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June 2, 2016

VIA ELECTRONIC FILING

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

Re: Minnkota Power Cooperative, Inc.'s Application for a Route Permit – Alternative Permitting Process
MPL - Laporte 115 KV HVTL Project
PUC Docket No. ET6/TL-16-327

Dear Mr. Wolf:

Please find enclosed, the Minnkota Power Cooperative, Inc. ("Applicant") Route Permit Application ("Application") for a 9.4 mile long 115 kV high voltage transmission line located in Itasca Township, Clearwater County, and Lake Hattie and Lake Alice Townships in Hubbard County, and a new 115/4.16 kV substation in Lake Alice township. The Application details the Applicants' proposed location of the MPL - Laporte 115 KV HVTL project.

The Route Permit Application is submitted under the Alternative Permitting process of Minn. Rules 7850.2800 to 7850.3900 and Minn. Stat. § 216E.04. An electronic copy on CD ROM and 22 paper copies of the Application have been provided to William Storm of the Department of Commerce, Energy Environmental Review and Analysis.

Minnkota has deposited with the Department of Commerce, $10,000.00 for processing the route permit application (as required by Minn. Rules 7850.1800 and Minn. Stat. § 216E.18).

Should you any questions with respect to the filing, please contact me at 701-795-4221. Thank you for your attention to this project.

Yours truly,

John T. Graves

John T. Graves, P.E.
Environmental Manager

C: Service List
William Storm, DOC
Jay Bushy
Randy E. Duncan - Barr Engr.

Application to the Minnesota Public Utilities Commission for a Route Permit

Minnkota Power Cooperative, Inc.
MPL - Laporte 115 kV HVTL Project

Alternative Permitting Process
Docket No. 16-327

June 2016

Application for a Route Permit
MPL – Laporte 115 kV HVTL Project

June 2016

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1.0 Proposal Summary

Minnkota Power Cooperative, Inc. (Minnkota or the Applicant) submits this application (Application) for a Route Permit to the Minnesota Public Utilities Commission (MPUC or Commission) pursuant to Minnesota Statutes (Minn. Stat.) §216E and Minnesota Rules (Minn. R.), chapter 7850. A Route Permit is requested to build an approximately 9.4-mile 115 kilovolt (kV) high voltage transmission line (HVTL) and a new 115/4.16 kV distribution substation (Substation). This project, referred to as the MPL-Laporte 115 kV HVTL Project, will serve an industrial load for a new pumping station to be constructed and operated by Minnesota Pipeline Company, LLC.

The proposed 9.4-mile 115 kV HVTL route and Substation site (Proposed Project) are located in Itasca Township in Clearwater County and Lake Hattie and Lake Alice Townships in Hubbard County. The route originates in Section 12 of Township 144N, Range 36W in Itasca Township. The proposed HVTL extends west from the existing line and then south, adjacent to existing roadway right-of-way (ROW) along 281st Avenue for approximately 3.7 miles. The HVTL then turns east and southeast and cuts cross-country until it reaches State Highway 200. The HVTL continues southeast adjacent to State Highway 200 and crosses the county line. Just after entering Hubbard County, the line turns east and is located adjacent to 400th Street for approximately 1.7 miles. The HVTL turns south at 115th Avenue and continues south adjacent to existing roadway ROW for approximately 2.0 miles before turning west for approximately 2,350 feet adjacent to County Road 95. The HVTL then turns south, crossing County Road 95 and entering the new Substation site in Section 17 of Township 143N, Range 35W. An overview of the proposed route is provided in **Figure 1**.

The proposed 115 kV HVTL will require an 80- to 100-foot-wide ROW (40 to 50 feet on either side of the centerline) referred to within this Application as the "Anticipated Alignment". The Applicant is requesting a variable route width ranging primarily from 150 to 450 feet and 400 feet to 810 feet at the interconnection and Substation sites, respectively. The variable route width is referred to within this Application as the "Proposed Route." The requested variable Proposed Route width will provide flexibility as the Applicant works with landowners and addresses engineering constraints in developing a final alignment for the proposed 115 kV HVTL.

1.1 Completeness Checklist

The content requirements for an application with the Commission under the Alternative Permitting Process are identified under Minn. Stat. § 216E.04, subdivision (subd.) 3 and Minnesota Rules, part 7850.3100. The rule requirements are listed in **Table 1** with references indicating where the information can be found in this Application.

Table 1 Completeness Checklist

Project Permit Application Requirements (Minn. R., part 7850.2800, Subp. 1, items C and D)	Application Section
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: C. high voltage transmission lines of between 100 and 200 kilovolts; D. high voltage transmission lines in excess of 200 kilovolts and less than five miles in length in Minnesota;	2.5

Project Permit Application Requirements (Minn. R , part 7850.2800, Subp. 2)	Application Section
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.	2.6 and **Appendix A**

Project Permit Application Requirements (Minn. R , part 7850.3100)	Application Section
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.	4.3

Project Permit Application Requirements (Minn. R., part 7850.1900, Subp. 2)	Application Section
A. a statement of proposed ownership of the facility as of the day of filing and after commercial operation;	2.1
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;	2.3
C. at least two proposed routes for the proposed high voltage transmission line and identification of the applicant's preferred route and the reasons for the preference;	Not applicable, per Minn. R., part 7850.3100; however, see 4.3
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;	3.2, 4.1, 4.4, 5.1.1
E. the environmental information required under subpart 3;	Section 6.0 see Minn. R., part 7850.1900, subpart 3 (A) - (H)
F. identification of land uses and environmental conditions along the proposed routes;	6.0
G. the names of each owner whose property is within any of the proposed routes for the high voltage transmission line;	**Appendix E**
H. United States Geological Survey topographical maps or other maps acceptable to the commission showing the entire length of the high voltage transmission line on all proposed routes;	**Figure 1**; **Figure 2**
I. identification of existing utility and public rights-of-way along or parallel to the proposed routes that have the potential to share the right-of-way with the proposed line;	4.2.2, 5.1.3
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;	5.0
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;	3.5, 5.1.6
L. a description of possible design options to accommodate expansion of the high voltage transmission line in the future;	4.5
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;	5.1.3, 5.1.5
N. a listing and brief description of federal, state, and local permits that may be required for the proposed high voltage transmission line; and	7.2
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;	2.4 Not applicable, per Minn. Stat. §216B.2421, subd. 2(3) and 216B.243

Environmental Information Requirements (Minn. R., part 7850.1900, Subp. 3)	Application Section
A. a description of the environmental setting for each site or route;	6.1
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;	6.2
C. a description of the effects of the facility on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining;	6.3
D. a description of the effects of the facility on archaeological and historic resources;	6.4
E. a description of the effects of the facility on the natural environment, including effects on air and water quality resources and flora and fauna;	6.5
F. a description of the effects of the facility on rare and unique natural resources;	6.6
G. identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route; and	6.0
H. a description of measures that might be implemented to mitigate the potential human and environmental impacts identified in items A to G and the estimated costs of such mitigative measures.	6.0

2.0 Introduction

Minnkota submits this Application for a Route Permit to the MPUC pursuant to Minn. Stat. §216E and Minn. R., chapter 7850. A Route Permit is requested to build a 9.4-mile 115 kilovolt (kV) high voltage transmission line (HVTL) and a new 115/4.16 kV distribution substation in Itasca Township in Clearwater County and Lake Hattie and Lake Alice Townships in Hubbard County. The proposed 9.4-mile 115 kV HVTL and Substation (the Proposed Project) is to be placed in service by fourth quarter of 2017. The Project is described in more detail throughout this Application.

2.1 Statement of Ownership

The proposed 115 kV HVTL and associated facilities will be constructed, owned and operated by Minnkota. Minnkota is a regional generation and transmission cooperative serving 11 member-owner distribution cooperatives. Minnkota's service area of 34,500 square miles is located in eastern North Dakota and northwestern Minnesota. The Proposed Project will be located in Clearwater-Polk Electric Cooperative, Inc.'s service area and will connect to the existing Otter Tail Power Shevlin Junction to Itasca 115 kV transmission line. Clearwater-Polk Electric is a distribution cooperative and member-owner of Minnkota.

2.2 Requested Action

This Application is submitted under the Alternative Permitting Process under Minn. Stat. § 216E.04, subd. 2(3) and Minn. R., parts 7850.2800 to 7850.3900 (*see* Minn. R., part 7850.2800, subpart 1(C)). While the rules do not require consideration of alternate routes in the Application (Minn. R., part 7850.3100), the Applicant's evaluation of alternatives during the development of the Anticipated Alignment is contained in this Application (Section 4.3 and **Figure 2**).

For reasons identified in subsequent sections of this Application, the Applicant prefers the Anticipated Alignment for constructing the 115 kV HVTL and the proposed Substation site for construction of the new 115/4.16 kV substation (**Appendix B**). The Applicant respectfully requests that the Commission approve the Proposed Route and proposed Substation Location, and authorize a route width ranging from 150 to 450 feet to allow adequate flexibility as the Applicant works with landowners and addresses engineering constraints in developing a final alignment for the proposed 115 kV HVTL. The Proposed Route widths of 400 feet to 810 feet will be needed at the Substation and interconnect sites to allow space for the interconnect and new Substation.

This Application demonstrates that construction of the Project along the Proposed Route and proposed Substation Location will comply with the applicable standards and criteria set out in Minn. Stat. § 216E.03, subd. 7 and Minn. R., part 7850.4100. The Project will support the State's goals to conserve resources, minimize environmental and human settlement impacts and land use conflicts, and ensure the State's electric energy security through the construction of efficient, cost-effective infrastructure.

2.3 Permittee

The permittee for the Proposed Project is:

Permittee:	Minnkota Power Cooperative, Inc.
Contact:	John T. Graves Environmental Manager
Address:	PO Box 13200 1822 Mill Road Grand Forks, ND 58208-3200
Phone:	(701) 795-4221
E-mail:	jgraves@minnkota.com

2.4 Certificate of Need

Minn. Stat. § 216B.243, subd. 2 states that "no large energy facility" shall be sited or constructed in Minnesota without the issuance of a Certificate of Need by the Commission. The Project does not meet the definition of a "large energy facility" under Minn. Stat. § 216B.2421. While the Project is a HVTL with a capacity of 100 kV or more, it is not more than 10 miles long in Minnesota and it does not cross a state line (Minn. Stat. § 216B.2421 subd. 2(3)). Therefore, a Certificate of Need is not required for the Proposed Project.

2.5 Route Permit, Alternative Permitting Process

The Minnesota Power Plant Siting Act (PPSA) states that no person may construct an HVTL without a Route Permit from the Commission (Minn. Stat. § 216E.03, subd. 2). Under the PPSA, an HVTL is considered to be a transmission line that is 100 kV or more and is greater than 1,500 feet in length (Minn. Stat. § 216E.01, subd. 4). The Project is capable of operating at more than 100 kV and is greater than 1,500 feet in length and, therefore, a Route Permit is required from the Commission prior to construction. The Project qualifies for review under the Alternative Permitting Process authorized by Minn. Stat. § 216E.04, subd. 2(3) and Minn. R., part 7850.2800, subpart 1(C). Accordingly, the Applicant is following the provisions of the Alternative Permitting Process outlined in Minn. R., parts 7850.2800 to 7850.3900 for this Project.

2.6 Notice to Commission

The Applicant notified the Commission on April 15, 2016, by letter sent via the U.S. Postal Service and e-filed that the Applicant intends to use the Alternative Permitting Process for the Project (**Appendix A**). This letter complies with the requirement of Minn. R., part 7850.2800, subpart 2, to notify the Commission of this election at least 10 days prior to submitting an application for a Route Permit. A copy of the letter is attached in **Appendix A**.

3.0 Proposed Project Information

3.1 Proposed Project Location

The Proposed Project is located in Clearwater and Hubbard Counties, Minnesota, west of the city of Laporte, MN. **Figure 1** shows an overview of the Proposed Project. The Anticipated Alignmentis shown in **Appendix B.** Maps providing an overview of natural resources in the Project area are included as **Figure 3** and **Figure 4**. **Table 2** identifies the detailed location information for the Proposed Project.

Table 2 Detailed Project Location

Township	Range	Section	County
143N	35W	4	Hubbard
143N	35W	5	Hubbard
143N	35W	8	Hubbard
143N	35W	9	Hubbard
143N	35W	17	Hubbard
144N	35W	31	Hubbard
144N	35W	32	Hubbard
144N	36W	12	Clearwater
144N	36W	13	Clearwater
144N	36W	24	Clearwater
144N	36W	25	Clearwater
144N	36W	26	Clearwater
144N	36E	36	Clearwater

3.2 Project Proposal

As shown in **Figure 1**, the proposed 115 kV HVTL will start in Itasca Township by tapping an existing 115 kV line via construction of a 3-way switch and will end in Lake Alice Township at the proposed 11k/4.16 kV Substation. The proposed HVTL will be constructed within an 80- to 100-foot wide ROW and the proposed Substation site will be approximately 150-foot by 150-foot. The anticipated location of the ROW is illustrated in **Appendix B** as the Anticipated Alignment.

3.3 Need for Project

Minnesota Pipeline Company, LLC is planning to construct a new pump station west of Laporte, Minnesota as part of its reliability project. Minnesota Pipeline Company, LLC has requested electric service for the pump station from Clearwater-Polk Electric, a distribution cooperative and member-owner of

Minnkota. This new facility is relatively large and is located in a rural area. It will require a distribution voltage which is different than the typical distribution voltage for Clearwater-Polk Electric volts. To serve this load, Minnkota will design, procure, and construct 9.4 miles of 115 kV HVTL, a 115 kV line switch to tap an existing line, and an industrial substation suitable to serve the load to be located directly adjacent to the pump station.

Minnkota commonly utilizes dedicated transmission and substation facilities for large, industrial loads that are constructed in rural areas. The Proposed Project will provide adequate and reliable service in the most cost effective manner.

3.4 Project Schedule

Construction of the Proposed Project is expected to begin in the first quarter of 2017, and the Applicant anticipates a fourth quarter 2017 in-service date for the proposed facilities. **Table 3** provides an estimated permitting and construction schedule summary for the Proposed Project. This schedule is based on information available at the date of this filing and planning assumptions that balance the timing of implementation with the availability of crews, materials, and other practical considerations. This schedule may be revised as further information is developed.

Table 3 Estimated Project Schedule

Project Task	Date
File Route Permit Application (Application) with the Commission	2nd Quarter 2016
Route Permit Review Process Complete	1st Quarter 2017
Begin HVTL and Substation Construction	1st Quarter 2017
In-Service Date	4th Quarter 2017

3.5 Project Costs

The Applicant estimates that the Proposed Project will cost approximately $7.2 million. A breakdown of the estimated Proposed Project cost is shown in **Table 4**.

Table 4 Estimated Project Cost

Project Item	Cost
115 kv HVTL facilities	$5,100,000
New Substation	$2,100,000
Total Project Cost	$7,200,000

Maintenance costs after construction will be nominal for several years because the proposed HVTL will be new and there will be minimal initial vegetation management required. Typical annual operating and maintenance costs for 115 kV HVTLs across Minnkota's system area are on the order of $2,000 per mile per year. The principal operating and maintenance costs include inspections of the transmission ROW, which are conducted using fixed-wing aircraft and helicopter on a regular basis.

Minnkota performs monthly inspections of substations and associated equipment. Maintenance and repair are performed on an as-needed basis, and therefore the cost varies from substation to substation.

4.0 Facility Description and Route Selection Rationale

4.1 Transmission Line Description

The Project involves constructing 9.4 miles of new 115 kV HVTL. As shown in **Figure 1**, the Proposed Project will start in Itasca Township by tapping an existing 115 kV line via a 3-way line switch and the Project will end in Lake Alice Township at the proposed 115/4.16 kV Substation site.

From its starting point at the existing line in Section 12 of Township 144N, Range 36W, the proposed HVTL extends west and then south adjacent to existing roadway ROW along 281st Avenue for approximately 3.7 miles. The HVTL then turns east and southeast and cuts cross-country until it reaches State Highway 200. The HVTL continues southeast adjacent to State Highway 200 and crosses the county line. Just after entering Hubbard County, the line turns east and is located adjacent to 400th Street for approximately 1.7 miles. The HVTL turns south at 115th Avenue and continues south adjacent to the existing roadway ROW for approximately 2.0 miles before turning west for approximately 2,350 feet adjacent to County Road 95. The HVTL then turns south, crossing County Road 95 and entering the new Substation site in Section 17 of Township 143N, Range 35W.

The HVTL will primarily use wood, steel, or ductile iron monopole or H-Frame structures as illustrated in the figures provided in **Appendix C**. The conduction will be ACSR and/or ACSS as determined in final design. Two- or three-pole structures will be used for wetland crossings greater than 350 feet.

4.2 Route Width and Alignment Selection Process

4.2.1 Route Width

The PPSA directs the Commission to locate transmission lines in a manner that "minimize[s] adverse human and environmental impact while ensuring continuing electric power system reliability and integrity and ensuring their electric needs are met and fulfilled in an orderly and timely fashion" (Minn. Stat., § 216E.02, subd. 1). The PPSA also authorizes the Commission to meet its routing responsibility by designating a "route" for a new transmission line when it issues a Route Permit. The route may have "a variable width of up to 1.25 miles" within which the ROW for the facilities can be located (Minn. Stat. § 216E.01, subd. 8).

