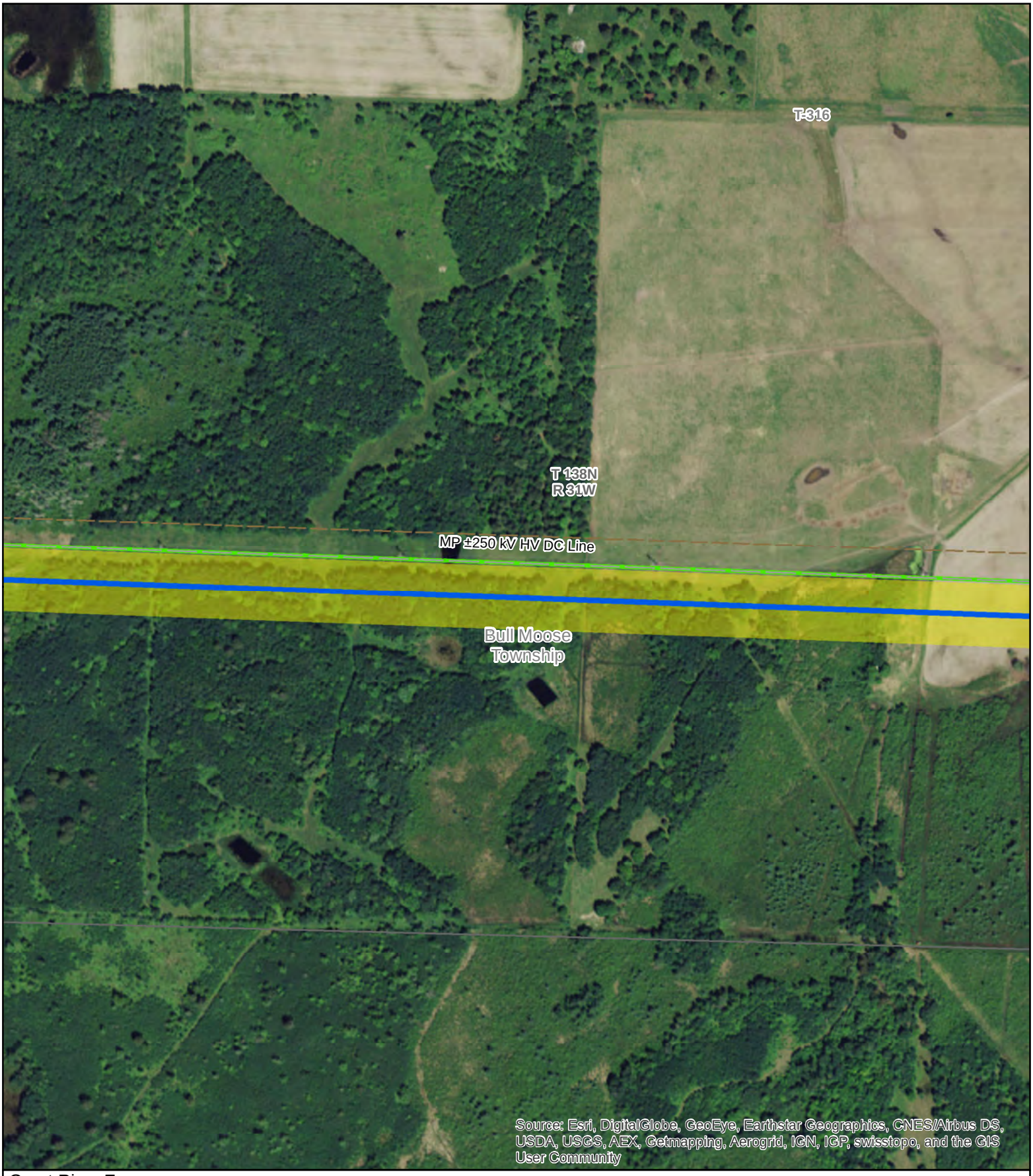
Bull Moose 115 kV Project
Appendix B - Detailed Route Maps
Map Sheet 3 of 5

N

0 50 100 200 Feet

GIS Data sources include:
MNGEO, MNDNR, MNDOT, and Great River Energy.

GREAT RIVER ENERGY



Great River Energy
- Anticipated 115 kV transmission line
- Proposed route (200 feet)

Minnesota Power
- Existing ±250 kV DC transmission line
- Anticipated pipeline

Bull Moose 115 kV Project
Appendix B - Detailed Route Maps
Map Sheet 4 of 5

N

0 50 100 200 Feet

GIS Data sources include:
MNGEO, MNDNR, MNDOT, and Great River Energy.

GREAT RIVER ENERGY

Great River Energy
- Anticipated 115 kV transmission line
- Proposed route (200 feet)

Minnesota Power
- Existing ±250 kV DC transmission line

Enbridge
- Anticipated pump station
- Anticipated pipeline

Bull Moose 115 kV Project
Appendix B - Detailed Route Maps
Map Sheet 5 of 5

N

0 50 100 200 Feet

GIS Data sources include:
MNGEO, MNDNR, MNDOT, and Great River Energy.

GREAT RIVER ENERGY

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APPENDIX C

List of Landowners within Proposed Route

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Landowners within Proposed Route

Cory and Pamela Borman

Bruce and Karen Eveland

Duane and Donna Eveland

Cass County Land Department (Tax Forfeit Land)

Minnesota Department of Natural Resources (Foot Hills State Forest)

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APPENDIX D

Agency Correspondence

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GREAT RIVER ENERGY

12300 Elm Creek Blvd • Maple Grove, Minnesota 55369-4718 • 763-445-5000 • Fax 763-445-5050

May 6, 2015

Mr. Don Berre
Office of Aeronautics
Minnesota Department of Transportation
222 E. Plato Blvd.
St. Paul, MN 55107-1618

RE: Proposed Bull Moose 115 kV Transmission Project - Cass County

Dear Mr. Berre:

Great River Energy is currently gathering data to be used in preparation of a regulatory application necessary to obtain approval to construct the proposed Bull Moose 115 kilovolt (kV) Transmission Project in Cass County (see enclosed fact sheet and map). Great River Energy intends to seek a Route Permit for the Project from the Minnesota Public Utilities Commission. The proposed Project is needed to provide power to a new petroleum pump station (Backus Station) being proposed by Enbridge Energy.

The Project will include approximately 2.5 miles of 115 kV transmission line that will exit the pump station substation, run parallel to Minnesota Power's existing 250 kV direct current (DC) transmission line (on the south side), and then tap the existing Minnesota Power "142" 115 kV transmission line (see fact sheet map). In most cases, round wood transmission structures will be used that will range in height from 70 to 80 feet above ground.

Great River Energy is requesting information on the possible effects of the proposed Project on airports or airstrips in the project area. The proposed Project is over 3 miles from the Backus Municipal Airport and approximately 8 miles from the Pine River Regional Airport.

We would appreciate receiving any written comments from your office by Friday, June 5, 2015. If you have any questions about this proposed project, please contact me at (763) 445-5214. If you wish to respond by e-mail, my address is cschmidt@grenergy.com. Thank you for your attention to this important project.

Sincerely,

GREAT RIVER ENERGY

Carole L. Schmidt

Carole L. Schmidt
Supervisor, Transmission Permitting and Compliance

Enclosure: Fact Sheet/Project Map

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Bull Moose 115 kV Transmission Line

GREAT RIVER ENERGY
12300 Elm Creek Blvd
Maple Grove, MN 55369-4718
1-888-521-0130
www.greatriverenergy.com

CROW WING POWER
17330 Highway 371 North, PO Box 507
Brainerd, MN 56401
218-829-2827
www.CWPower.com

Project Description/Need

Great River Energy, wholesale electric supplier to Crow Wing Power and 27 other electric cooperatives, proposes to construct a new overhead 115 kilovolt (kV) transmission line that is needed to provide electric power to a new petroleum pump station (Backus Station) being proposed by Enbridge Energy (Enbridge). The Enbridge pump station is part of a pipeline replacement project that will require permits from the Minnesota Public Utilities Commission.

Proposed Project

The 2.5-mile transmission line (see map on back for proposed route) would tap an existing Minnesota Power (MP) 115 kV transmission line approximately four miles south west of the City of Backus. From there the line would run northeast for one half mile to the existing 250 kV Direct Current (DC) transmission line owned by MP. The route would then parallel, on the south side of the DC line, east for two miles. From there the route would cross under the DC line and terminate at the proposed pump station location just west of 48th Ave SW.

The proposed transmission line will consist of wood poles that are 350 to 400 feet apart and 70 to 80 feet above ground. Guy wires and anchors, when necessary, will be used to stabilize poles. Some specialty poles may also be required. The new transmission line will require a 100-foot-wide right of way, 50 feet on each side of the centerline. Trees and vegetation in the right of way will be removed to provide a safe construction, operation and maintenance area.

Typical 115 kV Transmission Structure

Permitting

Great River Energy will submit a route permit application for the proposed Project to the Minnesota Public Utilities Commission (MPUC). During the route permit process, the public and regulatory agencies will have numerous opportunities to provide input on the proposed Project, including public meetings facilitated by the MPUC and Department of Commerce Energy Environmental Review and Analysis (DOC EERA) staff. The DOC EERA will prepare an Environmental Assessment (EA) for the Project. Construction cannot begin until an approved route permit is granted by the MPUC.

Easements/Trees

Once the project has been approved, Great River Energy will contact landowners to present an easement and offer of compensation. At that time, information will also be shared on tree removal, construction access and practices, and restoration of the right of way.

Project Schedule

Public contacts and/or notifications	2nd quarter 2015
Project permitting	Summer/fall 2015
Survey/design	Winter 2015/2016
Easement acquisition/right-of-way permits	Spring 2016
Transmission line construction	Starts 4th quarter 2016
Energization	Spring 2017

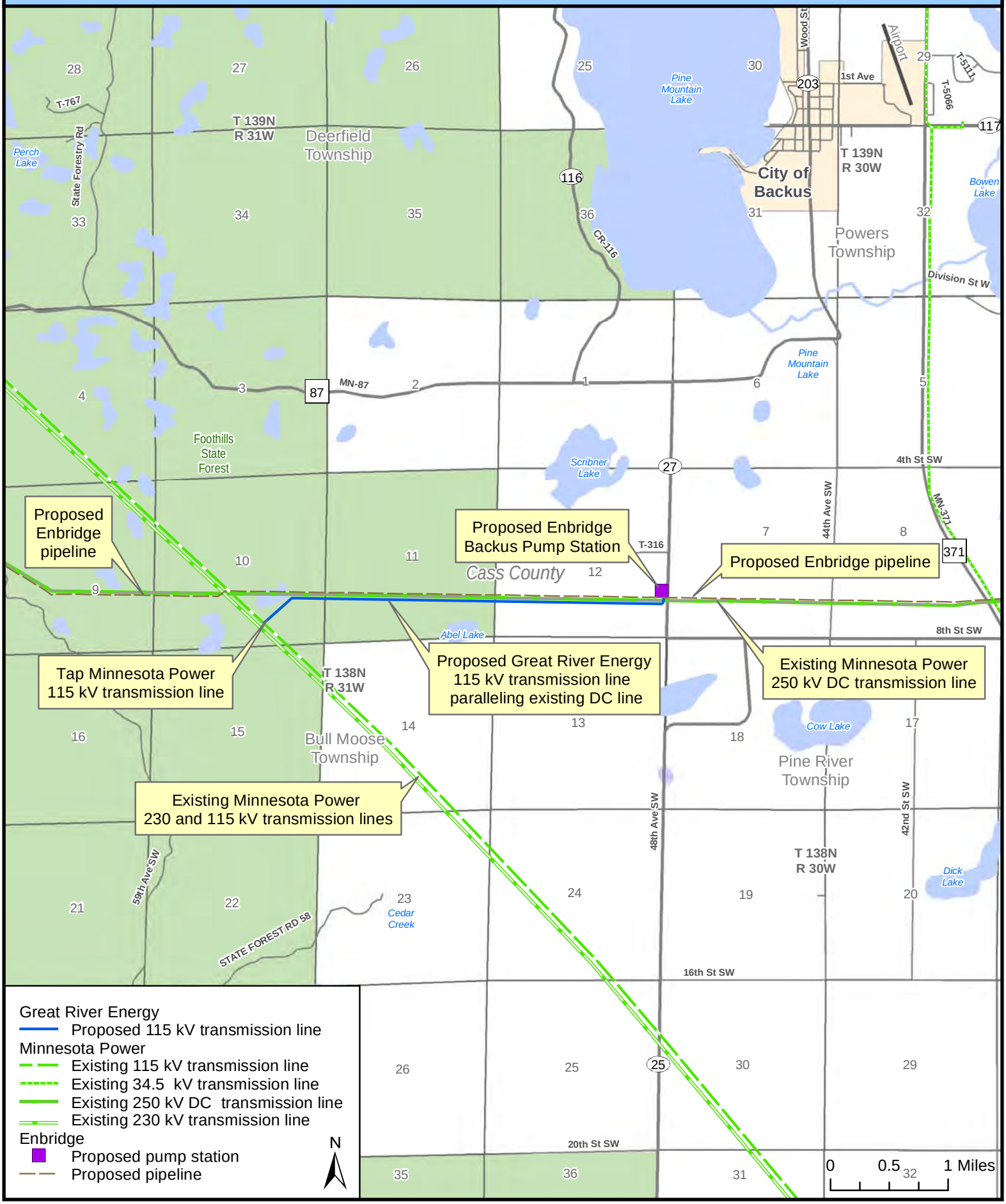
For project updates and information, visit greatriverenergy.com/bullmoose or contact:

