GREAT RIVER ENERGY

APPLICATION TO THE
MINNESOTA PUBLIC UTILITIES COMMISSION
FOR A ROUTE PERMIT TO

REBUILD EXISTING 69-kV ST-WW TRANSMISSION LINE TO 115-kV IN STEARNS COUNTY, MN

DOCKET NO.
ET2/TL-22-235

GREAT RIVER ENERGY™

August 25, 2022

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LIST OF ACRONYMS

ACRONYMS	
AIMD	Active Implantable Medical Devices
ALJ	Administrative Law Judge
Application	Route Permit Application
BMPs	Best Management Practices
BPA	Bonneville Power Administration
Brookings Project	Brookings County – Hampton 345 kV Proroject
CH4	Methane
CO2	Carbon Dioxide
CO2e	Carbon Dioxide Equivalent
Commission	Minnesota Public Utilities Commission
CSAH	County State Aid Highway
dBA	Decibel – A weighted
DOC	Department of Commerce
EA	Environmental Assessment
EERA	Energy Environmental Review and Analysis
EF	Electric Fields
EJ Screen	Environmental Justice Screening Tool
ELF	Extremely Low Frequency
EMF	Electromagnetic Fields
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
iPaC	Information for Planning and Consultation
IEEE	Institute of Electrical and Electronic Engineers
IMDs	Implantable Medical Devices
kV	Kilovolt
kV/m	Kilovolts Per Meter
LGUs	Local Government Units
mA rms	MilliAmperes Root Mean Square
MDNR	Minnesota Department of Natural Resources
MF	Magnetic Fields
mG	Milligauss
MISO	Midcontinent Independent System Operator
MnDOT	Minnesota Department of Transportation
MPH	Miles per hour
MPCA	Minnesota Pollution Control Agency
MRO	Midwest Reliability Organization
MW	Megawatt
N2O	Nitrous Oxide

ACRONYMS	
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
NWI	National Wetlands Inventory
Project	Rebuild the existing 69-kV ST-WW transmission line to a new 115-kV transmission line to be named the ST-WS line
Proposed Route	The corridor in which Great River Energy proposes to rebuild the approximately 3.2 mile transmission line presented in this Route Permit Application Great River Energy.
PWI	Public Waters Inventory
ROW	Right-of-Way
SHPO	State Historic Preservation Office
ST	Stearns Electric Association
ST-FPT Line	Existing Stearns Electric to Five Points line
ST-WS Line	The proposed new 115-kV transmission line
ST-WW Line	The existing 69kV ST-WW transmission line
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
Westwood	Westwood Professional Services
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 (as 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	5.1
	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	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 1-1; 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; 6.7
	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; 7.7
	F. a description of the effects of the facility on rare and unique natural resources	7.8
	G. identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route	7.10
	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	4.3; 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
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

Authority	Required Information	Location in Application
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; 7.7
	F. effects on rare and unique natural resources	7.8
	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	1.6; 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	7.10
	N. irreversible and irretrievable commitments of resources	7.10
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 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	7.10
	(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 rebuild approximately 3.2 miles of the existing 69-kilovolt (kV) "ST-WW"[1] transmission line to 115-kV in St. Joseph Township, the City of St. Joseph, and St. Wendell Township in Stearns County, MN **(Figure 1-1)** (Project). The Project will complete conversion of the regional transmission system to 115-kV service.

At this time, Great River Energy proposes that the Project will follow the alignment of the existing 69-kV transmission line; however, additional stakeholder engagement during the environmental review and permitting process may result in deviations from that alignment. After Commission issuance of a route permit for the Project, Great River Energy will commence designing the transmission line layout, including structure locations. This design will be shared with landowners and other regulatory agencies for their input.

Great River Energy anticipates starting construction in mid-2024 and energizing the transmission line in early 2025.

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 Stearns Electric Association, the distribution cooperative serving the area in which the Project will be located (**Figure 1-2**), and transmission customers. Great River Energy's distribution cooperatives and customers, in turn, supply electricity and related services to more than 720,000 residential, commercial, and industrial customers in Minnesota and Wisconsin.

1.3 Project Contact

The contact for the Project and this Route Permit Application (Application) is:

Mark Strohfus
Great River Energy
Project Manager, Transmission Permitting
12300 Elm Creek Blvd.

[1] Great River Energy's line naming convention has evolved over time. In this instance, the first two letters in the line name code refers to Stearns Electric Association (ST) and the second two letters refer to the Westwood Distribution Substation (WW). To avoid confusion in our transmission system database and operations, the new 115-kV transmission line will be named the ST-WS line.

Maple Grove, MN 55369
763-445-5210
MStrohfus@GREnergy.com

Figure 1-1. Proposed Project

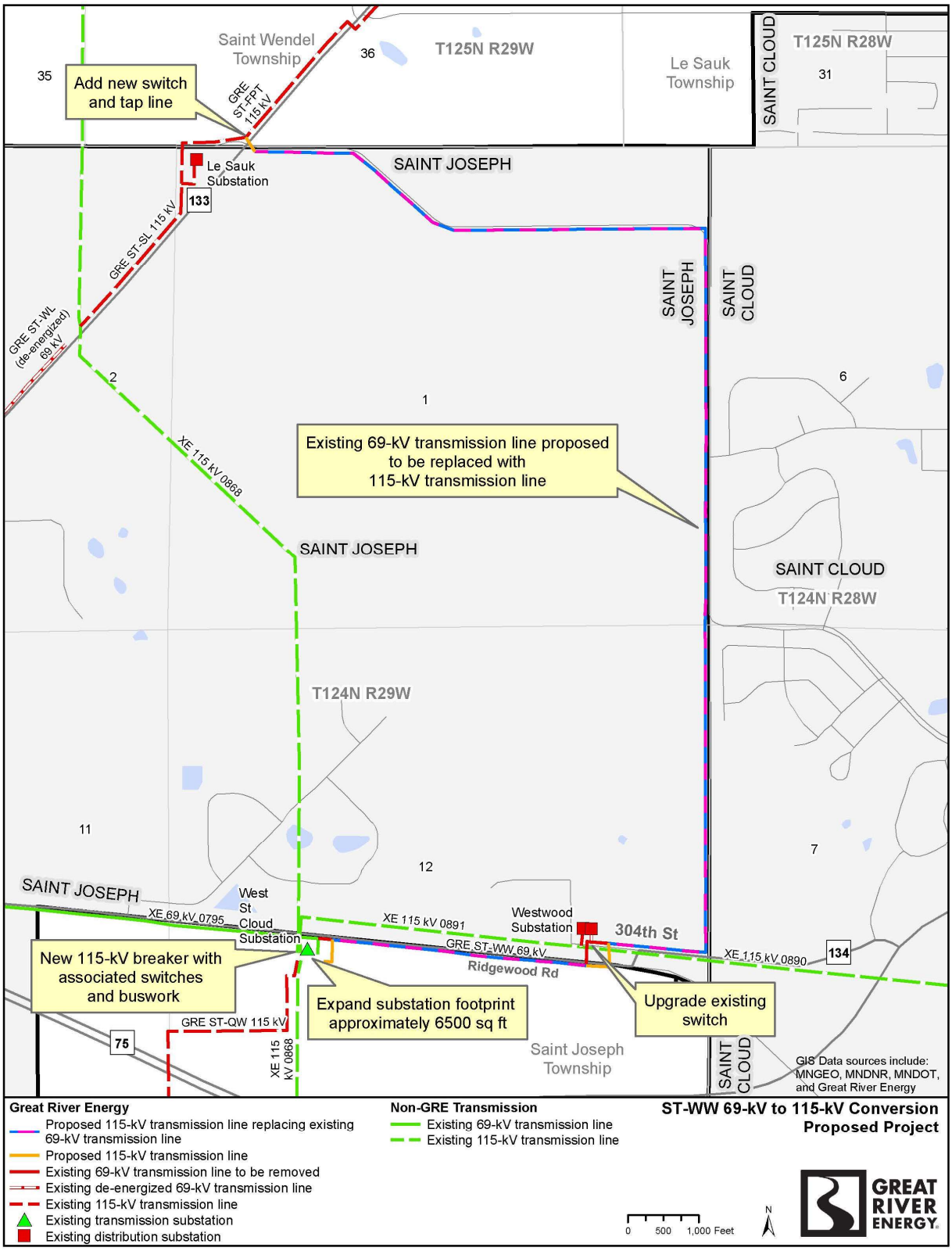
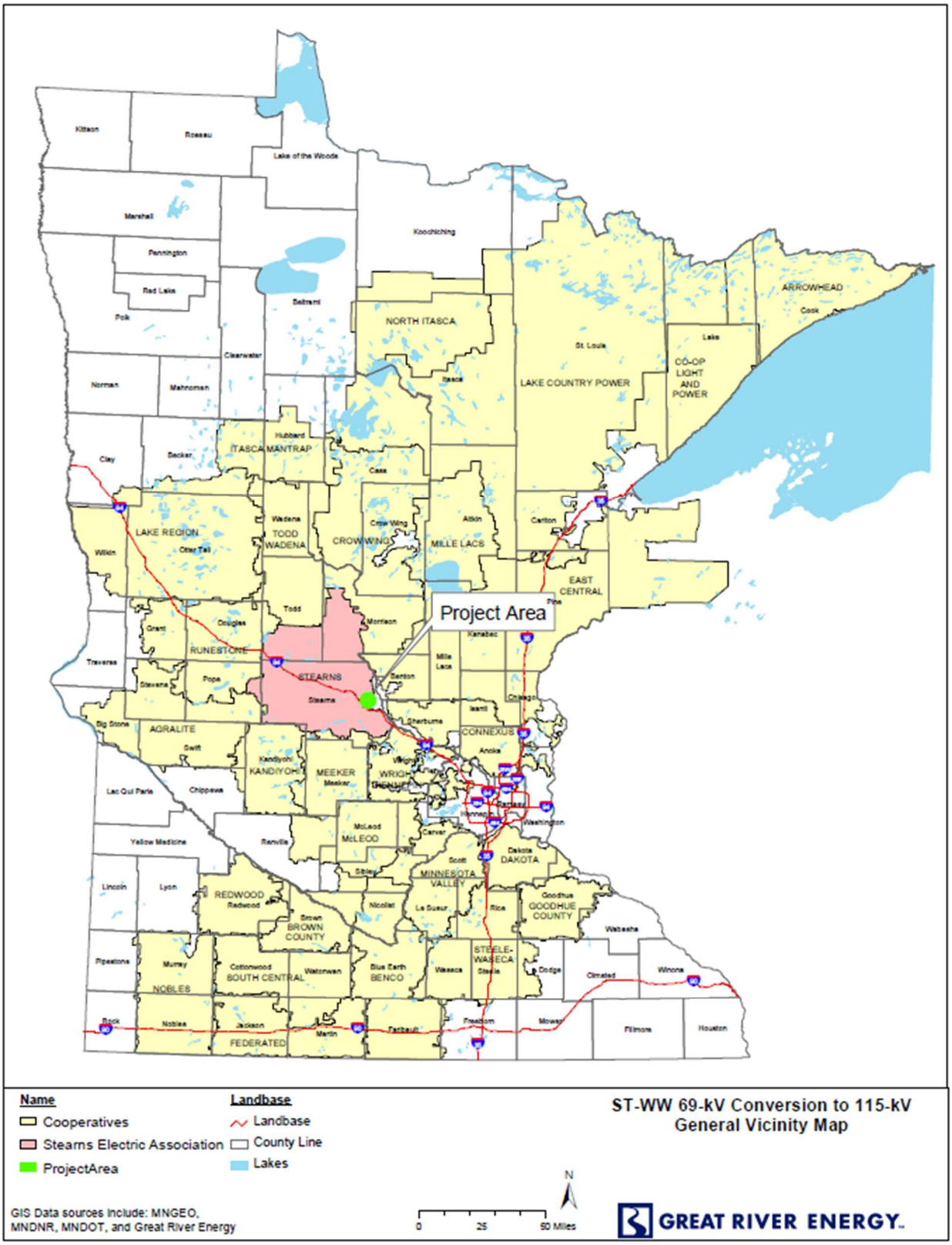


Figure 1-2. Great River Energy Service Territory



1.4 Proposed Project

Great River Energy proposes to rebuild the existing 69-kV ST-WW transmission line system as a new 115-kV transmission line system **(Figure 1-1),** to be designated as the ST-WS line, completing the conversion of the regional transmission system to operate at 115-kV.

Great River Energy proposes to:

- Remove approximately 3.2 miles of the existing 69-kV ST-WW transmission line and structures between the existing West St. Cloud, Westwood, and Le Sauk Substations and replace those facilities with an overhead 115-kV transmission line and structures. With some exceptions described further in **Section 1.5** of this Application, Great River Energy would like the new 115-kV transmission line to follow the alignment of the existing 69-kV transmission line to the extent possible after additional stakeholder engagement[2];
- Extend the transmission line approximately 170 feet northwesterly near the existing Le Sauk Substation to tap into a new 115-kV switch on Great River Energy's existing ST-FPT (loosely the Stearns - Five Points Substation line) transmission line;
- Install an additional 115-kV breaker and associated equipment at the existing West St. Cloud Substation, which will require an approximately 6,500-square-foot expansion of the substation;
- Install two 115-kV line switches: one for the tap feeding the existing Westwood Substation[3], and one north of the existing Le Sauk Substation.

The Project will be in St. Joseph Township, the City of St. Joseph, and St. Wendell Township,[4] 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 90 feet above ground, and spans between poles will range from 300 to 400 feet. Great River Energy understands that Stearns Electric Association and Xcel Energy currently plan to remove their existing distribution lines from the 69-kV structures and bury those lines rather than attaching the distribution as under-build to the Project's new structures.

Great River Energy estimates the Project will cost approximately $6.4 million dollars.

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[2] The proposed Route, as discussed in Section 1.5, includes some wider areas to facilitate the changes at the Westwood Substation and to accommodate potential landowner requests to move the transmission line.

[3] Stearns Electric Association will replace its existing 69-kV step-down distribution transformer and associated equipment at the Westwood I substation to accommodate 115-kV service. This work is not directed or controlled by Great River Energy and is not part of this Application.

[4] Approximately 100 feet of the proposed 115-kV transmission line connected at the Le Sauk switch structure will be located in St. Wendell Township.

1.5 Proposed Route

The proposed route (Proposed Route) is shown in **Figure 1-1,** Proposed Route widths are shown in **Figure 1-3**, and **Appendix B** contains a series of larger scale aerial photo maps depicting the proposed alignment, right-of-way (ROW), and route width for the Project.

The Project is proposed to replace the existing 69-kV transmission line. It will exit the east side of the West St. Cloud substation and run east on the south side of Ridgewood Road for approximately one-half mile, then cross over to an upgraded switch and tap line for Stearns Electric Association's Westwood Substation. From the Westwood Substation, the Project continues east for 1,100 feet along the north side of Ridgewood Road before turning north for approximately 1.4 miles to Mullen Road, then westerly along Mullen Road for approximately 0.9 miles where the existing 69-kV line terminates on the east side of County State Aid Highway (CSAH) 133. The 115-kV line will then extend approximately 170 feet northwest on new ROW, crossing over Mullen Road and CSAH 133, to a new switch pole on Great River Energy's existing ST-FPT 115-kV line.

Great River Energy is requesting approval of the following route widths for seven segments as depicted in **Figure 1-3**:

1. The entire parcel upon which the expanded West St. Cloud Substation is proposed to be located.

2. Along the south side of Ridgewood Road, a 100-foot-wide[5] route extending southerly and perpendicular from the road ROW.

3. An approximately 2.75-acre area around the existing Westwood Substation to enable design and construction options for the Project to cross over Ridgewood Road and railroad tracks, under the existing Xcel Energy 115-kV transmission line, over 304th Street, and to accommodate redesign options at the Westwood Substation[6].

4. Along the north side of 304th Street, a 100-feet-wide[7] route width extending northerly and perpendicular from the road ROW.

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[5] A 100-foot-wide route is generally needed to enable construction vehicle and equipment access and sufficient space to safely work. Where the existing 69-kV line is located in congested areas like along Ridgewood Road and 304th Street, the route width overlaps existing buildings, but Great River Energy does not intend to directly impact these buildings with the construction process.

[6] The approximately 2.75-acre area starts at the southwest corner of the Westwood Substation parcel, extending 450 feet easterly along the northern edge of the 304th Street road ROW, then turning south to a point 50 feet beyond the Ridgewood Road ROW, then turning westerly for 455 feet parallel to the southern edge of the Ridgewood Road ROW, and finally turning northerly approximately 230 feet to connect with the starting point on the southwest corner of the Westwood Substation parcel.