The proposed new 115 kV HVTL will require an 80- to 100-foot-wide ROW (40 to 50 feet on either side of the HVTL's centerline). The Applicant is requesting a Proposed Route variable width ranging from 150 to 450 feet along the transmission line and 400 feet to 810 feet at the interconnection and Substation sites, respectively. This variable width with provide flexibility as the Applicant works with landowners and addresses engineering constraints in developing a final alignment for the proposed 115 kV HVTL. **Appendix B** shows the Applicant's Proposed Route and the Anticipated Alignment (which is based on the anticipated centerline, also shown in **Appendix B**).

4.2.2 Route Selection Process

The Applicant developed the Anticipated Alignment with consideration of the statutory and rule criteria set forth in the PPSA and Minn. R., part 7850.4100 as well as to the State of Minnesota's practice of non-proliferation of new infrastructure corridors. The Applicant also worked to coordinate with state agencies and landowners to identify viable routes. In addition, the Applicant assessed existing utility and public ROWs to identify opportunities for ROW sharing and constraints for alignment and pole placement. **Appendix B** shows existing electric infrastructure in the Project area.

Early in the planning process, the Applicant assessed the general area surrounding the Proposed Project to identify significant routing issues that might arise and to evaluate environmental resources in the vicinity of the Proposed Project. A team of siting, ROW, planning, environmental, and engineering personnel worked together to develop an Anticipated Alignment that minimizes overall impacts of the Proposed Project while still fulfilling the Project purpose of providing service to the industrial customer's load in the Laporte area. In addition, Minnkota consulted with the Minnesota Department of Natural Resources (MDNR) to identify routes that minimize impacts on sensitive natural areas in the vicinity of the Project.

4.3 Alternate Route Segments Considered and Rejected

Under MN Rule 7850.3100, applicants applying under the Alternative Process are not required to propose any alternative routes. However, during the planning process, Minnkota consulted with regulatory agencies regarding the Proposed Project and, as a result, was requested to evaluate alternative routes. The results of this alternatives analysis are summarized below.

The range of potential routes considered by the Applicant for the Proposed Project was constrained by a need to connect to existing infrastructure and the small geographic area of the Proposed Project. However, in addition to the Proposed Route the Applicant identified and evaluated four alternative routes from the starting point in Clearwater County to the new Substation site in Hubbard County (**Figure 2**).

For the routes shown in **Figure 2**, the Applicant performed a desktop evaluation of potential impacts to humans and the natural environment using available Geographic Information System data. The alternative routes analysis considered proximity to buildings, potential for corridor sharing, total line length, sensitive natural areas, and wetland area within the potential ROW to assess potential impacts. **Table 5** summarizes data utilized to support the route alternative analysis.

Table 5 Alternatives Analysis

	Orange Route	Purple Route	Red Route	Green Route	Proposed Route (Yellow)
Total Route Length (miles)	9.17	9.57	7.04	9.23	9.36
Percent of Route Adjacent to Existing ROWs (roads, pipelines, distribution lines)	75%	78%	100%	97%	89%
Percent of Route Adjacent to Existing Distribution Lines	29%	10%	0%	46%	42%
NWI Freshwater Emergent Wetlands Crossed (miles)	0.04	0.02	0.08	0.06	0.01
NWI Freshwater Forested/Shrub Wetland Crossed (miles)	0.11	0.12	0.09	0.39	0.31
Total NWI Wetlands Crossed (miles)	0.16	0.13	0.17	0.45	0.32
PWI Streams Crossed (count)	1	1	1	1	1
NHD Watercourses Crossed (count)	3	1	2	2	2
Trout Streams Crossed (count)	1	0	1	1	1
Sites of Biodiversity Significance Areas Crossed (miles)	1.67	0.00	1.9	2.75	2.1
MDNR Native Plant Communities Crossed (miles)	0.53	0.00	0.93	0.06	0.00
NHIS Areas Crossed (count)	3	2	2	2	2
Aquatic Management Areas Crossed (miles)	0.02	0.00	0.01	0.00	0.00
Mississippi Headwaters State Forest Crossed (miles)	0.00	0.00	0.00	0.00	0.00
Residences within 200 ft (numbers)	6	7	3	8	5

Minnkota first studied the Orange Route as shown on **Figure 2**. As described in Minnkota's initial consultation letter (see October 13, 2015 MDNR Division of Ecological Services notification letter in **Appendix D**), this option was initially proposed because it provided the best options for minimizing potential impacts. The MDNR, however, raised concerns related to the Orange Route, including: total required greenfield to be disturbed; habitat fragmentation; MBS sites of High and Outstanding Biodiversity Significance; potential impacts to rare and natural features identified in the NHIS database; and the location of the LaSalle Creek crossing (see November 16, 2015 email from MDNR in **Appendix E**). Based on consultations with the MDNR, the Orange Route was rejected from further consideration.

Rare natural features identified in the NHIS database as well as sites of Biodiversity Significance (including the preliminary site which had not yet been surveyed per the November 16, 2015 email from MDNR in **Appendix E**) are illustrated on **Figure 3**. LaSalle Creek's designation as a trout stream and locations of the LaSalle Creek Aquatic Management Areas (AMAs) are illustrated on **Figure 4**.

The Purple Route was considered because it avoids crossing LaSalle Creek, Sites of High Biodiversity Significance, and rare natural features identified in the NHIS database. This alternative crosses less wetlands and watercourse than the other alternatives (**Table 5**); however, it is the longest route and is in the vicinity of seven residences. This route alternative was rejected due to proximity of homes and landowners concerns in the northern portion of the route.

The Red Route was considered because it entirely follows the existing Minnesota Pipeline Company, LLC corridor from the interconnect to the new Substation site. If the HVTL could share the existing pipeline ROW, this option would likely result in less tree clearing and habitat fragmentation, and would cross LaSalle Creek at the same location as the existing pipeline. It is also the shortest route (**Table 5**). However, Minnesota Pipeline Company, LLC indicated that in order to provide pipeline cathodic protection from induced currents and to avoid encumbrances within the pipeline ROW, an additional 100 feet of new ROW would be required adjacent to its existing ROW. In addition, the Red Route crosses the LaSalle Creek Aquatic Management Area, Sites of High Biodiversity Significance, and rare natural features identified in the NHIS database. The MDNR indicated that the crossing of LaSalle Creek for this route was not a preferred crossing location for the HVTL (see December 16, 2015 email from MDNR in **Appendix E**). The Red Route was therefore rejected from further consideration.

The Green Route was considered to minimize impacts on sensitive natural areas, minimize total required greenfield, and provide an alternative LaSalle Creek crossing location. The MDNR preferred this LaSalle Creek crossing location over the others (see December 16, 2015 email from MDNR in **Appendix E**). Minnkota met with MDNR on-site to review the Green Route and determined that this route was acceptable (see December 31, 2015 email from Minnkota to MDNR in **Appendix E**).

The Green Route was modified as illustrated on **Figure 2**; the modified route is referred to as the Yellow Route, or the Proposed Route. Minnkota modified the Green Route to avoid residences and conflicts with landowners. The Proposed Route (Yellow Route) avoids crossing Itasca State Park and does not cross LaSalle Creek within the Aquatic Management Area. Approximately 42% of the Proposed Route follows existing distribution line corridors.

Additionally, although the Proposed Route (Yellow Route) crosses 2.1 miles of Sites of High Biodiversity Significance, the Anticipated Alignment minimizes impacts to these areas by following the edges and sharing existing rights-of-way to the extent practicable. Thus, impacts to rare plant species and features located within the Sites of High Biodiversity Significance are avoided (see March 21, 2016 email from MDNR in **Appendix E**). The Proposed Route also addresses comments received from the MDNR (see January 5, 2016 email from MDNR in **Appendix E**).

4.4 Associated Facilities and Substation Modifications

The proposed 115/4.16 kV substation will have a 10 mega volt ampere (MVA) transformer; a 115 kV disconnect, fusing and circuit breaker; a low side bus, metering equipment, station service, circuit breaker, power factor correction capacitors and a disconnect. The 115 kV HVTL will be constructed within an 80- to 100-foot-wide ROW and the proposed Substation will have a 150-foot by 150-foot footprint.

The Substation layout is provided in **Figure 5** and **Appendix B** shows the location of the proposed Substation. The 150-foot by 150-foot footprint of the Substation will be fenced with 7-foot-high chain link security fence on the east, north and west perimeters. The north side of the Minnesota Pipeline fence will be used as the southern perimeter. The Substation will be unmanned and emergency lighting will be installed to provide lighting during emergencies or maintenance work by Minnkota or Clearwater-Polk Electric crews. Four 20-inch by 16-inch fiberglass warning signs will be installed on each side of the fence. No other signs will be installed at the Substation.

The Proposed Project does not include modifications to existing associated facilities or substations.

4.5 Design Options to Accommodate Future Expansion

The proposed facilities are designed with enough capacity to meet current and future needs of the industrial customer.

5.0 Engineering Design, Construction and ROW Acquisition

5.1 Structures, ROW, Construction and Maintenance

5.1.1 Transmission Structures

The 115 kV HVTL will primarily be carried on single wood, steel, or ductile iron poles with horizontal post or horizontal brace insulators and a single shield wire. Typical structure design and additional detail regarding typical structure design is provided in **Appendix C**. The proposed poles will be self-supporting (un-guyed) and will be directly embedded. The structures will have an average height of 80 feet with a 300 to 350-foot span between structures. Where it is necessary to cross wetlands, two- or three-pole structures (**Appendix C**) may be utilized. **Table 6** provides a general summary of typical structure design for the structures included in the Proposed Project.

Table 6 Typical Structure Design Summary

Line Type	Structure Type	Structure Material	Approximate Structure Height (feet)	Structure Base Diameter (inches)	Span Between Structures (feet)
Single Circuit 115 kV	Monopole (horizontal post)	Wood, steel, or ductile iron	80 (average) 110 (maximum)	24 to 36	300 to 350
	Two pole with cross arms	Wood, steel, or ductile iron	80 (average) 110 (maximum)	24 to 36	350 to 500
	Three pole guyed with cross arms	Wood, steel, or ductile iron	80 (average) 110 (maximum)	24 to 36	500 to 1,300

The Project will be designed to meet or surpass relevant local, state, and national codes including the National Electric Safety Code (NESC), Rural Utilities Service (RUS)-US Department of Agriculture and Minnkota standards. Appropriate standards will be met for construction and installation, and applicable safety procedures will be followed during and after installation.

5.1.2 Right-of-Way Width

The proposed new 115 kV HVTL will require an 80- to 100-foot-wide ROW. Where the HVTL is placed cross-country across private land, an easement for the entire ROW will be acquired from the affected landowner(s). When the HVTL parallels other existing infrastructure ROW (e.g., roads, other utilities), an easement of lesser width may be required as parts of the ROW of the existing infrastructure can often be shared with the ROW needed for the HVTL. When paralleling existing ROW, Minnkota's typical practice is to place poles on adjacent private property, a few feet away from the existing ROW. With this pole placement, the transmission line shares a portion of the existing ROW.

For some of the portions of the Project that run parallel to 281st Avenue, 400th Street, 115th Avenue, and County Road 95, the proposed HVTL will share ROW with existing Clearwater-Polk Electric Cooperative low-voltage distribution lines (**Appendix B**).

5.1.3 Right-of-Way Evaluation and Acquisition

The Proposed Project will require approximately 9.4 miles of new ROW for the proposed 115 kV HVTL. The proposed Substation will require a 150-foot by 150-foot plot within a parcel owned by the industrial customer.

For transmission lines, utilities typically acquire easement rights across the parcels to accommodate the facilities, including transmission lines and structures. The ROW acquisition process begins early in the detailed design process. The evaluation and acquisition process includes examining titles, contacting owners, surveying, preparing documents, and purchasing the ROW easement. Each of these activities, particularly as it applies to easements for transmission line facilities, is described in more detail below.

The first step in the ROW process is to identify all persons and entities that may have a legal interest in the real estate upon which the facilities will be built. To compile this list, a ROW agent or other person engaged by Minnkota completes a public records search of all land involved in the Proposed Project. A owner's and encumbrance report is then developed for each parcel to determine the legal description of the property and the owner(s) of record and to gather information about easements, liens, restrictions, encumbrances and other conditions of record.

A list of landowners is included in **Appendix F**. Addresses have been redacted from the landowner list due to privacy concerns.

The next step in the acquisition process is to evaluate the specific parcel. After owners are identified, a ROW representative personally contacts each property owner or the property owner's representative. The ROW agent describes the need for the transmission facilities and how the specific project may affect each parcel. The ROW agent also seeks information from the landowner about any specific construction concerns.

The ROW agent may request the owner's permission for survey crews to enter the property and conduct preliminary survey work. The agent may also request permission to take soil borings to assess soil conditions and determine appropriate foundation design. The soil analysis is performed by an experienced geotechnical testing laboratory. Surveys are conducted to locate the existing ROWs, natural features, man-made features and associated elevations for use during the detailed engineering of the line.

During the evaluation process, the location of the proposed HVTL will be staked. The survey crew identifies the future location of each structure or pole on the ground and places a surveyor's stake to mark the location. The ROW agent shows the landowner the approximate locations where the structure(s) will be located on the property. The ROW agent also delineates the boundaries of the easement area required for safe operation of the HVTL.

Prior to the acquisition of easements of property, land value data will be collected. Based on the impact of the easement or purchase to the market value of each parcel, a fair market value offer will be developed. The ROW agent will contact the property owner to present the offer for the easement and discuss the amount of just compensation to acquire the rights to build, operate, and maintain the transmission facilities within the easement area and for reasonable access to the easement area. The agent will also provide maps of the route or site and maps showing the landowner's parcel. The landowner is allowed a reasonable amount of time to consider the offer and to present any material that the owner believes is relevant to determining the property's value.

In nearly all cases, utilities are able to work with the landowners to address their concerns, and an agreement is reached for the utility's purchase of land rights. The ROW agent prepares all of the documents required to complete each transaction. Some of the documents that may be required include easement, purchase agreement, or contract and deed.

In rare instances, a negotiated settlement cannot be reached and the landowner chooses to have an independent third party determine the value of the rights taken. Such valuation is made through the utility's exercise of the right of eminent domain pursuant to Minn. Stat. §117. The process of exercising the right of eminent domain is called condemnation.

Before commencing a condemnation proceeding, the ROW agent must obtain at least one appraisal for the property proposed to be acquired and a copy of that appraisal must be provided to the property owner per Minn. Stat. § 117.036, subd. 2(a). The property owner may also obtain another property appraisal and the Company must reimburse the property owner for the cost of the appraisal according to the limits set forth in Minn. Stat. § 117.036, subd. 2(b). The property owner may be reimbursed for reasonable appraisal costs up to $1,500 for single-family and two-family residential properties, $1,500 for property with a value of $25,000 or less, and $5,000 for other types of properties. In the event of a condemnation, the utility will provide the landowner with a copy of each appraisal it has obtained for the land or property rights.

To start the condemnation process, a utility files a Petition in the district court where the property is located and serves that Petition on all owners of the property. If the court approves the Petition, the court then appoints a three-person condemnation "commission." The three people must understand applicable real estate issues. Once appointed, the commissioners schedule a viewing of the property over and across which the transmission line easement is to be located. Next, the commission schedules a valuation hearing where the utility and landowners can testify as to the fair market value of the easement or fee. The commission then makes an award as to the value of the property acquired and files it with the court. Each party has 40 days from the filing of the award to appeal to the district court for a jury trial. In the event of an appeal, the jury hears land value evidence and renders a verdict. At any point in this process, the case can be dismissed if the parties reach a settlement.

Once ROW is acquired and prior to construction, the ROW agent will again contact the owner of each parcel to discuss the construction schedule and construction requirements. To ensure safe construction of the line, special consideration may be needed for fences, crops, or livestock. For example, fences may

need to be moved or temporary or permanent gates may need to be installed; crops may need to be harvested early; and livestock may need to be moved. In each case the ROW agent coordinates these actions with the landowner.

5.1.4 Construction Procedures

Minnkota will begin construction after appropriate federal, state, and local approvals are obtained, property and ROWs are acquired, soil conditions are established, and a final design is completed. The precise timing of construction will take into account various requirements that may be in place due to permit conditions, system loading issues, and available workforce.

Minnkota's construction process will follow standard construction and mitigation practices, including best management practices (BMPs) that were developed from experience with past projects. These practices address staging, erecting HVTL structures, and stringing HVTLs. Construction and mitigation practices to minimize impacts will be developed by Minnkota based on the proposed schedule for activities, permit requirements, prohibitions, maintenance guidelines, inspection procedures, terrain, and other factors. In some cases, activities or schedules may be modified to minimize impacts on sensitive environmental features.

HVTL structures are generally designed for installation at existing grades. However, some sloped work areas may need to be graded or filled in order to establish a more level work surface for structure installation. If the landowner permits, it is preferred to leave the leveled areas and working pads in place for use in future maintenance activities, if any. If permission is not obtained, the site is graded back to its original condition to the extent feasible and imported fill is removed.

Typical construction equipment that may be used for the Proposed Project includes tree removal equipment, line construction equipment, stringing equipment, and general construction equipment on rubber tires or tracks, as appropriate.

Minnkota may also require staging areas for additional space for storage during construction. These areas have not been identified at this time, but will typically be selected for their location, access, security, and ability to efficiently and safely warehouse supplies. The temporary staging areas outside of the ROW will be obtained by Minnkota through rental agreements.

