October 1, 2009

Docket #ET2, E002/TL-09-1056

Xcel Energy
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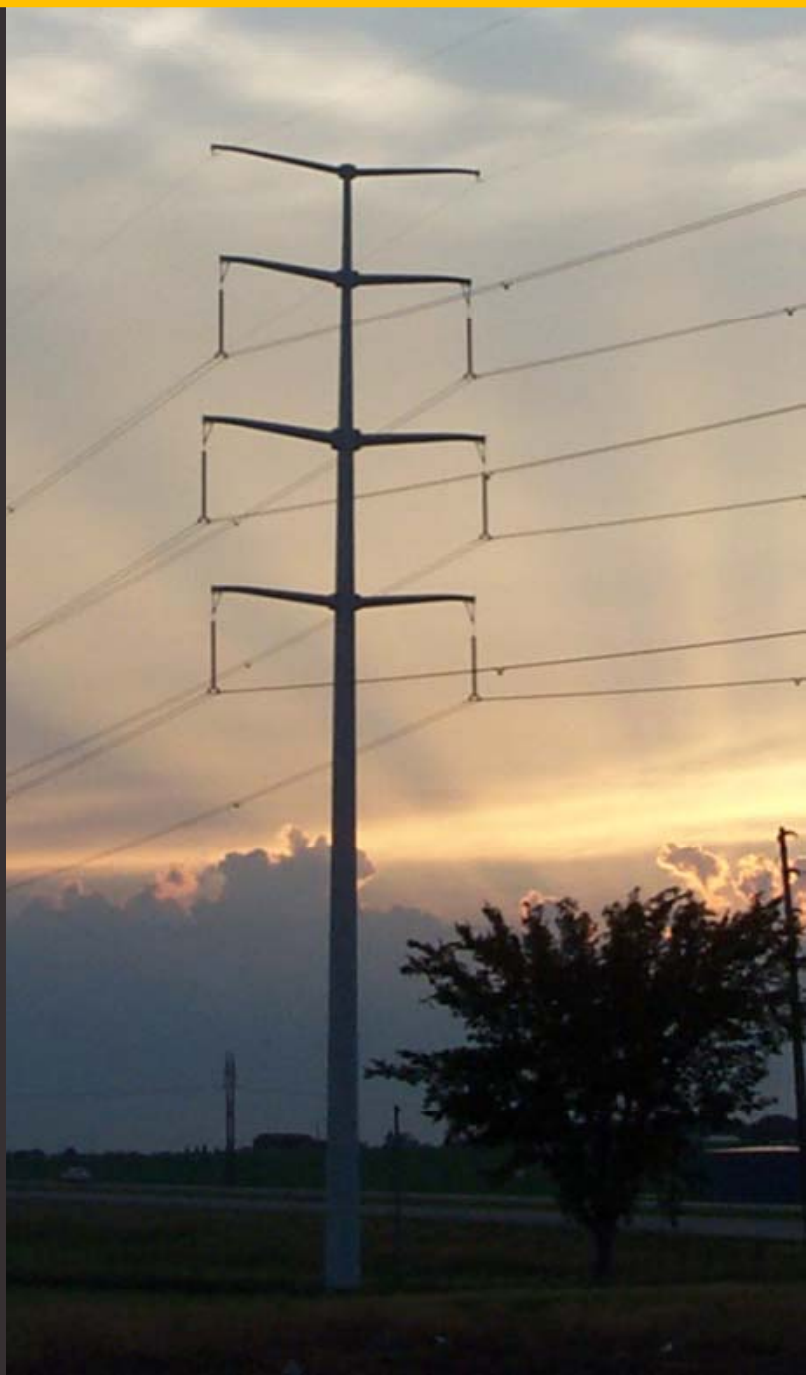
Application to the Minnesota Public Utilities Commission for a Route Permit for the Fargo to St. Cloud 345 kV Transmission Line Project



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EXECUTIVE SUMMARY

ES.1 APPLICANTS

Northern States Power Company, a Minnesota corporation (Xcel Energy), and Great River Energy, a Minnesota cooperative corporation (Great River Energy), jointly, the Applicants, submit this application for a Route Permit (Application) to the Minnesota Public Utilities Commission (MPUC, Minnesota PUC or Commission) pursuant to Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850 to construct the Minnesota portion of the Fargo to St. Cloud 345 kilovolt (kV) Transmission Line Project. For the purpose of this Application, the portion of the Fargo to St. Cloud 345 kV Transmission Line Project within Minnesota is also being referred to as the Fargo to St. Cloud 345 kV Project, or the Project. Applicants are making this Application on behalf of themselves and on behalf of the anticipated co-owners of the Project (currently contemplated to include), Missouri River Energy Services, Minnesota Power and Otter Tail Power Company (collectively, Owners).

The Fargo to St. Cloud 345 kV Project comprises the western section of the larger Fargo to Monticello 345 kV Project and will connect a new Fargo area substation to the existing Alexandria Switching Station and a new Quarry Substation to be located on the west side of St. Cloud. The eastern section of the Fargo to Monticello 345 kV Project, the Monticello to St. Cloud 345 kV Transmission Line Project, is being permitted separately and includes the Quarry Substation. *See* Application for a Route Permit for the Monticello to St. Cloud 345 kV Transmission Line Project (Docket No. ET2, E002/TL-09-246).

The portion of the Fargo to St. Cloud 345 kV Project within the state of North Dakota, including the new substation, is subject to separate review and approval by the North Dakota Public Service Commission and affected local jurisdictions.

ES.2 NEED

The Minnesota PUC granted a Certificate of Need for the Fargo to Monticello 345 kV Project in May 2009. Order Granting Certificates of Need with Conditions, *In the Matter of the Application of Great River Energy, Northern States Power Company (d/b/a Xcel Energy) and others for Certificates of Need for the CapX2020 345 kV Transmission Projects*, Docket No. ET-2, E-002, et al./CN-06-1115, (May 22, 2009) as modified (August 10, 2010) (Certificate of Need Order).

The Commission determined that the Fargo to Monticello 345 kV Project will address local community reliability needs in the St. Cloud area, Alexandria, and the southern zone of the Red River Valley. The Fargo to Monticello 345 kV Project will also help improve the bulk electric system serving Minnesota and portions of neighboring states. Finally, the Commission determined

that the new 345 kV line facilities will facilitate additional generation development, including renewable generation, in eastern North Dakota and western Minnesota.

ES.3 PROJECT DESCRIPTION

The total length of the Fargo to St. Cloud 345 kV Project is approximately 211 to 250 miles. This estimated mileage is calculated from the planning engineers' recommended location for the new Fargo area substation (Bison Substation), to the siting areas proposed in the Monticello to St. Cloud proceeding for the new Quarry Substation west of St. Cloud.

The Minnesota portion of the proposed Fargo to St. Cloud 345 kV Project will be approximately 169 to 180 miles long, extending from the Red River which extends along the Minnesota and North Dakota border, particularly between Clay and Wilkin counties, to the existing Alexandria Switching Station located south of Alexandria; and to the new Quarry Substation to be located west of St. Cloud. The North Dakota portion of the Fargo to St. Cloud 345 kV Project from the Bison Substation to the Red River, depending on the route selected, will be approximately 31 to 81 miles.

The proposed structures will primarily include single-pole, double circuit capable, self-weathering or galvanized steel structures that will range in height between 130 and 175 feet. The span length between structures will typically range between 600 and 1,000 feet depending on site-specific considerations. Although the proposed line will be built using double circuit capable poles, only one circuit will be installed for this Project. The second position will be available for a future additional circuit. The right-of-way for the proposed 345 kV electrical transmission line will generally be 150 feet in width.

The estimated cost of the Project for facilities to be located in Minnesota is between $269.0 and $308.9 million ($2009), depending on the final route selected. The Project is expected to be completed and in-service by third quarter 2015.

ES.4 PROPOSED ROUTES

This Application is being submitted under the full permitting process. Minn. Stat. §216E.03 and Minn. R. 7850.1700-7850.2700. The applicable statutes and rules require that an applicant provide at least two proposed routes for a project and state a preference for one of the proposed routes. Minn. Stat. §216E.03, Subd. 3; Minn. R. 7850.1900, Subp. 2(C). A "route" is defined as "the location of a high voltage transmission line between two end points," up to 1.25 miles wide. Minn. Stat. §216E.01, Subd. 8.

Applicants spent more than two years analyzing and evaluating potential route alternatives and gathering input from stakeholders and the general public. The Project team facilitated routing work group meetings and open houses throughout the Project area. Applicants met with state and federal

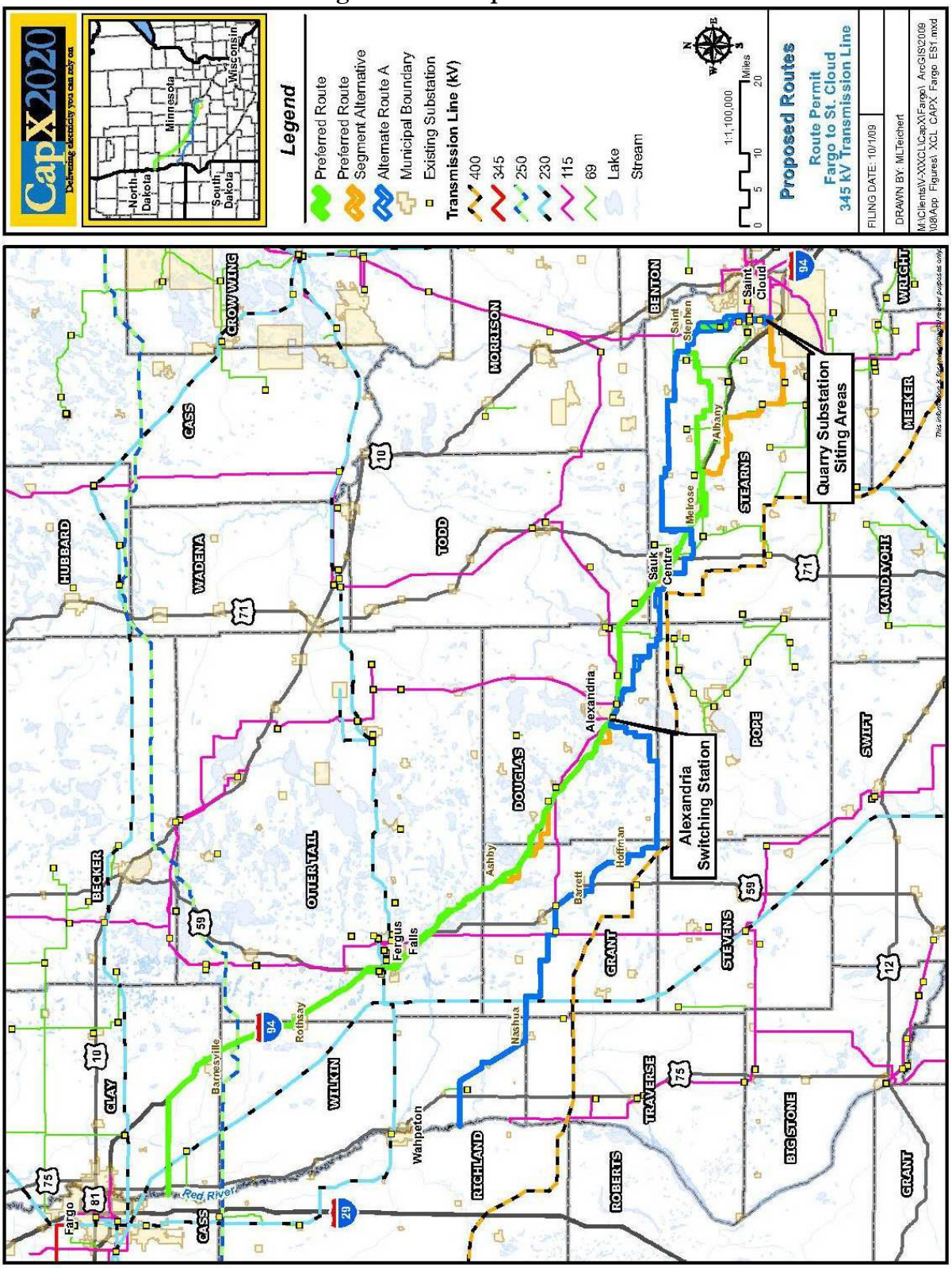
agencies, local governments and landowners that may be affected by the Project. The Project team also evaluated geographic information system (GIS) data from local, state, and federal agencies; reviewed aerial photographs; and conducted onsite investigations throughout the Project study area to gather additional site-specific information.

Through this process, Applicants developed two proposed end to end routes between the Red River and the new Quarry Substation, the portion of the Fargo to St. Cloud 345 kV Project within Minnesota. These routes are identified as the Preferred Route and Alternate Route A. Additionally, Applicants identified five shorter segment alternatives, Preferred Route Segment Alternatives, between 1.5 and 46 miles in length that could be used to modify the Preferred Route or connect a portion of the Preferred Route to a portion of Alternate Route A. The Preferred Route, Alternate Route A, and the Preferred Route Segment Alternatives collectively comprise the Proposed Routes. The Proposed Routes follow existing rights-of-way and property lines to the extent feasible. For each route, Applicants have identified a route width ranging from approximately 400 feet to 1.25 miles, although both routes are generally 1,000 feet in width for the majority of their length. In some areas, a wider route width of up to 1.25 miles is requested to accommodate site-specific considerations and substation interconnection requirements. In other areas, a narrower route width has been identified to avoid the inclusion of federally managed lands of which a proposed overhead transmission line would not be permitted.

Figure ES-1 depicts the Proposed Routes and is followed by a general description of the Proposed Routes. An in-depth analysis of each route is presented in subsequent sections in this Application, and in the various appendices.

As stated above, Applicants have also identified five segment alternatives for the Preferred Route. One segment alternative, west of Sauk Centre, is a transition segment that could be used to connect the eastern portion of Alternate Route A to the western portion of the Preferred Route. The other four segment alternatives provide for deviations from the Preferred Route corridor where optionality associated with site-specific routing, permitting, or design considerations may be warranted. The Preferred Route Segment Alternatives, 1 through 5, range in width from approximately 500 feet to 1.25 miles. The Preferred Route Segment Alternatives are described in further detail below and depicted on Figures ES-3 through ES-7.

Figure ES-1. Proposed Routes

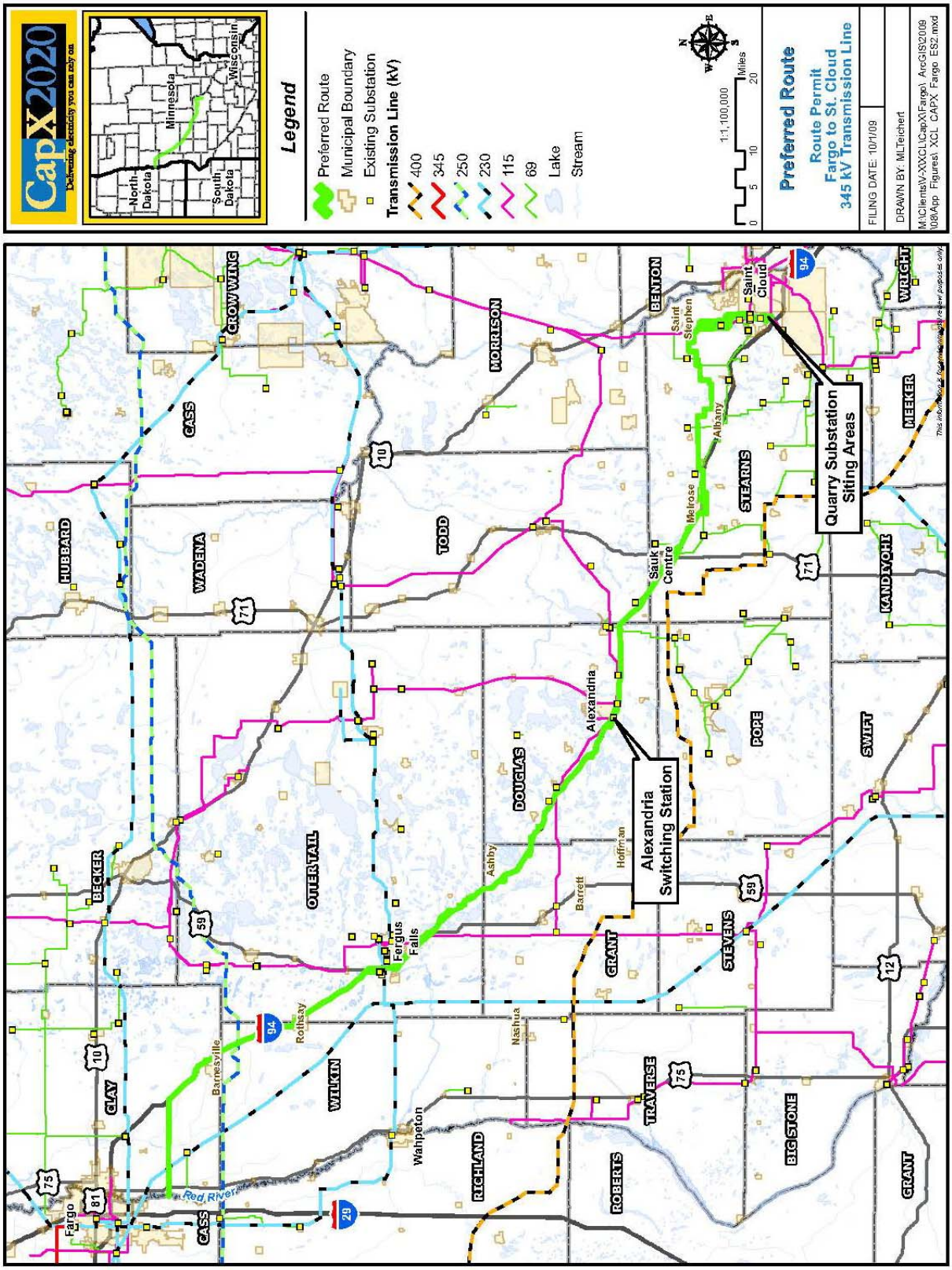


Preferred Route

The Preferred Route, illustrated in Figure ES-2, is approximately 180 miles in length and is estimated to cost $269.0 million ($2009). From one of two alternative Quarry Substation siting areas on the west side of St. Cloud, the Preferred Route mostly parallels an existing 115 kV line and property lines to an area west of St. Stephen. From this point, the Preferred Route mostly parallels existing road rights-of-way and property lines until intersecting Interstate 94 (I-94) east of Sauk Centre.

From an area east of Sauk Centre to the Alexandria Switching Station, and from the Alexandria Switching Station to the Red River, the Preferred Route mostly parallels I-94. North of Barnesville, however, the Preferred Route diverges from I-94 and mostly parallels an existing road right-of-way to the Red River. The Preferred Route between the new Quarry Substation and the Red River is described in detail in section 5.1.

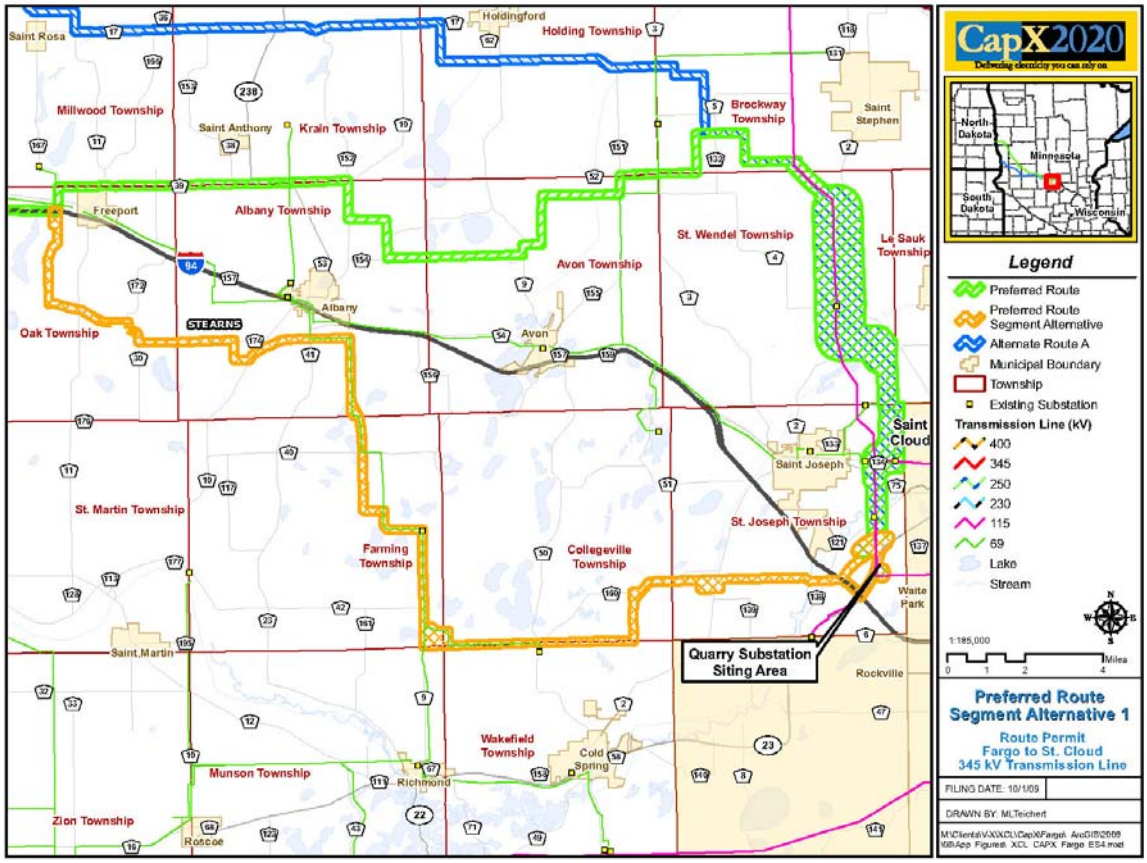
Figure ES-2. Preferred Route



Preferred Route Segment Alternatives

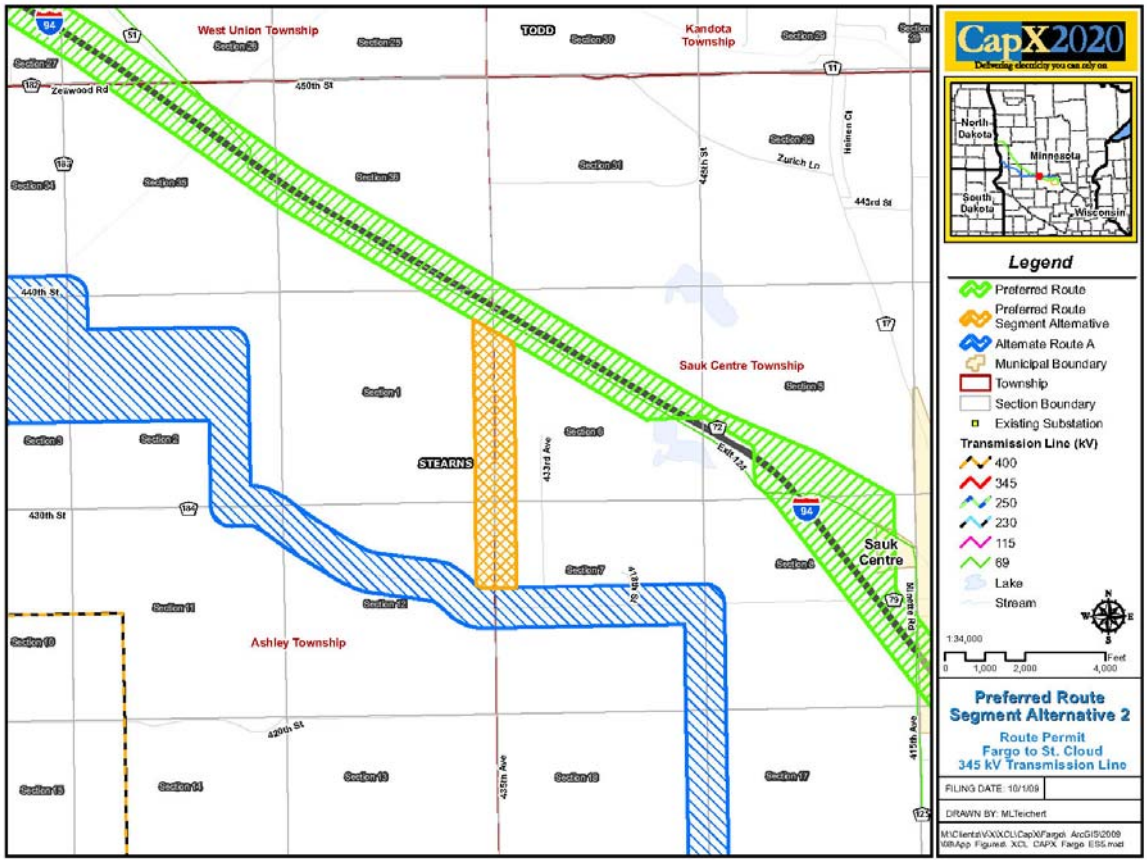
Preferred Route Segment Alternative 1 is approximately 35 miles in length and is estimated to cost $900,000 ($2009) more than the comparable portion of the Preferred Route. Preferred Route Segment Alternative 1, depicted on Figure ES-3 below, provides for deviation from the Preferred Route corridor to accommodate site-specific routing, permitting, or design considerations. From the new Quarry Substation to an area east of Sauk Centre, Preferred Route Segment Alternative 1 mostly parallels existing road rights-of-way and property lines.

Figure ES-3. Preferred Route Segment Alternative 1



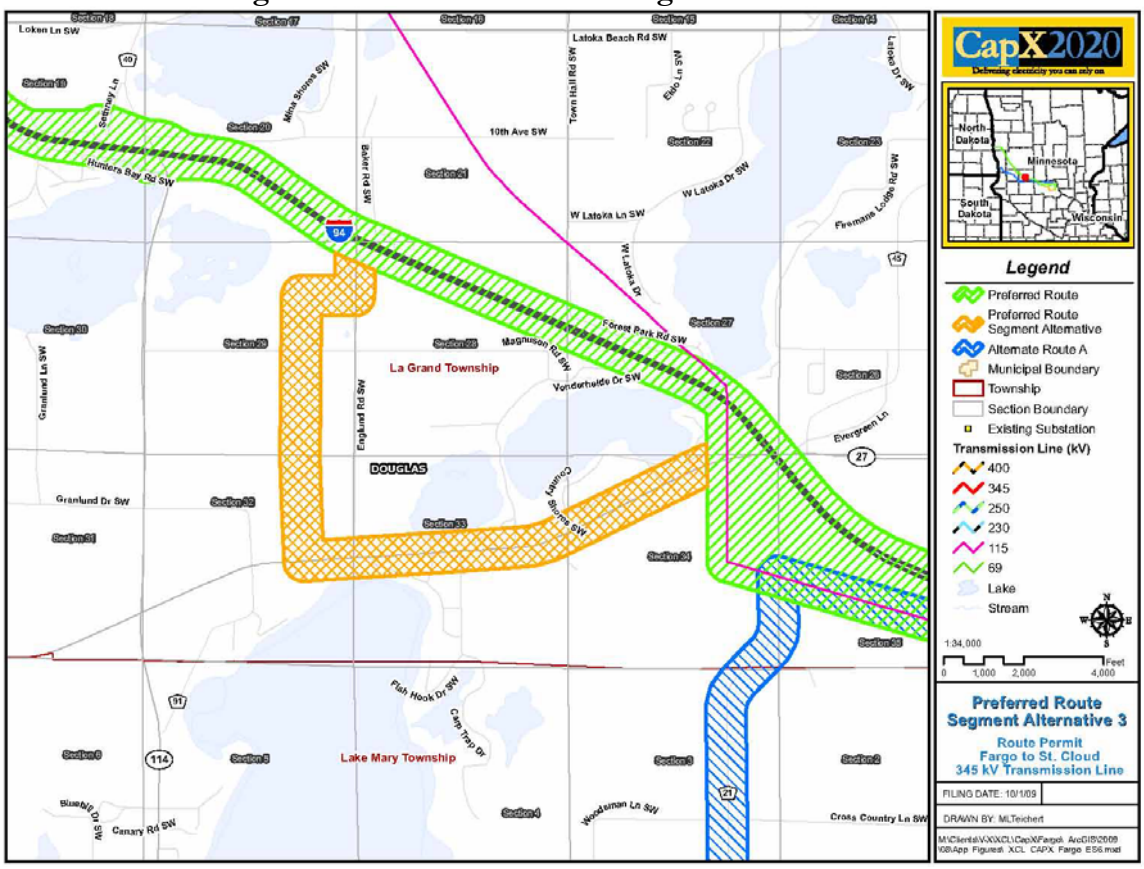
Preferred Route Segment Alternative 2, depicted on Figure ES-4 below, is approximately two miles in length and is estimated to cost $2.3 million ($2009). Preferred Route Segment Alternative 2, west of Sauk Centre, provides for a transition between the Preferred Route and Alternate Route A so that the west and east sections of the routes can be combined to form new routes in the route selection process. Preferred Route Segment Alternative 2 mostly parallels an existing property line.

Figure ES-4. Preferred Route Segment Alternative 2



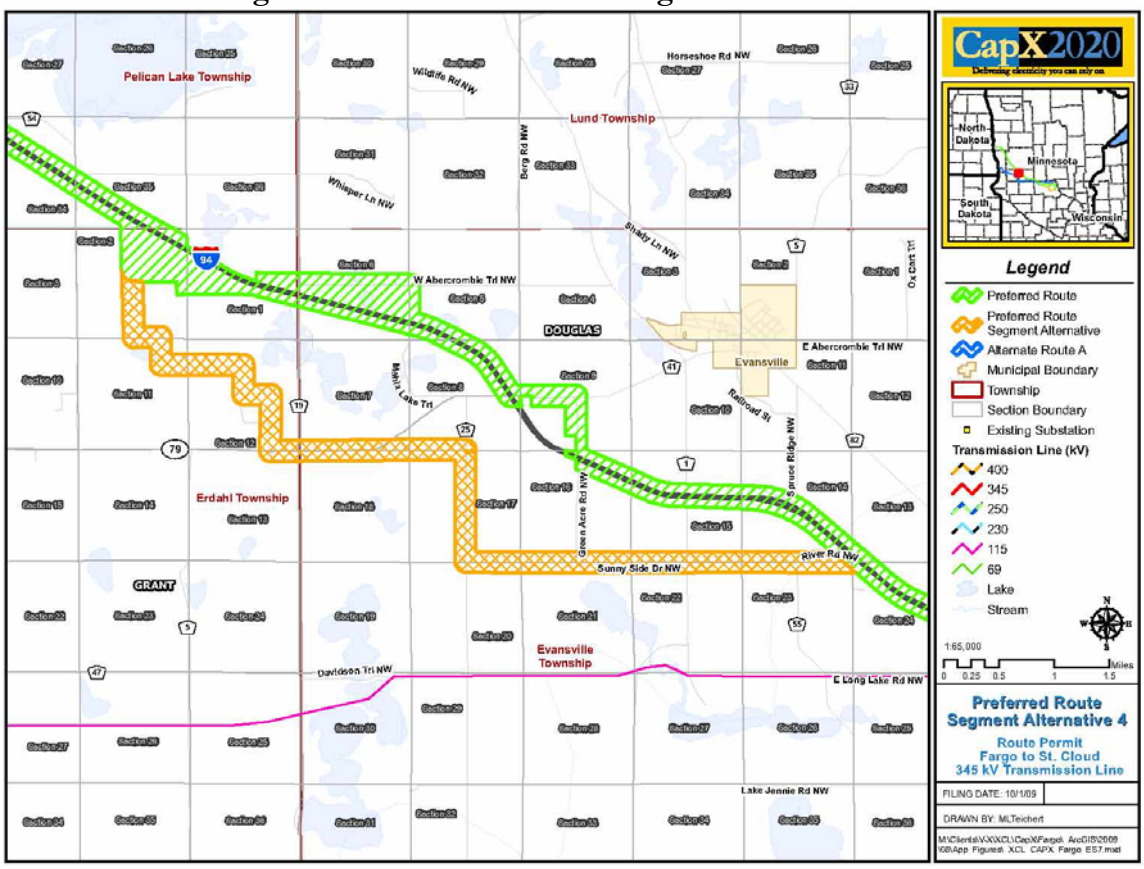
Preferred Route Segment Alternative 3, depicted on Figure ES-5 below, is approximately four miles in length and is estimated to cost $1.2 million ($2009) more than the comparable portion of the Preferred Route. Preferred Route Segment Alternative 3 provides for deviation from the Preferred Route corridor in an area just west of Alexandria to accommodate site-specific routing, permitting, or design considerations. More specifically, Preferred Route Segment Alternative 3 provides for deviation from the Preferred Route along I-94 in an area confined by an existing lake on both sides of the interstate, lakeshore residences, an existing 115 kV electrical transmission line, and a pipeline all immediately adjacent to the I-94 right-of-way. Preferred Route Segment Alternative 3 mostly parallels existing road rights-of-way and property lines.

Figure ES-5. Preferred Route Segment Alternative 3



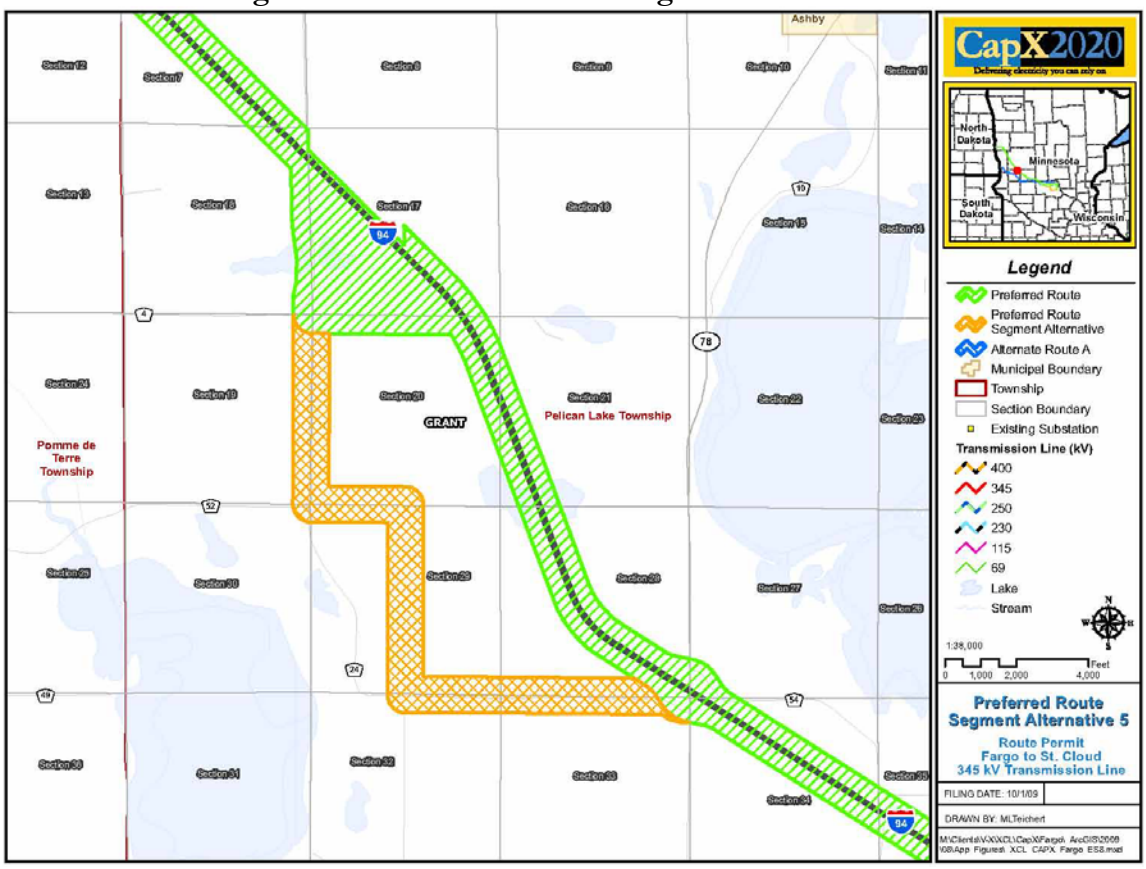
Preferred Route Segment Alternative 4, depicted on Figure ES-6 below, is approximately nine miles in length and is estimated to cost $3.3 million ($2009) more than the comparable portion of the Preferred Route. Preferred Route Segment Alternative 4 provides for deviation from the Preferred Route corridor to accommodate site-specific routing, permitting, or design considerations. More specifically, Preferred Route Segment Alternative 4 provides for deviation from the Preferred Route along I-94 in an area where land held in fee by the U.S. Fish and Wildlife Service (USFWS), across which an overhead transmission line would not be a permitted use, and an existing residence are immediately adjacent to the I-94 right-of-way but on opposite sides of the interstate. Preferred Route Segment Alternative 4 mostly parallels existing road rights-of-way and property lines.

Figure ES-6. Preferred Route Segment Alternative 4



Preferred Route Segment Alternative 5, depicted on Figure ES-7 below, is approximately four miles in length and is estimated to cost $3.1 million ($2009) more than the comparable portion of the Preferred Route. Preferred Route Segment Alternative 5 also provides for deviation from the Preferred Route corridor to accommodate site-specific routing, permitting, or design considerations. More specifically, Preferred Route Segment Alternative 5 provides for deviation from the Preferred Route along I-94 in an area where an existing residence is immediately adjacent to the I-94 right-of-way along one side of the interstate and lands held in fee or easement by the USFWS occur along the opposite side of the interstate. Preferred Route Segment Alternative 5 mostly parallels existing road rights-of-way and property lines.

Figure ES-7. Preferred Route Segment Alternative 5



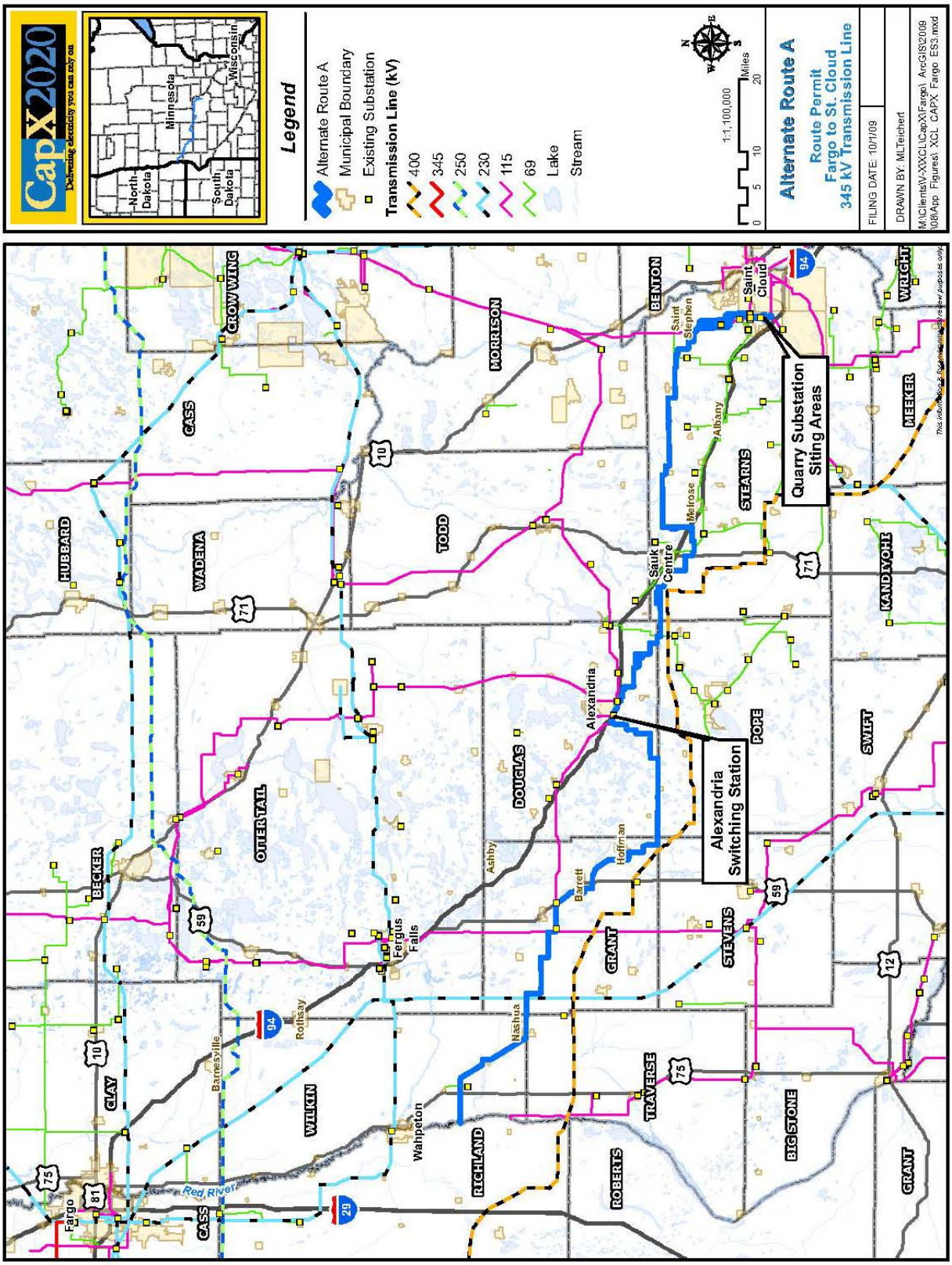
Preferred Route Segment Alternatives 1 through 5 are described in detail in section 5.1.

Alternate Route A

Alternate Route A, depicted on Figure ES-8 below, is approximately 169 miles in length in Minnesota and is estimated to cost $308.9 million ($2009). From one of two alternative Quarry Substation siting areas to an area west of St. Stephen, Alternate Route A is common with the Preferred Route. West of St. Stephen, Alternate Route A diverges from the Preferred Route and mostly parallels existing road rights-of-way and property lines until intersecting I-94 east of Sauk Centre.

From an area east of Sauk Centre to the Alexandria Switching Station, and from the Alexandria Switching Station to the Red River, Alternate Route A mostly parallels existing road rights-of-way and property lines. Alternate Route A between the new Quarry Substation and the Red River is described in detail in section 5.2.

Figure ES-8. Alternate Route A



ROUTE DEVELOPMENT AND SELECTION

In developing the routes proposed in this Application, Applicants analyzed the statutory and rule factors set forth in the Power Plant Siting Act (PPSA), Minn. Stat. Ch. 216E, and Minn. R. Ch. 7850. Proposed routes were derived from potential route alternatives. The potential route alternatives studied were based on geographic features and 1,000 feet in width, a width appropriate for transmission line routing. As priority options among the potential route alternatives were identified, Applicants refined their study and identified alignments within the 1,000-foot-wide route corridors in an effort to identify the location for the proposed transmission line within the Proposed Routes that minimizes the potential for impacts. The potential route alternatives were compared based on impacts at the 1,000-foot route-width level and based on impacts associated with identified alignments, rather than using the physical midpoint or centerline of the corridor.

Minnesota Routing Process, Role of Other Agencies

The PPSA requires that all state agencies authorized to issue permits for the construction of a high voltage transmission line participate in routing proceedings, and identify whether the site or route being considered for designation or permit and other design matters under consideration for approval will be in compliance with such agencies' standards, rules, or policies. Minn. Stat. §216E.10, Subd. 3(a). This statutory provision implements an important public policy of ensuring that permitting concerns are addressed in a timely fashion and stakeholders, including landowners, have a single forum in which they may question or comment on proposals and issues. Bringing all state permitting authorities into a single forum also minimizes the potential for conflicting or inconsistent outcomes because once the Commission issues a Route Permit, that permit is binding on other state agencies: "To assure the paramount and controlling effect of the provisions herein over other state agencies…the issuance of a site permit or route permit…shall be the sole site or route approval required to be obtained by the utility." Minn. Stat. §216E.10, Subd. 1.

Applicants have reached out to many state agencies prior to filing this Application and have had numerous meetings with them. Applicants are serving copies of this Application on all such agencies and look forward to working with them throughout the routing proceedings.

Minnesota's Policy of Non-Proliferation

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 that electric energy needs are met and fulfilled in an orderly and timely fashion." Minn. Stat. §216E.02, Subd. 1. In furtherance of this objective, the PPSA and the Commission's implementing routing rules call upon the Commission to consider the utilization of existing railroad and highway, including interstate, rights-of-way, as well as any existing transmission

corridors, in selecting transmission line routes. *People for Envt'l. Enlightenment & Responsibility (PEER), Inc. v. Minnesota Envt'l. Quality Council*, 266 N.W.2d 858 (Minn. 1978).

This policy of non-proliferation creates a preference for placing new power lines near existing infrastructure as a way to minimize the proliferation of new corridors. *See PEER*, 266 N.W.2d at 868 (holding that routing authority must "choose a pre-existing route unless there are extremely strong reasons not to do so"). In accordance with this policy, the Commission must evaluate "potential routes that will use or parallel existing railroad and highway rights-of-way." Minn. Stat. §216E.03, Subd. 7(b); *accord* Minn. R. 7850.4100 (requiring consideration of "use or paralleling of existing rights-of-way").

Throughout the route development process, Applicants have sought to identify areas to share rights-of-way with existing infrastructure, including transmission lines, roadways and railroads. This approach helps to implement the state's policy of non-proliferation.

The new 345 kV transmission line has a southeast-northwest "diagonal" orientation that makes routing along traditionally straight north-south or east-west features, such as most roads, section lines and property boundaries, difficult. Attempting to use such opportunities creates a large number of larger angle structures, or the need to cross properties diagonally. Like the Project, I-94 runs diagonally in a southeast-northwest orientation from St. Cloud toward the Fargo area. Through various phases of analysis, Applicants concluded that the I-94 corridor is an available existing infrastructure corridor that would meet the needs of the Project while also being consistent with the state's non-proliferation policy. As a result, Applicants have identified the I-94 corridor as the Preferred Route.

Once Applicants obtain a Route Permit from the Commission, they will seek Utility Permits from the Minnesota Department of Transportation (Mn/DOT) consistent with the Route Permit, to the extent such permits are required based on the proximity of the proposed line to Mn/DOT's right-of-way. Minn. R. 8810.3300.

Interstate Highway Corridors Present Special Issues for Consideration

Mn/DOT is the owner of the I-94 corridor and controls the right-of-way. Minn. Stat. §161.20; 161.23, Subd. 4. Minnesota law generally gives utilities the right to construct facilities along Mn/DOT's rights-of-way so long as such use does not interfere with public safety and convenience. See Minn. Stat. §222.37, Subd. 1 and Minn. Stat. §161.45, Subd. 1. Because the I-94 corridor presents a viable option for consideration, Applicants have spent particular effort working with the Mn/DOT to address issues relating to I-94. Applicants held several meetings with agency representatives to explore the I-94 right-of-way as a potential route alternative (see Appendix I). At

those meetings, Mn/DOT and its federal counterpart the Federal Highway Administration (FHWA) raised concerns regarding the placement of transmission structures on or near the I-94 right-of-way.

Mn/DOT has certain requirements for utilities who seek to install utility facilities in and along Mn/DOT's rights-of-way. Because the I-94 right-of-way was acquired by Mn/DOT in part with federal funding, the right-of-way is also subject to the oversight of both FHWA and Mn/DOT. 23 C.F.R. §645.215(a).

Mn/DOT has prepared guidelines permitting the longitudinal installation of utility facilities on or near highway right-of-way under certain conditions. Minn. R. 8810.3300, Subp. 4. Likewise, FHWA has determined that the accommodation of utility facilities within freeway right-of-way will promote the public interest. 23 C.F.R. §645.205(a).[1] This joint authority presents special challenges when considering routing a transmission line along an interstate highway. Mn/DOT *Procedures for Accommodation of Utilities on Highway Right of Way, Mn/DOT Position statement - Highways No. 6.4*, July 27, 1990, revised November 8, 2005 (Accommodation Policy). 23 C.F.R. §645.215(d).

See also Program Guide: Utility Adjustments and Accommodation on Federal-Aid Highway Projects, Sixth Edition, FHWA-IF-03-014, pp. B-54, B-60 (January 2003) (emphasis added).[2]

The Accommodation Policy authorizes longitudinal installations under certain conditions that are detailed in the rules, including showing special circumstances. Accommodation Policy §VI.C. Application of the Accommodation Policy and Mn/DOT's rules, regulations and policies pertaining to longitudinal installations of transmission facilities has been an important factor in analyzing the routes and developing alternatives. To provide adequate data and comparisons to assist in the analysis of the appropriate pole locations along I-94, multiple alignments were reviewed for the Preferred Route, which parallels the I-94 right-of-way at least in part. In order to provide the Commission with points of comparison for considering the relative impacts, Applicants collected data for three possible alignments along I-94: (i) at least 25 feet from the I-94 edge of right-of-way to provide data on a scenario that minimizes corridor sharing only to intermittent aerial intrusions of the conductor during certain wind conditions (blow out); (ii) at least 75 feet from the I-94 edge of right-of-way to avoid corridor sharing entirely and to minimize the need for Mn/DOT occupancy permits; and (iii) five feet from the I-94 edge of right-of-way to provide data on a scenario that maximizes corridor sharing with roadways. These potential alignments should provide the Commission, Mn/DOT, FHWA, other agencies and stakeholders with a wide array of data for

[1] 23 C.F.R. §1.23(c) requires a public interest determination before any non-highway use or occupancy of the right-of-way (including air space) may be authorized.
[2] Available at http://www.fhwa.dot.gov/reports/utilguid/if03014.pdf.

consideration in this proceeding. Whether and how Mn/DOT's Accommodation Policy might apply to the identified alignments continues to be discussed and Applicants do not currently know on what terms Mn/DOT will issue an occupancy permit for any of these alignments. Applicants will continue to work with Mn/DOT and FHWA to address their concerns to the extent possible in this proceeding in an effort to achieve a satisfactory outcome for all stakeholders.

ES.5 Environmental Impacts

The proposed 345 kV transmission line will traverse land with mixed uses, of which agricultural land uses are predominant. Applicants estimate that without corridor sharing, approximately 3,273 acres of permanent easements will be required for the proposed transmission line. This estimate is based on the length of the Preferred Route, and a right-of-way width of 150 feet. No displacement of homes is anticipated to occur. Permanent impacts in non-agricultural areas will be limited to the physical location of the transmission structures and in agricultural areas, permanent impacts will include an additional area within immediate proximity of each structure. Section 7.0 provides an assessment of potential impacts and proposed mitigation measures associated with the Proposed Routes and associated facilities.

As previously identified, this Project occurs in two states and will terminate at a proposed substation to be located west of Fargo, North Dakota. The portion of the Project that is located in Minnesota cannot be reviewed without an acknowledgement that the endpoint in North Dakota influences the overall length of the new transmission line between Fargo and St. Cloud. Specifically, Alternate Route A is approximately 11 miles shorter than the Preferred Route. However, these route lengths must be considered in the context of the route length that would be required in North Dakota to reach the Bison Substation termination. The total length of the Minnesota and North Dakota portions of the Project would be 39 miles longer if Alternate Route A were selected in Minnesota than if the Preferred Route were selected. Additional line length incurs additional costs, more ground disturbance, and the potential for other additional impacts.

ES.6 Requested Action

Applicants request that the Commission grant a Route Permit for the Preferred Route because it best meets the applicable standards and criteria set forth in Minn. Stat. §216E.03, Subd. 7, and Minn. R. 7850.4000 and 7850.4100. Implementation of the Project will support state goals to conserve resources, minimize impacts to the natural and human environment, and ensure the state's electric energy security through the construction of efficient, cost-effective electrical infrastructure.

ES.7 Next Steps

The Commission will determine whether this Application is complete and, if so, refer the matter to the Office of Administrative Hearings. An Administrative Law Judge (ALJ) will preside at a

contested case hearing and make a recommendation to the Commission regarding what route should be approved for the Project. As part of the routing proceeding, the Minnesota Department of Commerce, Office of Energy Security, Energy Facility Permitting Staff will conduct an environmental review and prepare an Environmental Impact Statement (EIS). The ALJ's recommendation and the EIS will be forwarded to the Commission for consideration in making its decision.

ES.8 COMPLETENESS CHECKLIST

The content requirements for an application with the Commission under the Full Permitting Process are identified in Minn. Stat. §216E.03 and Minn. R. 7850.1700 through 7850.1900, Subp. 2 and 3. The rule requirements are listed in Figure ES-9 below, with references indicating where the information can be found in this Application.

Figure ES-9. Route Permit Completeness Checklist

Authority	Required Information	Where
Minn. R. 7850.1900, Subp. 2	Site Permit for High Voltage Transmission Line (HVTL)	
A.	a statement of proposed ownership of the facility at the time of filing the application and after commercial operation;	Section 1.1
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;	Section 1.2
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;	Sections 2.2, 4.0, and 6.0
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;	Sections 2.2 and 3.1
E.	the environmental information required under Minn. R. 7850.1900, Subp. 3;	See Minn. R. 7850.1900, Subp.3 (A)-(H) below.
F.	identification of land uses and environmental conditions along the proposed routes;	Section 7.0
G.	the names of each owner whose property is within any of the proposed routes for the high voltage transmission line;	Section 8.1, Appendix K
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;	Appendices A, B, C
I.	identification of existing utility and public rights-of-way along or parallel to the proposed routes that have the potential to share right-of-way with the proposed line;	Section 3.2
J.	the engineering and operational design concepts for the proposed high voltage transmission line, including information on the electric and magnetic fields of the transmission line;	Sections 3.1 and 3.4

Authority	Required Information	Where
K.	cost analysis of each route, including the costs of constructing, operating, and maintaining the high voltage transmission line that are dependent on design and route;	Section 2.6
L.	a description of possible design options to accommodate expansion of the high voltage transmission line in the future;	Section 3.1.3
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;	Section 3.3
N.	a listing and brief description of federal, state, and local permits that may be required for the proposed high voltage transmission line;	Section 9.0
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.	Section 1.3
Minn. R. 7850.1900, Subp. 3	Environmental Information	
A.	a description of the environmental setting for each site or route;	Appendix D
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;	Sections 7.1.1 and 7.2.1
C.	a description of the effects of the facility on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining;	Sections 7.1.2 and 7.2.2
D.	a description of the effects of the facility on archaeological and historic resources;	Sections 7.1.3 and 7.2.3
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;	Sections 7.1.4 and 7.2.4
F.	a description of the effects of the facility on rare and unique natural resources;	Sections 7.1.5 and 7.2.5
G.	identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route;	Sections 7.1.4, 7.1.5, 7.2.4 and 7.2.5
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.	Sections 7.1 and 7.2

1.0 INTRODUCTION

1.1 APPLICANTS AND STATEMENT OF OWNERSHIP

Northern States Power Company, a Minnesota corporation headquartered in Minneapolis (Xcel Energy), is a wholly-owned subsidiary of Xcel Energy Inc., a utility holding company with its headquarters in Minneapolis. Xcel Energy provides electricity services to approximately 1.2 million customers and natural gas services to 425,000 residential, commercial and industrial customers in the state of Minnesota. Xcel Energy also provides electric service to more than 55,000 customers in North Dakota and to 73,000 customers in South Dakota.