[7] *Ibid.*

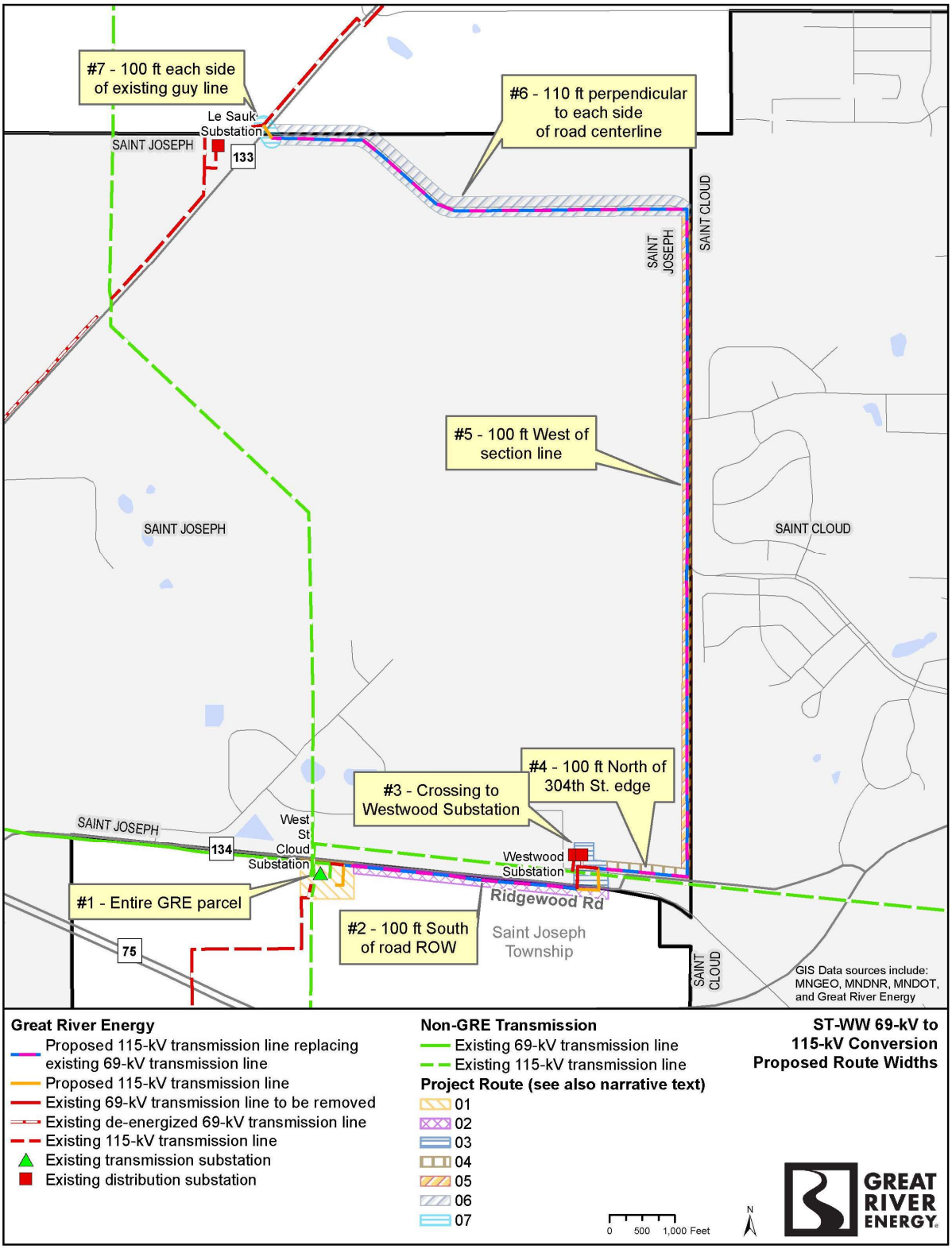
5. Along the north-to-south parcel/section lines, a 100-feet-wide route extending westerly and perpendicular from the north-to-south parcel/section lines.

6. Along the easterly-to-westerly Mullen Road, a 220-feet-wide route that extends 110 feet perpendicular from each side of the road centerline.

7. Along the final 115-kV transmission line segment connected to the new switch on Great River Energy's existing ST-FPT 115-kV transmission line, a 200-feet-wide route width that extends perpendicular from the proposed transmission line centerline.

Great River Energy holds easements for the existing 69-kV line and will evaluate what additional land rights will be needed for the Project after final design is completed. At this time, Great River Energy anticipates that the Project will require easements which allow for a ROW width of 70 feet (typically 35 feet of each side of the transmission centerline).

Figure 1-3. Route Widths Map



1.6 Project Need and Purpose

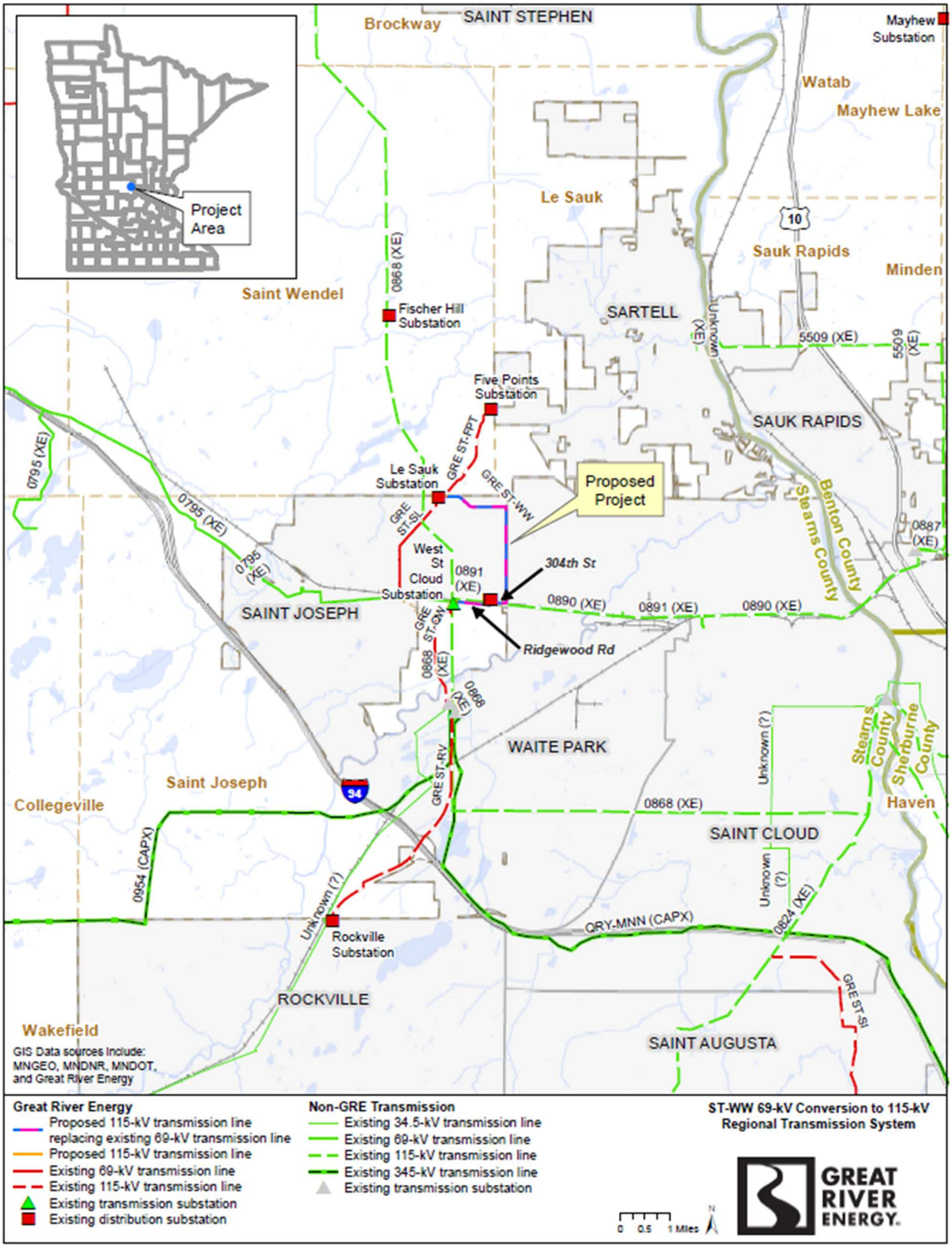
Over the last decade, Great River Energy has been upgrading the St. Joseph area to a 115-kV transmission system to improve reliability and resiliency. The electric transmission system in the area is shown on **Figure 1-4**. This Project will complete the area upgrade and loop the 115-kV system by allowing power to the Westwood Substation to be provided either through the West St. Cloud Substation to the south or the Le Sauk Substation to the north.

As compared to the 69-kV system, the 115-kV system will, once completed:

- **Improve service reliability and resiliency to Le Sauk, Westwood I, and Five Points Distribution Substations** by re-stablishing additional transmission lines to power the Le Sauk Substation. A substation that is served by more than one transmission line is described as being on a looped system. A substation that does not have looped service is described as having radial service. In the event of a transmission line being taken out of service due to maintenance, weather or accidents, looping provides a second (or more) transmission line to serve the load.
- **Address North American Electric Reliability Corporation (NERC) category P6 contingency low voltage problems** by eliminating low voltage problems, which can negatively impact the operation of some electrical equipment.
- **Address safety concerns resulting from high current levels amps on the distribution system** when transferring load between the Westwood I and Westwood II distribution banks. High current levels can potentially damage equipment and is a potential safety risk to technicians working in the substation.[8]
- **Reduce outage exposure to Westwood I, Le Sauk and Five Points Distribution Substations** by serving them with a shorter 115-kV transmission system.
- **Reduce the duration of any outage** by replacing some manual switches with motor operated switches that can be activated remotely.

[8] Westwood I is currently served by the 69-kV system and Westwood II is currently served from the existing 115-kV transmission system. Both the Westwood I and II distribution banks are located within the existing Westwood Distribution Substation.

Figure 1-4. Regional Transmission System



1.7 Summary of Potential Environmental Effects

Great River Energy analyzed the potential environmental effects of the proposed Project. Generally, Project effects are anticipated to be temporary and/or minor. No homeowners will be displaced by the Project. All land impacted during construction will be restored to the extent possible, and landowners will be compensated for any crop losses due to construction operations or structure and conductor placement. The electric fields associated with the new line (1.36 kilovolts per meter (kV/m)) will be significantly less than the maximum levels permitted by state regulators (8 kV/m). No stray voltage issues are anticipated. Similarly, Project facilities will comply with applicable noise standards. The Project is parallel with existing roads, transmission and distribution lines, and railroad ROW for much of its length. The routing of the Project minimizes potential tree removal,but may require the permanent removal of approximately 0.16 acres of trees within its ROW. There are wetlands within the proposed line ROW. Great River Energy prefers to span wetlands, and the minimal amount of wetlands on this project are supportive of this goal; however, sometimes stakeholder requests may preclude the design from avoiding all wetlands. Unavoidable impacts include a change in aesthetics due to an expanded substation and taller transmission structures, and the presence of additional traffic during construction on the local roads. These and other potential environmental effects, as well as applicable avoidance and minimization measures, are described in more detail in **Chapter 7** of this Application.

The Department of Commerce (DOC), Energy Environmental Review and Analysis (EERA) is responsible for environmental review of the Project and will prepare an Environmental Assessment (EA) that analyzes the Project's potential environmental impacts.

1.8 Public Involvement

Great River Energy held an Open House at the St. Joseph Community Fire Station, St. Joseph, Minnesota, on February 17, 2022. Great River Energy staff were available to provide information and answer questions concerning the Project from members of the public. Large posters showing the existing/proposed transmission line alignment and pictures of what the replacement structures will look like were also available to review.

Invitations to the meeting, including a Project fact sheet with maps, were mailed to all documented landowners along and adjacent to the Proposed Route. Advertisements were also placed in three regional newspapers. Copies of these communications are provided in **Appendix D**. Great River Energy also maintains a web site that contains Project information at https://greatriverenergy.com/transmission_project/st-joseph-115-kv-transmission-line-and-substation-upgrade/.

Eleven people signed in at the Open House. Attendees could learn about the Project and ask any questions. Only one landowner along the Proposed Route signed in. The remainder of the attendees who signed in consisted of two local government representatives and landowners in St. Cloud immediately east of the proposed route.

Great River Energy technical representatives provided information about the proposed Project and answered questions and/or responded to comments concerning: the reason for the Project; the process for permitting; tree/vegetation cutting or removal; what would be needed for easements;

how easements are acquired; and, when the permitting and construction process would occur. Several landowners asked if Great River Energy intended to place the transmission line on their property. In general, attendees did not express specific concerns about the Project.

The public will be afforded additional opportunities to participate and comment on the Project in accordance with Minnesota laws and regulations. This process is described in **Section 2.2**. The first opportunity for public involvement in the regulatory process is a scoping meeting conducted by EERA after the Commission's acceptance of this Application as complete.

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.

a). mn.gov/puc

b). Select green box *Subscribe to a Docket*

c). Type your e-mail address

d). For *Type of Subscription*, select *Docket Number*

e). For *Docket Number*, select *22* in the first box, type *235* in the second box

f). Select *Add to List*

g). 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 U.S. Mail (not self-service, must contact Commission staff to sign up). Contact docketing.puc@state.mn.us or 651-201-2234 with the docket number (*22-235*), your name, mailing address and email address.

1.9 Conclusion

Permitting and environmental review requirements for high voltage transmission lines (HVTLs), are found in Minnesota Rules Chapter 7850. This Project addresses the criteria for a route permit: the Project conserves resources, minimizes environmental impacts, and minimizes effects on human settlement and land-based economies by using and upgrading an existing 69-kV transmission line and its ROW and paralleling (immediately adjacent to) road and railroad 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." An HVTL is defined by Minn. Stat. § 216E.01, subd. 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-kV transmission line that is greater than 1,500 feet, a route permit from the Commission is required.

Minnesota Statutes Section 216E.04 provides for an Alternative Review Process for transmission lines between 100 and 200 kV; the Project is proposed to be 115-kV and thus 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 July 14, 2022 pursuant to Minn. R. 7850.2800, subp. 2 of its intent to utilize the Alternative Review Process and file its Application under Minne. R. 7850.2800 to 7850.3900. A copy of the notification letter is provided in **Appendix A**.

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

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, EERA is required to prepare an EA (Minn. Stat. § 216E.04, subd. 5). Unlike the full route permit process for higher voltage lines, a formal contested case hearing is not required. (Minn. Stat. § 216E.04, subd. 6). The Alternative Review Process procedures are discussed below in **Section 2.2**.

2.2 Regulatory Process

The Commission has jurisdiction over route permits. 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 in 2005 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 Review Process route permit rules. *See* Minn. R. Ch. 7850.

In accordance with Minn. Stat. § 216E.04, subdivision 4, within 15 days of filing this Application, the Applicant 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 government units (LGUs) whose jurisdictions are reasonably likely to be affected by the proposed Project. In addition, the Applicant will publish notice in a local newspaper in each county where the Project is proposed that announces the filing of this Application. *See* Minn. Stat. § 216E.04, subd. 4; Minn. R. 7850.2100.

An electronic version of the Application will be available on eDockets in docket number 22-235 and the EERA Project webpage. The Application will also be available on Great River Energy's transmission projects webpage https://greatriverenergy.com/transmission_project/st-joseph-115-kv-transmission-line-and-substation-upgrade/.

Upon acceptance of an application for a route permit as complete, EERA conducts environmental review of the Project, which requires preparation of an EA. *See* Minn. R. 7850.3700. The EA will contain information on the human and environmental impacts of the Project and addresses mitigation measures for all routes considered.

The process EERA must follow in preparing the EA is set forth in Minn. R. 7850.3700. This process requires EERA to schedule at least one scoping meeting and associated public comment period. The purpose of the meeting is to provide information about the Project and permitting process, answer questions, and gather input regarding potential impacts and mitigative measures that should be studied in the EA. The meeting also provides an opportunity to solicit potential route or route segment alternatives that mitigate impacts. Great River Energy, EERA, and the Commission will have representatives available during 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 scoping meeting has been held and after the public comment period closes, the Commissioner of the DOC 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 weekly publication of the Minnesota Environmental Quality Board (EQB) that can be accessed on the EQB webpage, www.eqb.state.mn.us/monitor.html. EERA will also send notice to persons who have placed their names on the Project mailing list (**Section 1.8)**. A copy of the EA will be available electronically through eDockets and the EERA webpage, and in paper copy at the St. Joseph City Hall. The EA will become part of the record for consideration by the Commission.

After the EA is issued, a public hearing and associated public comment period 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, which, in practice, is usually an administrative law judge (ALJ) from the Office of Administrative Hearings; however, another person acceptable to the Commission may be chosen. The Commission will establish the procedures to be followed at the hearing. *See* Minn. R. 7850.3800.

Once the hearing is concluded, the ALJ will prepare a report based on the record. After the report is issued, the matter will come to the Commission for a decision. During an open meeting, the

Commission will deliberate and make a decision as to the route for the Project, using the criteria set forth in Minn. Stat. 216E.03, subdivision 7(b), and Minn. R. 7850.4100 to guide its decision.

A route permit under the Alternative Review Process shall be issued six months after the Commission's determination that the Application is complete. This timeframe may be extended up to three months for just cause or upon agreement by the Applicant. *See* Minn. Stat. § 216E.04, subd. 7.

2.3 Landowner Coordination

Great River Energy has initiated landowner outreach by providing information on the Project via letters mailed to potentially impacted landowners, interested parties and local governmental officials, publishing notices in area newspapers, and holding an Open House meeting (**Section 1.8, Appendix D**).