Minnkota will access the ROW from existing roads or trails that run parallel or perpendicular to the ROW. In some situations, private field roads or trails may be used. Where necessary to accommodate the heavy equipment used in construction, including cranes, cement trucks, and hole-drilling equipment, existing access roads may be upgraded. To the extent possible, Minnkota will coordinate these activities with the affected property owner(s) and/or state and local highway departments as appropriate.

Structure installation first begins by moving structures from the staging areas and delivering them to a staked location. The structures are typically staged within the ROW until the structure is set. Depending on site conditions, structures may be framed in the ground and lifted into place, or the structures may be set first and then bracing and hardware attached.

Most structures will be direct embedded. The area around the structure is then backfilled with crushed rock and/or soil. In lowland areas with poor soil capacity, Minnkota will use galvanized steel culverts to increase structure stability.

Angle structures as well as some tangent structures used to span wetlands may be guyed. Guy wires will be anchored using screw anchors, cross plate anchors, or rock anchors depending on the soil conditions encountered.

After the structures have been assembled, set, and secured, conductors will be installed by establishing stringing setup areas along the route. The conductors will then be pulled with a rope lead that connects to each structure through dollies attached at the insulator locations.

Environmentally sensitive areas (e.g., wetlands) may require special construction techniques, which will vary according to conditions at the time of construction. During construction, impacts on wetland areas will be minimized by Minnkota to the extent possible by spanning them. Additionally, Minnkota will use construction practices that help prevent soil erosion and will take measures to ensure that equipment fueling and lubricating will occur at a distance from waterways. Additional mitigation measures relating to wetlands are contained in Section 6.5.2.6.

5.1.5 Restoration Procedures

Minnkota will limit ground disturbance during construction wherever possible. However, disturbance will occur during the normal course of work, which can take several weeks in any one location. As construction is completed (weather permitting), Minnkota will restore disturbed areas to their original condition to the maximum extent practicable. The ROW agents will contact each property owner after construction is completed to assess if any remaining damage has occurred as a result of the Proposed Project. If damage has occurred to crops, fences or the property, Minnkota will fairly reimburse the landowner for the damages sustained that are not repaired or restored by Minnkota or its representatives. In some cases, Minnkota may engage an outside contractor to restore the damaged property as nearly as possible to its original condition. Portions of vegetation that are disturbed or removed during construction of HVTLs will naturally reestablish to pre-disturbance conditions. Resilient species of common grasses and shrubs typically reestablish with few problems after disturbance. Areas with significant soil compaction and disturbance from construction activities may require assistance in reestablishing the vegetation stratum and controlling soil erosion. Commonly used methods to control soil erosion and assist in reestablishing vegetation include re-seeding and mulching, erosion control blankets, silt fence installation, and minimizing soil disturbance during construction. To avoid adversely impacting reptile and bird species, Minnkota will not use plastic mesh erosion control materials.

These erosion control and vegetation establishment practices are regularly used in construction projects and will be referenced in the construction stormwater permit plans. These construction techniques typically minimize long-term impacts that may result from the Proposed Project.

The Minnesota Noxious Weed Law (Minn. Stat. § 18.75-18.91) defines a noxious weed as an annual, biennial, or perennial plant that the Commissioner of Agriculture designates to be injurious to the public

health, the environment, public roads, crops, livestock, or other property. The Minnesota Department of Agriculture's Noxious & Invasive Weed Program assists local governments and landowners with resources for managing noxious and invasive weeds throughout Minnesota. Minnkota will strive to prevent the spread of noxious and invasive weeds by using invasive-free mulches, topsoil, and seed mixes. Permanent vegetation will be established in areas disturbed within the construction work area except in actively cultivated areas. Seed used will be purchased on a "Pure Live Seed" basis for seeding revegetation areas. The seed tags on the seed sacks will also certify that the seed is "Noxious Weed Free."

Minnkota may use both herbicides and/or mechanical methods to control the spread of noxious weeds. All herbicides used by Minnkota are approved by the Environmental Protection Agency and the State of Minnesota Department of Agriculture. These herbicides will be applied by Minnkota or commercial pesticide applicators that are licensed by the Minnesota Department of Agriculture. If during post-construction monitoring of the restored ROW indicates a higher density of noxious weeds on the ROW than noted in adjacent off ROW areas, Minnkota will obtain landowner permission and work to mitigate noxious weed concerns.

5.1.6 Maintenance Procedures

Transmission lines and substations are designed to operate for decades and require only moderate maintenance, particularly in the first few years of operation.

The estimated service life of the proposed HVTL for accounting purposes is approximately 40 years. However, practically speaking, transmission lines are seldom completely retired. Transmission infrastructure has very few mechanical elements and is built to withstand weather extremes that are normally encountered. With the exception of severe weather such as tornadoes and heavy ice storms, transmission lines rarely fail.

Transmission lines are automatically taken out of service by the operation of protective relaying equipment when a fault is sensed on the system. Such interruptions are usually only momentary. Scheduled maintenance outages are also infrequent. As a result, the average annual availability of transmission infrastructure is very high, in excess of 99 percent.

The principal operating and maintenance cost for transmission facilities is the cost of inspections, which is usually done monthly by air. Annual operating and maintenance costs for transmission lines in Minnesota and surrounding states vary, however, for voltages from 69 kV through 345 kV, past experience shows that costs are approximately $2,000 per mile. Actual line-specific maintenance costs depend on the setting, the amount of vegetation management necessary, storm damage occurrences, structure types, materials used, and the age of the line.

Substations require a certain amount of maintenance to keep them functioning in accordance with accepted operating parameters and the NESC requirements. Transformers, circuit breakers, batteries, protective relays, and other equipment need to be serviced periodically in accordance with the manufacturer's recommendations. The Substation site must be kept free of vegetation and adequate

drainage must be maintained. Minnkota personnel are typically on site at least once a month and maintenance needs are noted and scheduled for completion.

5.2 Electric and Magnetic Fields

The term EMF refers to electric and magnetic fields that are coupled together, such as in high frequency radiating fields. For the lower frequencies associated with power lines (referred to as "extremely low frequencies" (ELF)), EMF should be separated into electric fields (EFs) and magnetic fields (MFs), measured in kV per meter (kV/m) and milliGauss (mG), respectively. These fields are dependent on the voltage of a transmission line (EFs) and current carried by a transmission line (MFs). The intensity of the EF is proportional to the voltage of the line, and the intensity of the MF is proportional to the current flow through the conductors. Transmission lines operate at a power frequency of 60 hertz (Hz, cycles per second).

5.2.1 Health and Environmental Effects

Considerable research has been conducted in recent decades to determine whether exposure to power-frequency (60 Hz) electric and MFs 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 EMF exposure and health risks.

In 1999, the National Institute of Environmental Health Sciences (NIEHS) issued its final report on "Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields" in response to the Energy Policy Act of 1992. 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.

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

Many people are concerned about potential adverse health effects. Much of the research about power lines and potential health effects is inconclusive. Despite more than two decades of research to determine whether elevated EMF exposure, principally to magnetic fields, is related to an increased risk of childhood leukemia, there is still no definitive answer. The general scientific consensus is that, thus far, the evidence available is weak and is not sufficient to establish a definitive cause-effect relationship.

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 1970's. 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.

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." This conclusion was further justified in the recent 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 electric and MFs on human health. The administrative law judge (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 [EMF] exposure." The Commission adopted this finding on July 15, 2010.

5.2.2 Electric Fields

While there is no official state or federal standard for transmission line EFs, the Environmental Quality Board (EQB) has developed a standard of a maximum EF limit of 8 kV/m measured at one meter above the ground. The standard was designed to prevent serious hazards from shocks when touching large objects parked under alternative current (AC) transmission lines of 500 kV or greater. **Table 7** provides the EFs at maximum conductor voltage for the Proposed Project. Maximum conductor voltage is defined as the nominal voltage plus ten percent. This is generally an emergency condition, and Minnkota typically operates its transmission system between 101 percent and 104 percent of nominal voltage under normal conditions.

The unperturbed electric field calculations were performed using transmission line modeling software. For the single circuit 115 kV monopole type structure, the maximum EF at a height of 1.0 meter above ground was calculated to be 0.92 kV/m at the anticipated centerline and approximately 0.27 to 0.29 kV/m and 0.19 to 0.20 kV/m at the edges of the 80-foot-wide and 100-foot-wide ROWs, respectively.

Table 7 Calculated Electric Fields (kV/m) for Proposed Transmission Line Design (1 meter above ground)

Structure Type	Maximum Operating Voltage (kV)	Distance to Anticipated Centerline (feet)														
		-300	-200	-100	-75	-50	-40	-25	0	25	40	50	75	100	200	300
Single Circuit 115 kV Monopole	121	0.01	0.02	0.06	0.10	0.19	0.27	0.59	0.92	0.43	0.29	0.20	0.10	0.06	0.01	0.01

5.2.3 Magnetic Fields

There are presently no federal or Minnesota regulations pertaining to MF exposure. The EQB and the Commission have recognized that Florida (a 150 mG limit) and New York (a 200 mG limit) are the only two state standards in the country. Recent studies of the health effects from power frequency fields conclude that the evidence of health risk is weak (reference [1], reference [2], reference [3]). The general standard is one of prudent avoidance. The Applicant provides information to the public, interested customers and employees so they have an understanding of the MFs associated with the Proposed Project.

The MF profiles around the Proposed Project are shown in **Table 8**. MFs were calculated at the conductor's thermal limit based on the design of the HVTL and at the expected peak loading on the lines based on power flow modeling of the transmission system. The peak MF values are calculated at a point directly under the HVTL and where the conductor is closest to the ground. The same method is used to calculate the MF at the edge of the Proposed Alignment. MF profile data show that MF levels generally decrease rapidly as the distance from the centerline increases.

The estimates of the magnetic fields were performed for maximum cruise loading and maximum emergency line ratings using software based on the Electrical Power Research Institute (EPRI) methodology. The peak MF for this configuration at 1.0 meter above ground was calculated to be 7.3 mG at the anticipated centerline and approximately 3.0 mG and 2.0-2.3 mG at the edges of the 80-foot-wide and 100-foot-wide ROWs, respectively, under the expected peak loading condition. Peak MF under the conductor thermal limit condition was calculated to be 83 mG at the conductor thermal limits.

Because the actual power flow on a transmission line could potentially vary widely throughout the day depending on electric demand, the actual MF level could also vary widely from hour to hour. In any case, the typical loading of the transmission line will be far below the thermal limit of the line and should remain at or below the expected peak loading for the foreseeable future, resulting in typical MFs well below those indicated in **Table 8**.

Table 8 Calculated Magnetic Fields (mG) for Proposed 115 kV Transmission Line

Structure Type	Current (Amps)	Distance to Anticipated Centerline (feet)														
		-300	-200	-100	-75	-50	-40	-25	0	25	40	50	75	100	200	300
Magnetic Field Profile at Conductor Thermal Limits																
Single Circuit 115 kV Monopole	680	1	2	8	13	24	33	54	83	46	29	21	11	7	2	1
Magnetic Field Profile at Expected Peak Loading																
Single Circuit 115 kV Monopole	63	0.1	0.2	0.7	1.2	2.3	3.0	5.0	7.3	4.3	3.0	2.0	1.1	0.6	0.1	0

5.2.4 Stray Voltage

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, and can occur on the electric service entrances to structures from distribution lines, not HVTLs. HVTLs do not, by themselves, create stray voltage because they do not connect to businesses or residences.

5.2.5 Farm Operations, Vehicle Use and Metal Buildings near Power Line

Insulated electric fences used in livestock operations can pick up an induced charge from transmission lines. Usually, the induced charge will drain off when the charger unit is connected to the fence. When the charger is disconnected either for maintenance or when the fence is being built, shocks may result. Potential shocks can be prevented by using a couple of methods including:

- one or more of the fence insulators can be shorted out to ground with a wire when the charger is disconnected; or
- an electric filter can be installed that grounds out charges induced from a power line while still allowing the charger to be effective.

Farm equipment, passenger vehicles, and trucks may be safely used under and near power lines. The power lines will be designed to meet or exceed minimum clearance requirements over roads, driveways, cultivated fields, and grazing lands specified by the NESC. Recommended clearances within the NESC are designed to accommodate a relative vehicle height of 14 feet.

There is a potential for vehicles under HVTLs to build up an electric charge. If this occurs, the vehicle can be grounded by attaching a grounding strap to the vehicle long enough to touch the earth. Such buildup is a rare event because generally vehicles are effectively grounded through tires. Modern tires provide an electrical path to ground because carbon black, a good conductor of electricity, is added when they are produced. Metal parts of farming equipment are frequently in contact with the ground when plowing or

engaging in various other activities. Therefore, vehicles will not normally build up a charge unless they have unusually old tires or are parked on dry rock, plastic or other surfaces that insulate them from the ground.

Buildings are permitted near transmission lines but are generally prohibited within the ROW itself because a structure under a line may interfere with safe operation of the transmission facilities. For example, a fire in a building on the ROW could damage a transmission line. As a result, NESC guidelines establish clear zones for transmission facilities. Metal buildings may have unique issues. For example, metal buildings near power lines of 200 kV or greater must be properly grounded. Any person with questions about a new or existing metal structure can contact the Applicant for further information about proper grounding requirements.

6.0 Environmental Information

This section analyzes potential resource impacts associated with the Proposed Project. This section provides a description of the environmental setting, potential impacts, and mitigation measures the Applicant proposes, where appropriate, to minimize the impacts of siting, constructing, and operating the Proposed Project. The majority of the measures proposed are part of the standard construction process for the Applicant. Unless otherwise identified in the following text, the costs of the mitigation measures proposed are considered nominal.

6.1 Environmental Setting

The Proposed Project is located within the Northern Minnesota Drift and Lake Plains section, a section within the biogeographic province known as the Laurentian Mixed Forest Province under the Ecological Classification System (ECS) developed by the MDNR (reference [4]).

The Project area is primarily located within the Chippewa Plains Subsection with a very small portion of the Proposed Route and Substation crossing over into the Pine Moraines and Outwash Plains. The Chippewa Plains Subsection is characterized by gently rolling lake plains and till plains. Pre-settlement vegetation included deciduous and conifer forests. Recreation and forestry is the predominant land use in the subsection. The Pine Moraines and Outwash Plains Subsection is a mix of end moraines, outwash plains, till plains, and drumlin fields. Pre-settlement vegetation included aspen-birch and pine forests. Forest management and tourism are the predominant land uses in the subsection (reference [4]).

6.2 Human Settlement

6.2.1 Public Health and Safety

Minnkota will implement proper safeguards during construction and operation to avoid potential impacts to public health and safety. Concerns related to health and safety include hazards associated with coming into contact with energized equipment, induction, and potential impacts to implantable medical devices. In general, impacts to public health and safety from the project are not anticipated.

6.2.1.1 Mitigation Measures

The Proposed Project will be designed in compliance with local, state, NESC, and Minnkota standards for clearance to ground, crossing utilities and buildings, strength of materials, and ROW widths. Minnkota will ensure that construction and contract crews comply with local, state, NESC, and Company standards for installation of facilities and standard construction practices. Minnkota and industry safety procedures will also be followed after the Proposed Project is installed.

The proposed HVTL will be connected to an existing 115 kV transmission line which is equipped with protective measures to safeguard the public if an accident occurs, such as a structure or conductor falling to the ground. The protective equipment will de-energize the HVTL should such an event occur. The proposed Substation will be fenced. With implementation of safeguards and protective measures, the Proposed Project is not anticipated to result in adverse or significant impacts on public health and safety.

6.2.2 Residential and Non-Residential Land Use

The Proposed Project is located primarily within or adjacent to existing road rights-of-way including county roads and state highways. A few short segments deviate from the road rights-of-way in Clearwater County along 281st Avenue and State Highway 200 and along 115th Avenue in Hubbard County; one of these segments avoids a mature stand of pines and the other two segments avoid houses (Maps B-4/B-5, B-10, B-11/B12, and B-20/B-21 of **Appendix B**). Much of the areas adjacent to the road rights-of-way are undeveloped and forested with some grasslands, wetlands, and interspersed agricultural lands.

There are several residences located in the vicinity of the Proposed Project. The number of residential and commercial buildings located within 500 feet, 1,000 feet, and 1,500 feet of the Proposed Project are provided in **Table 9**. A total of 26 buildings are located within 1,500 feet of the Proposed Project. Of this total, four residences are located within the Proposed Route. The locations of residential structures within the Proposed Route are shown on the detailed route maps in **Appendix B**.

Table 9 Residence and Commercial Buildings within Vicinity of Proposed Project

Building Type	Buildings within 0 to 500 feet (count)	Buildings within 500 to 1,000 feet (count)	Buildings within 1,000 to 1,500 feet (count)	Total Buildings
Residential	14	6	5	25
Commercial	0	1	0	1

Source: aerial photographs review

6.2.3 Displacement

The Proposed Project will not require displacement of occupied residences or commercial businesses. Minnkota will seek to construct the HVTL consistent with any applicable zoning ordinances. However, no zoning, building, or land use approvals will be required from surrounding municipalities if a Route Permit is issued for the Proposed Project, because once the Commission issues a Route Permit, zoning, building, and land use regulations and rules are preempted per Minn. Stat. § 216E.10, subd. 1. No adverse or significant impacts on residential or commercial structures as a result of the Proposed Project are anticipated.