Great River Energy is a not-for-profit electric cooperative corporation providing electrical energy and related services to 28 distribution cooperatives serving nearly 1.5 million customers in Minnesota and Wisconsin. Headquartered in Maple Grove, Minnesota, Great River Energy is the second largest utility in Minnesota and the fifth largest utility of its type in the country.

Applicants Xcel Energy and Great River Energy seek a Route Permit to construct the Fargo to St. Cloud 345 kV Transmission Line Project. The Project consists of a proposed 345 kV transmission line between a new substation, the Quarry Substation, to be located west of the city of St. Cloud and a proposed substation to be located west of Fargo, North Dakota, the Bison Substation.[3]

The Project comprises the western portion of the Fargo to Monticello 345 kV Project. The eastern portion of the Fargo to Monticello 345 kV Project, the Monticello to St. Cloud 345 kV Project, is currently under review in a separate route permitting proceeding. *See* Application for a Route Permit for the Monticello to St. Cloud 345 kV Transmission Line Project (Docket No. ET2, E002 TL-09-246). The Monticello to St. Cloud 345 kV Transmission Line Project also includes the new Quarry Substation.

The portion of the Fargo to St. Cloud 345 kV Project within the state of North Dakota from the Red River to the Bison Substation is subject to separate review and approval by the North Dakota Public Service Commission and affected local jurisdictions.

The Fargo to Monticello 345 kV Project is designed to address three needs: local community reliability; regional reliability; and generation outlet support. The proposed 345 kV facilities brought

[3]The recommended location for the Bison Substation is along the Buffalo – Maple River 345 kV line northwest of Fargo. Planning engineers determined that this site was preferred over the Maple River Substation site in terms of system performance, capability for future expansion, flood vulnerability, right-of-way access, and system reliability. CapX2020 Group 1 Fargo Line Optimization Study, p. 3 (July 22, 2009).

by the Fargo to Monticello345 kV Project will also help improve the reliability of the bulk electric system serving Minnesota and portions of neighboring states. Additionally, the project provides a necessary 345 kV connection to the existing 345 kV network that will help facilitate additional generation development in eastern North Dakota and western Minnesota. Finally, the Fargo to Monticello 345 kV Project will address significant load serving issues in the St. Cloud area and the southern Red River Valley, including Alexandria. Both the eastern and western portions of the project are expected to be in service in third quarter 2015.

The Fargo to Monticello 345 kV Project is one of four transmission projects proposed by the CapX2020 utilities (CapX2020). CapX2020 is a joint initiative of 11 utilities in Minnesota, North Dakota, Wisconsin, and the surrounding region whose goal is to study, develop, permit, and construct transmission infrastructure needed to implement long-term and cost-effective solutions for customers to meet the growth in energy demand expected between 2009 and 2020. The 11 utilities currently participating in the CapX2020 initiative include Great River Energy, Xcel Energy, Central Minnesota Municipal Power Agency, Dairyland Power Cooperative, Minnesota Power, Minnkota Power Cooperative, Missouri River Energy Services, Otter Tail Power Company, Rochester Public Utilities, Southern Minnesota Municipal Power Agency, and WPPI Energy.

The three other CapX2020 projects are: 1) a 345 kV transmission line from Brookings County, South Dakota to Hampton, Minnesota; 2) a 345 kV transmission line between Hampton and Rochester, Minnesota and La Crosse, Wisconsin; and 3) a 230 kV transmission line from Bemidji, Minnesota to Grand Rapids, Minnesota. These four projects are collectively referred to as the Group 1 projects.

Xcel Energy will construct the facilities in accordance with a Project Development Agreement (PDA) executed in February 2007 by Applicants, Missouri River Energy Services, Minnesota Power, and Otter Tail Power Company (see Appendix L). The PDA identifies a "lead" utility or a "Development Manager" that is responsible for obtaining major permits and developing and implementing the Project if construction is authorized. Xcel Energy is identified as the Development Manager for the Fargo to Monticello 345 kV Project, which includes the Project that is the subject of this Application.

Xcel Energy will coordinate and manage the permitting process, engineering, procurement and future construction of the proposed line. As the Project proceeds, Xcel Energy will determine the conceptual design, determine the recommended interconnection/termination points, determine the scope and estimate Project cost and schedule, obtain permits, and make or undertake necessary related studies and analyses. Other utilities may assist Xcel Energy in some of the duties outlined above. Xcel Energy will report progress to the Project's Management Committee, which consists of one representative from each of the participating utilities.

Under the PDA, once all critical permits (including a Certificate of Need and Route Permit) have been obtained, the participating utilities will have the opportunity to decide whether to take ownership in the line. At that time, each utility has the option to: (i) take ownership up to a designated level; (ii) take some lesser percentage to minimize capital expenditures; or (iii) "opt out" of ownership entirely. Ownership decisions will occur toward the end of the development phase, as state, federal and other approvals and consents are realized. The current Project development percentages (and potential/non-binding ownership percentages) for the Fargo to Monticello 345 kV Project are provided in Figure 1-1 below:

Figure 1-1. Ownership Percentage of Participating Utilities

Utility	Ownership Percentage
Great River Energy	25.0
Minnesota Power	14.7
Missouri River Energy Services	11.0
Northern States Power Company	36.1
Otter Tail Power Company	13.2
TOTAL	100.0

If a participant does not elect to invest in the project, the PDA has established procedures by which other participants, including third parties, may take on that investment percentage share.

Agreements pertaining to the construction, operation, ownership and maintenance of each line are in the process of being negotiated. Participants will continue to refine the commercial arrangements as the regulatory process proceeds.

1.2 PERMITTEES

The permittees for the Project are Northern States Power Company, a Minnesota corporation, and Great River Energy, a Minnesota cooperative corporation, on behalf of themselves and on behalf of the other potential project owners. Contact information for the permittees is shown below:

	Northern States Power Company	Great River Energy
Contact:	Darrin Lahr	Craig Poorker
Address:	CapX2020 414 Nicollet Mall, MP-8A Minneapolis, MN 55401	CapX2020 12300 Elm Creek Boulevard Maple Grove, MN 55369
Phone:	1-866-876-2869	1-888-473-2279
Email:	**fargoinfo@capx2020.com**	**brookingsinfo@capx2020.com**

1.3 CERTIFICATE OF NEED PROCESS SUMMARY

Minn. Stat. §216B.243 dictates that a Certificate of Need is required for a "large energy facility" as that term is defined in Minn. Stat. §216B.2421. The definition of a large energy facility includes "any high-voltage transmission line with a capacity of 200 kilovolts or more and greater than 1,500 feet in length" (Minn. Stat. §216B.2421, Subd. 2(2)).

The Minnesota PUC granted a Certificate of Need for the Fargo to Monticello 345 kV Project in May 2009. Order Granting Certificates of Need with Conditions, *In the Matter of the Application of Great River Energy, Northern States Power Company (d/b/a Xcel Energy) and others for Certificates of Need for the CapX2020 345 kV Transmission Projects*, Docket No. ET-2, E-002, et al./CN-06-1115, (May 22, 2009) as modified (August 10, 2009) (Certificate of Need Order). In the Certificate of Need Order, the Commission also granted Certificates of Need for two other 345 kV transmission line projects, the Brookings County – Hampton 345 kV Project and the Hampton – La Crosse 345 kV Project.

1.4 ROUTE PERMIT, PERMITTING PROCESS

The PPSA provides that no person may construct an HVTL without a Route Permit from the Commission. Minn. Stat. §216E.03, Subd. 2. The definition of an HVTL under the PPSA is broader than the definition of an HVTL under the Certificate of Need statutes. Under the PPSA, an HVTL includes a transmission line of 100 kV or more and greater than 1,500 feet in length. Minn. Stat. §216E.01, Subd. 4. The 345 kV transmission line proposed in this application is an HVTL and, therefore, a Route Permit is required prior to construction.

2.0 PROJECT INFORMATION

2.1 PROJECT LOCATION

The proposed Project is generally located between the city of St. Cloud in Stearns County and the Red River, which extends along the Minnesota and North Dakota border, particularly the portion in Wilkin and Clay counties. Appendix A includes a Project overview map, which identifies the Project location (Project study area). The potentially affected local government units (LGUs) are identified in Figure 2-1 below.

Figure 2-1. Affected Local Government Units

Counties	
Clay	Stearns
Douglas	Stevens
Grant	Todd
Otter Tail	Traverse
Pope	Wilkin
Cities[1,2]	
Alexandria	Melrose
Barrett	Nashua
Fergus Falls	Rothsay
Freeport	Sauk Centre
Hoffman	Saint Cloud

Township[1]	Township and Range	Sections
Albany Township	T 125, R 31	1,2,3,4,5,6,10,11,12,13,14,19,20,21,22,23,26,27,28,29,30,34,35
Ashley Township	T 126, R 35	1,2,3,4,5,6,11,12
Ashley and West Union Townships	T 127, R 35	6,7,8,17,18,20,21,22,26,27,28,33,34,35,36
Avon Township	T 125, R 30	1,2,3,4,7,8,9,10,16,17,18
Barnesville Township	T 137, R 46	2,3,4,10,11,13,14
Ben Wade Township	T 126, R 39	1,2,3,4,5,6
Brandon Township	T 129, R 39	19,20,28,29,30,32,33,34
Brandrup Township	T 131, R 46	15,16,17,18,19,20,21,22,26,27,35,36
Brandrup Township	T 131, R 47	13,14,15,16,21,22,23,24
Brockway Township	T 126, R 29	19,20,28,29,30,31,32,33,34
Buse Township	T 132, R 43	4,5,6,8,9,10,14,15,23,24,25,26,36
Campbell Township	T 130, R 46	1,2,12

Township[1]	Township and Range	Sections
Carlisle Township	T 133, R 44	1,12
Champion Township	T 130, R 45	7,17,18,19,20,28,29,33,34,35,36
Collegeville Township	T 124, R 30	25,26,31,32,33,34,35,36
Dane Prairie Township	T 132, R 42	30,31,32
Elbow Lake Township	T 129, R 43	7,8,9,13,14,15,16,17,18,20,21,22,23,24,25
Elk Lake Township	T 128, R 41	18,19,20,21,28,29,33,34
Elkton Township	T 138, R 46	28,29,30,31,32,33,34
Elmwood Township	T 138, R 47	25,26,27,28,29,30,31,32,33,34,35,36
Erdahl Township	T 129, R 41	1,2,11,12,13
Evansville Township	T 129, R 40	5,6,7,8,9,13,14,15,16,17,18,20,21,22,23,24
Farming Township	T 124, R 31	2,3,10,11,13,14,15,23,24,25,36
Fergus Falls Township	T 133, R 43	6,7,8,17,18,19,20,29,32
Grove Township	T 125, R 33	1,2,3,4,9,10,11,12
Holding Township	T 126, R 30	7,14,15,16,17,18,19,20,21,22,23,24,35,36
Holmes City Township	T 127, R 39	25,26,31,32,33,34,35,36
Hudson Township	T 127, R 37	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,24
Humboldt Township	T 137, R 45	17,18,19,20,28,29,32,33,34
Krain Township	T 126, R 31	7,8,9,10,11,12,13,14,15,16,17,18,31,32,33,34,35
Kurtz Township	T 138, R 48	25,26,27,28,29,30,31,32,33,34,35,36
La Grand Township	T 128, R 38	18,19,20,21,26,27,28,29,32,33,34,35,36
Lake Mary Township	T 127, R 38	1,3,9,10,15,16,21,22,28,29,30,31,32,33
Land Township	T 127, R 41	3,4,9,10,11,14,15,16,22,23,25,26,27,35,36
Lawrence Township	T 130, R 44	31,32,33,34
Le Sauk Township	T 125, R 28	30,31
Lien Township	T 128, R 42	2,11,12,13,14,23,24
Melrose Township	T 126, R 33	1,2,3,4,5,6,7,8,9,10,11,12,17,18,19,20,29,30,31,32,33,34
Millwood Township	T 126, R 32	4,5,6,7,8,9,10,11,12,13,14,15,33,34,35,36
Moe Township	T 128, R 39	3,4,10,11,12,13,24
Munson Township	T 123, R 31	1
Nora Township	T 126, R 40	1,2,3,4,5,6
North Ottawa Township	T 129, R 44	3,4,5,6,9,10,11,12,13,14,15,16
Oak Township	T 125, R 32	1,2,3,4,5,6,7,9,10,15,16,21,22,23,24,25,26
Orange Township	T 127, R 36	1,2,3,4,5,6,7,8,9,10,11,12,17,18,19,20,27,28,29,30,32,33,34,35
Oscar Township	T 134, R 44	4,5,8,9,15,16,22,23,26,27,35,36
Pelican Lake Township	T 130, R 41	6,7,17,18,19,20,21,27,28,29,30,32,33,34,35
Pomme de Terre Township	T 130, R 42	1,12
Prairie View Township	T 136, R 45	4,5,9,10,15,16,22,26,27,35

Township[1]	Township and Range	Sections
Sanford Township	T 129, R 42	19,20,21,22,26,27,28,29,30,34,35,36
Sauk Centre Township	T 126, R 34	5,6,7,8,9,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,33,34,35,36
Sauk Centre Township	T 127, R 34	31
Solem Township	T 127, R 40	31,32,33,34,35,36
St. Joseph Township	T 124, R 29	1,11,12,13,14,23,24,25,26,27,28,29,30,35
St. Olaf Township	T 131, R 41	31
St. Wendel Township	T 125, R 29	1,2,3,5,6,10,11,12,13,14,15,22,23,24,25,26,27,36
Swan Lake Township	T 126, R 41	1,2
Tanberg Township	T 135, R 45	1,2,12,13,24,25
Tintah Township	T 129, R 45	1,2,3,4
Town of Alexandria	T 128, R 37	31
Trondhjem Township	T 135, R 44	30,31,32
Tumuli Township	T 131, R 42	4,5,9,10,15,16,22,23,25,26,35,36
Waite Park and St. Cloud	T 124, R 28	6
Wakefield Township	T 123, R 30	1,2,3,4,5,6
Westport Township	T 126, R 36	1,2,3,4

[1] "Affected" indicates that at least a portion of one of the proposed routes crosses the annexed boundaries of the municipality or township.

[2] Only incorporated municipalities are identified.

Notice to Local Governmental Units

Applicants provided notification of their intent to apply for a Route Permit to the LGUs listed in Figure 2-1 by letters dated June 29, 2009. These letters comply with the requirement of Minn. Stat. §216E.03, Subd. 3a. An exemplar letter and an affidavit of mailing are included in Appendix I.

2.2 Project Proposal

Applicants propose to construct a 345 kV single circuit transmission line on double circuit capable single steel poles from a new Quarry Substation to be located west of St. Cloud to the Bison Substation to be located west of Fargo, North Dakota. The Project will also interconnect with the existing Alexandria Switching Station south of Alexandria. The Quarry Substation was proposed as an associated facility within the application for a Route Permit for the Monticello to St. Cloud 345 kV Transmission Line Project (Docket No. ET2, E002/TL 09 246). The new Fargo area substation and the portion of the Fargo to St. Cloud 345 kV Project extending from this substation to the Red River are subject to review and approval by the North Dakota Public Service Commission and affected local jurisdictions.

The specific components of the Fargo to St. Cloud 345 kV Project are described below:

- Fargo to St. Cloud 345 kV Transmission Line – The proposed line will be constructed primarily on single-pole, double circuit capable, self-weathering or galvanized steel structures. The line will connect the new Quarry Substation to the existing Alexandria Switching Station south of Alexandria, and ultimately to a substation to be located west of Fargo. However, only the portion of the line within Minnesota is included as part of this Application.

- Quarry Substation – Modifications will be made at the new Quarry Substation to accommodate the proposed 345 kV transmission line. These modifications will include the addition of 345 kV equipment (circuit breakers, switches, and control panels), foundations and structures necessary to connect the line.

- Alexandria Switching Station – Modifications will be made at the existing Alexandria Switching Station to accommodate the proposed 345 kV transmission line. Equipment to be installed may include 345 and 115 kV equipment (including switches, a transformer, control panels, and circuit breakers), foundations and structures. Some additional land may be required depending on ultimate configuration.

Applicants have identified two routes between the new Quarry Substation and the Red River which include the Preferred Route and Alternate Route A. Applicants have also identified route segment alternatives along the Preferred Route called the Preferred Route Segment Alternatives. The Preferred Route, Alternate Route A, and Preferred Route Segment Alternatives collectively comprise the Proposed Routes subject to this Application.

The Preferred Route Segment Alternatives range in length from approximately 1.5 to 46 miles. One of the segment alternatives, Preferred Route Segment Alternative 2, provides for transition between the western portion of the Preferred Route and the eastern portion of Alternate Route A in the event there is interest in combining these route options.

The other four Preferred Route Segment Alternatives, including 1, 3, 4, and 5, provide for deviations from the Preferred Route corridor where optionality associated with site-specific routing, permitting, or design considerations may be warranted. More specifically, Preferred Route Segment Alternative 1 provides for deviation from the Preferred Route between the new Quarry Substation and Sauk Centre.

Preferred Route Segment Alternative 3 provides for deviation from the Preferred Route along I-94 in an area just west of Alexandria confined by an existing lake on either side of the interstate,

lakeshore residences, an existing 115 kV electrical transmission line, and a pipeline all immediately adjacent to the I-94 right-of-way.

Preferred Route Segment Alternative 4 provides for deviation from the Preferred Route along I-94 in an area where land held in fee by the USFWS, across which an overhead transmission line would not be a permitted use, and an existing residence are immediately adjacent to the I-94 right-of-way but on opposite sides of the interstate.

Preferred Route Segment Alternative 5 provides for deviation from the Preferred Route along I-94 in an area where an existing residence is immediately adjacent to the I-94 right-of-way along one side of the interstate and lands held in fee or easement by the USFWS occur along the opposite side of the interstate. The Preferred Route Segment Alternatives are discussed in further detail in section 5.1.

2.3 Route Width and Alignments

2.3.1 Route Width

The PPSA, Minn. Stat. Ch. 216E, 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 that electric energy needs are met and fulfilled in an orderly and timely fashion." Minn. Stat. §216E.02, Subd. 1. The PPSA further authorizes the Commission to meet its routing responsibility by designating a "route" between end points 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 right-of-way for the facilities can be located. Minn. Stat. §216E.01, Subd. 8.

The purpose of the route permitting process is not to establish exact structure locations for a transmission line but rather to establish a general alignment that best balances competing land use, human settlement, and environmental interests. Once a route is approved by the Commission, the utility then does more detailed engineering and contacts landowners to gather additional information about the circumstances of their property. Only after considering all inputs does the utility establish an exact alignment and pole placement. A "route" designation by the Commission should be wide enough to provide flexibility for the utility to work with landowners to adjust final design. Once the utility establishes an alignment and structure placement, construction drawings are provided to the Commission so the Commission can confirm the utility's plans are consistent with the Route Permit.

At the same time, a "route" designation cannot be so wide that it is unclear what the intended general alignment of the transmission line is meant to be. In a forest setting where there are large expanses of woodlands without discernable property boundaries or other obvious routing opportunities, it may be appropriate to establish a "route" one mile or more wide so the utility can

work with resource managers and property owners to establish an alignment. However, in an agricultural or mixed use setting, there typically are multiple alignment choices with different types of impacts within a one mile-wide "route" corridor. Thus, a narrower "route" is usually appropriate.

For this Project, Applicants propose a "route" nominally 1,000 feet in width for the majority of the Project. Roads, property lines, and other routing opportunities typically are found in 0.25-mile intervals in the land use setting in the Project area. Human settlement in rural areas also tends to have a similar 0.25-mile pattern. By narrowing the "route" to less than 1.25 miles in width, the intended feature that will be paralleled and associated land use features are more discernible. However, for this Project, there are numerous areas where site-specific considerations or substation interconnection requirements warrant additional flexibility for line placement and as a result, a route width up to 1.25 miles in width is appropriate. Additionally, there are areas where site-specific considerations warrant a reduced route width of no less than 400 feet. These areas are discussed in more detail in the following sections.

2.3.2 ALIGNMENTS

In developing the routes proposed in this Application, Applicants analyzed the statutory and rule factors set forth in the PPSA, Minn. Stat. Ch. 216E, and Minn. R. Ch. 7850. The routes studied were 1,000-foot-wide corridors based on geographic features deemed appropriate for transmission line routing. As preferred route options were identified, Applicants refined their study and calculated impacts based on potential route alignments.

Given that the routes are nominally 1,000 feet in width, Applicants identified and studied multiple alignments for those routes along the interstate corridor. This analysis will provide the Commission with data on the relative impacts among potential alignments associated with the Proposed Routes. In general, the overall impacts of the Project do not vary significantly based on proximity to I-94.

The discussion below describes the principle of non-proliferation set forth in the PPSA and Minnesota case law, issues that are specific to locating facilities along existing corridors; and includes a summary of related Mn/DOT regulations that may have a bearing on the Commission's consideration of the alternatives.

2.3.2.1 Minnesota's Policy of Non-Proliferation

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 that electric energy needs are met and fulfilled in an orderly and timely fashion." Minn. Stat. §216E.02, Subd. 1. In furtherance of this objective, the PPSA and the Commission's implementing routing rules call upon the Commission to consider the utilization of existing railroad and highway, including interstate, rights-of-way, as well as any existing transmission

corridors in selecting transmission line routes. *People for Envt'l. Enlightenment & Responsibility (PEER), Inc. v. Minnesota Envt'l. Quality Council,* 266 N.W.2d 858 (Minn. 1978).

This policy of non-proliferation creates a preference for placing new power lines near existing infrastructure as a way to minimize the proliferation of new corridors. See *PEER*, 266 N.W.2d at 868 (holding that routing authority must "choose a pre-existing route unless there are extremely strong reasons not to do so"). In accordance with this policy, the Commission must evaluate "potential routes that will use or parallel existing railroad and highway rights-of-way." Minn. Stat. §216E.03, Subd. 7(b); *accord* Minn. R. 7850.4100 (requiring consideration of "use or paralleling of existing rights-of-way").

Throughout the route development process, Applicants have sought to identify areas to share rights-of-way with existing infrastructure, including roads, railroads, and existing transmission corridors. The Project, from Fargo to St. Cloud, extends diagonally across the state. Similarly, I-94 runs diagonally in a southeast to northwest orientation from St. Cloud toward the Fargo area. Through various phases of analysis, Applicants concluded that the I-94 corridor is a viable and available existing infrastructure corridor that is consistent with the state's non-proliferation policy. As a result, Applicants identified the I-94 corridor as the Preferred Route. Once Applicants obtain a Route Permit from the Commission, they will seek Utility Permits from Mn/DOT consistent with the Commission's action, to the extent such permits are required based on the proximity of the proposed line to Mn/DOT's right-of-way. Minn. R. 8810.3300.

2.3.2.2 Interstate Highway Corridors Present Special Issues for Consideration

Mn/DOT is the owner of the I-94 corridor and controls the right-of-way. Minn. Stat. §161.20; §161.23, Subd. 4. Minnesota law generally gives utilities the right to construct facilities along Mn/DOT's rights-of-way so long as such use does not interfere with public safety and convenience. Minn. Stat. §222.37, Subd. 1; 161.45, Subd. 1. Because the I-94 corridor presents a viable option for consideration, Applicants have spent particular effort working with Mn/DOT to address issues relating to I-94. Applicants held several meetings with agency representatives to explore the I-94 right-of-way as a potential route alternative (see Appendix I). At these meetings, Mn/DOT and its federal counterpart, the FHWA, raised concerns regarding the placement of transmission structures on or near the I-94 right-of-way.

Mn/DOT's concerns arise from certain requirements it has for utilities who seek to install utility facilities in and along Mn/DOT's rights-of-way. Because the I-94 right-of-way was acquired by Mn/DOT in part with federal funding that right-of-way is also subject to the oversight of both FHWA and Mn/DOT. 23 C.F.R. §645.215(a).

Mn/DOT has prepared guidelines permitting the longitudinal installation of utility facilities on or near interstate highway right-of-way under certain conditions. Minn. R. 8810.3300, Subp. 4. Likewise, FHWA has determined that the accommodation of utility facilities within freeway right-of-way will promote the public interest. 23 C.F.R. §645.205(a).[4] This joint authority presents special challenges when considering routing a transmission line along an interstate highway. Mn/DOT *Procedures for Accommodation of Utilities on Highway Right of Way, Mn/DOT Position statement - Highways No. 6.4*, July 27, 1990, revised November 8, 2005 (Accommodation Policy); 23 C.F.R. §645.215(d); S*ee also Program Guide: Utility Adjustments and Accommodation on Federal-Aid Highway Projects, Sixth Edition*, FHWA-IF-03-014, pp. B-54, B-60 (January 2003) (emphasis added).[5]

The Accommodation Policy authorizes longitudinal installations under certain conditions that are detailed in the rules, including showing special circumstances. Accommodation Policy §VI.C (emphasis added). Application of the Accommodation Policy and Mn/DOT's rules, regulations and policies pertaining to longitudinal installations of transmission facilities has been an important factor in developing route alternatives. To provide adequate data and comparisons for the Commission's consideration, multiple alignments were developed for the Preferred Route and Alternate Route A, both of which parallel the I-94 right-of-way at least in part. These potential alignments should provide the Commission, Mn/DOT, FHWA, other agencies and stakeholders with a wide array of data for consideration in this proceeding. Whether and how Mn/DOT's Accommodation Policy might apply to the identified alignments continues to be discussed Applicants do not currently know on what terms Mn/DOT will issue an occupancy permit for any of these alignments. Applicants will continue to work with Mn/DOT and FHWA to address their concerns to the extent possible in this proceeding in an effort to achieve a satisfactory outcome to all stakeholders.

2.3.2.3 Minnesota Routing Process, Role of Other State Agencies

The PPSA requires that all state agencies that are authorized to issue permits for the construction of a HVTL participate in routing proceedings, and identify whether the site or route being considered for designation or permit and other design matters under consideration for approval will be in compliance with such agencies' standards, rules, or policies. Minn. Stat. §216E.10, Subd. 3(a). This statutory provision implements an important public policy of ensuring that permitting concerns are addressed in a timely fashion and stakeholders, including landowners, have a single forum in which they may question or comment on proposals and issues. Bringing all state permitting authorities into a single forum also minimizes the potential for conflicting or inconsistent outcomes because once

[4]23 C.F.R. §1.23(c) requires a public interest determination before any non-highway use or occupancy of the right-of-way (including air space) may be authorized.
[5]Available at http://www.fhwa.dot.gov/reports/utilguid/if03014.pdf.

the Commission issues a Route Permit, that permit is binding on other state agencies: "To assure the paramount and controlling effect of the provisions herein over other state agencies…the issuance of a site permit or route permit…shall be the sole site or route approval required to be obtained by the utility." Minn. Stat. §216E.10, Subd. 1.

Applicants have reached out to many state agencies prior to filing this Application and have met with them numerous times. Applicants will serve copies of this Application on all such agencies and look forward to working with them throughout the routing proceedings.

2.3.2.4 Identification of Alignments

As described above, the use of I-94 as the primary corridor for the Project raises issues of special concern. To provide the Commission with adequate data for its consideration, Applicants have evaluated the potential impacts of the proposed 345 kV line based on multiple alignments within the Proposed Routes.

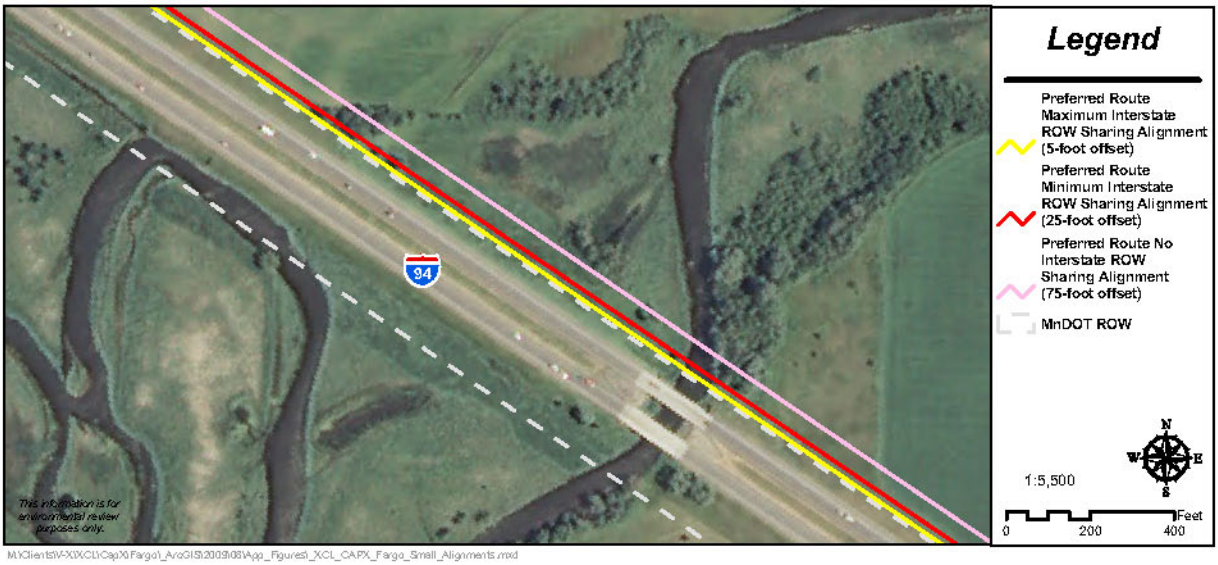
Applicants evaluated the impacts if the poles were placed at least 25 feet from the outside edge of the I-94 right-of-way. With this alignment, there will be no physical presence of the poles I the right-of-way and there will be no overhang by the arms of the pole or the conductors. However, under certain wind conditions, the conductors could sway or "blow out" over the I-94 right-of-way. This type of blowout potential occurs when the wind essentially pushes the conductors sideways and up into the airspace above the right-of-way. The amount of new or additionally required right-of-way will still be less than if there were no corridor sharing. At this time, it is unknown whether Mn/DOT will issue an occupancy permit for this alignment.

Applicants further evaluated the potential impacts of the Project if there were no right-of-way sharing with I-94. In such case, the line will need to be located at least 75 feet away from the outside edge of I-94 right-of-way in order to completely avoid Mn/DOT's right-of-way. At this distance, even blowout of the conductors will not reach Mn/DOT's right-of-way and corridor sharing can be completely avoided. If this alignment is utilized, it is not anticipated that Mn/DOT occupancy permits will be required for longitudinal installations but that such permits may still be needed fr crossings, interchanges, and potential pinch points. The amount of new or additionally required right-of-way will be greatest.

Finally, Applicants analyzed impacts of the transmission line with the centerline placed at five feet from the outside edge of the I-94 right-of-way. If this scenario is allowed, the arms of the poles as well as the conductors would be within the airspace above Mn/DOT's right-of-way. This potential alignment provides the Commission with data on the potential impacts if an alignment that maximizes corridor sharing is authorized. This potential alignment also provides data consistent with typical pole placement along non-interstate highways. At this time, it is unknown whether Mn/DOT will issue an occupancy permit for this alignment.

A diagram representing the three identified alignments along the interstate for the Preferred Route and Alternate Route A is provided in Figure 2-2. The identified alignments associated with the Proposed Routes are discussed in more detail in section 5.0.

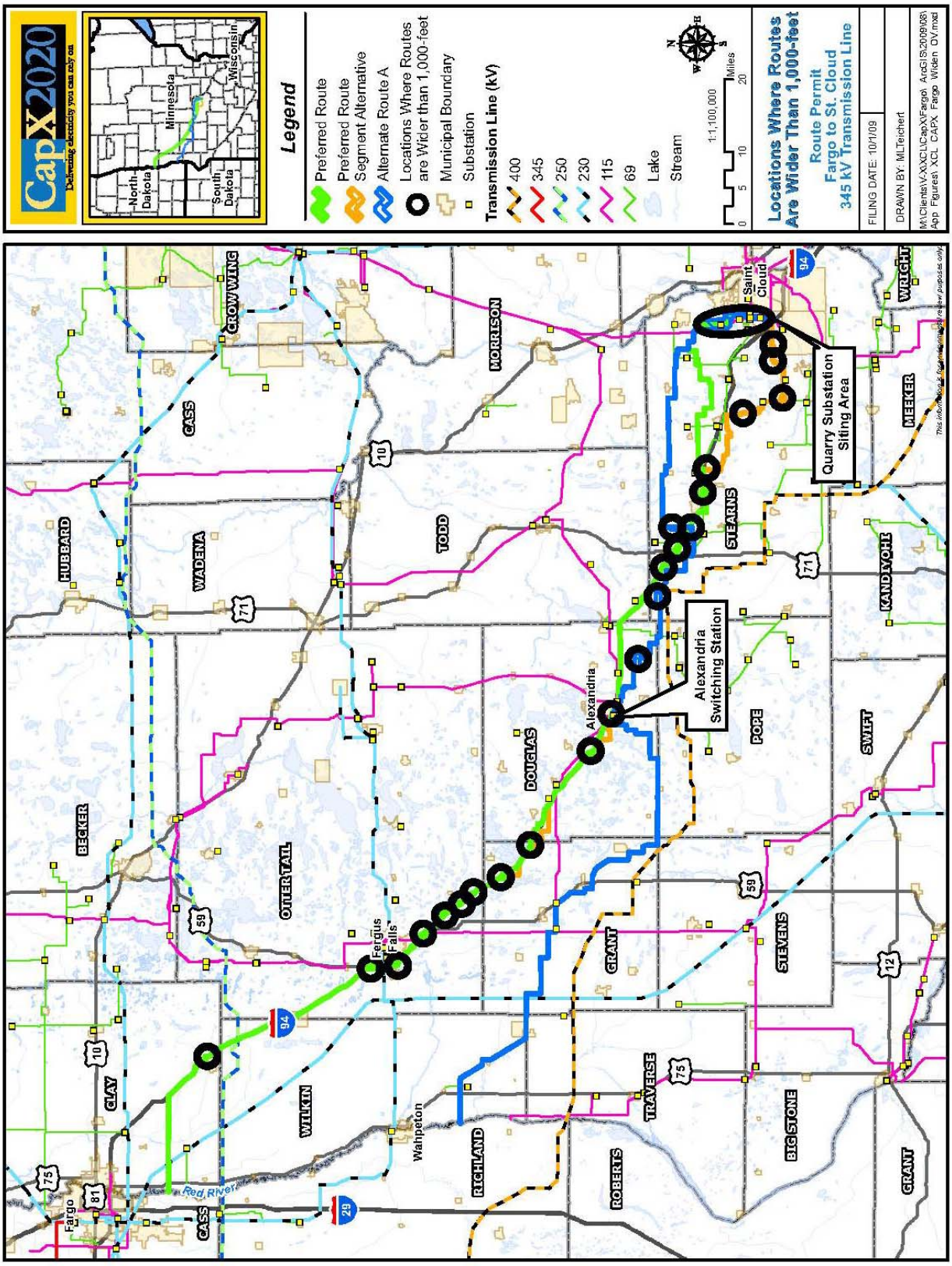
Figure 2-2. Representative Interstate Alignments



2.3.2.5 Areas where Requested Route Width is Greater or Less Than 1,000 Feet

Applicants request a route width of up to 1.25 miles in 34 specific areas along the Proposed Routes where site-specific considerations or substation interconnection requirements warrant additional flexibility for line placement. Figure 2-3 provides an overview of the locations where Applicants request a route up to 1.25 miles in width.

Figure 2-3. Overview of Areas of Increased Route Width



Each specific location where the Proposed Routes exceed 1,000 feet in width is further described in Figure 2-4 below.

Figure 2-4. Locations where Proposed Routes Exceed 1,000 Feet in Width

Widened Area Number	Widened Area Location	Rationale for Increased Route Width
Preferred Route		
1[1]	New Quarry Substation	Substation interconnection requirements
2	I-94 (milepost 138) and State Highway 237	Interstate interchange
3	I-94 (milepost 137 to milepost 136)	Site-specific consideration of shallow depths to groundwater within the area
4	I-94 (milepost 131) and State Highway 4/Stearns County Road 65	Interstate interchange
5	I-94 (milepost 129 to milepost 127)	Sauk Center Airport
6	I-94 (milepost 125 to milepost 126) and Stearns County Road 72	Interstate interchange
7	I-94 (milepost 119) and Todd County Road 92	Interstate interchange
8[1]	I-94 (milepost 115 west to milepost 114) and State Highway 127	Interstate interchange
9	I-94 (milepost 104) west to Interstate 94 and State Highway 27	Interstate interchange and substation interconnection requirements
10	I-94 (milepost 098 to milepost 097) and State Highway 114	Interstate interchange
11	I-94 (milepost 096 to milepost 095)	Site-specific consideration of proximity to existing residence or land held in fee by the USFWS
12	I-94 (milepost 090) and Douglas County Road 7	Interstate interchange
13	I-94 (milepost 082 to milepost 079)	Site-specific consideration of proximity to existing residences and lands held in fee or easement by the USFWS
14	I-94 (milepost 077) and State Highway 78	Interstate interchange
15	I-94 (milepost 075 to milepost 073)	Site-specific consideration of lands held in fee or easement by the USFWS and a Mn/DOT scenic easement
16	I-94 (milepost 069 to milepost 068)	Site-specific consideration of Mn/DOT scenic easements
17	I-94 (milepost 068 to milepost 066)	Interstate interchange and site-specific consideration of lands held in fee or easement by the USFWS and a Mn/DOT scenic easement
18	I-94 (milepost 66) and Tumuli Road to I-94 (milepost 63) and Otter Tail County Road 82	Site-specific consideration of proximity to existing residences or land held in fee by the USFWS
19	I-94 (milepost 062 to milepost 059)	Interstate interchange and site-specific consideration of proximity to existing residence land held in easement by the USFWS, Minnesota Department of Natural Resources (MDNR) Wildlife Management Area (WMA), and a Mn/DOT scenic easement
20	I-94 (milepost 058) and State Highway 210/Otter Tail County Road 25	Interstate interchange
21	I-94 (milepost 056) and Otter Tail County Road 1	Interstate interchange
22	I-94 (milepost 55) and Otter Tail County Road 15 west to I-94 (milepost 54) and State Highway 210	Interstate interchange and site-specific consideration of Mn/DOT scenic easements

Widened Area Number	Widened Area Location	Rationale for Increased Route Width
23	I-94 (milepost 52 to milepost 50) and U.S. Highway 59	Interstate interchange and site-specific consideration of lands held in fee and easement by the USFWS and a Mn/DOT scenic easement
24	I-94 (milepost 38) and Wilkin County Road 11	Interstate interchange
25	I-94 (milepost 33 to milepost 32) and State Highway 108	Interstate interchange
26	I-94 (milepost 25 to milepost 24) and State Highway 34	Interstate interchange and site-specific consideration of proximity to existing guyed communication towers
27	I-94 (milepost 23 to milepost 22) and State Highway 9	Interstate interchange
Alternate Route A		
28[1]	North of intersection of Stearns County Road 185 and 355th Avenue (Melrose Township, Sections 17 through 20)	Site-specific consideration of potential for impact to existing or future uses of affected land(s)
29	0.5 mile west of intersection of 430th Street and Stearns County Road 183 to intersection of 440th Street and Stearns County Road 189. Ashley Township, Section 2, 3, and 4 in T126N, R35W and Sections 33, 34, and 35 in T127N, R35W.	Site-specific consideration of potential for impact to existing or future uses of affected land(s) and MDNR WMA
30	0.5 mile east of intersection of Mikes Road Southeast and Douglas County Road 31 to ¼ mile west of the intersection of Balm of Gilead Road Southeast and Walsh Drive Southeast. Orange Township, Sections 17, 18, 19, 20, 29, and 30, Hudson Township, Sections 13 and 34.	Site-specific consideration of potential for impact to existing or future uses of affected land(s)
Preferred Route Segment Alternatives		
31	North of intersection of Stearns County Roads 2 and 139 (St. Joseph Township Section 29 and 30)	Site-specific consideration of potential for impact to existing or future uses of affected land(s)
32	Island Lake Road and Stearns County Road 160 (St. Joseph Township Section 25, Collegeville Township Section 26)	Site-specific consideration of potential for impact to existing or future uses of affected land(s)
33	Manana Road and Stearns County Road 9 (Collegeville Township Section 31, Farming Township Sections 36, Munson Township Section 1, and Wakefield Township Section 6)	Site-specific consideration of potential for impact to existing or future uses of affected land(s)
34	Sand Lake Road and Mapleview Road (Farming Township Sections 2 and 3, Albany Township Sections 34 and 35)	Site-specific consideration of potential for impact to existing or future uses of affected land(s)
35	I-94 (milepost 140) and Rimcrest Road (Oak Township Sections 3, 4, 9, and 10)	Site-specific consideration of potential for impact to existing or future uses of affected land(s)

Appendix B includes figures illustrating locations where the Proposed Routes exceed 1,000 feet in width. There are 35 total locations where the Proposed Routes have been widened beyond 1,000 feet. Of these, 13 locations have been widened along the interstate solely due to existing interchanges.

There are also areas where the Proposed Routes have been narrowed from 1,000 feet. The route width being narrowed in these areas is due to the occurrence of lands held in fee by the USFWS, across which an overhead transmission line would not be a permitted use. The minimum route width requested is 400 feet.

In summary, Applicants' Proposed Routes are generally 1,000 feet in width. However, there are specific locations where the Proposed Routes have been widened beyond 1,000 feet up to 1.25 miles or narrowed to no less than 400 feet. By adjusting the route widths, Applicants retain the flexibility to work with landowners to develop detailed design and pole placement, and reduce the potential for impacts. If there is environmental or land use information that should cause the route to be narrowed further in specific areas, Applicants anticipate affected parties will bring such information forward during this proceeding.

2.4 ASSOCIATED FACILITIES

The associated facilities for the Project include connection to the new Quarry Substation and modifications to the existing Alexandria Switching Station. Depending on final configuration needs, additional land may be required for modifications to be made at the Alexandria Switching Station. Applicants have sought to acquire up to 40 acres for the new Quarry Substation to ensure adequate space for planned facilities, future transmission line interconnections and approaches and an area surrounding the proposed facility to minimize impacts and limit encroachment.

2.4.1 QUARRY SUBSTATION (NEW)

The new Quarry Substation will be constructed as part of the Monticello to St. Cloud 345 kV Project. Facilities will be installed to accommodate the proposed 345 kV transmission line that is the subject of this Application. The construction will include 345 kV equipment (circuit breakers, switches, and control panels), foundations and structures necessary to connect the line.

2.4.2 ALEXANDRIA SWITCHING STATION (EXISTING)

Modifications will be made at the existing Alexandria Switching Station to accommodate the proposed 345 kV transmission line. Equipment to be installed may include 345 and 115 kV equipment (including switches, a transformer, control panels, and circuit breakers), foundations and structures. The 345 kV connection at Alexandria is being made to provide support to the underlying transmission system.

2.5 PROJECT SCHEDULE

Construction for the Project is expected to begin in the third quarter of 2012. Applicants anticipate a third quarter of 2015 in-service date for the proposed 345 kV transmission line. A permitting and construction schedule summary, with anticipated end dates identified, is provided below:

Minnesota Route Permit	First Quarter 2011
Environmental Permits	First Quarter 2012
Engineering and Right-of-Way Acquisition	Second Quarter 2011
Construction	Second Quarter 2012
In-Service	Third Quarter 2015
Post In-Service and Project Completion	First Quarter 2016

This schedule is based on information known as of the date of this filing and upon planning assumptions that balance the timing of implementation with the availability of crews, materials and other practical and seasonal considerations. This schedule may be subject to adjustment and revision as further information is developed.

2.6 PROJECT COSTS

2.6.1 ESTIMATED COSTS

Estimated costs for the Project are summarized below and provided in $2009. For estimating purposes, Applicants used the alignment 75 feet from the outside edge of the I-94 right-of-way for those sections of the Proposed Routes that parallel I-94. Final costs will be dependent on the final route permitted and final alignment.

Preferred Route Project Costs	
345 kV Transmission Line	$253.7 million
Alexandria Switching Station Modifications	$15.3 million
Total Project Costs:	$269.0 million
Alternate Route A Project Costs	
345 kV Transmission Line	$293.6 million
Alexandria Switching Station Modifications	$15.3 million
Total Project Costs:	$308.9 million

Preferred Route Segment Alternative 1 Incremental Project Costs[6]	
345 kV Transmission Line	$900,000
Preferred Route Segment Alternative 2 Incremental Project Costs	
345 kV Transmission Line	$2.3 million
Preferred Route Segment Alternative 3 Incremental Project Costs[6]	
345 kV Transmission Line	$1.2 million
Preferred Route Segment Alternative 4 Incremental Project Costs[6]	
345 kV Transmission Line	$3.3 million
Preferred Route Segment Alternative 5 Incremental Project Costs[6]	
345 kV Transmission Line	$3.1 million

The costs associated with the new Quarry Substation were included in the Monticello to St. Cloud Route Permit Application. There may be additional but minimal costs associated with the final connections and configurations at the substation to allow for the interconnection of the Fargo to St. Cloud 345 kV Project.

2.6.2 Operation and Maintenance

The primary operating and maintenance cost for transmission lines is the cost of inspections, usually done monthly by air and by ground once a year. Annual operating and maintenance costs for transmission lines in Minnesota and the surrounding states vary depending upon the setting, the amount of vegetation management necessary, storm damage occurrences, structure types, materials used and the transmission line's age. For 115 kV through 345 kV transmission lines, past experience has shown that generally beyond the first 10 years of operation, operation and maintenance costs are approximately $300 to $500 per mile.

Substations require a certain amount of maintenance to keep them functioning in accordance with accepted operating parameters and the National Electric Safety Code (NESC). Transformers, circuit breakers, batteries, protective relays and other equipment need to be serviced periodically in accordance with the manufacturer's recommendation. The site itself must be kept free of vegetation and drainage must be maintained.

[6] Estimated cost provided includes the differential cost of the Preferred Route Segment Alternative in comparison to the comparable portion of the Preferred Route.

3.0 ENGINEERING AND DESIGN, CONSTRUCTION, AND RIGHT-OF-WAY ACQUISITION

3.1 TRANSMISSION LINE ENGINEERING, SUBSTATION ENGINEERING AND OPERATIONAL DESIGN

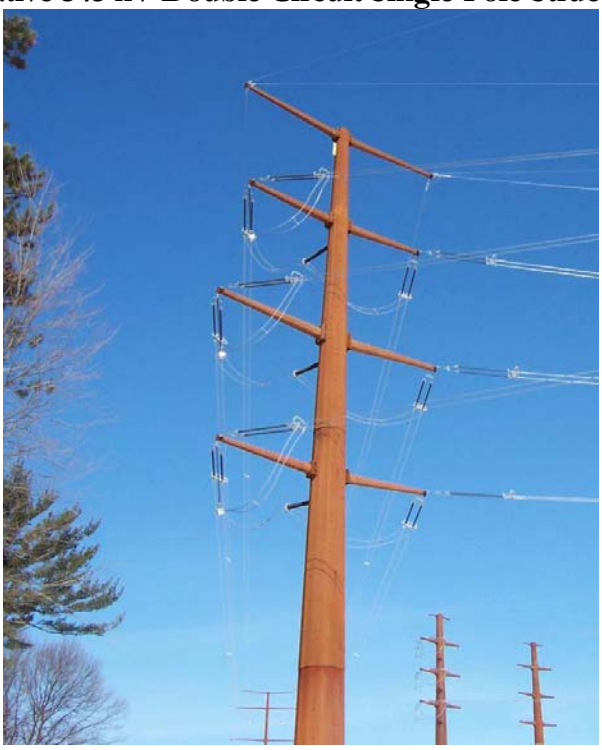
An HVTL consists of three phases, each at the end of a separate insulator string, all physically supported by structures. Each phase consists of one or more conductors. When more than one conductor is used to make up a phase, the term "bundled" conductors is used. Conductors are metal cables consisting of multiple strands of steel and aluminum wire wound together. There are also two shield wires, typically less than one inch in diameter, strung above the electrical phases to prevent damage from lightning strikes. The shield wire can also include fiber optic cable which provides a communication path between substations for transmission line protection equipment. A double circuit transmission line carries two circuits or six conductors and normally two shield wires. There are several different types of structures used for double circuit transmission lines, including single steel pole structures and multiple pole steel structures. Transmission lines are constructed in a right-of-way, which is primarily dependent on structure design, span length and the electrical safety requirements associated with the transmission line's voltage.

3.1.1 TRANSMISSION STRUCTURE DESIGN AND RIGHT-OF-WAY

Transmission Structures

Applicants propose to use primarily single pole, self-weathering or galvanized steel double circuit capable structures (Figure 3-1). Only one circuit will be installed for this Project. Self-weathering steel oxidizes or rusts to form a dark reddish brown surface coating to protect the structure from further weathering. Single steel pole structures are typically placed on a concrete foundation. There may be site-specific conditions where specialty structures, such as structures having a reduced height, or multiple pole structures will be required. One such condition that may require the use of reduced height structures includes the Sauk Centre Airport and the area immediately surrounding the airport. A second condition includes an area encompassing Melrose within which the existing groundwater level is at a shallow depth and may require the use of a modified foundation type and large angles may required multiple pole structures.

Figure 3-1. Representative 345 kV Double Circuit Single Pole Structure (Self-Weathering)



Each phase will normally consist of bundled conductors composed of two 954 Aluminum Conductor Steel Supported (ACSS) cables or conductors of comparable capacity. Each conductor is 954,000 circular mils or approximately 1.2 inches in diameter. ACSS cable consists of steel wires at the center surrounded by aluminum strands. Applicants propose to use the same conductor and bundled configuration for most of the Project.

Figure 3-2 summarizes the structure designs and foundations for the proposed single pole structures that may be installed for the Project.

Figure 3-2. Structure Design Summary

Line Type	Structure Type	Structure Material	Right-of-Way Width (feet)	Typical Structure Height (feet)	Typical Structure Base Diameter (inches)	Typical Foundation Diameter (feet)	Typical Span Length Between Structures (feet)
345 kV/345 kV Double Circuit	Single Pole Davit Arm	Steel	150 total	130-175	36-48 (tangent structures) 48-72 (angle structures)	6-12	600-1,000

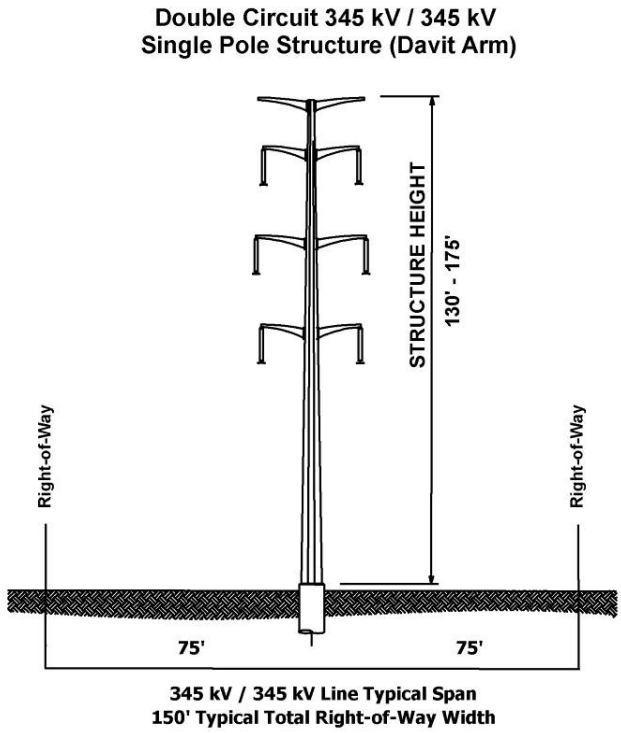
The proposed transmission line will be designed to meet or surpass all relevant local and state codes, NESC and North American Electric Reliability Corporation (NERC) requirements and Applicants' standards. Appropriate standards will be adhered to for construction and installation and all applicable safety procedures will be followed during and after installation.

The CapX2020 Utilities are currently exploring the cost, technical, and potential regulatory considerations surrounding whether it would be more appropriate to install the davit arms and conductor for the second circuit of the Three 345 kV Projects at the time of initial construction. The lines would be operated as a single circuit until future circumstances and regulatory approvals deem the second circuit necessary. CapX2020 transmission planners are also analyzing the installation of all davit arms as part of initial construction without stringing the conductor associated with the second circuit which may be a lower cost approach because it would mitigate the need for larger structures and would avoid expensive and complex construction on the poles after the first circuit has been energized. The CapX2020 Utilities will continue to analyze the impacts, costs, and regulatory considerations associated with concurrent installation and will provide additional information in the routing proceeding.

Right-of-Way

The proposed 345 kV transmission line will be built primarily with single pole structures, which typically require a right-of-way 150 feet in width for the length of the transmission line. In some limited instances, where specialty structures are required for long spans or in environmentally sensitive areas, up to 180 feet of right-of-way may be needed. When the transmission line is placed cross-country across private land, an easement for the entire right-of-way (150 to 180 feet in width) will be acquired from the affected landowner(s). Applicants will locate the poles as close to property division lines as reasonably possible. A diagram of a structure with right-of-way is shown in Figure 3-3.

Figure 3-3. Double Circuit 345 kV Structure with Right-of-Way



When the transmission line parallels other existing infrastructure right-of-way (e.g., roads, railroads, other utilities), an easement of lesser width may be required as parts of the right-of-way of the existing infrastructure can sometimes be combined with the right-of-way needed for the proposed transmission line. When paralleling existing right-of-way such as a road, Applicants' typical practice is to place the poles on adjacent private property, a few feet off the existing right-of-way. With this pole placement, the transmission line shares the existing right-of-way, thereby reducing the size of the easement required from the private landowner. For example, if required right-of-way is 150 feet and the pole is placed five feet off of an existing road right-of-way, an 80-foot-wide easement will be required from the landowner and the additional 70 feet of the needed right-of-way will be shared with the road right-of-way. The arms on the pole will be approximately 85 feet above the ground, depending on span length, and extend approximately 18 feet from the center of the pole. In each instance of sharing right-of-way, Applicants will acquire necessary approvals from the right-of-way owner (e.g., railroad) or the agency overseeing use of a particular right-of-way (e.g., Mn/DOT) for state trunk highways, including U.S. highways and interstates which approvals will be informed by the outcome of this proceeding.

As discussed in section 3.3, Applicants have sought to identify areas to share right-of-way with existing infrastructure, including interstates, highways and railroads. This approach implements the state's policy of non-proliferation. In the context of transmission line siting, the non-proliferation

policy creates a preference for placing new power lines near existing infrastructure as a way to minimize the proliferation of new corridors. The PPSA and the Commission's implementing routing rules recognize this preference and call upon the Commission to consider the utilization of existing railroad and highway right-of-way as well as any existing transmission corridors in selecting transmission line routes. Minn. Stat. §216E.03, sub. 7; Minn. R. 7850.4100.

3.1.2 SUBSTATION DESIGN

Quarry Substation (New)

The Quarry Substation is a new substation to be located west of St. Cloud, Minnesota. The Quarry Substation was proposed as an associated facility within the application for a Route Permit for the Monticello to St. Cloud 345 kV Transmission Line Project (Docket No. ET2, E002/TL 09 246). Modifications will be made at the new Quarry Substation to accommodate the interconnection of the Fargo to St. Cloud 345 kV electrical transmission line. These modifications will potentially include the addition of 345 kV equipment (circuit breakers, switches, and control panels), foundations and structures necessary to connect the line.