The majority of the Proposed Route is owned by private landowners. Great River Energy holds easements for the existing 69-kV line. New easements will be needed for the nominal 70-foot 115-kV transmission line segment to connect the Project to the existing ST-FPT 115-kV transmission line. Once a Route Permit is issued, Great River Energy will evaluate whether additional land rights or ROW are needed for the Project. If Great River Energy determines a new easement is necessary, Great River Energy land agents will work directly with individual landowners to acquire the necessary easement modifications for the Project. At a minimum, the Project will require a total ROW of 70 feet (typically 35 feet of each side of the transmission centerline) for the upgraded 115-KV transmission line system.

If a negotiated easement cannot be reached, Great River Energy can use the eminent domain process to obtain the rights necessary. *See* Minn. Stat. § 216E.12. With the eminent domain process, the landowner has the ability to have compensation for the ROW determined by impartial commissioners through a court process that is initiated by Great River Energy.

2.4 Other Permits/Approvals

In addition to the route permit sought in this Application, several other permits may 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**. Any required permits will be obtained by the Applicant in a timely manner.

Table 2-1. Summary of Possible Permits, Approvals, and Consultations

Permit	Jurisdiction
Local Approvals	
Road Crossing/ROW Permits	Stearns County, St. Joseph Township, City of St. Joseph, St. Wendell Township
Overwidth Load Permits	Stearns County, St. Joseph Township, City of St. Joseph, St. Wendell Township

Driveway/Access Permits	Stearns County, St. Joseph Township, City of St. Joseph, St. Wendell Township
Utility Permits	Stearns County, St. Joseph Township, City of St. Joseph, St. Wendell 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
Temporary Construction Dewatering Permit	Minnesota Department of Natural Resources
National Pollutant Discharge Elimination System Stormwater Permit	Minnesota Pollution Control Agency
Section 401 Clean Water Act Water Quality Certification	Minnesota Pollution Control Agency
Wetland Conservation Act	Board of Water and Soil Resources, County, City, Townships
Minnesota Statutes Chapter 138 (Minnesota Field Archaeology Act and Minnesota Historic Sites Act)	State Historic Preservation Office
Driveway/Access Permits	Minnesota Department of Transportation
Utility Accommodation on Trunk Highway ROW	Minnesota Department of Transportation
Oversize and/or Overweight Permit	Minnesota Department of Transportation
Federal Approvals	
Section 404 Dredge and Fill Permit[9]	United States Army Corps of Engineers
Section 10 Rivers and Harbors Act	United States Army Corps of Engineers
Endangered Species Consultation	United States Fish and Wildlife Service
Part 7460 Airport Obstruction Evaluation	Federal Aviation Administration / Minnesota Department of Transportation
Other Approvals	
Crossing Permits/Agreements	Other Utilities such as pipelines or railroads

2.4.1 Local Approvals

After the Commission approves a route and any appropriate design engineering is completed, Great River Energy will work with LGUs to obtain any of the following approvals if necessary.

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

[9] USACE may consult with Tribes pursuant to Section 106.

Utility Permit

A permit from the city and/or county may be required for conductors or guy wires that will crossover Ridgewood Road, 304th Street, 73rd Avenue North, Mullen Road, 320th Street, and County Road 133. Great River Energy will apply for these permits once the transmission line design is complete and acquire them prior to applicable construction activities.

2.4.2 State of Minnesota Approvals

Endangered Species Consultation

The Minnesota Department of Natural Resources (MDNR) Natural Heritage and Nongame Research Program collects, manages, and interprets information about nongame species. Consultation was requested from the MDNR for the Project regarding rare and unique species (**Appendix E**), but MDNR subsequently moved to an online review process through their Minnesota Conservation Explorer online application process (https://mce.dnr.state.mn.us/). Great River Energy will work with MDNR 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 MDNR 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 Minn. Stat. § 84.415 and Minn. R. Ch. 6135. The Project is not proposed to cross any mapped MDNR Public Waters or Lands. After the Commission approves a route, Great River Energy will work with the MDNR to clarify the need for a license.

Wetland Conservation Act

The Minnesota Board of Water and Soil Resources administers the state Wetland Conservation Act, under Minn. R. Ch. 8420. The proposed Project would require a permit under these rules if permanent impacts to wetlands are anticipated to result from construction. Based on wetland mapping as shown in the MDNR National Heritage Information System (NHIS), the Project is anticipated to result in impacts less than permitting thresholds to wetlands. This analysis will be updated once the Commission permits a final route and design of the transmission line is complete.

National Pollutant Discharge Elimination System (NPDES) Permit

A NPDES permit from the Minnesota Pollution Control Agency (MPCA) is required for stormwater discharges associated with construction activities disturbing one or more acres. 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 Project will cause a disturbance of one or more acres.

Section 401 Water Quality Certification

A Section 401 certification is necessary to obtain a federal permit for a project that could result in a discharge to navigable waters. There are no navigable waters in close proximity to the Project, and accordingly, a Section 401 certification is not necessary.

Utility Accommodation on Trunk Highway Right of Way

There are no state highways in the Project area.

Oversize/Overweight

An Oversize and/or Overweight permit is required by Minnesota Department of Transportation (MnDOT) when a vehicle is transporting an oversize/overweight load on Minnesota roadways.

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. Based on wetland mapping using MDNR's data set, the Project will cause minimal permanent and temporary impacts to wetlands. If the approved route deviates from the existing route and results in impacts exceeding the permitting thresholds, 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 reviewed the Project through the USFWS Information for Planning and Consultation (iPaC) website regarding federally-listed species or critical habitat. Results for the proposed Project are included in **Appendix E**. If the Commission permits a route substantially different from the proposed route, Great River Energy will conduct an iPaC review for that route.

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. Project design and construction will be done in accordance with Avian Power Line Interaction Committee guidelines. 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 (NLEB).

2.4.4 Other Approvals

Great River Energy will work with BNSF Railway Company to obtain a license to cross their rail line that runs parallel to Ridgewood Road and 304th Street.

2.5 Certificate of Need Not Required

Minnesota Statutes Section 216B.243, subdivision 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."[10] The proposed Project is less than ten miles in length and does not cross a state line; therefore a certificate of need is not required.

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

3 APPLICANT INFORMATION

3.1 Proposed Ownership

Great River Energy currently owns the existing 3.2-mile 69-kV line proposed for conversion to 115-kV. Great River Energy will continue ownership of the transmission line and associated switches and equipment upgrades.[11]

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 Stearns Electric Association, the distribution cooperative serving the area,[12] and customers. Great River Energy's distribution cooperatives, in turn, supply electricity and related services to more than 720,000 residential, commercial, and industrial customers in Minnesota and Wisconsin.

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

Great River Energy's power plants generate more than 3,000 megawatts of electricity and several solar arrays can produce over 480 kilowatts. In addition, Great River Energy purchases wind and hydroelectric energy. Great River Energy carefully designs and maintains a portfolio of power generation facilities and transmission resources to deliver reliable and affordable wholesale electricity to the regional electricity market and our member-owner cooperatives.

Great River Energy owns over 4,300 miles of transmission line (69 kV or higher) in Minnesota, North Dakota, South Dakota, and Wisconsin.

Figure 1-2 shows Great River Energy's service territory and highlights the service area of Stearns Electric Association. 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 Midcontinent Independent System Operator (MISO).

[11] The Westwood Substation distribution upgrades will be owned by Stearns Electric Association.

[12] Stearns Electric Association is a distribution cooperative that provides electricity and related services to approximately 27,585 residential, commercial, and industrial customers in Minnesota.

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4 PROPOSED PROJECT

4.1 Project Description

The proposed Project is located entirely in Stearns County, Minnesota (**Figures 1-1 and 4-1),** in the City of St. Joseph, the Township of St. Joseph and a small section of St. Wendell Township.

As shown on **Figure 1-1** Great River Energy proposes to:

- Remove approximately 3.2 miles of the existing 69-kV ST-WW transmission line and structures between the existing West St. Cloud, Westwood, and Le Sauk Substations and replace those facilities with an overhead 115-kV transmission line and structures; with some exceptions described further in **Section 1.5** of this Application, Great River Energy would like the new 115-kV transmission line to follow the alignment of the existing 69-kV transmission line to the extent possible after additional stakeholder engagement;
- Extend the transmission line approximately 170 feet northwesterly near the existing Le Sauk Substation to tap into a new 115-kV switch on Great River Energy's existing ST-FPT transmission line;
- Install an additional 115-kV breaker and associated equipment at the existing West St. Cloud Substation, which will require an approximately 6,500-square-foot expansion of the substation;
- Install two 115-kV line switches: one for the tap feeding the existing existing Westwood Substation, and one north of the existing Le Sauk Substation.

4.2 Transmission Line

The proposed route is shown in **Figure 1-1,** proposed route widths are shown in **Figures 1-3 and 4-1)**, and **Appendix B** contains a series of larger scale aerial photo maps depicting the proposed alignment, route, and ROW for the Project.

Proposed Route

The Project begins at Great River Energy's existing West St. Cloud Substation on Ridgewood Road in St. Joseph. The rebuilt line will exit the substation and run east on the south side of Ridgewood Road, and then cross over Ridgewood Road, existing railroad tracks and 304th Street to a new replacement switch and tap line for the existing Westwood Substation. From there, the Project will continue east along the north side of 304th Street for approximately 1,100 feet, where it will turn north and extend for approximately 1.4 miles to Mullen Road. The transmission line will turn west along Mullen Road to County Highway 133 and will terminate at a new switch pole on the west side of the highway near the existing Le Sauk Substation.

Right-of-Way and Route Widths

Great River Energy holds easements for the existing 69-kV line. New easements will be needed for the nominal 70-foot 115-kV transmission line segment to connect the Project to the existing ST-FPT 115-kV transmission line. Once a Route Permit is issued, Great River Energy will work with landowners and agencies and then evaluate whether existing easements and ROW are sufficient for the final design. If Great River Energy determines a new easement is necessary, Great River Energy land agents will work directly with individual landowners to acquire the necessary easement modifications for the Project. At a minimum, the Project will require a total ROW of 70 feet (typically 35 feet of each side of the transmission centerline) for the upgraded 115-KV transmission line system.

Great River Energy is requesting varied route widths for specific portions of the route to take into account existing infrastructure, mitigate potential engineering challenges, and/or to facilitate any necessary realignments to accommodate agency and/or landowner requests. The route width areas are shown in **Figure 4-1** and numbered consistent with the descriptions below. Detailed descriptions of each route width area and the requested widths are as follows:

Great River Energy is requesting approval of the following routes as depicted in **Figure 4-1**:

1. The entire parcel upon which the existing and expanded West St. Cloud Substation is, and will be, located.

2. Along the south side of Ridgewood Road, a 50-foot-wide route extending southerly and perpendicular from the road ROW.

3. An approximately 2.75-acre area around the existing Westwood Substation to enable design and construction options for the Project to cross over Ridgewood Road and railroad tracks, under the existing Xcel Energy 115-kV transmission line, over 304th Street, and to accommodate redesign options at the Westwood.

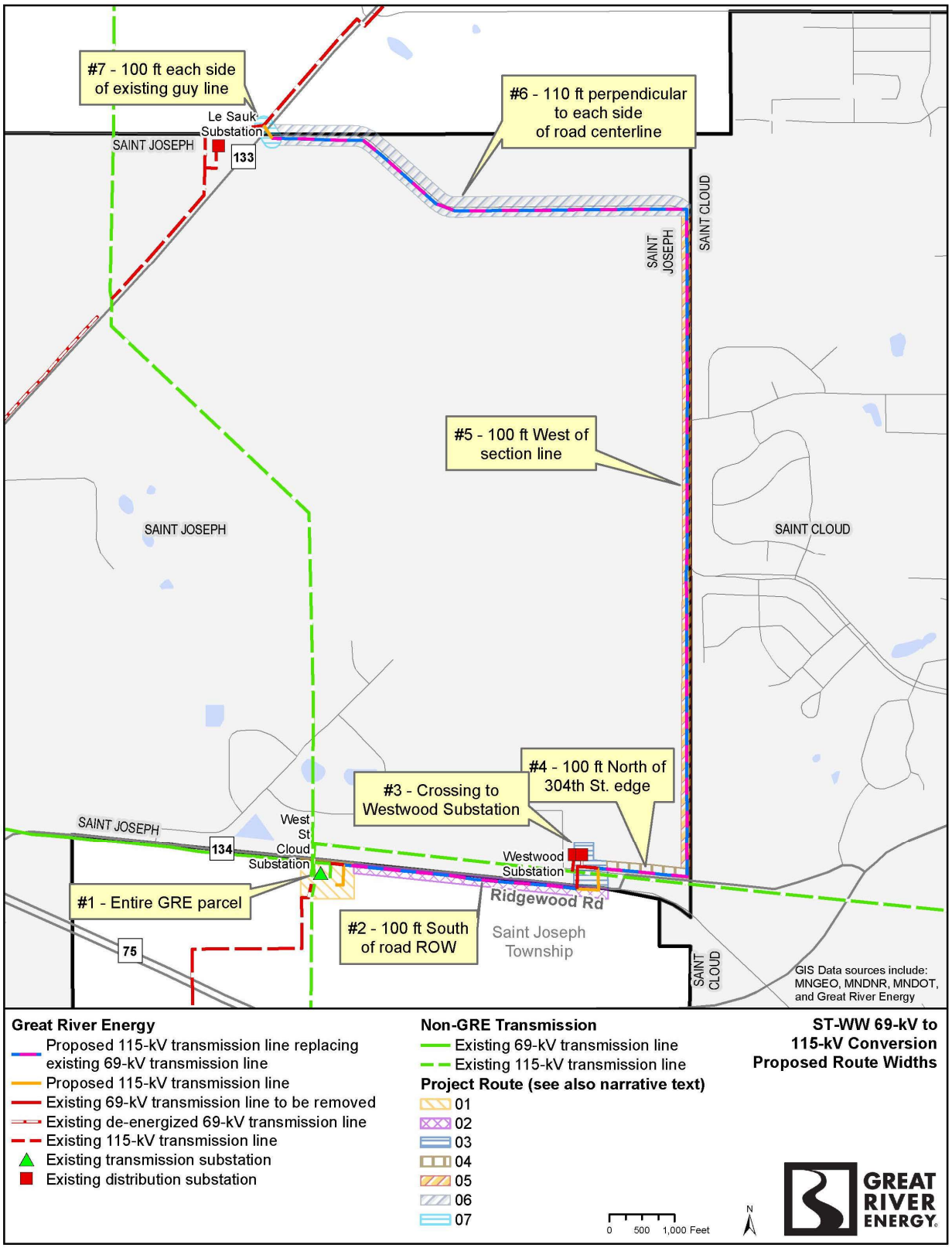
4. Along the north side of 304th Street, a 50-feet-wide route extending northerly and perpendicular from the road ROW.

5. Along the north-to-south parcel/section lines, a 100-feet-wide route extending westerly and perpendicular from the north-to-south parcel/section lines.

6. Along the easterly-to-westerly Mullen Road, a 220-feet-wide route that extends 110 feet perpendicular from each side of the road centerline.

7. Along the final 115-kV transmission line segment connected to the new switch on Great River Energy's existing ST-FPT 115-kV transmission line, a 200-feet-wide route width that extends perpendicular from the proposed transmission line centerline.

Figure 4-1 Route Widths Map



Structures and Design Considerations

Potential structure designs and photographs are provided in **Figures 4-2** and **4-3**. Structure dimensions are provided in **Table 4-1**.

Table 4-1 Typical 115-kV Structure Dimensions

Structure Type	Material	Approximate Height Above Ground (feet)	Structure Base Diameter (inches)	Span Between Distances (feet)
Monopole with horizontal post or braced post	Wood, steel or ductile iron	70 - 90	18 - 36	300 – 400
H-Frame	Wood, steel or ductile iron	70 - 90	18 - 36	350 - 800
Three-pole	Wood, steel or ductile iron	70 - 90	18 - 36	350 - 800

The majority of the rebuilt 115-kV line will consist of single circuit, monopole wood structures spaced approximately 300 to 400 feet apart. Transmission structures will typically range in height from 70 to 90 feet above ground, depending upon the terrain and environmental constraints. The average diameter of the wood structures at ground level is 20 inches.

Laminated wood structures or steel structures may be needed for switches and angled structures; the size of these structures is dependent on the weight of the switch material, the tension on the line, and/or the angle of deflection the pole location causes on the transmission line. Specific sizing of these structures will be determined after a route permit is issued and detailed engineering design is initiated.

Multi-pole (3-pole deadend) and/or H-frame structures may be used to cross underneath the existing Xcel Energy 115-kV line located between Ridgewood Road and 304th Street. 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 upgraded 115-kV transmission line to be as low as possible at the crossing point, while still maintaining the required clearances set forth by the National Electrical Safety Code (NESC). Specific sizing of these structures will be determined after a route permit is issued and detailed engineering design is initiated.

A deadend is a structure used to change direction and/or wire tension on a transmission line. Deadend structures are also used as a “storm structure” to limit the number of structures damaged

by a cascading effect due to higher line tensions when a pole is knocked down by a storm. Anticipated deadend structure locations are shown in the **Appendix B** map series.