Dan Lesher
Sr. Field Representative
Great River Energy – Transmission Land Rights
(763) 445-5975 or (612) 817-9910
dlesher@grenergy.com

Carole Schmidt
Supervisor, Transmission Permitting and Compliance
Great River Energy
763-445-5214
cschmidt@grenergy.com

Date last revised: 5/4/2015

Proposed Project



From: Berre, Donald (DOT)
To: Schmidt, Carole GRE-MG
Subject: RE: Bull Moose Project
Date: Thursday, July 09, 2015 6:59:43 AM

Carole,
I have reviewed the sketch of the proposed bull moose project in crow wing county in relation to both the backus and pine river airports.
There should not be any impacts to operations at either airport

GREAT RIVER ENERGY

12300 Elm Creek Blvd • Maple Grove, Minnesota 55369-4718 • 763-445-5000 • Fax 763-445-5050

May 6, 2015

Ms. Sarah Beimers, Manager
Government Programs and Compliance
Minnesota State Historic Preservation Office
345 Kellogg Boulevard West
St. Paul, MN 55102-1906

RE: Proposed Bull Moose 115 kV Transmission Project - Cass County

Dear Ms. Beimers:

Great River Energy is currently gathering data to be used in preparation of a regulatory application necessary to obtain approval to construct the proposed Bull Moose 115 kilovolt (kV) Transmission Project in Cass County (see enclosed fact sheet and map). Great River Energy intends to seek a Route Permit for the Project from the Minnesota Public Utilities Commission. The proposed Project is needed to provide power to a new petroleum pump station (Backus Station) being proposed by Enbridge Energy.

The Project will include approximately 2.5 miles of 115 kV transmission line that will exit the pump station substation, run parallel to Minnesota Power's existing 250 kV direct current (DC) transmission line (on the south side), and then tap the existing Minnesota Power "142" 115 kV transmission line (see fact sheet map). In most cases, round wood transmission structures will be used that will range in height from 70 to 80 feet above ground.

Merjent conducted a Phase 1A Cultural Resources Assessment of the proposed Project area (see enclosed letter). Merjent reported no previously recorded archaeological sites or previously recorded historic structures in the Project area, and supports the finding that there will be no adverse impact on known or suspected cultural resources as a result of this Project.

The Project will likely **not** require a Section 404 permit from the US Army Corps of Engineers (USACE). Although there will be some poles in wetlands, we believe the impacts will be below the permitting thresholds. If a permit is required, we understand the USACE will initiate the Section 106 requirements and consult with the SHPO under your joint Programmatic Agreement.

We would appreciate receiving any written comments from your office by Friday, June 5, 2015. If you have any questions about this proposed project, please contact me at (763) 445-5214. If you wish to respond by e-mail, my address is cschmidt@grenergy.com.

Thank you for your attention to this important project.

Sincerely,

GREAT RIVER ENERGY

Carole L. Schmidt

Carole L. Schmidt
Supervisor, Transmission Permitting and Compliance

Enclosure: Fact Sheet/Project Map; Merjent Letter

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Bull Moose 115 kV Transmission Line

GREAT RIVER ENERGY
12300 Elm Creek Blvd
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Project Description/Need

Great River Energy, wholesale electric supplier to Crow Wing Power and 27 other electric cooperatives, proposes to construct a new overhead 115 kilovolt (kV) transmission line that is needed to provide electric power to a new petroleum pump station (Backus Station) being proposed by Enbridge Energy (Enbridge). The Enbridge pump station is part of a pipeline replacement project that will require permits from the Minnesota Public Utilities Commission.

Proposed Project

The 2.5-mile transmission line (see map on back for proposed route) would tap an existing Minnesota Power (MP) 115 kV transmission line approximately four miles south west of the City of Backus. From there the line would run northeast for one half mile to the existing 250 kV Direct Current (DC) transmission line owned by MP. The route would then parallel, on the south side of the DC line, east for two miles. From there the route would cross under the DC line and terminate at the proposed pump station location just west of 48th Ave SW.

The proposed transmission line will consist of wood poles that are 350 to 400 feet apart and 70 to 80 feet above ground. Guy wires and anchors, when necessary, will be used to stabilize poles. Some specialty poles may also be required. The new transmission line will require a 100-foot-wide right of way, 50 feet on each side of the centerline. Trees and vegetation in the right of way will be removed to provide a safe construction, operation and maintenance area.

Typical 115 kV Transmission Structure

Permitting

Great River Energy will submit a route permit application for the proposed Project to the Minnesota Public Utilities Commission (MPUC). During the route permit process, the public and regulatory agencies will have numerous opportunities to provide input on the proposed Project, including public meetings facilitated by the MPUC and Department of Commerce Energy Environmental Review and Analysis (DOC EERA) staff. The DOC EERA will prepare an Environmental Assessment (EA) for the Project. Construction cannot begin until an approved route permit is granted by the MPUC.

Easements/Trees

Once the project has been approved, Great River Energy will contact landowners to present an easement and offer of compensation. At that time, information will also be shared on tree removal, construction access and practices, and restoration of the right of way.

Project Schedule

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Easement acquisition/right-of-way permits	Spring 2016
Transmission line construction	Starts 4th quarter 2016
Energization	Spring 2017

For project updates and information, visit greatriverenergy.com/bullmoose or contact:

Dan Lesher
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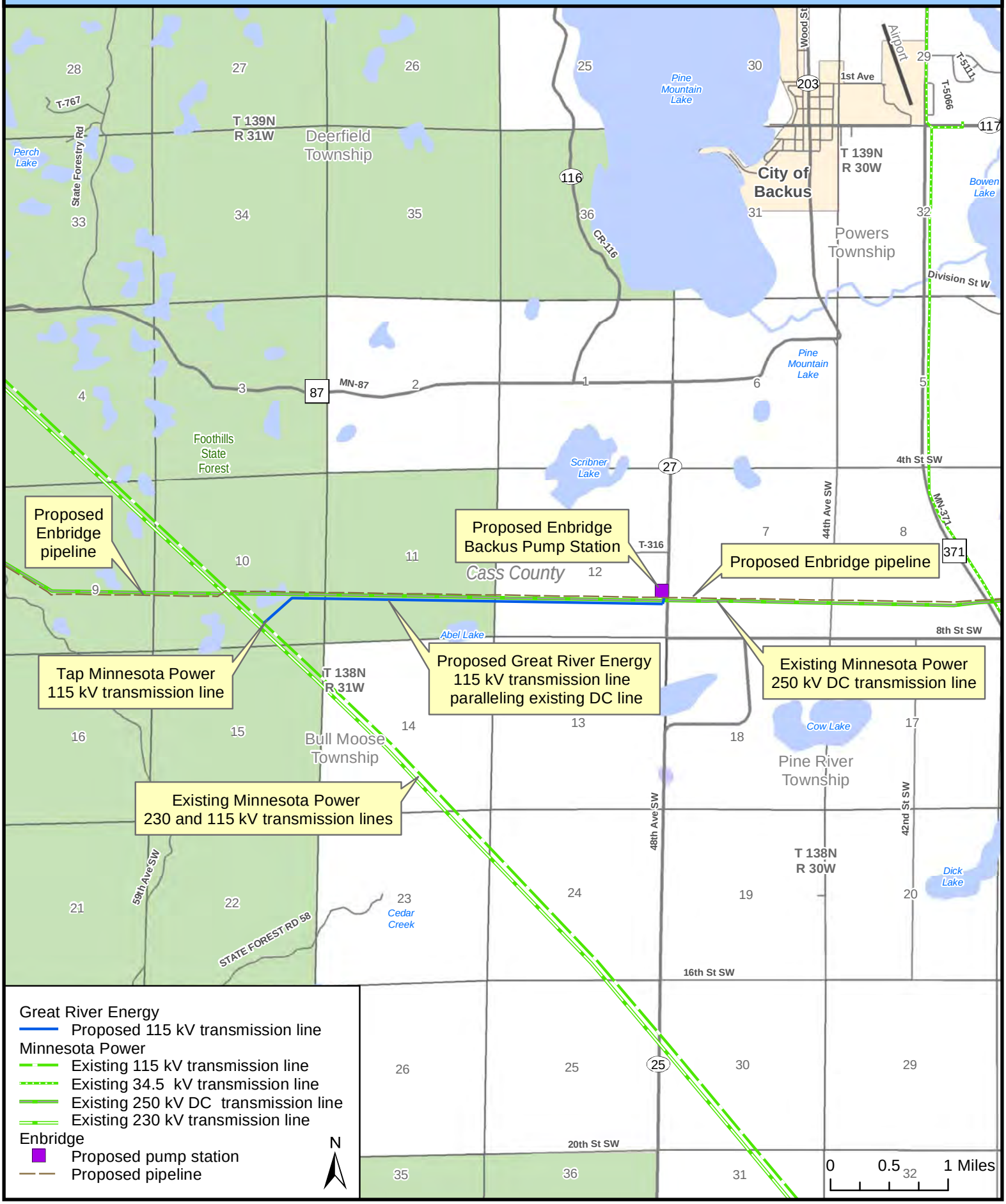
(763) 445-5975 or (612) 817-9910
dlesher@grenergy.com

Carole Schmidt
Supervisor, Transmission Permitting and Compliance
Great River Energy
763-445-5214
cschmidt@grenergy.com

Date last revised: 5/4/2015

Proposed Project



merjent

p 612.746.3660 ▪ f 612.746.3679

800 Washington Avenue North ▪ Suite 315 ▪ Minneapolis, Minnesota ▪ 55401

May 6, 2015

Carole Schmidt
Supervisor, Transmission Permitting and Compliance
Great River Energy
12300 Elm Creek Boulevard
Maple Grove, MN 56369-4718

Re: Phase IA Archaeological Assessment of the proposed Bull Moose 115 kV Transmission Line
Cass County, Minnesota.

Dear Carole:

Merjent was contacted in April 2015 by Great River Energy to conduct a Phase IA Cultural Resource Assessment of the proposed Bull Moose 115 kV Transmission Line Project (Project). The line is proposed to provide electric power to a proposed petroleum pump station to be constructed in concert with a pipeline replacement project. The proposed construction site for the transmission facility is located in Sections 10, 11, and 12 of Township 138 North, Range 31 West (Bull Moose Township) in Cass County, Minnesota.

Project Description
The proposed Project consists of the construction of approximately 2.5 miles of new 115kV transmission line that would tap into the existing Minnesota Power (MP) 115 kV transmission line approximately four miles southwest of the City of Backus. The proposed line would run northeast for approximately 0.5 mile to the route corridor of an existing 250 kV Direct Current (DC) transmission line owned by Minnesota Power. The proposed line would parallel the DC line towards the east for approximately 2.0 miles, cross under the DC line, and terminate at the proposed pump station location immediately west of 48th Ave SW.

The proposed transmission line will be strung on primarily wood poles approximately 70 to 80 feet above ground and spaced 350 to 400 feet apart. Guy wires and anchors will be used to stabilize poles when necessary. The proposed transmission line will require a 100-foot-wide right of way, 50 feet on each side of the centerline. Trees and vegetation in the right of way will be removed to provide a safe construction, operation and maintenance area.

Literature Review
The main objective in reviewing the cultural resources literature is to identify the recorded cultural sites and assess the potential for unrecorded sites to be located within the defined study area. The standard for considering a cultural property as significant is whether it meets the criteria for listing on the National Register of Historic Places (NRHP). The initial criterion for such listing is an age of 50 or more years. Beyond age, a property must retain integrity and be associated with significant historic trends, historic

persons, building styles and craftsmanship, or the property must have the potential to provide significant information about the past.

Merjent reviewed and followed the published guidelines for conducting cultural resources literature reviews in Minnesota. The Minnesota State Historic Preservation Office (SHPO), located in the Minnesota History Center in St. Paul, is the record keeper for the state's prehistoric and historic archaeological site files, historic standing structure inventory files, and field survey reports. The Office of the State Archaeologist (OSA), located at Fort Snelling History Center in St. Paul, maintains the records for burial sites within the State.