Alexandria Switching Station (Existing)

The Alexandria Switching Station is an existing substation located south of Alexandria. Equipment to be installed may include 345 and 115 kV equipment (including switches, a transformer, control panels, and circuit breakers), foundations and structures. The graded and fenced area at the Alexandria Switching Station will have to be enlarged. Design work is currently underway to determine if enough property is owned at Alexandria for the expansion.

3.1.3 DESIGN OPTIONS TO ACCOMMODATE FUTURE EXPANSION

Applicant's double circuit compatible configuration allows for expansion within the existing right-of-way. By constructing the structures to hold a future second circuit, the proposed 345 kV transmission line could be upgraded. A second circuit could be added to the proposed 345 kV transmission line if future conditions warrant. Applicants anticipate that they will be able to operate the double circuit line within the existing right-of-way.

3.2 IDENTIFICATION OF EXISTING CORRIDORS AND BOUNDARIES

Existing utility and public rights-of-way were identified in the route selection process. Figure 3-4 provides a summary of corridor sharing associated with the Proposed Routes. The data and information associated with all routes considered are also provided in Appendix E.

Figure 3-4. Summary of Length of Existing Right-of-Way, Field/Parcel Lines, or Other Natural Division Lines Paralleled by the Proposed Routes

Route	Route Length (miles)	Right-of-Way Type Paralleled (miles)		Field/Parcel Lines Paralleled (miles)	Miles not Paralleling Existing Rights-of-Way, Field/Parcel Lines, or Other Natural Division Lines	Total Length of Parallel	% of Length
		Transmission Line	Road				
Preferred Route	179.7	11.1	137.3	25.0	2.7	173.4	96.5%
Alternate Route A	169.0	11.7	96.7	52.6	4.0	161.0	95.2%
Preferred Route Segment Alternatives							
Preferred Route Segment Alternative 1	34.7	0.6	24.9	6.8	1.2	32.3	93.1%
Comparable Portion of Preferred Route	37.9	7.3	15.0	14.5	1.1	36.8	97.1%
Preferred Route Segment Alternative 2	1.5	0.0	0.0	1.5	0.0	1.5	100.0%
Preferred Route Segment Alternative 3	3.9	0.0	2.4	1.5	0.0	3.9	100.0%
Comparable Portion of Preferred Route	2.3	0.3	2.0	0	0.0	2.3	100.0%
Preferred Route Segment Alternative 4	9.3	0.0	5.8	3.5	0.0	9.3	100.0%
Comparable Portion of Preferred Route	7.9	0.0	7.5	0.3	0.0	7.9	100.0%

Route	Route Length (miles)	Right-of-Way Type Paralleled (miles)		Field/Parcel Lines Paralleled (miles)	Miles not Paralleling Existing Rights-of-Way, Field/Parcel Lines, or Other Natural Division Lines	Total Length of Parallel	% of Length
		Transmission Line	Road				
Preferred Route Segment Alternative 5	3.8	0.0	2.8	0.4	0.6	3.2	84.2%
Comparable Portion of Preferred Route	3.1	0.0	3.1	0.0	0.0	3.1	100.0%

3.3 Right-of-Way and Land Acquisition, Construction, Restoration and Maintenance Procedures

3.3.1 Right-of-Way and Land Acquisition

Transmission Line Right-of-Way

The right-of-way acquisition process begins early in the detailed design process. For transmission lines, utilities typically acquire easement rights to accommodate the facilities. The evaluation and acquisition process includes title examination, initial owner contacts, survey work, document preparation and purchase. 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 right-of-way process is to identify all persons and entities of whom may have a legal interest in the real estate upon which the facilities will be built. To compile this list, a right-of-way agent or other persons engaged by Applicants will complete a public records search of all land involved in the Project. A title report is then developed for each parcel to determine the legal description of the property and the owner(s) of record of the property and to gather information regarding easements, liens, restrictions, encumbrances and other conditions of record.

The next step is evaluation of the specific parcel. After owners are identified, and typically after a Route Permit is issued, a right-of-way representative contacts each property owner or the property owner's representative. The right-of-way agent describes the need for the transmission facilities, how the specific Project may affect each parcel, and seeks information from the landowner about any specific construction concerns. The right-of-way agent may also request the owner's permission for survey crews to enter the property to conduct preliminary survey work. Permission may also be requested to take soil borings to assess soil conditions and determine appropriate foundation design.

Surveys are conducted to locate right-of-way corridors, natural features, man-made features and associated elevations used during the detailed engineering of the transmission line. The soil analysis is performed by an experienced geotechnical testing laboratory.

During the evaluation process, the proposed transmission line's location will be staked. This means that the survey crew identifies the proposed location of each structure or pole on the ground and marks it with a surveyor's stake. The right-of-way agent shows the landowner where the structure(s) will be located on the property as well as delineates the boundaries of easement area required for safe operation of the line.

The right-of-way agent then negotiates with the property owner(s) to determine the amount of just compensation for the rights to build, operate and maintain the transmission facilities within the easement area and reasonable access to the easement area. The agent also provides maps of the transmission line route or site and the landowner's parcel and offers compensation for the transmission line easement. In the event that a complicated appraisal problem arises, an appraisal is completed by the utility's representative(s) to determine the value of the land rights being acquired. The landowner is allowed a reasonable amount of time to consider the offer and present any material that the owner believes is relevant to determining the property's value.

In the majority of cases, utilities are able to work with the landowners to address their concerns and an agreement is reached for the utilities' purchase of land rights. The right-of-way agent prepares all of the documents required to complete each transaction. Required documents may include: easement, purchase agreement or contract and deed.

In rare instances, if a negotiated settlement cannot be reached, the landowner may choose to have an independent third party determine the value of the land acquisition. Such valuation is made through the utility's exercise of the right of eminent domain pursuant to Minnesota Statutes Chapter 117. The process of exercising the right of eminent domain is called condemnation.

In the event of a condemnation for a high voltage transmission line, the utility will provide the landowner with a copy of each appraisal it has obtained for the property interests to be acquired. 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 appointed must be knowledgeable of 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. The commission can also award up to $3,000 in appraisal fees. Minn. Stat. §117.189. Each party has 40 days from the award filing 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 right-of-way is acquired and prior to construction, the right-of-way agent will again contact the owner of each parcel to discuss the construction schedule and requirements. To ensure safe construction of the transmission line, special consideration may be needed for fences, crops or livestock. For instance, 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 right-of-way agent coordinates these processes with the landowner, who is compensated for damages.

Substation Land Acquisition

No additional land is required for modifications at the new Quarry Substation. All modifications at the Quarry Substation will be made inside the existing fenced area. The graded and fenced area at the Alexandria Switching Station will have to be enlarged. Design work is currently underway to determine if enough property is owned at Alexandria for the expansion.

3.3.2 CONSTRUCTION PROCEDURES

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

The actual construction will follow standard construction and mitigation practices that were developed from experience with past projects following an agricultural impact mitigation plan. These best practices address right-of-way clearance, staging, erecting transmission line structures and stringing transmission lines. Construction and mitigation practices to minimize impacts will be developed based on the proposed schedule for activities, permit requirements, prohibitions, maintenance guidelines, inspection procedures, terrain and other practices. In some cases these activities, such as schedules, are modified to minimize impacts to sensitive environments.

Transmission Line Structures

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

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

Staging areas are usually established for the Project. Staging involves delivering the equipment and materials necessary to construct the new transmission line facilities. The materials are stored at staging areas until they are needed for the Project. Temporary lay down areas may be required for additional space for storage during construction. These areas will be selected for their location, access, security and ability to efficiently and safely warehouse supplies. The areas are chosen to minimize excavation and grading. The temporary lay down areas and any staging areas outside of the transmission line right-of-way will be obtained from affected landowners through rental agreements.

Access to the transmission line right-of-way corridor is typically made directly from existing roads or trails that run parallel or perpendicular to the transmission line right-of-way. In some situations, private field roads or trails are used. Permission from the property owner is obtained prior to accessing the transmission line corridor. Where necessary to accommodate the heavy equipment used in construction, including cranes, cement trucks and hole-drilling equipment, existing access roads may be upgraded or new roads may be constructed. New access roads may also be constructed when no current access is available or the existing access is inadequate to cross roadway ditches.

When it is time to install the poles, they are generally moved from the staging areas, and delivered to the staked location. The structures are typically placed within the right-of-way until set. Insulators and other hardware are attached while the pole is on the ground. The pole is then lifted, placed and secured using a crane. The conductors are then clipped to the insulators, as shown in Figure 3-5.

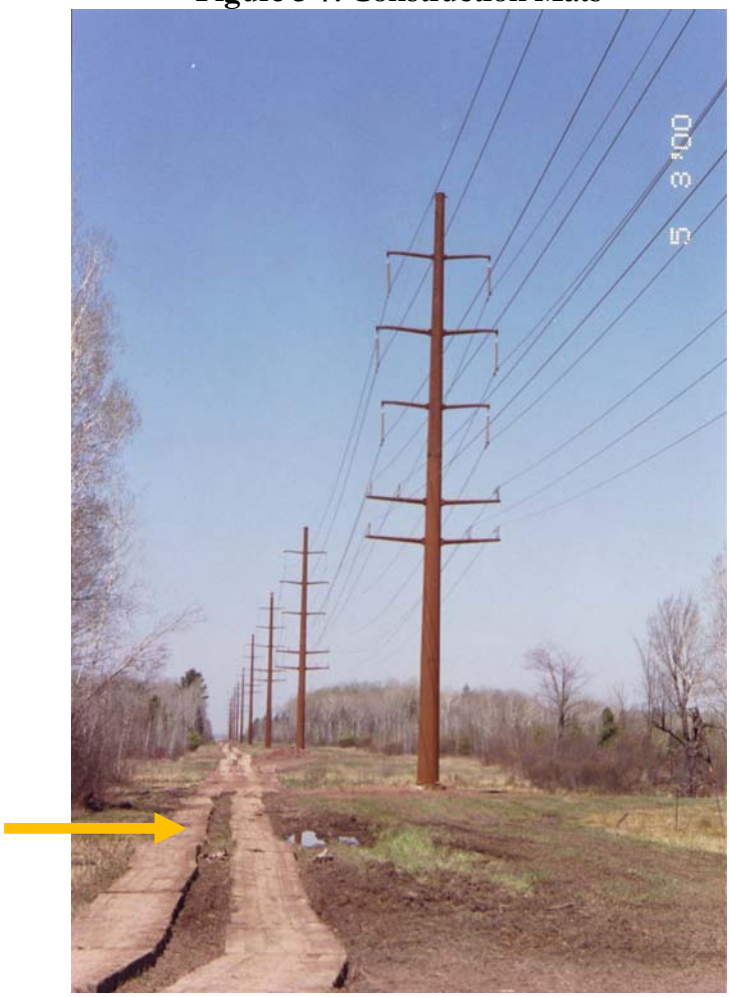
Figure 3-5. Clipping of Conductor to the Insulator

In general, structures will have drilled pier concrete foundations (see Figure 3-6). Drilled pier foundations may vary from six to nine feet in diameter and 25 feet or more deep, depending on soil conditions. After the concrete foundation is set, the pole is bolted to the foundation. Concrete trucks are required to bring the concrete in from a local concrete batch plant.

Figure 3-6. Pier Foundation

Construction mats are also placed in wet or soft soil locations and narrow ditches to minimize disturbances. These mats can also provide access to sensitive areas during times when the ground is not frozen to minimize impacts at the site. Figure 3-7 shows an example of construction mats.

Figure 3-7. Construction Mats



If landowner permission is obtained, it is preferred to spread excess soil from foundation holes on the structure site. If not allowed, it will be offered to the landowner or will be completely removed from the site.

The conductors are then installed by establishing stringing setup areas within the right-of-way or on temporary construction easements outside the right-of-way. These stringing setup areas are usually located every two miles along a final route. Conductor stringing operations also require brief access to each structure to secure the conductor wire to the insulator hardware and the shield wire to clamps once final sag is established. When the transmission line crosses streets, roads, highways, or other energized conductors or obstructions, a temporary guard or clearance poles may be installed. This ensures that conductors will not obstruct traffic or contact existing energized conductors or other cables during stringing operations; it also protects the conductors from damage. Figure 3-8 shows a single circuit steel 115 kV structure midway through the stringing process.

Figure 3-8. Stringing Process

Environmentally sensitive areas and wetlands may also require special construction techniques in some circumstances. During construction, the most effective way to minimize impacts to wet areas will be to span all streams and rivers. In addition, Applicants will not allow construction equipment to be driven across waterways except under special circumstances and only after discussion with the appropriate resource agency. Where waterways must be crossed to pull in the new conductors and shield wires, workers may walk across, use boats, or drive equipment across ice in the winter. These construction practices help prevent soil erosion and ensure that equipment fueling and lubricating will occur at a distance from waterways. Additional mitigative measures relating to wetlands are contained in section 7.0.

3.3.3 RESTORATION PROCEDURES

During construction of the transmission line and in areas outside of the fenced area of the existing and proposed substations, crews will attempt to limit ground disturbance wherever possible. However, areas are disturbed during the normal course of work, which can take several weeks in any one location. As construction on each parcel is completed, disturbed areas will be restored to their original condition to the extent practicable. The right-of-way agent will contact each property owner after construction is completed to see if any damage has occurred as a result of the Project. If damage has occurred to crops, fences or the property, Applicants will fairly reimburse the landowner for damages sustained.

In some cases, Applicants may engage an outside contractor to restore the damaged property to as near as possible to its original condition. Portions of vegetation that are disturbed or removed during construction of the transmission line 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 along the proposed transmission line corridor will require assistance in reestablishing the vegetation stratum and controlling soil erosion. Commonly used methods to control soil erosion and assist in reestablishing vegetation include, but are not limited to:

- Erosion control blankets with embedded seeds;
- Silt fences; and
- Straw bales.

These erosion control and vegetation establishment practices are regularly used in construction projects and are referenced in the construction permit plans. Long-term impacts are minimized by utilizing these construction techniques.

3.3.4 MAINTENANCE PROCEDURES

Transmission Lines

Transmission lines are designed to operate for decades and require only moderate maintenance, particularly in the first few years of operation. The estimated service life of a transmission line for accounting purposes is approximately 40 years. However, from a practical perspective, HVTLs 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 conditions such as tornadoes and ice, 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, usually done monthly by air. Annual operating and maintenance cost for transmission lines in Minnesota and the surrounding states vary. For voltages from 115 kV through 345 kV, Applicants' experience shows that costs are approximately $300 to $500 per mile. Actual line-specific maintenance costs depend on the setting, the amount of vegetation management necessary, storm damage occurrences, structure types, materials used and the age of the line.

Substations

Similar to transmission lines, substations are also designed to operate for decades and require only moderate maintenance, particularly in the first few years of operation. The principal operating and maintenance cost for substation facilities is the cost of routine inspections.

Substations require a certain amount of maintenance to keep them functioning in accordance with accepted operating parameters and NESC and NERC requirements. Transformers, circuit breakers, batteries, protective relays and other equipment need to be serviced periodically in accordance with the manufacturer's recommendation. The site itself must be kept free of vegetation and drainage must be maintained. The substation equipment that will be installed as part of the Project includes state of the art circuit breakers designed to minimize the risk of sulfur hexafluoride (SF6) release. SF6, used as an insulator in breakers, is considered a greenhouse gas by the Environmental Protection Agency (EPA). Current technologies require less SF6 at lower pressures than older technologies, resulting in a more secure system. Absent an equipment failure, newer breakers contain and maintain SF6 levels and do not sustain the releases associated with older circuit breakers.

3.4 ELECTRIC AND MAGNETIC FIELDS

The term electromagnetic field (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, which arise from the flow of electricity and the voltage of a power line. Electric fields are measured in kilovolts per meter (kV/m) and magnetic fields are measured in milliGauss (mG). The intensity of the electric field is proportional to the voltage of the transmission line, while the intensity of the magnetic field is proportional to the current flow through the conductors. Transmission lines operate at a power frequency of 60 hertz (cycles per second).

There is no federal standard for transmission line electric fields. The Commission, however, has imposed a maximum electric field limit of 8 kV/meter measured at one meter above the ground. *See Application to the Minnesota Public Utilities Commission for a Route Permit for Brookings County – Hampton 345 kV Transmission Line Project, Docket No. ET2/TL-08-1474 at p. 3-14; In the Matter of the Xcel Energy and Dairyland Power Cooperative Application for a Route Permit and a Certificate of Need for the Chisago County to Apple River 115/161 kV HVTL Project*, Docket Nos. E002,ET3/CN-04-1176, E002,ET3/TL-06-1677, Environmental Assessment, at p. 45 (August 20, 2007). The standard was designed to prevent serious hazards from shocks when touching large objects parked under alternating current (AC) transmission lines of 500 kV or greater. The maximum electric field associated with Applicants' proposal, measured at one meter above ground, is calculated to be 3.73 kV/m.

Considerable research has been conducted over the past three decades to determine if exposure to power-frequency (60 hertz) magnetic fields causes biological responses and health effects. Epidemiological and toxicological studies have shown no statistically significant association or weak associations between EMF exposure and health risks. The possible impact of EMF exposure to human health has also been investigated by public health professionals for the past several decades. While the general consensus is that electric fields pose no human risk, the question of whether exposure to magnetic fields can cause biological responses or health effects continues to be debated.

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

In 2007, the World Health Organization (WHO) concluded a review of the health implications of electromagnetic fields. In this report, the organization stated:

> Uncertainties in the hazard assessment [of epidemiological studies] include the role that control selection bias and exposure misclassification might have on the observed relationship between magnetic fields and childhood leukemia. In addition, virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF [Extremely Low Frequency] magnetic fields and changes in biological function or disease status. Thus, on balance, the evidence is not strong enough to be considered causal, but sufficiently strong to remain a concern. *Environmental Health Criteria Volume N°238 on Extremely Low Frequency Fields* at p. 12, WHO (2007).

In addition, regarding disease outcomes, aside from childhood leukemia, the organization stated:

> A number of other diseases have been investigated for possible association with ELF magnetic field exposure. These include cancers in both children and adults, depression, suicide, reproductive dysfunction, developmental disorders, immunological modifications and neurological disease. The scientific evidence supporting a linkage between ELF magnetic fields and any of these diseases is much weaker than for childhood leukemia and in some cases (for example, for cardiovascular

> disease or breast cancer) the evidence is sufficient to give confidence that magnetic fields do not cause the disease. *Id.* at p.12.

Furthermore, in its "Summary and Recommendations for Further Study" the organization emphasized:

> The limit values in [EMF] exposure guidelines [not] be reduced to some arbitrary level in the name of precaution. Such practice undermines the scientific foundation on which the limits are based and is likely to be an expensive and not necessarily effective way of providing protection. *Id.* at p. 12.

The organization concluded:

> Given both the weakness of the evidence for a link between exposure to ELF magnetic fields and childhood leukemia, and the limited impact on public health if there is a link, the benefits of exposure reduction on health are unclear. Thus, the costs of precautionary measures should be very low. *Id.* at p. 13.

Wisconsin, Minnesota and California have all conducted literature reviews or research to examine this issue. In 2002, Minnesota formed an Interagency Working Group (Working Group) to evaluate the body of research and develop policy recommendations to protect the public health from any potential problems resulting from HVTL EMF effects. The Working Group consisted of staff from various state agencies. Its findings were published in a White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options in September 2002 (Minnesota Department of Health, 2002). The report summarized the findings of the Working Group as follows:

> Research on the health effects of EMF has been carried out since the 1970s. Epidemiological studies have mixed results – some have shown no statistically significant association between exposure to EMF and health effects, some have shown a weak association. More recently, laboratory studies have failed to show such an association, or to establish a biological mechanism for how magnetic fields may cause cancer. A number of scientific panels convened by national and international health agencies and the United States Congress have reviewed the research carried out to date. Most researchers concluded that there is insufficient evidence to prove an association between EMF and health effects; however, many of them also concluded that there is insufficient evidence to prove that EMF exposure is safe. *Id.* at p. 1.

Based on the Working Group and WHO findings, the Commission has repeatedly found that "there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects." *In the Matter of the Application of Xcel Energy for a Route Permit for the Lake Yankton to Marshall Transmission Line Project in Lyon County*, Docket No. E-002/TL-07-1407, Findings of Fact, Conclusions of Law and Order Issuing a Route Permit to Xcel Energy for the Lake Yankton to Marshall Transmission Project at p. 7-8 (August 29, 2008); *See also*, *In the Matter of the Application for a HVTL Route Permit for the Tower Transmission Line Project*, Docket No. ET-2, ET015/TL-06-1624, Findings of Fact, Conclusions of Law and Order Issuing a Route Permit to Minnesota Power and Great River Energy for the Tower Transmission Line Project and Associated Facilities at p. 23 (August 1, 2007).

The OES has also analyzed the potential impacts of EMF on human health and safety and concluded that there is insufficient evidence to show a link between EMF and health effects:

> A number of national and international health agencies (the Minnesota Department of Health, the World Health Organization, the National Institute of Environmental Health Sciences) have generally concluded in their research that there is insufficient evidence to prove a connection between EMF exposure and health effects. Research has not been able to establish a cause and effect relationship between exposure to magnetic fields and human disease, nor a plausible biological mechanism by which exposure to EMF could cause disease.

In the Matter of the Application for a Route Permit for the Yankee Substation to Brookings County Substation 115 kV High Voltage Transmission Line Project, Docket No. E002/TL-07-1626, Environmental Assessment at p. 10 (May 30, 2008).

The Public Service Commission of Wisconsin (PSCW) has periodically reviewed the science on EMF since 1989 and has held hearings to consider the topic of EMF and human health effects. The most recent hearings on EMF were held in July 1998. In January 2008 and August 2009, the PSCW published a fact sheet regarding EMF, which noted:

> Many scientists believe the potential for health risks for exposure to EMF is very small. This is supported, in part, by weak epidemiological evidence and the lack of a plausible biological mechanism that explains how exposure to EMF could cause disease. The magnetic fields produced by electricity are weak and do not have enough energy to break chemical bonds or to cause mutations in DNA. Without a mechanism, scientists have no idea what kind of exposure, if any, might be harmful. In addition, whole animal studies investigating long-term

> exposure to power frequency EMF have shown no connection between exposure and cancer of any kind.

EMF-Electric & Magnetic Fields, Public Service Commission of Wisconsin. January 2008, August 2009. http://psc.wi.gov/thelibrary/publications/electric/electric12.pdf

There are presently no Minnesota regulations pertaining to EMF exposure. Applicants provide information to the public, interested customers, and employees so they can make informed decisions about EMF. Such information includes EMF measurements for customers and employees upon their request.

3.4.1 ELECTRIC FIELDS

The electric field from a transmission line can couple with a conductive object, such as a vehicle or a metal fence, which is in close proximity to the transmission line. HVTLs can induce a voltage on objects and therefore make it possible for current to flow as the object is discharged. The voltage buildup is dependent on many factors, including the weather; object shape, size, orientation, and capacitance; object to ground resistance; and location along the right-of-way. If these objects are insulated or semi-insulated from the ground and a person touches them, a small current will pass through the person's body to the ground. This might be accompanied by a spark discharge and mild shock, similar to what can occur when a person walks across a carpet and touches a grounded object or another person.

The main concern with induced voltage on an object is the discharge through the person to ground if a person were to touch the object. The best method to avoid these discharges is not to park equipment directly under the transmission line. Another option is to drop a chain that is attached to the equipment onto the ground (or lower the head to the ground on a combine) prior to dismounting if parked near a transmission line and pulling the chain (or head) up after getting into the equipment. It is important to note that use of a chain attached to farm machinery to eliminate spark discharges is not necessary for safety reasons and therefore should only be considered if the discharge is considered annoying to the operator and the vehicle must be parked under the transmission line.

To ensure that any discharge does not reach unsafe levels, the NESC requires that any discharge be less than 5 milliamperes (ma). Based on Applicants' 115 kV, 230 kV, and 345 kV transmission line operating experience, the discharge from any large mobile object—such as a bus, truck or farm machinery—parked under or adjacent to the transmission line will unlikely reach levels considered an annoyance and are less than the 5 ma NESC limit. Applicants will also ensure that any fixed object, such as a fence or other large permanent conductive object in close proximity to or parallel to the transmission line, will be grounded so any discharge will be less than the 5 ma NESC limit.

Similarly, the Commission's standard of maximum electric field limit of 8 kV/m measured one meter above ground was designed to prevent serious hazard from shocks when touching large objects placed under AC transmission lines of 500 kV or greater. The proposed facilities will comply with the NESC and Commission standards.

Figure 3-9 provides electric fields at the maximum conductor voltage for the type of transmission line facilities proposed. Electric fields were calculated using ENVIRO, a software program licensed by the Electric Power Research Institute, Inc. (EPRI). The calculated electric field assumed the maximum operating voltage of 362 kV, which is 105 percent of the nominal voltage for the transmission line. For any specific design, the set of phase conductors height above ground has a marked influence on the maximum electric field. The phasing arrangement is of particular importance for the maximum field for a double circuit configuration (two circuits on a single structure).

Figure 3-9. Calculated Electric Fields (kV/m) for Proposed Double Circuit 345 kV Transmission Line Designs (3.28 Feet Above Ground)

Structure Type	Nominal Voltage	Distance to Proposed Centerline										
		-300'	-200'	-100'	-75'	-50'	0'	50'	75'	100'	200'	300'
Single Pole Davit Arm 345 kV Single Circuit	362 kV	0.05	0.12	0.65	1.15	2.02	2.35	2.28	0.99	0.52	0.11	0.04
Single Pole Davit Arm 345 kV/345 kV Double Circuit with One Circuit In Service	362 kV	0.04	0.08	0.11	0.19	0.22	3.76	1.58	0.40	0.18	0.12	0.06
Single Pole Davit Arm 345 kV/345 kV Double Circuit with both Circuits In Service	362 kV	0.02	0.05	0.15	0.42	1.41	2.48	1.41	0.42	0.15	0.05	0.02

Other potential impacts of electric fields include interference with the operation of pacemakers and implantable cardioverters/defibrillators. Interference with implanted cardiac devices can occur if the electric field intensity is high enough to induce sufficient body currents to cause interaction.

Modern bipolar devices are much less susceptible to interactions with electric fields. Medtronic and Guidant, manufacturers of pacemakers and implantable cardioverters/defibrillators, have indicated that electric fields below 6 kV/meter are unlikely to cause interactions affecting operation of most of their devices.

Older unipolar designs are more susceptible to electric field interference. Research completed by Toivoen et al. (1991) indicated that the earliest evidence of interference was in electric fields ranging from 1.2 to 1.7 kV/meter. For older style unipolar designs, the electric field for some proposed structure types does exceed levels that Toivoen et al. has indicated may produce interference. However, a recent paper (Scholten et al., 2005) concludes that the risk of interference inhibition of unipolar cardiac pacemakers from high voltage power lines in everyday life is small. In the unlikely event a pacemaker is impacted, the effect is typically a temporary asynchronous pacing (commonly referred to as reversion mode or fixed rate pacing). The pacemaker returns to its normal operation when the person moves away from the source of the interference.

3.4.2 Magnetic Fields

Figure 3-10 provides calculated magnetic fields for each structure and conductor configuration proposed for the Project. Magnetic fields were calculated for each section of the Project and under two system conditions: the expected peak and average current flows as projected for the year 2011, under normal system intact conditions. Current is given in amps. The peak magnetic field values are calculated at a point directly under the transmission line and where the conductor is closest to the ground. The same method is used to calculate the magnetic field at varying distances from the alignment of the structure. The magnetic field profile data show that magnetic field levels decrease rapidly (inverse square of the distance from source) from the alignment.

Figure 3-10. Calculated Magnetic Fields (mG) for Proposed Double Circuit 345 kV Transmission Line Designs (3.28 Feet Above Ground)

			Distance to Proposed Centerline										
Structure Type	System Condition	Current (Amps)	-300'	-200'	-100'	-75'	-50'	0'	50'	75'	100'	200'	300'
Single Pole Davit Arm 345 kV Single Circuit	Peak	50.2	0.15	0.32	1.07	1.66	2.74	6.06	3.40	1.93	1.19	0.31	0.14
	Average	30.1	0.09	0.19	0.64	1.00	1.64	3.63	2.04	1.16	0.71	0.19	0.08
Single Pole Davit Arm 345 kV/345 kV Double Circuit with One Circuit In Service	Peak	50.2	0.14	0.28	0.84	1.22	1.88	4.87	3.46	2.11	1.35	0.37	0.16
	Average	30.1	0.08	0.17	0.51	0.73	1.13	2.92	2.07	1.27	0.81	0.22	0.10

Distance to Proposed Centerline													
Structure Type	**System Condition**	**Current (Amps)**	**-300'**	**-200'**	**-100'**	**-75'**	**-50'**	**0'**	**50'**	**75'**	**100'**	**200'**	**300'**
Single Pole Davit Arm 345 kV/345 kV Double Circuit with both Circuits In Service	Peak	50.2	0.04	0.11	0.63	1.1.6	2.27	5.71	2.30	1.17	0.64	0.11	0.04
	Average	30.1	0.02	0.07	0.38	0.69	1.36	3.42	1.38	0.70	0.39	0.07	0.02

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

As load growth occurs, the current flow on the line will increase, and because the magnetic field is directly related to current flow, the magnetic field will also increase.

Figures 3-9 and 3-10 indicate that electric and magnetic fields are lower for a double circuit configuration than for a single circuit configuration. When there are two circuits on a single structure, and if the phases of each circuit are opposite, they have a cancellation effect which reduces the electric and magnetic fields.

3.4.3 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 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. However, transmission lines can induce stray voltage on a distribution circuit that is parallel to and immediately under the transmission line. Appropriate measures will be taken to prevent stray voltage problems when the transmission lines proposed in this Application parallel or cross distribution lines.

3.4.3.1 Farming Operations, Vehicle Use, and Metal Buildings Near Power Lines

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 two methods: i) one or more of the fence insulators can be shorted out to ground with a wire when the charger is disconnected; or, ii) 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 long enough to touch the earth. However, such buildup is rare because vehicles generally are effectively grounded through tires. Modern tires provide an electrical path to the ground because carbon black, a good electricity conductor, 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 charge unless they have unusually old tires or are parked on dry rock, plastic or other surfaces that insulate them from the ground.

Another issue that arises when operating vehicles near power lines is whether vehicles can be safely refueled. The possibility of fuel ignition under a power line is remote. Nevertheless, Applicants do not recommend refueling vehicles directly under or within 100 feet of a transmission line 200 kV or greater.

Buildings are permitted near transmission lines, but are generally prohibited within the right-of-way itself because a structure under a transmission line may interfere with safe operation. For example, a fire in a building located in the right-of-way 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 transmission lines of 200 kV or greater must be properly grounded. Landowners who have questions about a new or existing metal structure can contact Applicants for further information about proper grounding requirements.

3.5 TRANSMISSION LINE RELIABILITY

When developing route segments for the Project, Applicants analyzed the potential to co-locate portions of the transmission line on the same structures as existing electric facilities as well as routing the 345 kV line parallel to existing facilities. Applicants concluded that co-locating the new facilities with existing facilities on common structures was not feasible because of reliability, safety and the need for the line to be double circuit capable. Paralleling opportunities were identified, however, and where appropriate, incorporated into the Proposed Routes.

When identifying suitable routes for new single circuit transmission lines, planning engineers typically analyze whether the new transmission line can be co-located with another existing transmission line (also referred to as double-circuited). In evaluating the appropriateness of such multiple circuit structures, Applicants applied reliability criteria established by NERC. NERC defines minimum transmission system performance requirements that must be met for different system conditions. NERC defines different types of system events and group them into four different categories:

Category A – All facilities in service (no contingencies)

Category B – Event resulting in loss of a single element

Category C – Event(s) resulting in the loss of two or more (multiple) elements

Category D – Extreme event resulting in two or more (multiple) elements removed or cascading out of service

For each of the different categories of contingencies, each reliability region is allowed to expand on NERC requirements to make them more stringent. This 345 kV transmission line Project is in the Midwest Reliability Organization (MRO) reliability region. NERC Category C (contingency C5) includes the loss of "any two circuits of a multiple circuit towerline" with an exclusion for multiple circuit towers used over short distances in accordance with regional exemption criteria. In the MRO region, if the transmission line is operated at a voltage of 100 kV or higher and if the overall distance that transmission lines are double circuited is greater than one mile, then it falls under the NERC Category C contingency definition.

NERC reliability standards require utilities to plan a transmission system to be able to survive all Category C contingencies without system performance violations. Double circuit construction has been found to be acceptable if the power system can reliably withstand simultaneous failure of both circuits on a common structure. Double circuit construction could be appropriate in some situations where the two circuits serve different functions, connect different substations, split away and proceed in different directions, or where high capacity (but not redundancy) is required.

Common tower outages for double circuit transmission lines could be caused by:

- electrical failure of transmission line insulation due to lightning strike
- mechanical failure of one or more structures
- broken shield wire falling into power conductors
- wind-blown debris causing conductor-conductor short circuits
- insulator contamination due to road salt, soot or agricultural chemicals
- wind, sleet and ice conditions
- contact with aircraft or construction equipment (crane, dump truck)
- protective relaying malfunction ("sympathetic tripping" due to fault on adjacent circuit)

These common tower failure mechanisms have all occurred on the transmission system within the northern MRO area on double circuit transmission lines.

Double circuiting of transmission lines is employed, for example, in situations where two circuits serve different functions or where high capacity (but not redundancy) is required. Double circuiting is not acceptable in situations where failure of both circuits will jeopardize reliability because of the substantial risk that both transmission lines will be out of service simultaneously. For example, if storm damage caused a double circuit structure to fail, it can be expected that an outage will occur on both circuits. Thus, if under the relevant reliability rules it were determined that simultaneous outage will jeopardize service, double circuiting will not be allowed.

This Project is proposed to be constructed with double circuit capable structures—strung with a single circuit initially and having the capability to add a second circuit at a later date.

Some stakeholders have inquired about whether portions of the 345 kV line could be "triple circuited" with an existing transmission line. In addition to the reliability considerations outlined above for multiple circuit towers, triple circuit structures pose additional maintenance safety considerations. Performing electrical work around multiple energized circuits adds a layer of complexity and safety concerns. Depending on the circumstances, it may be necessary to de-energize the lines when performing maintenance. Any outage to the circuits will require analysis to ensure adequate system reliability.

Because of these reliability and safety concerns, utilities generally avoid triple circuit construction wherever reasonably possible. Such configurations are typically limited to short distances where triple circuit construction is necessary to minimize the potential for impacts and the amount of new right-of-way required.

4.0 ROUTE DEVELOPMENT AND SELECTION PROCESS

The route development and selection process for the overall Fargo to Monticello 345 kV Project was driven by an extensive public participation and agency coordination effort. Almost 40,000 addresses in the Fargo to Monticello area received regular mailings throughout the public participation process, discussed in detail in section 8.0, which informed landowners of the Project, described opportunities to be involved in the route development and selection process, identified where additional information could be obtained, and explained how to submit comments to Applicants that could be utilized in the route development and selection process. Applicants gathered environmental data, collected stakeholder and public comments, and applied the factors listed in Minn. R. 7850.4100 and Minn. Stat. §216E.03, Subd. 7(b) to develop the Proposed Routes. Through this process, Applicants developed proposed routes for the Monticello to St. Cloud 345 kV Transmission Line Project, which are being considered in a separate docket, and the Proposed Routes for the Fargo to St. Cloud 345 kV Project included in this Application. This process is described below. Additional supporting information is provided in Appendix D.

4.1 SUMMARY OF ROUTE DEVELOPMENT SELECTION PROCESS

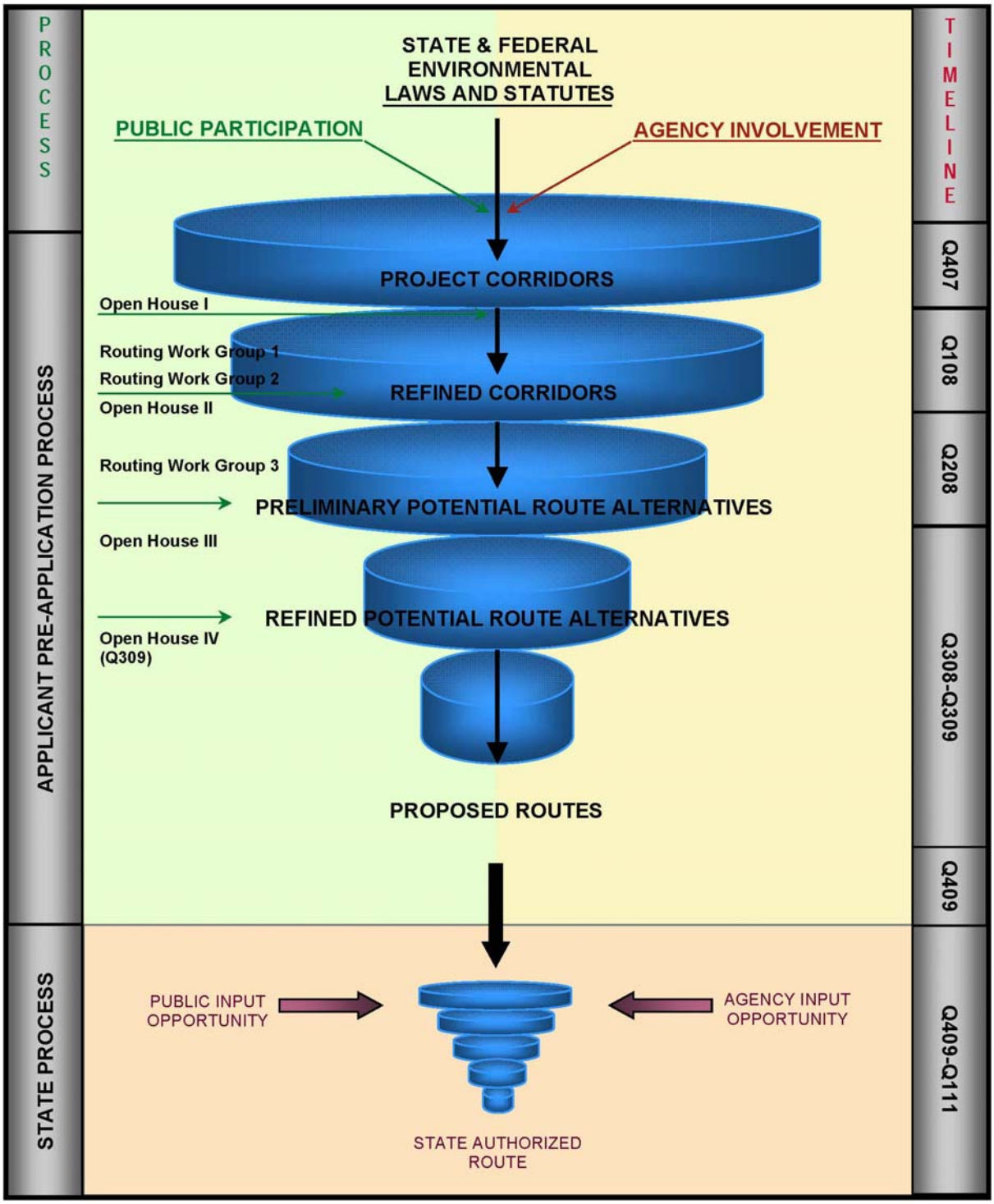
Applicants began their analysis by collecting GIS data from local, state and federal agencies; data repositories; or other data sources within the entire Fargo to Monticello project area. Data collected, along with observations and information collected during field reconnaissance, was used to develop a geospatial database. Data contained and analyzed within the geospatial database pertained to the environmental routing criteria that had been identified, and underlying data such as existing transportation and utility infrastructure, administrative boundaries, and property boundaries.

In developing the Proposed Routes, Applicants began by identifying the project corridors for the Fargo to Monticello 345 kV Project. The analysis then focused on what was separated as the Fargo to St. Cloud 345 kV Project. Four milestone stages associated with route development and selection included an emphasis on Project purpose and need, the development of refined corridors, the development of preliminary potential route alternatives, and the development of refined potential route alternatives—followed by selection of the Proposed Routes included in this Application. Transitioning from the project corridors to the development of refined corridors first required a discussion of the state siting criteria to be used for comparative analysis. The state siting criteria also served as the fundamental basis for comparative analysis, but also as the vehicle for seeking specific stakeholder and public input to be incorporated into the decision making process. Stakeholders, representative of various constituencies within the general public, were asked to identify the key factors to be considered among the complete list of criteria. Comments received that were specific to the siting criteria were used to validate data and inform decisions made throughout the route development and selection process.

Feedback from stakeholder and public participants throughout the route development and selection process identified a preference to routing the proposed 345 kV transmission line along the I-94 corridor, a preference to minimizing the potential for impact to existing residences, and a preference to minimizing the potential for impact to agricultural uses.

The route development and selection process can be described as a "funneling" of information. With each step, the scope or extent of study was reduced. Conversely, however, the analysis became more detailed and comprehensive with each step. Through the integration of multiple phases of stakeholder working groups and public meetings, Applicants inventoried existing and feasible linear features to be evaluated, refined the project corridors, developed preliminary potential route alternatives, identified refined potential route alternatives, and ultimately selected the Proposed Routes subject to this Application. The total number of segments or opportunities studied well exceeds 750 different segments. Figure 4-1 below generally outlines the route development and selection process.

Figure 4-1. Overview of the Route Development and Selection Process



Applicants spent more than two years analyzing and evaluating potential route alternatives and gathering input from stakeholders and the general public. The Project team facilitated stakeholder working groups and open houses throughout the Project area. Applicants met with state and federal agencies, local governments and landowners within the Project study area that may be affected by the Project. The Project team also evaluated GIS data from local, state, and federal agencies; reviewed aerial photographs; and conducted preliminary field investigation throughout the Project study area to gather additional site-specific information. Through this process, Applicants developed and selected the Proposed Routes. The Proposed Routes mostly follow existing rights-of-way and property lines, to the extent feasible. For each route, Applicants have identified a route width of 1,000 feet for the majority of the route length. In some areas, a wider route width of up to 1.25 miles is requested due to site-specific considerations and substation interconnection requirements. In other areas, a narrower route width between 400 and 1,000 feet is requested due to site-specific considerations.

4.2 REGULATORY FRAMEWORK AND GUIDING PRINCIPLES

The principles that guided the route development and selection process were the state criteria set forth in Minn. R. 7850.4100 and Minn. Stat. §216E.03, Subd. 7(b). The rule criteria are as follows:

A. effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services;

B. effects on public health and safety;

C. effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining;

D. effects on archaeological and historic resources;

E. effects on the natural environment, including effects on air and water quality resources and flora and fauna;

F. effects on rare and unique natural resources;

G. application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity;

H. use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries;

I. use of existing large electric power generating plant sites;

J. use of existing transportation, pipeline, and electrical transmission systems or rights-of-way;

K. electrical system reliability;

L. costs of constructing, operating, and maintaining the facility which are dependent on design and route;

M. adverse human and natural environmental effects which cannot be avoided; and

N. irreversible and irretrievable commitments of resources.

Id.

All of these factors are included in the statutory criteria listed in Minn. Stat. §216E.03, Subd. 7(b). There are also two additional factors included in Minn. Stat. §216E.03, Subd. 7(b)(7) (evaluation of route alternatives) and (12) (consideration of issues raised by other agencies and local entities).

Applicants applied these factors when making decisions about potentially removing certain route options from further evaluation or carrying forward certain route options, and ultimately in developing the routes proposed in this Application. Comparative evaluations were conducted at increasingly detailed levels following meetings with affected stakeholders and each phase of the public participation process.

4.3 IDENTIFICATION OF ALIGNMENTS WITHIN THE PROPOSED ROUTES

The refined potential route alternatives (also referred to as the Open House IV Route Alternatives) studied were 1,000 feet in width, based on geographic features, which was deemed appropriate for transmission line routing. The Open House IV Route Alternatives were presented to stakeholders and the general public at the final open houses. Prior to these public participation meetings, Applicants had met several times with other agencies, including Mn/DOT and the FHWA. Applicants described the route development and selection process, in addition to describing the integrated public participation process and our understanding of the key messages received from those that participated. Feedback from stakeholder and public participants identified a preference for routing the proposed 345 kV transmission line along the I-94 corridor, a preference for minimizing the potential for impact to existing residences, and a preference for minimizing the potential for impact to agricultural uses. Mn/DOT and FHWA representatives stated their concerns regarding constructing the proposed line near to the I-94 right-of-way and crossings.

To assist in the analysis of route impacts associated with proximity to I-94, multiple alignments were developed for the Preferred Route and Alternate Route A, both of which parallel the I-94 right-of-way at least in part. The Proposed Alignments used for analyzing impacts include: (i) at least 25 feet from the I-94 edge of right-of-way to provide data on a scenario that minimizes corridor sharing

only to intermittent aerial intrusions of the conductor during certain wind conditions (blowout); (ii) at least 75 feet from the I-94 edge of right-of-way to avoid corridor sharing entirely and to avoid the need for Mn/DOT occupancy permits; and (iii) five feet from the I-94 edge of right-of-way to provide data on a scenario that is equivalent to corridor sharing for non-interstate highways.

There are select areas along the Proposed Routes where a route width of up to 1.25 miles in width is requested. In three areas specifically, the consideration of the various alignments along I-94 influenced the requested route width. At these locations, discussed in more detail in section 2.3.2.6, Mn/DOT's preferences may require the line to be farther away from I-94. In this situation, the alignment will need to be shifted further away or divert away from the interstate, or cross the interstate, to minimize impacts at various locations along I-94. This is based on the evaluation of the varying alignments along the I-94 right-of-way. As a result, Applicants are seeking a route up to 1.25 miles in width in these areas to allow for flexibility to work with Mn/DOT and landowners having property adjacent to the interstate right-of-way that may be affected.

Through various phases of analysis, Applicants determined that the proximity of the transmission line facilities to existing transportation corridors has an effect on the overall impacts of the Project. In general, the overall impacts are minimized if the facilities are located adjacent to existing roadways or interstates and parallel or potentially share the existing right-of-way.

4.4 METHODOLOGY AND APPROACH

The methodology and approach associated with route development and selection for the Project involved the identification of project corridors, the development of refined corridors, the development of preliminary potential route alternatives, the identification of refined potential route alternatives, and the selection of Proposed Routes. There were a number of interim steps supporting each milestone stage of route development and selection.

As part of the route development and selection process, Applicants also met with local, state and federal agencies that may be affected by the Project. Agencies generally responded with requests to be updated on further Project developments and informed Applicants of potential permits that may be required for the Project, including specific applicable guidelines, rules and regulations. Applicants will continue to communicate with these agencies.

Applicants performed various levels of comparative analysis of environmental resources occurring within the Project study area using GIS and digital imagery such as recent aerial photographs and topographic maps. Data was obtained from federal, state, and local agencies that may be affected by the Project, as well other potentially affected stakeholders. For example, zoning and land use data was obtained from potentially affected local jurisdictions. The United States Department of Agriculture (USDA) was consulted for soil data and the Federal Emergency Management Agency (FEMA) for floodplain information. The MDNR provided information on native plant

communities, sites with biodiversity significance, streams and lakes, WMAs and rare natural features. The USFWS identified National Wetlands Inventory (NWI) wetlands in the Project study area. In addition, the Minnesota State Historic Preservation Office (SHPO) was consulted for the presence of cultural, archaeological or historic sites relative to the Proposed Routes.

Based on the above information, the Proposed Routes were developed in accordance with the following primary objectives:

- Maximize corridor sharing and minimize land use impacts by routing along roads and existing transmission lines to reduce the amount of new right-of-way required and by placing new facilities along natural corridors, and existing division lines (e.g., field lines, drainage ditches);
- Minimize impacts to human settlement;
- Minimize impacts to environmental and sensitive resources; and
- Minimize the length of the transmission line to reduce the impact area and costs for the Project.

Detailed maps of the Proposed Routes are included in Appendices B and C. Information pertaining to all route options that were considered during the route development and selection process is included in Appendix E.

Based on the information gathered from the participants in the stakeholder working groups and public meetings and agencies, Applicants selected the Proposed Routes as detailed in this Application. Applicants believe the Preferred Route is best suited for the Project as compared to the other Proposed Routes. A summary of the factors supporting the selection of the Preferred Route, based on the comparative evaluation of identified alignments, is as follows:

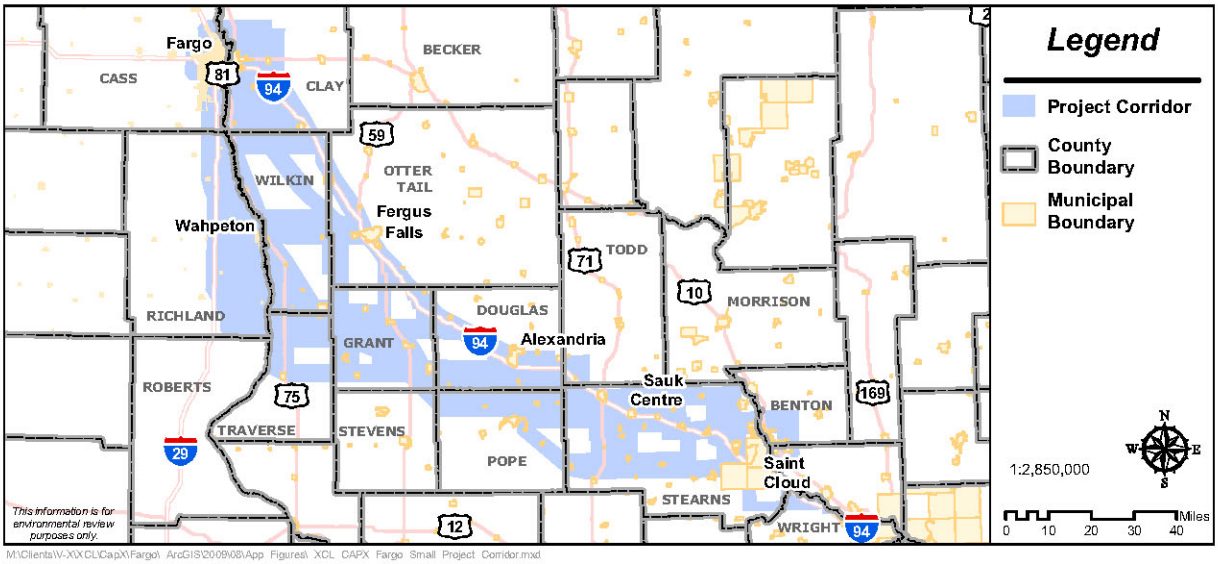
- Paralleling mostly interstate right-of-way minimizes land use impacts, particularly land uses such as existing residential use and agricultural use. Approximately 76 percent of the Preferred Route parallels the interstate right-of-way;
- Impacts to existing residences are minimized; and
- Environmental impacts are reduced to the extent feasible.

Section 6.0 further describes the rationale for selecting the Preferred Route for the Fargo to St. Cloud 345 kV Project.

4.4.1 FARGO TO MONTICELLO PROJECT CORRIDORS

The first step in the route development process was the identification of project corridors. Project corridors were developed for the Fargo to Monticello 345 kV Project. The project corridors were developed by delineating broad study boundaries around areas of obvious or predominant linear features, including existing transportation or transmission corridors, occurring between the general vicinities of the project end points. The project corridors were up to 12 miles in width and provided an adequate area of study for review between the designated endpoints. The project corridors, together with the areas occurring between the project corridors, effectively served to function as the Fargo to Monticello project area. Figure 4-2 below depicts the Fargo to Monticello project corridors.

Figure 4-2. Fargo to Monticello Project Corridors



Public information meetings were conducted throughout the Fargo to Monticello project area in September and October 2007. These meetings were conducted as open houses and provided an overview of the CapX2020 projects, including the need for the Fargo to Monticello 345 kV Project and resulting benefits. Section 8.0 describes the public participation process in greater detail.

4.4.2 FARGO TO ST. CLOUD REFINED CORRIDORS

The development of refined corridors for the Fargo to St. Cloud 345 kV Project involved the identification of the criteria to be evaluated, the collection of information and data pertaining to these criteria, database development and mapping, the preliminary assessment of existing linear features, and comparative analysis.

The environmental siting criteria to be evaluated within the overall project area were identified. The environmental siting criteria coincide with the criteria identified in Minn. R. 7850.4100 and include

"opportunities" and "sensitivities." For transmission lines, advantageous siting "opportunities" are characterized by corridors with the potential for sharing or running alongside existing facilities, infrastructure, and landscape features, and for substations, they are sites that allow a substation to be located on or adjacent to a property with existing facilities or compatible structures.

Existing linear opportunities were identified and mapped in a two-step process within the Fargo to Monticello project area. First, primary opportunities which included interstate highways, U.S. highways, state highways, county roads and existing transmission lines with voltages of at least 115 kV were identified. These existing linear features were identified as primary opportunities because they have existing associated rights-of-way that may allow for right-of-way sharing, therefore decreasing the amount of new right-of-way required. After primary opportunities were identified, secondary opportunities were then identified to add opportunities in the project area where there were otherwise few opportunities available, or where the added opportunity was of significant distance and relatively straight. Secondary opportunities included local level roads and existing transmission lines less than 115 kV.

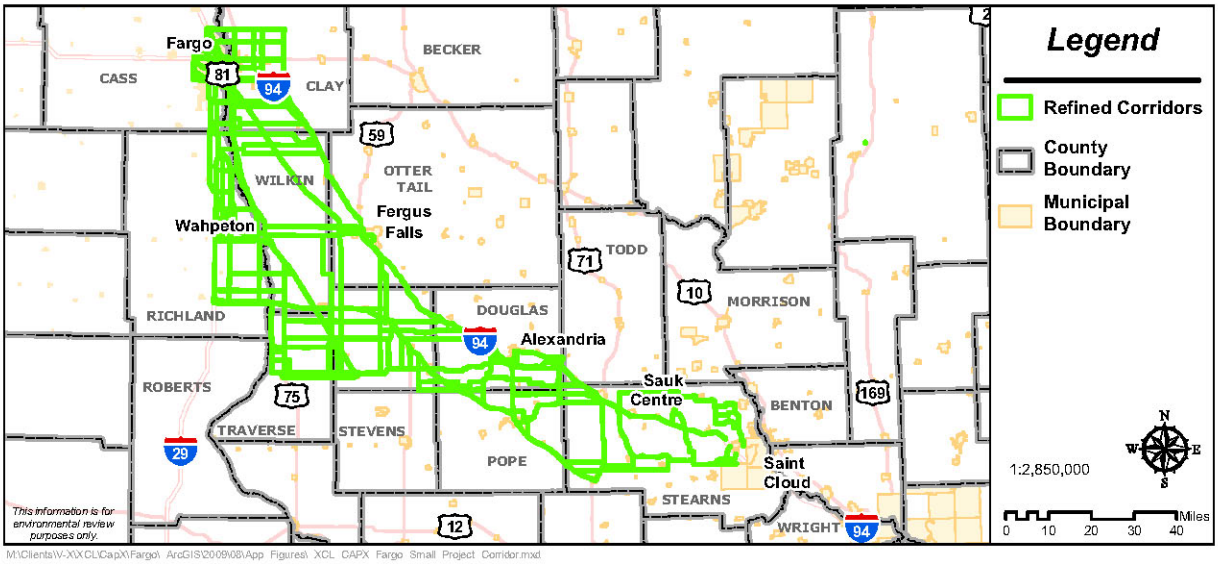
"Sensitivities" are those environmental siting criteria, including point locations, areas, or features, which should be taken into account with regard to routing, construction, or additional licensing/permitting procedures. Identification of a feature as being sensitive does not necessitate or imply it must be avoided.