Transmission Line Clearance Requirements

NESC sets minimum clearances of the conductors from structures adjacent to or within the ROW. NESC clearance requirements are summarized in **Table 4-2**. For a 115-kV transmission line like the Project, the NESC minimum clearance under a 48 mile per hour (mph) wind is 8.6 feet. When there is no wind, the conductors must have a clearance of 9.1 to 11.6 feet from various structures as listed in **Table 4-2**. Great River Energy also typically requires the blowout to remain within the ROW under a more extreme wind condition of 94 mph. Blowout on a typical 115-kV transmission line with a 300-foot span is approximately five feet with 48 mph winds and eight feet with 94 mph winds.[13] During preliminary and final engineering, both of which start after a route permit is issued, the span distances are constrained in part by the NESC and Great River Energy's clearance requirements.

Table 4-2 NESC Clearance Requirements for 115 kV

	Minimum Separation (feet)	
Risk Case	**No Wind**	**NESC 45 mph wind**
From a lightning support, traffic signal support, or support structure for another line.	9.1	8.6
From any other buildings, walls, projections, structures, bridges, etc.	11.6	8.6

Substation

The modified West St. Cloud Substation will be equipped with breakers and relays located where the transmission line will connect to the substation. This equipment is designed to protect human health as well as all of the equipment on the transmission system by de-energizing the transmission line should any unsafe line faults occur.

Outages

All necessary outages will be coordinated in accordance with MISO requirements and procedures that are established and followed by all MISO members to meet personnel safety and 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

[13] NESC also has standards regarding vegetation management which necessitates typically greater clearance distances. See **Section 6.5** for vegetation management requirements.

developed and shared with all parties involved using well-defined processes to ensure safety of personnel performing the work and transmission grid reliability.

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 795 thousand circular mil aluminum conductor steel supported with seven steel core strands and 26 outer aluminum strands, or a conductor with similar capacity.

The shield wire will be 0.528 optical ground wire.

Distribution Lines

Great River Energy does not own, operate, or install low voltage distribution lines. On some projects, Great River Energy has allowed other distribution utilities to attach their distribution lines to our high voltage transmission line structures. This is commonly called "underbuild" or "underbuilt". The existing 69-kV structures have distribution underbuild along Ridgewood Road, 73rd Avenue, and Mullen Road. Great River Energy currently understands that the distribution owners plan to bury these lines rather than attach them to the new 115-kV structures.

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.

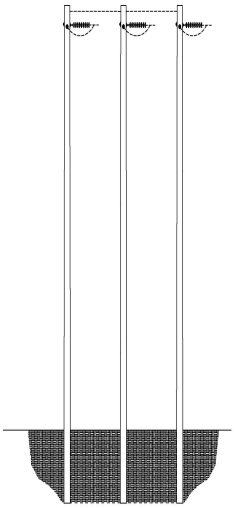
Annual Availability

An average 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.

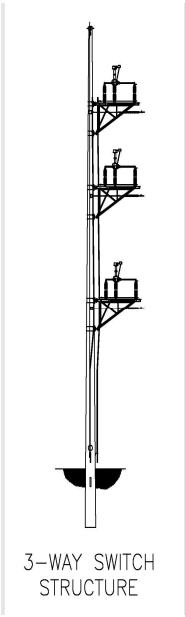
Figure 4-2. Typical Transmission Structure Types

SINGLE CIRCUIT
HORIZONTAL POST

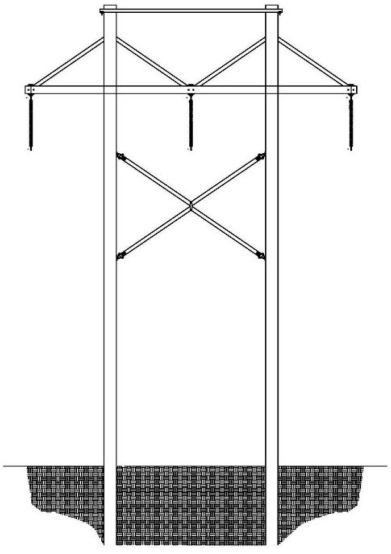
SINGLE CIRCUIT
BRACED POST



SINGLE CIRCUIT
3-POLE DEADEND

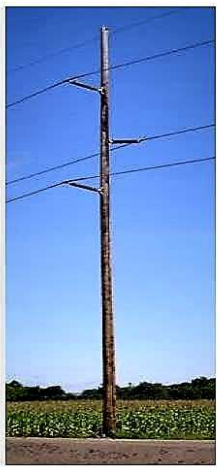


3-WAY SWITCH
STRUCTURE

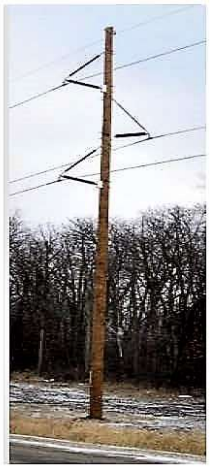


SINGLE CIRCUIT
H-FRAME

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

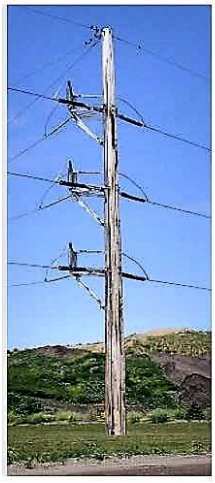


Single Circuit



Braced Post

3-Pole Deadend



Switch

H-Frame

4.3 Estimated Costs

Estimated costs for the proposed Project are approximately $6.4 million. Costs and tasks are divided into five phases as summarized in **Table 4-3**.

Table 4-3. Estimated Great River Energy Project Costs

Project	Planning/ State Permitting	Land Acquisition/ Permits	Design	Procurement	Construction	Close Out	Total
Transmission Line	201,369	412,800	178,378	492,000	1,486,626	58,827	**3,330,168**
Switches	13,725	0	51,750	164,250	210,150	80,125	**520,000**
	19,600	0	40,250	127,750	154,525	7,875	**350,000**
	8,400	0	17,250	54,750	66,225	3,375	**150,000**
Substation	0	0	7,750	18,750	22,750	750	**50,000**
	18,000	37,000	140,000	1,0650,000	712,000	28,000	**2,015,954**
Total	**261,094**	**449,800**	**435,378**	**1,922,500**	**2,652,276**	**178,952**	**6,416,122**

All capital costs for the Project will be borne by Great River Energy.

4.3.1 Transmission Line Construction Costs

In rural areas, single pole construction costs and easement costs are approximately $600,000 per mile. The proposed Project's costs are anticipated to be higher due to congestion from existing roads, railroad tracks, other utilities' transmission lines, buildings, and costs to remove the existing 69-kV transmission system.

4.3.2 Operation and Maintenance Costs

The estimated annual cost of ROW maintenance and operation of Great River Energy's transmission lines (69 kV to 500 kV) in Minnesota currently averages 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 summer of 2024 once required permits and approvals are obtained. Great River Energy anticipates construction will take approximately six months and the Project will be energized in early 2025.

4.5 Construction Practices

Great River Energy intends to employ its standard practices to construct the Project. These standard practices have been established and incorporate best management practices (BMPs) to meet internal, state, and federal requirements, balance construction costs, and minimize impacts to landowners and the environment. 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 perform inspections, maintain equipment, and repair damage to the transmission line. 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 or damages 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 (see **Section 6.5**). A three to seven-year cycle of vegetation maintenance is desirable. ROW practices include a combination of mechanical and hand clearing, along with targeted 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 Minn. R. 7850.3100 require an applicant to identify any alternative routes that were considered and rejected for the Project. Great River Energy evaluated one alternative route (**Figure 5-1**) for the Project.

The alternative route would be similar to the Proposed Route in that it would include: 1) similar modifications to the existing West St. Cloud Substation; 2) constructing a similar new 0.6-mile 115-kV tap line to the Westwood Distribution Substation, and; 3) installing a new 3-way switch outside of the Westwood Distribution Substation.

This alternative route differs from the Project in that, rather than replacing the existing 69-kV transmission line with 115-kV facilities to the east, a new 115-kV transmission line would be constructed to the west along new ROW. The new 115-kV line would extend from the Westwood Distribution Substation west for approximately 1.25 miles along 304th Street until intersecting with Great River Energy's existing de-energized 69-kV ST-WL line. The existing ST-WL would be removed and replaced with a new 115-kV line that would extend northerly for approximately 1.5 miles to Great River Energy's existing Le Sauk Substation. The existing ST-WW line extending east from the West St. Cloud Substation to the Westwood Distribution Substation would also be rebuilt to 115 kV.

This alternative was was rejected for the following reasons:

- It would require creating approximately 1.25 miles of new ROW along 304th Street, which would create new ROW restrictions, add new visual impacts, and cost more due to the need to acquire new ROW.

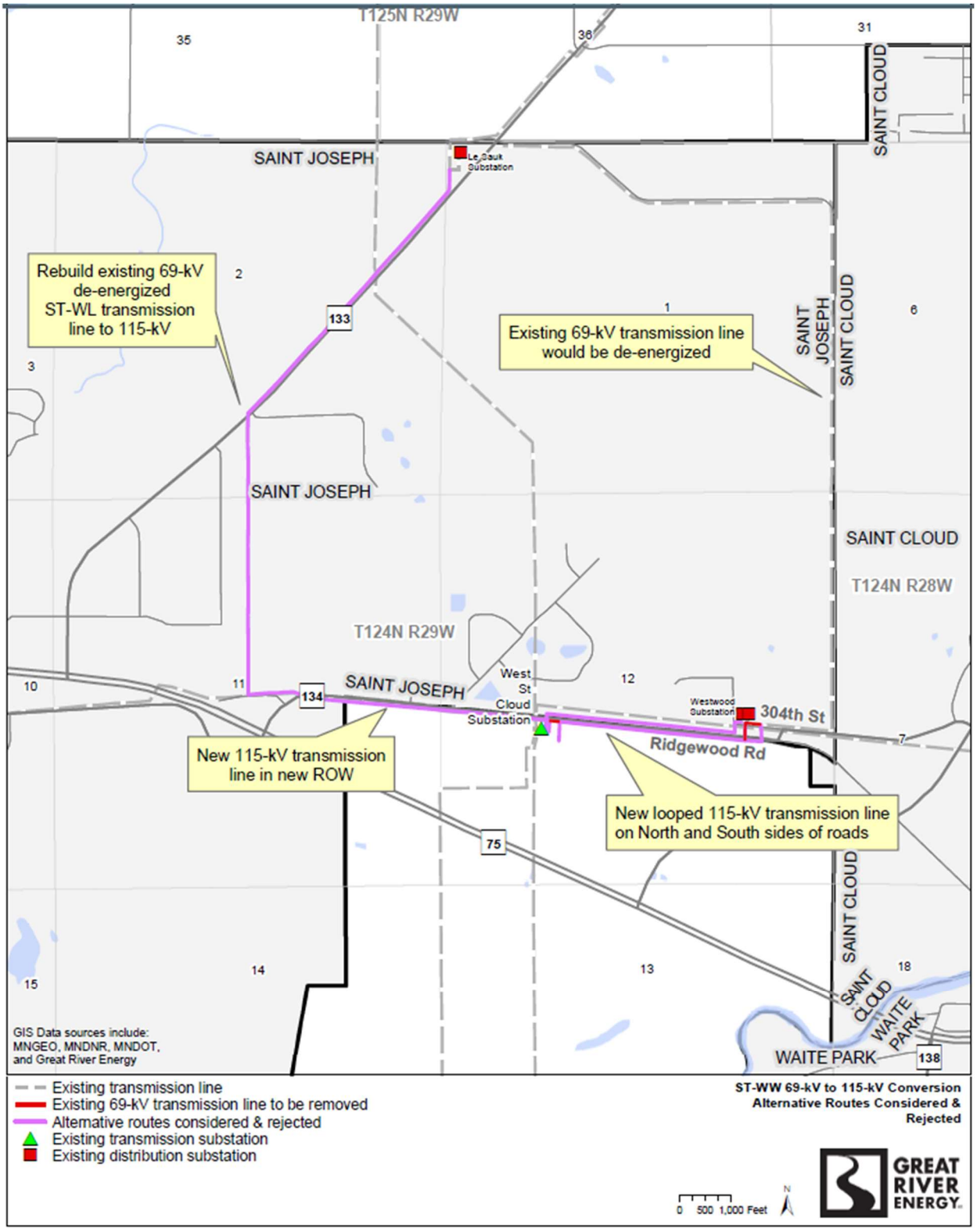
- The north side of 304th Street is already congested west of the Westwood Substation by existing industrial facilities and an existing Xcel Energy transmission line. Additional analysis and coordination with Xcel would be necessary to determine if this segment is even viable to construct.

- The alternative route would entail three crossings of Xcel Energy's lines compared to one crossing with the proposed Project, with related cost and reliability impacts.Further, although the alternative route is technically looped, it is less robust than the proposed Project because it relies on 0.6-mile of the two source lines to be located within approximately 175 feet of each other. Locating power sources this close to each other increases risks due to weather-related outages or a vehicle accident.

In summary, Great River Energy considered but rejected this alternative because it would result in the same types of impacts as the Project, but potentially on a greater magnitude because of the

creation of new ROW, while at the same time presenting feasibility and reliability concerns not present for the Project as proposed.

Figure 5-1 Route Alternative Considered and Rejected



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

Design and construction of transmission lines occur through multiple stages, including: transmission line design; identification of existing ROWs; ROW acquisition; construction; restoration; and, operation and maintenance. Each stage is discussed in further detail in the sections that follow.

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

Minnesota statutes and rules require the consideration of the potential for a project to accommodate future improvements to the transmission system. The Project is designed to maintain reliability requirements in the area and is sized to accommodate future expansion whereby another loop could be created to eliminate the current radial feed to the Five Points Substation, to the extent that future analysis determines it to be needed. As such, the Project is designed to appropriately accommodate future expansion, if needed.

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

The Project will be constructed almost entirely within existing utility ROW and will parallel existing road ROW. Specifically, the Project is expected to generally follow the same alignment of the existing 69-kV line, with the exception of where the Project will cross from the south side of Ridgewood Road to the north side of 304th Street; however, the Project here would be almost entirely within existing road ROW.

6.4 Transmission Line Right-of-Way Acquisition Procedures

As described previously, Great River Energy holds easements for the existing 69-kV line which will be replaced by the Project. After a route permit is issued, Great River Energy will evaluate what, if any, additional land rights are needed for the Project. Then, Great River Energy land agents will work directly with individual landowners to acquire the necessary easement modifications for the Project. At a minimum, the Project will require a total ROW of 70 feet (typically 35 feet of each side of the transmission centerline) for the upgraded 115-KV transmission line system.

While easement negotiations will not formally begin until after the Commission approves a route, Great River Energy will continue to engage with landowners throughout the permitting process to answer any questions they may have regarding the easement process or the Project.

During any necessary formal land rights acquisition, landowners are given a copy of the Route Permit, the transmission line easement, offer of compensation, information on the Project schedule, construction practices, vegetation removal, and damage settlement. Where existing easements are determined to be sufficient, the same information will be provided except for an offer of compensation. Additional information may also be given to each landowner regarding preliminary pole placement (if available at that time), structure design or photos, and power line safety. Great River Energy would respond to any comments or questions landowner may have including those with respect to the transmission line construction practices or operations of the transmission line.

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

As part of early transmission design work, Great River Energy will need to complete preliminary survey work and may need to acquire some soil characteristics data. Great River Energy will notify landowners in the event site access for soil boring is required to determine soil suitability in areas where special transmission structure design may be required.[14]

6.5 Construction Procedures

As described further below, construction will follow Great River Energy's standard construction and mitigation best practices. Construction typically occurs as follows:

- Surveying and staking the ROW;
- ROW clearing and preparation;
- Grading / filling, as needed;
- Installation of foundations;
- Installation of poles and related equipment;
- Conductor stringing; and
- Installation of any required aerial markers.

Procedures to be used for construction of the transmission line and modifications at the West St. Cloud Substation are discussed below. Equipment used in the transmission line construction process includes backhoes, cranes, boom trucks, and assorted small vehicles. Small grading equipment will also be used at the West St. Cloud Substation.

[14] Survey work and geotechnical studies do not require that the Commission issue a route permit for this work to occur. Minn. R. 7850.1200, subp. 5.