Merjent examined the current topographic and aerial photo-based maps to understand the modern land use of the Project area and to provide a baseline for examining the historic maps and documents. Several online resources were used to gather information. Merjent staff collected general information online about Cass County and the City of Backus. They also examined primary sources that have been digitized and made available online, such as the original land survey maps and the original land patent records.

In May 2015, Merjent Senior Cultural Resource Specialists Dean Sather examined site files maintained at the OSA and the SHPO.

Previously Recorded Archaeological Resources

An examination of cultural resource investigations conducted within the defined Project area yielded no information regarding previously recorded archaeological sites.

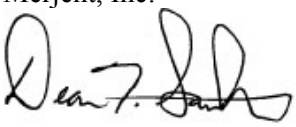
Previously Recorded Standing Historic Structures

A review of the History/Architecture Inventory Files at SHPO was conducted to identify inventoried historic structures recorded within the Project area. This review yielded no information regarding previously recorded/inventoried standing structures.

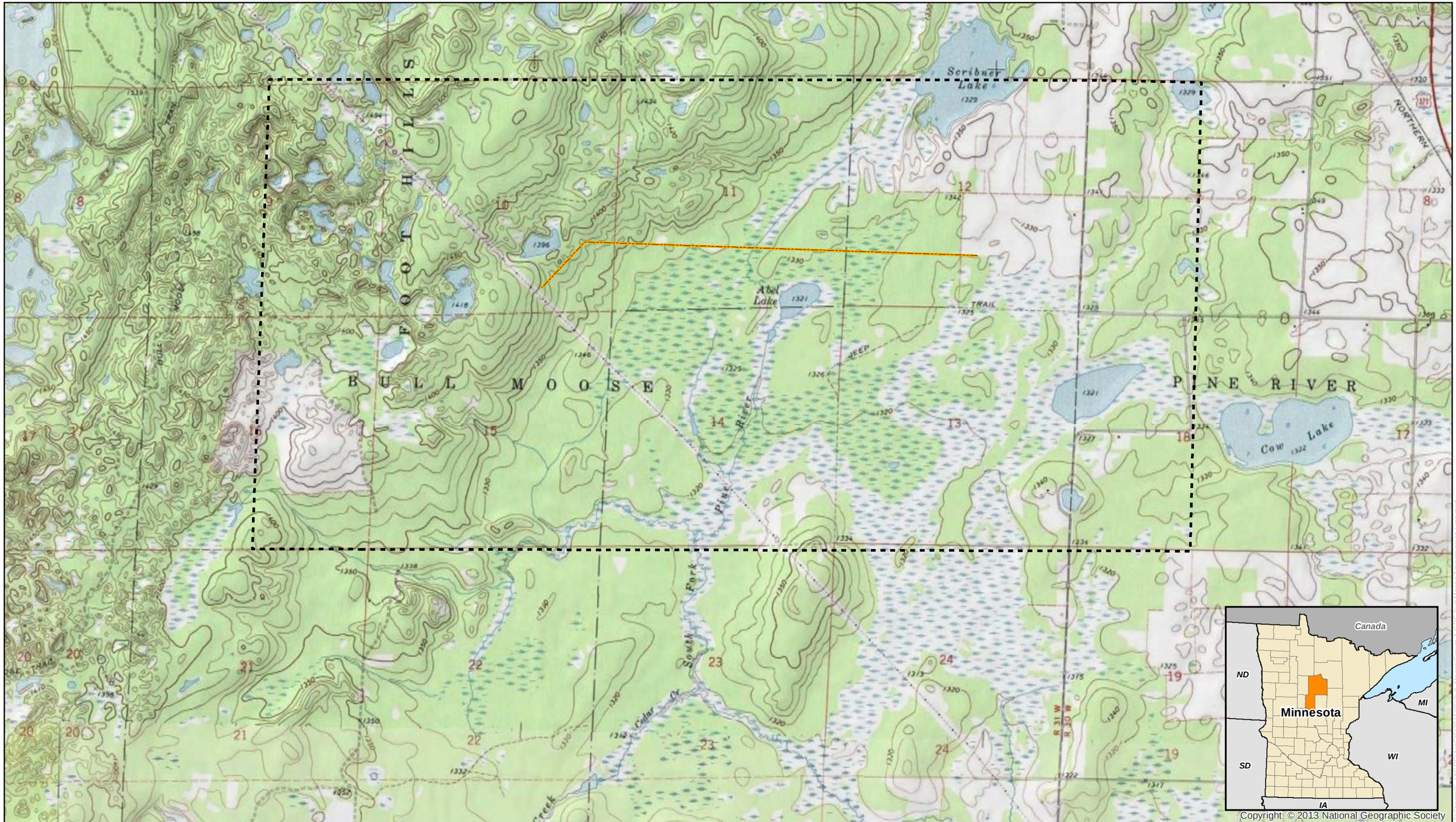
Conclusions

Merjent supports the finding that there will be no adverse impact on known or suspected cultural resources as a result of this Project. Merjent stresses that if construction plans are altered to affect areas that were not previously surveyed or disturbed, these locations should be examined for cultural resources. Further, if human remains are encountered during construction activities, all ground disturbing activity must cease and local law enforcement must be notified. Minnesota Statute 307.08, the Private Cemeteries Act, prohibits the intentional disturbance of human burials. Please contact us if you have questions.

Sincerely,
Merjent, Inc.



Dean T. Sather, MA, RPA
Sr. Cultural Resource Specialist



0 1,000 2,000 Feet

1 inch = 2,000 feet

For Environmental Review Purposes Only

merjent

Figure 1

GRE - Bull Moose 115 kV Transmission Project

Project Route and Review Area

Cass County, Minnesota

Project Route

Review Boundary

Source: Z:\Clients\E_H\GRE\ArcGIS\2015\05\Bull_Moose\Figure 1 GRE Bull Moose Transmission Line.mxd

Date: (7/7/2015)

Minnesota Historical Society

Using the Power of History to Transform Lives
PRESERVING › SHARING › CONNECTING

STATE HISTORIC PRESERVATION OFFICE

June 10, 2015

Ms. Carole Schmidt
Transmission Permitting Analyst
Great River Energy
12300 Elm Creek Blvd.
Maple Grove, MN 55369-4718

RE: Great River Energy Bull Moose 115 kV Transmission Project
Bull Moose Twp., Cass County
T138 R31 S10, 11, 12
SHPO Number: 2015-1956

Dear Ms. Schmidt:

Thank you for the opportunity to review and comment on the above project. It has been reviewed pursuant to the responsibilities given the Minnesota Historical Society by the Minnesota Historic Sites Act and the Minnesota Field Archaeology Act.

Based on our review of the project information, we conclude that there are **no properties** listed in the National or State Registers of Historic Places, and no known or suspected archaeological properties in the area that will be affected by this project.

Please note that this comment letter does not address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36CFR800, Procedures of the Advisory Council on Historic Preservation for the protection of historic properties. If this project is considered for federal assistance, or requires a federal permit or license, it should be submitted to our office by the responsible federal agency.

Please contact our Compliance Section at (651) 259-3455 if you have any questions regarding our review of this project.

Sincerely,

Sarah J. Beimers

Sarah J. Beimers, Manager
Government Programs and Compliance

GREAT RIVER ENERGY

12300 Elm Creek Blvd • Maple Grove, Minnesota 55369-4718 • 763-445-5000 • Fax 763-445-5050

May 6, 2015

Mr. Bill Baer
U.S. Army Corps of Engineers
Bemidji Regulatory Field Office
4111 Technology Drive, Suite 295
Bemidji, MN 56601

RE: Proposed Bull Moose 115 kV Transmission Project - Cass County

Dear Mr. Baer:

Great River Energy is currently gathering data to be used in preparation of a regulatory application necessary to obtain approval to construct the proposed Bull Moose 115 kilovolt (kV) Transmission Project in Cass County (see enclosed fact sheet and map). Great River Energy intends to seek a Route Permit for the Project from the Minnesota Public Utilities Commission. The proposed Project is needed to provide power to a new petroleum pump station (Backus Station) being proposed by Enbridge Energy.

The Project will include approximately 2.5 miles of 115 kV transmission line that will exit the pump station substation, run parallel to Minnesota Power's existing 250 kV direct current (DC) transmission line (on the south side), and then tap the existing Minnesota Power "142" 115 kV transmission line (see fact sheet map). In most cases, round wood transmission structures will be used that will range in height from 70 to 80 feet above ground.

Great River Energy is requesting information on the possible effects of the proposed project on floodplains, wetlands, and other important natural resources that occur in the project area. The transmission line will not cross any DNR public waters but will cross a number of NWI wetlands (see enclosed map); however, some of the wetlands will be spanned and we believe impacts will be below the permitting thresholds. Great River Energy will work with the Corps and Cass County to address impacts once design details are available.

Merjent conducted a Phase 1A Cultural Resources Assessment of the proposed Project area (see enclosed letter). Merjent reported no previously recorded archaeological sites or previously recorded historic structures in the Project area, and supports the finding that there will be no adverse impact on known or suspected cultural resources as a result of this Project.

We would appreciate receiving any written comments from your office by Friday, June 5, 2015. If you have any questions about this proposed project, please contact me at (763) 445-5214. If you wish to respond by e-mail, my address is cschmidt@grenergy.com.

Thank you for your attention to this important project.

Sincerely,

GREAT RIVER ENERGY

Carole L. Schmidt

Carole L. Schmidt
Supervisor, Transmission Permitting and Compliance

Enclosures: Fact Sheet/Project Map; Hydrologic Features Map; Merjent Letter

s:\legal\environmental\transmission\projects\Bull Moose Project\Agency Correspondence\Bull Moose USACEltr 5-6-15.doc

Bull Moose 115 kV Transmission Line

GREAT RIVER ENERGY
12300 Elm Creek Blvd
Maple Grove, MN 55369-4718
1-888-521-0130
www.greatriverenergy.com

CROW WING POWER
17330 Highway 371 North, PO Box 507
Brainerd, MN 56401
218-829-2827
www.CWPower.com

Project Description/Need

Great River Energy, wholesale electric supplier to Crow Wing Power and 27 other electric cooperatives, proposes to construct a new overhead 115 kilovolt (kV) transmission line that is needed to provide electric power to a new petroleum pump station (Backus Station) being proposed by Enbridge Energy (Enbridge). The Enbridge pump station is part of a pipeline replacement project that will require permits from the Minnesota Public Utilities Commission.

Proposed Project

The 2.5-mile transmission line (see map on back for proposed route) would tap an existing Minnesota Power (MP) 115 kV transmission line approximately four miles south west of the City of Backus. From there the line would run northeast for one half mile to the existing 250 kV Direct Current (DC) transmission line owned by MP. The route would then parallel, on the south side of the DC line, east for two miles. From there the route would cross under the DC line and terminate at the proposed pump station location just west of 48th Ave SW.

The proposed transmission line will consist of wood poles that are 350 to 400 feet apart and 70 to 80 feet above ground. Guy wires and anchors, when necessary, will be used to stabilize poles. Some specialty poles may also be required. The new transmission line will require a 100-foot-wide right of way, 50 feet on each side of the centerline. Trees and vegetation in the right of way will be removed to provide a safe construction, operation and maintenance area.

Typical 115 kV Transmission Structure

Permitting

Great River Energy will submit a route permit application for the proposed Project to the Minnesota Public Utilities Commission (MPUC). During the route permit process, the public and regulatory agencies will have numerous opportunities to provide input on the proposed Project, including public meetings facilitated by the MPUC and Department of Commerce Energy Environmental Review and Analysis (DOC EERA) staff. The DOC EERA will prepare an Environmental Assessment (EA) for the Project. Construction cannot begin until an approved route permit is granted by the MPUC.

Easements/Trees

Once the project has been approved, Great River Energy will contact landowners to present an easement and offer of compensation. At that time, information will also be shared on tree removal, construction access and practices, and restoration of the right of way.