Data and information associated with the environmental siting criteria were collected and incorporated into GIS. A geospatial database was developed. The opportunities and sensitivities were then mapped. The composite mapping of the opportunities and sensitivities occurring within the Fargo to St. Cloud Project area allowed for a preliminary assessment of the strength or feasibility of the various linear features as potential routing considerations. Opportunities that conflicted with the directional orientation of the project were identified and removed from consideration. For example, since the Fargo to St. Cloud Project area was orientated northwest to southeast, any opportunity of considerable distance extending in an opposite orientation was removed from consideration. Additionally, opportunities obviously constrained by a high concentration or density of sensitivities within an area were also removed from consideration. The remaining opportunities were characterized as the study corridors to be evaluated. The study corridors were generally 1,000 feet in width.

Concurrent with the timing associated with data collection and preliminary assessment efforts, it was separately determined that due to the critical in-service need in the greater St. Cloud area, the Fargo to Monticello 345 kV Project would be divided into the Monticello to St. Cloud and Fargo to St. Cloud 345 kV projects.

An initial phase of stakeholder working group meetings was facilitated in January 2008. Attendees, including agency representatives, elected officials, community leaders and other representatives of constituencies within the general public, were provided a more in-depth overview of the overall Fargo to Monticello 345 kV Project. They were also asked to identify the key factors to be considered in the route development and selection process. As previously identified, participants of these meetings generally identified a preference for routing the proposed 345 kV transmission line along the interstate, a preference for minimizing the potential for impacts to existing residences, and a preference for minimizing the potential for impacts to agricultural uses. Although a number of consistent concepts were derived from the public participation process, these three concepts were the key common messages or themes. Figure 4-3 below illustrates the existing linear features that were further evaluated in the route development and selection process.

Figure 4-3. Refined Fargo to St. Cloud Corridors



The refined corridors, and the methodology as to how they were developed, were presented to stakeholders and the general public at a second series of stakeholder working group meetings and a second series of open houses in March 2008.

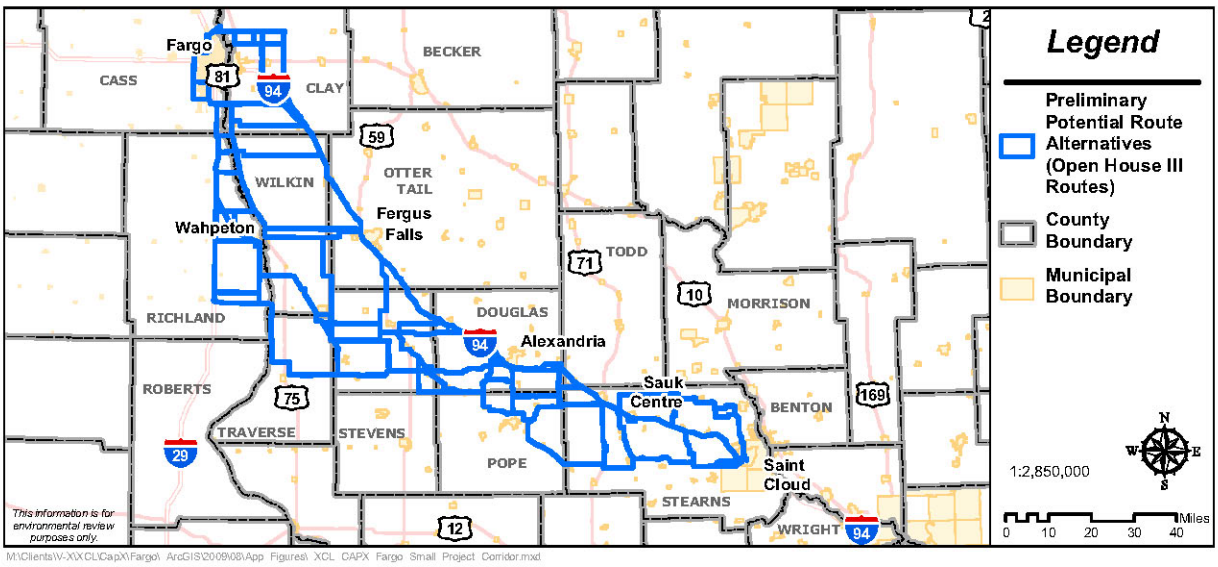
4.4.3 Fargo to St. Cloud Preliminary Potential Route Alternatives

Areas among the existing linear features that had been carried forward for analysis where features were similar in function and located close to one another were then identified. Using GIS, localized comparisons were conducted in these areas to further reduce the number of opportunities or study corridors being evaluated. The comparative analysis assessed the cumulative occurrence of sensitivities associated with each opportunity and the strength of opportunity from a right-of-way sharing perspective. If two study corridors were considered comparable based on these considerations, deference was then made to the occurrence of residential use areas or the number of

estimated angle structures. Transmission angle structures typically have a greater associated impact in that they are larger transmission structures and they are more costly.

The study corridor having a greater associated occurrence of existing residential use, or will require a greater estimated number of angle structures, was removed from further consideration. The remaining study corridors were carried forward as the preliminary potential route alternatives, or Open House III Route Alternatives. Figure 4-4 below depicts the Open House III Route Alternatives.

Figure 4-4. Preliminary Fargo to St. Cloud Potential Route Alternatives (Open House III Route Alternatives)



The preliminary potential route alternatives, and the methodology as to how they were developed, were presented to stakeholders and the general public at a third series of stakeholder working group meetings and a third series of open houses in June 2008.

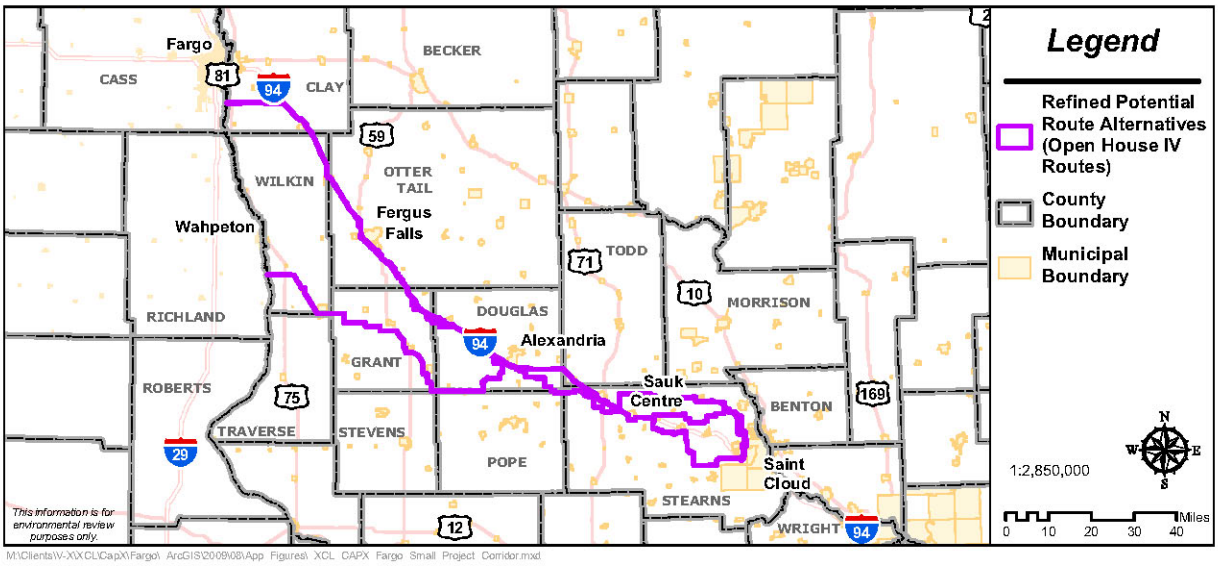
4.4.4 Fargo to St. Cloud Refined Potential Route Alternatives

Similar to the development of the preliminary potential route alternatives, or Open House III Route Alternatives, the refined potential route alternatives (Open House IV Route Alternatives) were selected through various levels of comparative analysis although at an increasing level of detail. Localized segment or segment combination comparisons were evaluated, as well as broader comparisons associated with lengthier route options. Additionally, some of the factors being considered were further refined. For example, rather than assessing the occurrence of zoned or classified residential use areas, the number of existing residences occurring within proximity of the preliminary potential route alternatives was instead evaluated. Existing residential and non-residential buildings were identified through aerial interpretation and field reconnaissance. With this modified

sensitivity, some study corridors that were removed during the first stage of route refinement were identified as potentially needing further study and therefore were added back in as potential route alternatives. The comparative analyses assessed the cumulative occurrence of sensitivities associated with each route alternative and the strength of the route alternative from a right-of-way sharing perspective. If two route alternatives were considered comparable based on these considerations, deference was then made to the number of existing residences within proximity of the route alternatives or the number of estimated angle structures.

The preliminary potential route alternative having a greater number of existing residences within proximity, or will require a greater estimated number of angle structures, was removed from further consideration. Further, some route alternatives were identified as being infeasible in that a viable alignment could not be located within the route alternative that will avoid the displacement of existing residences. Therefore, in order to avoid displacing homes, these route alternatives were either removed from consideration or modified as appropriate to make them feasible. The remaining route alternatives were carried forward as the refined potential route alternatives, or Open House IV Route Alternatives. Figure 4-5 below depicts the Open House IV Route Alternatives.

Figure 4-5. Refined Fargo to St. Cloud Potential Route Alternatives (Open House IV Route Alternatives)

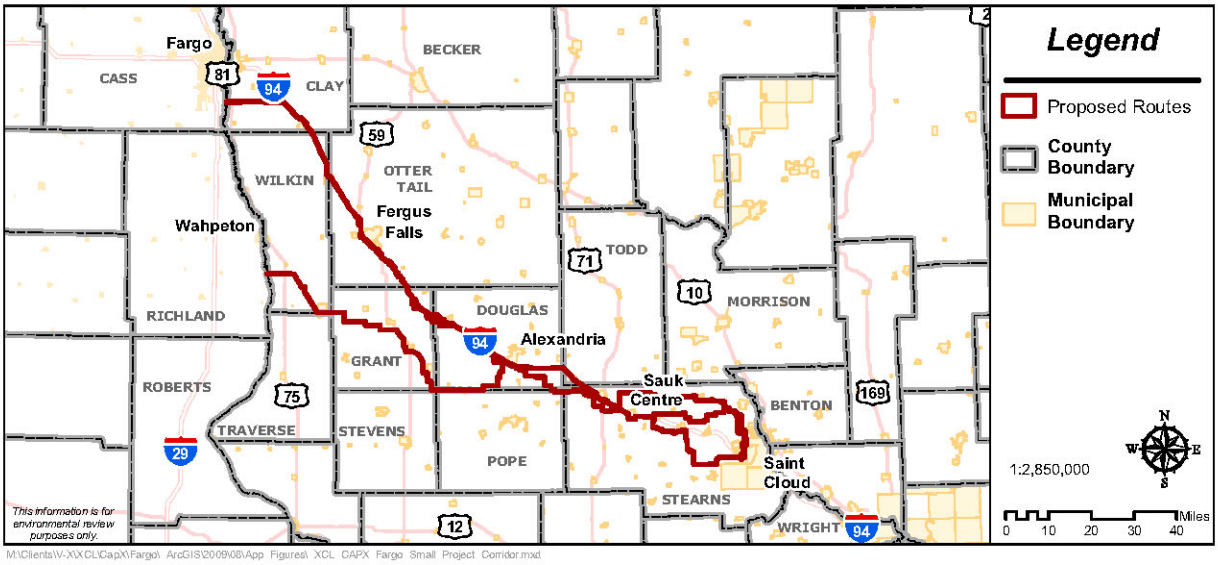


The refined potential route alternatives, and the methodology as to how they were developed, were presented to the general public at a fourth series of open houses in July 2009.

4.4.5 FARGO TO ST. CLOUD PROPOSED ROUTES

Similar to the development of the refined potential route alternatives, the Proposed Routes were selected through various levels of comparative analysis although at an increasing level of detail. Figure 4-6 depicts the Proposed Routes for the Fargo to St. Cloud 345 kV Project.

Figure 4-6. Fargo to St. Cloud Proposed Routes



4.4.6 IDENTIFIED ALIGNMENTS

Subsequent to the third phase of the public participation process, Applicants participated in various meetings with Mn/DOT and the FHWA. During these meetings, Mn/DOT and the FHWA identified concerns associated with placing the proposed 345 kV transmission line along I-94. Applicants then identified potential alignments along the I-94 right-of-way and conducted a comparative analysis of these alignments.

To assist in the analysis of the appropriate alignment along I-94, multiple alignments were developed for the Preferred Route and Alternate Route A, both of which parallel the I-94 right-of-way at least in part. The identified alignments include: (i) at least 25 feet from the I-94 edge of right-of-way; (ii) at least 75 feet from the I-94 edge of right-of-way; and (iii) five feet from the I-94 edge of right-of-way.

4.4.7 CONSIDERATION OF ROUTE ALTERNATIVES

In selecting the routes proposed in this Application, Applicants comparatively evaluated various study corridors, route alternatives, route options, and ultimately various alignments within the Proposed Routes extending between the new Quarry Substation and the Red River. More than 750

different segments were evaluated throughout the route development and selection process. In developing and selecting the Proposed Routes, many factors were evaluated including social, environmental and other factors that may contribute to potential impacts and cost – such as length, number of estimated angle structures, number of potentially affected landowners, road crossings, existing utility crossings, and right-of-way sharing. Information pertaining to all segments that were considered in the route development and selection process is provided in Appendix E.

4.4.8 ROUTE ALTERNATIVES REMOVED FROM CONSIDERATION

In addition to the Proposed Routes described in this Application, Applicants also evaluated and rejected more than 500 segments. The route alternatives that were rejected included various segments along mostly secondary roadways, property lines, or cross-country route options where sensitivities occur more frequently or densely. Applicants removed from consideration a number of segments based on the comparative analyses performed. The removal of route alternatives from consideration was based on the following key factors:

- The Proposed Routes optimize right-of-way sharing or corridor sharing along existing linear features, such as the I-94 right-of-way.
- The Proposed Routes have a lower associated cumulative occurrence of sensitivities.
- The Proposed Routes more effectively minimize the potential for impacts to existing residences or residential use areas, as well as agricultural use areas.

Information pertaining to all segments that were considered, but removed from further consideration, is provided in Appendix E.

5.0 DESCRIPTION OF PROPOSED ROUTES

Minnesota statutes and rules require that an applicant for a Route Permit for an HVTL under the Full Permitting Process propose at least two routes and identify a preferred route. This section describes in more detail the Proposed Routes for the Fargo to St. Cloud 345 kV Project. In an effort to simplify the detailed description of each of the Proposed Routes for the reader, they are being discussed in three geographic extents. The geographic extents include Quarry to Sauk Centre, which is the portion of the Fargo to St. Cloud 345 kV Project generally extending between the new Quarry Substation and the Sauk Centre area; Sauk Centre to Alexandria, which is the portion of the Fargo to St. Cloud 345 kV Project generally extending between the Sauk Centre area and the Alexandria Switching Station; and Alexandria to Red River, which is the portion of the portion of the Fargo to St. Cloud 345 kV Project generally extending between the Alexandria Switching Station and the Red River.

The Proposed Routes were developed through the route development and selection process detailed in section 4.0. A Project overview map included in Appendix A illustrates the Proposed Routes. The route descriptions begin at the new Quarry Substation and end at the Red River. Detailed route maps are provided in Appendices B and C and include the various alignments analyzed. For illustrative purposes, the specific detail provided in the sections below regarding alignments where the Proposed Routes parallel the interstate corridor is based on an alignment five feet from the I-94 edge of right-of-way.

5.1 PREFERRED ROUTE AND PREFERRED ROUTE SEGMENT ALTERNATIVES

Preferred Route

Quarry to Sauk Centre

Figure 5-1 describes the Preferred Route, between the new Quarry Substation and the Sauk Centre area.

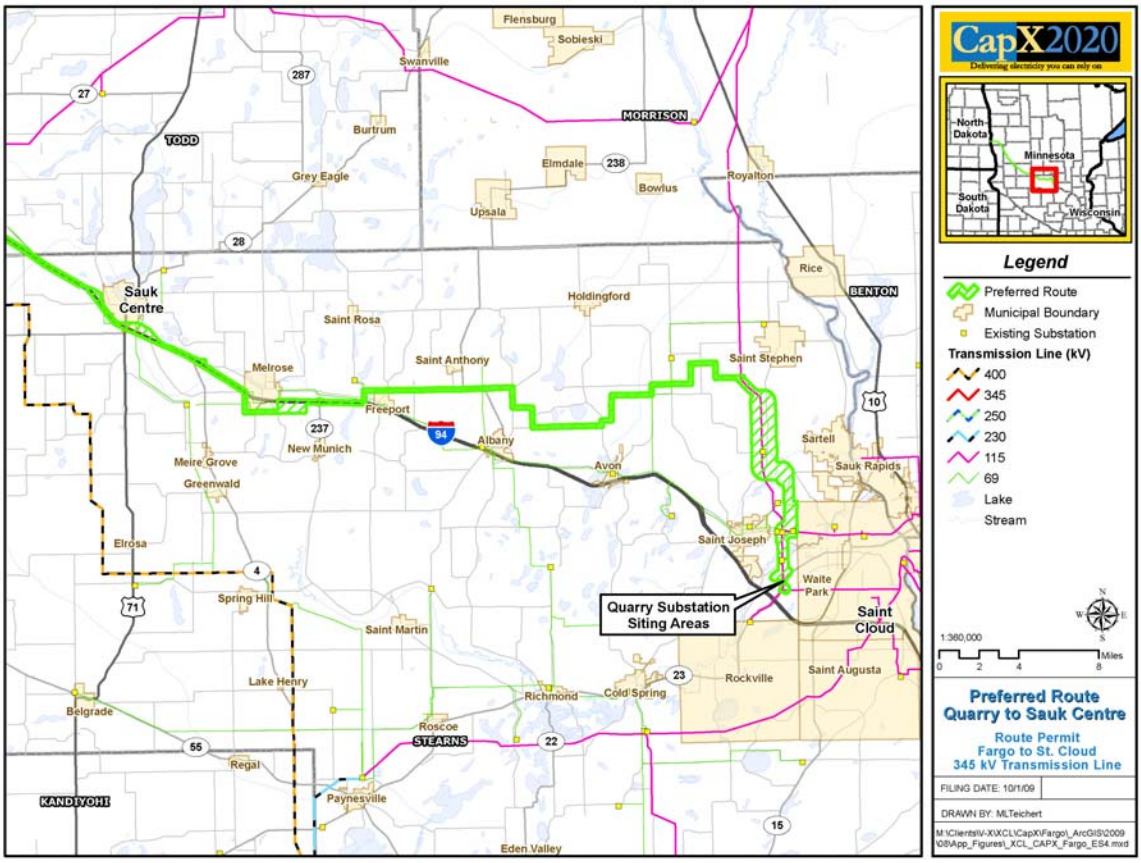
Figure 5-1. Preferred Route Description, Quarry to Sauk Centre

Route Description	Alignment Description
Quarry to Sauk Centre	
North from alternative Quarry Substation Siting Areas following existing 115 kV transmission line for 2.3 miles	East side of transmission line for 1.5 miles
	West side of transmission line for 0.8 mile
West on 304th Street for 0.2 mile	North side of 304th Street for 0.2 mile
North on parcel and field lines for 3.4 miles	On parcel lines and field lines. On west side of County Road 133.
West on parcel lines and 338th Street for 1.1 miles	On parcel lines and north side of 338th Street
North and northwest following existing 115 kV	East side of transmission line for 4.9 miles

Route Description	Alignment Description
Quarry to Sauk Centre	
transmission line for 4.9 miles	
West on parcel lines for 1.2 miles	On parcel lines for 1.2 miles
North on parcel lines for 0.8 mile	On parcel lines for 0.8 mile
West on parcel lines for 1.3 miles	On parcels lines for 1.3 miles
South on parcel lines for 1.0 mile	On parcel lines for 1.0 mile
West on parcel lines and County Road 52 for 2.0 miles	On parcel lines for 0.5 mile
	South side of County Road 52 for 0.9 mile
	North side of County Road 52 for 0.6 mile
South on County Road 155 for 0.5 mile	West side of County Road 155 for 0.5 mile
West on 363rd Street for 0.5 mile	On parcel lines and south side of 363rd Street for 0.5 mile
South on County Road 9 for 0.3 mile	East side of County Road 9 for 0.3 mile
West on 360th Street and parcel lines for 3.5 miles	North side of 360th Street for 1.0 mile
	South side of 360th Street for 0.6 mile
	On parcel lines for 2.0 miles
North on 205th Avenue for 1.0 mile	West side of 205th Avenue
West on St. Anna Drive for 1.0 mile	South side of St. Anna Drive for 0.1 mile
	North side of St. Anna Drive for 0.6 mile
	South side of St. Anna Drive for 0.3 mile
North on County Road 10 for 1.0 mile	West side of County Road 10 for 1.0 mile
West on 360th Street, Country Road 39 and parcel lines for 7.5 miles	North side of road for 1.9 miles
	South side of road for 3.6 miles
	North side of road for 0.7 mile
	Parcel lines for 1.2 miles
South on County Road 167 for 0.6 mile	East side of County Road 167
West on I-94 for 4.2 miles	North side of I-94
South on parcel lines for 0.5 mile	West side of parcel lines
West on parcel lines and 370th Street for 1.8 miles	On parcel lines for 1.3 miles
	South side of 370th Street for 0.5 mile
Northwest along Wobegon Trail corridor for 1.4 miles	South side of Wobegon Trail corridor for 1.4 miles
West on 12th Street South for 1.0 mile	South side of 12th Street South for 0.3 mile
	North side of 12th Street South for 0.3 mile
	South side of 12th Street South for 0.4 mile
Cross country south between 12th Street South and I-94 for 0.2 mile	Cross country
West on I-94 for 1.6 miles	South side of I-94 for 0.3 mile
	North side of I-94 for 0.9 mile
	South side of I-94 for 0.4 mile

Figure 5-2 depicts the Preferred Route extending between the new Quarry Substation and the Sauk Centre area.

Figure 5-2. Preferred Route, Quarry to Sauk Centre



Sauk Centre to Alexandria

Figure 5-3 describes the Preferred Route, between the Sauk Centre area and the Alexandria Switching Station.

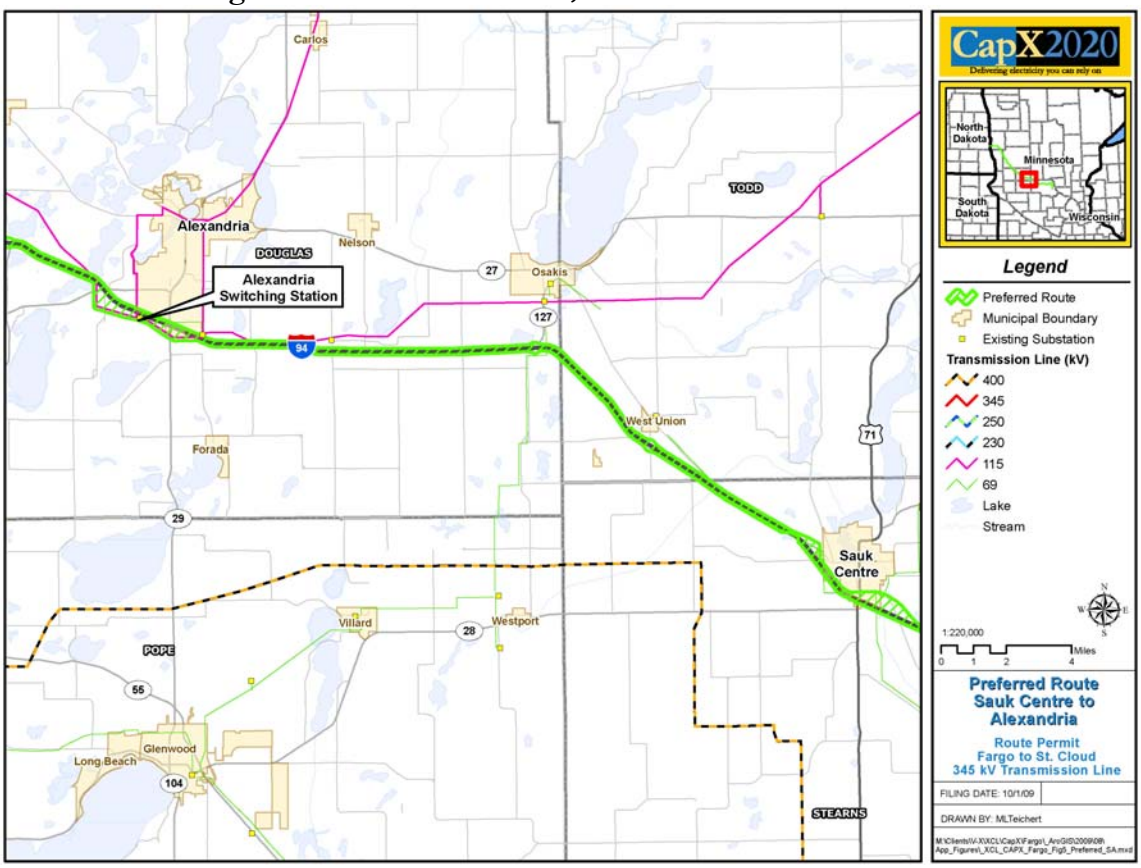
Figure 5-3. Preferred Route Description, Sauk Centre to Alexandria

Route Description	Alignment Description
Sauk Centre to Alexandria	
North along parcel lines for 0.5 mile	On parcel lines for 0.5 mile
West along railroad corridor for 3.3 miles	North side of railroad for 3.3 miles
West on I-94 for 17.8 miles	North side of I-94 for 14.6 miles
	South side of I-94 for 3.2 miles

Route Description	Alignment Description
Sauk Centre to Alexandria	
West following existing 115 kV transmission line for 1.3 miles	North side of existing 115 kV transmission line for 1.3 miles

Figure 5-4 depicts the Preferred Route extending between the Sauk Centre area and the Alexandria Switching Station.

Figure 5-4. Preferred Route, Sauk Centre to Alexandria



Alexandria to Red River

Figure 5-5 describes the Preferred Route, between the Alexandria Switching Station and the Red River.

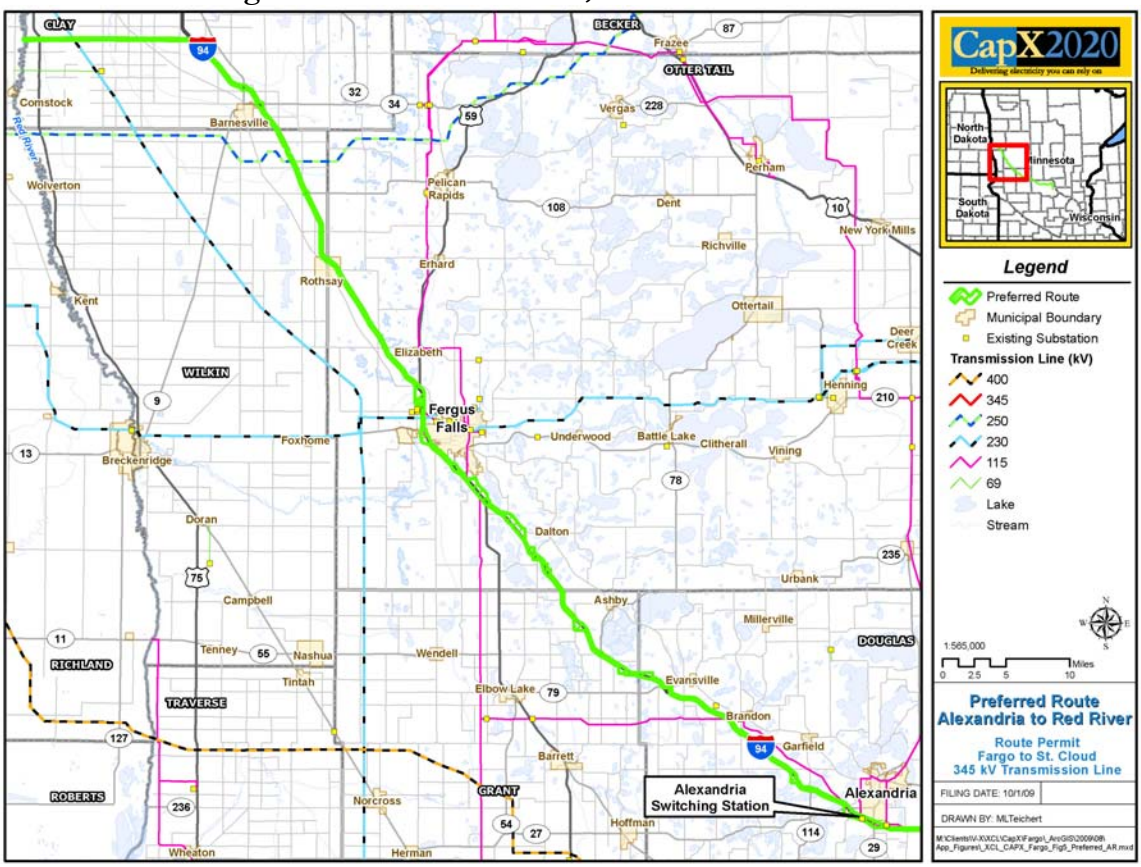
Figure 5-5. Preferred Route Description, Alexandria to Red River

Route Description	Alignment Description
Alexandria to Red River	
West and north following existing 115 kV transmission line for 1.2 miles	North and east side of existing 115 kV transmission line for 1.2 miles
West on I-94 for 3.2 miles	South side of I-94 for 0.6 mile
	North side of I-94 for 0.6 mile
	South side of I-94 for 1.7 miles
	North side of I-94 for 0.3 mile
West cross country and Sethery Lane for 0.4 mile	North side of Sethery Lane and cross country for 0.4 miles
West on I-94 for 13.2 miles	North side of I-94 for 0.5 mile
	South side of I-94 for 3.4 miles
	North side of I-94 for 9.3 miles
North on Kenworth Drive Northwest for 0.5 miles	East side of Kenworth Drive Northwest for 0.5 miles
West on County Road 41 for 0.5 mile	South side of County Road 41 for 0.2 mile
	North side of County Road 41 for 0.3 mile
West on I-94 for 19.2 miles	North side of I-94 for 1.3 miles
	South side of I-94 for 14.1 miles
	North side of I-94 for 3.9 miles
North on parcel lines for 0.2 mile	On parcel lines for 0.2 mile
West on County Road 82 for 0.4 mil	North side of County Road 82 for 0.4 mile
West on I-94 for 30.5 miles	North side of I-94 for 3.7 miles
	South side of I-94 for 6.6 miles
	East side of I-94 for 1.2 miles
	South side of I-94 for 5.2 miles
	North side of I-94 for 0.8 mile
	South side of I-94 for 2.1 miles
	North side of I-94 for 1.4 miles
	South side of I-94 for 2.5 miles
	North side of I-94 for 7.2 miles
West on County Road 19 for 0.7 mile	North side of County Road 19 for 0.7 mile
West on I-94 for 6.8 miles	South side of I-94 for 2.8 miles
	North side of I-94 for 3.0 miles
North on parcel lines for 0.5 miles	On parcel lines for 0.5 miles
Northwest on I-94 for 7.4 miles	North side of I-94 for 1.5 miles

Route Description	Alignment Description
Alexandria to Red River	
	South side of I-94 for 5.9 miles
West on County Road 63 for 6.9 miles	South side of County Road 63 for 4.6 miles
	North side of County Road 63 for 0.8 mile
	South side of County Road 63 for 0.6 mile
	North side of County Road 63 for 0.9 mile
West on County Road 8 for 6.4 miles	South side of County Road 8 for 5.4 miles
	North side of County Road 8 for 0.9 mile

Figure 5-6 depicts the Preferred Route extending between the Alexandria Switching Station and the Red River.

Figure 5-6. Preferred Route, Alexandria to Red River



Preferred Route Segment Alternatives

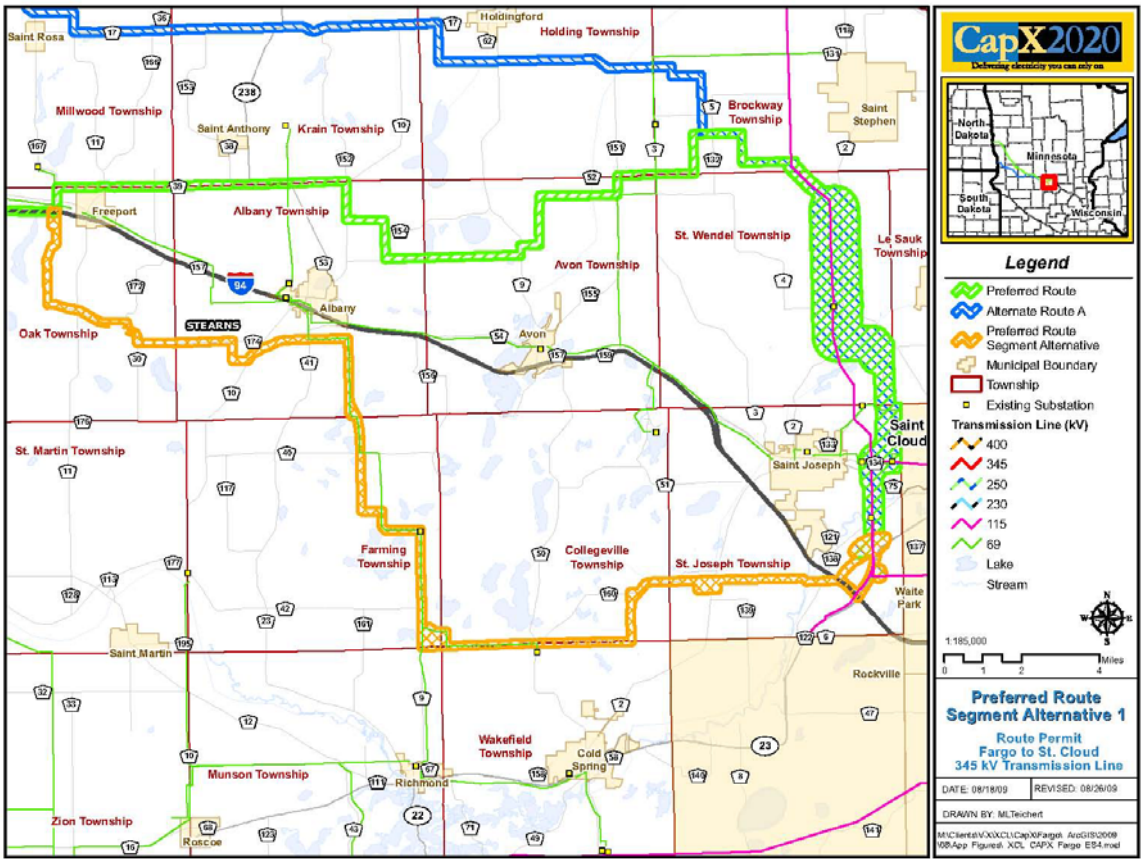
Figure 5-7 describes Preferred Route Segment Alternative 1.

Figure 5-7. Preferred Route Segment Alternative 1 Description

Route Description	Alignment Description
Southwest following railroad for 1.2 miles	North side of railroad for 1.2 miles
West on field and parcel lines for 4.1 miles	On parcel lines for 4.1 miles
West on County Road 160 for 1.3 miles	South side of County Road 160 for 1.3 miles
South on Island Lake Road for 1.2 miles	West side of Island Lake Road for 1.2 miles
West on 260th Street and parcel lines for 5.4 miles	South side of 260th Street for 1.5 miles
	On parcel lines for 0.9 mile
	North side of 260th Street for 2.3 miles
	On parcel lines for 0.6 mile
North on County Road 9 for 3 miles	West side of County Road 9 for 3.0 miles
West on 290th Street for 0.9 mile	North side of 290th Street for 0.9 mile
North on Clear Lake Road for 0.5 mile	East side of Clear Lake Road for 0.5 mile
West on parcel lines for 0.5 mile	On parcel lines for 0.5 mile
North on parcel lines and Mapleview Road for 4.5 miles	On parcel lines for 0.5 mile
	East side of Mapleview Road for 2.1 miles
	West side of Mapleview Road for 1.9 miles
West on 340th Street, parcel lines and Orchard Road for 2.6 miles	South side of 340th Street and parcel lines for 1 mile
	On parcel lines for 0.3 mile
	South side of Orchard Road for 1.3 miles
West on parcel lines for 0.4 mile	On parcel lines for 0.4 mile
North on parcel lines for 0.5 mile	On parcel lines for 0.5 mile
West on County Road 174 for 2.5 miles	South side of County Road 174 for 2.5 miles
North and West on County Road 30 for 2.8 miles	East/north side of County Road 30 for 2.8 miles
North on Rimcrest for 2.1 miles	East side of Rimcrest for 2.1 miles
West on parcel lines for 0.1 mile	On parcel lines for 0.1 mile
North on parcel lines for 0.3 mile	On parcel lines for 0.3 mile

Figure 5-8 depicts Preferred Route Segment Alternative 1.

Figure 5-8. Preferred Route Segment Alternative 1



Preferred Route Segment Alternative 2 parallels a parcel line for its entire 1.5 miles in length. Figure 5-9 depicts Preferred Route Segment Alternative 2.

Figure 5-9. Preferred Route Segment Alternative 2

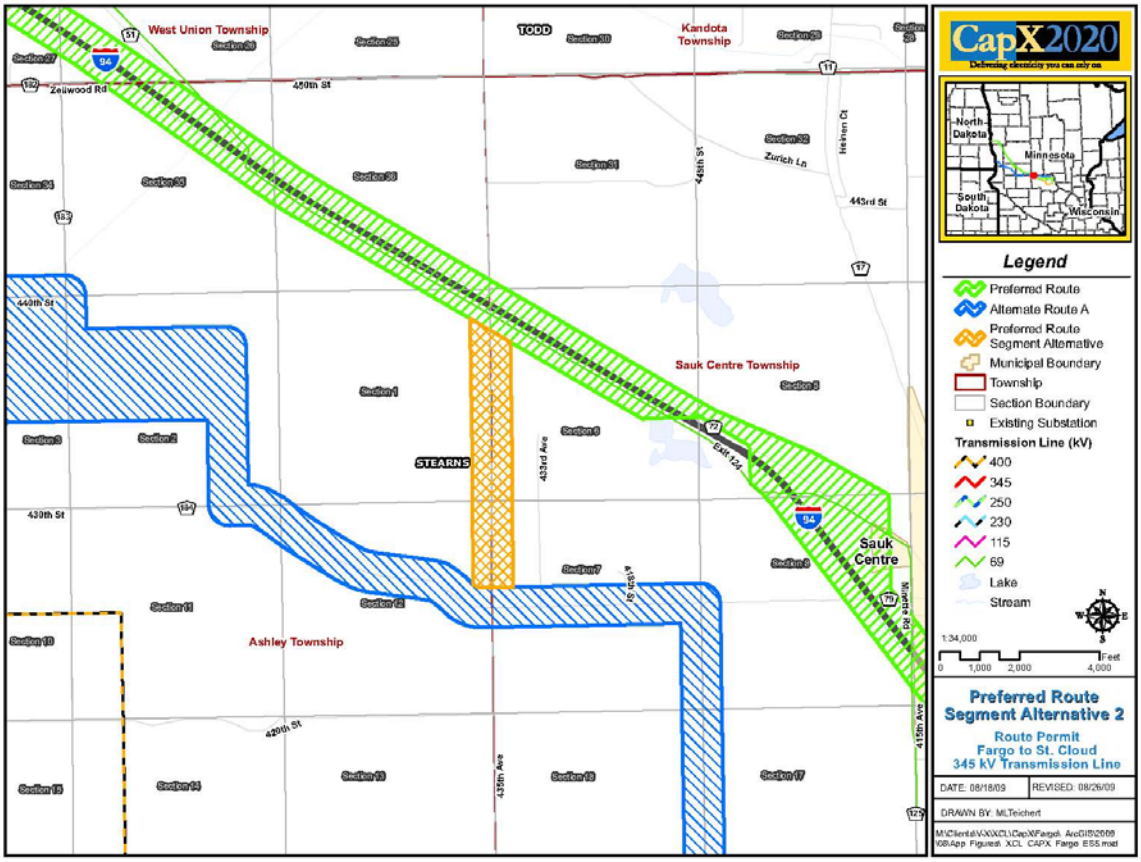


Figure 5-10 describes Preferred Route Segment Alternative 3.

Figure 5-10. Preferred Route Segment Alternative 3 Description

Route Description	Alignment Description
West on State Highway 27 for 2.6 miles	South side of State Highway 27 for 0.8 mile
	North side of State Highway 27 for 0.4 mile
	South side of State Highway 27 for 0.3 mile
	North side of State Highway 27 for 0.2 mile
	South side of State Highway 27 for 0.4 mile
North on parcel lines for 1.3 miles	On parcel lines for 1.3 miles
West on parcel lines for 0.2 mile	On parcel lines for 0.2 mile
North on Englund Road SW for 0.2 mile	West side of Englund Road SW for 0.2 mile

Figure 5-11 depicts Preferred Route Segment Alternative 3.

Figure 5-11. Preferred Route Segment Alternative 3

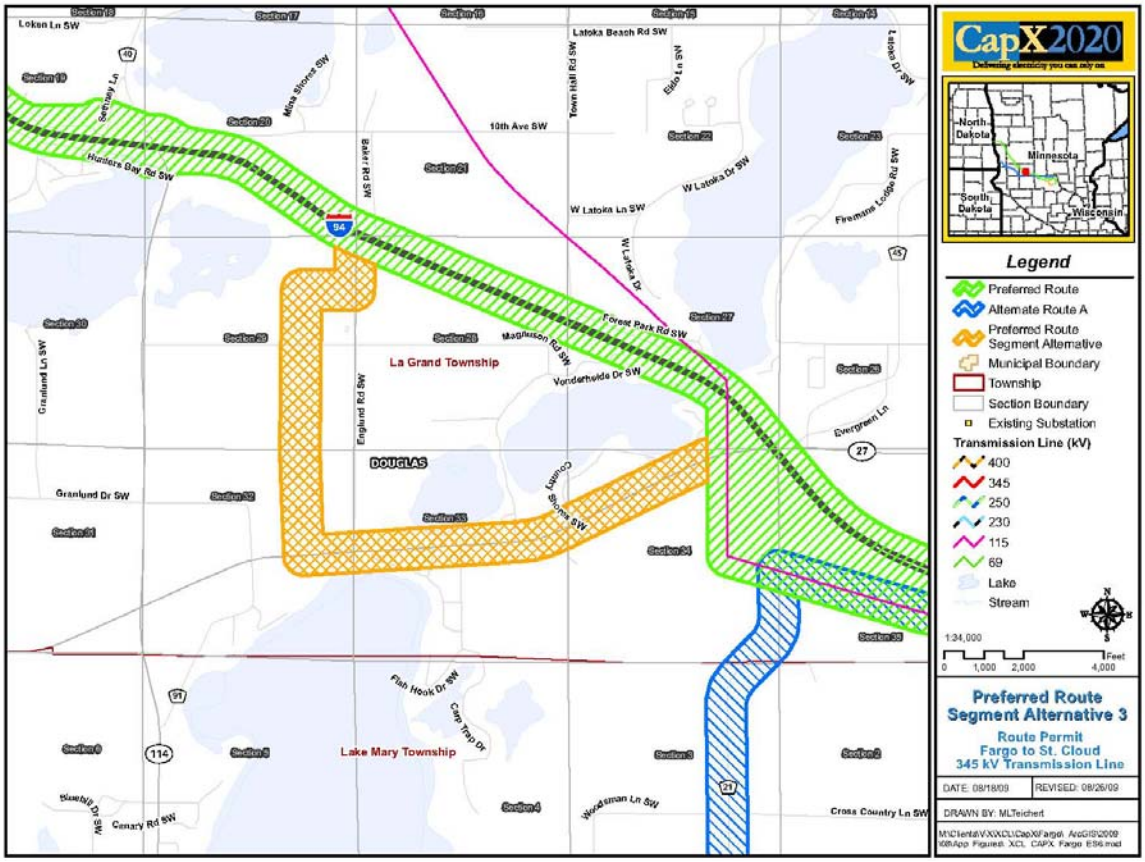


Figure 5-12 describes Preferred Route Segment Alternative 4.

Figure 5-12. Preferred Route Segment Alternative 4 Description

Route Description	Alignment Description
West on River Road NW, County Road 55 and Sunnyside Drive NW for 3.6 miles	South side of all roads for 2.3 miles
	North side of Sunnyside Drive NW for 0.9
	South side of Sunnyside Drive NW for 0.4
North on County Road 25 for 1 mile	West side of County Road 25 for 1.0 mile
West on parcel lines and County Road 79 for 1.7 miles	On parcel lines for 0.8 mile
	North side of County Road 79 for 0.9 mile
North on parcel lines for 0.5 mile	On parcel lines for 0.5 mile
West on parcel lines for 0.2 mile	On parcel lines for 0.2 mile
North on parcel lines for 0.3 mile	On parcel lines for 0.3 mile
West on parcel lines for 0.8 mile	On parcel lines for 0.8 mile
North on parcel lines for 0.2 mile	On parcel lines for 0.2 mile

Route Description	Alignment Description
West on parcel lines and Township Highway 130 for 0.5 mile	On parcel lines for 0.3 mile
	North side of Township Highway 130 for 0.2 mile
North on parcel lines for 1 mile	On parcel lines for 1.0 mile

Figure 5-13 depicts Preferred Route Segment Alternative 4.

Figure 5-13. Preferred Route Segment Alternative 4

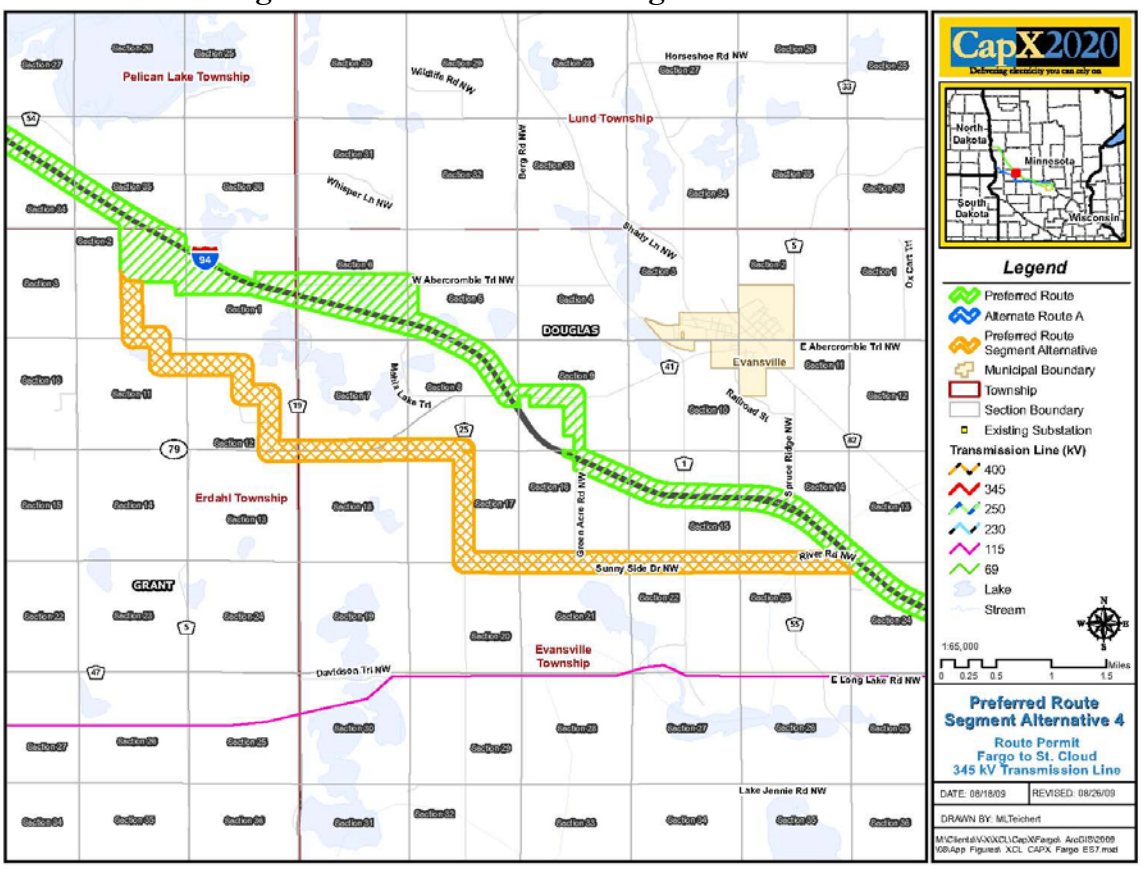


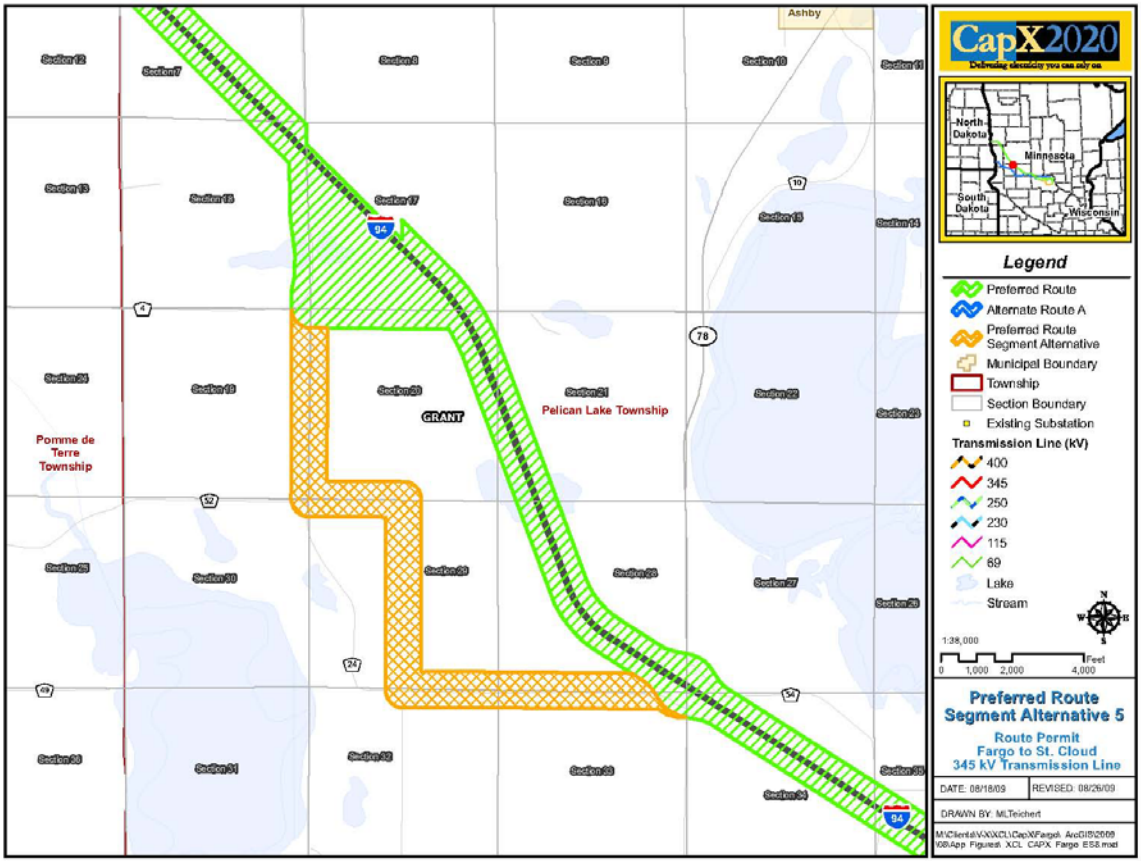
Figure 5-14 describes Preferred Route Segment Alternative 5.

Figure 5-14. Preferred Route Segment Alternative 5 Description

Route Description	Alignment Description
West on County Road 54 for 1.4 miles	South side of County Road 54 for 1.4 miles
North on parcel lines for 1.0 mile	On parcel lines for 1.0 mile
West on Township Highway 17 for 0.5 mile	North side of Township Highway 17 for 0.5 mile
North on County Road 24 for 1 mile	East side of County Road 24 for 1 mile

Figure 5-15 depicts Preferred Route Segment Alternative 5.

Figure 5-15. Preferred Route Segment Alternative 5



5.2 ALTERNATE ROUTE A

Quarry to Sauk Centre

Figure 5-16 describes Alternate Route A, between the new Quarry Substation and the Sauk Centre area.

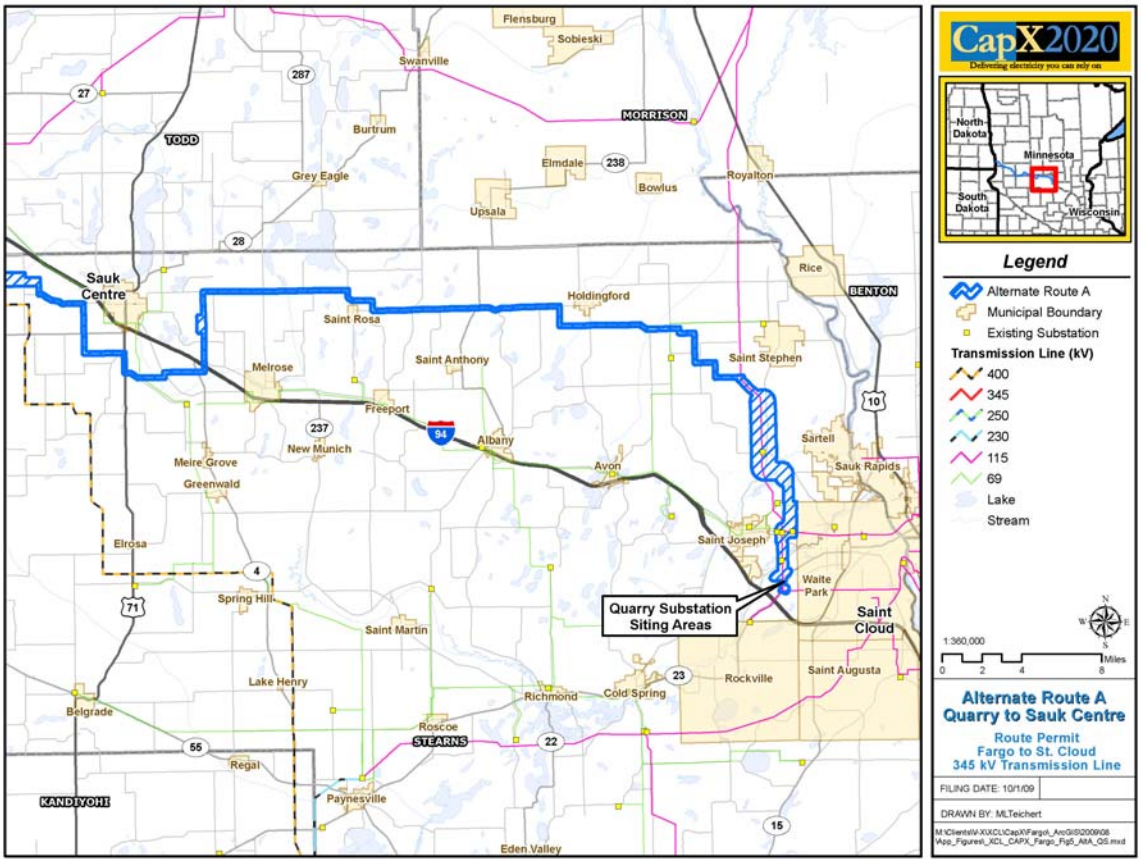
Figure 5-16. Alternate Route A Description, Quarry to Sauk Centre

Route Description	Alignment Description
Quarry to Sauk Centre	
North from proposed Quarry Substation Siting Areas following existing 115 kV transmission line for 2.3 miles	East side of transmission line for 1.5 miles
	West side of transmission line for 0.8 miles
West on 304th Street for 0.2 mile	North side of 304th Street for 0.2 mile
North on parcel and field lines for 3.4 miles	On parcel lines and field lines. On west side of County Road 133.