6.2.3.1 Mitigation Measures

As discussed in Section 4.2.2 and Section 4.3 as part of the planning process, the Applicant assessed the general area surrounding the Proposed Project to identify significant routing issues that might arise and to evaluate environmental resources in the vicinity of the Proposed Project. A team of siting, ROW, planning, environmental, and engineering personnel worked together to develop an Anticipated Alignment that minimizes overall impacts of the Proposed Project. Based on this work the Proposed Route has been designed to avoid displacement of homes. Because no displacement will occur, no additional mitigation measures are proposed.

6.2.4 Noise

Transmission conductors produce noise under certain conditions. The level of noise depends on conductor conditions, voltage level, and weather conditions. Generally, activity-related noise levels during the operation and maintenance of transmission lines are minimal.

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

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

Table 10 Common Noise Sources and Levels

Noise Source	Sound Pressure Level (dBA)
Jet Engine (at 25 meters)	140
Jet Aircraft (at 100 meters)	130
Rock Concert	120
Pneumatic Chipper	110
Jackhammer (at 1 meter)	100
Chainsaw, Lawn Mower (at 1 meter)	90
Heavy Truck Traffic	80
Business Office, Vacuum Cleaner	70
Conversational Speech, Typical TV Volume	60
Library	50
Bedroom	40
Secluded Woods	30
Whisper	10

Source: Minnesota Pollution Control Agency (reference [5])

In Minnesota, statistical sound levels ("L" or Level Descriptors) are used to evaluate noise levels and identify noise impacts. The standards are expressed as a range of permissible dBA within a one hour period; L_{50} is the dBA that may be exceeded 50 percent of the time within an hour, while L_{10} may be exceeded 10 percent of the time within an hour.

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

Table 11 identifies the established daytime and nighttime noise standards by NAC.

Table 11 Noise Standards by Noise Area Classification (dBA)

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

Table 12 presents the L_{50} noise levels predicted for single pole 115 kV structures using the Corona and Field Effects (CFE) spreadsheets developed by the Bonneville Power Administration. The worst case indicated that the audible L_{50} noise levels measured at the edge of the 80- and 100-foot-wide ROW (40 and 50 feet from centerline) are well below the MPCA limits for the relevant noise area classifications (NAC 2 and NAC 3) in the area crossed by the line.

Table 12 Calculated Audible Noise (dBA) for Proposed Transmission Line

Structure Type	Weather Condition	Noise L_{50} At Edge of 80-foot-wide ROW (Decibels as weighted)	Noise L_{50} At Edge of 100-foot-wide ROW (Decibels as weighted)
115 kV Single Pole	Rainy	22	21
	Fair	12	11

The noise generated from the proposed HVTL is not expected to exceed background noise levels and will, therefore, not be audible at any receptor location. The proposed HVTL will be designed and constructed to comply with state noise standards established by the MPCA. Any audible noise will be below the MPCA noise standards established for NAC 1. Additionally, it is not anticipated that the Proposed Project will increase noise from HVTL conductors or any associated facilities to a level with the potential to impact nearby residences.

Transformer "hum" is the dominant noise source at substations. Transformer hum is caused by magnetic forces within the core of the transformer. These magnetic forces cause the core laminations to expand and contract, creating vibration and sound at a frequency of 120 Hz (twice the a.c. mains frequency), and at multiples of 60Hz (harmonics). Typically, the noise level does not vary with transformer load, as the core is magnetically saturated and cannot produce any more noise.

For the proposed Substation, the maximum noise level at the transformer is estimated to be 69 dBA. Given the distance of over 1,500 feet from the proposed Substation to the nearest home (Map B-23 of **Appendix B**), it would be unlikely that noise from this transformer would be audible to nearby residents. The proposed Substation will be designed and constructed to comply with state noise standards established by the MPCA.

With implementation of state design and construction standards, the Proposed Project is not anticipated to result in adverse or significant impacts on the public as a result of noise.

6.2.4.1 Mitigation Measures

As discussed in Section 4.2.2 and Section 4.3 as part of the planning process, the Applicant assessed the general area surrounding the Proposed Project to identify significant routing issues that might arise and to evaluate environmental resources in the vicinity of the Proposed Project. A team of siting, ROW, planning, environmental, and engineering personnel worked together to develop an Anticipated Alignment that minimizes overall impacts of the Proposed Project. Based on this work the Proposed Project has been designed to avoid proximity to sensitive noise receptors (homes) and no additional mitigation measures are proposed.

6.2.5 Television and Radio Interference

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

If radio interference from transmission line corona does occur, satisfactory reception from AM radio stations previously providing good reception can be restored by appropriate modification of (or addition to) the receiving antenna system. AM radio frequency interference typically occurs immediately under a transmission line and dissipates rapidly within the ROW to either side.

FM radio receivers usually do not pick up interference from transmission lines because:

- corona-generated radio frequency noise currents decrease in magnitude with increasing frequency and are quite small in the FM broadcast band (88-108 Megahertz); and
- the excellent interference rejection properties inherent in FM radio systems make them virtually immune to amplitude type disturbances

A two-way mobile radio located immediately adjacent to and/or behind a large metallic structure (such as a steel tower) may experience interference because of signal-blocking effects. Movement of either mobile unit so that the metallic structure is not immediately between the two units should restore communications. This will generally require a movement of less than 50 feet by the mobile unit adjacent to a metallic tower.

Television interference is rare but may occur when a large transmission structure is aligned between the receiver and a weak distant signal, creating a shadow effect. Loose and/or damaged hardware may also cause television interference. If television or radio interference is caused by or from the operation of the Proposed Project in those areas where good reception is presently obtained, the Applicant will inspect and repair any loose or damaged hardware in the HVTL, or take other necessary action to restore

reception to the present level, including the appropriate modification of receiving antenna systems if deemed necessary.

6.2.5.1 Mitigation Measures

The Applicant does not anticipate that the Proposed Project will create interference with radio or television signals, however if radio or television interference occurs due to the Proposed Project, the Applicant will work with the affected landowner to restore reception to pre-Project quality.

6.2.6 Aesthetics

Aesthetics refer to the natural and human modified landscape features or visual resources that contribute to the public's experience and appreciation of the environment. Wetlands, surface waters, landforms, forests, and vegetation patterns are among the natural landscape features that define an area's visual character. Buildings, roads, bridges, and other structures reflect human modifications to the landscape. The scenic value or visual importance of an area is a subjective matter and depends upon the perception and philosophical and/or psychological response of the viewer. Generally, landscapes that exhibit a high degree of variety and harmony among the basic elements of form, line, color, and texture have the greatest potential for high visual and aesthetic quality. The level of impact to visual resources is also subjective and generally depends on the sensitivity and exposure of a particular viewer and can, therefore, vary greatly from one individual to the next.

The Proposed Project will be constructed primarily adjacent to existing road ROWs, including county and township roads and state highways. Within some of the road ROWs, the Proposed Route will also be adjacent to or within existing distribution line ROWs.

As discussed in Section 5.1.1 the HVTL will primarily be constructed of wood or steel monopole structures with an average pole height of 65 feet and approximately 300-foot to 350-foot span length. These proposed HVTL structures will be visible to drivers traveling along 281st Avenue, State Highway 200, 400th Street, 115th Avenue, and County Road 95 and may be visible to residents located near the HVTL. The number of residences located within the vicinity of the Proposed Route are discussed in Section 6.2.2.

Given that much of the area adjacent to the Proposed Route is forested and there are existing distribution lines along portions of the route, the Proposed Project is not expected to appreciably alter the visual experience of travelers and residents in the area.

6.2.6.1 Mitigation Measures

The Proposed Route maximizes ROW sharing with existing linear corridors (distribution lines and roadways) to minimize the proliferation of visual impacts to open spaces. During the construction, uniform structure types will be used to the extent practicable.

6.2.7 Socioeconomic

Population and economic characteristics based on the 2010 U.S. Census are provided in **Table 13**. As reported in the 2010 U.S. Census, the population density of Clearwater's County is 8.7 people per square

mile. Minorities and persons living in poverty make up 12.8 percent and 17.8 percent of the population, respectively. Also as reported in the 2010 U.S. Census, the population density of Hubbard's County is 22.1 people per square mile. Minorities and persons living in poverty make up 5.5 percent and 12.2 percent of the population, respectively. For comparison, minorities comprise 15.9 percent of the statewide population and 11 percent of Minnesota residents live in poverty (reference [6], reference [7]).

Although poverty levels in both Clearwater County and Hubbard County are slightly higher than the statewide average, the Proposed Project is not anticipated to have disproportionate effect on the county's population living below the poverty level because nominal socioeconomic impacts are anticipated.

Table 13 Population and Economic Characteristics

Location	Population	Minority Population (percent)	Caucasian Population (percent)	Per Capita Income	Percentage of Population Below Poverty Level
Clearwater County	8,695	12.8%	87.2%	$22,773	17.8%
Hubbard County	20,428	5.5%	94.5%	$25,050	12.2%

Approximately 25 workers will be required for HVTL construction and 12 workers will be needed, on average, for the proposed Substation construction. These workers will likely be a combination of local contractors as well as skilled tradesman for outside the Project area.

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

It is not expected that additional permanent jobs will be created by the Proposed Project. The construction activities will provide a seasonal influx of additional dollars into the communities during the construction phase, and materials such as concrete may be purchased from local vendors where feasible. Long-term beneficial impacts from the proposed HVTL and proposed Substation construction include increased local tax base resulting from the incremental increase in revenues from utility property taxes.

6.2.7.1 Mitigation Measures

Socioeconomic impacts resulting from the Proposed Project will be primarily positive with an influx of wages and expenditures made at local businesses during Project construction, and increased tax revenue once the Proposed Project is operational.

6.2.8 Cultural Values

Cultural values include those perceived community beliefs or attitudes that provide a framework for unity in a given community. Clearwater County is home to Lake Itasca, the source of the Mississippi River, which

is located within Lake Itasca Park (reference [8]). The communities in the Project area have cultural ties to German, Norwegian, Swedish, English, and Native American heritages (reference [9]). Cultivated wild rice paddies are located north of Clearbrook, Clearwater County. Wild rice has cultural significance for tribal communities (reference [10]). Portions of the Red Lake and White Earth Indian reservations extend into the county (reference [10]). In Hubbard County, portions of the Leech Lake Indian Reservations extend into the county (reference [9]). The majority of the Hubbard County population is of German, Norwegian, English, and Swedish ancestry (reference [9]).

The communities near the Proposed Project value outdoor recreation and the scenic nature of the northwoods region. The Proposed Project is not expected to impact the framework or sense of unity of the community and will not alter features in the area that contribute significantly to the cultural nature of the region.

6.2.8.1 Mitigation Measures

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

6.2.9 Recreation

The Project area is located in a region that is known for its outdoor recreation opportunities. The region includes vast areas of forest, lakes, rivers, and streams, making it a destination for outdoor recreation. The area offers opportunities for walleye and northern pike fishing, kayaking, boating, cycling, hiking, hunting, cross country skiing, and snowmobiling.

A portion of the Proposed Route is located adjacent to, but does not cross, Itasca State Park which is open to the public for recreational purposes. The Proposed Route crosses a portion of the Mississippi Headwaters State Forest; however, the Anticipated Alignment does not cross it. Direct impacts to existing recreational opportunities are not expected to occur as the Proposed Route is located in an area that is adjacent to a major roadway as well as existing electrical infrastructure.

6.2.9.1 Mitigation Measures

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

6.2.10 Public Services

Public services and facilities in the Project area generally include emergency services provided by government entities, including hospitals, fire departments, and police departments, water supply or wastewater disposal systems, and gas and electricity services, and existing and future transportation corridors and projects.

6.2.10.1 Emergency Services

Any potentially required temporary lane closures on 281st Avenue, 400th Street, 115th Avenue, and County Road 95 will be coordinated with the local jurisdictions, and will provide for safe access of police, fire, and other rescue vehicles. Lane closures on state highways are not anticipated during construction of the HTVL.

6.2.11 Utilities

Construction and operation of the Proposed Project is not anticipated to impact any public service utilities. The Project is needed to address Minnesota Pipeline Company, LLC's industrial load for a new substation for its pipeline system.

6.2.12 Transportation and Traffic

Roads are the main transportation infrastructure in the Project area. The Proposed Route runs parallel to and in some places crosses the following township and county roads: 281st Avenue, 400th Street, 115th Avenue, and County Road 95. The Proposed Route also runs parallel to State Highway 200. Roadways could potentially be impacted temporarily during construction activities and during maintenance of the HVTL. Impacts could result from construction vehicles and safety perimeters temporarily blocking public access to streets; these temporary impacts are anticipated along the township and county roads but are not anticipated along the state highway. Access during construction and maintenance is expected to be primarily from existing roads. Due to the temporary nature of the proposed construction activities, traffic disruptions are expected to be minor and temporary. Structure placement along roadways can also impact future road expansions, as structures placed within the ROW must be moved to allow a safe distance between structures and the edge of the roadway. Minnkota has consulted with the Minnesota Department of Transportation (MnDOT) to minimize impacts on State Highway 200.

The closest airports to the Proposed Project include Hoiland Field in Shevlin (10.5 miles northwest), Up Yonder in Laporte (15 miles east), and Sky Manor Aero Estates in Park Rapids (11 miles south). Multiple airports are located within and near Bemidji, including a public airport located 19 miles northeast of the Proposed Project, the Bemidji Regional Airport.

Tall HVTLs can conflict with the safe operation of public and private airports and air strips. The Federal Aviation Administration (FAA) and MnDOT have each established development guidelines on the proximity of tall structures to public use airports. The FAA has also developed guidelines for the proximity of structures to Very-High-Frequency Omni-Directional Range (VOR) navigation systems. Due to the distance between the nearby airports and their air strips, and the Proposed Project, construction and operation of the proposed HVTL and proposed Substation are not anticipated to impact safe operation and use of the airport.

6.2.12.1 Mitigation Measures

No impacts to emergency services are anticipated, Minnkota will minimize potential impacts through coordination of the construction with local and state road authorities and use signage during construction to alert drivers. No significant conflicts are anticipated.

Operation of the HVTL is not expected to impact traffic along these roadways and pole placement and construction procedures will be developed in consultation with state and county roadway authorities to meet requirements for clear zones and roadside obstructions. Planning for the Proposed Project will also be coordinated with MnDOT, Clearwater County, and Hubbard County transportation policies to minimize impacts from construction of the Proposed Project.

6.3 Land Based Economics

6.3.1 Agriculture

A portion of the Proposed Route is classified as herbaceous agricultural vegetation in the MDNR Gap Analysis Program (GAP) Land Cover data set (reference [11]) as shown on **Figure 6**.

Soil types included within the Proposed Route are shown on **Figure 7** ([reference [12]). A complete list of soil types mapped by SSURGO crossed by the anticipated centerline are included in **Table 14**. The two most predominant soil types within the Proposed Route include Snellman sandy loam, 1 to 8 percent slopes and Sugarbush-Two Inlets complex, 1 to 8 percent slopes. Snellman sandy loams is considered prime farmland and is well drained. The Sugarbush-Two Inlets complex is not considered prime farmland and is also well drained.

Table 14 SSURGO Soil Types Crossed by Anticipated Centerline

Mapunit Symbol	Mapunit Name	Miles Crossed by Anticipated Centerline
1152B	Sugarbush loamy sand, 1 to 8 percent slopes	0.03
1164	Zerkel loam	0.44
121	Wykeham fine sandy loam, 1 to 3 percent slopes	0.80
1244B	Sol-Sugarbush complex, 2 to 8 percent slopes, very stony	0.19
1244E	Sol-Sugarbush complex, 15 to 30 percent slopes, very stony	0.10
1294	Nary fine sandy loam, 1 to 3 percent slopes	0.16
1336	Blowers fine sandy loam, morainic, 1 to 3 percent slopes, stony	0.17
1421B	Rockwood-Two Inlets, morainic, complex, 3 to 8 percent slopes, stony	0.46
1421C	Rockwood-Two Inlets, morainic, complex, 8 to 15 percent slopes, stony	0.15
1421E	Rockwood-Two Inlets, morainic, complex, 15 to 30 percent slopes, stony	0.10
1943	Roscommon loamy sand, map 22-30, 0 to 2 percent slopes	0.06
267B	Snellman sandy loam, 1 to 8 percent slopes	1.71
267C	Snellman sandy loam, 8 to 15 percent slopes	0.32
540	Seelyeville muck	0.06
544	Cathro muck	0.21
675C	Two Inlets-Eagleview-Steamboat complex, pitted, 3 to 15 percent slopes	0.52
709B	Lengby fine sandy loam, 2 to 8 percent slopes	0.58
709C	Lengby fine sandy loam, 8 to 15 percent slopes	0.28
775B	Sugarbush-Two Inlets complex, 1 to 8 percent slopes	1.73
775C	Sugarbush-Two Inlets complex, 8 to 15 percent slopes	0.15
776B	Snellman-Sugarbush complex, 2 to 8 percent slopes	0.77
797	Mooselake and Lupton soils, 0 to 1 percent slopes	0.39
		9.36

Federal regulations define prime farmland as "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses." (7 C.F.R. 657.5(a)(1)). Areas identified as prime farmland occur within nearly half of the Proposed Route; representing approximately 42 percent of the area within the Anticipated Alignment and 41 percent of the area within the Proposed Route (**Table 15**).