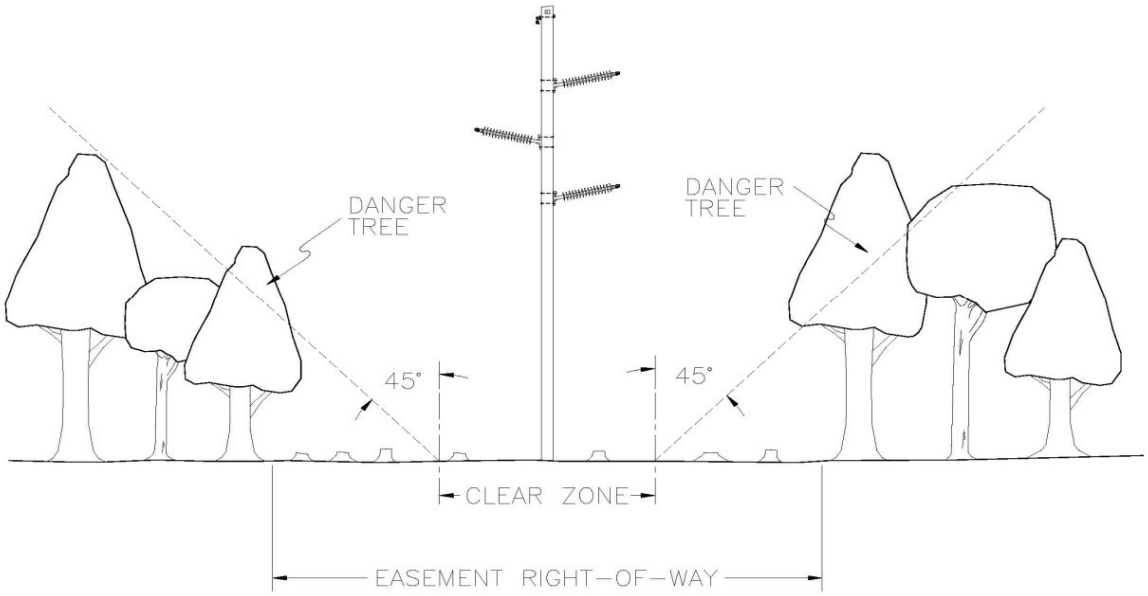
Transmission Line Construction

After land rights have been secured and prior to any construction activites starting, landowners will be notified on the Project schedule and other related construction activities.

The first phase of the transmission line 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. Great River Energy uses an integrated vegetation management plan that incorporates a wire/border zone practice for ROW clearing and maintenance. As a general practice, low-growing brush or tree species are allowable at the outer limits (the "border zone") 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 border zone, as agreed to during easement negotiations. The area below the outer conductors plus 10 to 15 feet (the "wire zone" or "clear zone") is cleared of all shrubs and trees to ensure maintenance trucks can access the line and no vegetation interferes with the safe operation of the transmission line.

The 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, that could grow into the wire zone, or are otherwise deemed to be a hazard to the safe operation of the line ("danger trees") may be removed or trimmed to eliminate the hazard as shown in **Figure 6-1**, if allowed by the terms in the easement. Danger trees generally are those that are dead, diseased, weak, or leaning towards the energized conductors. Tree trimming may be possible to minimize tree removal based on negotiations with individual landowners.

Figure 6-1. Standard Tree Removal Practices



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 or in accordance with agency requirements.

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.

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 as well as industry-specific 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.

A majority of the proposed structures will be installed directly in the ground by augering a hole typically 10 to 15 feet deep and 2 to 4 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. Some of the proposed structures will be steel poles, which may be directly imbedded or set on a concrete foundation. The concrete foundations will be approximately 5 to 7 feet in diameter and generally are exposed one foot above the existing ground level. Concrete trucks are used to bring the concrete in from a local concrete batch plant.

After a direct-imbedded pole is set into the hole, the void space is backfilled with crushed rock. Based on typical soil types in Minnesota, it is anticipated that the 70-foot above ground pole would be buried approximately 13 feet into the ground. In poor soil conditions (peat, marl, soft clay or loose sand) a galvanized steel culvert is sometimes installed vertically with the structure set inside.

After a number of proposed structures have been erected, Great River Energy will begin to install the shield wire and conductors by establishing stringing setup areas within the ROW. These stringing setup areas are located at deadend structures along a Project route and occupy approximately 15,000 square feet for linear segments of the line and approximately 30,000 square feet for angled segment of the line. 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.

West St. Cloud Substation Modifications

The final substation fenceline will be squared off in the southeast corner of the substation for an expansion of approximately 6,500 square feet (**Figure 6-2**). A construction schedule for the substation modifications will be developed based upon material deliveries, availability of crews, outage restrictions for the transmission lines that may be affected, weather conditions, spring load restrictions on roads, and any restrictions placed on certain areas for minimizing impacts from construction.

The site will be surveyed for initial grading work. A Gopher One-Call utility location will be completed. The existing fence will be removed and temporary fencing will be installed to enable the grading contractor to move its equipment on the site.

Once the initial grading is completed, the site will be re-surveyed to establish equipment and structure locations.

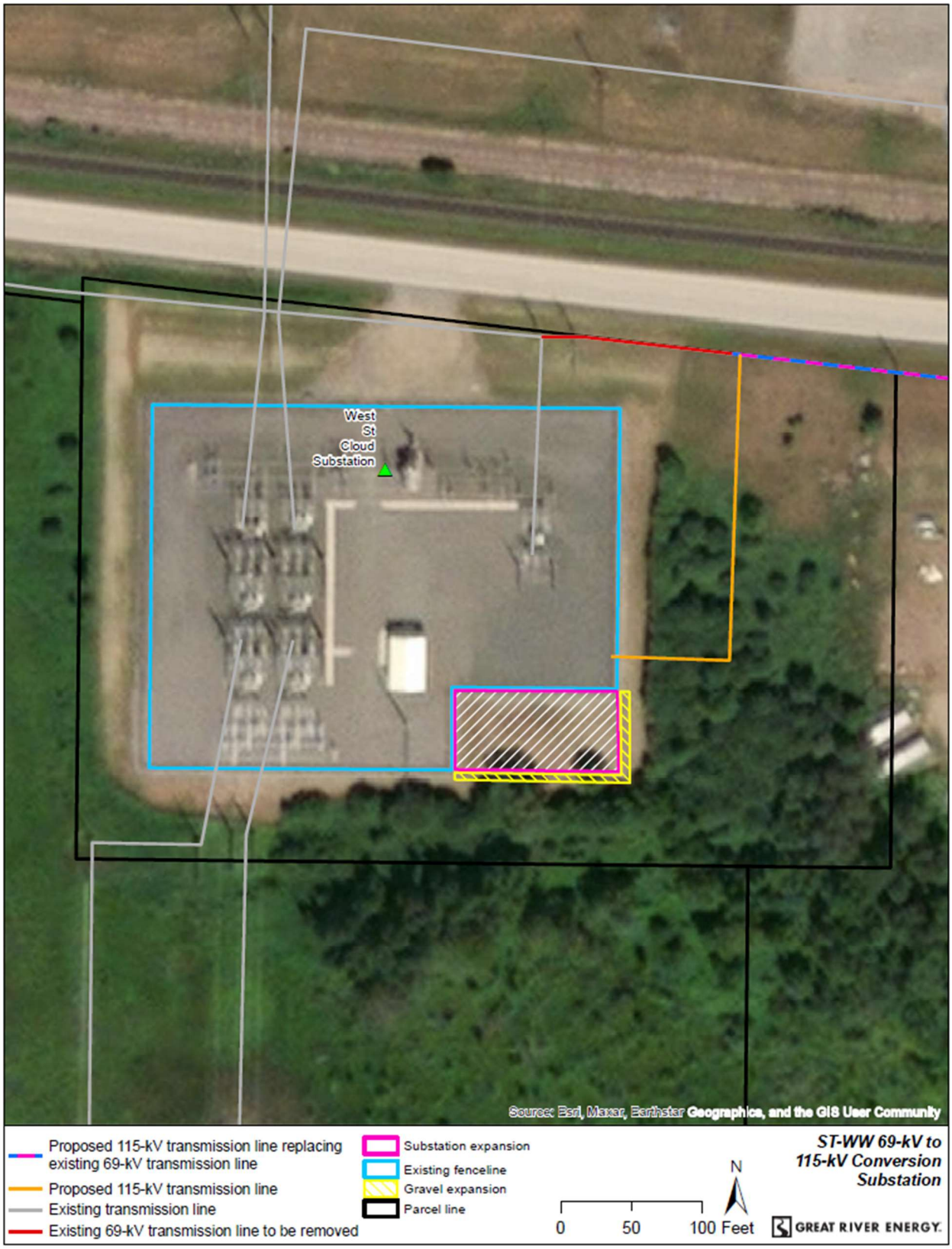
The footprint for the substation typically includes installing a layer of sand and a layer of compacted class 5 aggregate as a base material. Excavation or drilling will be completed as necessary for concrete foundations and piers to support the substation equipment, and concrete will be poured for the foundations or piers.

Buildings, structural rigid metal conductors called buswork, breakers, fencing, necessary switches and control equipment, and the transmission line structures for the new 115-kV line will be erected. Once the majority of the equipment has been erected, the substation footprint is topped with four to six inches of crushed rock.

A short outage may be needed to connect the new buswork to the existing buswork. Any and all outages would be coordinated through MISO to mitigate any power outages or outage duration. Coordination involves MISO ensuring that no other planned outages during the same time frame would negatively impact system reliability, evaluating and planning of switching within the transmission system to enhance reliability of the system, and if necessary, scheduling the outage during low demand periods.

All construction will be completed in accordance with state, NESC, and Great River Energy construction standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, erection of power poles (to connect the line to the substation) and stringing of transmission line conductors.

Figure 6-2 Preliminary West St. Cloud Substation Layout



6.6 Restoration Procedures

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 condition of the transmission line and structures 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. 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 averages 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.

6.8.1 Electric Fields

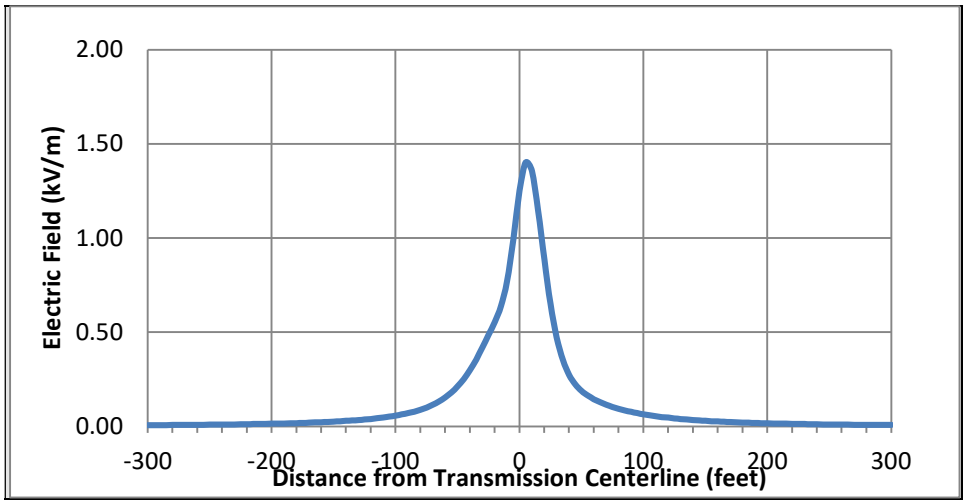
Voltage on a wire produces an electric field in the area surrounding the wire. The voltage on the conductors of a transmission line generates an electric field extending from the energized conductors. The intensity of transmission line electric fields is measured in kV/m, and the magnitude of the electric 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 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 6-3**.

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 6-3**)	121	0.01	0.02	0.06	0.22	0.49	1.36	0.67	0.20	0.07	0.02	0.01

Figure 6-3. 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. 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 6-3** 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, 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.[15]

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

[15] 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.

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.[16] The general standard is one of prudent avoidance.

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) [17]

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 magnetic field calculations are also shown graphically in **Figure 6-4.** 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.

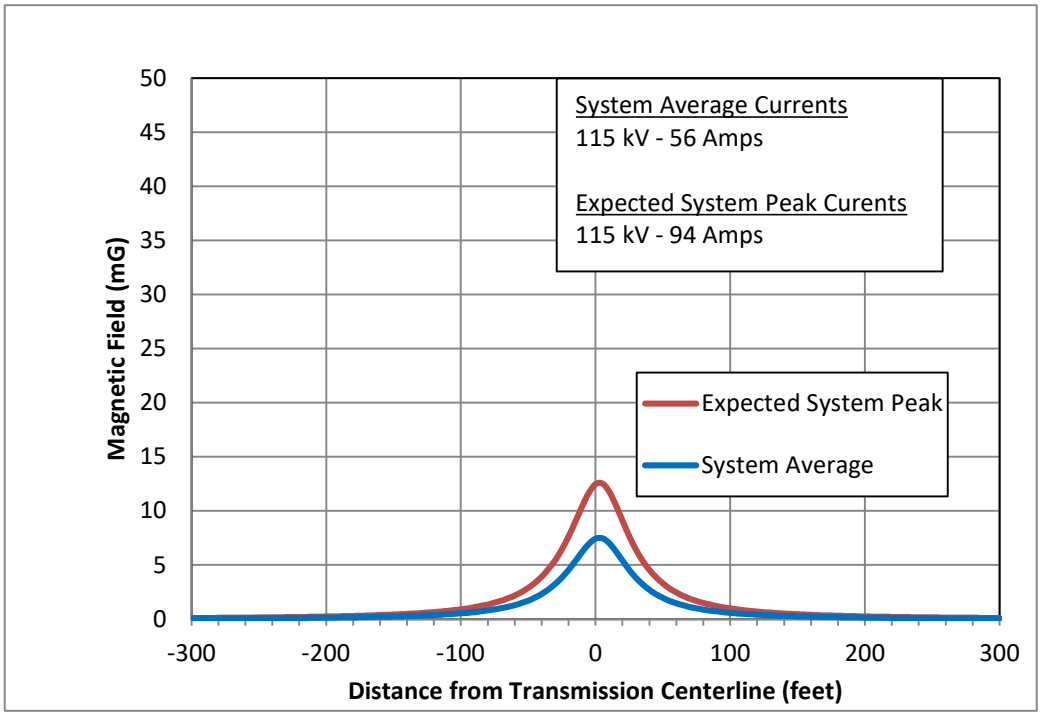
[16] Minnesota Department of Health. *EMF White Paper on Electric and Magnetic Field* (EMF) Policy and Mitigation Options. 2002; National Research Council. *Possible Health Effects of Exposure to Residential Electric and Magnetic Fields*. 1997; www.niehs.nih.gov/health/topics/agents/emf/.

[17] *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 6-4**)	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 6-4**)	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 6-4. 115 kV Single Circuit Line Magnetic Field Profile



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. 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.

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.

Corona formation is a function of the conductor radius, surface condition, line geometry, weather condition, and most importantly, the line's operating voltage. As discussed in the subsections that follow, 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. T

6.10.1 Corona: Radio and Television Interference

Because the likelihood of significant corona formation on the Project 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 any 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 Corona: Audible Noise

Transmission lines can cause audible noise due to corona discharges from the conductors. The impacts and mitigation of audible noise due to the Project, including that due to corona, are discussed further in **Section 7.2.3**.

6.10.3 Corona: Air Impacts

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

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.

7.1 Environmental Setting

The Project lies in the Anoka Sand Plain Subsection of the Eastern Broadleaf Forest Province, according to the MDNR Ecological Classification System. The MDNR describes the Anoka Sand Plains as:

> *The major landform is a broad sandy lake plain, which contains small dunes, kettle lakes, and tunnel valleys. Topography is level to gently rolling. There are small inclusions of ground moraine and end moraine (Wright 1972). The other important landform is a series of sandy terraces associated with historic levels of the Mississippi River. Terraces are also associated with major tributaries of the Mississippi.*[18]

The environmental setting of the Project area (within a couple miles of the proposed route) includes several hydrologic features, such as wetlands areas, rivers, small lakes, and the Sauk River. The physical geography is depicted in **Figures 7-1 through 7-5** and the **Appendix B** map series. The characteristics of the Project area is typical of the surrounding areas and does not preclude development of this Project.

The Project is located in the following Townships and Ranges:

- T124N R39W Section 12 – Quartersections NESW, NWSE, NENE, SENE, NENE
- T124N R39W Section 1 – Quartersections SESE, NESE, SENE,NENE, SWNE, NWNE, SENW, NENW, NWNW
- T125N R29W Section 36 – Quartersections SWSE, SESW

Land use along the proposed route is primarily agricultural and industrial, with pockets of suburban/rural residential areas. The West St. Cloud Substation and the proposed 115-kV transmission line south of Ridgewood Road are located in St. Joseph Township. The remainder of the Project is located almost entirely within the city of St. Joseph, except approximately 100 feet of the tap line to the new switch on the existing ST-FPT line is in St. Wendell Township. The Project is immediately adjacent to the western border of the city of St. Cloud.

There are existing transmission lines and substations within the Project area. Two 115-kV Xcel Energy lines (0868 and 0891) run west and south of the Project and connect to the West St. Cloud

[18] https://www.dnr.state.mn.us/ecs/222Mc/index.html

Substation (**Figure 1-4**). No modifications to these lines are anticipated as a result of the proposed Project.

7.2 Human Settlement

7.2.1 Public Health and Safety

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. See **Section 6** for detailed discussions on construction practices and safety.