Route Description	Alignment Description
Quarry to Sauk Centre	
West on parcel lines and 338th Street for 1.1 miles	On parcel lines and north side of 338th Street
North and northwest following existing 115 kV transmission line for 4.9 miles	East side of transmission line for 4.9 miles
West on parcel lines for 1.2 miles	On parcel lines for 1.2 miles
North on parcel lines for 0.8 mile	On parcel lines for 0.8 mile
West on parcel lines for 1.3 miles	On parcels lines for 1.3 miles
North on parcel lines for 1.5 miles	On parcel lines for 1.5 miles
West on parcel lines for 0.8 mile	On parcel lines for 0.8 mile
North on parcel lines for 0.3 mile	On parcel lines for 0.3 mile
West on parcel lines for 1.6 miles	North on parcel lines for 1.6 miles
Northwest on County Road 151 and parcel lines for 4.5 miles	North side of County Road 151 for 1.2 miles
	South side of County Road 151 for 1.1 miles
	North side of County Road 151 for 0.7 mile
	On parcel lines for 1.5 miles
North on 190th Avenue for 1.0 mile	West side of 190th Avenue for 0.6 mile
	East side of 190th Avenue for 0.1 mile
	West side of 190th Avenue for 0.3 mile
West on County Road 17 for 9.4 miles	North side of County Road 17 for 0.8 mile
	South side of County Road 17 for 0.6 mile
	North side of County Road 17 for 0.6 mile
	South side of County Road 17 for 5.8 mile
	North side of County Road 17 for 1.6 mile
North on 280th Avenue for 0.5 mile	East side of 280th Avenue for 0.5 mile
West along parcel lines for 1.1 miles	On parcel lines for 1.1 miles
North on County Road 17 for 0.5 mile	East side of County Road 17 for 0.5 mile
West on County Road 17 for 7.25 miles	South side of County Road 17 for 1.3 miles
	North side of County Road 17 for 0.4 mile
	South side of County Road 17 for 0.5 mile
	North side of County Road 17 for 0.7 mile
	South side of County Road 17 for 1.3 miles
	North side of County Road 17 for 2.95 miles
South along parcel lines and 355th Avenue for 4.0 miles	On parcel lines for 1.6 miles
	Bumps out to west for 0.2 mile
	On parcel lines and east side of 355th Avenue for 2.35 miles

Figure 5-17 depicts Alternate Route A between the new Quarry Substation and the Sauk Centre area.

Figure 5-17. Alternate Route A, Quarry to Sauk Centre



Sauk Centre to Alexandria

Figure 5-18 describes Alternate Route A, between the Sauk Centre area and the Alexandria Switching Station.

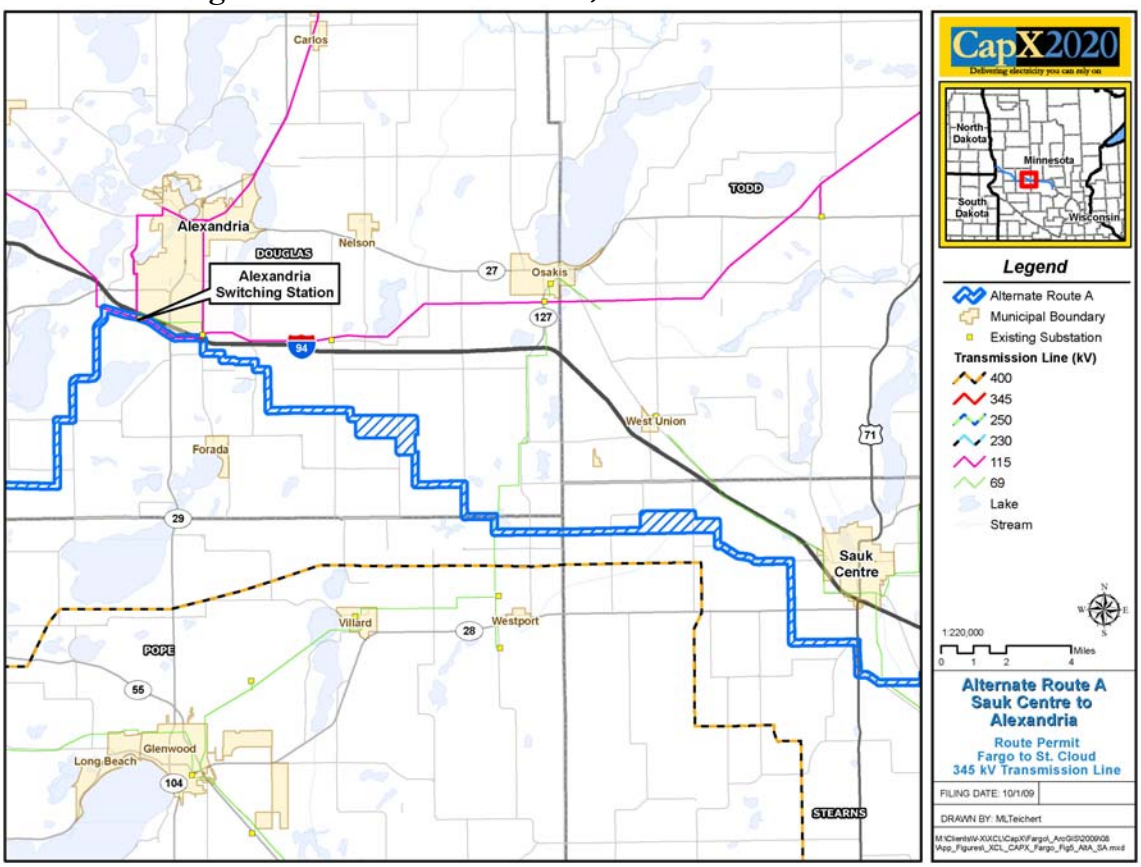
Figure 5-18. Alternate Route A Description, Sauk Centre to Alexandria

Route Description	Alignment Description
Sauk Centre to Alexandria	
West along parcel lines for 2.0 miles	On parcel lines for 2.0 miles
South along parcel lines for 0.2 mile	On parcel lines for 0.2 mile
West along parcel lines for 1.3 miles	On parcel lines for 1.3 miles
Northwest on County Road 29 for 0.8 mile	Southwest side of County Road 29 for 0.8 mile
North on US Highway 71 for 1.0 mile	East side of US Highway for 1.0 mile
West on County Road 187 and parcel lines for 2.0 miles	On parcel lines for 2.0 miles
North on 425th Avenue and parcel lines for 2.5 miles	East side of 425th Avenue and on parcel lines for 2.5 miles

Route Description	Alignment Description
Sauk Centre to Alexandria	
West on County Road 184 for 2.3 miles	North side of County Road 184 for 1.0 mile
	South side of County Road 184 for 0.3 mile
	North side of County Road 184 for 1.0 mile
North on parcel lines for 0.8 mile	On parcel lines for 0.8 mile
West on parcel lines for 0.8 mile	On parcel lines for 0.8 mile
North on County Road 183 for 0.3 mile	East side of County Road 183 for 0.3 mile
West on 440th Street for 1.5 miles	North side for 440th Street for 1.5 miles
South on 470th Street for 0.5 mile	East side of 470th Street for 0.5 mile
West on parcel lines for 4.5 miles	On parcel lines for 4.5 miles
North following existing 69 kV Transmission Line for 0.5 mile	East side of transmission line for 0.5 mile
West on Parcel lines for 1.0 mile	On parcel lines for 1.0 mile
North on County Road 2 for 1.0 mile	East side of County Road 2 for 1.0 mile
West on W Cemetery Road SE for 1.5 miles	North side of W Cemetery Road SE for 1.5 miles
North on parcel lines for 2.0 miles	On parcel lines for 1.0 mile
	West side of parcel lines for 0.5 mile
	On parcel lines for 0.5 mile
West on parcel lines and Walsh Drive SE for 2.0 miles	On parcel lines for 1.0 mile
	North side of parcel lines for 0.5 mile
	South side of parcel lines for 0.5 mile
North on parcel lines for 0.3 mile	On parcel lines for 0.3 mile
West on parcel lines for 2.5 miles	On parcel lines for 1.5 miles
	North of parcel lines for 1.0 mile
North on parcel lines for 1.3 miles	On parcel lines for 1.3 miles
West on parcel lines for 0.3 mile	On parcel lines for 0.3 mile
North on County Road 22 for 0.3 mile	East side of County Road 22 for 0.3 mile
West on field lines and open areas for 1.0 mile	On field lines and open areas for 1.0 mile
North on parcel lines for 0.1 mile	On parcel lines for 0.1 mile
West on parcel lines for 0.6 mile	North of parcel lines for 0.6 mile
North on railroad corridor for 0.4 mile	West side of railroad corridor for 0.4 mile
West on I-94 for 0.3 mile	South side of I-94 for 0.3 mile
West following existing 115 kV T-Line for 1.9 miles	North side of transmission line for 1.9 miles

Figure 5-19 depicts Alternate Route A between the Sauk Centre area and the Alexandria Switching Station.

Figure 5-19. Alternate Route A, Sauk Centre to Alexandria



Alexandria to Red River

Figure 5-20 describes Alternate Route A, between the Sauk Centre area and the Alexandria Switching Station.

Figure 5-20. Alternate Route A Description, Sauk Centre to Alexandria

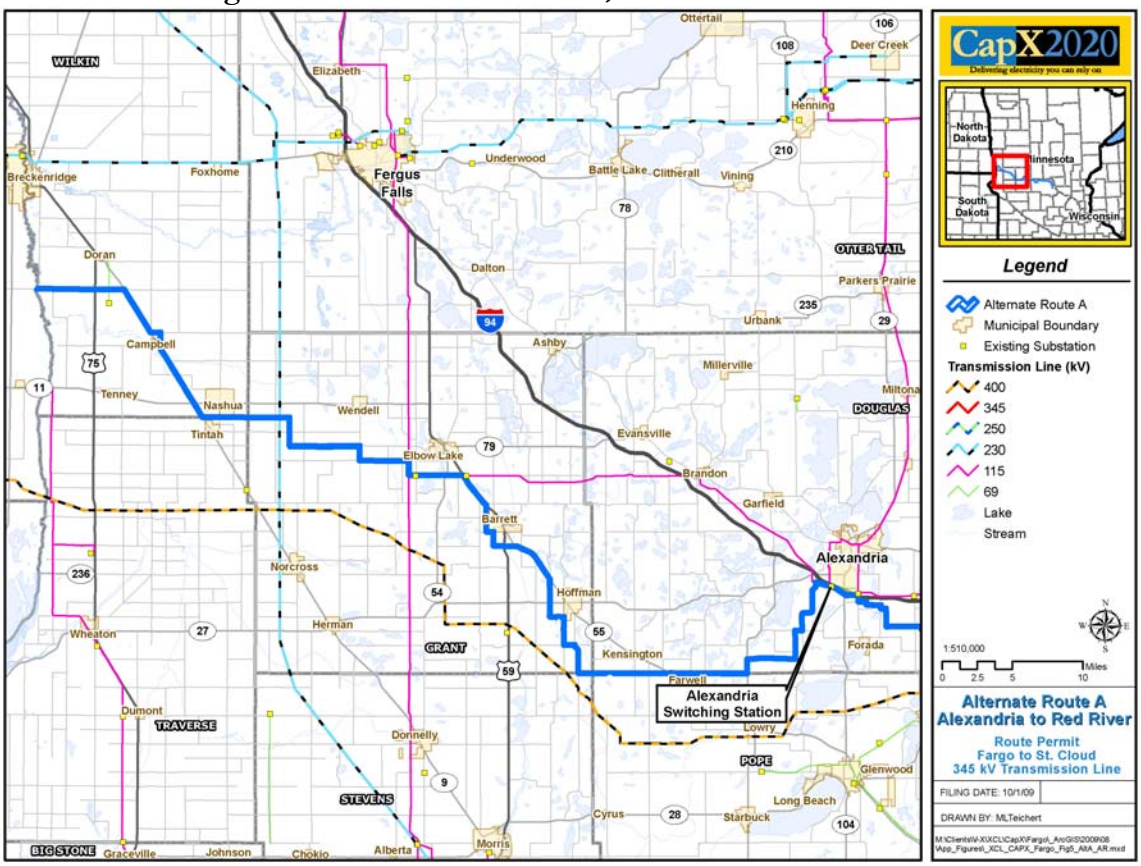
Route Description	Alignment Description
Alexandria to Red River	
West following existing 115 kV T-Line for 1.0 mile	North side of existing 115 kV transmission line for 1.2 miles
South on County Road 21 for 4.1 miles	East side of County Road 21 for 0.3 mile
	West side of County Road 21 for 3.8 miles
West on County Road 4 for 0.5 mile	South side County Road 4 for 0.5 mile
South on parcel lines for 2.0 miles	On parcel lines for 2.0 miles

Route Description	Alignment Description
Alexandria to Red River	
West on parcel lines for 3.4 miles	On parcel lines for 3.4 miles
South on State Highway 114 for 1.0 mile	West side of State Highway 114 for 1.0 mile
West on parcel lines, Lake Olaf Road SW, County Road 11 and Pope Douglas SW for 12 miles	On parcel lines for 1.8 mile
	South side of Lake Olaf Road SW for 1.6 miles
	North side of County Road 11 for 4.9 miles
	South side of County Road 11 for 0.9 mile
	North side of County Road 11 for 2.0 miles
	South side of County Road 11 for 0.8 mile
North on County Road 5 for 2.1 miles	West side of County Road 5 for 2.1 miles
West on County Road 37 for 0.8 mile	North side of County Road 37 for 0.8 mile
North on County Road 37 for 2.0 miles	West side of County Road 37 for 2.0 miles
West on Township Highway 176 for 1.0 mile	North side of Township Highway 176 for 0.5 mile
	South side of Township Highway 176 for 0.5 mile
North on County Road 38 for 2.6 miles	East side of County Road 38 for 2.6 miles
Northwest on State Highway 55 for 2.4 miles	Southwest side of State Highway 55 for 2.4 miles
Northwest on railroad corridor for 1.1 miles	Northeast side of railroad corridor for 1.1 miles
West on Township Highway 148 and parcel lines for 1.7 miles	North side of road and on parcel lines for 1.7 miles
North on Township Highway 31 for 1.0 mile	East side of Township Highway 31 for 1.0 mile
West on County Road 2 for 0.5 mile	North side of County Road 2 for 0.5 mile
North on parcel lines for 1.9 miles	On parcel lines for 2.7 miles
Northwest on railroad corridor for 2.7 miles	Northeast side of railroad corridor for 2.7 miles
West on County Road 47 for 3.9 miles	North side of County Road 47 for 1.3 miles
	South side of County Road 47 for 0.3 mile
	North side of County Road 47 for 1.0 mile
	On parcel lines for 1.3 miles
North following existing 115 kV transmission line for 1.0 mile	West side of transmission line for 1.0 mile
West on County Road 1 for 3.5 miles	South side of County Road 1 for 3.5 miles
North on County Road 11 for 1.0 mile	West side of County Road 11 for 1.0 mile
West on County Road 42 for 5.0 miles	North side of County Road 42 for 3.3 miles
	South side of County Road 42 for 1.7 miles
North on Township Highway 93 for 2.0 miles	West side of Township Highway 93 for 2.0 miles
West on Township Highway 129 for 6.2 miles	North side of Township Highway 129 for 2.6 miles
	South side of Township Highway 129 for 3.6 miles
Northwest on State Highway 9 for 5.7 miles	Northeast side of State Highway 9 for 5.7 miles
North on field lines for 1.1 miles	On field lines for 1.1 miles
West on field lines for 0.7 mile	On field lines for 0.7 mile

Route Description	Alignment Description
Alexandria to Red River	
Northwest on State Highway 9 for 3.6 miles	Northeast side of State Highway 9 for 3.6 miles
West on County Road 156 for 6.2 miles	North side of County Road 156 for 5.7 miles
	South side of County Road 156 for 0.5 mile

Figure 5-21 depicts Alternate Route A between the existing Alexandria Switching Station and the Red River.

Figure 5-21. Alternate Route A, Alexandria to Red River



6.0 RATIONALE FOR SELECTING PREFERRED ROUTE

Applicants developed two proposed routes, the Preferred Route and Alternate Route A, between the Red River and the new Quarry Substation, the portion of the Fargo to St. Cloud 345 kV Project within Minnesota. The Proposed Routes follow existing rights-of-way and property lines to the extent feasible. For each route, Applicants have identified a route width ranging from approximately 400 feet to 1.25 miles, although both routes are generally 1,000 feet in width for the majority of their length. In some areas, a wider route width of up to 1.25 miles is requested to accommodate site-specific considerations and substation interconnection requirements. In other areas, a narrower route width has been identified to avoid the inclusion of federally managed lands of which a proposed overhead transmission line would not be permitted.

Applicants have also identified five segment alternatives for the Preferred Route. One segment alternative, west of Sauk Centre, is a transition segment to connect the eastern portion of Alternate Route A to the western portion of the Preferred Route. The other four segment alternatives, ranging from 1.5 miles to 46 miles in length, provide for deviations from the Preferred Route corridor where optionality associated with site-specific routing, permitting, or design considerations may be warranted. The Preferred Route Segment Alternatives, 1 through 5, range in width from approximately 400 feet to 1.25 miles. The Proposed Routes collectively include the Preferred Route, Alternate Route A, and the Preferred Route Segment Alternatives.

Applicants selected the routes based on the factors identified in the state routing criteria. The route development and selection process was informed by the public participation process and information related to agency involvement, described in detail in section 8.0. The Preferred Route is consistent with state goals to conserve resources, minimize environmental impacts, and minimize human settlement and other land use conflicts. Applicants concluded that the Preferred Route was favored over Alternate Route A because it impacts fewer homes, makes better use of existing rights-of-way, and is substantially shorter in length. Because the Preferred Route is shorter in length, it impacts less land, including agricultural land, impacts fewer landowners, and is less costly.

Applicants also analyzed the potential impacts associated with alignments adjacent to I-94. Generally, if the line is constructed on an alignment farther away from I-94, additional interstate crossings will be required to minimize impacts to existing residences. In addition, placing poles farther away from I-94 will increase the amount of agricultural land that is impacted and agricultural operations could be impacted by having poles set farther away from the interstate and into fields.

Figure 6-1 summarizes Applicants' application of the factors set forth in Minn. R. 7850.4100 to the Proposed Routes. Environmental data supporting the analysis below is contained in the remaining sections of this Application and the appendices. Final impacts are dependent on the final route selected by the Commission and the final alignment.

Figure 6-1. Summary Comparison of Proposed Routes

Factor	Preferred Route	Alternate Route A	Summary
Affects on Human Settlement			
Displacement	No displacement of homes is anticipated.		
Noise	Transmission line and substation noise levels are not predicted to exceed Minnesota Pollution Control Agency (MPCA) noise limits.		
Aesthetics	The proposed transmission line will likely affect visual resources within close proximity of the line. Several scenic and recreational resources are crossed by the Preferred Route. Three scenic byways, including the Glacial Ridge Trail, Otter Trail, and King of Trails, are crossed or within proximity to the Preferred Route. The Preferred Route does not parallel any scenic byways. Several scenic easements, located along Interstate 94, are within the Preferred Route. Recreational resources along the Preferred Route include: Waterfowl Production Areas (WPAs), Scientific and Natural Areas (SNAs), lakes, local and regional trails, golf courses, and other recreational uses. There are 187 homes within 500 feet of the Preferred Route alignment generally nearest to the interstate.	The proposed transmsision line will likely affect visual resources within close proximity of the transmission line. Several scenic and recreational resources are crossed by Alternate Route A. Three scenic byways, including the Glacial Ridge Trail, Otter Trail, and King of Trails, are crossed or within proximity to Alternate Route A. Alternate Route A does not parallel any scenic byways. Recreational resources along Alternate Route A include: WPAs, SNAs, state forests, lakes, local and regional trails, golf courses, and other recreational uses. There are 225 homes within 500 feet of the Alternate Route A alignment.	Both routes impact aesthetics similarly. There are fewer homes within 500 feet of the Preferred Route alignment generally nearest to the interstate than the Alternate Route A alignment which suggests a fewer number of homes would directly view the line.
Cultural Values	No impacts to cultural values are anticipated.		
Recreation	Forty-seven WPAs, 14 WMAs, two SNAs, and two scenic byways are within one mile of the Preferred Route. Other recreational resources along the Preferred Route include trails and golf courses. No Wild and Scenic River Districts are within one mile of the Preferred Route.	Thirty-two WPAs, 14 WMAs, one state forest, and two scenic byways are within one mile of Alternate Route A. Other recreational resources along Alternate Route A include trails and golf courses. No Wild and Scenic River Districts within one mile of Alternate Route A.	Both routes would impact recreational resources similarly.

Factor	Preferred Route	Alternate Route A	Summary
Public Services	No impacts to public services are anticipated.		
Effects on Public Health and Safety			
Public Health and Safety	Applicants will ensure that all safety requirements are met during the construction and operation of the proposed transmission line and associated facilities.		
Effects on Land-based Economies			
Agriculture	Based on a Preferred Route alignment generally nearest to the interstate, approximately 19 acres of permanent impacts to agriculture are anticipated for construction of the transmission line.	Based on the Alternate Route A alignment, approximately 19 acres of permanent impacts to agriculture are anticipated for construction of the transmission line.	The Preferred Route would impact approximately the same number of acres as Alternate Route A, based on the two alignments. However, the Preferred Route reduces the overall length of the line between the substation to be located west of Fargo and the new Quarry Substation by approximately 39 miles, thereby impacting less land, including agricultural land.
Forestry	No impacts to economically important forestry will occur.		
Tourism	No impacts to tourism are anticipated.		
Mining	Thirteen aggregate source pits have been identified within the Preferred Route. Nine of the pits are prospected and/or leased by the Mn/DOT, one is a commercial source of aggregate, two pits are inactive and one pit is identified as an "Other" pit by Mn/DOT.	One aggregate source pit has been identified within Alternate Route A. This pit is a prospected pit.	There are fewer aggregate source pits within Alternate Route A than the Preferred Route.
Effects on Archaeological and Historic Resources			
Archaeological Resources	Nine recorded archaeological sites occur within the Preferred Route. None of the sites have been evaluated for listing on the NRHP.	Four recorded archaeological sites are located within Alternate Route A. None of the sites have been evaluated for listing on the NRHP.	There are a greater number of known archaeological sites located within the Preferred Route than Alternate Route A.

Factor	Preferred Route	Alternate Route A	Summary
Historic Resources	Twenty known historic sites have been identified within the Preferred Route. Twelve of the 20 sites are located on one farmstead. None of the 20 sites have been evaluated for listing on the NRHP.	Four known historic sites are located within Alternate Route A. The Bois de Sioux Flood Control and Water Project is eligible for listing on the NRHP. This project is related to the channelization of the Bois de Sioux River and will only be crossed by Alternate Route A.	There are a greater number of known historical sites located within the Preferred Route than Alternate Route A.
Effects on the Natural Environment			
Air Quality	The maximum one-hour concentration of ozone during worst case weather is estimated at 0.0007 ppm. This is well below both federal and state standards. No air quality impacts due to the operation of the transmission line are anticipated. Temporary air quality impacts caused by construction vehicle emissions and fugitive dust from right-of-way clearing are expected to occur.		
Water Quality and Wetlands	One-hundred fifty eight water wells are located within the Preferred Route and five wellhead protection areas are crossed by the Preferred Route. Eight streams and four lakes, which have been identified by the MPCA as 'Impaired Waters', are crossed by the Preferred Route. Approximately 37 poles will be placed in wetlands, resulting in approximately 2,035 square feet (0.05 acres) of permanent impacts. Temporary wetland impacts are estimated to be 81 acres. Additionally, approximately 16 acres of forest wetlands will undergo a permanent vegetation type change.	One-hundred twenty seven water wells are located within Alternate Route A and three wellhead protection areas are crossed by Alternate Route A. Eight streams, which have been identified by the MPCA as 'Impaired Waters', are crossed by the Preferred Route. Approximately 35 poles will be placed in wetlands, resulting in approximately 1,925 square feet (0.04 acres) of permanent impacts. Temporary wetland impact acres are estimated to be 91 acres. Additionally, approximately 20 acres of forested wetlands will undergo a permanent vegetation type change.	The Preferred Route encompasses more water wells and crosses a greater number of wellhead protection areas than Alternate Route A, and crosses more 'Impaired Waters'. However, impacts to these resources will be avoided to the extent feasible and impacts are anticipated to be similar. Permanent impacts to wetlands are similar for the Preferred Route and Alternate Route A. The Preferred Route will require fewer acres of temporary wetland impacts and fewer acres of forested wetlands to undergo a permanent vegetation type change.

Factor	Preferred Route	Alternate Route A	Summary
Flora, Sensitive Management Areas and Conservation Easements	Forty-five USFWS easements, five WMAs, six Minnesota County Biological Survey (MCBS) Sites of Biodiversity Significance, and 10 Native Plant Communities are crossed by the Preferred Route. No WPAs or SNAs are crossed by the Preferred Route.	Eighteen USFWS easements, four WMAs, eight MCBS Sites of Biodiversity Significance, and 14 Native Plant Communities are crossed by Alternate Route A. No WPAs or SNAs are crossed by Alternate Route A.	The Preferred Route crosses 27 more USFWS easements, one more WMA, two less MCBS Sites of Biodiversity Significance, and four less Native Plant Communities. Although the Preferred Route crosses more USFWS easements and WMAs, it crosses less MCBS Sites of Biodiversity Significance and Native Plant Communities. The Preferred Route also parallels more existing rights-of-way than Alternate Route A. It is expected that impacts to flora for the Preferred Route would be similar to or less than associated with Alternate Route A.
Fauna	There is a potential for temporary displacement of wildlife during construction and for loss of small amounts of habitat in the Preferred Route; however, it is likely species would only be displaced a short distance since there is similar habitat close by.	There is a potential for temporary displacement of wildlife during construction and for loss of small amounts of habitat in Alternate Route A; however, it is likely species would only be displaced a short distance since there is similar habitat close by.	The impacts to fauna would be similar for both the Preferred Route and Alternate Route A.
Effects on Rare and Unique Natural Resources			
Rare and Unique Natural Resources	A total of six state-listed threatened, endangered or candidate species were identified within the Preferred Route. Eight total occurrences of these species have been recorded within the Preferred Route.	A total of two state-listed threatened, endangered or candidate species were identified within Alternate Route A. One occurrence of each of these species has been recorded within Alternate Route A.	The Preferred Route has more recorded threatened, endangered, or candidate species and total occurrences of species than Alternate Route A.
Application of Design Options that Maximize Energy Efficiencies, Mitigate Adverse Environmental Effects, and Could Accommodate Expansion of Transmission or Generating Capacity			
General	The design options of the facilities along the Preferred Route and Alternate Route A will maximize energy efficiencies and mitigate adverse environmental effects.		
Route Specific	The design of the transmission line pole structure will accommodate the addition of another circuit in the future along the entire length of both Proposed Routes.		

Factor	Preferred Route	Alternate Route A	Summary
Use or Paralleling of Existing Rights-of-Way, Survey Lines, Natural Division Lines, and Agricultural Field Boundaries			
Existing right-of-way, survey lines, natural division lines, and agricultural field boundaries	Approximately 97 percent of the Preferred Route alignment generally nearest to the interstate uses or parallels existing right-of-way, survey lines, natural division lines or agricultural field lines.	Approximately 95 percent of the Alternate Route A alignment uses or parallels existing right-of-way, survey lines, natural division lines or agricultural field lines.	The Preferred Route uses or parallels the greatest length of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries.
Use of Existing Transportation, Pipeline and Electrical Transmission Systems Right-of-Ways			
Existing transportation, pipeline and electrical transmission systems right-of-ways	Approximately 83 percent of a Preferred Route alignment generally nearest to the intersate follows the rights-of-way of existing transportation, pipeline and electrical transmission systems.	Approximately 64 percent of the Alternate Route A alignment follows the rights-of-way of existing transportation, pipeline and electrical transmission systems.	The Preferred Route follows a greater percentage of existing transportation, pipeline and electrical transmission systems rights-of-way.
Electrical System Reliability			
Electrical System Reliability	Both Proposed Routes would support the reliable operation of the transmission system.		
Cost of Constructing, Operating and Maintaining the Facility which are Dependent on Design and Route			
Costs	The Preferred Route, within Minnesota and within this application, is approximately 180 miles in length. Including the approximate length that would be required to reach the proposed new Bison Substation, the route would be approximately 211 miles in length. The Preferred Route project costs are estimated at $269.0 million ($2009).	Alternate Route A, within Minnesota and within this application, is approximately 169 miles in length. Including the approximate length that would be required to reach the proposed new Bison Substation, the route would be approximately 250 miles in length. Alternate Route A project costs are estimated at $308.9 million ($2009).	Although the length of the Preferred Route within Minnesota is 11 miles longer than Alternate Route A, the total length of the Preferred Route to reach the new Bison Substation is approximately 39 miles shorter than the length of Alternate Route A to reach the new Bison Substation.
Adverse Human and Natural Environmental Effects Which Cannot be Avoided			
General	Unavoidable adverse impacts include the physical impacts to the land (primarily agricultural land) due to the construction of the Project. Applicants will implement measures as described in the environmental analysis and as identified by regulatory agencies to minimize these unavoidable adverse environmental effects.		The Preferred Route permanently impacts more acres of land within Minnesota than Alternate Route A. The Preferred Route permanently impacts less acres of land than Alternate Route A when the entire length of the Project is included.

Factor	Preferred Route	Alternate Route A	Summary
Route Specific	Based on a Preferred Route alignment generally nearest to the interstate, approximately 19 acres of permanent agricultural land impact is anticipated.	Based on the Alternate Route A alignment, approximately 19 acres of permanent agricultural land impact is anticipated.	The Preferred Route permanently impacts approximately the same number of acres of agricultural land as Alternate Route A. However, the Preferred Route reduces the overall length of the line between the substation to be located west of Fargo and the new Quarry Substation by approximately 39 miles, thereby impacting less land, including agricultural land.
Irreversible and Irretrievable Commitments of Resources			
General	Irreversible and irretrievable resources commitments are related to the use of nonrenewable resources and the effects that the use of these resources have on future generations. Irreversible effects result primarily from use or destruction of a specific resource that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action. There are few commitments of resources associated with this Project that are irreversible and irretrievable, but those few are resources primarily related to construction. Construction resources that will be used to construct the Project include aggregate resources, concrete, steel, and hydrocarbon fuel. During construction, vehicles will be traveling to and from the site, utilizing hydrocarbon fuels. These commitments of resources are similar for all both Proposed Routes.		The Preferred Route is shorter in length and is anticipated to require fewer poles that Alternate Route A.
Route Specific	The Preferred Route within Minnesota is approximately 180 miles in length and will require approximately 1,124 poles. The Preferred Route is approximately 211 miles in length when the portion of the route within North Dakota, which is required for the Project, is included.	Alternate Route A within Minnesota approximately 169 miles in length and will require approximately 1,037 poles. Alternate Route A is approximately 250 miles in length when the portion of the route within North Dakota, which is required for the Project, is included.	The Preferred Route is longer and will require more poles within the Minnesota portion of the Project than Alternate Route A. However, the total length of the line and total number of poles for the Project is less than what is required for Alternate Route A.

Based on this comparison, Applicants concluded that the Preferred Route best conserves natural resources because it reduces the overall length of the line between the substation to be located west of Fargo and the new Quarry Substation by approximately 39 miles, thereby reducing the potential for environmental impacts and minimizing the potential for human settlement and other land use conflicts.

7.0 ENVIRONMENTAL INFORMATION

This section provides a description of the environmental setting, potential impacts, and Applicants' proposed mitigative measures, where appropriate, to minimize the impacts of siting, constructing, and operating the Project. If the 345 kV transmission line were removed in the future, the land could be restored to its prior condition and/or put to a different use. The majority of the mitigative measures proposed are Applicants' standard construction practices. Unless otherwise identified in the following text, the associated costs of the mitigative measures proposed are considered nominal in comparison to the overall estimated Project costs.

Throughout this section, two types of measurements are described depending on the specific impact. One type, such as land use classifications, is more appropriately analyzed at the 1,000-foot-route-width level. The other type of measurement is for impacts that are more appropriately measured from a fixed location, such as an alignment or associated right-of-way. These impacts include, for example, the number of homes within a categorical distance from the proposed facilities. All impacts described in the subsequent sections, as associated with the Proposed Routes and particularly where the Proposed Routes parallel I-94 (Preferred Route and Alternate Route A), are approximate values reflecting potential impacts. Additional specificity regarding the slight variation in impacts associated with the 5-foot, 25-foot and 75-foot offset alignments is included in Appendix F. Potential impacts associated with the Proposed Routes are based on alignments previously described in this Application. For locations where the Proposed Routes parallel the interstate, the alignment nearest to the interstate right-of-way was used for the impact assessment presented in the subsequent sections. Actual impacts will vary depending upon the final route (or route segment combination) selected by the Commission and the final alignment.

Associated facilities of the proposed 345 kV electrical transmission line include the new Quarry Substation, the existing Alexandria Switching Station, and the Bison Substation. However, the portion of the proposed 345 kV transmission line extending into North Dakota and interconnecting at the Bison Substation are subject to separate review and approval by the North Dakota Public Service Commission and affected local jurisdictions. Modifications will be made at the new Quarry Substation to accommodate the interconnection of the proposed Fargo to St. Cloud 345 kV Project. Since potential impacts were assessed for the two alternative Quarry Substation siting areas as part of the Monticello to St. Cloud 345 kV Transmission Line Project (Docket No. ET2, E002/TL-09-246), the potential for impacts associated with the new Quarry Substation are not restated herein. The work at the Quarry substation will not require grading or an expansion of the substation fenced area. The work at the Alexandria Switching Station will require an expansion of the graded area and an enlargement of the substation fenced area. Design work is underway to determine if additional property will be required at Alexandria. In addition, there may be some temporary impacts at the Quarry Substation and the Alexandria Switching Station. Any potential temporary impacts are discussed below.

General information related to the environmental setting within the Project area is provided in Appendix D. This includes a list of typical flora and fauna species that have the potential to occur within the Project area, along with a general discussion of existing environmental conditions.

7.1 PREFERRED ROUTE

7.1.1 HUMAN SETTLEMENT

7.1.1.1 Public Health and Safety

Proper safeguards will be implemented for construction and operation of the facility. The Project will be designed according to local, state, and NESC standards regarding ground clearance, crossing utilities clearance, building clearance, strength of materials and right-of-way widths. Construction crews and/or contract crews will comply with local, state, and NESC standards regarding facility installation and standard construction practices. Established Applicants' and industry safety procedures will be followed during and after installation of the transmission line, including clear signage during all construction activities.

The proposed transmission line will be equipped with protective devices (circuit breakers and relays located in substations where transmission lines terminate) to safeguard the public in the event of an accident, or if the structure or conductor falls to the ground. The protective equipment will de-energize the transmission line should such an event occur. In addition, the substation facilities will be properly fenced and accessible only by authorized personnel.

Airports, Landing Strips, and Airplane Safety

HVTLs can present an important safety concern to airports and aircraft. An airport, whether public or private, is defined by the state and the Federal Aviation Administration (FAA) as an area of land or water that is used or intended to be used for the landing and takeoff of aircraft, and includes its buildings and facilities, if any. 14 C.F.R. Part 1, §1.1 and Minn. R. 8800.0100, Subp. 3. The placement of transmission line structures or the stringing of conductors between structures could impact the safe operation of an airport or hinder the maneuverability of aircraft. If close enough, the presence of a steel transmission line structure or wiring could interfere with the operation of air navigation or weather systems. Conductors can also present a risk to pilots.

The physical dimensions of airport runways determine the class size of aircraft capable of landing at an airport. Furthermore, the aircraft design and propulsion system are determinants in an aircraft's ability to land at a given facility. For example, jet aircraft are heavier, typically require a greater runway length for take-off and landing, and require more glide slope clearance distance compared to propeller-driven aircraft. Both of these factors are important in relation to structures such as transmission lines because they determine the take-off and landing glide slopes necessary for safe

flight operation, which in turn determine the setback distance of structures such as transmission line structures.

The FAA and Mn/DOT have established development guidelines on the proximity of structures, including HVTLs, to public use airports and heliports. Federal Aviation Regulation (FAR) Part 77 establishes standards and notice requirements for reporting airspace obstructions for objects currently impacting or that could impact navigable airspace around aviation facilities. FAR Part 77 defines a series of imaginary surface zones surrounding airports that specify height restrictions for structures based on slope ratios. These imaginary surfaces include the primary surface, horizontal surface, conical surface, approach surface, precision instrument approach surface, and the transitional surface. According to FAR Part 77, "an object will be considered an obstruction to a public airport (excluding seaplane bases and heliports) if it is of greater height" than any of the aforementioned imaginary surfaces. Each of these imaginary surfaces have corresponding slopes, based in part on the airports' use designation, flight volumes, and plane size capabilities. All surfaces are measured at the mean sea-level elevation of the airport. If necessary or appropriate, Applicants will file the required notice with FAA pursuant to the requirements set forth by FAR Part 77, Subsection 13.

In addition to FAA regulations, the state of Minnesota establishes air navigation obstruction criteria under Minn. R. Ch. 8800. These regulations are intended to control the type of development around airports to prevent incompatible land uses. The state regulations are similar to the FAA regulations as published in FAR Part 77. State runway Safety Zones A through C, which follow the runway approach zones and restrict specific types of development, are included as this part of these regulations. The most restrictive safety zones are A and B; Safety Zone A does not allow any buildings or temporary structures, places of public assembly or transmission lines; Safety Zone B does not allow places of public or semipublic assembly (i.e., churches, hospitals, or schools). Permitted land uses in both zones include agricultural uses, cemeteries, and parking lots. A complete description and copy of the Minn. R. Ch. 8800 Department of Transportation Aeronautics Section 2400 Airport Zoning Standards can be found at http://www.dot.state.mn.us/aero/avoffice/planning/zoning.html.

Furthermore, certain objects such as steel pole transmission line structures have the potential to conflict with the operation of airport navigational aids and weather observation station facilities. Specifically, these facilities include Very High Frequency Omnidirectional Radio Range (VOR) air navigation systems and Automated Weather Observation Stations (AWOS). FAA Order 6820.10 "VOR, VOR/DME, and VORTAC Siting Criteria," specifies the distance setback requirements for trees, buildings, and metallic structures. Within this order, obstruction criteria for a VOR facility are identified, in addition to setback distances for transmission line structures. These regulations specify that overhead transmission line structures with conductors should be located beyond 1,200 feet of the VOR antenna to avoid communication interference. Additionally, metallic structures are

required to subtend vertical angles of 1.2 degrees or less, measured from the ground elevation of the VOR facility. As applied here, structures of 130 feet in height must be 6,206 feet away from a VOR air navigational station to avoid interference with the operation of the facility. Transmission structures of 140 feet in height must be 6,683 feet away and transmission structures of 175 feet in height must be 8,354 feet away from a VOR.

Six airports licensed by the state of Minnesota or registered with the FAA are located within five miles of the Preferred Route, as identified in Figure 7-1 below.

Figure 7-1. Licensed/FAA Registered Public and Private Airports within Five Miles of the Preferred Route

Airport[1]	Public or Private	City	Distance From Preferred Route (miles)	Runway Length(s) (feet)[1]	Runway Direction
Barnesville Municipal Airport[2]	Private	Barnesville	0.95	Runway 17 / 35 – 2,780	N-S
Chandler Field Airport[2]	Public	Alexandria	0.72	Runway 13 / 31 – 5,100 Runway 4 /22 – 4,099	NW – SE NE – SW
Elig Field Airport[3]	Private	Hickson, North Dakota	1.40	Runway 18 – 36 – 2,640	N-S
Fergus Falls Municipal Airport – Einar Mickelson Field[2]	Public	Fergus Falls	0.85	Runway 13 / 31 – 5,639 Runway 17 / 35 – 3,301	NW-SE N-S
Sauk Centre Airport[2]	Public	Sauk Centre	0.15	Runway 14 / 32 – 3,300 Runway 8 / 26 – 2,270	NNW – SSE E-W
South Hector Airstrip Airport[3]	Private	Fargo, North Dakota	4.25	Runway 17 / 35 – 4,000	N-S

[1]Source: AirNav, 2009.
[2]Source: Minn. R. 8800.0100; Mn/DOT, 2009.
[3]FAA designation as obtained from AirNav.

Applicants have met with the city of Sauk Centre. Sauk Centre identified plans to extend the Sauk Centre Airport's north-south orientated runway further to the north and south, although to a greater distance to the south. Applicants understand that the type of instrumentation used for the airport may also be modified. Both considerations may have an affect on allowable heights of structures within the approach path, and otherwise within proximity to the airport. As a result, the Preferred Route has been widened beyond 1,000 feet along I-94 and north of the Sauk Centre Airport. Applicants will continue to coordinate with Sauk Centre to review placement of the proposed 345 kV transmission line as it relates to the airport and incorporate any alternative engineering or design considerations, as applicable or appropriate.

The closest VOR to the Preferred Route is located at the Fergus Falls Municipal Airport. The VOR is approximately 7,490 feet from the Preferred Route. In order to comply with the above mentioned regulations regarding VORs, the transmission line structures in this area could not be taller than 156 feet. The VOR is approximately 8,500 feet from the Preferred Route alignment. In order to comply with the above mentioned regulations regarding VORs, the transmission line structures in this area could not be taller than 178 feet. These estimates assume that the ground surface elevation at the VOR site and the transmission line structures are the same.

Preferred Route Segment Alternatives

There are no public or private airports located within five miles of Preferred Route Segment Alternative 1 or the comparable portion of the Preferred Route.

There is one airport located within five miles of Preferred Route Segment Alternative 2. The Sauk Centre Airport, a public airport, is located approximately 4.20 miles from Preferred Route Segment Alternative 1. This distance is approximately 4.1 miles farther from the airport than the comparable portion of the Preferred Route.

There is one airport located within five miles of Preferred Route Segment Alternative 3. Chandler Field Airport, a public airport, is located approximately 1.60 miles from Preferred Route Segment Alternative 3. This is approximately the same distance from the airport as the comparable portion of the Preferred Route.

There are no public or private airports located within five miles of Preferred Route Segment Alternative 4 or the comparable portion of the Preferred Route.

There are no public or private airports located within five miles of Preferred Route Segment Alternative 5 or the comparable portion of the Preferred Route.

Mitigative Measures

With the proper safeguards and protective measures described above, impacts related to public health and safety are not anticipated. In addition, the proposed structures will comply with all FAA airport and VOR height restrictions. Therefore, no additional mitigative measures are proposed.

7.1.1.2 Commercial, Industrial, Residential Land Use

The Preferred Route crosses Stearns, Todd, Douglas, Grant, Otter Tail, Wilkin, and Clay counties and affects the cities of St. Cloud, Freeport, Melrose, Sauk Centre, Alexandria, Fergus Falls, Rothsay, and Barnesville, as well as their neighboring townships. The Preferred Route primarily follows I-94, though other co-location opportunities including other existing transportation rights-of-way, utility rights-of-way, and property lines also are paralleled. Detailed land use maps are provided in

Appendix G. Zoning or land use classifications crossed by the Preferred Route are summarized in Figure 7-2 below.

Figure 7-2. Preferred Route Zoning/Land Use Summary

Zoning/Land Use Classification[1]	Percent (%) Crossed by Preferred Route
Agricultural	65
Undefined	18
Recreational/Open Space/Park	6
Residential	5
Industrial	3
Commercial/Business/Institutional/Public	3
County Identified Municipal	<1
Special Protection Agriculture	0
Transitional Area/Growth Area	0

[1]Zoning/land use classifications were obtained for all affected jurisdictions and individual classifications were regrouped into one representative classification system.

Areas zoned or classified for agriculture are most affected by the Preferred Route, as a significant portion (65 percent) of the route crosses agricultural lands. Areas with no zoning or land use classification also make up a considerable portion of the Preferred Route (18 percent). All of the land characterized as undefined falls within Otter Tail County and appears, based on aerial interpretation, to support mostly agriculture use. Recreational and residential land use make up similar portions (six and five percent, respectively) of the Preferred Route. The Preferred Route also crosses a minimal amount of land zoned for industrial and commercial uses (three percent each).

Future land use associated with the Preferred Route varies by municipality. According to the 2003 comprehensive plan for the city of St. Cloud, the Preferred Route would not affect areas having been identified as primary growth areas, secondary growth areas, or ultimate service areas. Currently, St. Cloud has various orderly annexation agreements in place. St. Cloud has an orderly annexation agreement with LeSauk Township. The city of Waite Park has established an annexation agreement with St. Joseph Township which includes four five-year incremental phases and encompassing a total of 2,996 acres of varying land uses and rights-of-way. The city of Melrose has identified areas south of the I-94 corridor as areas of future industrial growth. The city of Alexandria has identified a planning area southwest of the intersection of I-94 and Hwy 29. Additionally, a planning area has been identified north of I-94 and south of 50th Avenue adjacent to Lake Burgen. Future land use designations for the city of Barnesville include extending the commercial land designation from Seventh Avenue NW to 145th Avenue along Hwy 9. The area south of I-94 between Hwy 9 and 175th street has a future land use designation of industrial. Additionally, an area north of I-94 and between 175th Street and Hwy 9 has a future land use designation of public/semi-

public area. Each of the areas identified above as being identified for some future annexation, zoning, or land use classification would be crossed by the Preferred Route.

Other land uses encompassed within the Preferred Route include other land-based economic uses, recreational uses, state WMAs, various types of state easements generally established for conservation purposes, federal conservation easements, private conservation easements, and state scenic easements associated with I-94. Land-based economic uses such as mining and forestry are discussed in more detail in section 7.1.2. Recreational uses that may be affected by the Preferred Route are discussed in more detail in section 7.1.1.9. Sensitive management areas and conservation easements are discussed in more detail in section 7.1.4.6.

With regard to I-94, there are four rest areas along the interstate that may be affected by the Preferred Route. The Burgen Lake rest area is located 1.5 miles east of Hwy 29 in Douglas County. The Lake Latoka rest area is located 1.15 miles northwest of Hwy 27 in Douglas County. The Hansel Lake rest area located in Otter Tail County approximately 0.4 mile southeast the Hwy 59/ I-94 intersection. The Lake Iverson rest area is located 8.0 miles southeast of Fergus Falls in Otter Tail County (Mn/DOT, 2009b).

One registered day care facility may be affected by the Preferred Route. This facility is located in the city of Sauk Centre. One church (Tenmile Lake Church) located in Otter Tail County near the city of Dalton may be affected by the Preferred Route. One assisted living facility occurs along the Preferred Route in Sauk Centre. Three cemeteries in Stearns, Douglas, and Otter Tail Counties occur along the Preferred Route. No schools occur within or along the Preferred Route.

There are a number of airports that are located within proximity of the Preferred Route. These airports were previously identified in section 7.1.1.1 and will also be discussed in section 7.1.1.10, along with other transportation uses.

Impacts to land uses include the potential for loss of land available to support a particular use, such as some forms of agricultural use, due to structure placement or right-of-way requirements. Other potential impacts include consideration of the compatibility of the proposed transmission line with existing uses.

Preferred Route Segment Alternatives

The Proposed Routes include five Preferred Route Segment Alternatives. Figure 7-3 identifies the various land uses that would be crossed by each of the segment alternatives.

Figure 7-3. Preferred Route Segment Alternatives Zoning/Land Use Summary

Preferred Route Segment Alternative	Zoning/Land Use Classification1	Percent (%) Crossed by Segment Alternative	Percent (%) Crossed by Comparable Portion of Preferred Route
Preferred Preferred Route Segment Alternative 1	Agricultural	93	92
	Undefined	0	0
	Recreational/Open Space/Park	1	<1
	Residential	1	<1
	Industrial	2	5
	Commercial/Business/Institutional/Public	<1	2
	County Identified Municipal	<1	<1
	Special Protection Agriculture	0	0
	Transitional Area/Growth Area	2	0
Preferred Preferred Route Segment Alternative 2	Agricultural	100	Not Applicable
	Undefined	0	
	Recreational/Open Space/Park	0	
	Residential	0	
	Industrial	0	
	Commercial/Business/Institutional/Public	0	
	County Identified Municipal	0	
	Special Protection Agriculture	0	
	Transitional Area/Growth Area	0	
Preferred Preferred Route Segment Alternative 3	Agricultural	0	0
	Undefined	0	0
	Recreational/Open Space/Park	49	41
	Residential	50	59
	Industrial	0	0
	Commercial/Business/Institutional/Public	<1	0
	County Identified Municipal	0	0
	Special Protection Agriculture	0	0
	Transitional Area/Growth Area	0	0
Preferred Preferred Route Segment Alternative 4	Agricultural	95	70
	Undefined	0	0
	Recreational/Open Space/Park	5	30
	Residential	0	0
	Industrial	0	0
	Commercial/Business/Institutional/Public	0	0
	County Identified Municipal	0	0
	Special Protection Agriculture	0	0

Preferred Route Segment Alternative	Zoning/Land Use Classification1	Percent (%) Crossed by Segment Alternative	Percent (%) Crossed by Comparable Portion of Preferred Route
	Transitional Area/Growth Area	0	0
Preferred Preferred Route Segment Alternative 5	Agricultural	100	96
	Undefined	0	0
	Recreational/Open Space/Park	0	4
	Residential	0	0
	Industrial	0	0
	Commercial/Business/Institutional/Public	0	0
	County Identified Municipal	0	0
	Special Protection Agriculture	0	0
	Transitional Area/Growth Area	0	0

[1]Zoning/land use classifications were obtained for all affected jurisdictions and individual classifications were regrouped into one representative classification system.

Land uses occurring along Preferred Route Segment Alternatives 1, 3, and 5 are similar to those occurring along the comparable portion of the Preferred Route. Preferred Route Segment Alternative 5 is within proximity of the same church located in Otter Tail County near Dalton. Similar to the Preferred Route Segment Alternatives 2 and 5 are within proximity of the same two cemeteries located in Douglas and Otter Tail Counties. Preferred Route Segment Alternative 4 would cross less existing agricultural and more recreational use lands.

Mitigative Measures

Existing land uses that will be affected by the Preferred Route are not expected to change as a result of construction and operation of the proposed 345 kV transmission line. In agricultural areas, the majority of land crossed by the transmission lines could still be used for agricultural purposes. Temporary impacts to agricultural lands during construction are discussed in section 3.3.1. Permanent impacts to agricultural lands include the location of each pole, in addition to an area of up to 1,000 square feet around each pole. Restoration procedures in agricultural areas are discussed in section 3.3.3. No additional mitigative measures are necessary relative to land use.

7.1.1.3 Displacement

NESC and Applicants' standards require certain clearances between transmission line facilities and structures for safe operation of a transmission line. Applicants will acquire a right-of-way for the proposed transmission line that is sufficient to maintain these clearances. Displacement can occur when an existing structure is located within the right-of-way for a new transmission facility.

Although a total of 316 residences are located within the Preferred Route, the proposed 345 kV transmission line can be designed so that all existing residences are located outside of the required right-of-way, to the extent feasible. Figure 7-4 below identifies the number of residences within various distances from the Preferred Route alignment. A number of non-residential structures are within immediate proximity of the alignment and may be directly affected by the required right-of-way. These include up to 35 non-residential structures, which have the potential of being displaced. The majority of these non-residential structures are billboards adjacent to roadways. Other types of non-residential structures that are located within immediate proximity of the alignment include sheds, outbuildings, silos, etc.

Figure 7-4. Residences within Proximity of the Preferred Route Alignment

Proximity (Feet)	Preferred Route
Right-of-Way Required	150 (feet in width)
Residences 0-75	0
Residences 75-150	31
Residences 150-300	87
Residences 300-500	69
Total Residences	187
Density (Homes/Mile)	1.0

Preferred Route Segment Alternatives

Although 74 residences are located within Preferred Route Segment Alternative 1, the proposed 345 kV transmission line will be designed so that existing residences are located outside of the required right-of-way, to the extent feasible. Figure 7-5 below identifies the number of residences within various distances from the Preferred Route Segment Alternative 1 alignment, as compared to the alignment of the comparable portion of the Preferred Route. Five non-residential structures have been identified that are within immediate proximity of the alignment that could be affected by the required right-of-way. This is two more than the comparable portion of the Preferred Route.

Figure 7-5. Residences within Proximity of the Preferred Route Segment Alternative 1 Alignment

Proximity (Feet)	Preferred Route Segment Alternative 1	Comparable Portion of Preferred Route
Right-of-Way Required	150 (feet in width)	150 (feet in width)
Residences 0-75	0	0
Residences 75-150	12	8
Residences 150-300	30	36
Residences 300-500	27	27
Total Residences	69	71
Density (Homes/Mile)	2.0	1.9

There are zero residences within Preferred Route Segment Alternative 2. Figure 7-6 identifies the number of residences within various distances from the Preferred Route Segment Alternative 2 alignment. No non-residential structures have been identified that are within immediate proximity of the alignment that could be affected by the required right-of-way.

Figure 7-6. Residences within Proximity of the Preferred Route Segment Alternative 2 Alignment

Proximity (Feet)	Preferred Route Segment Alternative 2
Right-of-Way Required	150 (feet in width)
Residences 0-75	0
Residences 75-150	0
Residences 150-300	0
Residences 300-500	0
Total Residences	0
Density (Homes/Mile)	0.0

There are 65 more residences within Preferred Route Segment Alternative 3 than the comparable portion of the Preferred Route. Although there are 74 total residences within Preferred Route Segment Alternative 3, the proposed 345 kV transmission line will be designed so that all existing residences are located outside the required right-of-way, to the extent feasible. Figure 7-7 identifies the number of residences within various distances from the Preferred Route Segment Alternative 3 alignment, as compared to the alignment of the comparable portion of the Preferred Route. No non-residential structures have been identified that are within immediate proximity of the alignment that could be affected by the required right-of-way. This is one less than the number of non-residential structures within immediate proximity of the Preferred Route alignment.