However, the amount of agricultural land removed from production will be minimal and will be limited to areas where HVTL structures are built. The HVTL structures will affect only about 0.04 acre of prime farmland.

There are no areas within the Project area identified as prime farmland if drained (soils that have the potential to be prime farmland but will require hydrologic alteration).

Generally, HVTL construction activities can result in impacts to agricultural lands, including soil erosion, interference with and damage to agricultural surface and subsurface drainage and irrigation systems, mixing or loss of topsoil and subsoil, and soil compaction. Given the location of the Proposed Project along existing roadway corridors and the limited number of agricultural fields along the route, these impacts are expected to be minimal.

Table 15 Prime Farmland within the Anticipated Alignment and Proposed Route

Project Area	Prime Farmland (Acres)		
	Anticipated Alignment	Proposed Route	Area Affected by Proposed Structures
Proposed Project	41	140	0.04

6.3.1.1 Mitigation Measures

Landowners will be compensated for the use of their land through easement payments. Additionally, the Applicant intends to minimize loss of farmland and rural properties and to ensure reasonable access to the land near the structures by overlapping with existing ROW along the existing Clearwater-Polk Electric distribution line corridor in the areas shown in **Appendix B**.

Permanent impacts to cropland will occur where HVTL structures are placed on cropland. In areas where cropland is crossed, temporary impacts such as soil compaction and crop damages within the ROW may occur. When possible the Applicant will construct the poles before crops are planted. However, if construction after crop planting is necessary, disturbance to farm soil from access to each structure location will be minimized by using the shortest access route. This may require construction of temporary driveways between the roadway and the structure, but will limit traffic on fields between structures. Construction mats may also be used to minimize impacts on the access paths and in construction areas. The Applicant's construction team will work with the property owner, ROW agent, and engineers to minimize the impact on property through use of the landowner's knowledge of the property. In addition to payments for easements acquired, the Applicant will compensate landowners for any crop damage and soil compaction that occurs as a result of the Proposed Project.

6.3.2 Forestry

There are no known tree farms or federal forests located within the Proposed Route or proposed Substation site. The Paul Bunyan State Forest is located adjacent to the Proposed Route as shown on

Figure 3. The Proposed Route crosses a portion of the Mississippi Headwaters State Forest; however, the Anticipated Alignment does not cross it. Additionally, the general vicinity near the Proposed Route is largely comprised of temperate and boreal forests as shown on **Figure 6;** however the majority of the Anticipated Alignment is located within existing ROWs in non-forested areas. Some minimal impacts to forestry resources are anticipated as the result of tree clearing needed to construct the Proposed Project and to maintain the HVTL right-of-way.,

6.3.2.1 Mitigation Measures

Minnkota will limit the amount of tree clearing in the right-of-way to what is necessary to construct the Project. The Anticipated Alignment is mostly located within existing ROWs which will also minimize the need to clear trees from the forested areas within the vicinity of the Proposed Project. In addition, Minnkota will consult with landowners, MDNR, MnDOT, and local agencies to develop plans for replacing cleared trees, where required.

6.3.3 Tourism

No designated tourist areas are present within the Proposed Route or proposed Substation site.

However, nearby lakes, rivers, state forests, and Itasca State Park (located adjacent to portions of the Proposed Project), provide a variety of outdoor recreational activities for tourists visiting the area (**Figure 4**).

6.3.3.1 Mitigation Measures

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

6.3.4 Mining

Based on a review of aerial photographs, no gravel pits, rock quarries, or commercial aggregate sources will be impacted by the Proposed Project. A small borrow area is located along 115th Avenue southwest of the intersection of 400th Street and 115th Avenue. Because the Anticipated Alignment is located on the opposite side of 115th Avenue, there will be no impacts on this borrow area.

6.3.4.1 Mitigation Measures

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

6.4 Archaeological and Historic Resources

Archaeological and historic resources are those places that represent the visible or otherwise tangible record of human occupation. These resources vary in size, shape, condition, and importance, among other considerations; some are evident on the landscape, while others are buried or only visible to knowledgeable people.

A Phase Ia background research was conducted to identify any known archaeological or historic resources within the Proposed Route. The Phase Ia background research indicated that two historic sites, one

archaeological site, and one possible archaeological site are recorded within of 0.5 mile of the Proposed Route (**Figure 8**). These sites include CE-ITS-001, CE-ITS-002, 21CE0065, and FS4.

Itasca State Park (CE-ITS-001) is listed on the National Register of Historic Places (NRHP), and is located adjacent to the Proposed Route. The portion of the Proposed Route adjacent to Itasca State Park is heavily wooded with scattered tamarack swamps. CE-ITS-002 is the Wicken Farmstead at the far northern limits of the Proposed Project. This historic property is located approximately 0.3 mile west-northwest of the Proposed Route (**Figure 8**).

The archaeological resource (21CE0065) is located within 800 feet of the Proposed Route and was recommended not eligible for NRHP. The Site lead (FS4 [Find Sport 4]) is located within 0.5 mile of the Proposed Route and consists of a reference in Aborigines of Minnesota (Winchell 1911: 364) which states that village sites, mounds, and a midden were located within the SW 1/4 of Section 36 (T144N, R36W) (State Archaeological Files, Office of the State Archaeologist). The Proposed Route runs along a portion of the far eastern and northern edges of FS4.

Minnkota contracted with 10,000 Lakes Archaeology, Inc. to conduct field archaeological surveys in the areas along the Anticipated Alignment that were identified as having a moderate to high potential for unrecorded archaeological sites based on the outcomes of the Phase Ia background research. These included areas near water sources or recorded archaeological sites, or on prominent topographic features.

Phase I archaeological survey methods typically involve archaeologists walking areas where over 25% of the ground surface is visible (e.g. agricultural fields) in transects at five to 15-meter (m) intervals as appropriate. In areas where less than 25% of the ground surface is visible, or where buried archaeological sites have a high probability of existing, archaeologists conduct shovel tests. These excavations measure 30 to 40 centimeters in diameter and are placed at 15-m intervals within areas of moderate and high potential, as appropriate. Soil is screened through ¼-inch mesh hardware cloth to determine if cultural materials are present. The methods used for the archaeological survey are further discussed in the Phase I Archaeological Survey are provided in **Appendix G**.

The surveys were conducted in October 2015 and April 2016 and the results of the surveys indicated that there are no cultural resources located along the Anticipated Alignment. A report summarizing these findings are attached in **Appendix G**. One historic property, listed on the NRHP, is located adjacent to the Proposed Route; however the portion of the Proposed Route that is located directly adjacent to the historic property is co-located with an existing transmission line. Additionally, the historic property is the Itasca State Park which is heavily wooded and therefore obscures the viewshed.

The 10,000 Lakes Archaeology, Inc.'s Phase 1 cultural resources survey report (**Appendix G**) recommends no adverse effect by the Proposed Project on the historic property, the Itasca State Park (CE-ITS-001).

6.5 Natural Environment

6.5.1 Air Quality

Potential air quality effects related to HVTL facilities include fugitive dust emissions during construction, exhaust emissions from construction equipment, and ozone generation during operations. All of these potential effects are considered to be relatively minor, and all but the ozone effects are short term.

State and federal governments currently regulate permissible concentrations of ozone and nitrogen oxides. Ozone forms in the atmosphere when nitrogen oxides and volatile organic compounds react in the presence of heat and sunlight. Air pollution from cars, trucks, power plants, and solvents contribute to the concentration of ground-level ozone through these reactions. Currently, both state and federal governments regulate permissible concentrations of ozone and nitrogen oxides. The national standard is 0.075 parts per million (ppm) during an 8-hour averaging period. The state standard is 0.08 ppm based upon the fourth-highest 8-hour daily maximum average in 1 year. There are currently no non-attainment areas listed for Clearwater and Hubbard Counties (reference [13]).

The only potential air emissions from an HVTL result from corona, and such emissions are limited. Corona consists of the breakdown or ionization of air within a few centimeters immediately surrounding conductors and can produce ozone and oxides of nitrogen in the air surrounding the conductor. This process is limited because the conductor electrical gradient of a 115 kV HVTL is usually less than that necessary for the air to break down. Typically, some imperfection such as a scratch on the conductor or a water droplet is necessary to cause corona.

Ozone is not only produced by corona, but also forms naturally in the lower atmosphere from lightning discharges and from reactions between solar ultraviolet radiation and air pollutants such as hydrocarbons from auto emissions. The natural production rate of ozone is directly proportional to temperature and sunlight and inversely proportional to humidity. Thus, humidity (or moisture), the same factor that increases corona discharges from HVTLs, inhibits the production of ozone. Ozone is a reactive form of oxygen and combines readily with other elements and compounds in the atmosphere. Because of its reactivity, it is relatively short-lived.

During construction of the Proposed Project, minor emissions from vehicles and other construction equipment and fugitive dust from clearing activities will occur, but will be limited. Air quality impacts during the construction phase will also be temporary. The magnitude of construction emissions is heavily influenced by weather conditions and the specific construction activity. Exhaust emissions, primarily from diesel equipment, will vary according to the phase of construction, but will be minimal and temporary. Adverse impacts on the surrounding environment will be minimal because of the short and intermittent nature of the emission and dust-producing construction phases.

The Proposed Project is not anticipated to result in adverse or significant effects on air quality.

6.5.1.1 Mitigation Measures

BMPs will be implemented to minimize the amount of fugitive dust created by the construction process. Tracking control at access roads and wetting surfaces are examples of BMPs that may be used to minimize fugitive dust. With the use of these BMPs, it is that the Proposed Project will have minimal impacts on air quality.

6.5.2 Water Resources

6.5.2.1 Water Quality

The Proposed Project may have minor, short term effects on water quality. Impacts on water quality are possible during the construction phase of the Proposed Project, when sediment could possibly reach surface waters as excavation, grading, and construction traffic disturb the ground.

6.5.2.2 Mitigation Measures

The MPCA regulates construction activities that may impact storm water under the Clean Water Act. A National Pollutant Discharge Elimination System (NPDES) construction storm water permit and Storm Water Pollution Prevention Plan (SWPPP) are required for any construction activity disturbing: 1) one acre or more of soil; 2) less than one acre of soil if that activity is part of a "larger common plan of development or sale" that is greater than one acre; or 3) less than one acre of soil, but the MPCA determines that the activity poses a risk to water resources. The SWPPP outlines strategies and steps that will be taken to prevent nonpoint source pollution discharging from construction areas. The Applicant will obtain an NPDES permit and prepare a SWPPP for the Proposed Project.

Additionally, the proposed Substation will have a crushed aggregate surface which will limit impacts to ground water and BMPs, such as silt fence, will be installed to minimize water quality impacts during construction.

6.5.2.3 MDNR Public Waters Inventory

The MDNR Public Waters Inventory (PWI) identifies basins (lakes and wetlands) and watercourses over which the MDNR has regulatory jurisdiction (Minn. Stat. § 103G.005, subd. 15 and 15a). The Proposed Project will cross one PWI waterbody, LaSalle Creek, which is also a designated trout stream (**Figure 4**). However, it does not cross LaSalle Creek in the area designated as an Aquatic Management Area.

6.5.2.4 Mitigation Measures

No HVTL structures will be placed in LaSalle Creek or within a 50-foot buffer of the creek. To minimize erosion and sedimentation during construction activities, BMPs identified in the SWPPP will be implemented at the creek crossing. Only woody vegetation within the buffer will be removed at the ground surface, allowing for the existing root systems to stay in place and stabilize soils adjacent to the creek, preventing erosion and sedimentation.

6.5.2.5 Wetlands

Wetland locations within the Proposed Route were identified using the United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps. Wetlands are summarized in **Table 16** and shown on **Figure 4**.

Approximately 3.47 acres of wetland have been mapped within the Anticipated Alignment and approximately 11.55 acres of wetland have been mapped within the Proposed Route. Of the total wetlands present within the Proposed Route approximately 5 percent are emergent wetlands, 13 percent are forested, and 82 percent are scrub shrub. The Proposed Project will require five wetland crossings ranging in lengths from approximately 25 feet to approximately 787 feet. The maximum span length for the proposed single pole HVTL is 350 feet. Therefore, three wetland crossings measuring less than 350 feet will likely be spanned with single pole structures, and two wetland crossings measuring greater than 350 feet will be spanned using two or three pole structures. No HVTL structures will be placed in wetlands.

No wetlands were identified at the proposed Substation site and thus there will be no wetland impacts associated with construction of this facility.

Table 16 Acres of Wetland within Route/ROW and Substation Site

Wetland Type	Wetland (acres)		
	Anticipated Alignment	Proposed Route	Substation Site
Emergent	0.09	0.60	0.00
Forested	0.44	1.47	0.00
Scrub Shrub	2.94	9.48	0.00
Total acres	3.47	11.55	0.00

6.5.2.6 Mitigation Measures

The HVTL will be designed to span wetlands. The Applicant has designed the Proposed Project to avoid and minimize wetland impacts, and will install the appropriate BMPs as identified in the SWPPP, such as using silt fence.

6.5.2.7 Floodplain

This area has not been mapped for floodplains by the Flood Emergency Management Agency (FEMA) (reference [14]).

6.5.2.8 Mitigation Measures

No impacts to floodplain resources are anticipated; therefore, no mitigation measures are proposed.

6.5.3 Flora

The MDNR Gap Analysis Program (GAP) Land Cover data set (reference [11]) was used to identify land cover types within the Proposed Route. GAP land cover types within the Proposed Route and proposed Substation site are shown on **Figure 6**.

The GAP land cover data identifies approximately 27 percent of the land within the Proposed Route as developed/urban (roadway and roadway ROW in the Project area are classified by GAP as developed/urban), approximately 29 percent of the land as Eastern North American Cool Temperate Forest, and approximately 27 percent as North American Boreal Forest. Additional land cover types include Eastern North American Flooded and Swamp Forest, North American Boreal Flooded Swamp Forest, agricultural, and disturbed land (**Figure 6**).

Current GAP-reported land cover in the proposed Substation site is North American Boreal Forest (**Figure 6**).

6.5.3.1 Mitigation Measures

Impacts to non-forested areas will be temporary and will primarily occur during construction of the Proposed Project. To minimize impacts to trees the Applicant will limit tree clearing and removal to the HVTL ROW and areas that impact the safe operation of the facilities. Tree clearing to facilitate access to the ROW is not anticipated. Trees (danger trees) outside the ROW that may need to be trimmed or removed will primarily include trees that are unstable and could potentially fall into the transmission facilities. The Applicant will work with and compensate landowners for removal of trees not in the ROW.

Construction equipment has the potential to spread noxious weed-propagating material to new locations. The Applicant will comply with Minnesota noxious weed laws as described in Minn. Stat. § 18.75 to 18.91 and avoid the transport of state prohibited noxious weeds as well as secondary noxious weeds on the Hubbard and Clearwater County weed lists. Areas disturbed by construction of the HVTL will be reseeded using a seed mix appropriate to the site.

6.5.4 Fauna

The forested areas in the immediate vicinity of the Proposed Project provide habitat for a variety of fauna that are commonly found in wooded areas. These species may include deer, small mammals, waterfowl, raptors, perching birds, and amphibians. Because much of the Proposed Route is located adjacent to existing roads, fauna present in the vicinity of the Proposed Route are likely adapted to anthropogenic disturbance. Therefore it is not likely that the construction, operation, or maintenance of the Proposed Project will have any notable effect on fauna present in the area.

The primary potential impact presented to fauna by transmission lines is the potential injury and death of migratory birds such as raptors, waterfowl, and other large bird species. The electrocution of large birds, such as raptors, is more commonly associated with small distribution lines than large transmission lines. However, birds have the potential to collide with all elevated structures, including transmission lines. Avian collisions with transmission lines can occur in proximity to agricultural fields that serve as feeding areas,

wetlands and water features, and along riparian corridors that may be used during migration. Because the Proposed Project is located in or adjacent to heavily forested areas and will cross few waterbodies, it is anticipated that there will be minimal impacts on birds.

LaSalle Creek is a designated trout stream; however, HVTL structures will not be placed in the creek or within a 50-foot buffer of the creek. Woody vegetation, within a 50-foot buffer of the creek, will be removed at the ground surface, allowing the existing root systems to stay in place and stabilize the soils. The clearing of woody vegetation along the stream banks could result in temporary impacts to trout habitat by removing shade trees and causing a slight increase in water temperature.

6.5.4.1 Mitigation Measures

Displacement of fauna is anticipated to be minor and temporary in nature, and no long-term population-level impacts are anticipated from the Proposed Project. The Applicant will construct the HVTL according to Avian Power Line Interaction Committee (APLIC) recommended safety design standards regarding avian collisions and avian electrocution with HVTLs (reference [15]). In addition, the Applicant will install bird flight diverters on the static line where the line crosses a water body to reduce the likelihood of avian collisions.

Woody vegetation cleared from the 50-foot buffer zone of LaSalle Creek will be allowed to grow back as long as it does not pose a safety hazard to during the operations of the Proposed Project. The revegetation of shrubs and small trees will provide shade and restore trout habitat.

6.6 Rare and Unique Natural Resources

The USFWS list of federally threatened, endangered, proposed, and candidate species was reviewed (reference [16]) to obtain information on federally-listed species that could be present in the Project area. Within both counties, the gray wolf (*Canis lupus*; federally threatened) and the northern long-eared bat (*Myotis septentrionalis;* federally threatened*)* are known to occur. Additionally, the Canada lynx (*Lynx Canadensis*; federally threatened) is known to occur within Clearwater county. No critical habitat will be impacted by the Proposed Project.