Project Schedule

Public contacts and/or notifications	2nd quarter 2015
Project permitting	Summer/fall 2015
Survey/design	Winter 2015/2016
Easement acquisition/right-of-way permits	Spring 2016
Transmission line construction	Starts 4th quarter 2016
Energization	Spring 2017

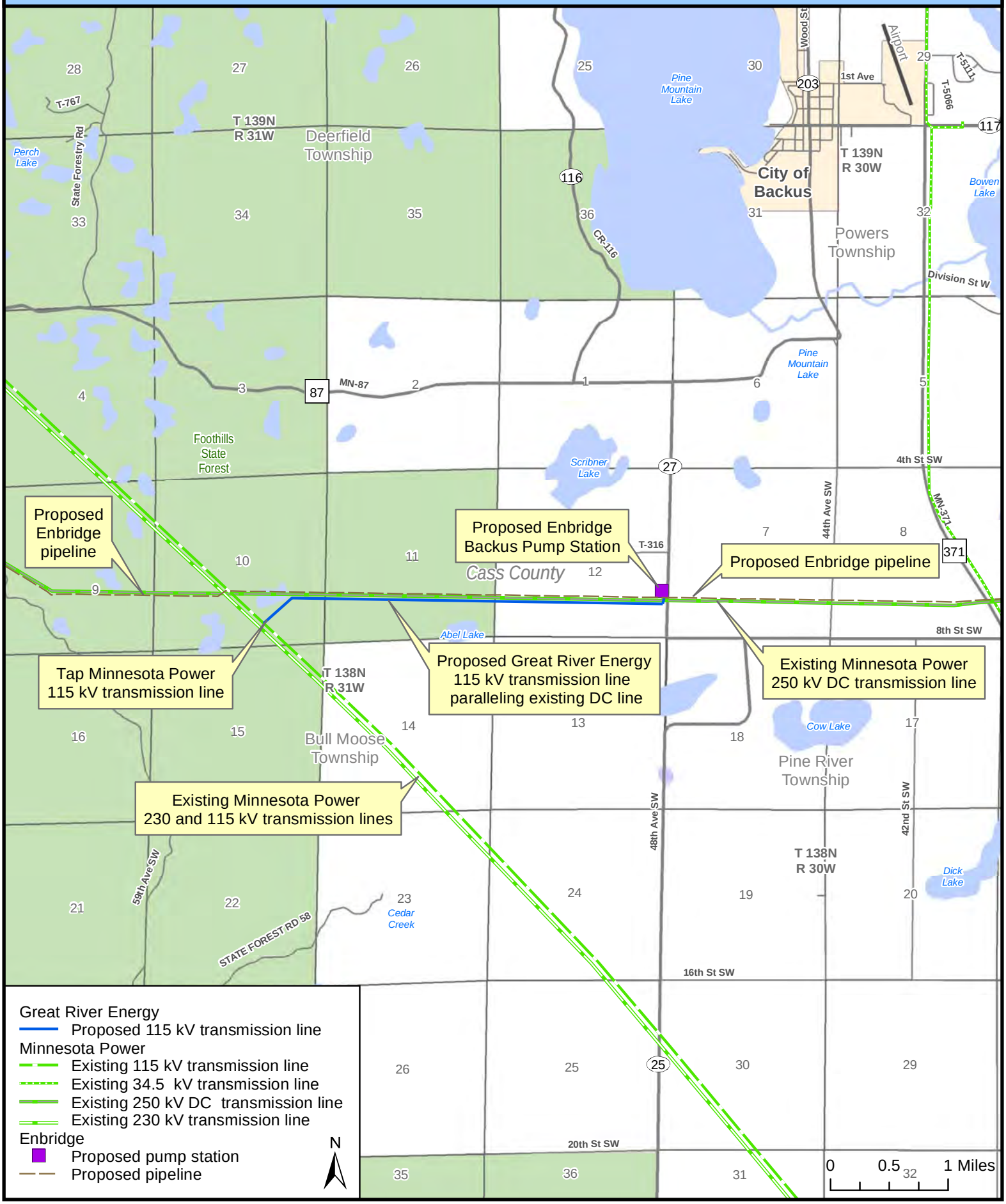
For project updates and information, visit greatriverenergy.com/bullmoose or contact:

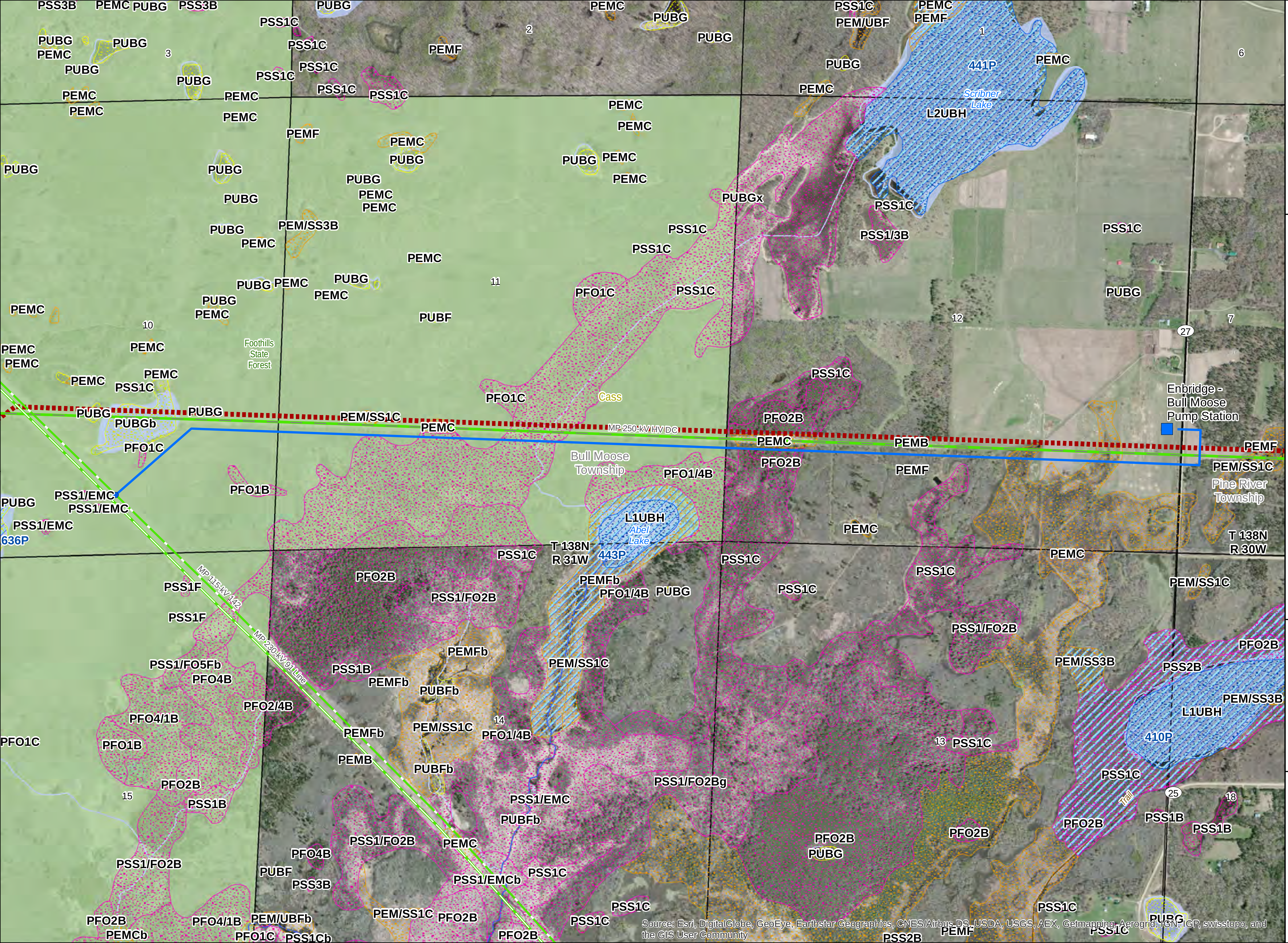
Dan Lesher
Sr. Field Representative
Great River Energy – Transmission Land Rights
(763) 445-5975 or (612) 817-9910
dlesher@grenergy.com

Carole Schmidt
Supervisor, Transmission Permitting and Compliance
Great River Energy
763-445-5214
cschmidt@grenergy.com

Date last revised: 5/4/2015

Proposed Project





GREAT RIVER ENERGY®

A Touchstone Energy® Cooperative

Great River Energy

- Proposed 115 kV Transmission Line

Enbridge

- Proposed Pump Station
- Proposed Pipeline

Minnesota Power (MP)

- Existing 115 kV Transmission Line
- Existing 230 kV Transmission Line
- Existing 250 kV Transmission Line

NWI Wetlands

- Freshwater Emergent Wetland
- Freshwater Forested/
- Freshwater Pond
- Lake

MN Public Waters Inventory (PWI)

- Public Water Basin
- MN Public Watercourse

Updated: 4/28/2015

Data Sources vary between MNDOT, MNDNR, MNGEO and Great River Energy

Aerial Imagery form:
ESRI World Imagery Basemap service

Map Projection:
UTM, NAD83, Zone15, Meters

0 250 500 750 1,000 Feet

N

Bull Moose Pumping Station 115 kV Line Project

NWI Wetlands and Hydrologic Features

merjent

p 612.746.3660 ▪ f 612.746.3679

800 Washington Avenue North ▪ Suite 315 ▪ Minneapolis, Minnesota ▪ 55401

May 6, 2015

Carole Schmidt
Supervisor, Transmission Permitting and Compliance
Great River Energy
12300 Elm Creek Boulevard
Maple Grove, MN 56369-4718

Re: Phase IA Archaeological Assessment of the proposed Bull Moose 115 kV Transmission Line
Cass County, Minnesota.

Dear Carole:

Merjent was contacted in April 2015 by Great River Energy to conduct a Phase IA Cultural Resource Assessment of the proposed Bull Moose 115 kV Transmission Line Project (Project). The line is proposed to provide electric power to a proposed petroleum pump station to be constructed in concert with a pipeline replacement project. The proposed construction site for the transmission facility is located in Sections 10, 11, and 12 of Township 138 North, Range 31 West (Bull Moose Township) in Cass County, Minnesota.

Project Description
The proposed Project consists of the construction of approximately 2.5 miles of new 115kV transmission line that would tap into the existing Minnesota Power (MP) 115 kV transmission line approximately four miles southwest of the City of Backus. The proposed line would run northeast for approximately 0.5 mile to the route corridor of an existing 250 kV Direct Current (DC) transmission line owned by Minnesota Power. The proposed line would parallel the DC line towards the east for approximately 2.0 miles, cross under the DC line, and terminate at the proposed pump station location immediately west of 48th Ave SW.

The proposed transmission line will be strung on primarily wood poles approximately 70 to 80 feet above ground and spaced 350 to 400 feet apart. Guy wires and anchors will be used to stabilize poles when necessary. The proposed transmission line will require a 100-foot-wide right of way, 50 feet on each side of the centerline. Trees and vegetation in the right of way will be removed to provide a safe construction, operation and maintenance area.

Literature Review
The main objective in reviewing the cultural resources literature is to identify the recorded cultural sites and assess the potential for unrecorded sites to be located within the defined study area. The standard for considering a cultural property as significant is whether it meets the criteria for listing on the National Register of Historic Places (NRHP). The initial criterion for such listing is an age of 50 or more years. Beyond age, a property must retain integrity and be associated with significant historic trends, historic

persons, building styles and craftsmanship, or the property must have the potential to provide significant information about the past.

Merjent reviewed and followed the published guidelines for conducting cultural resources literature reviews in Minnesota. The Minnesota State Historic Preservation Office (SHPO), located in the Minnesota History Center in St. Paul, is the record keeper for the state's prehistoric and historic archaeological site files, historic standing structure inventory files, and field survey reports. The Office of the State Archaeologist (OSA), located at Fort Snelling History Center in St. Paul, maintains the records for burial sites within the State.

Merjent examined the current topographic and aerial photo-based maps to understand the modern land use of the Project area and to provide a baseline for examining the historic maps and documents. Several online resources were used to gather information. Merjent staff collected general information online about Cass County and the City of Backus. They also examined primary sources that have been digitized and made available online, such as the original land survey maps and the original land patent records.

In May 2015, Merjent Senior Cultural Resource Specialists Dean Sather examined site files maintained at the OSA and the SHPO.

Previously Recorded Archaeological Resources

An examination of cultural resource investigations conducted within the defined Project area yielded no information regarding previously recorded archaeological sites.

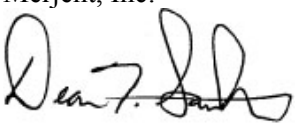
Previously Recorded Standing Historic Structures

A review of the History/Architecture Inventory Files at SHPO was conducted to identify inventoried historic structures recorded within the Project area. This review yielded no information regarding previously recorded/inventoried standing structures.