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.[19]

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

> *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 that, thus far,*

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

> *the evidence available is weak and is not sufficient to establish a definitive cause-effect relationship*.[20]

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.*[21]

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."[22] 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."[23] The guidelines referred to by WHO are those of the International Commission on Non-Ionizing Radiation Protection (ICNIRP)[24] and the Institute of Electrical and Electronic Engineers (IEEE) exposure limit guidelines.[25] 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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[20] http://www.epa.gov/radtown/power-lines.html

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

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

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

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

[25] *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."[26] 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."[27] The Commission adopted this finding on July 15, 2010.[28]

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 upgraded substations will be equipped with breakers and relays located where the transmission line will connect to the substations. The protective equipment is designed to de-energize the transmission line should such an event occur. The substations will be protected by barbed-wire-topped fencing. Signage attached to the fence will list Great River Energy as the owner, provide a telephone contact number and warn about electrical hazards within the substation.

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

[26] 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)

[27] *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)

[28] *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)

clearances. Great River Energy believes the proposed Project route provides sufficient design flexibility and distances from existing homes and structures for a transmission line design that achieves the requisite clearances.

The nearest residences are located in the City of St. Cloud where the Project is adjacent to the city line. The closest home is approximately 70 feet from the proposed transmission centerline (see detailed route maps in **Appendix B)**.[29] **Table 7-1** summarizes the residential and non-residential buildings at various distances to the expected centerline for the Project.

Table 7-1. Building Distances from Proposed Centerline

Building Type	0-50 feet	50-100 feet	100-150 feet	150-200 feet	Total
Home	0	13	0	18	31
Business	0	2	0	1	3
Outbuilding	1	5	0	7	13
Total	**1**	**20**	**0**	**26**	**47**

Impacts and Mitigation

No residences or businesses are anticipated to be displaced by the Project. The Project will replace an existing line and 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 temporary noise associated with the construction phase of the Project, and from operation of the Project.

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

[29] The name of each owner whose property is within and directly adjacent to the proposed route is provided in **Appendix C.**

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 considered the lowest perceptible level to human hearing. A 5 dBA change in noise level is considered 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 7-2** shows noise levels associated with common, everyday sources.

Table 7-2. 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)

Established daytime and nighttime noise standards per Minnesota Rule 7030.0040 by Noise Area Classifications (NAC) are provided in **Table 7-3**. The standards are expressed as limiting levels of dBA within a one hour period; L_{50} is the dBA not to be exceeded over 50 percent of the time (30 minutes) within an hour, while L_{10} is not to be exceeded over 10 percent of the time (6 minutes) within the hour.

Table 7-3. MPCA Noise Limits by Noise Area Classification (dBA)[30]

Applicable Noise Area Classification	Daytime (7a – 10p)		Nighttime (10p – 7a)	
	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 are assigned a NAC based on the land use activities at the location of the receiver and determine the noise standards applicable to that land use activity. 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.

Noise Related to Construction

Construction noise is generally 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 Substations

No new substations will be constructed as part of the Project, and the Project involves modifications within only the existing West St. Cloud Substation. The only new noise source added to the West St. Cloud Substation will be switches, which can cause short-term (a minute or less) noise during opening or closing of the switches. These events would be infrequent and not likely perceivable by commercial and industrial workers close to the substation because of work-related noise. The breaker noise will not be perceptible to the nearest residence because it is approximately 0.85 miles to the west-northwest. Tranformers and their cooling fans are typically the most prevalent and continuous noise source within substations, and the Project does not include adding a transformer.

[30] This table identifies the classifications potentially relevant to this Project. See Minn. R. 7030.0050 for the complete text of the rule.

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. The Project will replace an existing 69-kV transmission line, which typically have similar operational noise levels as the proposed Project. As such, appreciable operational noise impacts are not anticipated as a result of the Project. Further, proper design and construction of the transmission line in accordance with industry standards will help to ensure that noise impacts are not problematic.

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 7-4**.

Table 7-4. 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

While the transmission line noises are well below state noise standards directly under the line, insufficient data was presented in the report to be able to accurately extrapolate noise levels at further distances from the transmission line. Noise levels decrease by 6 dBA when the distance from the noise source doubles. Thus, assuming the transmission line is 30 feet above grade at the centerline, the noise levels would be approximately 13 dBA at 50 feet from the centerline, approximately 7 dBA at 115 feet from the centerline, and 1 dBA at 240 feet from the centerline.

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 generally be limited to daytime hours between 7 a.m. and 9 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. Great River Energy will work with applicable LGUs in the event that construction becomes necessary outside of these hours. Heavy equipment will also be equipped, as required by local ordinances, 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, the Project is not anticipated to contribute to an exceedance of noise standards, and no mitigation is proposed.

7.2.4 Aesthetics

The proposed transmission line will be a feature visible along the route, similar to the existing 69-kV transmission line and supporting equipment. The majority of the structures will be wood poles approximately 70 to 90 feet above ground with spans between poles ranging from 300 to 400 feet.[31] Design standards for a 115-kV line require taller structures than for 69-kV lines. The taller structures could enable fewer structures to be used along the transmission line.

The landscape in the Project area is a mix of commercial, industrial, rural residential, agricultural land, open space, and utility infrastructure (**Figure 7-2** and **Appendix B)**. The visual effect will depend largely on the perceptions of the observers across these various landscapes, but will remain similar to current conditions. The visual contrast added by the taller transmission structures and lines may be perceived as a visual disruption.

Impacts and Mitigation

Because the Project is replacing an existing 69-kV line, aesthetic impacts are anticipated to be minimal. The existing 69-kV line has been in place for multiple decades, and it appears that development has occurred around that line over time. Visual impacts might be perceived by a viewer as less because Great River Energy anticipates that the existing distribution underbuild will be buried by the owners of those facilities. The new transmission line structures will be 20 to 30 feet taller with larger insulators, which might increase the visual impacts perceived by a viewer; however, the number of structures may decrease, as compared to the existing 69-kV line.

Where trees need to be cleared, this change to the landscape is typically a noticeable visual impact to receptors. However, barring any changes to the Project centerline, the large majority of the maintained ROW will not significantly change, which will mitigate this visual impact.

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 to minimize visual impacts.

[31] The existing 69-kV structures are typically approximately 50-60 feet above ground.

- 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 may be compensated for the removal of trees and vegetation based on easement negotiations.

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

7.2.5 Socioeconomics & Environmental Justice

The socioeconomic setting of the proposed Project area was evaluated on a regional basis, comparing data for the City of St. Joseph with average data for Stearns County and the State of Minnesota. Data compiled from the 2010 and 2020 U.S. Censuses are summarized in **Table 7-5**.

Table 7-5. Socioeconomic Characteristics within the Project Area[32]

LOCATION	POPULATION			MEDIAN INCOME (2016-2020)	PERCENT BELOW POVERTY LEVEL	WHITE ALONE POPULATION
	2010	2020	CHANGE			
State of Minnesota	5,303,925	5,706,494	7.6%	$73,382	8.3%	83.3%
Stearns County	150,642	158,292	5.1%	$65,244	10.6%	87.5%
City of St. Joseph	6,534	7,029	7.6%	$67,350	17.7%	90.8%

The data does not show a meaningfully greater low-income or minority population residing in surrounding census tracts. This means that, when comparing the census tracts for the City of St. Joseph to Stearns County and the State of Minnesota data, the percentage of people living in poverty or not self-identifying as white alone were either: 1) not greater than 50 percent, or 2) not 10 percentage points or more than the percentage of the population in Stearns County.[33]

The US EPA's Environmental Justice Screening Tool (EJ Screen) was also used to evaluate the Project route plus a 0.25 mile buffer. The tool's output report is included in **Appendix F**. This tool suggests the population in the Project area's exposure to environmental hazards is similar to or less than the state and national average exposure values across a range of many variables.

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[32] Data Source: US Census QuickFacts, downloaded 05/12/2022: https://www.census.gov/quickfacts/fact/table/MN,stearnscountyminnesota,stjosephcityminnesota,US/IPE120220

[33] These thresholds were selected here because they are consistent with the thresholds used in a recent environmental assessment for a transmission line proposed by Great River Energy. *See* Environmental Assessment: Frazee to Erie Transmission Line Project, Docket No. 20-423 (May 14, 2021), at 37.

The federal government's Beta Climate and Economic Justice Screening Tool[34] was also used to analyze the Project and shows none of the census tracts within or adjacent to the Project contains disadvantaged communities, as defined by that tool. The tool's output reports are included in **Appendix F.** The tool defines a disadvantaged community as follows:

> *Under the current formula, a census tract will be identified as disadvantaged in one or more categories of criteria:*
>
> > *IF the census tract is above the threshold for one or more environmental or climate indicators*
> >
> > *AND the census tract is above the threshold for the socioeconomic indicators.*[35]

Impacts and Mitigation

During construction, there may be short-term positive impacts to the nearby communities. Potential increases in local revenue may occur for businesses, such as hotels, grocery stores, gas stations and restaurants to support utility personnel and contractors.

Long term benefits of the Project include the ongoing reliable electrical services and the ability to serve existing and new local load growth. The benefits apply to the local community regardless of economic status, race, and personal identification.

There are no disadvantaged communities impacted by the Project, so there are no environmental justice issues.

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. According to Stearns County's website, Stearns County is a "commercial and tourism gateway" because of its location along I-94. The County is home to several universities, colleges, and business schools, and agriculture (particularly dairy production) continues to be a an important source of economic activity within the County. Stearns County leads the state in agriculture and is known as Minnesota's organic farming capital. In addition, Stearns County touts it recreational opportunities, including biking, boating, fishing, hiking, and swimming.[36]Cultural representation in community events appears to be more closely tied to

[34] https://screeningtool.geoplatform.gov/en/about#10.76/45.473/-94.2987

[35] https://screeningtool.geoplatform.gov/en/methodology

[36] *See* https://www.stearnscountymn.gov/700/About-the-County

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 several miles of the proposed route, including trails, rivers, and lakes.

The Stearns County area provides ample opportunities to boat, fish, scuba diving and swim, along with biking and hiking against a backdrop of rolling hills, woodlands and scenic lakes.

Recreational resources near the proposed route are shown on **Figure 7-1** The primary recreational resources in the Project area are the Lake Wobegon Regional Trail[37] and snowmobile trail number 211.[38] A portion of the Lake Wobegon Trail was built in 2018 and runs parallel along the north side of Ridgewood Road. The Lake Wobegon Trail Association and Stearns County Park Department manage the trail. The snowmobile trail follows alongside CSAH 33 and passes near the Le Sauk and Five Points substations.

Impacts and Mitigation

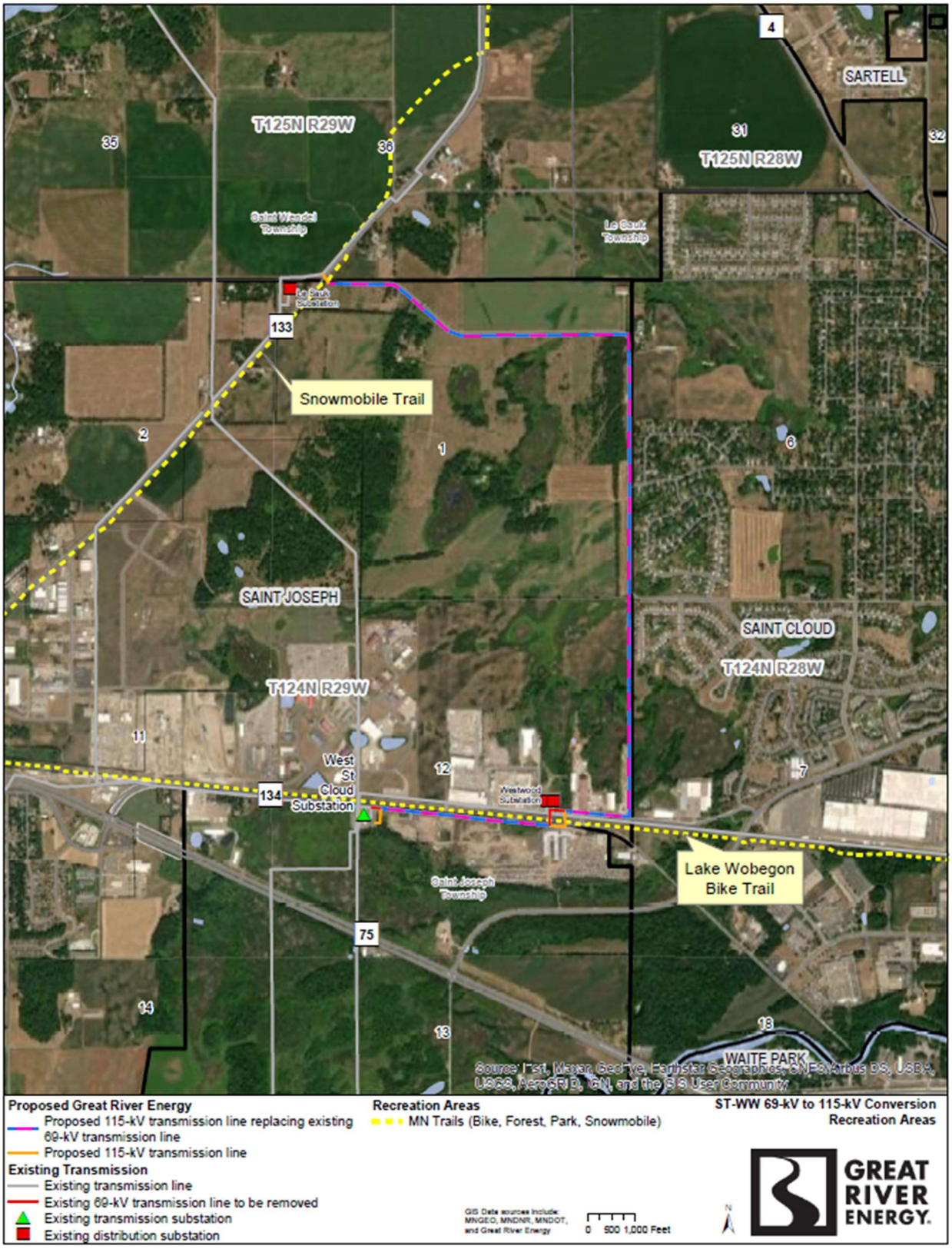
The proposed transmission line will cross over the Lake Wobegon Trail when the line crosses from the south side of Ridgewood Road to the north side of 304th Street, and it will also cross over the snowmobile trail were the transmission line crosses over CSAH 33 to connect with the switch structure (**Figure 7-1**). The existing 69-kV line already crosses the bike trail and there are other existing transmission and substations in this area, which will help to mitigate the transmission line's visual impacts. Great River Energy does not anticipate that the Lake Wobegon Trail or the snowmobile trail will need to be closed due to Project construction.

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

[37] https://lakewobegontrail.com/

[38] https://www.dnr.state.mn.us/snowmobiling/interactive_map/index.html

Figure 7-1. Recreation Areas



7.2.8 Public Services and Transportation

The Project is located in a mixed area of light to heavy industry, grazing and cultivated lands, residential, and some pockets of wooded areas with typical public services (police, fire protection, waste collection, natural gas, wells, septic systems, cable television, electricity, telephone, etc.).

Several existing overhead transmission lines are located in the area. There is an existing natural gas pipeline which will be crossed by the Project. 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 follows an existing transmission line for nearly the entire route. The majority of the proposed transmission line and poles will be located inside existing electric utility easements.

Traffic volumes on Ridgewood Road (MnDOT Monitoring Point SEQ 67040) were 3,200 vehicles per day in 2017. Volumes on Mullen Road (MnDOT Monitoring Point SEQ 70052) were 2,050 cars per day in 2017.[39]

The proposed Project is more than 8 miles west of the St. Cloud Regional Airport. The MnDOT Office of Aeronautics web page (https://www.dot.state.mn.us/aero/talltowers.html) indicates proposed structures would be located greater than its three-nautical-mile threshold for marking requirements. Furthermore, the Project does not include any structures that would be more than 200 feet above ground level. Thus, the proposed Project would not have an impact to area airports.

Impacts and Mitigation

Great River Energy will coordinate Project construction schedules, including any outages, with the local distribution cooperative, to avoid and/or minimize disruptions to service in the area. 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 stay along the existing transmission line centerline barring any requested changes to the centerline. No structure locations will be placed on or near existing utilities, including the natural gas pipeline. Because the majority of the route follows existing electric utility ROW, no impacts to public services are anticipated and, therefore, no mitigation is proposed. Similarly, because the Project is primarily proposed to be routed in existing ROW, Great River Energy does not anticipate impacts to site improvements such as wells or septic systems.

The Project will require a license to cross an existing railroad; Project construction and operation are not anticipated to impact the railroad, and no mitigation is proposed.

Temporary access for construction of the transmission line would be along the transmission line ROW. Temporary and infrequent traffic impacts associated with equipment/material delivery and worker transportation will occur. If traffic impacts are unavoidable for the stringing of the

[39] https://mndot.maps.arcgis.com/apps/webappviewer/index.html?id=7b3be07daed84e7fa170a91059ce63bb

conductors across Ridgewood Road and 304th Street, Great River Energy or its contractors will work with the appropriate road authority(ies).

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 coordination with the appropriate road authorities and in a manner that would avoid traffic congestion and reduce likelihood of dangerous situations along local roadways.