Based on a desktop review, suitable foraging habitat is present for the Canada lynx and gray wolf; however, due to the species wide range, significant adjacent habitat, and ability to avoid temporary disturbance, the Proposed Project will have *no effect* on these species.

No known hibernacula or maternity roost trees for the northern long-eared bat have been documented within 1 mile of the Proposed Project (reference [17]). However, the USFWS has documented that these bats are known to occur within Clearwater County. Therefore, the Proposed Project *may affect, but is not likely to adversely affect* the northern long-eared bat. The USFWS has recently determined that no critical habitat will be designated for the northern long-eared bat (reference [18]).

In order to fulfill federal review requirements under Section 7 of the Endangered Species Act, the USFWS was consulted to address the potential for impacts to federally listed species (see Section 7.2).

In addition to the review of the USFWS federally threatened, endangered, proposed, and candidate species list, the MDNR Natural Heritage Information System (NHIS) database was queried in to obtain information on rare and unique natural resources within 1 mile of the Proposed Route (**Figure 3**).

Based on the NHIS database review, 17 features were identified within 1 mile of the Proposed Route. Eight of these features are special concern (not legally protected), one is on the watch list (not legally protected), six are rare communities (not legally protected), one is a plant listed as endangered, and one is a plant listed as threatened. Clinton's bulrush (*Trichophorum clintonii*, state threatened species) is known to occur within floodplains, shores, of rivers or lakes. The Project will not impact suitable habitat for this species. The Bog Adder's mouth (*Malaxis paludosa*, state endangered species) is known to occur within rich conifer swamps dominated black spruce, with occasional white cedar, tamarack, or balsam fir. The Project will not impact suitable habitat for this species. Based on this review of the NHIS database, we conclude the project will have no effect on state-listed species. The MDNR has indicated that it will conduct a survey of the Project corridor prior to construction to verify that no state-listed species will be impacted by the Proposed Project.

Several sites of high biodiversity significance are located in the vicinity of the Proposed Route (**Figure 3**). A site's biodiversity significance is based on the presence of rare species populations, native plant communities, and the landscape context of the site. Sites of high biodiversity significance contain very good quality occurrences of the rarest species, high-quality examples of rare native communities, and/or important functional landscapes. The Proposed Route crosses one site of high biodiversity significance in Clearwater County; however, this data is preliminary. In addition, the Proposed Route crosses one site of high biodiversity significance in Hubbard County.

The bald eagle is not protected by the state or federal threatened and endangered species programs in Minnesota; however, under the Bald and Golden Eagle Act, bald eagle nest structures may not be removed, regardless of bird activity or time of year. If a nest is identified in a tree which would otherwise require removal for construction activities, this tree must be marked for preservation and appropriate avoidance measures employed, including buffer zones, time of year restrictions, or project realignment if necessary.

6.6.1 Mitigation Measures

The Proposed Route and Anticipated Alignment are located within or adjacent to road ROWs, and existing distribution line ROWs to minimize impacts to the sites of high biodiversity significance. The Proposed Project will not result in significant impacts to rare and unique resources. As previously mentioned, the Applicant will construct the transmission line according to APLIC recommended safety design standards regarding avian collisions and avian electrocution with HVTLs (reference [15]).

Based on early consultations with the MDNR, the Proposed Project has been designed to minimize impacts to rare and unique resources to the extent practicable. In the event that avoiding impacts to threatened or endangered species is not feasible, the Applicant will work with regulatory agencies to identify appropriate measures to minimize impacts, if they cannot be avoided.

Mitigation measures to reduce impacts to the northern long-eared bat are not required per consultation with the MDNR and the USFWS 4(d) Rule because there are no known roost trees located within 150 feet of the Proposed Project and no known bat hibernacula located within 0.25 mile of the Proposed Project (reference [19]). Therefore, Minnkota will have no timing restrictions for clearing trees within the Anticipated Alignment.

7.0 Agency Involvement, Public Participation and Required Permits and Approvals

In October 2015 and January and February of 2016, Minnkota submitted pre-filing notice letters to the Local Governmental Units (LGU), state agencies, and federal agencies within the Project area to provide notice of the Proposed Project, and to request comments and concerns regarding the Proposed Project. These letters are included in **Appendix D**. Responses received are summarized below and are included in **Appendix E**. No responses have been received from LGUs.

7.1 United States Rural Utilities Service

As the Proposed Project will be financed through RUS, an Environmental Report will be prepared to fulfill National Environmental Policy Act (NEPA) requirements. Consultation under the Section 106 of the National Historic Preservation Act (NHPA) and Section 7 of the Endangered Species Act (ESA) will be required as part of this environmental review process.

Section 106 of the NHPA (16 U.S.C. 470) requires that federal agencies take into account the potential effects of their proposed actions (undertakings) on historic properties, and to develop measures to avoid, minimize, or mitigate any adverse effects. The NHPA also requires federal agencies to consult with Indian Tribes that may be affected by the Proposed Project, the State Historic Preservation Officer, and other appropriate parties as defined in 36 CFR § Section 800.2.

Minnkota contacted tribes in the vicinity of the Proposed Project. Leech Lake Band of Ojibwe responded on March 9, 2016 (**Appendix E**) indicating that they do not have any known recorded sites of religious or cultural importance within the Project area. The SHPO will be consulted after completion of the Phase 1 archaeological surveys.

The USFWS oversees compliance with ESA (16 U.SC. Sections 15361–1534), which requires that federal agencies "insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat of such species." Minnkota, on behalf of the RUS, consulted with the USFWS regarding the potential for adverse effects (**Appendix D**). Minnkota received concurrence that the Proposed Project will not adversely affect all federally-listed species except the northern long-eared bat (**Appendix E**). Based on consultation with the UWFWS regarding the bat, Minnkota submitted a Streamlined Consultation Form, specific to the northern long-eared bat, on March 31, 2016 (**Appendix D**). In May 2016 correspondence, the USFWS stated that because the Proposed Project is covered under the final 4(d) Rule and 30 days have elapsed since submittal of the Streamlined Consultation Form, Minnkota may proceed with the proposed construction activities with no restrictions in tree clearing.

7.2 Required Permits and Approvals

In addition to a Route Permit, other federal, state, and local permits could potentially be required for the Proposed Project. These are identified below in **Table 17**.

Table 17 Potential Permits Required

Permit	Jurisdiction
Federal	
NEPA Environmental Review	RUS
Section 404 Permit	USACE
State	
Route Permit	MPUC
Utility Permit	MnDOT
Utility Crossing License	MDNR
NPDES Construction Stormwater Permit	MPCA
Local	
Minnesota Wetland Conservation Act Certification	Clearwater County and Hubbard Soil and Water Conservation District

For the other permits listed in **Table 17**, and any additional permit requirements identified during subsequent agency consultations, the Applicant will acquire the necessary authorizations and develop the appropriate plans associated with any permit or authorization.

7.2.1 Federal Permits

7.2.1.1 U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (USACE) regulates the placement of fill material into wetlands that are located adjacent to, or hydraulically connected to, interstate or navigable waters under the authority of Section 404 of the Clean Water Act.

On January 27, 2016, Minnkota submitted a pre-filing notice letter to the USACE to provide notice of the Proposed Project and requested comments and concerns on the Proposed Project. This letter is included in **Appendix D**. The USACE responded that it is unlikely that they will review or comment on the document until they receive a jurisdictional determination request, a request for a pre-application consultation meeting, and/or a permit application. They provided a general comment that if the project involves activity in a navigable water, it may be subject to Section 10 of the Rivers and Harbors Act of 1899, or if the project involves discharge of dredge or fill material into the waters of the United States, it may be subject to Section 404 of the Clean Water Act. Their response is included in **Appendix E**.

No pole placement or fill is anticipated to occur within wetlands as a result of the Proposed Project therefore a Section 404 permit will not be required from USACE. In the unanticipated event that a pole or fill is required to be placed in a wetland as a result of the Proposed Project, work will likely occur under a non-reporting Regional General Permit (RGP-3-MN) which provides for utility line discharges. Notification

will be required if the Proposed Project crosses more than 500 feet of wetland and requires direct fill for placement of structures in wetlands.

7.2.2 State of Minnesota Permits

7.2.2.1 Minnesota Public Utilities Commission

Minn. Stat. § 216E.03, subd. 2, provides that no person may construct a HVTL without a Route Permit from the Commission. The Applicant is seeking a Route Permit from the Commission with this Application.

7.2.2.2 Minnesota Department of Natural Resources

The MDNR Division of Lands and Minerals regulates utility crossings on, over, or under any state land or public water identified on the Public Waters and Wetlands Maps. A license to cross Public Waters is required under Minn. Stat. § 84.415 and Minn. R., chapter 6135. MDNR comments on the Proposed Project are included in **Appendix E**.

7.2.2.3 Minnesota Pollution Control Agency

MPCA requires an NPDES construction storm water permit and SWPPP for owners or operators for any construction activity disturbing: 1) one acre or more of soil; 2) less than one acre of soil if that activity is part of a "larger common plan of development or sale" that is greater than one acre. The MPCA may also require the Proposed Project to have an individual NPDES/SDS construction storm water permit. Most construction activities are covered by the general NPDES storm water permit for construction activity. Individual NPDES/SDS permits may be required for very large projects or projects that have a high potential to impact environmentally sensitive areas. The Applicant will determine if their project exceeds the one acre threshold, and, if so, obtain the permit or notice of permit coverage from the MPCA. The MPCA would notify the Applicant if they will need to obtain an individual NPDES/SDS permit for their project.

7.2.3 Local Permits

Once the Commission issues a Route Permit, zoning, building and land use regulations and rules are preempted per Minn. Stat. § 216E.10, subd. 1. Applicable permits from Hubbard and Clearwater Counties concerning road access, road ROW, and wetlands under Minnesota Wetland Conservation Act (WCA) will be secured as needed for the Proposed Project. The applicant did not receive responses from Hubbard or Clearwater County by the time of this application.

8.0 References

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[18] Federal Register, *Endangered and Threatened Wildlife and Plants; Determination That Designation of Critical Habitat Is Not Prudent for the Northern Long-Eared Bat (50 C.F.R. Part 17,* vol. 81, 2016, pp. 24707-24714.

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9.0 Definitions

Following are a list of definitions used in this Application:

Avian	Of or relating to birds.
A-weighted Scale	The sensitivity range for human hearing.
Breaker	Device for opening a circuit.
Bus	An electrical conductor that serves as a common connection for two or more electrical circuits; may be in the form of rigid bars or stranded conductors or cables.
Conductor	A material or object that permits an electric current to flow easily.
Corona	The breakdown or ionization of air in a few centimeters or less immediately surrounding conductors.
Double-circuit	The construction of two separate circuits at the same or different voltage on the same structures to increase capacity of the line.
Electric Field (EF)	The field of force that is produced as a result of a voltage charge on a conductor or antenna.
Electromagnetic	The term describing the relationship between electricity and magnetism; a quality that combines both magnetic and electric properties.
Electromagnetic Fields (EMF)	The term EMF refers to electric and magnetic fields that are coupled together, such as in high frequency radiating fields. For the lower frequencies associated with power lines, EMF should be separated into electric and magnetic fields. Electric and magnetic fields arise from the flow of electricity and the voltage of a line. The intensity of the electric field is related to the voltage of the line. The intensity of the magnetic field is related to the current flow through the conductors.
Excavation	A cavity formed by cutting, digging, or scooping.
Fauna	The collective animals of any place or time that live in mutual association.
Flora	The collective plants of any place or time that live in mutual association.
Grading	To level off to a smooth horizontal or sloping surface.
Grounding	To connect electrically with a ground.
Habitat	The place or environment where a plant or animal naturally or normally lives and grows.
High Voltage Transmission Lines (HVTL)	Overhead and underground conducting lines of either copper or aluminum used to transmit electric power over relatively long distances, usually from a central generating station to main substations. They are also used for electric power transmission from one central station to another for load sharing. High voltage transmission lines typically have a voltage of 69 kV or more.
Hydrocarbons	Compounds that contain carbon and hydrogen, found in fossil fuels.

Ionization	Removal of an electron from an atom or molecule. The process of producing ions. The electrically charged particles produced by high-energy radiation, such as light or ultraviolet rays, or by the collision of particles during thermal agitation.
Magnetic Field (MF)	The region in which the magnetic forces created by a permanent magnet or by a current-carrying conductor or coil can be detected. The field that is produced when current flows through a conductor or antenna.
Mitigate	To lessen the severity of or alleviate the effects of.
Neutral to Earth Voltage (NEV)	The term NEV is used to describe a measurable level of voltage which may occur between a metal object and the adjacent floor or earth.
Oxide	A compound of oxygen with one other more positive element or radical.
Ozone	A form of oxygen in which the molecule is made of three atoms instead of the usual two.
Raptor	A member of the order Falconiformes, which contains the diurnal birds of prey, such as the hawks, harriers, eagles, and falcons.
Sediment	Material deposited by water, wind, or glaciers.
Scientific and Natural Area	A program administered by the MDNR with the goal to preserve and perpetuate the ecological diversity of Minnesota's natural heritage, including landforms, fossil remains, plant and animal communities, rare and endangered species, or other biotic features and geological formations, for scientific study and public edification as components of a healthy environment.
Site of Biodiversity Significance	The Minnesota County Biological Survey collects baseline data on the distribution and ecology of native plant communities. At the conclusion of the work, the MCBS assigns a biodiversity significance rank to each site surveyed.
Stray Voltage	"Stray voltage" is a condition that can occur on the electric service entrances to structures from distribution lines, not transmission 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 or residences. Transmission lines, however, can induce stray voltage on a distribution circuit that is parallel to and immediately under the transmission line.
Substation	A substation is a high voltage electric system facility. It is used to switch generators, equipment, and circuits or lines in and out of a system. It also is used to change AC voltages from one level to another. Some substations are small with little more than a transformer and associated switches. Others are very large with several transformers and dozens of switches and other equipment.
Ultraviolet Radiation	A portion of the electromagnetic spectrum with wavelengths shorter than visible light.
Voltage	Electric potential or potential difference expressed in volts.

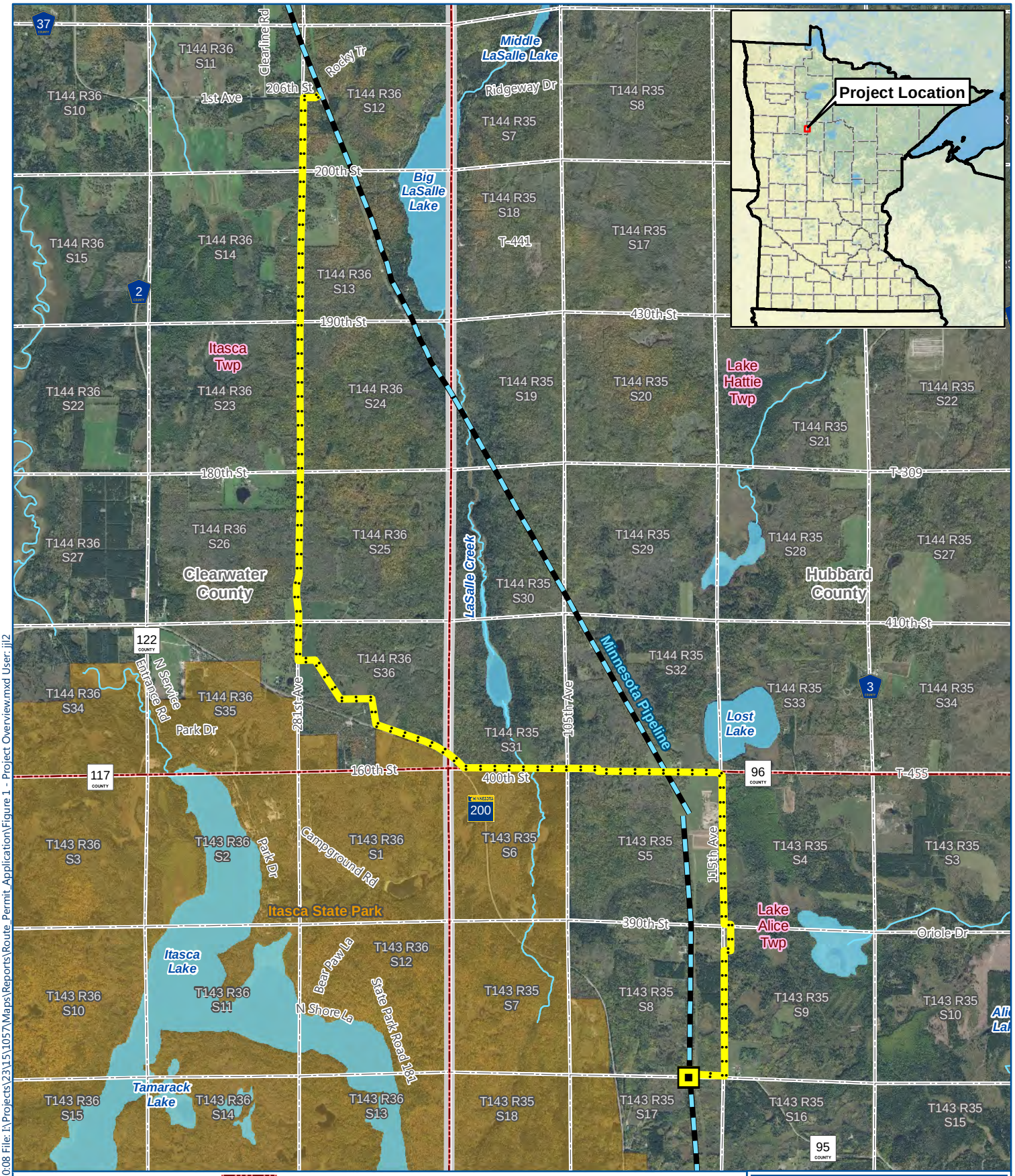
Waterfowl	A bird that frequents water; especially a swimming game bird (as a duck or goose) as distinguished from an upland game bird or shorebird.
Waterfowl Production Area (WPA)	Waterfowl Production Areas preserve wetlands and grasslands critical to waterfowl and other wildlife. These public lands, managed by the U.S. Fish and Wildlife Service, were included in the National Wildlife Refuge System in 1966 through the National Wildlife Refuge Administration Act.
Wetland	Wetlands are areas that are periodically or permanently inundated by surface or ground water and support vegetation adapted for life in saturated soil. Wetlands include swamps, marshes, bogs, and similar areas.
Wildlife Management Area (WMA)	Wildlife Management Areas are part of Minnesota's outdoor recreation system and are established to protect those lands and waters that have a high potential for wildlife production, public hunting, trapping, fishing and other compatible recreational uses.