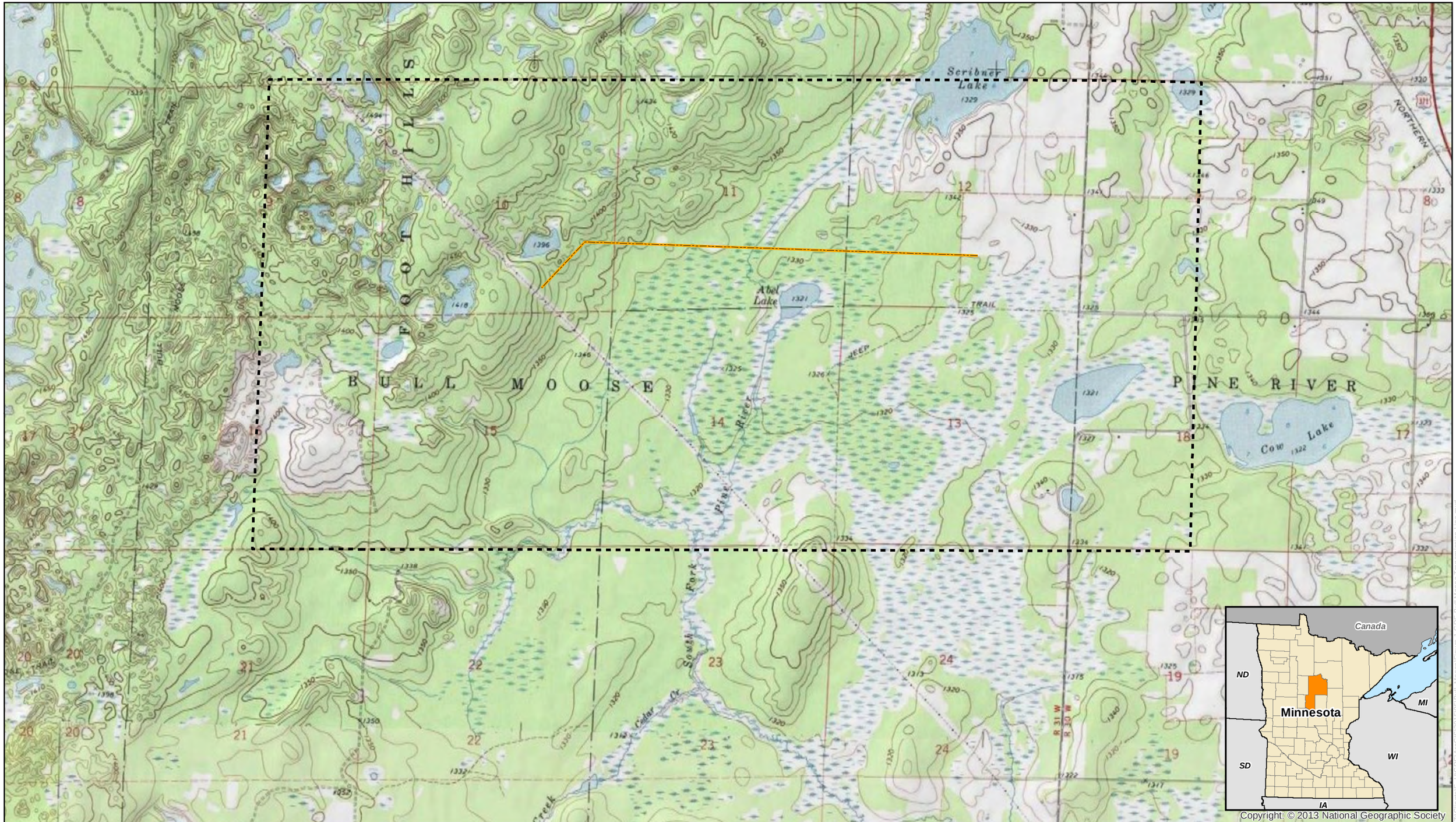
Conclusions

Merjent supports the finding that there will be no adverse impact on known or suspected cultural resources as a result of this Project. Merjent stresses that if construction plans are altered to affect areas that were not previously surveyed or disturbed, these locations should be examined for cultural resources. Further, if human remains are encountered during construction activities, all ground disturbing activity must cease and local law enforcement must be notified. Minnesota Statute 307.08, the Private Cemeteries Act, prohibits the intentional disturbance of human burials. Please contact us if you have questions.

Sincerely,
Merjent, Inc.



Dean T. Sather, MA, RPA
Sr. Cultural Resource Specialist



0 1,000 2,000 Feet

1 inch = 2,000 feet

For Environmental Review Purposes Only

merjent

Figure 1

GRE - Bull Moose 115 kV Transmission Project

Project Route and Review Area

Cass County, Minnesota

Project Route

Review Boundary

Source: Z:\Clients\E_H\GRE\ArcGIS\2015\05\Bull_Moose\Figure 1 GRE Bull Moose Transmission Line.mxd

Date: (7/7/2015)

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL MINNESOTA 55101-1678

REPLY TO
ATTENTION

JUN 15 2015

Operations
Regulatory (2015-01467-TJH)

Carole L. Schmidt
Great River Energy
12300 Elm Creek Blvd
Maple Grove, Minnesota 55369-4718

Dear Ms. Schmidt:

We have received the document entitled "Proposed Bull Moose 115 kV Transmission Project - Cass County", dated May 6, 2015. Due to limited staff and resources, it is unlikely that U.S. Army Corps of Engineers Regulatory staff will review or comment on this document until we receive a jurisdictional determination request, a request for a pre-application consultation meeting, and/or a permit application. In lieu of a specific response, please consider the following general information concerning our regulatory program that may apply to the proposed project.

If the proposal involves activity in navigable waters of the United States, it may be subject to the Corps of Engineers' jurisdiction under Section 10 of the Rivers and Harbors Act of 1899 (Section 10). Section 10 prohibits the construction, excavation, or deposition of materials in, over, or under navigable waters of the United States, or any work that would affect the course, location, condition, or capacity of those waters, unless the work has been authorized by a Department of the Army permit.

If the proposal involves discharge of dredged or fill material into waters of the United States, it may be subject to the Corps of Engineers' jurisdiction under Section 404 of the Clean Water Act (CWA Section 404). Waters of the United States include navigable waters, their tributaries, and adjacent wetlands (33 CFR § 328.3). CWA Section 301(a) prohibits discharges of dredged or fill material into waters of the United States, unless the work has been authorized by a Department of the Army permit under Section 404. Information about the Corps permitting process can be obtained online at http://www.mvp.usace.army.mil/regulatory.

The Corps' evaluation of a Section 10 and/or a Section 404 permit application involves multiple analyses, including (1) evaluating the proposal's impacts in accordance with the National Environmental Policy Act (NEPA) (33 CFR part 325), (2) determining whether the proposal is contrary to the public interest (33 CFR § 320.4), and (3) in the case of a Section 404 permit, determining whether the proposal complies with the Section 404(b)(1) Guidelines (Guidelines) (40 CFR part 230).

If the proposal requires a Section 404 permit application, the Guidelines specifically require that "no discharge of dredged or fill material shall be permitted if there is a practicable

alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences" (40 CFR § 230.10(a)). Time and money spent on the proposal prior to applying for a Section 404 permit cannot be factored into the Corps' decision whether there is a less damaging practicable alternative to the proposal.

If an application for a Corps permit has not yet been submitted, the project proposer may request a pre-application consultation meeting with the Corps to obtain information regarding the data, studies or other information that will be necessary for the permit evaluation process. A pre-application consultation meeting is strongly recommended if the proposal has substantial impacts to waters of the United States, or if it is a large or controversial project.

For further information or to request a pre-application consultation meeting, please contact the Corps' project manager for this project, Tom Hingsberger, at 651-290-5367, or by email at: thomas.j.hingsberger@usace.army.mil.

Sincerely,

for Tamara E. Cameron
Chief, Regulatory Branch

GREAT RIVER ENERGY

12300 Elm Creek Blvd • Maple Grove, Minnesota 55369-4718 • 763-445-5000 • Fax 763-445-5050

May 6, 2015

Mr. Andrew Horton, Habitat Conservation Biologist
United States Department of the Interior
Fish and Wildlife Service
Twin Cities Field Office
4101 American Blvd. East
Bloomington, MN 55425-1665

RE: Proposed Bull Moose 115 kV Transmission Project - Cass County

Dear Mr. Horton:

Great River Energy is currently gathering data to be used in preparation of a regulatory application necessary to obtain approval to construct the proposed Bull Moose 115 kilovolt (kV) Transmission Project (Project) in Cass County (see enclosed fact sheet and map). Great River Energy intends to seek a Route Permit for the Project from the Minnesota Public Utilities Commission. The proposed Project is needed to provide power to a new petroleum pump station (Backus Station) being proposed by Enbridge Energy (Enbridge).

The Project will include approximately 2.5 miles of 115 kV transmission line that will exit the pump station substation, run parallel to Minnesota Power's existing 250 kV direct current (DC) transmission line (on the south side), and then tap the existing Minnesota Power "142" 115 kV transmission line (see fact sheet map). In most cases, round wood transmission structures will be used that will range in height from 70 to 80 feet above ground.

The Fish and Wildlife Service website list for threatened and endangered species in Cass County includes the Canada lynx, Gray wolf, and the Northern long-eared bat (NLEB). Great River Energy does not believe the proposed transmission project will affect either the lynx or gray wolf, or, per study results provided by Enbridge, the NLEB.

Enbridge used desktop analysis to identify areas of potentially suitable NLEB habitat along its preferred pipeline route both west and east of Clearbrook, MN. Data from this analysis were used to select survey target sites, which were reviewed and approved by the USFWS prior to survey. Enbridge conducted presence/absence acoustic surveys in proximity to the Backus Pump Station/Bull Moose transmission line Project area between June 2 and August 9, 2014. There were no acoustic positives within 5 miles of linear survey in either direction of the Backus Pump Station/Bull Moose transmission line Project area. The nearest NLEB acoustic detection was approximately 9.5 miles to the east of the Backus Pump Station/Bull Moose transmission line Project area, in Crow

Wing County. A companion mist net survey conducted on August 4-5, 2014 was negative at this location.

The DNR Rare features database indicates no rare features intersected by the proposed Project. Trumpeter swans are shown to be present to the south of the Project (see enclosed map).

Great River Energy is requesting concurrence or information on the possible effects of the proposed project on any listed or proposed threatened or endangered species and designated or proposed critical habitat that may be present in the project area.

We would appreciate receiving any written comments from your office by Friday, June 5, 2015. If you have any questions about this proposed project, please contact me at (763) 445-5214. If you wish to respond by e-mail, my address is cschmidt@grenergy.com.

Thank you for your attention to this important project.

Sincerely,

GREAT RIVER ENERGY

Carole L. Schmidt

Carole L. Schmidt
Supervisor, Transmission Permitting and Compliance

Enclosures: Fact Sheet/Project Map; Rare Features Map

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Bull Moose 115 kV Transmission Line

GREAT RIVER ENERGY
12300 Elm Creek Blvd
Maple Grove, MN 55369-4718
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CROW WING POWER
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Project Description/Need

Great River Energy, wholesale electric supplier to Crow Wing Power and 27 other electric cooperatives, proposes to construct a new overhead 115 kilovolt (kV) transmission line that is needed to provide electric power to a new petroleum pump station (Backus Station) being proposed by Enbridge Energy (Enbridge). The Enbridge pump station is part of a pipeline replacement project that will require permits from the Minnesota Public Utilities Commission.

Proposed Project

The 2.5-mile transmission line (see map on back for proposed route) would tap an existing Minnesota Power (MP) 115 kV transmission line approximately four miles south west of the City of Backus. From there the line would run northeast for one half mile to the existing 250 kV Direct Current (DC) transmission line owned by MP. The route would then parallel, on the south side of the DC line, east for two miles. From there the route would cross under the DC line and terminate at the proposed pump station location just west of 48th Ave SW.

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Typical 115 kV Transmission Structure

Permitting

Great River Energy will submit a route permit application for the proposed Project to the Minnesota Public Utilities Commission (MPUC). During the route permit process, the public and regulatory agencies will have numerous opportunities to provide input on the proposed Project, including public meetings facilitated by the MPUC and Department of Commerce Energy Environmental Review and Analysis (DOC EERA) staff. The DOC EERA will prepare an Environmental Assessment (EA) for the Project. Construction cannot begin until an approved route permit is granted by the MPUC.

Easements/Trees

Once the project has been approved, Great River Energy will contact landowners to present an easement and offer of compensation. At that time, information will also be shared on tree removal, construction access and practices, and restoration of the right of way.