Given that the Project will primarily follow existing transmission line ROW, there will be minimal impacts to other utilities. To ensure that any short-term and infrequent traffic impacts are minimized, Great River Energy will coordinate with local road authorities and, to the extent practicable, schedule large material/equipment deliveries to avoid periods when traffic volumes are high.

7.3 Land Use/Zoning

The Project area consists of a variety of land use patterns in both rural and suburban environments. Land cover along the proposed route is a mix of light to heavy industry, agriculture and woodlands lands, and residential (**Figure 7-2**).

Zoning information for the Project area is provided in **Figure 7-3**. The Project is zoned as follows:

- City of St. Joseph – Rural Residential and Light Industrial
- Stearns County/St. Joseph Township – Industrial
- Stearns County/St. Wendell Township – Agricultural District A-

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 land uses, particularly given that the Project will replace an existing 69-kV line. Short-term agricultural impacts might occur during construction, which would be mitigated through restoration and compensatory payments (**Section 7.4.1**). Minimal impacts to residential or commercial/industrial land uses are anticipated; therefore no additional mitigation is proposed.

7.4 Land-based Economies

7.4.1 Agriculture

According to the 2017 United States Department of Agriculture (USDA) Census of Agriculture, Stearns County has 2,951 individual farms with an average farm size of 390 acres, and covers approximately 650,821 acres (73 percent) of the county. Over $180 million was generated from both crop and livestock sales in 2017.

Agricultural lands within the proposed route consist primarily of pasture, hay, and cultivated lands (**Figure 7-2**). The transmission line ROW is not inconsistent for use as pasture, hay, or other crop cultivation. The transmission line would cross about 5600 feet of agricultural land, which conservatively is 6.4 acres (assuming a 70-foot ROW). The Project will remain primarily within the existing 69-kV transmission line ROW, which also overlaps existing road ROW. Accordingly, there will be negligible incremental impacts to pasture, hay, and cultivated lands.

Figure 7-2. Land Cover

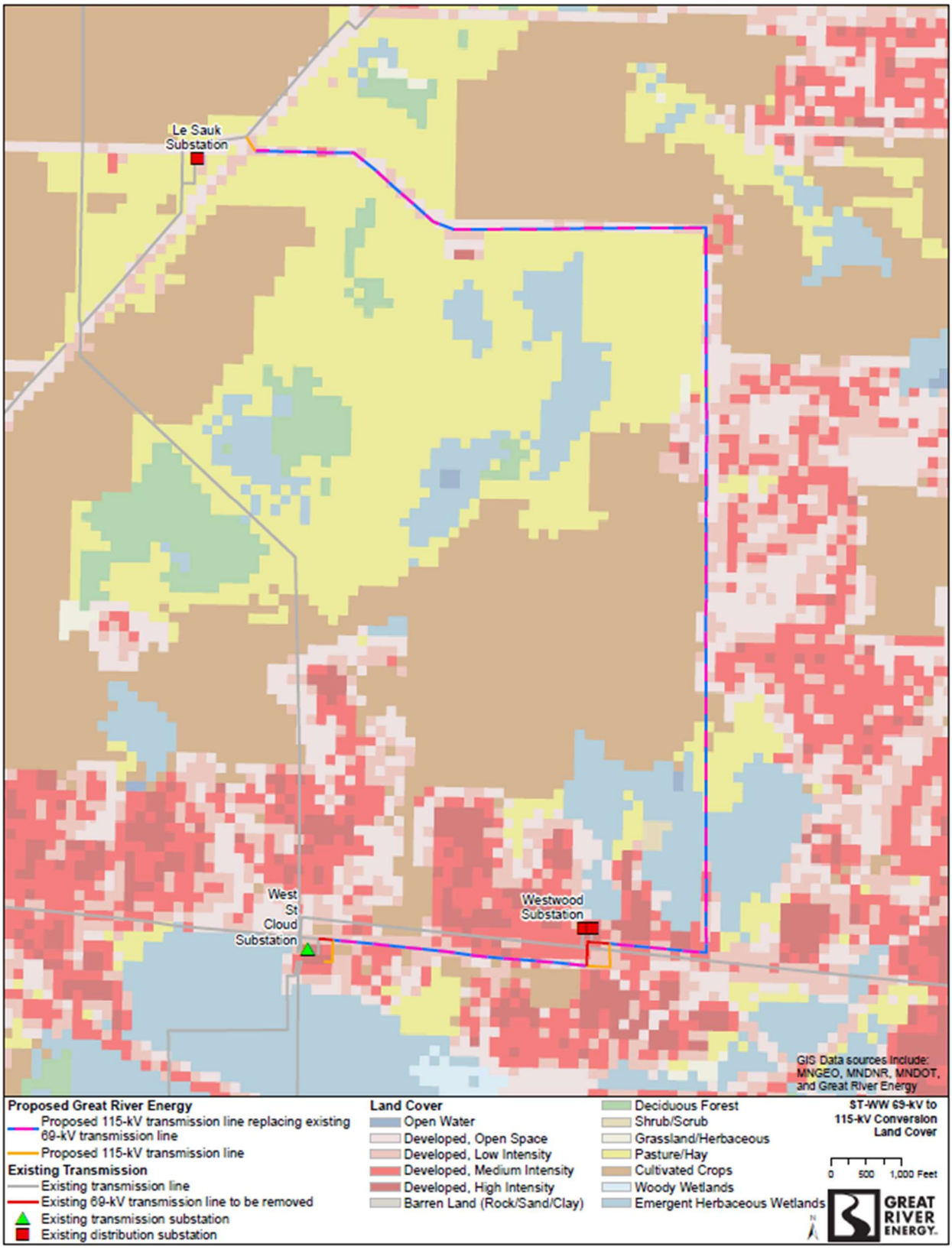
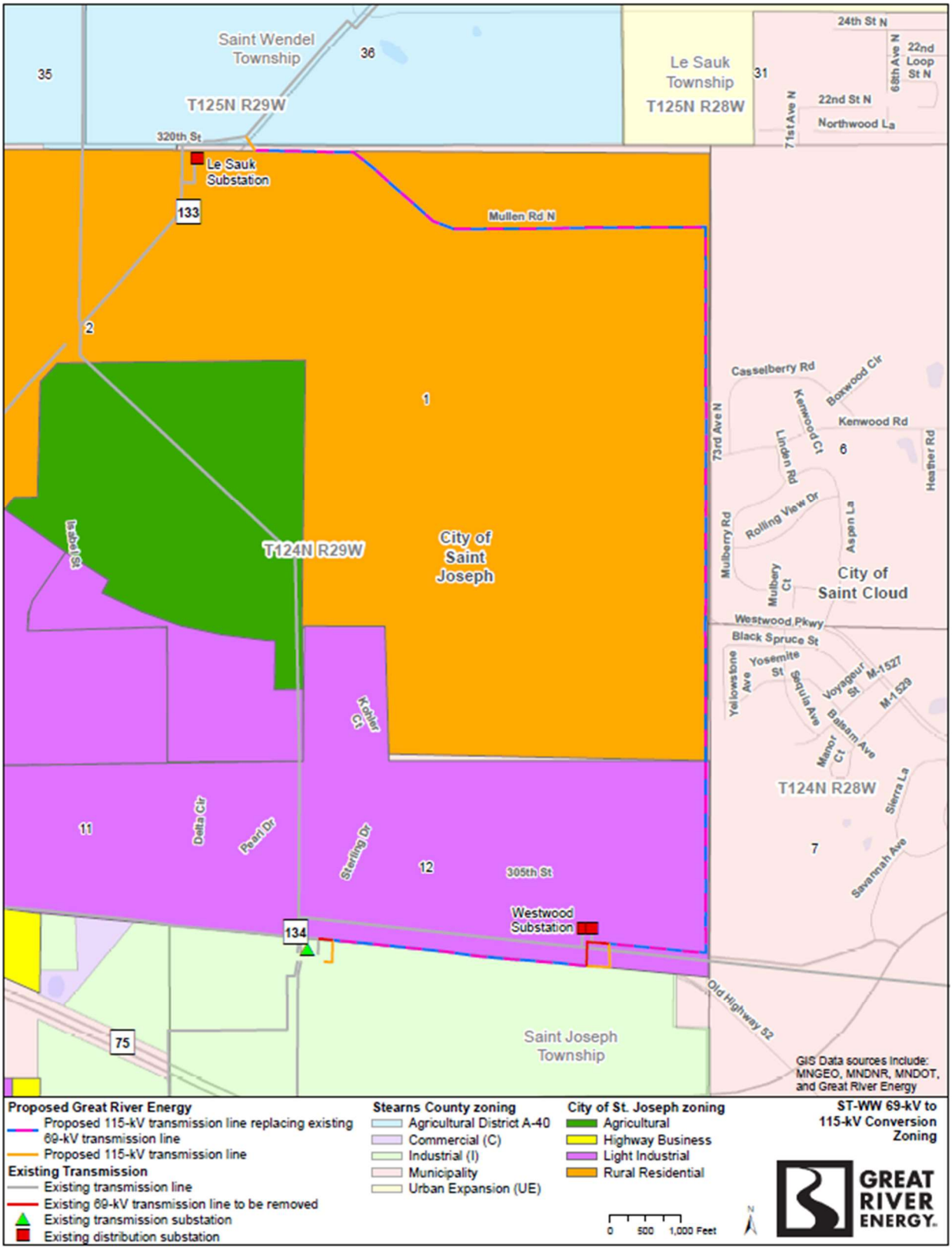


Figure 7-3. Zoning



Impacts and Mitigation

Some agricultural land may be temporarily removed from production during transmission line construction. Permanent and incrementally negligible agricultural land conversion will occur due to marginally larger structure diameters for the 115-kV circuit. The diameter of the 69-kV structure at ground level are approximately 16 inches, whereas the 115-kV structures will typically be 20 inches.

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 includes some cultivated lands. Construction of the proposed 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 soil compaction, particularly during springtime and otherwise wet conditions.

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/loss 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:

- Local roads will be used as practicable for moving equipment and installing structures.

- Where local roads cannot be used, 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.

- 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, discing, 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 work with local landowners to 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

According to the 2017 USDA Census of Agriculture, Stearns County has six percent (approximately 53,376 acres) of commercial forested land.

Forested areas in the Project area are shown on **Figure 7-2** as well as the aerial maps in **Appendix B**. Based on available aerial photographs, there is approximately 2,000 feet of the existing ROW where trees or shrubs are growing within 35 feet of the transmission line. Great River Energy's ROW manager has historically inspected this area and determined the vegetation management to be appropriate for the existing 69-kV transmission line. If, as Great River Energy proposes in this Application, the Project follows the centerline of the existing 69-kV line, even in the unlikely situation where Great River Energy determines that all of these trees in this 2,000-foot area are hazardous to the reliable operation of the transmission line, only approximately 0.16 acres of trees would need to be cleared.

Impacts and Mitigation

Because the Project will primarily follow the existing ROW for the 69-kV transmission line, there will be minimal incremental impacts from the construction and maintenance of the Project. The ROW will need to be maintained for the safe and reliable operation of the transmission line. If additional trees need to be removed, 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 Lake Wobegon Trail, rivers, and lakes. Popular activities include fishing, boating, swimming, biking, hiking, and scuba diving. The

recently constructed portion of Lake Wobegon Trail within the Project area provides opportunities for biking, picnicking, viewing wildlife and ecosystems.

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. Minimal tree clearing may be required, but if it is, it would 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 Westwood Professional Services (Westwood). 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 six previously recorded historic/archaeological sites within the study area (see Westwood letter in **Appendix E**). Westwood concluded that there will be no adverse impact on known or suspected cultural resources as a result of the Project.

SHPO was contacted requesting information on the possible effects of the proposed Project on historic properties in the Project area. In a letter dated December 16, 2020, SHPO "concluded that there are no properties listed in the National or State Registers of Historic Places in the area that will be affected by this Project" (**Appendix E**).

Great River Energy requested feedback on the Project from the 11 federally-recognized Tribes with geography within Minnesota and the Minnesota Indian Affairs Council on July 20, 2022. To date, no Tribe has conveyed concerns regarding the Project. These correspondences are included in **Appendix E**.

Impacts and Mitigation

Because no impacts to archaeological and historic 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 SHPO 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 Minn. Stat. § 307.08.

7.6 Natural Environment

7.6.1 Air Quality

7.6.1.1 Criteria Pollutants

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.

7.6.1.2 Greenhouse Gas Emissions and Climate

Construction of the transmission line will result in greenhouse gas emissions from fuel combustion in construction equipment. As a preliminary estimate, fuel use on an average construction day may average 120 gallons, depending on the size and type of equipment used. The typical fuel used is a mixture of number 1 and 2 diesel fuel. Project construction is anticipated to take approximately nine months; conservatively assuming four weeks per month and five workdays per week, total fuel consumption would be 10,800 gallons of each number 1 and 2 diesel fuel. As indicated, this is a conservative estimate in that it likely overestimates fuel use.

Using EPA emissions factors[40], **Table 7-6** shows a preliminary estimate of the emission calculations for the greenhouse gas emissions of carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O).

[40] 40 CFR 98 Table A-1 for global warming potentials, Table C-1 for heating values and CO2 emission factors, and Table C-2 for CH4 and N20 emissions factors
https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98

Table 7-6 Preliminary Estimate: Greenhouse Gas Emissions

Fuel Type	Estimated Total Fuel Use (gal)	Heating Value (mmBtu/gal)	CO2 Emission Factor (kg/mmBtu)	Total CO2 Emissions (kG)	CH4 Emission Factor (kg/mmBtu)	Total CH4 Emissions (kG)	N2O Emission Factor (kg/mmBtu)	Total CH4 Emissions (kG)
Distillate No. 1	10,800	0.139	73.25	109,963	0.003	4.5	0.0006	0.90
Distillate No. 2	10,800	0.138	73.96	110,230	0.003	4.5	0.0006	0.89
TOTAL (kG)	---	---	---	220,193	---	9.0	---	2
Global Warming Potential	---	---	---	1	---	25	---	298
Grandtotal as CO2e (kG)	---	---	---	220,193	---	224	---	535
Grandtotal as CO2e (tons)	**---**	**---**	**---**	**243**	**---**	**0.25**	**---**	**0.59**

Impacts and Mitigation

EPA's Greenhouse Gas Reporting Tool[41] shows emissions within Minnesota totaled 34,929,605 metric tonnes of CO2e (38,502,906 tons) in 2020. Accordingly, the preliminary estimate of Project emissions identified here would be neligible.

Great River Energy will mitigate vehicle emissions by limiting vehicle idiling to only times when necessary.

Great River Energy is actively assessing risks to the reliable operation of its transmission system from the potential impacts of climate change (extreme weather events such as high winds and excessive rainfall) and is working on opportunities to mitigate those risks. Over the last three years, Great River Energy has invested over $67M in transmission resiliency improvement projects.

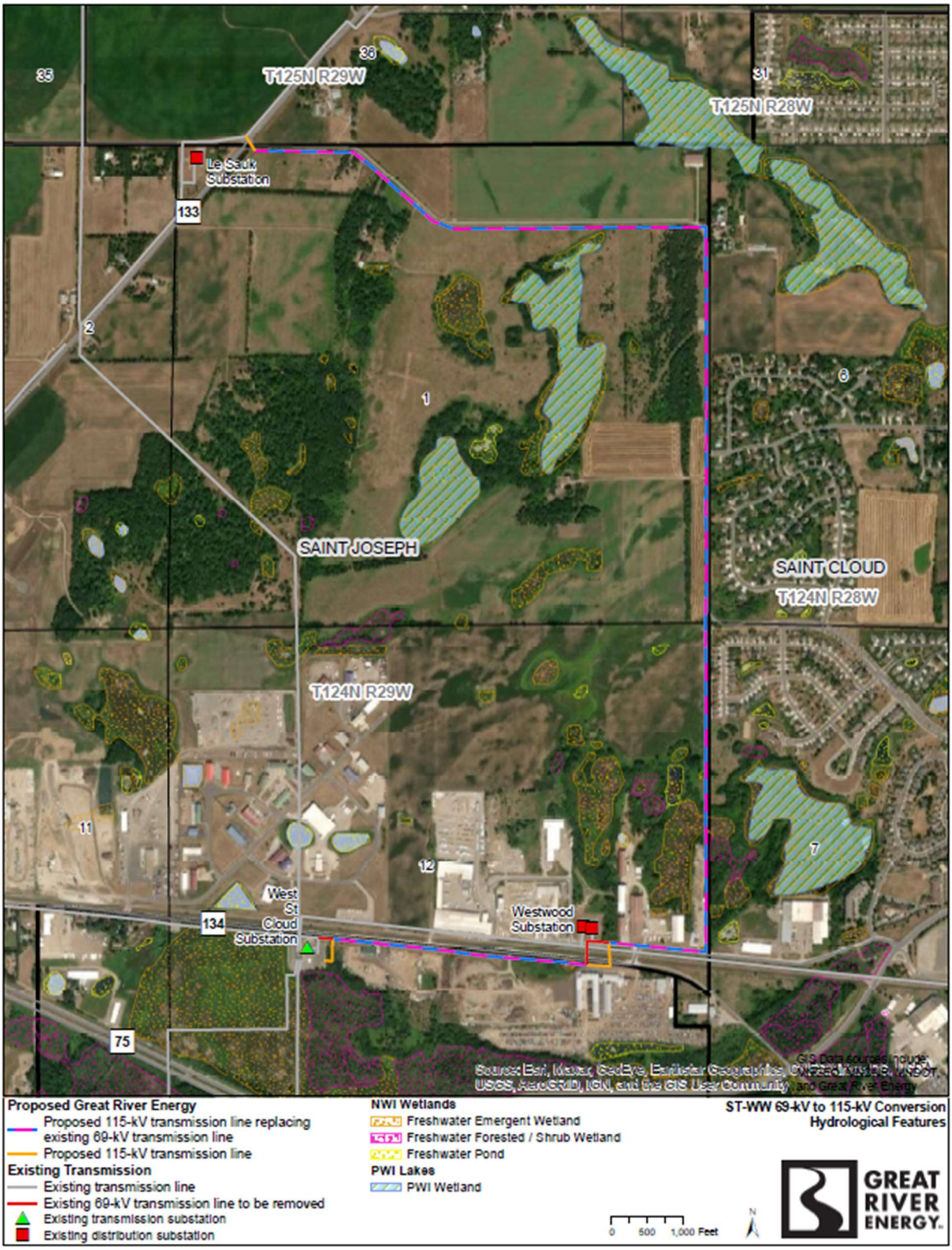
7.6.2 Water Resources

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 Mississippi River - Sartell watershed, in the south portion of the Upper Mississippi River Basin.[42]

[41] https://ejscreen.epa.gov/mapper/
[42] https://www.dnr.state.mn.us/watersheds/map.html

Figure 7-4. Hydrologic Features



Groundwater

The MDNR divides Minnesota into six groundwater provinces. Stearns County is in the Central Province, which is characterized by buried sand aquifers and relatively extensive surficial sand plains, part of sediment deposited by glaciers overlying the bedrock. This province has glacial sediment, sand and gravel aquifers are common, and the deeper fractured crystalline bedrock has poor aquifer properties and limited use as an aquifer.[43]

Lakes

There are no lakes in the proposed route[44] (**Figure 7-4**). The route is closest to Rossier Lake, approximately one mile northwest of the Project.