Figure 7-7. Residences within Proximity of the Preferred Route Segment Alternative 3 Alignment

Proximity (Feet)	Preferred Route Segment Alternative 3	Comparable Portion of Preferred Route
Right-of-Way Required	150 (feet in width)	150 (feet in width)
Residences 0-75	0	0
Residences 75-150	3	0
Residences 150-300	33	1
Residences 300-500	33	5
Total Residences	69	6
Density (Homes/Mile)	17.6	2.6

There are 10 less residences within Preferred Route Segment Alternative 4 than the comparable portion of the Preferred Route. Although there are two total residences within Preferred Route Segment Alternative 4, the proposed 345 kV transmission line will be designed so that all existing residences are located outside the required right-of-way, to the extent feasible. Figure 7-8 identifies the number of residences within various distances from the Preferred Route Segment Alternative 4 alignment, as compared to the Preferred Route alignment. No non-residential structures have been identified that are within immediate proximity of the alignment that could be affected by the required right-of-way. This is eight less non-residential structures than have been identified within immediate proximity of the alignment of the comparable portion of the Preferred Route.

Figure 7-8. Residences within Proximity of the Preferred Route Segment Alternative 4 Alignment

Proximity (Feet)	Preferred Route Segment Alternative 4	Comparable Portion of Preferred Route
Right-of-way Required	150 (feet in width)	150 (feet in width)
Residences 0-75	0	0
Residences 75-150	2	1
Residences 150-300	0	5
Residences 300-500	1	3
Total Residences	3	11
Density (Homes/Mile)	0.3	1.4

There is one more residence within Preferred Route Segment Alternative 5 than the comparable portion of the Preferred Route. Although there are two total residences within Preferred Route Segment Alternative 5, the proposed 345 kV transmission line will be designed so that all existing residences are located outside the required right-of-way, to the extent feasible. Figure 7-9 identifies

the number of residences within various distances from the Preferred Route Segment Alternative 5 alignment, as compared to the alignment of the comparable portion of the Preferred Route. No non-residential structures have been identified that are within immediate proximity of the alignment that could be affected by the required right-of-way. No non-residential structures have been identified within immediate proximity of the Preferred Route alignment either.

Figure 7-9. Residences within Proximity of the Preferred Route Segment Alternative 5 Alignment

Proximity (Feet)	Preferred Route Segment Alternative 5	Comparable Portion of Preferred Route
Right-of-way Required	150 (feet in width)	150 (feet in width)
Residences 0-75	0	0
Residences 75-150	0	0
Residences 150-300	1	1
Residences 300-500	2	0
Total Residences	3	1
Density (Homes/Mile)	0.8	0.3

Mitigative Measures

The proposed 345 kV transmission line will be designed so that all existing residences will be located outside of the required right-of-way, to the extent feasible. Impacts to non-residential structures or structures will also be minimized with final engineering and design, to the extent feasible.

7.1.1.4 Noise

Noise is defined as unwanted sound. Noise may include a variety of sounds of different intensities across the entire frequency spectrum. Noise is measured in units of decibels (dB) on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more "weight." The A-weighted decibel (dBA) scale corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA. A noise level change of three dBA is barely perceptible to average human hearing. A five dBA change in noise level, however, is clearly noticeable. A ten dBA change in noise levels is perceived as a doubling or halving of noise loudness, while a 20 dBA change is considered a dramatic change in loudness.

Cumulative noise increases occur on a logarithmic scale. If a noise source is doubled, there is a three dBA increase in noise, which is barely discernible to the human ear. For cumulative increases resulting from sources of different magnitudes, the rule of thumb is that if there is a difference of greater than ten dBA between noise sources, there will be no additive effect (i.e., only the louder

source will be heard and the quieter source will not contribute to noise levels). Therefore, predicted noise levels associated with the transmission line are typically much lower than the ambient noise in the Project area and will not increase the existing background noise levels in the Project area. Figure 7-10 below provides noise levels associated with common, everyday sources and places the magnitude of noise levels discussed here in context.

Figure 7-10. Noise Levels Associated with Common Sources

Sound Pressure Level (dBA)	Noise Source
140	Jet engine (at 25 meters)
130	Jet aircraft (at 100 meters)
120	Concert
110	Pneumatic chipper (powered by compressed air or hydraulics)
100	Jointer/planer
90	Chainsaw
80	Heavy truck traffic
70	Business office
60	Conversational speech
50	Library
40	Bedroom
30	Secluded woods
20	Whisper

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

Construction activities will generate noise that is short-term and intermittent. Construction activities will be limited to daytime hours to the extent feasible. As such, the Project will not have significant noise effects for the surrounding area during construction.

Transmission lines 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 and do not exceed the MPCA Noise Limits outside of the right-of-way.

In foggy, damp, or rainy weather, transmission lines can create a crackling sound due to the small amount of electricity ionizing the moist air near the conductors. 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 will produce audible noise approximately equal to household background levels.

The MPCA has established standards for the regulation of noise levels. The land use activities associated with residential, commercial and industrial land have been grouped together into Noise Area Classifications (NAC). See Minn. R. 7030.0050. Each NAC is then assigned both daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) limits for land use activities within the NAC. See Minn. R. 7030.0040. Figure 7-11 shows the MPCA daytime and nighttime limits in dBA for each NAC. The limits are expressed as a range of permissible dBA within a one hour period; L50 is the dBA that may be exceeded 50 percent (30 minutes) of the time within an hour, while L10 is the dBA that may be exceeded 10 percent (six minutes) of the time within an hour. Residences, which are typically considered sensitive to noise, are classified as NAC 1.

Figure 7-11. MPCA Noise Limits by Noise Area Classification (dBA)

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

There are a number of residences within proximity of the Preferred Route. These residences would fall within the NAC 1 category under Minnesota Rules. As such, the L_{10} and L_{50} from the Project must not exceed nighttime levels of 55 and 50 dBA at these residences, respectively. Since it is assumed that the noise levels generated by the Project will be the same at night as those generated during the daytime, compliance with the nighttime levels (more restrictive) will also demonstrate compliance with the daytime noise standards due to greater noise sensitivity of humans at night.

The proposed transmission line was modeled using the Bonneville Power Administration CFI8X model to evaluate audible noise from HVTLs. Where possible, the model was executed as a worst-case scenario benchmark, to ensure that noise was not under-predicted. Figure 7-12 presents the L_5 and L_{50} predicted for proposed transmission lines for the Project. The L_5 is a noise level that will not be exceeded more than five percent of the time. Using the L_5 for demonstrating compliance with the MPCA L_{10} standard is conservative because the noise level exceeded 10 percent of the time will definitively be less than noise level exceeded five percent of the time.

Figure 7-12. Calculated Audible Noise for the Operation of Proposed Single/Double Circuit Transmission Line Designs (3.28 Feet Above Ground)

Structure Type	Noise L_5 (Edge of Right-of-Way, dBA)	Noise L_{50} (Edge of Right-of-Way, dBA)
Single Pole, Davit Arm, 345 kV/345 kV Double Circuit with one Circuit In Service	54.1	45.8

There may be temporary noise at the Quarry Substation and Alexandria Switching Station while modifications are being made at these facilities to accommodate the proposed 345 kV electrical transmission line.

Mitigative Measures

Noise associated with the operation of the proposed 345 kV transmission line is not expected to exceed the limits identified by the MPCA. Therefore, no mitigative measures are proposed.

7.1.1.5 Radio, Television, Cellular Phone, and GPS Interference

Corona from transmission line conductors can generate electromagnetic "noise" at Corona from transmission line conductors can generate electromagnetic "noise" at the same frequencies that radio and television signals are transmitted (corona consists of the breakdown or ionization of air within a few centimeters of conductors and hardware). 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. Eight communication towers are located with the corridor of the Preferred Route.

If radio interference from transmission line corona does occur, satisfactory reception from AM radio stations can be restored by appropriate modification of (or addition to) the receiving antenna system. Moreover, AM radio frequency interference typically occurs immediately under a transmission line and dissipates rapidly within the right-of-way 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 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 facilities in those areas where good reception is presently obtained, Applicants will inspect and repair any loose or damaged hardware in the transmission line, or take other necessary action to restore reception to the present level, including the appropriate modification of receiving antenna systems if deemed necessary.

According to a study performed by the Institute of Electronics and Electrical Engineers (IEEE), power line conductors are unlikely to cause signal degradation to Global Positioning System (GPS) signals. A GPS receiver relies on a dispersed constellation of satellites, at least four and often more. This study noted that there was no loss of satellite signals as a GPS receiver was moved across a power line easement (IEEE, 2002).

Eight communication towers occur within the Preferred Route.

Preferred Route Segment Alternatives

No communication towers occur within Preferred Route Segment Alternative 1. Three communication towers occur within the comparable portion of the Preferred Route. Potential radio, television, cellular phone, and GPS interference impacts are expected to be similar for Preferred Route Segment Alternative 1 as they would be for the Preferred Route.

No communication towers occur within Preferred Route Segment Alternative 2. Potential radio, television, cellular phone, and GPS interference impacts are expected to be similar for Preferred Route Segment Alternative 2 as they would be for the Preferred Route.

No communication towers occur within Preferred Route Segment Alternative 3. One communication tower occurs within the comparable portion of the Preferred Route. Potential radio, television, cellular phone, and GPS interference impacts are expected to be similar for Preferred Route Segment Alternative 3 as they would be for the Preferred Route.

No communication towers occur within Preferred Route Segment Alternative 4. No communication towers occur within the comparable portion of the Preferred Route. Potential radio, television,

cellular phone, and GPS interference impacts are expected to be similar for Preferred Route Segment Alternative 4 as they would be for the Preferred Route.

One communication tower occurs within Preferred Route Segment Alternative 5. One communication tower occurs within the comparable portion of the Preferred Route. Potential radio, television, cellular phone, and GPS interference impacts are expected to be similar for Preferred Route Segment Alternative 1 as they would be for the Preferred Route.

Mitigative Measures

The transmission line hardware will be designed and maintained to minimize gap and corona discharges. There is a potential for interference impacts to occur to omnidirectional communication towers. The height of the transmission line may interfere with beam paths. If interference occurs, Applicants will work with the microwave tower owner to mitigate the impacts.

If interference from transmission line corona does occur for an AM radio station that is within the station's primary coverage area and which had good reception before the Project was built, satisfactory reception can be obtained by appropriate modification of the receiving antenna system. It is expected that the transition to digital TV broadcasts will be complete by the time the Project is constructed.

Digital reception is, in most cases, more tolerant of noise and somewhat less resistant to multipath reflections (i.e., reflections from structures) than analog broadcasts. Although digital reception is more tolerant of RF noise, if the noise levels or reflections are great enough, they will impact digital television reception. In the rare occasion where the construction of the Project may cause interference within a television station's primary coverage area, Applicants will work with the affected viewers to correct the problem, which can usually be corrected with the addition of an outside antenna.

7.1.1.6 Aesthetics

The area encompassed by and surrounding the Preferred Route is characterized by flat to rolling terrain. The regional landscape includes undulating sandy plains with wetlands, lakes, woodlands, rolling plains with drumlins, kettle landscapes, and flat ancient lake beds (EPA, 2007). Land uses associated with the Preferred Route are dominated by agricultural uses, characterizing the regional setting as mostly rural around dispersed population centers. Open space, recreational areas, and other non-private sensitive management areas or areas generally hosting various types of conservation provide for a variety of viewing areas along the Preferred Route.

Sensitive viewpoints include locations from which a significant number of people who have a concern for scenic resources would view a landscape or an area that may be affected by the Project,

or would otherwise be visually exposed to the Project. Potential sensitive viewpoints along the Preferred Route may include existing transportation corridors, designated scenic byways, existing residences within immediate proximity of the proposed electrical transmission line having an unobstructed line of sight of the proposed line, and recreational use areas.

The Preferred Route parallels existing transportation and utility rights-of-way (in accordance with Minn. R. 7850.4100), both generally considered pre-disturbed in nature, for most of its length. Motorists along any roadways of which the Preferred Route parallels would view the line. Although traffic volumes are typically highest when associated with major roads such as I-94, U.S. highways, and state highways, motorist views may be considered more intermittent in that these roadways typically do not support local traffic. Local secondary roads of which the Preferred Route parallels do support motorists who use these roads more regularly or repeatedly. Additionally, while the interstate corridor itself is a pre-disturbed right-of-way that is regularly maintained, Mn/DOT has obtained scenic easements at various locations along I-94.

Designated scenic byways occurring along the Preferred Route include the Otter Trail, Glacial Ridge Trail, and the King of Trails. The Otter Trail scenic byway includes various state highways that comprise a 150-mile loop meandering north, east, and southeast of Fergus Falls. The Otter Trail scenic byway is east of the Preferred Route at a distance of at least 1.5 miles. The Glacial Ridge Trail scenic byway includes various state and county highways that comprise a 245-mile loop meandering south from both Alexandria and Sauk Centre. The Preferred Route crosses the Glacial Ridge Trail near the intersections of I-94 and State Highways 27 and 29. The King of Trails scenic byway includes U.S. Highway 75. The Preferred Route crosses the King of Trails byway near the intersection of U.S. Highway 75 and County Road 8 in Clay County.

Residential uses occurring within and along the Preferred Route include dispersed rural residential uses and residential uses occurring within or near incorporated communities. Residences having an unobstructed line of sight of the proposed 345 kV electrical transmission line would view the line. The distance between these residences and the line would also dictate the field of view, for example, a foreground or background view.

Recreational uses occurring within or adjacent to the Preferred Route include various parks or open space associated with established population centers, the Central Lakes and Lake Wobegon Trails, campgrounds, and other non-private sensitive management areas or areas generally hosting various types of conservation such as existing federal WPAs and state WMAs. The Central Lakes Trail is a 55-mile paved trail which begins in Fergus Falls and end in Osakis. At the end of the trail, in Osakis, the trail connects to the Lake Wobegon Trail (Douglas County, 2009). This 62-mile trail parallels I-94 along a majority of its length towards St. Joseph (Explore Minnesota, 2009). Visitors of these various recreational use areas may view the line.

Visual resources would be impacted by the introduction of the proposed 345 kV transmission line into the regional landscape. The transmission line would introduce new vertical forms or lines in areas where it would not otherwise parallel an existing transmission line. Since the area is largely rural, the proposed 345 kV line may introduce color contrasts during some lighting conditions or seasons. In addition to the proposed single pole steel structures, establishment of the required right-of-way may alter color and textural contrasts as a result of vegetation removal. Vegetative tree species and some shrub species will be permanently removed within the right-of-way.

Preferred Route Segment Alternatives

Sensitive viewpoints along the Preferred Route Segment Alternatives and the potential for impact to visual resources as it relates to these viewpoints would be similar to those described above for the Preferred Route.

Mitigative Measures

Although the proposed 345 kV transmission line will introduce a new vertical form, line, color, and contrast in some areas, the Proposed Routes attempt to maximize the use of existing, pre-disturbed rights-of-way and minimizes the proximity to existing residences to the greatest extent practicable.

7.1.1.7 Socioeconomic

The Project is located in east central to northwest Minnesota. The area of study for the socioeconomic analysis includes Clay, Douglas, Grant, Otter Tail, Pope, Stearns, Stevens, Todd, Traverse and Wilkin Counties in central and northwest Minnesota. The Preferred Route is located entirely in Clay, Douglas, Grant, Otter Tail, Stearns, Todd and Wilkin Counties.

Socioeconomic factors analyzed include population, income, poverty, and employment. U.S. Census data for 2000 and 2006 was obtained at the county, community, and township level to characterize the area along the Preferred Route. These data sets were compared to county and state data, as demonstrated below in Figure 7-13.

Figure 7-13. Population Characteristics Associated with the Preferred Route

Location	Population	White or Caucasian	Black or African American	Asian	Other Races	Hispanic or Latino
Preferred Route[1]	131,416	124,962 95.1%	1,657 1.3%	2,413 1.8%	2,621 2.0%	1,785 1.4%
Clay County	51,229	48,149 94.0%	268 0.5%	449 0.9%	2,363 4.5%	1,872 3.7%
Douglas County	32,821	32,326 98.5%	60 0.2%	132 0.4%	303 0.9%	193 0.6%

Location	Population	White or Caucasian	Black or African American	Asian	Other Races	Hispanic or Latino
Grant County	6,289	6,181 98.3%	13 0.2%	12 0.2%	83 1.3%	33 0.5%
Otter Tail County	57,159	55,505 97.1%	163 0.3%	251 0.4	1,240 2.2%	957 1.7%
Stearns County	133,166	127,832 96.0 %	1,110 0.8 %	2,104 1.6 %	2,120 1.6 %	1,827 1.4 %
Todd County	24,426	23,826 97.5%	27 0.1%	76 0.3%	298 1.2%	463 1.9%
Wilkin County	7,138	6,979 97.8%	11 0.2%	11 0.2%	137 1.9%	110 1.5%
State of Minnesota	4,919,479	4,400,282 89.4 %	171,731 3.5 %	141,968 2.9 %	205,498 4.2 %	143,382 2.9 %

[1]Data includes Alexandria, Barnesville, Fergus Falls, Freeport, Melrose, Rothsay, Sauk Centre, St. Cloud, Waite Park, West Union Township, Albany Township, Alexandria Township, Ashley Township, Avon Township, Barnesville Township, Brandon Township, Brockway Township, Buse Township, Carlisle Township, Dane Prairie Township, Elkton Township, Elmwood Township, Erdahl Township, Evansville Township, Fergus Falls Township, Getty Township, Grove Township, Hudson Township, Humboldt Township, Kurtz Township, La Grand Township, Le Sauk Township, Melrose Township, Millwood Township, North Ottawa Township, Orange Township, Oscar Township, Pelican Lake Township, Prairie View Township, Sauk Centre Township, St. Joseph Township, St. Olaf Township, St. Wendel, Township, Tanberg Township, Trondhjem Township, Western Township

Source: 2000 U.S. Census: General Demographic Characteristics

The seven-county area is located between the Red River Valley and St. Cloud. The population of Stearns County is concentrated in the St. Cloud area, while the population of Douglas County is concentrated in the Alexandria area, and the population of Clay County is concentrated in the Moorhead area. St. Cloud is the largest city near the Preferred Route. Considerable growth is expected in Stearns, Douglas, and Clay Counties, in part because the area is located within commuting distance of the cities of St. Cloud, Alexandria, and Moorhead. Little to negative growth is expected in Otter Tail, Todd, and Wilkin Counties due largely in part to the lack of a largely populated city within county limits. The State Demographic Center projects continuation of this growth trend over the next 30 years and indicates that the Clay County population will grow by 25 percent, Douglas County by 32 percent, Grant County by 4 percent, Otter Tail County by 10 percent, Stearns County by 35 percent, Todd County by 7 percent, and Wilkin County by six percent between 2005 and 2035 (Minnesota State Demographic Center, 2007).

According to the U.S. Census Bureau (U.S. Census Bureau, 2000a), the majority of the population in the Project area is white, as shown in Figure 7-12 above. None of the communities within the Project area counties contain disproportionately high minority populations or low-income populations. There is a lower percentage of minority populations associated with the counties crossed by the Preferred Route, in comparison to the state.

Figure 7-14 shows the 2000 per capita income and the percentage of the population below the poverty level for the state, counties, and Preferred Route. The per capita income in all counties is smaller than the state per capita income, with the largest percentage difference being that of Todd County, at 33 percent. Clay, Douglas, Grant, Otter Tail, Stearns, and Wilkin Counties have higher per capita incomes than Todd County but were still below the state level. An explanation for the low per capita income of the counties encompassed within the Preferred Route relative to the state is presented by the Minnesota State Demographic Center Population Statistics, which indicates that there is a high population in the counties crossed by the Preferred Route that are younger than the state. Younger individuals tend to have lower incomes due to educational commitments, part-time jobs, and entry-level positions. Another factor that could contribute to lower income is the larger percentage of individuals who do not have education beyond a high school degree. Also, there is a high population of individuals over 55 years old as compared to the state. Individuals in this age group are more likely to be retired, thus having a lower per capita income.

The poverty level rates in all counties affected by the Preferred Route are higher than the state poverty rate of 7.9 percent, as presented in Figure 7-14. Clay, Otter Tail, and Todd Counties have higher poverty rates than the rest of the area at 13.2, 10.1, and 12.9 percents respectively. The per capita income for the area crossed by the Preferred Route is lower than the state percentage, at 6.2 percent.

Figure 7-14. Economic Characteristics Associated with the Preferred Route

Location	Per Capita Income	Percentage of Individuals Below Poverty Level
Preferred Route[1]	$18,690	6.2
Clay County	$17,557	13.2
Douglas County	$18,850	8.5
Grant County	$17,131	8.4
Otter Tail County	$18,014	10.1
Stearns County	$19,211	8.7
Todd County	$15,658	12.9
Wilkin County	$16,873	8.1
State of Minnesota	$23,198	7.9

[1]Data includes Alexandria, Barnesville, Fergus Falls, Freeport, Melrose, Rothsay, Rustad, Sauk Centre, St. Cloud, Waite Park, West Union Township, Albany Township, Alexandria Township, Ashley Township, Avon Township, Barnesville Township, Brandon Township, Brockway Township, Buse Township, Carlisle Township, Dane Prairie Township, Elkton Township, Elmwood Township, Erdahl Township, Evansville Township, Fergus Falls Township, Getty Township, Grove Township, Hudson Township, Humboldt Township, Kurtz Township, La Grand Township, Le Sauk Township, Melrose Township, Millwood Township, North Ottawa Township, Orange Township, Oscar Township, Pelican Lake Township, Prairie View Township, Sauk Centre Township, St. Joseph Township, St. Olaf Township, St. Wendel, Township, Tanberg Township, Trondhjem Township, Western Township

Source: 2000 U.S. Census, General Demographic Characteristics

Historically, the economies of the affected counties have been based in agricultural production. The economic base for counties and communities within the Project area are manufacturing, service establishments, and agricultural industries. The higher poverty rates in Todd, Clay, and Otter Tail counties can be explained by the lower incidence of non-agricultural work. According to the U.S. Census Bureau (U.S. Census Bureau, 2000b) Quick Facts, 4.5 percent of Todd County's businesses include private, non-farm establishments. Clay County includes 2.7 percent, and Otter Tail County includes 3.1 percent. The smaller percentage of available employment in these counties can explain the higher poverty rates. The largest industry in terms of employment within the Project area is manufacturing, followed by wholesale trade, retail, and food service.

Figure 7-15 below provides a comparison of population and economic characteristics using 2006 census data (U.S. Census Bureau, American Community Survey, 2006), where data has been updated.

Figure 7-15. Population and Economic Characteristics Associated with the Preferred Route, Based on 2006 Census Data

Location	Total Population	White Population	Minority Population[1]	Hispanic or Latino (of any race) Population[2]	Per Capita Income	Percentage of Population Below Poverty Level
State of Minnesota	5,167,101	87.8	12.2	3.8	27,591	9.8
Clay County	54,110	94.2	5.7	3.4	21,604	13.1
Douglas County	35,600	97.8	2.2	0.8	24,490	12.0
Grant County[3]	-	-	-	-	-	-
Otter Tail County	57,112	97.4	2.7	1.9	22,112	11.9
Stearns County	144,443	94.4	5.6	1.7	22,948	14.1
Todd County	24,008	97.0	3.0	0.0	20,709	13.1
Wilkin County[a]	-	-	-	-	-	-

[1]Minority population consists of Black or African American, American Indian and Alaska Native, Asian, and some other race.

[2]Hispanic population may include individuals of any race, and may also include individuals within the white or minority population estimates; therefore, percent total may be greater than 100 percent.

Source: U.S. Census 2006

[3] 2006 Census Data is not available for these counties.

Temporary housing, consisting of apartment rentals, hotels, motels, and campgrounds, is more abundant in Clay, Douglas, and Stearns counties due to the larger metropolitan areas that fall within their limits. Higher homeownership rates are seen in Grant, Otter Tail, Todd, and Wilkin Counties as most residences within these counties are not as near in proximity to larger metropolitan areas and consist of mostly agricultural land.

The construction and operation of the transmission line is expected to have minimal influence on the local (county and municipal) economies. The counties within the Project area may see a small boost in economic benefit due to payroll earnings, employment opportunities, and construction expenditures. Long-term beneficial impacts from the Project will include incremental increases in revenues from utility property taxes.

Preferred Route Segment Alternatives

Socioeconomic considerations associated with the Preferred Route Segment Alternatives would be similar to those described above for the Preferred Route.

Mitigative Measures

No adverse socioeconomic impacts are anticipated, and therefore, no mitigative measures are proposed.

7.1.1.8 Cultural Values

Cultural values include those perceived community beliefs or attitudes in a given area which provide a framework for the unity of social groups. The communities along the Preferred Route regard their pioneer roots, the history of their settlement, and their predominately agricultural economy as important. Values within the region include individualism and loyalty to local businesses and service providers.

Manufacturing, retail, and service industries are the commercial strength of the region, equally supported by the extensive highly productive farming and diary professions. The area has a diversified agricultural mix of livestock and crops including corn, soybeans, oats, sugar beets, poultry, swine, dairy and beef cattle. Manufacturing opportunities are centered on food and agriculture.

Attractions in the area include numerous state and federal conservation lands, some of which are available to visitors to these areas for hunting, trapping, wildlife viewing, and other recreational uses.

Much of the Project area was historically and continues to be an important gateway for commerce to the Twin Cities. Major railways and roads traverse the project area and are important for

transporting goods. The Fargo to St. Cloud 345 kV Project is not expected to conflict with regional cultural values.

Preferred Route Segment Alternatives

Cultural values associated with the Preferred Route Segment Alternatives would be similar to those described above for the Preferred Route.

Mitigative Measures

No impacts to cultural values are anticipated, and therefore, no mitigative measures are proposed.

7.1.1.9 Recreation

Recreational uses along the Preferred Route include trails, scenic byways, federal and state sensitive management or conservation areas, campgrounds, and local parks or open space.

The Lake Wobegon Trail extends from the city of St. Joseph to the city of Osakis. The trail also has an extension on the west side of Albany which extends northeast to Holdingford and beyond. This 62-mile trail parallels I-94 along a majority of its length (Explore Minnesota, 2009). The Preferred Route crosses the Lake Wobegon Trail just north of Albany and again west of Freeport where it then parallels the trail into the Sauk Centre area. The Preferred Route and the Lake Wobegon Trail separate briefly through Sauk Centre and reconvene northwest of the city. As the Preferred Route enters Todd County, the trail extends north to West Union and terminates in Osakis (Lake Wobegon Trail, 2006). The Central Lakes Trail is a 55-mile trail which begins in Fergus Falls and end in Osakis. At the end of the trail, in Osakis, the trail connects to the Lake Wobegon Trail (Douglas County, 2009).

Designated scenic byways occurring along the Preferred Route include the Otter Trail, Glacial Ridge Trail, and the King of Trails. The Otter Trail scenic byway includes various state highways that comprise a 150-mile loop meandering north, east, and southeast of Fergus Falls. The Otter Trail scenic byway is east of the Preferred Route at a distance of at least 1.5 miles. The Glacial Ridge Trail scenic byway includes various state and county highways that comprise a 245-mile loop meandering south from both Alexandria and Sauk Centre. The Preferred Route crosses the Glacial Ridge Trail near the intersections of I-94 and State Highways 27 and 29. The King of Trails scenic byway includes U.S. Highway 75. The Preferred Route crosses the King of Trails byway near the intersection of U.S. Highway 75 and County Road 8 in Clay County.

There are various federal conservation lands, specifically Waterfowl Production Areas, along the Preferred Route. These areas provide for wildlife viewing, hiking, and other recreational uses while also conserving waterfowl and their associated habitats.

State WMAs make up an important part of Minnesota's outdoor recreation system, protecting those lands and waters that have a high potential for wildlife production, public hunting, trapping, fishing, hiking, wildlife viewing, and other compatible recreational uses.

Various campgrounds occur along the Preferred Route. Lands generally grouped as recreational use areas, which would otherwise include local parks and open space, occur within the counties affected by the Preferred Route and incorporated communities.

Mitigative Measures

No impacts on recreational uses that would alter or limit the use of these areas are anticipated, and therefore, no mitigative measures are proposed.

7.1.1.10 Public Services

Public services in the Project vicinity are provided primarily through the county and municipal governments, as well as several regional agencies. The larger municipalities in the Project vicinity (St. Cloud, Sauk Centre, Alexandria, Fergus Falls) offer the typical range of public services, including police and fire protection, water and sewer services, garbage collection, and street maintenance.

The counties have responsibility for the operation and maintenance of a system of county roads. These highways include county state aid highways and county roads. Mn/DOT also has responsibility for planning and funding roadway improvements, including interstate highways, U.S. Highways, and state trunk highways.

Figure 7-16 lists most of the roads of which the Preferred Route will parallel, and traffic data, if available, for these roads.

Figure 7-16. Average Annual Daily Traffic for Select Roads of which the Preferred Route will Parallel

Road	Existing Average Annual Daily Traffic	Parallel Length (miles)
380th Street, St. Wendel Township	NA	0.3
Stearns County Road 151	680	1.0
363rd Street, Avon Township	NA	0.5
Stearns County Road 9	NA	0.3
360th Street, Avon Township	3,150	0.4
Stearns County Road 154	NA	1.5
205th Avenue, Albany Township	940	0.5
Saint Anna Drive, Albany Township	NA	0.5
Stearns County Road 10	NA	1.1

Road	Existing Average Annual Daily Traffic	Parallel Length (miles)
Stearns County Road 152	1,250	1.1
380th Street, Albany Township	NA	1.5
State Highway 238	1,350	0.9
Stearns County Road 39	390	3.8
Stearns County Road 167	1,750	0.4
I-94	13,000 to 31,000[1]	121.5

Source: Mn/DOT, 2006.
NA: Traffic data is not available for this roadway segment.
[1]The traffic volume increases from west (Barnesville) to east (St. Cloud) along I-94.

I-94 supports a high volume of traffic, which more than doubles in volume from Barnesville to St. Cloud. State Highway 238 supports a relatively higher volume of traffic as well. County roads crossed by the Preferred Route average about 1,300 vehicles per day annually. Traffic information was unavailable for many of the surface streets crossed by the Preferred Route.

There are several highway projects funded or proposed in proximity to the Preferred Route including installation of cable median guardrails from Sauk Centre to the Douglas/Todd County line along I-94. This improvement project is funded for construction during May through August of 2009. Installation of median cable guardrails has also been proposed from Avon to Kimball in Stearns County along I-94 from May to July of 2009. Mn/DOT has proposed to replace and paint the bridge deck structures at the intersection of I-94 and CR 186 in Sauk Centre. Construction for this project is scheduled from April through October in 2009. Concrete rehabilitation and rest area preservation is proposed from May to June along I-94 from the Hwy 59 intersection to the Grant County line. Interstate signage in portions of the area is scheduled for replacement beginning in 2009.

Stearns County Public Works, in partnership with the St. Cloud Area Planning Organization and the cities of St. Joseph and Waite Park, has prepared a Scoping Document for a proposed minor arterial roadway (Southwest Beltway) that would connect State Highway 15 in Waite Park to County Highway 133 in St. Wendel and Le Sauk townships (http://www.co.stearns.mn.us/5844.htm). The study area extends 33rd Street South from Highway 15 west to Highway 23, and north/northwest to the intersection of County Road 4 and County Road 133. Past studies have identified three potential general corridor alignments: west, central and eastern. Stearns County anticipates submitting the Draft EIS in 2009 and receiving the Final EIS in 2011. Stearns County is scheduled to begin corridor preservation in 2012 in anticipation of funding by 2020. The Preferred Route is not located near any of the three corridors, except where the Southwest Beltway's proposed West and Central Corridors cross Bel Clare Drive on the east side of State Highway 23.

Six airports licensed by the state of Minnesota or registered with the FAA are located within five miles of the Preferred Route. The closest airport to the Preferred Route is the Sauk Centre Airport located in the city of Sauk Centre. The Sauk Centre Airport is a public airport located approximately 0.15 mile from the Preferred Route. Other airports that are located within one mile of the Preferred Route include the Barnesville Municipal Airport, the Chandler Field Airport in Alexandria, and the Fergus Falls Municipal Airport – Einar Mickelson Field.

Preferred Route Segment Alternatives

Public services associated with the Preferred Route Segment Alternatives would be similar to those described above for the Preferred Route. The Preferred Route Segment Alternatives mostly parallel secondary roads or property lines. There is one airport located within five miles of Preferred Route Segment Alternative 2. The Sauk Centre Airport, a public airport, is located approximately 4.20 miles from Preferred Route Segment Alternative 1. This distance is approximately 4.1 miles farther from the airport than the comparable portion of the Preferred Route. There is one airport located within five miles of Preferred Route Segment Alternative 3. Chandler Field Airport, a public airport, is located approximately 1.60 miles from Preferred Route Segment Alternative 3. This is approximately the same distance from the airport as the comparable portion of the Preferred Route.

Mitigative Measures

The Preferred Route is not expected to impact any public services. Applicants will work with any potentially affected parties to minimize the potential for impacts to planned roadway projects, as appropriate or to the extent feasible. Therefore, no mitigative measures are proposed.

7.1.2 LAND-BASED ECONOMICS

7.1.2.1 Agriculture

According to the U.S. Department of Agriculture 2007 Census of Agriculture (U.S. Department of Agriculture, 2009), primary crops in the Project area are corn, soybeans, oats, wheat, sugar beets, and hay. Primary livestock found within the Project area include dairy cattle, beef cattle, sheep, swine, and poultry. Figure 7-17 illustrates the number of farms, average farm size, acres of farmland, market value of agricultural products, and market value of agricultural products per acre of farmland for each county within the Project area.

Figure 7-17. Agricultural Production within Project Area by County

County	Number of Farms	Average Farm Size (acres)	Acres of Farmland	Market Value of Agricultural Products (millions of dollars)	Market Value of Agricultural Products per Acre of Farmland (dollars)
Clay	921	666	613,819	$202	$329
Douglas	1,199	219	262,695	$65	$247
Grant	675	476	321,501	$103	$320
Otter Tail	3,296	273	898,703	$300	$334
Pope	1,055	341	360,095	$117	$325
Stearns	3,368	210	708,284	$519	$733
Stevens	639	533	340,347	$244	$717
Todd	1,910	198	378,374	$149	$394
Traverse	479	684	327,627	$111	$339
Wilkin	428	993	424,976	$131	$308

Sixty-five percent of lands occurring within the Preferred Route are zoned for agriculture. An additional 18% of lands occurring within the Preferred Route corridor are not zoned or undefined. Being that the majority of the Project area outside of municipalities is agricultural, it is likely that a large portion of the 18% is agricultural land. Permanent impacts on agricultural land can include loss of agricultural land due to pole placement. The permanent impacts associated with the Preferred Route represent approximately 19 acres, assuming that 1,000 square feet per pole will be permanently impacted. Temporary impacts during construction may include soil compaction, disruption of agricultural practices (e.g., center pivot irrigation) and crop damages within the right-of-way at proposed structure location, locations of permanent access, and other work areas. Temporary impacts are estimated at approximately 832 acres, based on a rate of one acre per pole.

During public outreach meetings for the Project, some landowners expressed concerns with whether high voltage transmission lines, such as proposed for the Project, could interfere with electromagnetically guided cornering systems that some center pivot irrigation systems utilize. A study published in the Institute of Electronics and Electrical Engineers Transactions on Power Delivery (Olsen et. al, 1998) found that the level and frequency of magnetic fields required to cause interference with the electromagnetically guided cornering systems is significantly higher than found near most high voltage transmission lines.

Preferred Route Segment Alternatives

The permanent impacts associated with Preferred Route Segment Alternative 1 represent less than an acre less than the comparable portion of the Preferred Route. Temporary impacts are estimated at approximately 116 acres less than the comparable portion of the Preferred Route.

The permanent impacts associated with Preferred Route Segment Alternative 2 represent less than one acre. Temporary impacts are estimated at approximately 8 acres.

The permanent impacts associated with Preferred Route Segment Alternative 3 represent less than an acre more than the comparable portion of the Preferred Route. Temporary impacts are estimated at approximately 2 acres more than the comparable portion of the Preferred Route.

The permanent impacts associated with Preferred Route Segment Alternative 4 represent less than an acre more than the comparable portion of the Preferred Route. Temporary impacts are estimated at approximately 19 acres more than the comparable portion of the Preferred Route.

The permanent impacts associated with Preferred Route Segment Alternative 5 represent less than an acre more than the comparable portion of the Preferred Route. Temporary impacts are estimated at approximately 8 acres more than the comparable portion of the Preferred Route.

Mitigative Measures

Together with the Department of Agriculture and other parties, Applicants have developed an Agricultural Impact Mitigation Plan to identify measures the utilities will take to avoid, mitigate, repair and/or provide compensation for impacts that may result from construction of the proposed transmission facilities. A copy of the final Plan is included in Appendix I.

Landowners will be compensated for the use of their land through easement payments. To minimize loss of farmland and to ensure reasonable access to the land near the poles, Applicants would prefer to place the poles approximately five feet from the road right-of-way. When possible, Applicants will attempt to construct the transmission line before crops are planted or following harvest. Applicants will compensate landowners for crop damage and soil compaction that occurs as a result of the Project. Soil compaction will be addressed by compensating the farmer to repair the ground or by using contractors to chisel-plow the site. Normally, a declining scale of payments is set up over a period of a few years.

To further minimize agricultural impacts where possible, spring time construction will be avoided. However, if construction during spring is necessary, disturbance to farm soil from access to each structure location will be minimized by using the shortest access route feasible or practicable. 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.

Some landowners use GPS navigation systems on farm equipment. Once the Project is complete, the transmission line poles will have GPS coordinates that Applicants may provide to the landowners, if requested.

Tile lines may be present along the transmission line route. Applicants will work with the landowners to identify locations of drainage tiles along the route and will minimize interference with tiling, where possible. In the event that Applicants locate a tile line that the landowner did not discuss, Applicants will relocate the pole and repair the tile line, if damaged.

Crop dusting may occur within agricultural fields along the route. If this farming practice is utilized, and has the potential to become impacted by the Project, Applicants will work with the landowner to identify mitigative measures to avoid or reduce changes to farming practices caused by the Project.

7.1.2.2 Forestry

The Preferred Route is located primarily in grassland and cultivated land with some forested areas adjacent to farmsteads, waterways, and within MDNR managed lands. The Preferred Route will cross 1,946 acres of wooded lands (USGS, 2001). The wooded areas are located primarily on privately held lands. The wooded areas that are privately owned may be selectively cut periodically for firewood, timber, or pulpwood. However, these wooded areas are not necessarily commercial forestry operations. The majority of the forest industry is located within the northeastern portion of the state. According to the MDNR, Forestry Division, Fiscal Year 2010 Harvest Plans (MDNR, 2009c), no townships within the Preferred Route have timber harvest plans. Impacts on forest resources will occur at locations where trees will be cleared within the right-of-way. For potential impacts on flora, see section 7.1.5.3.

Preferred Route Segment Alternatives

Forest resources, notably tree stands, are present along Preferred Route Segment Alternative 1. Preferred Route Segment Alternative 1 will cross 468 acres of wooded lands, which is 666 less than the comparable portion of the Preferred Route.

Forest resources, notably tree stands, are present along Preferred Route Segment Alternative 3. Preferred Route Segment Alternative 3 will cross 52 acres of wooded lands.

Forest resources, notably tree stands, are present along Preferred Route Segment Alternative 4. Preferred Route Segment Alternative 4 will cross 21 acres of wooded lands, which is 10 less acres of wooded lands than crossed by the comparable portion of the Preferred Route.

Forest resources, notably tree stands, are present along Preferred Route Segment Alternative 5. Preferred Route Segment Alternative 5 will cross 24 acres of wooded lands, which is 20 less acres of wooded lands than crossed by the comparable portion of the Preferred Route.

Mitigative Measures

No impacts on commercial forest resources will occur. Impacts on wooded lands have been minimized by locating the Preferred Route to minimize tree clearing to the extent feasible. As a result, no mitigative measures are proposed.

7.1.2.3 Tourism

The majority of tourism activities or opportunities along the Preferred Route are associated with recreational uses. Refer to section 7.1.1.7 for a discussion of recreational uses along the Preferred Route.

Preferred Route Segment Alternatives

Tourism considerations associated with the Preferred Route Segment Alternatives would be similar to those described above for the Preferred Route.

Mitigative Measures

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

7.1.2.4 Mining

In 1984, Minnesota Statues Section 84.94 was passed, which required each county in Minnesota to identify and protect aggregate resources. Since then, counties in Minnesota have begun to identify areas of potential mining and develop long-term comprehensive plans that incorporate aggregate resources (MDNR, 2009a). Wright County and Clay County are the only counties of which mapping of Aggregate Resources has been completed by the MDNR. Stearns County mapping is in progress. Due to the incompleteness of the mapping across the Project area, aggregate resources in the Project area were identified using the Mn/DOT Aggregate Source Information System, which is a database of aggregate sources that are depicted on County Pit Maps. County Pit Maps show the locations of gravel pits, rock quarries and commercial aggregate sources. The maps were completed prior to 2003 and there are no plans to update the maps. Thirteen aggregate source sites were identified within the Preferred Route, based on data from the Aggregate Source Information System database. Ten of the pits are pits prospected and/or leased by Mn/DOT. These sources may not be producing aggregate at this time. One pit is identified as "Other" with no additional information provided. Two pits are inactive. Inactive pits are a source that is either depleted or at least unavailable for future use.

Preferred Route Segment Alternatives

Based on the Aggregate Source Information System database, one aggregate source has been identified within Preferred Route Segment Alternative 1. This pit is identified as a commercial

source of aggregate. No aggregate sources have been identified within the comparable portion of the Preferred Route either.

Based on the Aggregate Source Information System database, no aggregate sources have been identified within Preferred Route Segment Alternative 2.

Based on the Aggregate Source Information System database, no aggregate sources have been identified within Preferred Route Segment Alternative 3. No aggregate sources have been identified within the comparable portion of the Preferred Route either.

Based on the Aggregate Source Information System database, no aggregate sources have been identified within Preferred Route Segment Alternative 4. No aggregate sources have been identified within the comparable portion of the Preferred Route either.

Based on the Aggregate Source Information System database, no aggregate sources have been identified within Preferred Route Segment Alternative 5. One aggregate source has been identified within the comparable portion of the Preferred Route. This pit is a prospected pit.

Mitigative Measures

The Preferred Route is not located within immediate proximity of any mines, nor would it otherwise have any affect on existing mining operations. Therefore, no mitigative measures are proposed.

7.1.3 ARCHAEOLOGICAL AND HISTORIC RESOURCES

As recently as May 2009, the SHPO Archaeological and Architectural database records were accessed to determine if any known or suspected archaeological sites or historic standing structures are located within the Project area. Based on a preliminary review, it was determined that there are known sites in the general vicinity of the Project. Currently, however, Applicants do not anticipate impacts to previously or newly identified resources as a result of the Project. Applicants plan to avoid impact to any newly discovered resources by adjusting pole spacing to span any resources, as appropriate or to the extent feasible. In the event that impacts cannot be avoided, Applicants will determine, in consultation with SHPO, whether or not the resource is eligible for listing in the National Register of Historic Places (NRHP). Any future correspondence will be forwarded to the Commission upon receipt.

Applicants reviewed SHPO records in St. Paul to identify known archaeological resources and historical structures within the Preferred Route. The literature review also included reports of previously surveyed areas relevant to the area encompassed by the Preferred Route.

Nine archaeological sites have been recorded within the Preferred Route; however, only six archaeological sites would be crossed by the Preferred Route alignment. Of these, one is a possible

ghost town referenced only in historic documentation and one is the likely location of Red River Trails which was used by for commerce in the early nineteenth century. The remaining sites represent prehistoric isolated finds, lithic or artifact scatters dating to the Woodland or an unspecified prehistoric period. Of these, one is characterized by prehistoric mounds; however, it has been reported as destroyed. None of the sites have been evaluated for listing on the NRHP. Placement of structures will strive, however, to avoid these sites to the extent feasible or practicable. Figure 7-18 below identifies known archaeological resources within the Preferred Route and that would be crossed by the Preferred Route alignment.

Figure 7-18. Archaeological Resources within the Preferred Route

Site Type	Number Within Preferred Route	Number Crossed by Alignment	Eligible or Listed
Prehistoric Lithic Scatter	3	2	0
Prehistoric Artifact Scatter	2	1	0
Prehistoric Lithic Scatter and Earthwork	1	0	0
Prehistoric Single Artifact	1	1	0
Subtotal	7	4	0
Historic Documentation	1	1	0
Historic Trail/Road	1	1	0
Subtotal	2	2	0
Total	9	6	0

A total of 20 previously identified historic architectural properties are situated within the Preferred Route. Of these 20 resources, the Anton Gogala Farmstead encompasses 12 individual structures and is listed on the NRHP. The remaining eight resources consist of a bridge, a flour mill, a church, a log outbuilding, three schools, and a music hall. These properties have not been evaluated for listing on the NRHP. Placement of structures will strive, however, to avoid these sites to the extent feasible or practicable. Figure 7-19 below identifies known historic architectural properties within the Preferred Route.

Figure 7-19. Historic Architectural Properties within the Preferred Route

Property Type	Number Within Preferred Route	Eligible or Listed
Historic Farmstead	12	12
Flour Mil	1	0
Church	1	0
Outbuilding	1	0
School	3	0
Bridge	1	0
Music Hall	1	0
Total	20	12

Historic Landscapes

According to the National Park Service, a cultural landscape is defined as "a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values." A historic landscape is associated with an event or series of events of historical note and may also be the visual perception of a particular period of civilization, a way of life or patterns of living. A historic landscape can range from thousands of acres of rural tracts to a small homestead with a front yard of less than one acre. Like historic buildings and structures, these places reveal aspects of our country's origins and development through their forms, features, and the way they were used (National Park Service, 2008). Identification of historic landscapes typically arises out of federal preservation requirements, including Sections 106 and 110 of the NHPA of 1966, as amended, or through the state's preservation planning program.

The King of Trails scenic byway along U.S. Highway 75 extends along the entire length of Minnesota, paralleling the Red and Bois de Sioux Rivers along the western state boundary. Designated a scenic byway by the Minnesota State Legislature in 2001, the King of Trails byway intersects the Preferred Route in a flat agricultural area south of Moorhead.

Preferred Route Segment Alternatives

Five Preferred Route Segment Alternatives have been identified along the Preferred Route between Melrose and Fergus Falls. Two of these alternate segments, Preferred Route Segment Alternatives 1 and 3, have the potential to affect cultural resources. No recorded archaeological sites or historic properties have been identified for the other Preferred Route Segment Alternatives or their comparable portions of the Preferred Route.

One archaeological site, a prehistoric artifact scatter, has been recorded within Preferred Route Segment Alternative 1. No archaeological sites have been recorded within the comparable portion of the Preferred Route.

Four archaeological sites have been recorded within Preferred Route Segment Alternative 3. The sites represent lithic or artifact scatters dating to the Woodland or an unspecified prehistoric period. One of the Woodland period artifact scatters is listed on the NRHP. No archaeological sites have been recorded within the comparable portion of the Preferred Route.

Two historic properties have been recorded within Preferred Route Segment Alternative 1. One property is a township hall and the other is a historic stage coach route. There are 13 historic properties recorded within the comparable portion of the Preferred Route. Twelve of the properties are part of the Anton Gogala Farmstead, which is listed on the NRHP.

Mitigative Measures

Adverse impacts to archaeology sites result from ground disturbance during construction or operation of the Project facilities that displace or destroy information important to the prehistory or history of Minnesota or the nation. Six archaeology sites have been identified as within or near the proposed construction right-of-way. Impacts to most, if not all, of these sites can be avoided by designation of sensitive areas, minor adjustments to Project design, and designation of no-traffic areas during construction and operation. Cultural resource inventories should be completed in areas of proposed ground disturbance to identify any undocumented archaeology sites that may be affected by the proposed Project. If any sites cannot be avoided, site specific treatment plans will be developed to mitigate the adverse impacts of this Project.

Adverse impacts to historic buildings or structures can result from physical and structural damage to the building or structure from construction or operation of the Project. Indirect impacts can also result from visual intrusion of Project elements on the historic setting of the building or structure that diminishes the historic character of the building or structure. Two historic buildings or structures have been identified as within or near the proposed construction right-of-way. Like direct impacts to archaeology sites, many of these impacts can be avoided or minimized by designation of sensitive areas, minor adjustments to Project design, and designation of no-traffic areas during construction and operation. However, because impacts to buildings and structures can be indirect, these avoidance measures are developed in consultation with the SHPO.

Currently, Applicants do not anticipate impacts to previously or newly identified resources as a result of the Preferred Route. Applicants plans to avoid impact to any newly discovered resources by adjusting pole spacing to span any resources in the corridor. In the event that an impact would

occur, Applicants will determine, in consultation with SHPO, whether or not the resource is eligible for listing in the NRHP.

Additional survey work may occur upon completion of Preferred Route design. Areas of archaeological potential will be spanned when possible. If such landforms cannot be spanned, areas will be examined using standard Phase I techniques. If new resources are discovered during the course of the survey, pole spacing will be adjusted to span such resources to the extent feasible.

7.1.4 NATURAL ENVIRONMENT

7.1.4.1 Air Quality

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

The only potential air emissions from a 345 kV transmission line result from corona and are limited. Corona consists of the breakdown or ionization of air in a few centimeters or less immediately surrounding conductors and can produce ozone and oxides of nitrogen in the air surrounding the conductor. For a 345 kV transmission line, the conductor gradient surface is usually below the air breakdown level. 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 transmission lines, inhibits the production of ozone. Ozone is a very reactive form of oxygen and combines readily with other elements and compounds in the atmosphere. Because of its reactivity, it is relatively short-lived. The area within proximity of the Preferred Route presently meets all federal air quality standards.

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

The magnitude of the construction emissions is influenced heavily by weather conditions and the specific construction activity occurring. Exhaust emissions, primarily from diesel equipment, will vary according to the phase of construction, but will be minimal and temporary. Adverse impacts to

the surrounding environment will be minimal because of the short and intermittent nature of the emission and dust-producing construction phases.

Mitigative Measures

Applicants anticipate nominal impacts to air quality; therefore, no mitigative measures are proposed.

7.1.4.2 Surface and Ground Water Resources

The Preferred Route crosses two major water resource regions (watersheds), as defined by the USGS. The western portion of the route crosses the Souris-Red-Rainy Region (09), which ultimately drains into Lake Winnipeg and Hudson Bay. The central and eastern portions of the route cross the Upper Mississippi Region (07), which ultimately drains to the Gulf of Mexico.

Within each region, several smaller watersheds, or cataloging units are crossed. These are denoted by 8-digit Hydrologic Unit Codes. Figure 7-20 contains a list of all 8-digit Hydrologic Unit Code watersheds crossed by the Preferred Route.

Figure 7-20. Watersheds (8-digit HUC) Crossed by the Preferred Route

Watershed Name	Hydrologic Unit Code (8-digit)	Crossing Length (miles)
Long Prairie River	07010108	16.1
Mississippi River – Sartell	07010201	29.1
Sauk River	07010202	49.3
Pomme de Terre River	07020002	19.8
Chippewa River	07020005	12.9
Otter Tail River	09020103	25.0
Upper Red River of the North	09020104	11.9
Buffalo River	09020106	26.5

FEMA designates areas that are likely to experience flooding in a 100-year and 500-year rainfall event. While transmission structures can withstand some inundation, operation and maintenance of the transmission structures could be affected within the floodplain during a flood event. Approximately 704 acres of FEMA-designated floodplains occur within the Preferred Route. Floodplains are depicted on the detailed maps provided in Appendix B.

Surface Water Resources

Surface waters are protected under the federal Clean Water Act (CWA), which grants states the authority to regulate discharges to surface waters. In Minnesota, the MPCA is the regulatory agency with jurisdiction of discharges to surface waters. This Project will require a National Pollutant

Discharge Elimination System (NPDES) permit from the MPCA for the discharge of stormwater generated from construction activities. As a requirement of the NPDES permit, a Stormwater Pollution Prevention Plan (SWPPP) will be developed to manage stormwater discharges generated from construction activities.

Additionally, the United States Army Corps of Engineers (USACE) holds jurisdiction over certain navigable waterbodies (Section 404 of the CWA). A permit will be required from the USACE under Section 10 of the Rivers and Harbors Act for work in federally designated navigable waters. The Project area contains two Section 10 waterbodies, the Red River of the North and the Bois de Sioux River.

The USACE also maintains jurisdiction over waters of the U.S. The definition of "waters of the United States" is found in 40 Code of Federal Regulations 230.3(s). Under Section 404 of the CWA, a permit from the USACE is required for the discharge of dredged or fill material into waters of the U.S.

Some rivers and streams are designated as Public Waters by the state of Minnesota and are under the regulatory jurisdiction of the MDNR. These are listed in the Public Waters Inventory (PWI). The statutory definition of Public Waters can be found in Minn. Stat. §103G.005, subdivisions 15 and 15a. A license from the MDNR is required to cross these features.

Applicants conducted a review of streams and rivers with perennial and intermittent classifications based on 1:24,000 USGS 7.5 minute quadrangle maps. Several rivers, streams, and drainage ditches are located within the Preferred Route. The Preferred Route encompasses 60 intermittent and 34 perennial waterbodies, some of which are crossed multiple times. Streams and rivers crossed by the Preferred Route are shown on the detailed maps provided in Appendix B. Streams and rivers listed in the PWI are summarized below in Figure 7-21.

Figure 7-21. Minnesota Designated Public Waters (Streams and Rivers) Crossed by the Preferred Route

Waterbody Name	Number of Crossings
Ashley Creek	1
Buffalo River, South Branch	1
Chippewa River	1
County Ditch 22	2
County Ditch 12	4
Getchell Creek	1
Hoboken Creek	1
Otter Tail River	1
Pelican Creek	1

Waterbody Name	Number of Crossings
Pelican River	1
Pomme De Terre River	1
Red River	1
Sauk River	4
Silver Creek	1
South Two River	1
Spunk Creek	1
Stony Creek	2
Watab River, South Fork	1
Whiskey Creek	1
Unnamed Streams	11

Applicants conducted a review of lakes within the Preferred Route from readily available MDNR lake data, which were derived directly from medium scale lake polygons originally based off of NWI polygons and Mn/DOT basemap lake delineations. According to this dataset, the Preferred Route encompasses 198 lakes or portions of lakes. Based on review of recent, high-resolution aerial photographs and 1:24,000 USGS 7.5 minute quadrangle maps, it appears that a significant number of these 198 lakes are relatively small in size, and do not contain standing water. Of the 198 lakes, 118 (60 percent) are less than one acre in size, 55 (28 percent) are between one and five acres in size, and 25 (13 percent) are greater than five acres in size.

Public Waters also include some lakes. Applicants will attempt to locate the proposed 345 kV transmission line whereby impacts to Public Waters and other significant surface waters can be minimized or reduced to the extent feasible. Applicants will obtain utility crossing licenses from the MDNR for PWI lakes crossed. Lakes listed in the PWI are denoted in Figure 7-22.