Project Schedule

Public contacts and/or notifications	2nd quarter 2015
Project permitting	Summer/fall 2015
Survey/design	Winter 2015/2016
Easement acquisition/right-of-way permits	Spring 2016
Transmission line construction	Starts 4th quarter 2016
Energization	Spring 2017

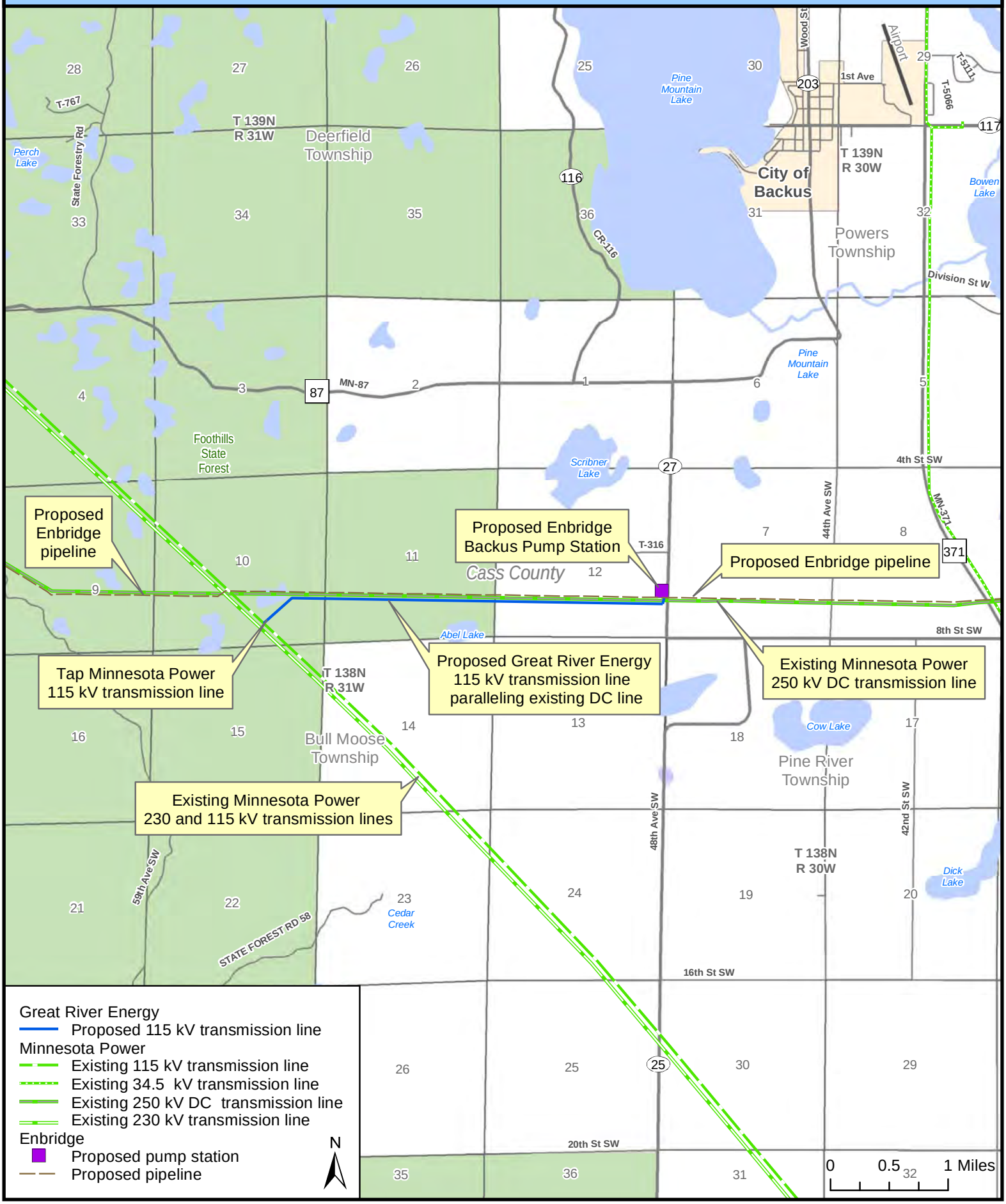
For project updates and information, visit greatriverenergy.com/bullmoose or contact:

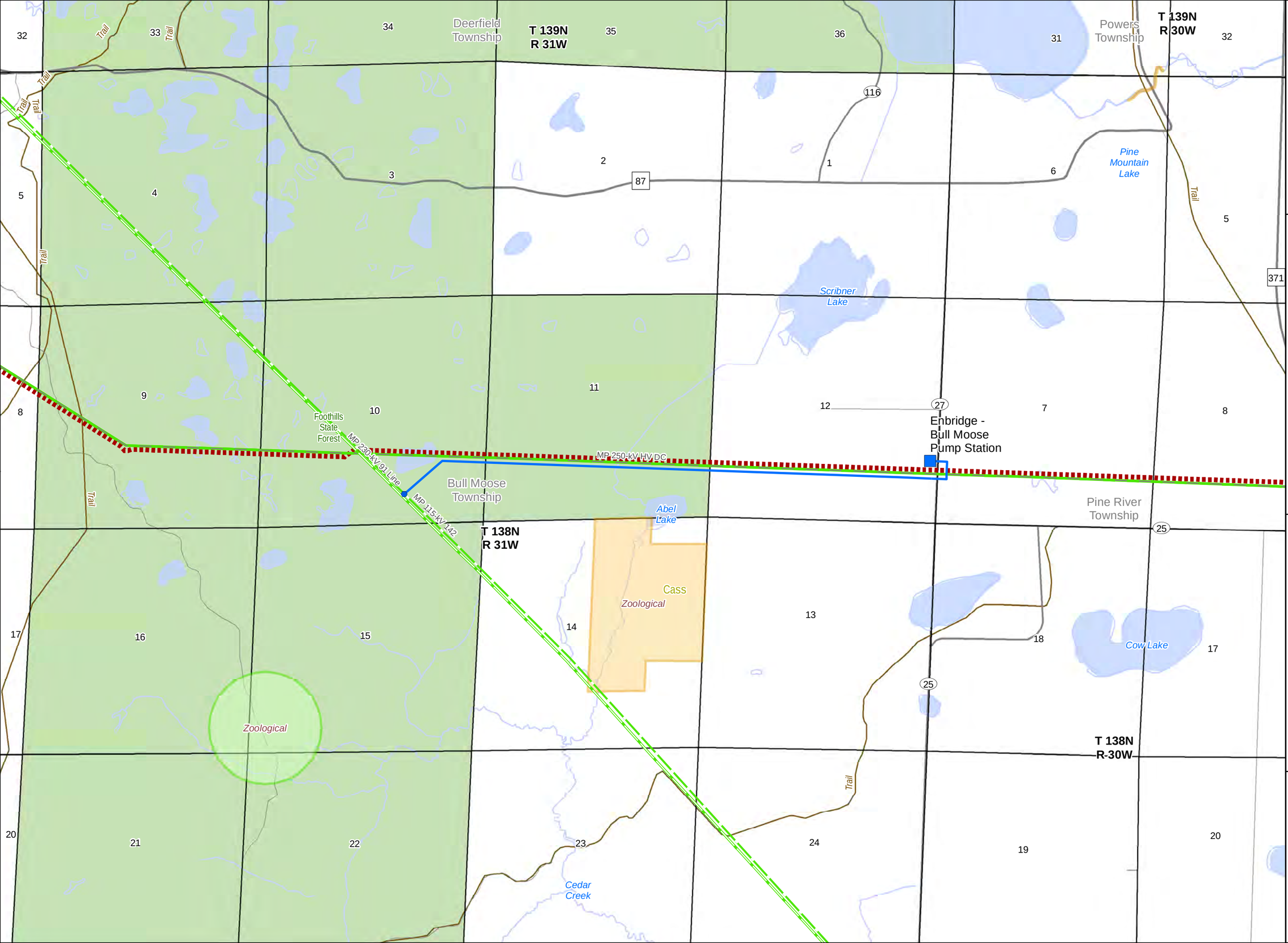
Dan Lesher
Sr. Field Representative
Great River Energy – Transmission Land Rights
(763) 445-5975 or (612) 817-9910
dlesher@grenergy.com

Carole Schmidt
Supervisor, Transmission Permitting and Compliance
Great River Energy
763-445-5214
cschmidt@grenergy.com

Date last revised: 5/4/2015

Proposed Project





GREAT RIVER ENERGY®

A Touchstone Energy® Cooperative

Great River Energy
- Proposed 115 kV Transmission Lin

Minnesota Power (MP)
- Existing 115 kV Transmission Line
- Existing 230 kV Transmission Line
- Existing 250 kV Transmission Line

Enbridge
- Proposed Pump Station
- Pipeline

MN Rare Natural Feature (NHIS)

Protection Status
- Special Concern
- Not listed

Updated: 4/28/2015

Data Sources Vary Between MNDOT, MNDNR, MNGEO and Great River Energy
Rare Features Heritage data from MNDOT
Topo scaned image maps from the United States Geological Survey (USGS)

Map Projection:
UTM, NAD83, Zone15, Meters

N

0 0.25 0.5 Miles

Bull Moose Pumping Station 115 kV Line Project

Rare Features

From: Horton, Andrew
To: Schmidt, Carole GRE-MG
Subject: RE: Bull Moose 115kV Transmission Project - Cass County
Date: Monday, June 15, 2015 5:58:38 AM

Carole,

I have reviewed your project proposal for Bull Moose 115kV Transmission Upgrade in Cass County, Minnesota. For the county listed, the following species may occur:

Cass	Canada lynx *(Lynx canadensis)*	Threatened	Northern forest
	Gray wolf *Canis lupus*	Threatened	Northern forest
	Northern long-eared bat *Myotis septentrionalis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during spring and summer.

We have no known records for federally listed or proposed species and/or designated or proposed critical habitat within the action area. The project area is also not within a quarter mile of any known roost trees or hibernacula for the northern long-eared bat.

As you have noted, there have been three acoustic survey sites along your project area that failed to detect the northern long-eared bat in 2014. Habitat in the area still appears to be suitable for the species and any tree removal that may occur during the species' active season (April 1-September 30) has the potential to take the northern long-eared bat. We recommend that any tree removal at this location be conducted outside the the summer roost period for the species. Between the months of October 1st and March 30th, we would not anticipate the northern long-eared bat to be present in the action area.

Under the Interim 4(d) Rule, any incidental take would not be prohibited provided the project can be defined as "Routine Maintenance" or "Limited Expansion of Existing Rights-of-way and Transmission Corridors." In order to be considered "Limted Expansion" the expansion must be "...of a corridor or ROW by up to 100 feet (30 m) from the edge of an existing cleared corridor or ROW..." Incidental take will not be prohibited provided the following conservation measures are adhered to, the activity must: 1) occur more than 0.25 mile (0.4 kilometer) from a known, occupied hibernacula; 2) avoid cutting or destroying known, occupied roost trees during the pup season (June 1–July 31); and avoid clearcuts (and similar harvest methods, e.g., seed tree, shelterwood, and coppice) within 0.25 mile (0.4 kilometer) of known, occupied roost trees during the pup season (June 1–July 31). Please refer to Threatened with an Interim 4(d) Listing Rule for additional information regarding the the northern long-eared bat Threatened designation and Interim 4(d) Rule exemptions.
http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/FRnlebFinalListing02April2015.pdf

Additionally, Under the Migratory Bird Treaty Act of 1918, as amended, it is unlawful to take, capture, kill, or possess migratory birds, their nests, eggs, and young. If migratory birds are known to nest on any structures or habitat which may be disturbed by project construction, activities (e.g., tree removal) should begin and be completed before the initiation of the breeding season for those species or after breeding has concluded. Generally, we recommend that any habitat disturbance occur before May 1 or after August 30 to minimize potential impacts to migratory birds, but please be aware that some species may initiate nesting before May 1.

If project plans change, additional information on listed or proposed species becomes available, or new species are listed that may be affected by the project, our office should be contacted. This concludes our technical assistance review of the proposed action at the above location. If you have any further endangered species questions, please contact Andrew Horton at andrew_horton@fws.gov or (612) 725-3548 x2208.

Thank you,

Andrew Horton
Twin Cities Ecological Services Field Office
U.S. Fish and Wildlife Service
4101 American Blvd East
Bloomington, MN 55425-1665
(612) 725-3548 ext. 2208

GREAT RIVER ENERGY

12300 Elm Creek Blvd • Maple Grove, Minnesota 55369-4718 • 763-445-5000 • Fax 763-445-5050

May 6, 2015

Ms. Lisa Joyal
Minnesota Department of Natural Resources
Natural Heritage and Nongame Research Program
500 Lafayette Road, Box 25
St. Paul, MN 55155

RE: Proposed Bull Moose 115 kV Transmission Project - Cass County

Dear Ms. Joyal:

Great River Energy is currently gathering data to be used in preparation of a regulatory application necessary to obtain approval to construct the proposed Bull Moose 115 kilovolt (kV) Transmission Project in Cass County (see enclosed fact sheet and map). Great River Energy intends to seek a Route Permit for the Project from the Minnesota Public Utilities Commission. The proposed Project is needed to provide power to a new petroleum pump station (Backus Station) being proposed by Enbridge Energy.

The Project will include approximately 2.5 miles of 115 kV transmission line that will exit the pump station substation, run parallel to Minnesota Power's existing 250 kV direct current (DC) transmission line (on the south side), and then tap the existing Minnesota Power "142" 115 kV transmission line (see fact sheet map). In most cases, round wood transmission structures will be used that will range in height from 70 to 80 feet above ground.

The transmission line will not cross any DNR public waters (see enclosed hydrologic features map). The line is proposed to cross through a small portion of the Foot Hills State Forest in Section 10, T138N, R31W; Great River Energy will work with the DNR regarding crossing this forest.

The DNR Rare features database indicates no rare features intersected by the proposed Project. Trumpeter swans are shown to be present to the south of the Project (see enclosed rare features map).