Rivers and Streams

There are no rivers and streams in the proposed route (**Figure 7-4**). The closest river is the Sauk River, approximately 0.6 miles south of the Project.

Public Waters

Public Waters are wetlands, water basins and watercourses of significant recreational or natural resource value in Minnesota as defined in Minn. Stat. § 103G.005. The MDNR has regulatory jurisdiction over these waters, which are identified on the MDNR Public Waters Inventory maps and MDNR's NHIS data[45].

The proposed transmission line will not cross any MDNR Public Waters (**Figure 7-4)**.

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 various impairments. The list, known as the 303(d) list, is based on violations of water quality standards and are described as "impaired". In Minnesota, the MPCA has jurisdiction over determining 303(d) waters. There are no impaired waters in the vicinity of the Project (**Figure 7-4**). The closest impaired water is County Ditch 16 for aquatic recreation due to E. coli.

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

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[43] https://www.dnr.state.mn.us/groundwater/provinces/index.html

[44] *Ibid.*

[45] NHIS data (2022) and https://www.dnr.state.mn.us/maps/compass/index.html

The USFWS produced maps of wetlands based on aerial photographs and Natural Resources Conservation Service 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.

There are two emergent wetland basins (type PEM1C)[46] within the Project ROW. The proposed transmission line will cross an approximately 160-feet segment of one wetland basin and another approximately 85-feet segment of the other wetland basin.

Impacts and Mitigation

Groundwater

No impacts to groundwater in the Project area are anticipated. Dewatering activities are not expected for this Project, and any effects on water tables would be localized and short term and would not affect hydrologic resources.

Lakes, Rivers, and Streams

Given that the nearest lakes, rivers and streams are more than one-half mile from the Project and the transmission line will not cross any lakes, rivers or streams, no navigable waters will be affected by the Project.

Public Waters

The Project will not cross any MDNR Public Waters; no impacts are anticipated, and no mitigation is proposed.

Impaired Waters

There are no impaired waters within the Project area. Therefore, there are no impacts to impaired waters. Also, the Project is not anticipated to cause a water to be newly listed in the Project area. There is minimal potential to increase turbidity due to sedimentation from construction activities because of the significant distance to any receiving waters, and appropriate erosion and sediment control measures will be implemented to avoid or minimize such impacts. Regardless of whether or not a General Construction Stormwater Permit is required for the Project, Great River Energy will utilize BMPs (e.g, silt fencing) to mitigate the potential for sediments to reach any impaired waters.

Wetlands

Once construction of the Project is completed, there would be no significant impacts to wetlands because 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. Given the

[46] *Ibid.*

short distance for the two wetland crossings, Great River Energy will strive to span these wetlands. 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. 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
- 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.
- 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.

If the final line design cannot enable the Project to span the 160-feet or 85-feet wetland segment, permanent impacts to wetlands would occur where a structure is located in the wetland (approximately 20 square feet of permanent impact per structure). Wetland vegetation would be restored in the disturbed areas following construction.

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. If the Commission issues a permit for the proposed route, mitigation for the incremental conversion of forested wetlands is not likely to be required by the USACE due to the minimal wetlands within the route[47]. Great River Energy will prepare and submit a Joint Application Form for Activities Affecting Water Resources In Minnesota and submit it to the USACE and the Stearns County Soil and Water Conservation District once preliminary design is completed and will work on any additional mitigation strategies they request.

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.

[47] USACE Utility Regional General Permit allows for up to 0.5 acres of permanent wetland impacts without mitigation. https://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RGP/Utility_RGP.pdf?ver=2018-02-22-093531-073

7.6.3 Flora and Fauna

Flora

Presettlement vegetation included maple-basswood forests interspersed with oak savannas, tallgrass prairies, and oak forests. Much of this region is currently farmed.

The Project is in an area called the Eastern Broadleaf Forest Province. The MDNR describes this area as serving, "as a transition, or ecotone, between semi-arid portions of the state that were historically prairie and semi-humid mixed conifer-deciduous forests to the northeast. The western boundary of the province in Minnesota is sharply defined along much of its length as an abrupt transition from forest and woodland to open grassland."

The Project area is further categorized as being in the Minnesota and Northeast Iowa Morainal Section and the Anoka Sand Plains Subsection. The MDNR describes this subsection as follows:

> *The major landform is a broad sandy lake plain, which contains small dunes, kettle lakes, and tunnel valleys. Topography is level to gently rolling. There are small inclusions of ground moraine and end moraine (Wright 1972). The other important landform is a series of sandy terraces associated with historic levels of the Mississippi River. Terraces are also associated with major tributaries of the Mississippi.48*

There are no MDNR Wildlife Management Areas, MDNR Scientific and Natural Areas, or USFWS Waterfowl Production Areas in the Project area.[49]

Fauna

Typical Minnesota wildlife species can be expected in the Project area, including deer, bald eagles, wild turkey, songbirds, waterfowl, rabbits, squirrels, fox, racoon, skunks, and coyotes.

The USFWS's iPaC[50] online service was used to obtain data on the following USFWS responsibilities in the Project area:

- Listed threatened, endangered or candidate species - Two species were identified: the threatened NLEB (*Myotis septentrionalis*) and the candidate Monarch Butterfly (*Anaus plexippus*).
- National Wildlife Refuge Lands – None.
- Migratory birds of conservation concern – Seven birds are listed.

An auto-generated letter on listed species from the iPaC system is included in **Appendix E** as well as a 4(d) key determination for the NLEB. The 4(d) key for the bat states the Project "is not likely

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[48] https://www.dnr.state.mn.us/ecs/222Mc/index.html

[49] https://www.dnr.state.mn.us/maps/compass/index.html

[50] https://ipac.ecosphere.fws.gov/

to result in unauthorized take of the northern long-eared bat." Great River Energy plans to update the iPaC process prior to construction and will comply with the USFWS recommendations and requirements in effect at that time. On March 22, 2022 the USFWS indicated it is planning to propose relisting of the NLEB as endangered. If the NLEB is listed as endangered, Great River Energy will coordinate with the USFWS on any new protective standards and guidance.

Impacts and Mitigation

Minimal impacts to native vegetation are anticipated. The proposed transmission line will follow an 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.

Great River Energy will address avian issues by working with the MDNR 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 NLEB is discussed in more detail in **Section 7.8**.

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 in the Project area include reed canary grass, common buckthorn, purple loosestrife, and leafy spurge, in addition to various invasive aquatic species.

Impacts and Mitigation

To minimize the potential for the introduction or spread of invasive species, Great River Energy proposes to implement the following 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.

7.6.5 Rare and Unique Natural Resources

A desktop review of the Minnesota MDNR's NHIS records was completed on April 28, 2022. The review report is included in **Appendix E.** The review included a finding for a calcareous fen and the presense of the black sandshell in the vicinity of the Project. The report does not indicate any known NLEB, hibernacula, or acoustic data in the vicinity. There are no known rare features within the proposed route. Great River Energy has communicated with MDNR concerning the Project and, consistent with practices in prior projects, will submit a final project review request after a route permit is issued.

The calcareous fen is located over 4.5 miles from the proposed Project. Because the Project is not located near any lakes, streams or rivers, the Project is not in the vicinity of the black sandshell. The MDNR recommends Great River Energy to coordinate with the USFWS regarding the NLEB.

Once preliminary engineering is completed a final NHIS request will be submitted and Great River Energy will work with the DNR to implement any recommendations they may have.

Impacts and Mitigation

Constructing within and/or adjacent to an existing utility ROW minimizes impacts to habitat in this area. Great River Energy will continue to coordinate with the MDNR and USFWS to avoid and minimize Project impacts on sensitive species.

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:

- Minimal tree clearing is expected because the existing ROW for the 69-kV line has been well maintained.

- 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 also coordinate with MDNR regarding the placement of bird diverters and any other concerns.

7.7 Physiographic Features

7.7.1 Topography

The Project area is generally flat with gradual elevation changes across the entirety of the Project.

Impacts and Mitigation

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

7.7.2 Geology

Depth of glacial drift over bedrock in the Bigwoods Subsection varies from 100 to over 400 feet. Underlying bedrock includes Ordovician and Cambrian sandstone, shale, and dolomite to the south and Cretaceous shale, sandstone, and clay to the north.

Impacts and Mitigation

Few geological constraints on design, construction, or operation are anticipated in the Project area. Great River Energy will strive to span the couple small wetlands. Accordingly dewatering (e.g., during pole augering and 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.

7.7.3 Soils

USDA data[51] 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 7-7** and shown in **Figure 7-5**.

[51] https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

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

Soil Association	General Description
Isan-Hubbard-Duelm	**Isan-Hubbard-Duelm** are excessively to well drained soils (loamy sands) with 0-2 percent slopes, found in level to undulating outwash planes, stream terraces, flood plains, and valley trains.
Hawick-Estherville-Dickman	**Hawick-Estherville-Dickman** are very deep, nearly level (1 to 4 percent slopes), excessively drained soils (sandy loams) formed in sandy outwash plains found in cultivated fields.

Impacts and Mitigation

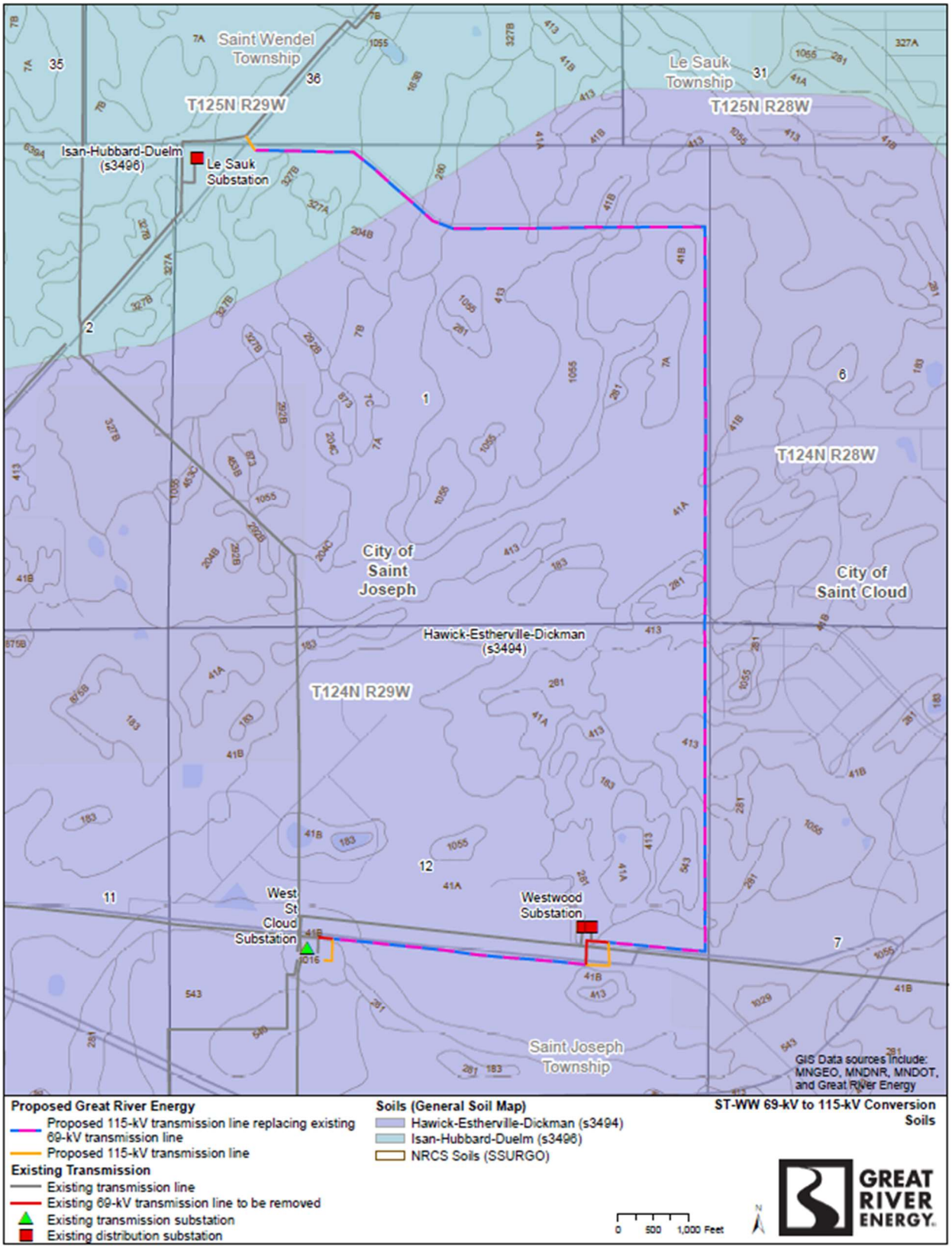
Potential impacts of construction are compaction of the soil and exposing the soils to wind and water erosion. Impacts to physiographic features should be minimal during and after installation of the transmission line structures, and these impacts will be short term. Top soils from grading at the West St. Cloud Substation will be stock-piled for subsequent surface spreading. There should be no long-term impacts resulting from this Project.

Erosion control methods and BMPs will be utilized to minimize runoff during line construction. Soils will be revegetated as soon as possible to minimize erosion.

Project construction is not anticipated to result in the disturbance of more than one acre of soils. If more than one 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.

Long-term impacts to soils are not anticipated, and no impact from Project operations are expected.

Figure 7-5. Soils



7.8 Unavoidable Impacts

Minnesota Rule 7850.1900, subpart 3(G) requires that an application discuss "human and environmental effects that cannot be avoided if the facility is approved at a specific site or route." The Project will be designed, constructed, and operated using processes and procedures, as described in this Application, that will avoid, minimize, and mitigate potential impacts. There will nevertheless be a nominal amount of impacts that cannot be avoided. The nominal impacts from construction activities include soil compaction and erosion, short-term traffic delays, vegetative clearing, wetland conversion, visual impacts, habitat loss, disturbance and displacement of wildlife, and loss of land use for other purposes. The nominal impacts from operations include the continued maintenance of tall growing vegetation, conversion of agricultural land, visual impacts, interference with AM radio signals, and individual wildlife impacts from habitat reduction and avian collisions.

The Project will require only minimal commitments of resources that are irreversible and irretrievable. 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. For the Project, 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 Minn. Stat. § 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 Project addresses these criteria:

- The Project is consistent with state goals to conserve resources because it is proposed to be routed in an existing corridor, thus avoiding and minimizing potential additional impacts.
- The Project will minimize environmental impacts because it is proposed to be routed in an existing corridor, which avoids and minimizes potential impacts on vegetation and wildlife.
- The Project will minimize impacts on human settlement and other land use conflicts because it is proposed to generally use an existing alignment, thus avoiding impacts to new landowners and parcels.
- The Project is consistent with state goals to ensure electric energy security because it will help ensure continued reliable and secure electrical service to consumers in the region.

8.2 Conclusion

Great River Energy respectfully requests that the Commission issue a Route Permit for the proposed Project in Stearns County, Minnesota.

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