Figure 7-22. Minnesota Designated Public Waters (Lakes) Crossed by the Preferred Route

Lake Name
Burns
Clear
Clifford
Cook
Freeport
Hansel
Indian
Iverson
Latoka

Lake Name
Lobster
Long
Lower Watab
Mahla
Mina
Mud
Pine
Rose
Shepard
The Great Belclair Marsh
Uhlenkolts
West Union
Unnamed Lakes (17 total)

Section 303(d) of the CWA requires states to publish, every two years, a list of streams and lakes that are not meeting their designated uses because of excess pollutants; these are also referred to as impaired waters. The list, known as the 303(d) list, is based on violations of water quality standards. The majority of impairments to surface waters are caused by agricultural sources (fecal coliform, dissolved oxygen, turbidity, excess nutrients/eutrophication) or industrial sources (Mercury, Polychlorinated Biphenyls). The MPCA has jurisdiction over determining 303(d) waters in the state of Minnesota. Figure 7-23 contains a list of impaired waters crossed by the Preferred Route, based on the 2008 MPCA 303(d) list, along with the causes of impairment.

Figure 7-23. Impaired Waters Crossed or Within the Preferred Route

Waterbody Name	Cause(s) of Impairment
Ashley Creek	Dissolved oxygen
Chippewa River	Turbidity
Getchell Creek (County Ditch 2)	Invertebrate Index of Biological Integrity (IBI)
Pomme de Terre River	Mercury
Red River of the North	Mercury, Polychlorinated Biphenyls, Turbidity
Sauk River	Fecal Coliform, Polychlorinated Biphenyls, Turbidity, Mercury
Spunk Creek	Fecal Coliform
Stony Creek	Turbidity
Lakes	
Clifford Lake	Excess nutrients/eutrophication
Lakota Lake (North Bay)	Mercury
Lakota Lake (South Bay)	Mercury
Lobster Lake (East Bay)	Mercury

The only impairment that could potentially be generated by the Project is increased turbidity due to sediment deposition from construction activities. Applicants will employ avoidance measures and Best Management Practices to minimize or reduce the potential for erosion and sedimentation resulting from construction activities.

Section 401 of the CWA grants state agencies the authority to require certification (Water Quality Certification) of compliance with state and federal water quality regulations for projects which may result in a discharge to navigable waters. In Minnesota, the MPCA implements Section 401 and will grant Project certification.

Certain surface waters are designated as trout streams or lakes by the state of Minnesota and are under the regulatory jurisdiction of the MDNR. State designated trout streams and lakes can be found in Minn. Stat. §6264.0050. There are no designated trout streams or lakes within or crossed by the Preferred Route.

Groundwater Resources

The state of Minnesota is divided into six groundwater provinces with varying characteristics. The majority of the Preferred Route will cross the Central Province, which is characterized by sand aquifers in generally thick sandy and clayey glacial drift overlying Precambrian and Cretaceous bedrock. Groundwater within fractured and weathered Precambrian bedrock is used locally as a water source. A small portion of the Preferred Route in Stearns County will cross the Arrowhead province, which is typified by Precambrian rocks exposed at the surface, with groundwater typically found locally in faults and fractures. The extreme western portion of the Preferred Route will cross the Western Province, which contains clayey glacial drift overlying Cretaceous and Precambrian bedrock.

Based on the county well index, a computerized database containing basic well information for over 340,000 water wells drilled in Minnesota, within the corridor of the Preferred Route there are 158 water wells. Additionally, portions of the Preferred Route cross five wellhead protection areas (Barnesville, Melrose, New Munich, Sartell North, and Waite Park), which are designated areas having been established to protect public water supply wells from potential contamination sources. Wellhead protection areas are administered by the Minnesota Department of Health under the state wellhead protection rule (Minn. Rule 4720.5100-4720.5590).

Applicants received information from the city of Melrose which identified shallow depths to groundwater at existing well locations along the south side of I-94. These existing wells are located within Melrose's identified wellhead protection area, which encompasses their drinking water supply management areas. The use of specialty structures that would have a wider foundation but require shallower excavation, some other design consideration, or construction techniques may be

considered in this area. The use of specialty structures would potentially reduce the likelihood of encountering groundwater in this area. As a result, the Preferred Route has been widened beyond 1,000 feet in an area southwest of the city of Melrose.

Preferred Route Segment Alternatives

Five Preferred Route Segment Alternatives have been analyzed and compared to the portion of the Preferred Route that they would serve as a routing alternative to.

Preferred Route Segment Alternative 1 is located in the Central Groundwater Province. According to the county well index, Preferred Route Segment Alternative 1 contains 35 wells, as compared to 68 wells for the comparable portion of the Preferred Route. There are three additional wellhead protection areas that are crossed by the segment alternative that are not crossed by the comparable portion of the Preferred Route. These wellhead protection areas include Cold Spring Alano, Cold Spring NE, and Gold'N Plump Poultry. Both the segment alternative and the comparable portion cross the New Munich wellhead protection area. These well head protection areas include Sartell North and Waite Park. There are 270 less acres of FEMA-designated floodplain located within Preferred Route Segment Alternative 1 than the comparable portion of the Preferred Route. Preferred Route Segment Alternative 1 contains two more intermittent stream crossings and the same number of perennial stream crossings (twelve) as the comparable portion of the Preferred Route. Preferred Route Segment Alternative 1 has two less PWI stream crossings than the comparable portion of the Preferred Route. Preferred Route Segment Alternative 1 contains 27 lakes, of which seven are listed in the PWI. The comparable portion of the Preferred Route contains 83 lakes, of which five are listed in the PWI. Two streams contained by Preferred Route Segment Alternative 1, Getchell Creek (County Ditch 2) and the Sauk River, are listed as impaired with respect to Section 303(d) of the CWA. Getchell Creek's cause of impairment is its Invertebrate Index of Biological Integrity and the Sauk River is listed due to fecal coliform, Polychlorinated Biphenyls (PCBs), and turbidity. The comparable portion of the Preferred Route contains the same two impaired streams, in addition to Spunk Creek. Spunk Creek is listed due to fecal Coliform. Neither Preferred Route Segment Alternative 1 nor the comparable portion of the Preferred Route cross contain lakes that are listed as impaired.

Preferred Route Segment Alternative 2 is located in the Central Groundwater Province, and does not contain any wellhead protection areas or additional wells listed in the county well index. No additional FEMA-designated floodplains occur within Preferred Route Segment Alternative 1. This alternative is located in the Sauk River watershed. One intermittent stream is located within Preferred Route Segment Alternative 2. The stream is not listed in the PWI, and is not listed as an impaired waterbody with respect to Section 303(d) of the CWA. No additional lakes are located within the corridor.

Preferred Route Segment Alternative 3 is located in the Central Groundwater Province, and does not contain any wellhead protection areas. According to the county well index, Preferred Route Segment Alternative 3 contains 16 wells, as compared to eight wells for the comparable portion of the Preferred Route. No additional FEMA-designated floodplains occur within Preferred Route Segment Alternative 3. This alternative is located in the Long Prairie River watershed. There are no streams or rivers located in Preferred Route Segment Alternative 3 or the comparable portion of the Preferred Route. Preferred Route Segment Alternative 3 contains six lakes, which is two more as compared to the comparable portion of the Preferred Route. Preferred Route Segment Alternative 3 and the comparable portion of the Preferred Route each contain two lakes which are listed as impaired with respect to Section 303(d) of the CWA.

Preferred Route Segment Alternative 4 is located in the Central Groundwater Province, and does not contain any wellhead protection areas. According to the county well index, Preferred Route Segment Alternative 4 contains two wells, as compared to three wells for the comparable portion of the Preferred Route. Preferred Route Segment Alternative 4 contains an additional 6.9 acres of FEMA-designated floodplains. This alternative is located in the Pomme de Terre and Chippewa River watersheds. Preferred Route Segment Alternative 4 contains one less crossing of an intermittent stream and the same number of crossings of a perennial waterbody as compared to the comparable portion of the Preferred Route. One less PWI stream crossing is located in Preferred Route Segment Alternative 4 as compared to the comparable portion of the Preferred Route. Preferred Route Segment Alternative 4 and the comparable portion of the Preferred Route each contain two crossings of the Chippewa River, which is listed as impaired (Turbidity) with respect to Section 303(d) of the CWA. Preferred Route Segment Alternative 4 contains four lakes, of which one is listed in the PWI. The comparable portion of the Preferred Route contains seven lakes, of which three are listed in the PWI. Neither Preferred Route Segment Alternative 4 nor the comparable portion of the Preferred Route contain lakes which are listed as impaired with respect to Section 303(d) of the CWA.

Preferred Route Segment Alternative 5 is located in the Central Groundwater Province, and does not contain any wellhead protection areas. According to the county well index, Preferred Route Segment Alternative 5 does not contain any wells, as compared to one well for the comparable portion of the Preferred Route. No additional FEMA-designated floodplains occur within Preferred Route Segment Alternative 5. This alternative is located in the Pomme de Terre River watershed. Neither Preferred Route Segment Alternative 5 nor the comparable portion of the Preferred Route cross any streams. Preferred Route Segment Alternative 5 contains five lakes, two of which are listed in the PWI. The comparable portion of the Preferred Route contains five lakes, three of which are listed in the PWI. Neither Preferred Route Segment Alternative 5 nor the comparable portion of the Preferred Route contain lakes which are listed as impaired with respect to Section 303(d) of the CWA.

Mitigative Measures

Applicants will follow standard erosion control measures identified in the MPCA's Stormwater Best Management Practices Manual to maintain sound water and soil conservation practices during construction of the Project to minimize soil erosion, and protect topsoil and adjacent water resources. These measures include using silt fencing, slope breaks, containing excavated material, protecting exposed soil, and stabilizing restored soil. These measures will be used to minimize erosion and sedimentation impacts to adjacent water resources. Construction will be completed according to NPDES permit requirements.

No construction activities will occur within or immediately adjacent to waterbodies or wetlands, to the extent feasible. Applicants will avoid major disturbance of individual wetlands and waterbodies during construction. This will primarily be accomplished by spanning wetlands and waterbodies.

Where water resources must be crossed to string new conductors and shield wires, workers may walk across, use boats, drive equipment across ice in the winter, or use temporary bridges to cross over or through the wetland or waterbody. Wetland and waterbody boundaries along the construction corridor will be identified and marked prior to construction to assure these sensitive areas are protected accordingly. Setbacks will be established to identify safe fueling areas and staging areas a sufficient distance from waterbodies and wetlands when possible or as required by permit conditions. These construction practices will help to prevent siltation within waterbodies and wetlands and minimize the risk of an inadvertent release of harmful fluids due to fueling and lubricating of equipment.

Avoidance and minimization will be accomplished by strategically locating new access roads outside of wetland and waterbody boundaries and spanning wetlands and waterbodies, where possible. When it is not feasible to span a water resource, or avoid access to the right-of-way through a wetland or waterbody, construction crews will rely on several options during construction to minimize impacts, including:

- When possible, construction will be scheduled during frozen ground conditions;
- When construction during winter is not possible, construction mats will be used as needed to minimize temporary impacts due to construction in a water resource;
- Crews will attempt to access the wetland with the least amount of physical impact to the wetland (i.e., shortest route); and
- The structures will be assembled in upland areas before they are installed within a water resource to minimize temporary impacts due to structure installation.

7.1.4.3 Wetlands and Waters

In Minnesota, wetlands are protected under the state's Wetland Conservation Act, and by the MDNR for those areas identified as Protected Waters Inventory wetlands. A wetland permit from the USACE under Section 404 of the CWA is required when working in jurisdictional wetlands or waters, and a license to cross Protected Waters Inventory wetlands is required from the MDNR. This Project may not require a permit under the Wetland Conservation Act by definition (Minn. R. 8420.0110 Subp. 18) or by exemption (Minn. R. 8420.0122 Subp. 6). Coordination with the local government units and/or the Board of Water and Soil Resource is required for the Wetland Conservation Act determination.

The USACE and the state of Minnesota jointly define wetlands as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

In accordance with the 1987 United States Army Corps of Engineers Wetlands Delineation Manual, the USACE and the state of Minnesota use three criteria when making wetland determinations: vegetation, soil, and hydrology (Environmental Laboratory 1987). Hydrophytic vegetation includes plants that are adapted to life in soil that is at least periodically saturated. Soils that may occur in wetlands, called hydric soils, have characteristics that indicate the soil developed in conditions where oxygen is limited or absent due to the presence of saturated conditions for extended periods during the growing season. Wetland hydrology refers to the presence of water at or near the soil surface for a sufficient period of the year to significantly influence the plant community and soil development in the area. Generally all three indicators, wetland vegetation, hydric soil, and wetland hydrology, must be present for an area to meet the definition of a wetland.

Wetlands along the Preferred Route vary according to hydrology, soils, and the vegetation community occurring within the wetland. Generally the majority of wetlands in central and west-central Minnesota are palustrine emergent wetlands, or wetlands that are in depressions with emergent vegetation such as grasses, sedges, cattails, and rushes. Forested wetlands and wetlands with shrub vegetation (scrub-shrub) are less common and typically located adjacent to waterbodies or as a component of large wetland complex. Even less common are lacustrine wetlands, or wetlands associated with lakes or deeper water, and riverine wetlands, which are wetlands associated with waterbodies or riparian corridors.

Wetlands support unique wildlife, aquatic invertebrates, and plants, and are considered important areas for wildlife. Wetlands also store surface water for flood control, improve water quality, and provide open spaces that support recreational opportunities such as hunting, fishing, trapping, bird watching, and photography.

Hydrology for wetlands can come from surface water, groundwater, or a combination of the two. The source of the hydrology often determines the type of soil and vegetation community that occur within a wetland. Unique wetlands within central Minnesota include calcareous fens, which are protected resources under the Minnesota Wetland Conservation Act (Minn. R. 8420.0520 Subp. 9) and by Minn. Stat. §103G.223. Calcareous fens occur as a result of groundwater upwelling through calcareous glacial substrates, which enriches the water with minerals that provides a habitat for variety of unique and rare plant species. These wetland types are typically found at the base of steep slope areas, such as river bluffs. While present throughout central Minnesota, no known calcareous fens occur within the Preferred Route.

There are two common wetland classification systems used within the regulatory framework for this Project. The USFWS, Circular 39 (Shaw and Fredine 1956) classification uses eight wetland classes or types: Type 1- seasonally flooded, Type 2- wet meadow, Type 3- shallow marsh, Type 4- deep marsh, Type 5- shallow open water, Type 6- shrub swamp, Type 7- wooded swamps, and Type 8- bogs. The Circular 39 is referenced primarily within the Minnesota Wetland Conservation Act.

The Cowardin classification system is a hierarchical system that breaks wetlands into ecological systems (lacustrine, palustrine, riverine, etc.), classes that are substrate or habitat dependent (emergent, scrub-shrub, forested, rock bottom, unconsolidated bottom, etc.), and by water regime (saturated, temporarily flooded, seasonally flooded, permanently flooded, etc.) (Cowardin et al., 1979). Wetlands along the Preferred Route consist of palustrine, lacustrine, and riverine wetlands in order of abundance. Palustrine wetlands are generally depressional areas that consist of forested, scrub-shrub, and emergent (herbaceous vegetation) varying from saturated to permanently flooded basins. Lacustrine wetlands are generally associated with open water habitat, such as lakes and ponds, but in order to be considered wetland they must be less than two meters deep. Riverine wetlands are associated with riparian systems, along rivers, streams, and natural drainages along the route. The Cowardin classification system is more commonly used by the USACE, and generally by field staff completing wetland delineations.

The wetland impact analysis includes an assessment of both permanent impacts and temporary impacts. Permanent impacts are generally expected at the footprint of the concrete footing necessary to support each pole. The permanent impacts from the concrete footing at each pole will be 55 square feet. Temporary impacts are being estimated to include a 20-foot-wide corridor necessary for through-access along the right-of-way. In addition, an estimate of one acre is assumed as the area of disturbance at each structure location as a result of structure assembly activities. Because all wetlands, rivers, streams, and ditches will be spanned or avoided wherever possible, it will only be necessary to place a limited number of structures within these features.

Indirect impacts to wetland and water resources could include sedimentation reaching surface waters during construction due to ground disturbing activities such as excavations, grading, construction

traffic, and dewatering. This could temporarily degrade water quality due to turbidity. These impacts will be minimized to the extent feasible through the use of appropriate sediment and erosion control practices, and other construction-related best management practices. These practices will be detailed in the NPDES permit and SWPPP that will be completed prior to the start of construction. Applicants will also be seeking Section 401 certification from the MPCA, as appropriate. Once the Project is completed, there will be no significant impact to surface water quality. Wetland impacts will be minimized to the extent feasible and mitigated, disturbed soil will be restored to preconstruction conditions, and the amount of land area converted to an impervious surface will be relatively small.

Temporary impacts to wetlands may occur during construction given that construction will likely require passing through wetlands and waterbodies. However, wetlands and waterbodies will not be crossed by construction equipment unless necessary and until appropriate consultations have been conducted or permits acquired from any appropriate local, state, and federal agencies.

Access will be selected to minimize wetland impacts by identifying access to and within the right-of-way outside wetland boundaries where possible. If crossing through a wetland is required, efforts will be made to locate the access road at the narrowest point of crossing, or along the edge of the wetland to minimize potential temporary impacts. Applicants will implement any appropriate mitigative measures and otherwise obtain necessary permits or approvals prior to improving access roads.

Permanent impacts to wetlands are expected only where structures must be located within wetland boundaries. The area of impact associated with each structure includes an area of approximately 55 square feet per structure. This area is based on an average foundation size. An additional area approximately one acre in size at each pole location will be impacted, returned to pre-construction contours, and low-growing wetland vegetation restored following construction. Temporary impacts associated with structures and the required right-of-way would otherwise include an access road approximately 20 feet in width extending between structures.

Vegetation maintenance procedures under transmission lines prohibit trees from establishing. Existing trees must be removed within the 150-foot right-of-way, including within forested wetlands. Wetland mitigation for conversion of forested wetlands to non-forested wetlands may be required as a result of these tree clearing activities.

NWI maps, produced by the USFWS, are based on aerial photographs and Natural Resource Conservation Service soil surveys, and are the best available source of wetland data prior to completing field verified wetland and waterbody surveys. NWI data were used to determine the number and types of wetlands, and estimate the percentage of wetlands occurring within the Preferred Route. Data from NWI maps are assumed to be accurate, however wetland types and

boundaries illustrated on NWI maps may be inconsistent with existing wetland conditions. Figure 7-24 includes a summary of data pertaining to NWI wetlands crossed by the Preferred Route.

The most common wetland type crossed by the Preferred Route is palustrine emergent (PEM) wetland, which vary from temporarily flooded potholes to expansive cattail marshes and saturated wet meadows. Overall, palustrine wetlands cover approximately 11 percent of the Preferred Route, consisting of eight percent palustrine emergent, less than one percent palustrine forested (PFO), two percent palustrine scrub-shrub (PSS), and one percent palustrine unconsolidated bottom (PUB).

In addition, 27 of the wetlands crossed by the Preferred Route are included in the PWI and are thus subject to the jurisdiction of the MDNR.

Figure 7-24. Wetlands Crossed by the Preferred Route

Wetland Type	Total Wetlands		MDNR PWI Wetlands
	Count	% of Route	
PEM	1,206	8	19
PFO	75	<1	0
PSS	122	2	2
PUB	158	1	3
Lake	28	1	3
Riverine	12	<1	0
Total	1,601	12	27

Applicants have estimated that approximately 37 poles will need to be placed in wetlands along the Preferred Route, resulting in approximately 2,035 square feet (or 0.05 acre) of permanent wetland impacts. The type of wetland where poles will be placed will be identified prior to construction and provided to appropriate agencies. Temporary wetland impacts total 81 acres within the Preferred Route. Approximately 16 acres of PFO wetlands, which is less than one percent of the proposed right-of-way, will undergo a permanent vegetation type change to PEM or PSS vegetation. Applicants will continue to minimize the potential for impacts to wetlands to the maximum extent feasible with final engineering and design.

MDNR data were reviewed for known occurrences of state protected calcareous fens. There are no records of calcareous fens within the Preferred Route. In addition, land ownership and management data were reviewed for lands managed as natural wetland areas under the control of the USFWS. There are several properties where Waterfowl Production Areas and wetland easements occur adjacent to or within the Preferred Route.

Preferred Route Segment Alternatives

NWI wetlands comprise 17 percent of Preferred Route Segment Alternative 1, as compared to 20 percent of the comparable portion of the Preferred Route. Preferred Route Segment Alternative 1 includes 13 wetlands in the PWI, whereas the comparable portion of the Preferred Route segment contains seven. Based on the NWI data, Preferred Route Segment Alternative 1 would require placement of 20 poles in wetlands, resulting in 1,100 square feet (0.03 acre) of permanent impacts. In addition, 42 acres of temporary wetland impacts would occur. In addition, one acre of PFO wetlands would undergo a permanent vegetation type change to PEM or PSS vegetation. According to the NWI data, the comparable portion of the Preferred Route also require placement of 18 poles in wetlands, resulting in 990 square feet (0.02 acre) of permanent impacts and 36 acres of temporary wetland impacts. In addition, 12 acres of PFO wetlands would undergo a permanent vegetation type change to PEM or PSS vegetation. According to available data, no portion of either Preferred Route Segment Alternative 1 or the comparable portion of the Preferred Route is located within a known calcareous fen, or within a MCBS area of biodiversity significance, or includes a known occurrence of federally or state listed plant species.

NWI wetlands comprise three percent of Preferred Route Segment Alternative 2. No wetlands within Preferred Route Segment Alternative 2 are included in the PWI. Based on the NWI data, Preferred Route Segment Alternative 2 would not require placement of poles in wetland; however, less than one acre of temporary impacts would occur. No PFO wetlands would be converted to PEM or PSS vegetation within Preferred Route Segment Alternative 2. According to available data, no known calcareous fens, or MCBS areas of biodiversity significance, or known occurrences of federally or state listed plant species were present within Preferred Route Alternative Segment 2.

NWI wetlands comprise 12 percent of Preferred Route Segment Alternative 3, as compared to 11 percent of the comparable portion of the Preferred Route. Preferred Route Segment Alternative 3 includes two wetlands in the PWI, whereas the comparable portion of the Preferred Route segment does not have any wetlands in the PWI. Based on the NWI data, Preferred Route Segment Alternative 3 would require placement of one pole in wetlands, resulting in 55 square feet (0.001 acres) of permanent impacts. In addition, three acres of temporary wetland impacts would occur. Less than one acre of PFO wetlands would undergo a permanent vegetation type change to PEM or PSS vegetation. According to the NWI data, the comparable portion of the Preferred Route also would not require placement of poles in wetlands, although one acre of temporary wetland impacts would occur, and no conversion of PFO wetlands to PEM or PSS vegetation would be required. According to available data, no portion of either Preferred Route Segment Alternative 3 or the comparable portion of the Preferred Route is located within a known calcareous fen, or within a MCBS area of biodiversity significance, or includes a known occurrence of federally or state listed plant species.

NWI wetlands comprise five percent of Preferred Route Segment Alternative 4, as compared to nine percent of the comparable portion of the Preferred Route. Preferred Route Segment Alternative 4 includes two wetlands in the PWI, whereas the comparable portion of the Preferred Route included five wetlands in the PWI. Based on the NWI data, Preferred Route Segment Alternative 4 would not require placement of poles in wetlands, although two acres of temporary wetland impacts would occur, and no conversion of PFO wetlands to PEM or PSS vegetation would be required. According to the NWI data, the comparable portion of the Preferred Route also would not require placement of poles in wetlands, although one acre of temporary wetland impacts would occur, and no conversion of PFO wetlands to PEM or PSS vegetation would be required. According to available data, no portion of either Preferred Route Segment Alternative 4 or the comparable portion of the Preferred Route is located within a known calcareous fen, or within a MCBS area of biodiversity significance, or includes a known occurrence of federally or state listed plant species.

NWI wetlands comprise four percent of Preferred Route Segment Alternative 5, as compared to nine percent of the comparable portion of the Preferred Route. Both the Preferred Route Segment Alternative 5 and the comparable portion of the Preferred Route include one wetland in the PWI. Based on the NWI data, Preferred Route Segment Alternative 5 would not require placement of poles in wetlands, although less than one acre of temporary wetland impacts would occur, and no conversion of PFO wetlands to PEM or PSS vegetation would be required. According to the NWI data, the comparable portion of the Preferred Route also would not require placement of poles in wetlands, although less than one acre of temporary wetland impacts would occur, and no conversion of PFO wetlands to PEM or PSS vegetation would be required. According to available data, no portion of either Preferred Route Segment Alternative 5 or the comparable portion of the Preferred Route is located within a known calcareous fen, or within a MCBS area of biodiversity significance, or includes a known occurrence of federally or state listed plant species.

Mitigative Measures

Applicants will follow standard erosion control measures identified in the MPCA's Stormwater Best Management Practices Manual to maintain sound water and soil conservation practices during construction of the Project to minimize soil erosion, and protect topsoil and adjacent water resources. These measures include using silt fencing, slope breaks, containing excavated material, protecting exposed soil, and stabilizing restored soil. These measures will be used to minimize erosion and sedimentation impacts to adjacent water resources. Construction will be completed according to NPDES permit requirements.

No construction activities will occur within or immediately adjacent to waterbodies or wetlands, to the extent feasible. Applicants will avoid major disturbance of individual wetlands and waterbodies during construction. This will primarily be accomplished by spanning wetlands and waterbodies.

Where water resources must be crossed to string new conductors and shield wires, workers may walk across, use boats, drive equipment across ice in the winter, or use temporary bridges to cross over or through the wetland or waterbody. Wetland and waterbody boundaries along the construction corridor will be identified and marked prior to construction to assure these sensitive areas are protected accordingly. Setbacks will be established to identify safe fueling areas and staging areas a sufficient distance from waterbodies and wetlands when possible or as required by permit conditions. These construction practices will help to prevent siltation within waterbodies and wetlands and minimize the risk of an inadvertent release of harmful fluids due to fueling and lubricating of equipment.

Avoidance and minimization will be accomplished by strategically locating new access roads outside of wetland and waterbody boundaries and spanning wetlands and waterbodies, where possible. When it is not feasible to span a water resource, or avoid access to the right-of-way through a wetland or waterbody, construction crews will rely on several options during construction to minimize impacts, including:

- When possible, construction will be scheduled during frozen ground conditions;
- When construction during winter is not possible, construction mats will be used as needed to minimize temporary impacts due to construction in a water resource;
- Crews will attempt to access the wetland with the least amount of physical impact to the wetland (i.e., shortest route); and
- The structures will be assembled in upland areas before they are installed within a water resource to minimize temporary impacts due to structure installation.

In addition to mitigation measures utilized during construction, it is likely that the USACE will require compensatory wetland mitigation as part of the permitting process under Section 404 of the CWA.

7.1.4.4 Flora

The Preferred Route occurs within two ecological classification system provinces, as described by the MDNR and United States Forest Service: the Eastern Broadleaf Forest and Prairie Parkland Provinces (ECOMAP 1993). The Preferred Route occurs within four subsections of the ecological classification system: Anoka Sandplain, Hardwood Hills, Minnesota River Prairie, and Red River Prairie.

The Preferred Route generally follows the prairie-forest border along the majority of its length from the new Quarry Substation to just south of Fergus Falls, near Dalton, Minnesota. After this point

the route primarily occurs within the Red River Prairie ecological classification system subsection. The route generally follows along the Alexandria Moraine, which is a large end moraine that created topographically diverse landscapes interspersed with many kettle lakes and depressional wetlands. Thus the Preferred Route occurs within a mosaic of wooded areas, open prairie, and agricultural land with many scattered lakes, streams, and wetlands.

The Preferred Route crosses a small portion of the Anoka Sandplain ecological classification system subsection immediately north of the alternative Quarry Substation siting areas. Presettlement vegetation within the Anoka Sandplain ecological classification system subsection consisted of a mosaic dry prairies, with little bluestem (*Schizachyrium scoparium*) and porcupine grass (*Stipa spartea*) as dominant grasses, and savannahs of bur oak (*Quercus macrocarpa*), and northern pin oak (*Quercus ellipsoidales*) interspersed with scattered wetlands across a generally flat to subtly rolling landscape (MDNR, 2009b; MDNR, 2005a and 2005b).

The Preferred Route crosses back and forth several times between the Hardwood Hills and Minnesota River Prairie ecological classification system subsections between Stearns County and Otter Tail County. Presettlement vegetation within the Hardwood Hills ecological classification system subsection consisted of primarily mesic oak-basswood and mesic maple-basswood forests consisting of northern red oak (*Quercus rubra*), basswood (*Tilia americana*), and sugar maple (*Acer saccharum*), with small lakes and wetlands scattered throughout the woodlands. In addition, a mosaic of savannah and open grasslands were also present throughout the western fringe of the Hardwood Hills ecological classification system subsection, along the prairie-forest border (MDNR, 2009b; MDNR, 2005a and 2005b). Woodlands and forests dominated sites sheltered from fire by the many lakes, rivers, and wetlands that occur throughout this portion of the Preferred Route.

Presettlement vegetation within the Minnesota River Prairie ecological classification system subclass included primarily tallgrass prairie with many prairie potholes and depressional areas consisting of wet prairie. Common tallgrass prairie species would have included big bluestem (*Andropogon gerardii*), Indian grass (*Sorghastrum nutans*), prairie dropseed (*Sporobolus curtipendula*), and bluejoint grass (*Calamagrostis canadensis*), prairie cordgrass (*Spartina pectinata*), sedges (*Carex* sp.) and rushes (*Juncus* sp.) occurring within wet prairies. Forested portions of this subsection would have generally been limited to river floodplain corridors, that consisted of silver maple (*Acer saccharinum*) cottonwood (*Populus deltoides*), and American elm (*Ulmus americana*) trees and dense willow (*Salix* sp.) stands within the floodplain (MDNR, 2009b; MDNR, 2005a and 2005b).

The final ecological classification system subsection crossed by the Preferred Route is the Red River Prairie subsection. The Red River Prairie subsection would have consisted of primarily tallgrass prairie, comprised of many of the same species described previously for the Minnesota River Prairie subsection. However, unlike the Minnesota River Prairie, which consisted of rolling topography resulting from glacial moraines, the Red River Prairie was generally developed with fine textured

lacustrine sediments, and thus a very flat landscape. Slight topographic variation would have provided microhabitats that differentiated between mesic and wet prairies, with dry prairies less common but occurring along sandy beach ridges (MDNR, 2009b; MDNR, 2005a and 2005b).

Flora throughout most of the Project area is typical of that normally found in an agricultural setting. The majority of the Preferred Route occurs along existing rights-of-way, including roads, and is also often adjacent to cultivated row crops. Given that the vegetation communities that occur in these areas are regularly disturbed, impacts due to construction are not anticipated to substantially disrupt vegetative community quality or function. Applicants will span areas containing native plant communities wherever possible or practicable. Applicants will also work to avoid and minimize direct impacts on habitat and conservation areas to the extent feasible.

Temporary impacts to flora will take place most intensively at the structure locations. Temporary impacts are estimated at one acre per pole. In forested areas, clearing for access roads and staging areas will be limited to only trees necessary to permit the passage of equipment. Once construction is complete, temporary access roads will be removed and the area will be restored to its original grade and seeded to stabilize the soil.

Permanent vegetative changes will take place in woodland areas within the right-of-way. Trees and shrubs that may interfere with maintenance and the safe operation of the transmission line will not be allowed to establish within the right-of-way. Co-locating with existing corridors through wooded areas will reduce the impact on trees and habitats they support. Typically, vegetation is controlled mechanically or with herbicides on a regular maintenance schedule. Vegetation that does not interfere with the safe operation of the transmission line is allowed to reestablish within the right-of-way after construction. In addition, permanent impacts will be required at each pole location. The permanent impacts are estimated at 55 square feet per pole.

Preferred Route Segment Alternatives

The potential for impacts to flora as associated with the Preferred Route Segment Alternatives would be similar to those described above for the Preferred Route.

Mitigative Measures

Applicants will continue to work with the MDNR and USFWS to minimize and avoid impacts to properties where native vegetation occurs and is managed. The Preferred Route will avoid and minimize impacts on properties where native vegetation occurs, wherever possible. When native vegetation communities cannot feasibly be spanned, Applicants will work to minimize the number of permanent structures that may impact the native community. Naturally managed properties disturbed during construction will be restored to pre-construction contours and will be reseeded with a seed mix recommended by agency staff or required according to required Project permits.

Other lands disturbed during construction will be restored to pre-construction contours and stabilized using a seed mix specified within the Project's NPDES permit requirements.

Construction equipment can spread noxious weed-propagating material to new locations. Applicants will comply with Minnesota noxious weed laws as described in Minn. R. Ch. 1505 and will observe county weed lists where they occur. Around substations and switches, Applicants will provide for weed control in a manner that does not allow for the spread of weeds onto adjacent agricultural land during operation of the transmission line.

7.1.4.5 Fauna

Common wildlife species found within the regional area include large and small mammals, songbirds, waterfowl, raptors, fish, reptiles, amphibians, mussels, and insects. Wildlife throughout the Project area consists of both resident and migratory species, which use the area habitat for forage, shelter, breeding, or as a stopover during migration. Species include those found in agricultural landscapes, prairie remnants, pasture, grasslands, wetland, and riverine habitats. Common mammals for these habitats include raccoon *(Procyon lotor)*, skunk *(Mephitis* spp.*)*, white-tailed deer *(Odocoileus virginianus)*, coyote *(Canis latrans)*, red fox *(Vulpes vulpes)*, badger *(Taxidea taxus*), porcupine *(Erethizon dorsatum),* and rabbit *(Sylvilagus* spp.*)*. Common birds include songbirds, hawks such as red-tailed hawk (*Buteo jamaicensis*) and Cooper's hawk (*Accipter cooperii*), waterfowl, and game birds such as pheasant *(Phasianus colchinus)* and turkey *(Meleagus gallopavo)* (MDNR AniMap, 2008; Tester, 1995). Appendix D provides lists of common mammals, birds, reptiles, and amphibians that may occur in the area.

Throughout the Project area, there are several areas where high-quality wildlife habitat occurs naturally or is being managed. Designated habitat or conservation areas including managed areas such as MDNR WMAs; USFWS WPAs and conservation easements; and unmanaged areas including MDNR-designated MCBS biodiversity significance and rare native habitats and communities were analyzed within the Preferred Route.

While agricultural land uses are an important component of wildlife resources in the Project area, land managed to promote wildlife habitat can provide for higher species diversity and larger populations than surrounding landscapes that are intensively used for agriculture.

The Migratory Bird Treaty Act of 1918 (16 United States Code (USC) 703-712) governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. The Fish and Wildlife Conservation Act of 1980 (16 USC 2901-2911) affords protection to Birds of Conservation Concern. Migratory birds and Birds of Conservation Concern are an important component of biodiversity in North America. Many species are known to occur in the Project area in a variety of upland and wetland habitats. Additionally, the Bald and Golden Eagle Protection Act (16 USC 668-668C), which was enacted in 1940, specifically prohibits the taking or possession of

and commerce in bald eagles (*Haliaeetus leucocephalus)* and golden eagles (*Aquila chrysaetos*), either alive or dead, or any part, nest, or egg of these eagles.

Raptors, waterfowl, and other bird species may be affected by the construction and placement of the transmission line. Avian collisions are a possibility after the completion of the transmission line but the larger size of conductors associated with transmission lines compared to distribution lines would result in higher visibility, potentially decreasing collisions. Waterfowl typically are more susceptible to transmission line collision, especially if the transmission line is placed between agricultural fields that serve as feeding areas, and wetlands or open water, which serve as resting areas. In these areas, it is likely that waterfowl and other birds will be traveling between different habitats, potentially increasing the likelihood of avian conflicts with the transmission line. Because of the high density of birds in such nesting sites, disturbance to the site has the potential to impact individuals. Species' population reproductive success is not likely to be impacted.

Through coordination with the USFWS and MDNR, two areas of concern to both agencies were identified along the Preferred Route. These two areas were identified as being primary migration and staging areas for high concentrations of waterfowl and other migratory birds. One area is between Pomme de Terre Lake, Pelican Lake, and Lake Christine. The USFWS has indicated that 20% of the entire population of canvasback ducks (*Aythya valisineria)* that migrate across the U.S. congregate within the area extending between these water bodies. The other area identified by both agencies is an area between North Ten Mile Lake, Mineral Lake, and Swan Lake. Concern was expressed by both agencies regarding these two locations as they would have the highest potential along the Preferred Route for avian collisions. They felt this potential would also be the highest during inclement weather and low flight over the interstate between the lakes.

Electrocution of large birds, such as raptors, is a concern typically related to distribution lines. Electrocution occurs when birds with large wingspans come in contact with either two conductors or a conductor and a grounding device. Applicants' transmission line design standards provide adequate spacing to eliminate the risk of raptor electrocution. As such, electrocution is not a concern related to this Project.

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

Habitat fragmentation could be caused by the transmission line bisecting habitats. Because the proposed transmission line follows existing features such as roads, transmission lines, or field lines, very few new corridors will be created as a result of this Project. Areas of sensitive habitat will be

spanned as much as possible. Impacts from habitat fragmentation can extend beyond the area disturbed by a new route. Fragmentation affects some wildlife species by creating barriers to daily migrations. Predation can increase among animals that are forced out of cover as they search for food, and decreases the distance that predators may have to travel to penetrate large habitat areas. Some species depend on large areas of undisturbed habitat and their survivability decreases as fragmentation increases.

Temporary impacts on fauna will take place most intensively at the structure locations (requiring one acre per structure). Staging areas and stringing areas will also temporarily impact fauna within the Project area. Grading could occur at the staging areas if they are not located in previously disturbed sites. Through right-of-way access will be limited to 20 feet in width. In forested areas, clearing will be limited to only those trees necessary to permit the passage of equipment and the area will be restored to original condition.

Preferred Route Segment Alternatives

The potential for impacts to general fauna as associated with the Preferred Route Segment Alternatives would be similar to those described above for the Preferred Route.

Mitigative Measures

To mitigate possible impacts on wildlife, Applicants will span designated high quality wildlife habitat areas to the extent feasible. In areas where complete spanning is not possible, Applicants will minimize the number of structures placed in high quality wildlife habitat, and will work with the MDNR and USFWS to determine appropriate minimization and/or mitigation measures. Also, Applicants have routed the Preferred Route such that the majority is co-located with the I-94 corridor or other existing rights-of-way that have been previously disturbed; therefore, minimizing additional tree clearing that could increase fragmentation. Similarly, because transmission line routing avoids direct impacts to lakes and rivers, impacts on fisheries will be small. Any impacts, temporary or permanent, are unlikely to affect population levels of these species. Areas disturbed due to construction activities will be restored to pre-construction contours and will be reseeded with a MDNR-recommended seed mix that is free of noxious weeds.

Applicants will address avian issues at waterbody crossings and other areas of concern by working with the USFWS and MDNR to identify any areas that may require marking the proposed transmission line, such as with the use of bird flight diverters, in an effort to reduce the likelihood of collisions. In 2002, Xcel Energy entered into a voluntary Memorandum of Understanding with the USFWS to work together to address avian issues throughout its service territories. The development of Avian Protection Plans for each state the Company serves, including Minnesota, is currently underway to help support the Memorandum of Understanding.

7.1.4.6 Sensitive Management Areas and Conservation Easements

Rare and unique communities and habitats occur throughout the regional area. Rare and unique communities include federal waterfowl production areas and state WMAs, SNAs, parks, trails, and MCBS sites of biodiversity significance.

Data from the USFWS, MDNR, and private organizations were reviewed to determine areas containing rare or unique communities and habitats within the Preferred Route. Federal lands along the Preferred Route include waterfowl production areas, which are included within the National Wildlife Refuge system and are managed by the USFWS, preserve wetlands and grasslands critical to waterfowl and other wildlife; and wetland, grassland, and Farmers Home Administration easements, which are managed by the USFWS to protect the prairie pothole community and wetlands on farmlands, respectively.

State-owned lands along the Preferred Route include WMAs and easements managed by the Board of Water and Soil Resources (BWSR). In addition, the MDNR, Division of Ecological Resources, MCBS data were reviewed to determine if there were areas with moderate, high, or outstanding biodiversity significance within the Preferred Route. Areas with moderate biodiversity significance contain significant occurrences of rare species and/or moderately disturbed native plant communities and landscapes that have a strong potential for recovery. Areas with high biodiversity significance contain sites with high quality occurrences of the rarest plant communities and/or important functional landscapes. Areas with outstanding biodiversity significance contain the best occurrence of the rarest species; the most outstanding example of the rarest native plant communities and/or the largest, most intact functional landscapes present in Minnesota. Figure 7-25 below identifies sensitive management areas and conservation easements within the Preferred Route and within the right-of-way of the Preferred Route alignment.

Figure 7-25. Sensitive Management Areas and Conservation Easements Associated with the Preferred Route

Habitat Classification	Acreage within 150-foot-wide Right-of-Way	Acreage within Preferred Route Corridor
WPAs	0	0
WMAs	12	167
USFWS Easements	58	971
Wetland	58	971
Grassland	0	0
Farmers Home Administration	0	0
Other	0	0
MCBS, Sites of Biodiversity Significance	21	368
Moderate	1	12

Habitat Classification	Acreage within 150-foot-wide Right-of-Way	Acreage within Preferred Route Corridor
High	20	356
Outstanding	0	0
MCBS, Native Plant Communities	7	101
MCBS, Railroad Rights-of-Way Prairies	0 mile of parallel	<1 mile of parallel
Fair	0 mile of parallel	0 mile of parallel
Good	0 mile of parallel	<1 mile of parallel
Very Good	0 mile of parallel	0 mile of parallel
SNAs	0	0
Minnesota Land Trust Conservation Easements	3	12
BWSR, Re-Invest in Minnesota (RIM) Easements	0	53
Calcareous Fens	0	0

Preferred Route Segment Alternatives

None of the Preferred Route Segment Alternatives encompass WPAs.

Preferred Route Segment Alternative 1 crosses 17 acres of WMAs and 37 acres of land supporting native plant communities, compared to no WMAs and 92 acres of land supporting native plant communities within the comparable portion of the Preferred Route. The Preferred Route Segment Alternative 1 alignment affects less than one acre of WMAs and three acres of land supporting native plant communities, compared to no WMAs and seven acres of land supporting native plant communities affected by the alignment of the comparable portion of the Preferred Route.

Preferred Route Segment Alternative 4 encompasses 32 acres of USFWS wetland easements, compared to 239 acres encompassed by the comparable portion of the Preferred Route. The Preferred Route Segment Alternative 4 alignment affects two acres of USFWS wetland easements, compared to 14 acres affected by the alignment of the comparable portion of the Preferred Route. Preferred Route Segment Alternative 5 encompasses 20 acres of USFWS wetland easements, compared to 112 acres encompassed by the comparable portion of the Preferred Route. The Preferred Route Segment Alternative 5 alignment affects less than one acre of USFWS wetland easements, compared to 9 acres affected by the alignment of the comparable portion of the Preferred Route.

Preferred Route Segment Alternative 1 crosses 20 acres of high MCBS sites of biodiversity significance and 42 acres of moderate MCBS sites, compared to 356 acres affected by the comparable portion of the Preferred Route. The Preferred Route Segment Alternative 1 alignment

affects two acres of high MCBS sites of biodiversity significance and six acres of moderate MCBS sites, compared to 20 acres of high MCBS sites affected by the alignment of the comparable portion of the Preferred Route.

None of the Preferred Route Segment Alternatives encompass MCBS railroad rights-of-way prairies, SNAs, Minnesota Land Trust easements, RIM easements or calcareous fens.

Mitigative Measures

As discussed above, MCSB areas of moderate, high, and outstanding biodiversity significance, and MDNR-listed natural communities are areas known to be capable of supporting rare and unique species. The number of structures placed in these areas will either be avoided or minimized by maximizing the span across them. Where structure placement cannot be avoided in these sensitive communities, special status species associated with these habitats could be affected. Applicants will also span any habitats where unique plant communities have been recorded or are likely to occur, wherever possible. If construction within these resources cannot be avoided, surveys will be conducted and the appropriate agencies will be consulted to assure impacts to listed species are avoided or minimized.

As discussed in previous sections, Applicants have routed the Preferred Route such that the majority is co-located with existing rights-of-way, therefore minimizing additional tree clearing that could increase fragmentation of sensitive habitats.

In addition, Applicants will follow standard erosion control measures identified in the MPCA's Stormwater Best Management Practices Manual to maintain sound water and soil conservation practices during construction of the Project to minimize soil erosion, and protect topsoil and adjacent water resources. These measures include using silt fencing, slope breaks, containing excavated material, protecting exposed soil, and stabilizing restored soil. These measures will be used to minimize erosion and sedimentation impacts to adjacent water resources. Construction will be completed according to NPDES permit requirements.

No construction activities will occur within or immediately adjacent to waterbodies or wetlands, to the extent feasible. Applicants will avoid major disturbance of individual wetlands and waterbodies during construction. This will primarily be accomplished by spanning wetlands and waterbodies.

Where water resources must be crossed to string new conductors and shield wires, workers may walk across, use boats, drive equipment across ice in the winter, or use temporary bridges to cross over or through the wetland or waterbody. Wetland and waterbody boundaries along the construction corridor will be identified and marked prior to construction to assure these sensitive areas are protected accordingly. Setbacks will be established to identify safe fueling areas and staging areas a sufficient distance from waterbodies and wetlands when possible or as required by permit

conditions. These construction practices will help to prevent siltation within waterbodies and wetlands and minimize the risk of an inadvertent release of harmful fluids due to fueling and lubricating of equipment.

Avoidance and minimization will be accomplished by strategically locating new access roads outside of wetland and waterbody boundaries and spanning wetlands and waterbodies, where possible. When it is not feasible to span a water resource, or avoid access to the right-of-way through a wetland or waterbody, construction crews will rely on several options during construction to minimize impacts, including:

- When possible, construction will be scheduled during frozen ground conditions;
- When construction during winter is not possible, construction mats will be used as needed to minimize temporary impacts due to construction in a water resource;
- Crews will attempt to access the wetland with the least amount of physical impact to the wetland (i.e., shortest route); and
- The structures will be assembled in upland areas before they are installed within a water resource to minimize temporary impacts due to structure installation.

7.1.4.7 Noxious Weeds and Invasive Plant Species

Noxious weeds are regulated under Minnesota Statutes, Chapter 18. Noxious weeds can overtake native vegetation and degrade habitat quality. Cropland may suffer losses in productivity following noxious weed infestations. Noxious weeds can be introduced to new areas through transporting propagating material like roots or seeds on contaminated construction equipment. Disturbed soil surfaces allow noxious weeds to become established. Eleven species of prohibited noxious weeds are recognized and prohibited by Minnesota Administrative Rules 1505.0730 *See* Figure 7-26. The Minnesota Noxious Weed Law also identifies 52 secondary noxious weeds. A county may select a weed or weeds from this secondary list to be placed on its noxious weeds list. If a secondary noxious weed is placed on a county noxious weed list, that weed must be controlled in that county. Applicants will continue to work with the state and counties crossed to identify locations along the Preferred Route where invasive species may occur, and identify measures that must be taken to control these species.

Figure 7-26. Minnesota Prohibited Noxious Weeds

Common Name	Scientific Name
Mustard, garlic	*Alliaria petiolata*
Hemp	*Cannabis sativa*
Plumeless Thistle	*Carduus acanthoides*
Musk Thistle	*Carduus nutans*
Canada Thistle	*Cirsium arvense*
Bull Thistle	*Cirsium vulgare*
Field Bindweed	*Convolvulus arvensis*
Leafy Spurge	*Euphorbia esula*
Purple Loosestrife	*Lythrum salicaria*
Perennial Sowthistle	*Sonchus arvensis*
Poison Ivy	*Toxicodendron radicans*

Preferred Route Segment Alternatives

The potential for noxious weed impacts as associated with the Preferred Route Segment Alternatives would be similar to those described above for the Preferred Route.

Mitigative Measures

Applicants will continue to work with the MDNR and USFWS to minimize and avoid impacts on sensitive flora along the route and will avoid and minimize impacts on any areas known to contain native vegetation, wherever possible. When native vegetation communities cannot feasibly be spanned, Applicants will work to minimize the number of permanent structures within the area. Areas disturbed due to construction activities will be restored to pre-construction contours and will be reseeded with a seed mix recommended by local MDNR management and that is certified to be free of noxious weeds.

Construction equipment can spread noxious weed-propagating material to new locations. Applicants will comply with Minnesota noxious weed laws as described in Minn. R. Ch. 1505 and will observe county weed lists where they occur. Around substations and switches, Applicants will provide for weed control in a manner that does not allow for the spread of weeds onto adjacent agricultural land during operation of the transmission line.

7.1.5 Rare and Unique Natural Resources

This section discusses species protected under Section 7 of the Endangered Species Act and Minn. Stat. §84.895. Species protected under the Endangered Species Act include those listed as federally threatened or endangered. Species protected under state statute are those listed as special concern,

threatened, and endangered. Wildlife species occurring in the Project area that are not protected by state or federal regulations are discussed in section 7.1.5.4. Figure 7-27 below lists the state listed species found within the right-of-way of the Preferred Route alignment and within the Preferred Route. No federally listed species have been identified within one mile of the Preferred Route.

Figure 7-27. Protected Species Occurrences Associated with the Preferred Route

Common Name	Scientific Name	Number of Occurrences		MN State Status
		150-Foot Right-of-Way	Route	
Birds				
Bald Eagle	*Haliaeetus leucocephalus*	0	1	SC
Greater Prairie-chicken	*Tympanuchus cupido*	0	2	SC
Marbled Godwit	*Limosa fedoa*	0	1	SC
Invertebrates				
Black Sandshell	*Ligumia recta*	0	2	SC
Creek Heelsplitter	*Lasmigona compressa*	0	1	SC
Fluted-shell	*Lasmigona costata*	0	1	SC

The types of impacts to protected species would be similar to those described above for general fauna in section 7.1.4.5.

Preferred Route Segment Alternatives

None of the Preferred Route Segment Alternatives encompass known occurrences of protected species. The types of impacts to protected species would be similar to those described above for the Preferred Route.

Mitigative Measures

As discussed above, six species listed as endangered, threatened, or special concern by the state of Minnesota have been documented within the Preferred Route. Where possible, impacts on these species will be prevented by avoiding known locations and potentially suitable habitats during finalization of the transmission line alignment. Where structure placement and/or spanning of transmission lines cannot be avoided in suitable habitats, listed species associated with these habitats could be affected. If Project activities within potentially suitable habitat cannot be avoided, surveys will be conducted and the MDNR will be consulted to ensure impacts on listed species are avoided or minimized.

As discussed in previous sections, Applicants have routed the Preferred Route such that the majority is co-located with existing rights-of-way, therefore minimizing additional tree clearing that could increase fragmentation of sensitive habitats.

The special status species associated with wetlands, stream banks, and rivers could be impacted by placement of structures within these habitats, or by increased erosion and sedimentation that could occur if appropriate mitigative measures or Best Management Practices are not employed. Therefore, Applicants will work to span rivers, streams, and wetlands throughout the Project area, implement the appropriate mitigation measures or practices, and maintain sound water and soil conservation practices during construction of the Project to protect topsoil and adjacent water resources, minimizing soil erosion and sedimentation. However, if it is not feasible to span, surveys will be conducted to determine the presence of state-listed species or suitability of habitat for such species, and coordination will occur with the appropriate agencies to avoid and minimize any associated impacts.

Additionally, to mitigate possible impacts on wildlife, Applicants will avoid areas known as major flyways or migratory resting spots, and span designated high quality wildlife habitat areas to the extent feasible. In areas where complete spanning is not possible, Applicants will minimize the number of structures placed in high quality wildlife habitat, and will work with the MDNR and USFWS to determine appropriate minimization and/or mitigation measures. Also, Applicants have routed the Preferred Route such that the majority is co-located with the I-94 corridor or other existing rights-of-way that have been previously disturbed; therefore, minimizing additional tree clearing that could increase fragmentation. Similarly, because transmission line routing avoids direct impacts to lakes and rivers, impacts on fisheries will be small. Any impacts, temporary or permanent, are unlikely to affect population levels of these species. Areas disturbed due to construction activities will be restored to pre-construction contours and will be reseeded with a MDNR-recommended seed mix that is free of noxious weeds.

Applicants will address avian issues at waterbody crossings and other areas of concern by working with the MDNR and USFWS to identify any areas that may require marking transmission line with shield wires and/or to use alternate structures to reduce the likelihood of collisions. In 2002, Xcel Energy entered into a voluntary Memorandum of Understanding with the USFWS to work together to address avian issues throughout its service territories. The development of Avian Protection Plans for each state the Company serves, including Minnesota, is currently underway to help support the Memorandum of Understanding.

7.2 ALTERNATE ROUTE A

7.2.1 HUMAN SETTLEMENT

7.2.1.1 Public Health and Safety

As previously identified, regardless of the route ultimately selected, the Project will be designed in comply with local, state, NESC and Company standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials and right-of-way widths. Applicants' construction crews and/or contract crews will comply with local, state, National Electric Safety Code and Company standards regarding installation of facilities and standard construction practices. Established Company and industry safety procedures will be followed after installation of the transmission line. This will include clear signage during all construction activities.

The proposed transmission line will be equipped with protective devices to safeguard the public from the transmission line if an accident occurs, such as a structure or conductor falling to the ground. The protective devices are circuit breakers and relays located in substations where the transmission line terminates. The protective equipment will de-energize the line should such an event occur. Proper signage will be posted warning the public of the risk of coming into contact with the energized equipment.

Airports, Landing Strips, and Airplane Safety

Five airports are located within five miles of Alternate Route A. Figure 7-28 below lists the airports, both public and private, that are within five miles of Alternate Route A.

Figure 7-28. Airports within Five Miles of Alternate Route A

Airport[1]	Public or Private	City	Distance From Alternate Route A (miles)	Runway Length(s) (feet)[1]	Runway Direction
Chandler Field Airport[2]	Public	Alexandria	0.72	Runway 13 / 31 – 5,100 Runway 4 /22 - 4,099	NW – SE NE – SW
Elig Field Airport[3]	Private	Hickson, ND	1.40	Runway 18 – 36 – 2,640	N-S
Pride of the Prairie Airport – Elbow Lake Municipal[2]	Public	Elbow Lake	1.30	Runway 14 / 32 – 3,400	NW-SE
Sauk Centre Airport[2]	Public	Sauk Centre	1.20	Runway 14 / 32 – 3,300 Runway 8 / 26 – 2,270	NNW – SSE E-W
South Hector Airstrip Airport[3]	Private	Fargo, ND	4.25	Runway 17 / 35 – 4,000	N-S

[1]Source: AirNav, 2009.
[2]Source: Minn. R. 8800.0100; Mn/DOT, 2009.
[3]FAA designation as obtained from AirNav.

The closest VOR site to Alternate Route A is over 10 miles away and therefore, no impacts to VOR sites is anticipated.

Mitigative Measures

With the proper safeguards and protective measures described above, impacts related to public health and safety are not anticipated. Therefore, no additional mitigative measures are proposed.

7.2.1.2 Commercial, Industrial, Residential Land Use

Like the Preferred Route, Alternate Route A primarily crosses agricultural lands. However, Alternative Route A parallels more property lines and secondary roads, rather than a major transportation corridor. Other components such as co-locating with existing 115 and 69 kV lines are also of consideration along portions of Alternative Route A. Detailed land use maps are provided in Appendix G. Zoning of the area crossed by Alternate Route A is summarized in Figure 7-29.