Enbridge used desktop analysis to identify areas of potentially suitable NLEB habitat along its preferred pipeline route both west and east of Clearbrook, MN. Data from this analysis were used to select survey target sites, which were reviewed and approved by the USFWS prior to survey. Enbridge conducted presence/absence acoustic surveys in proximity to the Backus Pump Station/Bull Moose transmission line Project area between June 2 and August 9, 2014. There were no acoustic positives within 5 miles of linear

survey in either direction of the Backus Pump Station/Bull Moose transmission line Project area. The nearest NLEB acoustic detection was approximately 9.5 miles to the east of the Backus Pump Station/Bull Moose transmission line Project area, in Crow Wing County. A companion mist net survey conducted on August 4-5, 2014 was negative at this location.

Great River Energy is requesting concurrence of its interpretation of the rare features in the vicinity and the possible effects of the new transmission line and substation on wetlands, threatened and endangered species, and other important state natural resources that occur in the project area. A Data Request Form is enclosed for your information; the shape file will be sent via email.

We would appreciate receiving any written comments from your office by Friday, June 5, 2015. If you have any questions about this proposed project, please contact me at (763) 445-5214. If you wish to respond by e-mail, my address is cschmidt@grenergy.com.

Thank you for your attention to this important project.

Sincerely,

GREAT RIVER ENERGY

Carole L. Schmidt

Carole L. Schmidt
Supervisor, Transmission Permitting and Compliance

Enclosures: Fact Sheet/Project Map; Hydrologic Features Map; Rare Features Map; Data Request Form; Shapefile via email

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Bull Moose 115 kV Transmission Line

GREAT RIVER ENERGY
12300 Elm Creek Blvd
Maple Grove, MN 55369-4718
1-888-521-0130
www.greatriverenergy.com

CROW WING POWER
17330 Highway 371 North, PO Box 507
Brainerd, MN 56401
218-829-2827
www.CWPower.com

Project Description/Need

Great River Energy, wholesale electric supplier to Crow Wing Power and 27 other electric cooperatives, proposes to construct a new overhead 115 kilovolt (kV) transmission line that is needed to provide electric power to a new petroleum pump station (Backus Station) being proposed by Enbridge Energy (Enbridge). The Enbridge pump station is part of a pipeline replacement project that will require permits from the Minnesota Public Utilities Commission.

Proposed Project

The 2.5-mile transmission line (see map on back for proposed route) would tap an existing Minnesota Power (MP) 115 kV transmission line approximately four miles south west of the City of Backus. From there the line would run northeast for one half mile to the existing 250 kV Direct Current (DC) transmission line owned by MP. The route would then parallel, on the south side of the DC line, east for two miles. From there the route would cross under the DC line and terminate at the proposed pump station location just west of 48th Ave SW.

The proposed transmission line will consist of wood poles that are 350 to 400 feet apart and 70 to 80 feet above ground. Guy wires and anchors, when necessary, will be used to stabilize poles. Some specialty poles may also be required. The new transmission line will require a 100-foot-wide right of way, 50 feet on each side of the centerline. Trees and vegetation in the right of way will be removed to provide a safe construction, operation and maintenance area.

Typical 115 kV Transmission Structure

Permitting

Great River Energy will submit a route permit application for the proposed Project to the Minnesota Public Utilities Commission (MPUC). During the route permit process, the public and regulatory agencies will have numerous opportunities to provide input on the proposed Project, including public meetings facilitated by the MPUC and Department of Commerce Energy Environmental Review and Analysis (DOC EERA) staff. The DOC EERA will prepare an Environmental Assessment (EA) for the Project. Construction cannot begin until an approved route permit is granted by the MPUC.

Easements/Trees

Once the project has been approved, Great River Energy will contact landowners to present an easement and offer of compensation. At that time, information will also be shared on tree removal, construction access and practices, and restoration of the right of way.

Project Schedule

Public contacts and/or notifications	2nd quarter 2015
Project permitting	Summer/fall 2015
Survey/design	Winter 2015/2016
Easement acquisition/right-of-way permits	Spring 2016
Transmission line construction	Starts 4th quarter 2016
Energization	Spring 2017

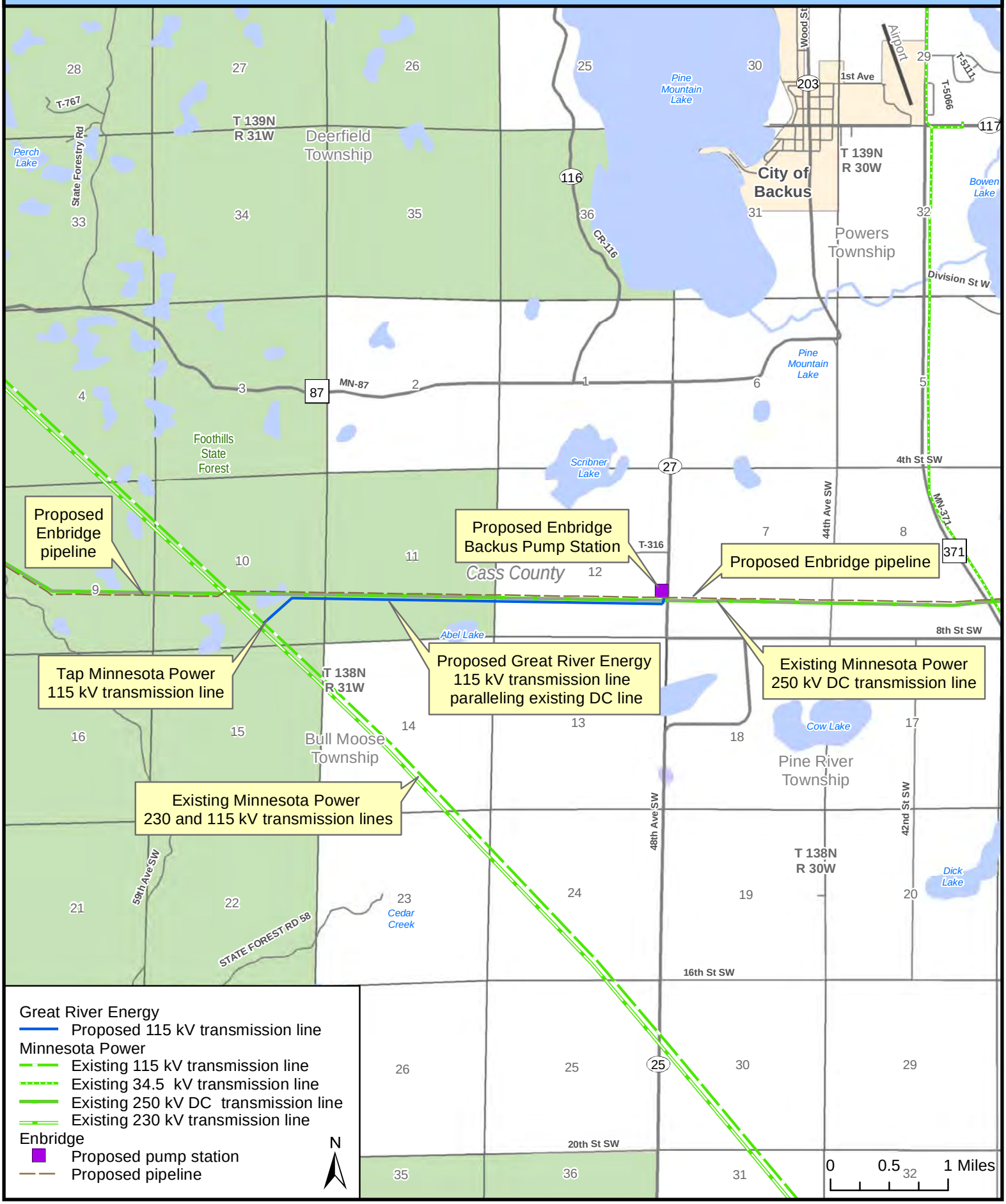
For project updates and information, visit greatriverenergy.com/bullmoose or contact:

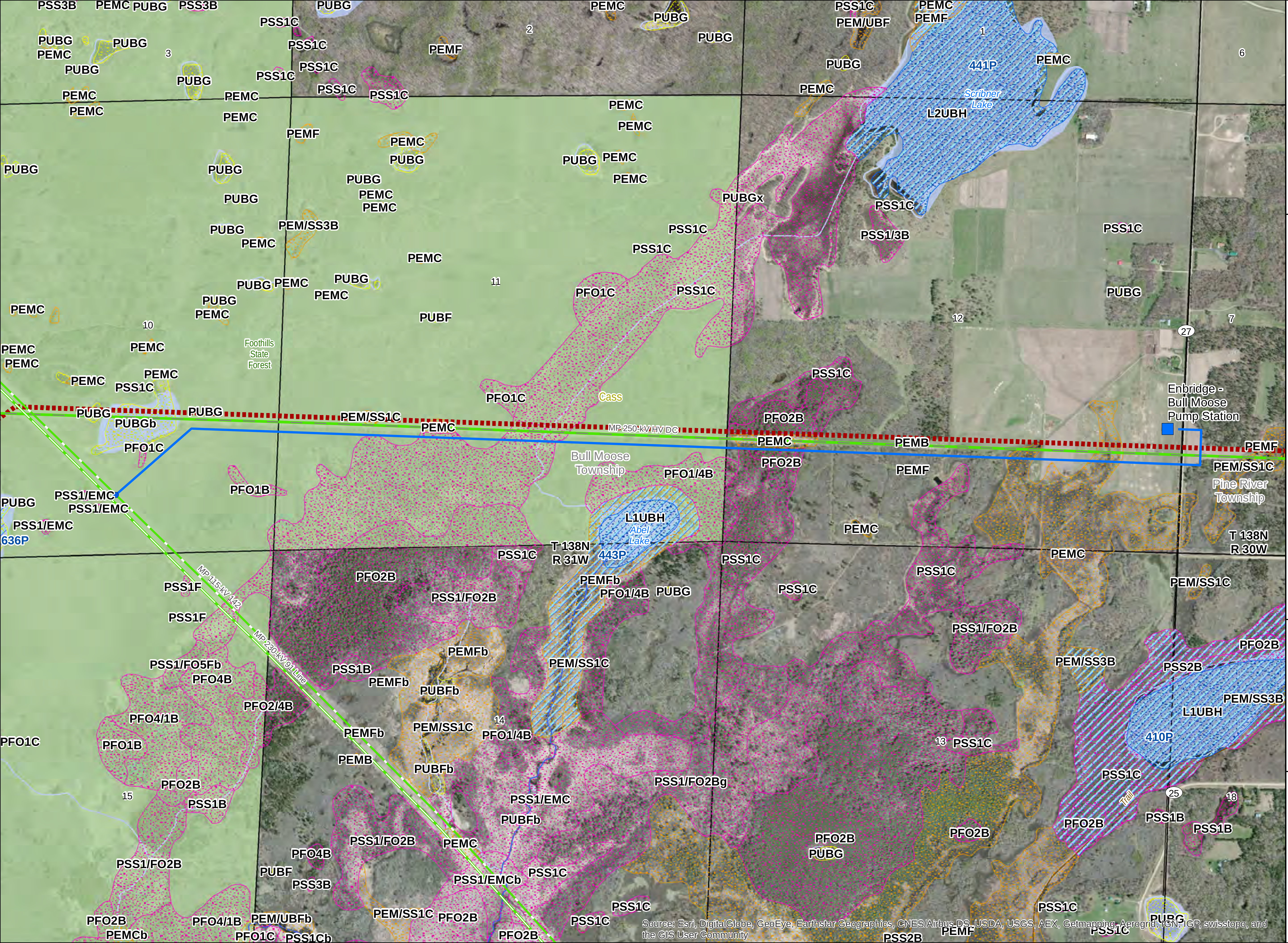
Dan Lesher
Sr. Field Representative
Great River Energy – Transmission Land Rights
(763) 445-5975 or (612) 817-9910
dlesher@grenergy.com

Carole Schmidt
Supervisor, Transmission Permitting and Compliance
Great River Energy
763-445-5214
cschmidt@grenergy.com

Date last revised: 5/4/2015

Proposed Project





GREAT RIVER ENERGY®

A Touchstone Energy® Cooperative

Great River Energy

- Proposed 115 kV Transmission Line

Enbridge

- Proposed Pump Station
- Proposed Pipeline

Minnesota Power (MP)

- Existing 115 kV Transmission Line
- Existing 230 kV Transmission Line
- Existing 250 kV Transmission Line

NWI Wetlands

- Freshwater Emergent Wetland
- Freshwater Forested/
- Freshwater Pond
- Lake

MN Public Waters Inventory (PWI)