10.0 Acronyms

AC	Alternating Current
ACOE	U.S. Army Corps of Engineers
ALJ	Administrative Law Judge
Applicant	Minnkota Power Cooperative, Inc. (Minnkota)
Application	Route Permit Application
Barr	Barr Engineering Company
BMP	Best Management Practice
BPA	Bonneville Power Administration
Brookings Project	Brookings County – Hampton 345 kV Route Permit proceeding
Commission	Minnesota Public Utilities Commission
Company	Northern States Power Company
dBA	A-weighted sound level in decibels
DC	Direct Current
ECS	Ecological Classification System
EF	Electric Field
ELF	Extremely Low Frequency
EMF	Electric and Magnetic Fields
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
GAP	Gap Analysis Program
GIS	Geographic Information System
HVTL	High Voltage Transmission Line
kV	Kilovolt
kV/m	Kilovolts Per Meter
L	Level Descriptors or Statistical Sound Levels
L_{10}	the dBA that may be exceeded 10 percent of the time within an hour
L_{50}	the dBA that may be exceeded 50 percent of the time within an hour
LGU	Local Government Unit
MCBS	Minnesota County Biological Survey
MF	Magnetic Field
mG	milliGauss
MnDNR	Minnesota Department of Natural Resources
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MPUC	Minnesota Public Utilities Commission
NAC	Noise Area Classification
NESC	National Electric Safety Code
NEV	Neutral to Earth Voltage
NHIS	National Heritage Information System
NIEHS	National Institute of Environmental Health Sciences

NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
ppm	parts per million
PPSA	Power Plant Siting Act
Project	MPL - Laporte Project
PWI	MnDNR Public Water Inventory
RGP	Regional General Permit
SHPO	Minnesota State Historic Preservation Office
SBS	Site of Biodiversity Significance
SNA	Scientific and Natural Area
SWPPP	Stormwater Pollution Prevention Plan
USFWS	United States Fish and Wildlife Service
VOR	Very-High-Frequency Omni-Directional Range
WCA	Wetland Conservation Act
WMA	Wildlife Management Area
Working Group	Interagency Working Group
WPA	Waterfowl Production Area

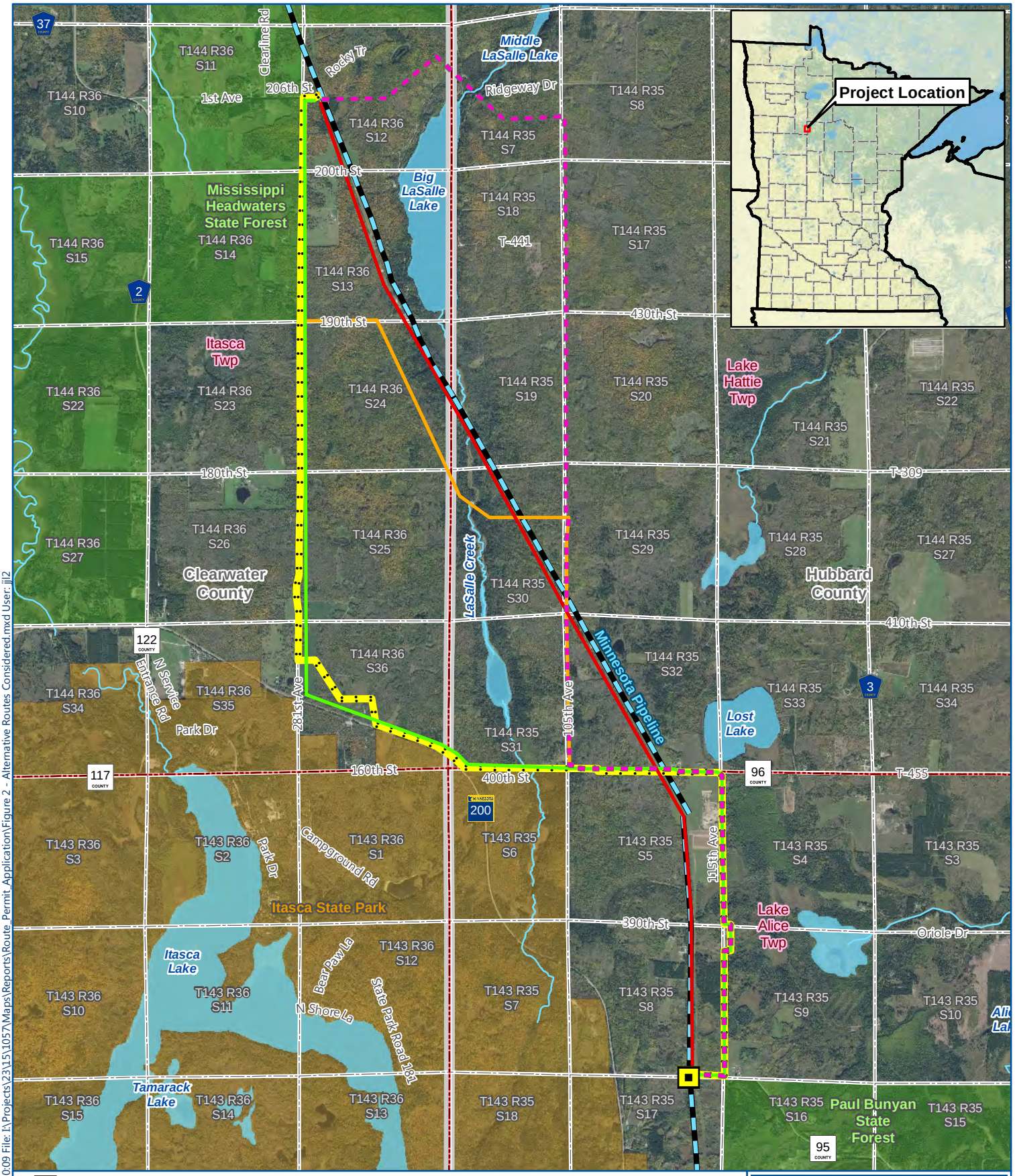
Figures



PROJECT OVERVIEW
MPL - Laporte Project
Minnkota Power Cooperative, Inc.
Clearwater and Hubbard Counties

FIGURE 1

Barr Footer: ArcGIS 10.4, 2016-05-26 10:08 File: I:\Projects\23\15\1057\Maps\Reports\Route_Permit_Application\Figure 1 - Project Overview.mxd User: jjl2



New Substation
PWI Watercourse
PWI Basin
Township Boundary
PLS Section
County Boundary
State Park
State Forest
Minnesota Pipeline

Alternative Routes

Orange Route
Purple Route
Red Route
Green Route
Proposed Route (Yellow Route)

N

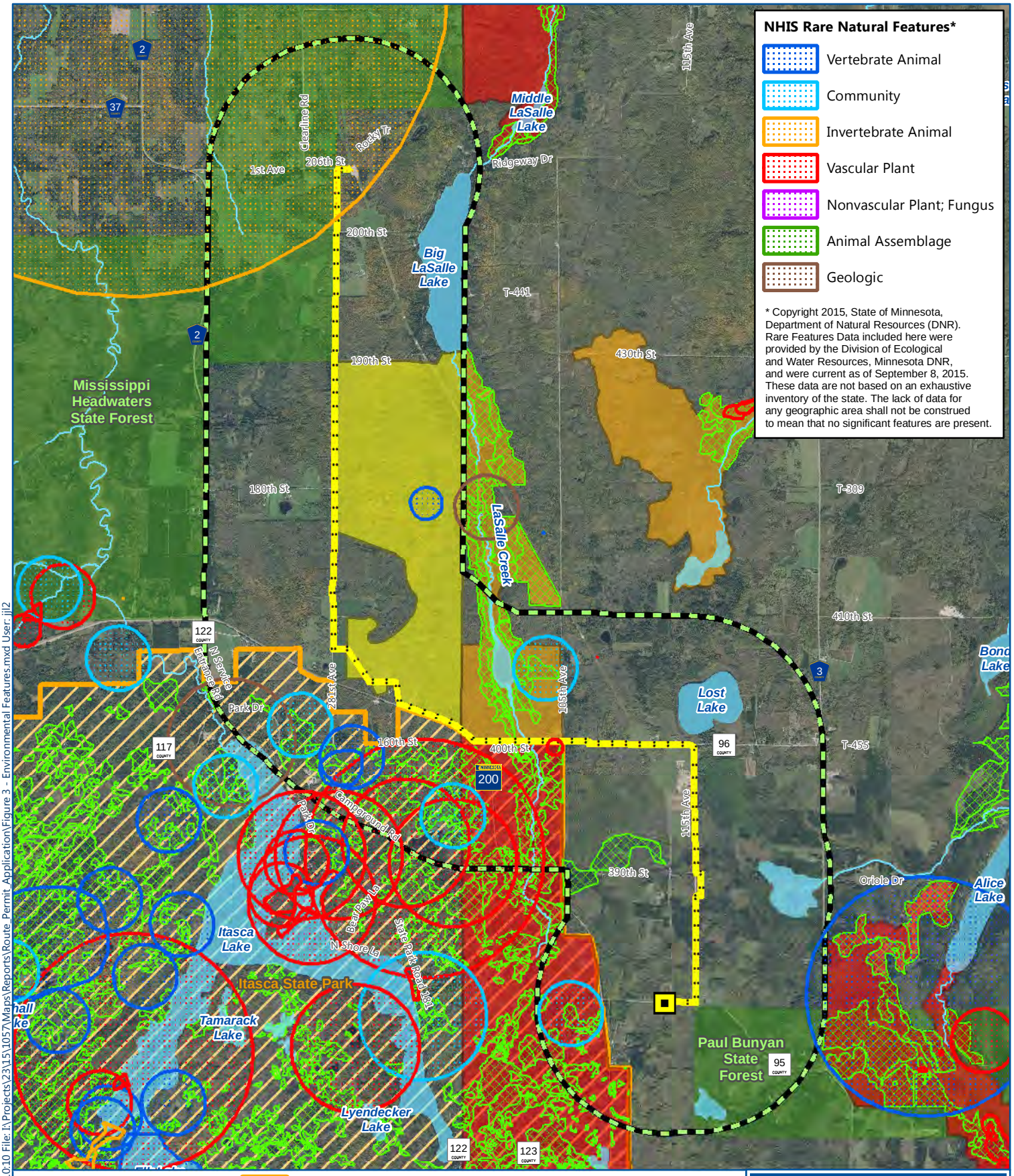
0 2,250 4,500
Feet

Image Source: FSA (2015)

ALTERNATIVE ROUTES CONSIDERED
MPL - Laporte Project
Minnkota Power Cooperative, Inc.
Clearwater and Hubbard Counties

FIGURE 2

Barr Footer: ArcGIS 10.4, 2016-05-26 10:09 File: I:\Projects\23\15\1057\Maps\Reports\Route_Permit_Application\Figure 2 - Alternative Routes Considered.mxd User: jil2



New Substation
Proposed Route
1 Mile Buffer
PWI Watercourse
PWI Basin
Native Plant Community

State Park
State Forest

Sites of Biodiversity Significance

Outstanding
High
High (Preliminary)

N

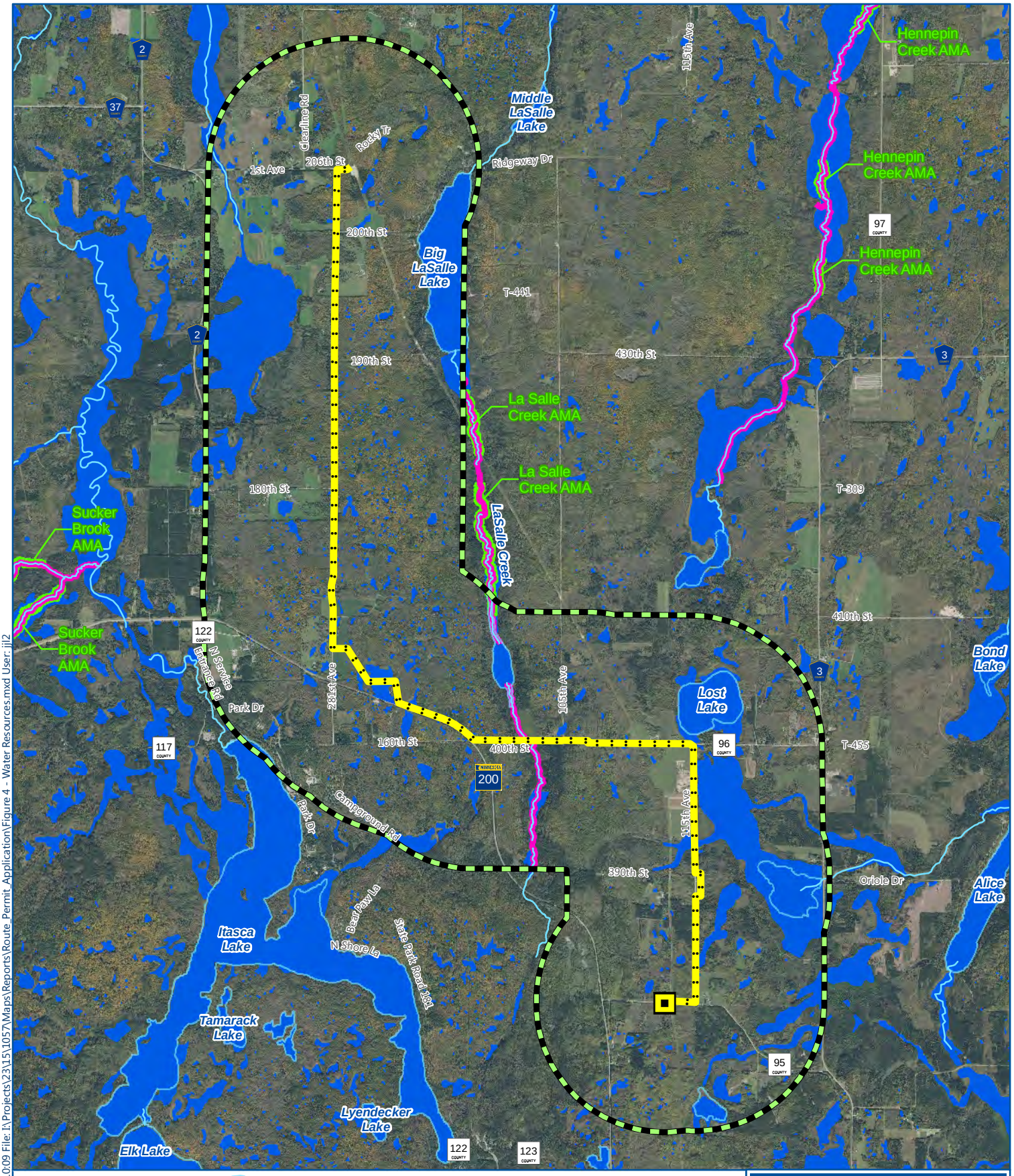
0 0.5 1
Miles

Image Source: FSA (2015)

ENVIRONMENTAL FEATURES
MPL - Laporte Project
Minnkota Power Cooperative, Inc.
Clearwater and Hubbard Counties

FIGURE 3

Barr Footer: ArcGIS 10.4, 2016-05-26 10:10 File: I:\Projects\23\15\1057\Maps\Reports\Route_Permit_Application\Figure 3 - Environmental Features.mxd User: jjl2