- Public Water Basin
- MN Public Watercourse

Updated: 4/28/2015

Data Sources vary between MNDOT, MNDNR, MNGEO and Great River Energy

Aerial Imagery form: ESRI World Imagery Basemap service

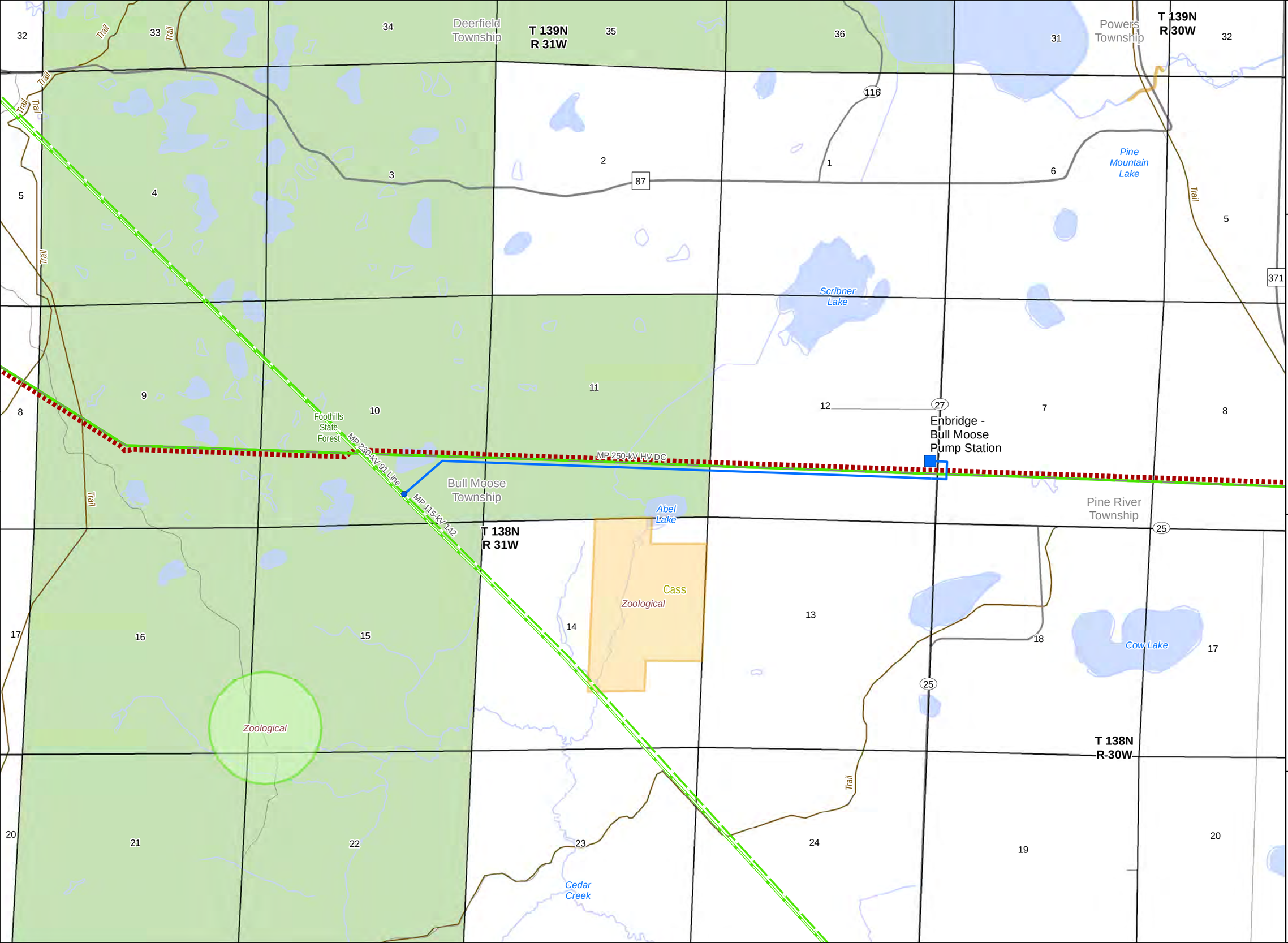
Map Projection: UTM, NAD83, Zone15, Meters

0 250 500 750 1,000 Feet

N

Bull Moose Pumping Station 115 kV Line Project

NWI Wetlands and Hydrologic Features



GREAT RIVER ENERGY®

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Great River Energy
- Proposed 115 kV Transmission Lin

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- Existing 230 kV Transmission Line
- Existing 250 kV Transmission Line

Enbridge
- Proposed Pump Station
- Pipeline

MN Rare Natural Feature (NHIS)

Protection Status
- Special Concern
- Not listed

Updated: 4/28/2015

Data Sources Vary Between MNDOT, MNDNR, MNGEO and Great River Energy
Rare Features Heritage data from MNDOT
Topo scaned image maps from the United States Geological Survey (USGS)

Map Projection:
UTM, NAD83, Zone15, Meters

N

0 0.25 0.5 Miles

Bull Moose Pumping Station 115 kV Line Project

Rare Features

Minnesota Department of Natural Resources
Division of Ecological and Water Resources, Box 25
500 Lafayette Road
St. Paul, Minnesota 55155-4025
Phone: 651-259-5109 E-mail: lisa.joyal@state.mn.us

July 9, 2015 **Correspondence # ERDB 20150366**

Ms. Carole Schmidt
Great River Energy
12300 Elm Creek Boulevard
Maple Grove, MN 55369-4718

RE: Natural Heritage Review of the proposed Bull Moose 115 kV Transmission Line,
T138N R31W Sections 10-12, Cass County

Dear Ms. Schmidt,

As requested, the Minnesota Natural Heritage Information System (NHIS) has been queried to determine if any rare species or other significant natural features are known to occur within an approximate one-mile radius of the proposed project. Based on this query, rare features have been documented within the search area (for details, see the enclosed database reports; please visit the Rare Species Guide at http://www.dnr.state.mn.us/rsg/index.html for more information on the biology, habitat use, and conservation measures of these rare species). Please note that the following **rare features *may* be adversely affected** by the proposed project:

- Trumpeter swans (*Cygnus buccinator*), a state-listed species of special concern, have been documented nesting in the vicinity of the proposed project. These rare birds may be at risk for colliding with or being electrocuted by overhead transmission lines. The DNR recommends the use of bird diverters on overhead lines near lakes and rivers, or other areas that may attract large concentrations of waterfowl. Please contact Nathan Kestner, Regional Environmental Assessment Ecologist, at 218-308-2672 for regional input on recommended placement of bird diverters.

- The northern long-eared bat (*Myotis septentrionalis*), a state-listed species of special concern, can be found throughout Minnesota. During the winter this species hibernates in caves and mines, and during the active season (approximately April-October) it roosts underneath bark, in cavities, or in crevices of both live and dead trees. Activities that may impact this species include, but are not limited to, wind farm operation, any disturbance to hibernacula, and destruction/degradation of habitat (including tree removal). The NHIS does not contain any known occurrences of northern long-eared bat roosts or hibernacula within an approximate one-mile radius of the proposed project. It is my understanding that acoustic and mist net surveys conducted for this project were also negative.

- The proposed line crosses a Northern Mesic Hardwood Forest within the Foot Hills State Forest in T138N R31W Section 10 (see map). This type of native plant community is uncommon but not rare in Minnesota.

- Please include a copy of this letter in any DNR license or permit application.

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area. **If additional information becomes available regarding rare features in the vicinity of the project, further review may be necessary.**

The enclosed results include an Index Report of records in the Rare Features Database, the main database of the NHIS. To control the release of specific location data, the report is copyrighted and only provides rare features locations to the nearest section. The Index Report may be reprinted, unaltered, in any environmental review document (e.g., EAW or EIS), municipal natural resource plan, or report compiled by your company for the project listed above. If you wish to reproduce the Index Report for any other purpose, please contact me to request written permission.

For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location (noted above) and the project description provided on the NHIS Data Request Form. Please contact me if project details change or for an updated review if construction has not occurred within one year.

The Natural Heritage Review does not constitute review or approval by the Department of Natural Resources as a whole. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. To determine whether there are other natural resource concerns associated with the proposed project, please contact your DNR Regional Environmental Assessment Ecologist (contact information available at http://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html). Please be aware that additional site assessments or review may be required.

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources. An invoice will be mailed to you under separate cover.

Sincerely,

Lisa Joyal

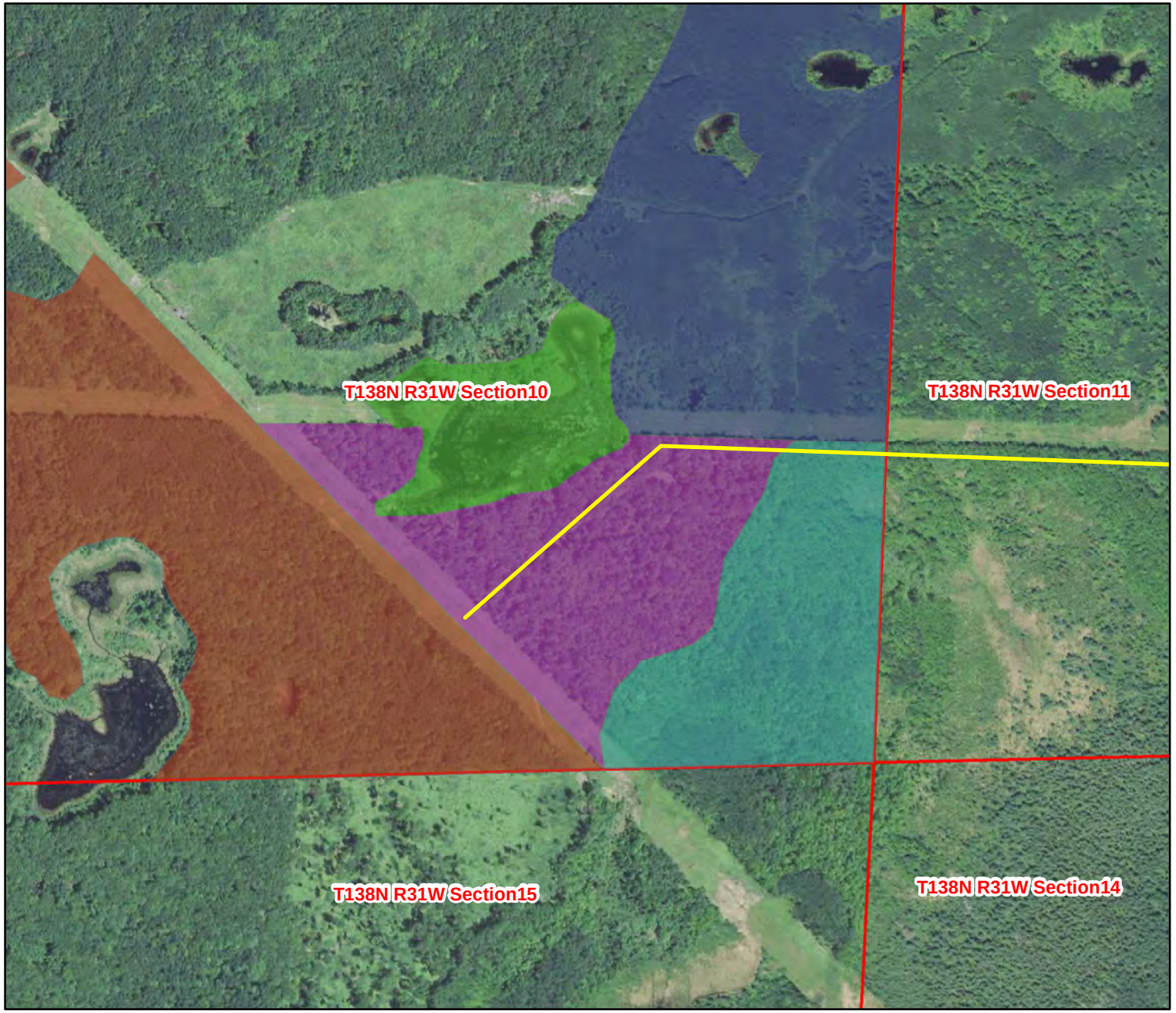
Lisa Joyal
Endangered Species Review Coordinator

enc. Rare Features Database: Index Report
Map

cc: Nathan Kestner
Christine Herwig

ERDB# 20150366 - Bull Moose 115 kV Line
T138N R31W Sections 10-12
Cass County

GIS shapefiles of MBS Sites of Biodiversity Significance and MBS Native Plant Communities can be downloaded from the DNR Data Deli at http://deli.dnr.state.mn.us.



Legend

- GREBullMooseRoute

Native Plant Communities

- Central Dry-Mesic Oak-Aspen Forest
- Northern Mesic Hardwood Forest
- Northern Wet Ash Swamp
- Northern Wet Meadow/Carr
- Oak - Aspen - Red Maple Forest
- PLS Section

0 0.125 0.25 0.5 Miles

N

Rare Feature, Prairie Railroad Survey, Native Plant Community, and Sites of Biodiversity Significance data are from the Natural Heritage Information System. The absence of rare features for a particular location should not be construed to mean that the DNR is confident rare features are absent from that location.