New Substation

Proposed Route

1 Mile Buffer

Trout Stream

PWI Watercourse

PWI Basin

Aquatic Management Area

NWI Wetlands

N

0 0.5 1

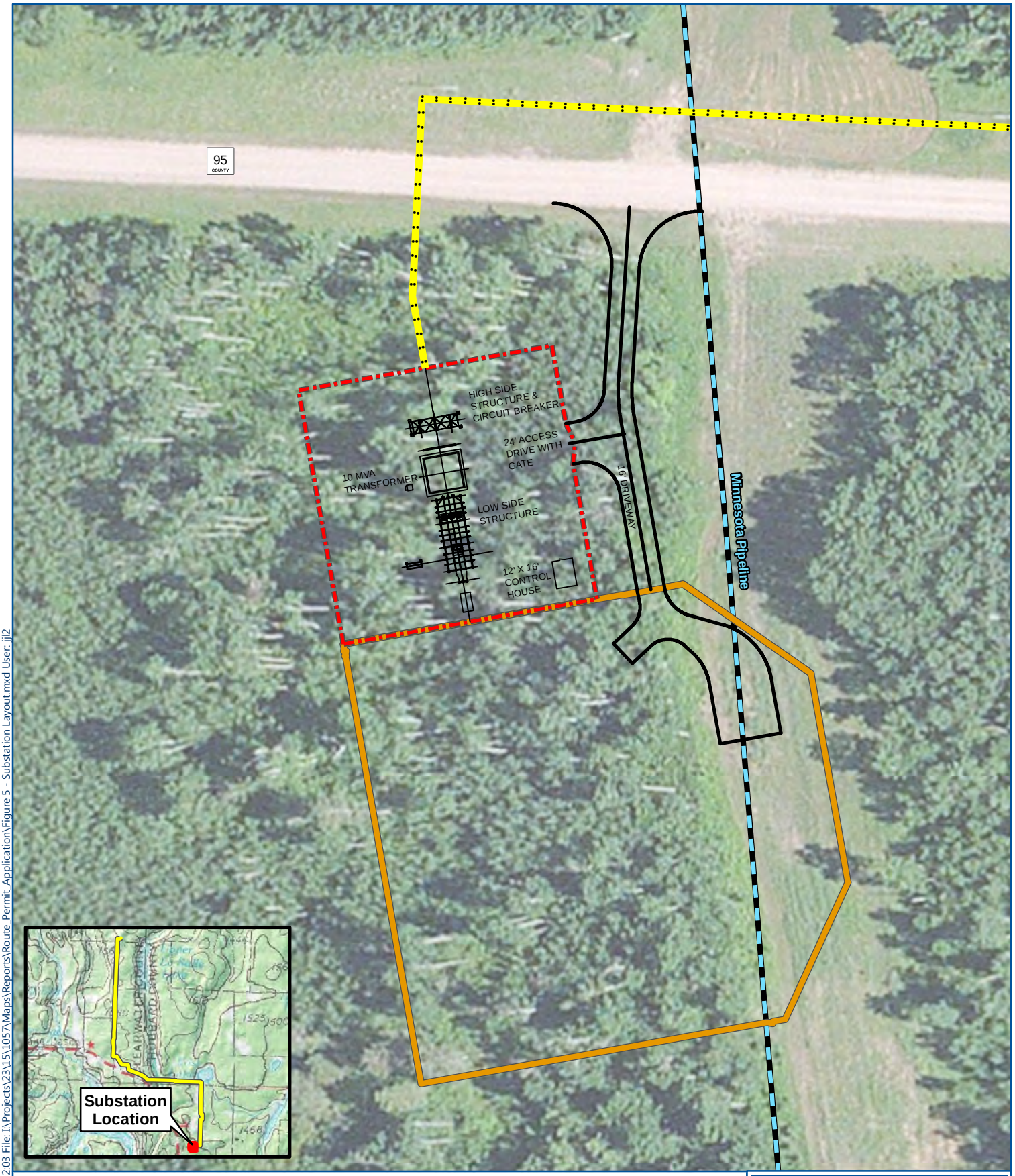
Miles

Image Source: FSA (2015)

WATER RESOURCES
MPL - Laporte Project
Minnkota Power Cooperative, Inc.
Clearwater and Hubbard Counties

FIGURE 4

Barr Footer: ArcGIS 10.4, 2016-05-26 10:09 File: I:\Projects\23\15\1057\Maps\Reports\Route_Permit_Application\Figure 4 - Water Resources.mxd User: jjl2



Proposed Route

Minnesota Pipeline

Substation

Pumping Station

N

0 37.5 75

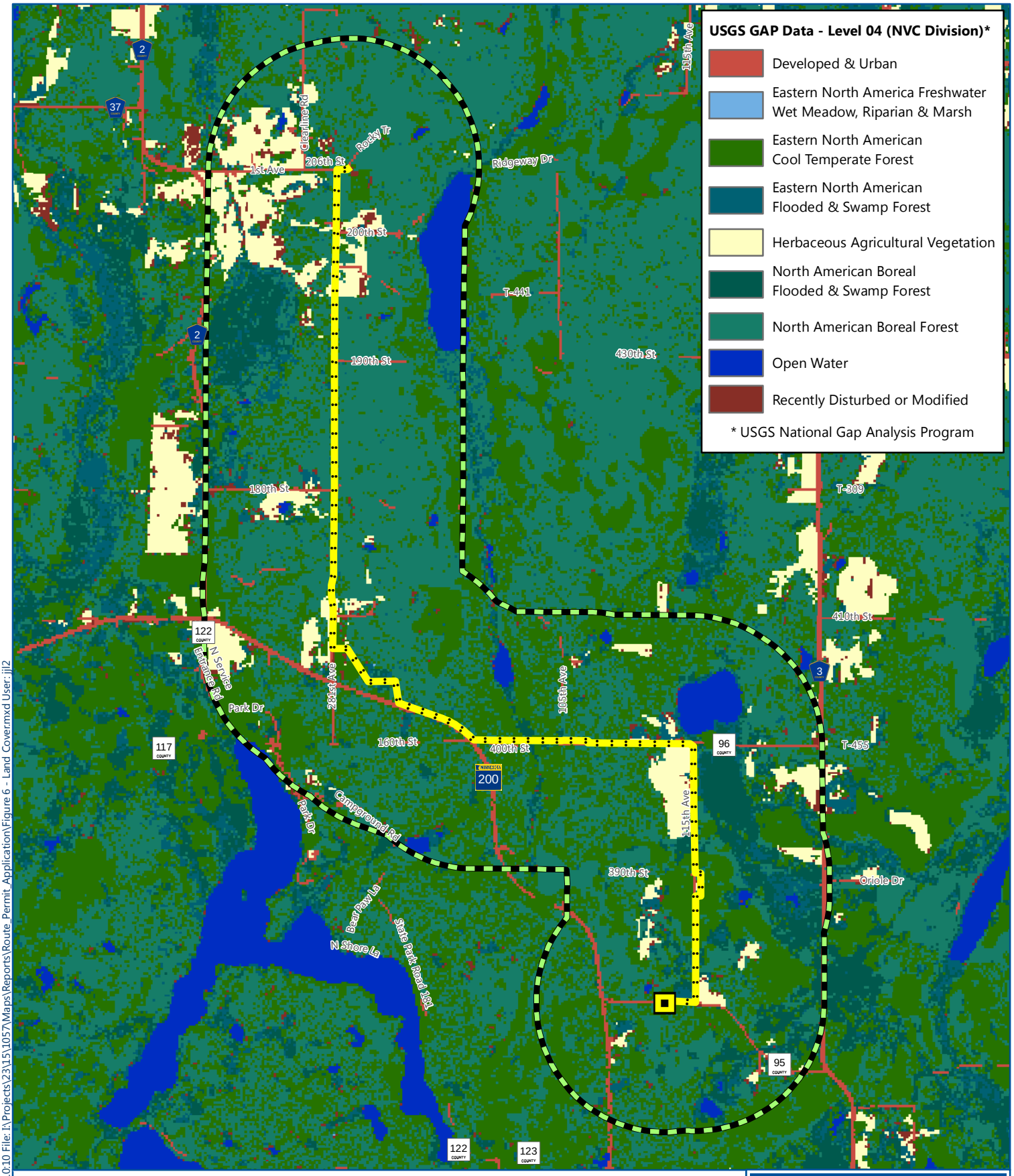
Feet

Image Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

SUBSTATION LAYOUT
MPL - Laporte Project
Minnkota Power Cooperative, Inc.
Clearwater and Hubbard Counties

FIGURE 5

Barr Footer: ArcGIS 10.4, 2016-05-26 12:03 File: I:\Projects\23\15\1057\Maps\Reports\Route_Permit_Application\Figure 5 - Substation Layout.mxd User: jil2



New Substation

Proposed Route

1 Mile Buffer

N

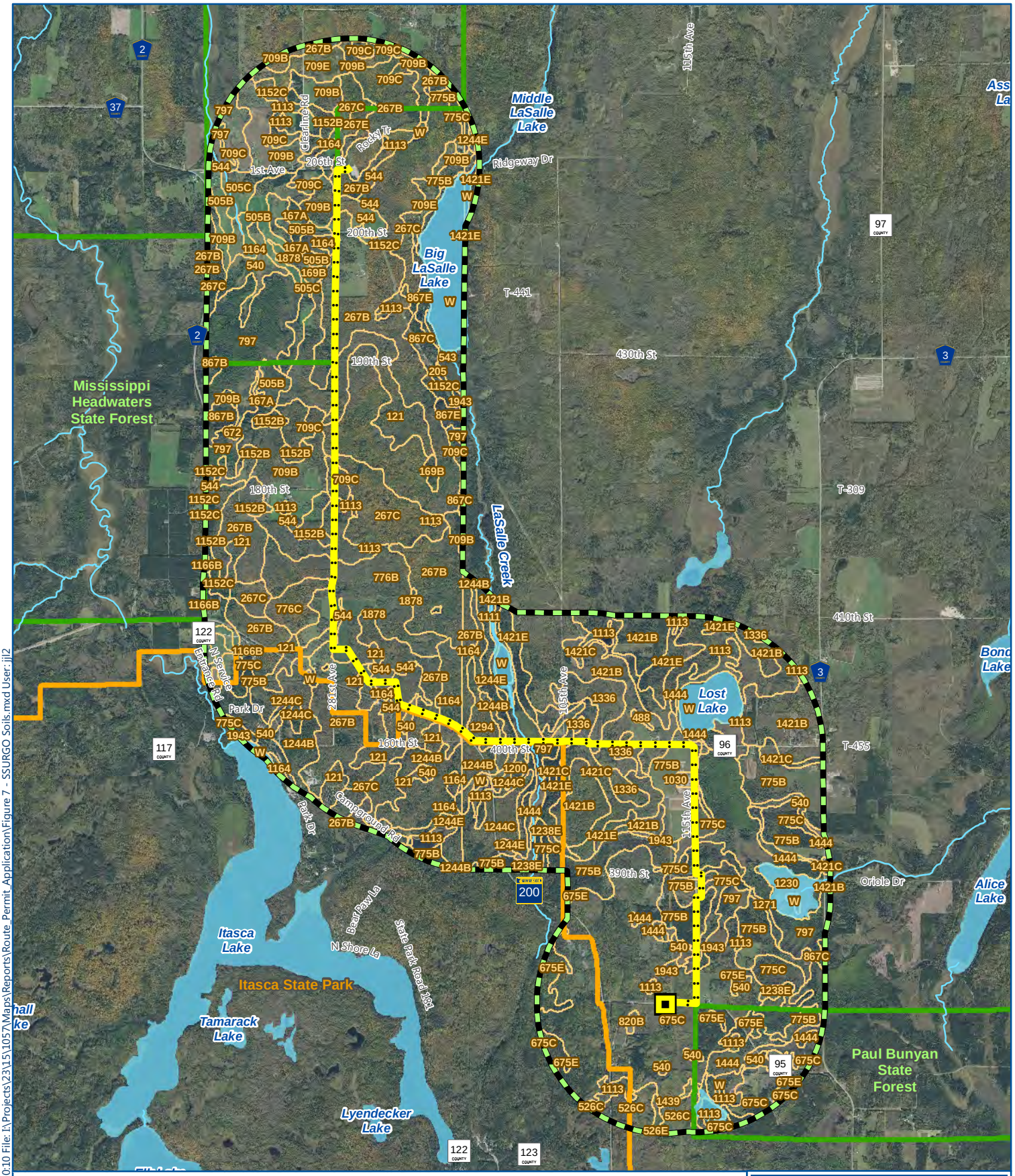
0 0.5 1

Miles

LAND COVER
MPL - Laporte Project
Minnkota Power Cooperative, Inc.
Clearwater and
Hubbard Counties

FIGURE 6

Barr Footer: ArcGIS 10.4, 2016-05-26 10:10 File: I:\Projects\23\15\1057\Maps\Reports\Route_Permit_Application\Figure 6 - Land Cover.mxd User: jjl2



New Substation
Proposed Route
1 Mile Buffer
PWI Watercourse
PWI Basin
SSURGO Soils
State Park
State Forest

N

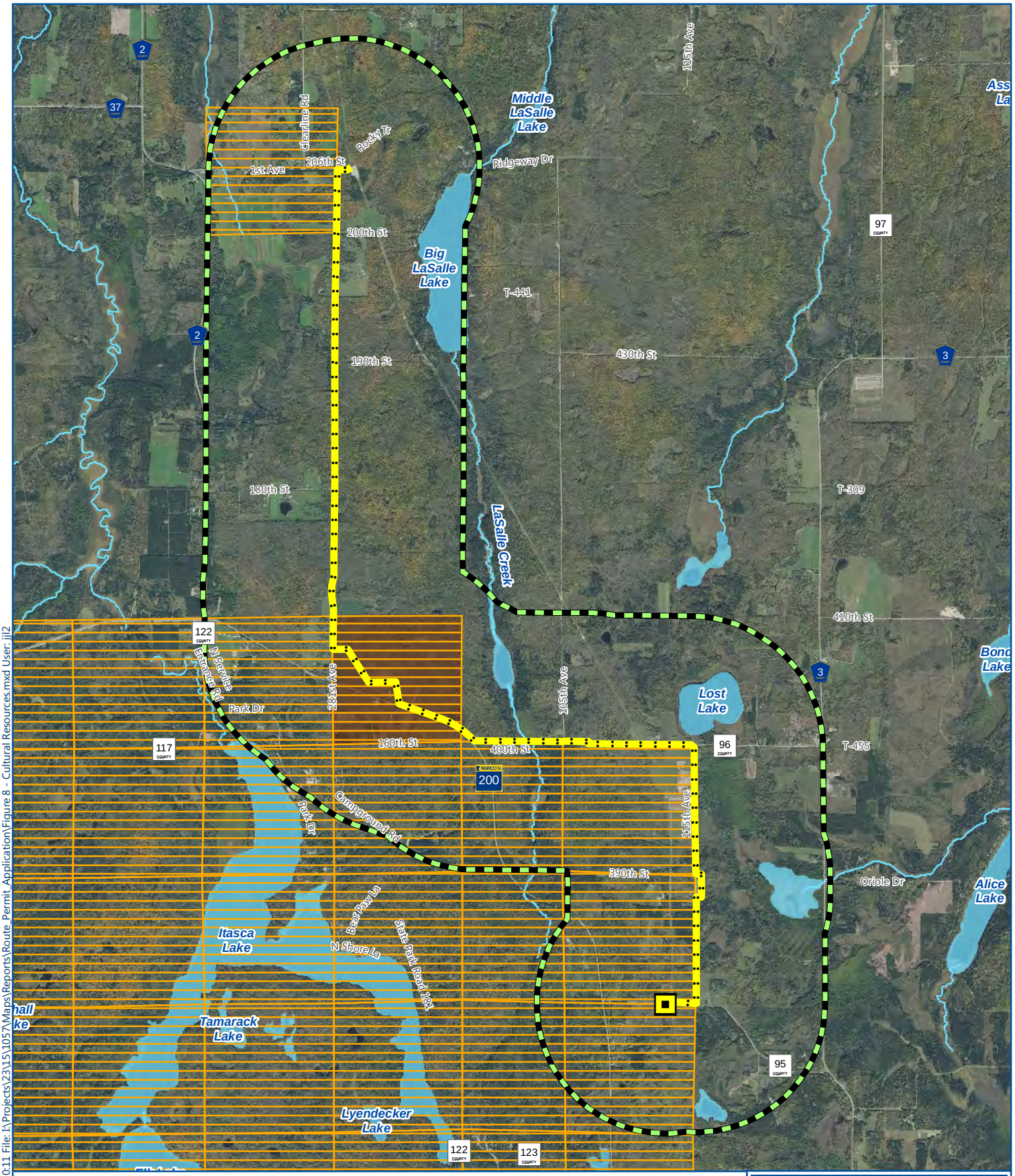
0 0.5 1
Miles

Image Source: FSA (2015)

SSURGO SOILS
MPL - Laporte Project
Minnkota Power Cooperative, Inc.
Clearwater and
Hubbard Counties

FIGURE 7

Barr Footer: ArcGIS 10.4, 2016-05-26 10:10 File: I:\Projects\23\15\1057\Maps\Reports\Route_Permit_Application\Figure 7 - SSURGO Soils.mxd User: jjl2



New Substation

Proposed Route

1 Mile Buffer

PWI Watercourse

PWI Basin

PLS Section with Archaelogical Site

PLS Section with Historic Site

N

0 0.5 1

Miles

Image Source: FSA (2015)

CULTURAL RESOURCES
MPL - Laporte Project
Minnkota Power Cooperative, Inc.
Clearwater and Hubbard Counties

FIGURE 8

Barr Footer: ArcGIS 10.4, 2016-05-26 10:11 File: I:\Projects\23\15\1057\Maps\Reports\Route_Permit_Application\Figure 8 - Cultural Resources.mxd User: jjl2