Figure 7-29. Alternate Route A Zoning and Land Use Summary

Zoning/Land Use Classification[1]	Percent (%) Crossed by Alternate Route A
Agricultural	82
Undefined	<1
Recreational/Open Space/Park	3
Residential	5
Industrial	2

Zoning/Land Use Classification[1]	Percent (%) Crossed by Alternate Route A
Commercial/Business/Institutional/Public	1
County Identified Municipal	<1
Special Protection Agriculture	3
Transitional Area/Growth Area	3

[1]Zoning/land use classifications were obtained for all affected jurisdictions and individual classifications were regrouped into one representative classification system.

Alternate Route A crosses Stearns, Pope, Douglas, Stevens, Grant, and Wilkin Counties and affects the cities of Alexandria, Hoffman, Barrett, and Nashua as well as surrounding townships. Areas that are zoned for agriculture make up the majority of land affected by the route with an even higher percentage than the Preferred Route (82 percent compared to 65 percent). In addition, three percent of lands within Alternate Route A are zoned for special protection agriculture. Alternate Route A crosses approximately the same percentage of lands zoned residential (five percent) and slightly less recreationally zoned areas (three percent compared to six percent).

Commercial zoning classifications along Alternate Route A make up a lower percentage than the Preferred Route (one percent compared to three percent) as a result of businesses occurring along I-94. Industrial land uses are also slightly lower along Alternate Route A (two percent) when compared to the Preferred Route (three percent).

Future land use within an area extending from the new Quarry Substation to approximately two miles west of the City of Melrose would be similar to the Preferred Route.

Other land uses encompassed within Alternate Route A include other land-based economic uses, recreational uses, state WMAs, various types of state easements generally established for conservation purposes, federal easements, and private conservation easements. Land-based economic uses such as mining and forestry are discussed in more detail in section 7.2.2. Recreational uses that may be affected by Alternate Route are discussed in more detail in section 7.2.1.9. Sensitive management areas and conservation easements are discussed in more detail in section 7.2.4.6.

One day care facility occurs along Alternate Route A. This facility is located in a rural area approximately four miles west of Sauk Centre. Two cemeteries in Stearns County occur along Alternate Route A. No churches or schools occur along Alternate Route A.

There are a number of airports that are located within proximity of Alternate Route A. These airports were previously identified in section 7.2.1.1 and will also be discussed in section 7.2.1.10, along with other transportation uses.

Impacts to land uses include the potential for loss of land available to support a particular use, such as some forms of agricultural use, due to structure placement or right-of-way requirements. Other potential impacts include consideration of the compatibility of the proposed transmission line with existing uses.

Mitigative Measures

Existing land uses in proximity to Alternate Route A are not expected to change as a result of construction and operation of the proposed transmission line. In agricultural areas, the majority of land underneath the transmission lines could still be used for agricultural purposes. Temporary impacts on agriculture during construction are discussed in section 3.3.1. Minor permanent impacts on land use will be incurred due to the small loss of land around each pole. As indicated below, Applicants will purchase right-of-way easements for private property crossed by the transmission line in accordance with state and federal land acquisition requirements. No additional mitigative measures are necessary relative to land use.

7.2.1.3 Displacement

As explained in previous sections, NESC and Company standards require certain clearances between transmission line facilities and buildings for safe operation of the transmission line. Applicants acquire a right-of-way for transmission lines that is sufficient to maintain these clearances. Displacement can occur when an existing structure is located within the right-of-way for a new transmission facility. A total of 302 residences are within Alternative Route A, as indicated below. This is 14 less than within the Preferred Route. The line will be designed so that all existing residences are located outside of the right-of-way. Figure 7-30 below identifies the number of residences within various distances from the Alternate Route A alignment. A number of non-residential structures are within 75 feet of the alignment. These include up to nine non-residential buildings, which may be displaced. This is 26 less than the number of non-residential buildings that have the potential of being displaced within the Preferred Route. Types of non-residential buildings that are located within immediate proximity to the alignment include billboards, outbuildings, silos, etc.

Figure 7-30. Residences within Proximity of the Alternate Route A Alignment

Proximity (Feet)	Alternate Route A
Right-of-way Required	150 (feet in width)
Residences 0-75	0
Residences 75-150	36
Residences 150-300	102
Residences 300-500	87
Total Residences	225
Density (Homes/Mile)	1.3

Mitigative Measures

The proposed 345 kV transmission line will be designed so that all existing residences will be located outside of the required right-of-way, to the extent feasible. Impacts to non-residential buildings or structures will also be minimized with final engineering and design, to the extent feasible.

7.2.1.4 Noise

See section 7.1.1.4 for an explanation of noise emission in general and in relation to the proposed transmission line.

7.2.1.5 Television and Radio Interference

See section 7.1.1.5 for a discussion of television and radio interference related to transmission lines. Potential impacts associated with Alternate Route A will be similar to those along the Preferred Route.

7.2.1.6 Aesthetics

The potential for impacts to visual resources associated with Alternate Route A is similar to those described above for the Preferred Route. The types of sensitive viewpoints along Alternate Route A would be similar to those occurring along the Preferred Route. Alternate Route A, however, parallels property lines and secondary roads, and in some locations would extend cross-country along no specific linear feature, whereas the Preferred Route parallels a pre-disturbed major transportation corridor for most of its length.

As previously identified in section 7.1.1.6, visual resources would be impacted by the introduction of the proposed 345 kV transmission line into the regional landscape. The transmission line would introduce new vertical forms or lines in areas where it would not otherwise parallel an existing transmission line. Since the area is largely rural, the proposed 345 kV line may introduce color contrasts during some lighting conditions or seasons. In addition to the proposed single pole steel

structures, establishment of the required right-of-way may alter color and textural contrasts as a result of vegetation removal. Vegetative tree species and some shrub species will be permanently removed within the right-of-way.

Mitigative Measures

Although the proposed 345 kV transmission line will introduce a new vertical form, line, color, and contrast in some areas, the Proposed Routes attempt to maximize the use of existing, pre-disturbed rights-of-way and minimizes the proximity to existing residences to the greatest extent practicable.

7.2.1.7 Socioeconomic

Alternate Route A is located entirely in Douglas, Grant, Pope, Stearns, Stevens and Wilkin Counties. Socioeconomic factors analyzed include population, income, poverty, and employment. U.S. Census data for 2000 and 2006 was obtained at the county, community and township level to characterize the area along Alternate Route A. These data sets were compared to county and state data, as demonstrated below in Figure 7-31.

Figure 7-31. Population Characteristics Associated with Alternate Route A

Location	Population	White or Caucasian	Black or African American	Asian	Other Races	Hispanic or Latino
Alternate Route A[1]	98,465	92,535 94.0%	1,529 1.6%	2,176 2.2%	2,223 2.3%	1,462 1.5%
Douglas County	32,821	32,326 98.5%	60 0.2%	132 0.4%	303 0.9%	193 0.6%
Grant County	6,289	6,181 98.3%	13 0.2%	12 0.2%	83 1.3%	33 0.5%
Pope County	11,236	11,107 98.9%	23 0.2%	9 0.1%	97 0.9%	57 0.5%
Stearns County	133,166	127,832 96.0 %	1,110 0.8 %	2,104 1.6 %	2,120 1.6 %	1,827 1.4 %
Stevens County	10,053	9,664 96.1%	92 0.9%	86 0.9%	211 2.1%	90 0.9%
Traverse County	4,134	3,986 96.4%	1 0.0%	11 0.3%	136 3.3%	50 1.2%
Wilkin County	7,138	6,979 97.8%	11 0.2%	11 0.2%	137 1.9%	110 1.5%
State of Minnesota	4,919,479	4,400,282 89.4 %	171,731 3.5 %	141,968 2.9 %	205,498 4.2 %	143,382 2.9 %

Location	Population	White or Caucasian	Black or African American	Asian	Other Races	Hispanic or Latino

[1]Data includes Alexandria, Barrett, Elbow Lake, Hoffman, Melrose, Nashua, St. Cloud, Waite Park, Alexandria Township, Ashley Township, Ben Wade Township, Bradford Township, Brandrup Township, Brockway Township, Campbell Township, Champion Township, Elbow Lake Township, Elk Lake Township, Getty Township, Grove Township, Holding Township, Holmes City Township, Hudson Township, Krain Township, Lake Mary Township, Land Township, Lawrence Township, Lien Township, Melrose Township, Moe Township, Nora Township, North Ottawa Township, Orange Township, Sanford Township, Sauk Centre Township, Solem Township, Swan Lake Township, Westport Township

Source: 2000 U.S. Census: General Demographic Characteristics

Like the Preferred Route, Alternate Route A is located between the Red River Valley and St. Cloud. Alternate Route A follows a similar projected growth pattern as the Preferred Route. Refer to section 7.1.1.7 for population growth description within the Project area. Unlike the Preferred Route, however, Alternate Route A does not cross Clay, Otter Tail, and Todd Counties. It crosses Pope and Stevens counties instead. Pope and Stevens counties have lower projected growth rates over the next 30 years which are likely due to the lack of a largely populated city within county limits. According to the State Demographic Center, Pope County is anticipated to have 12.3 percent growth and Stevens County 3.4 percent growth between 2005 and 2035 (Minnesota State Demographic Center, 2007).

According to the U.S. Census Bureau (U.S. Census Bureau, 2000a), the majority of the population the Project area is white, as shown in Figure 7-31 above. None of the communities within the affected counties contain disproportionately high minority populations or low-income populations. Counties affected by Alternate Route A contain a lower percentage of minority populations than the state.

Figure 7-32 shows the 2000 per capita income and the percentage of the population below the poverty level for the state, counties, and Alternate Route A. The per capita income in all counties is lower than the state per capita income, with the largest percent difference being that of Wilkin County, at 27 percent. All other counties within Alternate Route A have higher per capita incomes than Wilkin County, but were still below the state level. Alternate Route A has similar data explanations for the low per capita income, as described above for the Preferred Route. The Minnesota State Demographic Center Population Statistics are described in section 7.1.1.7.

The poverty level rates in all counties within Alternate Route A area are larger than the state poverty rate of 7.9 percent as presented in Figure 7-32. Stevens County has a higher poverty rate than the rest of the project area at 13.6 percent. The per capita income for the area crossed by Alternate Route A is lower than the state percentage rate, at 6.2 percent.

Figure 7-32. Economic Characteristics Associated with Alternate Route A

Location	Per Capita Income	Percentage of Individuals Below Poverty Level
Alternate Route A[1]	$17,540	7.4
Douglas County	$18,850	8.5
Grant County	$17,131	8.4
Pope County	$19,032	8.8
Stearns County	$19,211	8.7
Stevens County	$17,569	13.6
Traverse County	$16,378	12.0
Wilkin County	$16,873	8.1
State of Minnesota	$23,198	7.9

[1]Data includes Alexandria, Barrett, Elbow Lake, Hoffman, Melrose, Nashua, St. Cloud, Waite Park, Alexandria Township, Ashley Township, Ben Wade Township, Bradford Township, Brandrup Township, Brockway Township, Campbell Township, Champion Township, Elbow Lake Township, Elk Lake Township, Getty Township, Grove Township, Holding Township, Holmes City Township, Hudson Township, Krain Township, Lake Mary Township, Land Township, Lawrence Township, Lien Township, Melrose Township, Moe Township, Nora Township, North Ottawa Township, Orange Township, Sanford Township, Sauk Centre Township, Solem Township, Swan Lake Township, Westport Township

Source: 2000 U.S. Census, General Demographic Characteristics

Historically, the economies of the affected counties have been based in agricultural production. The economic base for counties and communities within the Project area are manufacturing, service establishments, and agricultural industries. The largest industry in terms of employment within the Project area is manufacturing, followed by wholesale trade, retail, and foodservice. The higher poverty rate in Stevens County can be explained by the lower incidence of non-agricultural work. According to the U.S. Census Bureau (U.S. Census Bureau, 2000b) Quick Facts, Stevens County has 7.4 percent of its businesses in private, non-farm establishments while Traverse County has 136 total private non-farm establishments. Like the Preferred Route, the lower percentage of available employment in Stevens and Traverse Counties can explain the higher poverty rate.

Figure 7-33 below provides a comparison of population and economic characteristics using 2006 census data (U.S. Census Bureau, American Community Survey, 2006), where data has been updated.

Figure 7-33. Population and Economic Characteristics Associated with Alternate Route A, Based on 2006 Census Data

Location	Total Population	White Population	Minority Population[1]	Hispanic or Latino (of any race) Population[2]	Per Capita Income	Percentage of Population Below Poverty Level
State of Minnesota	5,167,101	87.8	12.2	3.8	27,591	9.8
Douglas County	35,600	97.8	2.2	0.8	24,490	12.0
Grant County[3]	-	-	-	-	-	-
Pope County[3]	-	-	-	-	-	-
Stearns County	144,443	94.4	5.6	1.7	22,948	14.1
Stevens County[3]	-	-	-	-	-	-
Traverse County	3,660	95.5	6.5	1.9	-	11.3%
Wilkin County[3]	-	-	-	-	-	-

[1]Minority population consists of Black or African American, American Indian and Alaska Native, Asian, and Some other race.

[2]Hispanic population may include individuals of any race, and may also include individuals within the white or minority population estimates; therefore, percent total may be greater than 100 percent.

Source: U.S. Census 2006

[3] 2006 Census Data is not available for these counties.

Temporary housing, consisting of apartment rentals, hotels, motels, and campgrounds, is more abundant in Douglas and Stearns Counties due to the larger metropolitan areas that fall within their limits. Higher homeownership rates are seen in Grant, Stevens, Traverse, and Wilkin Counties as most residences within these counties are not as near in proximity to larger metropolitan areas and consist of mostly agricultural land.

The construction and operation of the transmission line is expected to have minimal influence on the local (county and municipal) economies. The counties within the Project area may see a small boost in economic benefit due to payroll earnings, employment opportunities, and construction expenditures. Long-term beneficial impacts from the Project will include incremental increases in revenues from utility property taxes.

Mitigative Measures

No adverse socioeconomic impacts are anticipated, and therefore, no mitigative measures are proposed.

7.2.1.8 Cultural Values

Similar to the Preferred Route, no impacts to cultural values as associated with Alternate Route A are anticipated.

7.2.1.9 Recreation

The types of recreational uses that may be impacted by Alternate Route A are similar to those described above for the Preferred Route.

Mitigative Measures

No impacts on recreational uses that would alter or limit the use of these areas are anticipated, and therefore, no mitigative measures are proposed.

7.2.1.10 Public Services

Consideration of public services associated with Alternate Route A is similar to those described above for the Preferred Route. Figure 7-34 identifies most of the roads that Alternate Route A will parallel and traffic data, if available, for these roads.

Figure 7-34. Average Annual Daily Traffic for Selected Roads Parallel to Alternate Route A

Alternate Route A	Existing Average Annual Daily Traffic	Parallel Length (miles)
Stearns County Road 151	335	3.1
190th Avenuce, Holding Township	NA	1.2
State Highway 17, Stearns County	890 to 1,550[1]	4.2
Stearns County Road 17	450	0.3
280th Avenue,Millwood Township	NA	0.7
355th Avenue, Melrose Township	NA	0.6
365th Avenue, Melrose Township	NA	0.5
Stearns County Road 17	1,100	7.4
Hollencamp Road, Melrose Township	NA	0.4
Stearns County Road 29	370	0.9
State Highway 71, Stearns County	3,300	1.2
425th Avenue, Sauk Centre Township	NA	1.1
Stearns County Road 184	365	2.6
Stearns County Road 183	325	0.4
440th Street, Ashley Township	NA	1.6
Stearns County Road 189	30	0.7
Douglas/Pope County Road 2	190	1.2
West Cemetery Road SE, Orange Township	NA	1.7
Walsh Drive SE, Orange Township	NA	0.6

Alternate Route A	Existing Average Annual Daily Traffic	Parallel Length (miles)
Douglas County Road 23	600	0.4
I-94, Douglas County	16,200	3.4
Jackson Park Road, Hudson Township	NA	0.4
Douglas County Road 21	850	4.3
Douglas County Road 4	400	3.0
State Highway 114	NA	3.8
Lake Olaf Road, Ben Wade Township	NA	1.4
Grsant County Road 11	NA	1.3
Horizon Drive SW, Ben Wade Township	NA	1.3
Pope Douglas Road SW, Ben Wade and Nora Township	NA	6.5
Grant County Road 5	465	2.2
Grant County Road 37	35	3.0
Grant County Road 176	NA	1.1
Grant County Road 38	135	2.7
State Highway 55, Grant County	1,850	3.7
Grant County Road 148	NA	0.8
Grant County Road 31	NA	1.2
Grant County Road 2	180	0.7
State Highway 59, Grant County	1,600	3.0
Grant County Road 138	NA	2.7
Grant County Road 1	365	3.6
Grant County Road 11	445	1.2
Grant County Road 42	NA	5.2
Grant County Road 93	NA	2.2
Grant County Road 129	NA	3.1
Wilkin County Road 129	NA	3.1
State Highway 9, Wilkin and Traverse Counties	500 to 520[1]	5.9
State Highway 9, Wilkin County	700	3.8
Wilkin County Road 156	35	2.1
Wilkin County Road 6	55	4.2

Source: Mn/DOT, 2006-2007

NA: Traffic data are not available for this roadway segment.

[1] The traffic volumes increase south to north.

Alternative Route A only parallels the I-94 corridor for approximately three miles. The amount of Alternate Route A that is adjacent to I-94 is reduced by about 97 percent when compared to the Preferred Route.

No Mn/DOT road improvement projects have been identified along roadways of which Alternative Route A would parallel. As discussed in section 7.1.1.10, several highway projects are planned or proposed along I-94 but there are no projects scheduled along the short segment of Alternative Route A that parallels I-94. There is no information currently available on projects related to the county and city roads paralleled by Alternative Route A.

Five airports are located within five miles of Alternate Route A. The closest airport to Alternative Route A is the Chandler Field Airport located in the City of Alexandria (Airnav, 2009). For a more detailed description of airport regulations and a list of all airports within five miles of Alternate Route A, please see section 7.2.1.1.

Mitigative Measures

No impacts to public services are anticipated and therefore, no mitigative measures are proposed.

7.2.2 LAND-BASED ECONOMICS

7.2.2.1 Agriculture

Agricultural characteristics and conditions in the Project area are described in section 7.1.2.1. Eighty-two percent of lands occurring within Alternate Route A are zoned for agriculture, including three percent of those as special protection agriculture. Permanent impacts on agricultural land can include loss of agricultural land due to pole placement. These permanent impacts associated with Alternate Route A represents approximately 19 acres, assuming that 1,000 square feet per pole will be permanently impacted. Temporary impacts during construction may include soil compaction, disruption of agricultural practices (e.g., center pivot irrigation), and crop damages within the right-of-way at proposed structure locations, locations of access to the right-of-way, and other work areas. Temporary impacts are estimated at approximately 841 acres, based on a rate of one acre per pole.

Mitigative Measures

Together with the Department of Agriculture and other parties, Applicants have developed an Agricultural Impact Mitigation Plan to identify measures the utilities will take to avoid, mitigate, repair and/or provide compensation for impacts that may result from construction of the proposed transmission facilities. A copy of the final Plan is included in Appendix I.

Landowners will be compensated for the use of their land through easement payments. To minimize loss of farmland and to ensure reasonable access to the land near the poles, Applicants would prefer to place the poles approximately five feet from the road right-of-way. When possible, Applicants will attempt to construct the transmission line before crops are planted or following harvest. Applicants will compensate landowners for crop damage and soil compaction that occurs as a result of the

Project. Soil compaction will be addressed by compensating the farmer to repair the ground or by using contractors to chisel-plow the site. Normally, a declining scale of payments is set up over a period of a few years.

To further minimize agricultural impacts where possible, spring time construction will be avoided. However, if construction during spring is necessary, disturbance to farm soil from access to each structure location will be minimized by using the shortest access route feasible. 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.

Some landowners use GPS navigation systems on farm equipment. Once the Project is complete, the transmission line poles will have GPS coordinates that Applicants may provide to the landowners, if requested.

Tile lines may be present along the transmission line route. Applicants will work with the landowners to identify locations of drainage tiles along the route and will minimize interference with tiling, where possible. In the event that Applicants locate a tile line that the landowner did not discuss, Applicants will relocate the pole and repair the tile line, if damaged.

Crop dusting may occur within agricultural fields along the route. If this farming practice is utilized, and has the potential to become impacted by the Project, Applicants will work with the landowner to identify mitigative measures to avoid or reduce changes to farming practices caused by the Project.

7.2.2.2 Forestry

Alternate Route A is located primarily in grassland and cultivated land with some forested areas adjacent to farmsteads, waterways, and within MDNR managed lands. Alternate Route A will cross 1,722 of wooded lands (USGS, 2001). The wooded areas are located primarily on privately held lands. The wooded areas that are privately owned may be selectively cut periodically for firewood, timber, or pulpwood. However, these wooded areas are not necessarily commercial forestry operations. According to the MDNR Forestry Division's Fiscal Year 2010 Harvest Plans (MDNR, 2009c), no townships within Alternate Route A have timber harvest plans. Impacts on forest resources will occur at locations where trees will be cleared within the right-of-way. For potential impacts on flora, see section 7.2.4.4.

Mitigative Measures

No impact on commercial forest resources will occur. Impacts on wooded lands have been minimized by locating Alternate Route A to minimize tree clearing to the extent feasible. As a result, no mitigative measures are proposed.

7.2.2.3 Tourism

The majority of tourism activities or opportunities along Alternate Route A are associated with recreational uses. Refer to section 7.2.1.9 for a discussion of recreational uses associated with Alternate Route A.

Mitigative Measures

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

7.2.2.4 Mining

See section 7.1.2.4 for a description of the regional geologic setting. The regional geology of Alternate Route A is similar to that described above as associated with the Preferred Route.

One aggregate source has been identified within Alternate Route A. This source is a prospected pit.

Mitigative Measures

Alternate Route A is not located within immediate proximity of any mines, nor would it otherwise have any affect on existing mining operations. Therefore, no mitigative measures are proposed.

7.2.3 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Four archaeological sites are located within Alternate Route A. The four sites represent prehistoric isolated finds, lithic or artifact scatters dating to an unspecified prehistoric period. None of the sites have been evaluated for listing on the NRHP. Placement of structures will strive, however, to avoid these sites to the extent feasible or practicable. Figure 7-35 below identifies known archaeological resources within Alternate Route A and the number crossed by the identified alignment for Alternate Route A.

Figure 7-35. Archaeological Resources within Alternate Route A

Site Type	Number Within Preferred Route	Number Crossed by the Identified Alignment	Eligible or Listed
Prehistoric Lithic Scatter	1	0	0
Prehistoric Artifact Scatter	2	1	0
Prehistoric Single Artifact	1	0	0
Total	4	1	0

Because of its proximity to the Preferred Route, one of the four previously recorded historic architectural properties within Alternate Route A was discussed previously. The remaining three properties include two bridges that have not been evaluated for listing on the NRHP, and the Lake Traverse & Bois de Sioux Flood Control and Water project. The latter property is related to the channelization of Bois de Sioux and is considered eligible for listing on the NRHP. This site and one bridge will be crossed by the Alternate Route A identified alignment. Placement of structures will strive, however, to avoid these sites to the extent feasible or practicable. Figure 7-36 below identifies known historic architectural properties within Alternate Route A.

Figure 7-36. Historic Architectural Properties within Alternate Route A

Property Type	Number Within Preferred Route	Eligible or Listed
Government	1	1
School	1	0
Bridge	2	0
Total	4	1

Historic Landscapes

The King of Trails scenic byway along U.S. Highway 75 extends along the entire length of Minnesota, paralleling the Red and Bois de Sioux Rivers along the western state boundary. Designated a scenic byway by the Minnesota State Legislature in 2001, the King of Trails byway intersects Alternate Route A in a flat agricultural area south of Breckenridge. Applicants will consult with appropriate parties and consideration will be given to potential Project-related impacts.

Mitigative Measures

Mitigative measures would be similar to those described above for the Preferred Route.

7.2.4 NATURAL ENVIRONMENT

7.2.4.1 Air Quality

The potential for impacts to air quality as associated with Alternate Route A are similar to those described above for the Preferred Route.

Mitigative Measures

Applicants anticipate nominal impacts to air quality and therefore, no mitigative measures are proposed.

7.2.4.2 Surface and Ground Water Resources

The majority of Alternate Route A will cross the Central Groundwater Province, with smaller portions of the route crossing the Western and Arrowhead Provinces. Within Alternate Route A, there are 127 water wells listed in the County Well Index database. Additionally, portions of Alternate Route A cross three wellhead protection areas (Barrett, Sartell North, and Waite Park), which are designated areas which have been established to protect public water supply wells from potential contamination sources.

Alternate Route A crosses two major water resource regions (Souris-Red-Rainy Region and Upper Mississippi Region), as defined by the USGS. Within each region, several smaller watersheds (denoted by 8-digit Hydrologic Unit Codes) are crossed. Figure 7-37 contains a list of all 8-digit Hydrologic Unit Code watersheds in Minnesota crossed by Alternate Route A.

Figure 7-37. Watersheds (8-digit HUC) Crossed by Alternate Route A

Watershed Name	Hydrologic Unit Code (8-digit)	Crossing Length (miles)
Long Prairie River	07010108	14.9
Mississippi River-Sartell	07010201	26.1
Sauk River	07010202	49.0
Pomme de Terre River	07020002	14.2
Chippewa River	07020005	26.0
Bois De Sioux River	09020101	33.3
Mustinka River	09020102	5.5

FEMA designates areas that are likely to experience flooding in a 100-year and 500-year rainfall event. Approximately 807 acres of FEMA-designated floodplain occur within Alternate Route A.

Surface Water Resources

Applicants conducted a review of streams and rivers with perennial and intermittent classifications based on 1:24,000 USGS 7.5 minute quadrangle maps. Several rivers, streams, and drainage ditches are located within Alternate Route A (wetland resources are discussed separately later in this section). Alternative Route A contains 127 intermittent and 34 perennial waterbodies, some of which are crossed multiple times. Streams and rivers listed on the PWI are summarized below in Figure 7-38.

Figure 7-38. Minnesota Designated Public Waters (Streams and Rivers) Crossed by Alternate Route A

Waterbody Name	Number of Crossings
Adley Creek	1
Ashley Creek	1
Chippewa River	1
County Ditch 12	4
County Ditch 17	1
Getchell Creek	1
Hoboken Creek	1
Krain Creek	3
Mustinka River	1
Pomme De Terre River	1
Rabbit River	1
Red River of the North	1
Sauk River	2
Silver Creek	1
South Two River	1
Spunk Creek	1
Watab River, South Fork	1
Unnamed Streams	12

Applicants conducted a review of lakes within the Alternative Route A corridor from readily available MDNR lake data. According to this dataset, Alternate Route A contains 121 lakes or portions of lakes. Upon review of recent, high-resolution aerial photographs and 1:24,000 USGS 7.5 minute quadrangle maps of Alternate Route A, it appears that a significant amount of these 121 lakes are relatively small in size, and do not contain standing water. Of the 121 lakes, 90 (74 percent) are less than one acre in size, 20 (20 percent) are between one and five acres in size, and seven (6 percent) are greater than five acres in size.

Public Waters also include some lakes. Applicants will attempt to route the alignment and site structures to avoid impacts to Public Waters and other significant surface waters to the extent feasible or practicable. Applicants will obtain utility crossing licenses from the MDNR for PWI lakes crossed. Lakes listed in the PWI as associated with Alternative A are denoted in Figure 7-39.

Figure 7-39. Minnesota Designated Public Waters (Lakes) Crossed by Alternate Route A

Lake Name
Andrew
Bolin
Burroughs
Doebben's Marsh
Horseshoe
Island
Long
Lower Watab
Mud
Sylvia
The Great Belclair Marsh
Turtle
Unnamed Lakes (6)

Figure 7-40 contains a list of impaired waters crossed by Alternate Route A, based on the 2008 MPCA 303(d) list, and also lists the causes of impairment. The only impairment that could potentially be generated by the Project is increased turbidity due to increased sediment deposition from construction activities. There are no impaired lakes associated with Alternate Route A.

Figure 7-40. Impaired Waters Crossed or Within Alternate Route A

Waterbody Name	Cause(s) of Impairment
Ashley Creek	Dissolved Oxygen
Bois de Sioux River	Fish Index of Biological Integrity, Turbidity, Dissolved Oxygen
Chippewa River	Turbidity
Mustinka River	Turbidity
Pomme de Terre River	Mercury
Rabbit River	Fish Index of Biological Integrity, Turbidity, Dissolved Oxygen
Sauk River	Fecal Coliform, Polychlorinated Biphenyls, Turbidity, Mercury
Spunk Creek	Fecal Coliform

There are no designated trout streams or lakes within Alternate Route A.

Groundwater Resources

The state of Minnesota is divided into six groundwater provinces with varying characteristics. The majority of Alternate Route A will cross the Central Province, which is characterized by sand aquifers in generally thick sandy and clayey glacial drift overlying Precambrian and Cretaceous bedrock. Groundwater within fractured and weathered Precambrian bedrock is used locally as a water source. The extreme western portion of Alternate Route A will cross the Western Province, which contains clayey glacial drift overlying Cretaceous and Precambrian bedrock.

Based on the county well index, there are 127 water wells within Alternate Route A. This is 31 fewer water wells than within the Preferred Route. Additionally, portions of Alternate Route A cross three well head protection areas (Barrett, Sartell North, and Waite Park), which are designated areas having been established to protect public water supply from potential contamination sources. Wellhead protection areas are administered by the Minnesota Department of Health under the state wellhead protection rule (Minn. Rule 4720.5100-4720.5590).

Mitigative Measures

Mitigative measures would be similar to those described above for the Preferred Route.

7.2.4.3 Wetlands and Waters

Similar to the Preferred Route, Alternate Route A was reviewed for NWI wetlands occurring within the route corridor. A summary of NWI wetlands crossed by Alternate Route A is included in Figure 7-41.

The most common wetland type crossed by Alternate Route A is PEM wetland, which varies from temporarily flooded potholes to expansive cattail marshes and saturated wet meadows. Palustrine wetlands cover approximately 12 percent of Alternate Route A, consisting of eight percent palustrine emergent, one percent PFO, two percent PSS, less than one percent PUB, and less than one percent PAB.

In addition, 14 of the wetlands crossed by Alternate Route A are illustrated on PWI maps and are thus subject to the jurisdiction of the MDNR.

Figure 7-41. Wetlands Crossed by Alternate Route A

Wetland Type	Total Wetlands		MnDNR PWI Wetlands
	Count	% of Route	
PEM	1,024	8	14
PFO	113	1	0
PSS	89	2	0
PUB	107	<1	0
PAB	1	<1	0
Lake	8	<1	0
Riverine	4	<1	0
Total	1,346	12	14

Applicants have determined that 35 poles may need to be placed in wetlands along the Alternate Route A identified alignment, resulting in approximately 1,925 square feet (or 0.04 acre) of permanent wetland impacts. The type of wetland where poles will be placed will be identified prior to construction and provided to appropriate agencies. Temporary wetland impacts total 91 acres within Alternate Route A. Approximately 20 acres of PFO wetlands will undergo a permanent vegetation type change to PEM or PSS vegetation.

MDNR data were reviewed for known occurrences of state protected calcareous fens. There are no known calcareous fens within Alternate Route A. In addition, land ownership and management data were reviewed pertaining to lands managed for wetlands under the control of the USFWS. There are several properties where Waterfowl Production Areas and wetland easements occur adjacent to Alternate Route A.

Mitigative Measures

See section 7.1.4.3 for a detailed discussion for potential construction-related mitigation measures related to water resources.

7.2.4.4 Flora

General flora occurring within proximity of Alternate Route A is the same as that described above for the Preferred Route.

Mitigative Measures

See section 7.1.4.4 for a detailed discussion for potential construction-related mitigation measures related to general flora.

7.2.4.5 Fauna

General fauna occurring within proximity of Alternate Route A is the same as that described above for the Preferred Route. Through coordination with the USFWS and MDNR, one area of concern identified by both agencies along Alternate Route A and related to high waterfowl and migratory bird concentrations is where the route crosses the Mustinka River in Elbow Lake Township.

Mitigative Measures

See section 7.1.4.5 for a detailed discussion for potential construction-related mitigation measures related to general fauna.

7.2.4.6 Sensitive Management Areas and Conservation Easements

Rare and unique communities and habitats occur throughout the regional area. Rare and unique communities include federal waterfowl production areas and state WMAs, SNAs, parks, trails, and MCBS sites of biodiversity significance.

Data from the USFWS, MDNR, and private organizations were reviewed to determine areas containing rare or unique communities and habitats within Alternate Route A. Federal lands along Alternate Route A include waterfowl production areas, which are included within the National Wildlife Refuge system and are managed by the USFWS, preserve wetlands and grasslands critical to waterfowl and other wildlife; and wetland, grassland, and Farmers Home Administration easements, which are managed by the USFWS to protect the prairie pothole community and wetlands on farmlands, respectively.

State-owned lands along Alternate Route A include WMAs and easements managed by the Board of Water and Soil Resources. In addition, the MDNR, Division of Ecological Resources, MCBS data were reviewed to determine if there were areas with moderate, high, or outstanding biodiversity significance within Alternate Route A. Areas with moderate biodiversity significance contain significant occurrences of rare species and/or moderately disturbed native plant communities and landscapes that have a strong potential for recovery. Areas with high biodiversity significance contain sites with high quality occurrences of the rarest plant communities and/or important functional landscapes. Areas with outstanding biodiversity significance contain the best occurrence of the rarest species; the most outstanding example of the rarest native plant communities and/or the largest, most intact functional landscapes present in Minnesota. Figure 7-42 below identifies sensitive management areas and conservation easements within Alternate Route A and within the right-of-way associated with the Alternate Route A identified alignment.

Figure 7-42. Sensitive Management Areas and Conservation Easements Associated with Alternate Route A

Habitat Classification	Acreage within 150-foot-wide Right-of-Way	Acreage within Route
WPAs	0	0
WMAs	12	235
USFWS Easements	15	272
Wetland	15	258
Grassland	0	0
Farmers Home Administration	0	14
MCBS, Sites of Biodiversity Significance	33	435
Moderate	13	79
High	20	356
Outstanding	0	0
MCBS, Native Plant Communities	13	143
MCBS, Railroad Rights-of-Way Prairies	<1 mile of parallel	22 miles of parallel
Fair	<1 mile of parallel	12 miles of parallel
Good	<1 mile of parallel	4 miles of parallel
Very Good	0 mile of parallel	8 miles of parallel
SNAs	0	0
Minnesota Land Trust Conservation Easements	0	1
BWSR, RIM Easements	0	78
Calcareous Fens	0	0

Mitigative Measures

Mitigative measures would be similar to those described above for the Preferred Route.

7.2.4.7 Noxious Weeds and Invasive Plant Species

Refer to section 7.1.4.7 for details regarding designated noxious weeds in Minnesota and regulatory requirements pertaining to them.

Mitigative Measures

Mitigative measures would be similar to those described above for the Preferred Route.

7.2.5 RARE AND UNIQUE NATURAL RESOURCES

Figure 7-43 below lists the state listed species found within the right-of-way of the Alternate Route A identified alignment, and within Alternate Route A.

Figure 7-43. Protected Species Occurrences Associated with Alternate Route A

Common Name	Scientific Name	Number of Occurrences		MN State Status
		150-foot Right-of-Way	Route	
Birds				
Marbled Godwit	*Limosa fedoa*	0	1	SC
Plants				
Small White Lady's-slipper	*Cypripedium candidum*	1	1	SC

Mitigative Measures

As discussed above, two species listed as endangered, threatened, or special concern by the state of Minnesota have been documented within Alternate Route A. Mitigative measures would be similar to those described above for the Preferred Route.

8.0 PUBLIC PARTICIPATION AND AGENCY INVOLVEMENT

8.1 IDENTIFICATION OF LAND OWNERS

Potentially affected landowners along the Proposed Routes are identified in Appendix K. There are 1,250 landowners associated with the Preferred Route and 1,445 landowners associated with Alternate Route A. An additional 372 landowners are associated with the Preferred Route Segment Alternatives.

8.2 PUBLIC PARTICIPATION PROCESS

8.2.1 INTRODUCTION

The initial project corridors also comprised an area from Fargo to Monticello within which potentially affected landowners were identified. The list of landowners within the project corridors served as the list for notification purposes for invitation to attend the various meetings conducted as part of the public participation process. The corridors were further refined into two distinct project areas, Monticello to St. Cloud and Fargo to St. Cloud. The overall outreach process for the projects is detailed in this section.

Prior to commencing Project-specific efforts, utility representatives of the CapX2020 participating utilities were actively engaged in coordination with various stakeholders. This coordination included meetings, presentations, or briefings with stakeholders such as the Stearns County Township Association and the Minnesota Association of Townships. During the spring and summer of 2007, the public participation plan for the Fargo to Monticello 345 kV Project was developed. Project-specific coordination with key stakeholders continued and the approach to route development and selection, integrated with formal engagement of stakeholders and involvement of the general public in a broader scale public participation process, was established. The public participation process is discussed below.

8.2.2 PROCESS OVERVIEW

The public participation process was planned as a vehicle for integrating land owners, local residents, and other stakeholders within the Project study area into the route development and selection process. Their participation, generally considered a consultation role, was used to validate data and decisions made throughout the route development and selection process. A consultation role can be generally described as one in which the public is informed, and shares concerns and provides feedback regarding the process itself, how decisions were made within the process, and how evaluations were conducted within the process. The sections below describe in more detail the public participation process that was facilitated for the Project. Materials associated with the public participation process are included in Appendix I.

8.2.3 VENUES

Routing Work Group Meetings

Routing Work Group (RWG) meetings were made up of landowners, community representatives, public officials, potentially affected agencies and other interested parties within the Project study area. Also included as invitees to the RWG meetings were any open house attendees who requested to be invited.

The RWG meetings were specifically aimed at formally engaging potentially affected stakeholders. These stakeholders, such as local officials, agencies, non-government organizations, and special interest groups, represent the various constituencies that collectively comprise the general public within the Project study area. Representative stakeholders typically have an understanding of local perceptions or values. The RWG forum included a formal presentation of Project information and interactive exercises typical of workshops. The overall objectives of the RWG meetings were to facilitate the involvement of stakeholders in the route development and selection process, and provide them with a strong knowledge base so that they were able to respond to their constituents.

Open Houses

Open houses were different from the RWG meetings only with regard to the parties invited to attend, and the method of presentation of information. Open houses were facilitated to engage a larger audience, in this case local residents and land owners, within the Project study area. Open houses are also typically less formal, emphasizing one-on-one exchanges of information. Attendees can attend anytime during the hosted timeframe and obtain information, and most importantly share information, at key topic stations. Information presented at the open houses was the same information presented at the RWG meetings. The open houses did not, however, include interactive exercises.

Each phase of the public participation process, including a series of RWG meetings and open houses, was conducted in conjunction with each milestone phase of route development and selection.

8.2.4 OVERVIEW OF PHASES OF PUBLIC PARTICIPATION PROCESS

The four milestone phases of route development and selection identified for the Project included Phase I – Project Overview and Need, Phase II – Refined Corridors, Phase III – Preliminary Potential Route Alternatives, and Phase IV – Refined Potential Route Alternatives. However, the route alternatives presented to stakeholders and the general public, during Phase IV of the public participation process, were further analyzed beyond the final public meetings. In some instances this was as a result of public comment. For example, there were two areas along the refined potential

route alternatives where the route width was widened beyond 1,000 feet. Additionally, a short segment of the refined route alternative located to the west and south of Lake Mary was re-aligned as a result of public comment. From the refined potential route alternatives emerged the final Proposed Routes. The Proposed Routes are subject to this application for a Route Permit.

Phase I – Project Overview and Need

Phase I involved the presentation of an overview of the CapX2020 Group I projects and the need for these projects. This included introducing the project corridors and seeking feedback from attendees. At this early step in the process, Applicants sought feedback regarding local environmental considerations, issues, or concerns that should be addressed in the route development and selection process.

The community outreach component of Phase I included a series of public information meetings or open houses at various locations throughout the overall area. A total of nine public information meetings were conducted in September and October of 2007. Additionally, CapX2020 representatives attended a public meeting that was conducted on behalf of the Midwest Independent System Operator. Information pertaining to the CapX2020 projects was available to attendees of this meeting.

Phase II – Refined Corridors

Phase II first involved the presentation of the approach to route development and selection. This included the identification of the siting criteria. The criteria, or routing considerations, provided a means for encouraging specific comments that were used in the route development and selection process. Phase II then introduced the concept of dividing the Fargo to Monticello 345 kV Project into the Monticello to St. Cloud 345 kV Project and the Fargo to St. Cloud 345 kV Project, subject to this Application, due to the interconnection in the St. Cloud area having a more critical timing and desired in-service date. Separating the project into two projects allows Applicants to more readily serve the critical need in the St. Cloud area. With the division of the two projects, the route development and selection process associated with the Monticello to St. Cloud 345 kV Project was accelerated, as compared to the Fargo to St. Cloud 345 kV Project. For the Fargo to St. Cloud 345 kV Project during Phase II of the public participation process, refined corridors were presented and discussed. Applicants sought feedback regarding the refined corridors.

The community outreach component of Phase II included a series of RWG meetings and open houses at various locations throughout the overall area.

Phase III – Preliminary Potential Route Alternatives (Open House III Route Alternatives)

Phase III involved the presentation of the preliminary potential route alternatives, now referred to as the Open House III Route Alternatives, and the rationale as to how they were developed. Applicants sought feedback regarding the Open House III Route Alternatives.

The community outreach component of Phase III included a series of RWG meetings and open houses at various locations throughout the Project study area. A total of five open houses were conducted throughout the Fargo to St. Cloud 345 kV Project area.

Phase IV – Refined Potential Route Alternatives (Open House IV Route Alternatives)

Phase IV involved the presentation and discussion of the refined potential route alternatives, now referred to as the Open House IV Route Alternatives, and the rationale as to how they were developed. Applicants sought feedback regarding the Open House IV Route Alternatives.

The community outreach component of Phase IV included a series of open houses at various locations throughout the Project study area. A total of seven open houses were conducted throughout the Fargo to St. Cloud 345 kV Project area.

As previously identified, the route alternatives presented to stakeholders and the general public, during Phase IV of the public participation process, were further analyzed beyond the final public meetings. In some instances this was as a result of public comment. For example, there were two areas along the refined potential route alternatives where the route width was widened beyond 1,000 feet. Additionally, a short segment of the refined route alternative located to the west and south of Lake Mary was re-aligned as a result of public comment. From the refined potential route alternatives emerged the final Proposed Routes. The Proposed Routes are subject to this application for a Route Permit.

8.2.5 Tools and Techniques

The routing study involved the utilization of a number of tools and techniques. These included interactive exercises, interactive GIS, a Project hotline, and an external Project website. Various methods were utilized to provide for a diverse but readily available means of information exchange.

Interactive GIS

A GIS is a system for capturing, storing, analyzing and managing data and associated attributes which are spatially referenced to the earth. It is a computer system capable of integrating, storing, editing, analyzing, and displaying geographically-referenced information. GIS is a tool that allows users to create interactive queries (user-created searches), analyze spatial information, edit data, and present the results, typically in the form of maps. Geographic information science is the science

underlying the applications and systems. The interactive GIS stations hosted a GIS specialist and a visual display of the data contained within the spatial database. Open house attendees were able to view various spatial datasets layered over current aerial photography and obtain site-specific maps. Comments from meeting attendees were captured. These comments pertained specifically to routing considerations.

Interactive GIS was incorporated into the various RWG meetings and open houses in an effort to validate data included within the geospatial database; capture comments and public input; generate site-specific maps linking comments and input to specific geographic features; and identify spatial relationships between features of interest. A number of data sources were used, and therefore public participants were utilized as a means of limited quality control in validating data. For example, not all agricultural areas irrigated by center pivot systems are readily recognizable. In various instances, landowners helped identify additional center pivot irrigation areas. Capturing general comments and public input was done interactively by linking comments to a precise point, area, or linear feature and attributing that element with the specific comment. Entering comment attributes real-time, as the GIS was projected to a large screen monitor, further ensured meeting attendees that comments were captured. Often times, specific concerns can be alleviated if public participants can simply locate features on the map, or on-screen as was provided in the open house venues. Using GIS as a spatial analysis tool and an interactive component of the public participation process provided a reliable, open, and transparent means of sharing information, and validating decisions made throughout the route development and selection process.

Interactive Exercises

Various interactive exercises were utilized throughout the community outreach process as part of the RWG meetings. These exercises were aimed at engaging stakeholders in participating in exercises that simulated the route development and selection decision-making process, and reinforcing the considerations and difficulties involved in siting electrical facilities. The exercises were facilitated to encourage participant understanding of the decision-making process for each step of route development and selection. The results of these exercises influenced the decision-making process but did not necessarily dictate the process. Interactive exercises included a siting exercise involving a fictional study area and a criteria prioritization exercise. These interactive exercises will be discussed in each of the respective sections associated with route development and selection.

Project Website

An external Project website, www.CapX2020.com, was also established for the CapX2020 Group I projects. This website, intended for viewing by stakeholders and the general public, provided a portal to archived and updated Project information. Summaries of the various RWG meetings and

open houses are included on the Project website. In addition to the external Project website, a general email address, fargoinfo@CapX2020.com, was also established.

Project Hotline

A toll-free hotline, 1-866-876-2869, was established for the CapX2020 Group I projects. The hotline allowed stakeholders and members of the public to reach a CapX2020 representative during normal business hours for general inquiries related to the Project. For specific inquiries or information requests, contact information was provided to the Project team for follow-up or response.

8.3 PHASE I – PROJECT OVERVIEW AND NEED

Phase I involved the presentation of an overview of the CapX2020 Group I projects and the need for these projects. This included introducing the project corridors and seeking feedback from attendees. At this early step in the process, Applicants sought feedback regarding local environmental considerations, issues, or concerns that should be addressed in the route development and selection process.

The community outreach component of Phase I included a series of public information meetings or open houses at various locations throughout the overall area. Eleven meetings were facilitated in September and October 2007.

8.3.1 PHASE I OPEN HOUSES

Objectives and Approach

The first phase of open houses was aimed at introducing the Project to interested members of the public. This introduction included an overview of the CapX2020 Group I projects and the need for these projects. Information pertaining to project locations and substation interconnection, need, anticipated structure types to be constructed for the projects, renewable generation, and energy conservation was presented. A streaming video which documented various stages of transmission line construction was available to attendees for viewing. Large format aerial tile maps depicting the project corridors were available for review. Information generally related to route development and selection and the regulatory review process was also presented. Comment forms seeking input as to the type and extent of information presented, specific considerations relative to a local area or property, and otherwise related to routing considerations were distributed and collected.

Notification

Invitation letters were sent to approximately 37,000 landowners within the project corridors. Advertisements announcing the open houses were published in 18 local newspapers. Additionally,

the open houses were announced on the Project website (www.CapX2020.com), which was referenced on all public information pieces including the Project brochure and newsletters.

Meeting Summary

The Phase I open houses were attended by 582 members of the public. A total 184 comment forms were received as a result of the open houses and a summary of the comments received is provided below. In addition to comments submitted by individuals, comments made by attendees were also recorded by CapX2020 facilitators.

Summary of Comment Forms Received from the Phase I Open Houses

- Land use – property devaluation and planned development
- Agricultural use – power lines interfering with operations
- Visual impacts on natural surroundings
- Effects on health
- Where the proposed line will be located
- Loss of trees
- Proximity to homes
- Making use of existing transmission line routes
- Continuing to communicate with the public
- Costs
- Siting criteria
- Time frame
- Interference with TV, radio, and cell phones
- Currently hosting a transmission line or pipeline and don't want to host anything else
- Wobegon Trail should not be considered
- Kensington Runestone Park and the viewshed from it should be avoided
- Making sure line is the right capacity to enable for future growth
- Project alternatives – transmission versus power plants, nuclear, wind energy

Throughout the public participation process, representatives of the CapX2020 utilities continued to meet with key stakeholders and, upon individual request, with landowners and local groups or organizations.

8.4 PHASE II – REFINED CORRIDORS

Phase II involved the presentation and discussion of the approach to route development and selection. This included review of the environmental siting criteria. The criteria or routing

considerations, which were the basis of the routing decision-making process, also provided a means for encouraging specific comments that were used in the route development and selection process. The primary set of principles guiding the route development and selection process were the factors set forth in Minn. R. 7850.4100. These state routing criteria established the guiding principles Applicants applied when making decisions about potentially removing certain route options from further evaluation or carrying forward certain route options, and ultimately in developing the routes proposed in this Application.

Phase II then introduced the concept of dividing the Fargo to Monticello 345 kV Project into the Monticello to St. Cloud 345 kV Project and the Fargo to St. Cloud 345 kV Project, subject to this Application, due to the interconnection in the St. Cloud area having a more critical timing and desired in-service date. Separating the project into two projects allows Applicants' to more readily serve the critical need in the St. Cloud area. With the division of the two projects, the route development and selection process associated with the Monticello to St. Cloud 345 kV Project was accelerated, as compared to the Fargo to St. Cloud 345 kV Project. For the Fargo to St. Cloud 345 kV Project during Phase II of the public participation process, refined corridors were presented and discussed. Applicants sought feedback regarding the refined corridors.

The community outreach component of Phase II included a series of RWG meetings and open houses at various locations throughout the Fargo to Monticello area. Eight RWG meetings and seven open houses were facilitated in January and March 2008.

8.4.1 ROUTING WORK GROUP 1

The first series of the RWG meetings, Routing Work Group 1, were conducted January 28-31, 2008. Four total meetings were conducted. Information was conveyed through a formal presentation with questions and answers deferred to the end of each speaker's presentation. The following sections discuss the objectives and approach to the meetings, explain the facilitated interactive exercises, and provide a summary of the meetings.

Objectives and Approach

The first RWG Meeting was aimed at re-introducing the Project to and gathering input from identified stakeholders within the Fargo to Monticello area. Identified stakeholders included representatives of potentially affected jurisdictions, potentially affected agencies, local interest groups, and other interested or potentially affected parties. The presentation included welcome and introductions, an explanation of the format and purpose of the RWG, completion of an interactive exercise, an overview of the Fargo to Monticello 345 kV Project and associated need, an overview of the regulatory process, an overview of siting criteria, completion of a second interactive exercise, and an explanation of the next steps to be implemented in the route development and selection process.

The presentation of information and interactive exercises were followed by a question and answer session.

As it relates to the siting criteria or routing considerations, much emphasis was placed on the definition of sensitivities to prevent the misunderstanding that 'sensitivity' necessitates or implies avoidance. Additionally, emphasis was also placed on the guiding principles serving as the basis of the route development and selection process. The primary set of principles guiding the route development and selection process were the factors set forth in Minn. R. 7850.4100. These state routing criteria established the guiding principles Applicants applied when making decisions about potentially removing certain route options from further evaluation or carrying forward certain route options, and ultimately in developing the routes proposed in this Application.

Interactive Exercises

Two interactive exercises were facilitated as a part of the first series of RWG meetings. The first interactive exercise was one in which attendees were asked to create a list of general items associated with transmission line routing that are sensitive to them. The attendees were divided into groups of five or six individuals. Each group was led by a facilitator. Sensitive items identified within each group were documented by the group facilitator on a 36 by 44 inch poster board, with no order of priority given to any of the items listed.

The second interactive exercise involved a review of the results of the first interactive exercise. The list of sensitive items generated by the meeting participants was presented to the entire group as part of an interactive group discussion. The group was encouraged to ask questions about the sensitivities listed and to add any others that came to mind. Participants were also presented with the list of criteria outlined by the state, and given a chance to discuss and compare items occurring on that list to those areas identified by participants in the exercises.

Meeting Summary

RWG meetings were held at four locations throughout the overall area. A separate list of invitees was generated for each location. There were more than 320 invitees and 66 attendees at the RWG 1 meetings.

8.4.2 ROUTING WORK GROUP 2

The second series of RWG Meetings, Routing Work Group 2, consisted of four meetings conducted over a three day period from March 4-6, 2008. Information was conveyed in the same manner as for RWG 1, including a review of information that had been previously presented. However, additional information presented and discussed included the identification of the need to separate the Fargo to Monticello 345 kV Project into the Monticello to St. Cloud 345 kV Project and the Fargo to St.

Cloud 345 kV Project, subject to this Application, due to the critical timing associated with the in-service date in the St. Cloud area. The location of refined corridors for the Fargo to St. Cloud 345 kV Project and potential route alternatives for the Monticello to St. Cloud 345 kV Project, as well as an overview of the rationale associated with the development of these routing options, were also presented. As previously identified, the route development and selection process associated with the Monticello to St. Cloud 345 kV Project was accelerated in comparison to the Fargo to St. Cloud 345 kV Project due to the critical in-service need in the St. Cloud area. The following sections discuss the objectives and approach for the meetings, explain the facilitated interactive exercise, and provide a summary of the meetings.

Objectives and Approach

The second RWG Meeting was largely aimed at introducing the Fargo to St. Cloud 345 kV Project refined corridors, including a discussion of the rationale associated with the development of these routing options. The presentation included welcome and introductions, a review of RWG 1, completion of an interactive exercise, an overview of the Project and regulatory process, a review of the siting criteria and the route development and selection process, and the presentation and discussion of the Fargo to St. Cloud refined corridors. The presentation of information and interactive exercise were followed by a question and answer session.

Interactive Exercise

An interactive exercise demonstrating the difficulties and considerations involved in transmission line siting was facilitated as part of the second RWG meeting. Each group, led by a facilitator, was asked to participate in selecting a route corridor on a fictitious map. This map had many of the same characteristics and land features as the Project area. For example, it depicted agricultural land uses, existing and proposed residential developments, airports, wildlife areas, lakes, highways and other existing rights-of-way, and cities. A number of features with a relatively high density were mapped between the two interconnection points. Additionally, various route corridors extending between the two interconnection points were also identified. The groups worked together to select a route corridor of those identified within the fictitious study area. Each team then presented their route and the rationale for selecting their route to the larger group.

The objective behind the use of this exercise was to involve the participants in a similar routing exercise to convey the difficulties and complexities associated with transmission ling siting.

Meeting Summary

RWG meetings were held at four locations throughout the Fargo to Monticello area. There were more than 320 invitees and 58 attendees at the RWG 2 meetings.

8.4.3 PHASE II PUBLIC MEETINGS

The second phase of open houses occurred on March 18th through March 20th, 2008 and March 25-27, 2008. The purpose of these open houses was to review the need for the CapX2020 Group I projects, explain the division of the overall Fargo to Monticello 345 kV Project into two separate projects, the criteria to be used and the sequence of steps associated with route development and selection, and the identification of the refined corridors for the Fargo to St. Cloud 345 kV Project.

Objectives and Approach

The objective of the Phase II open houses was to continue to provide an overview of the Project's background and need, while also providing an update on the status of the route development and selection process. Much of the same information as was provided at the Phase I open houses and the first two RWG Meetings was reviewed for the benefit of those invitees who had not attended a previous open house. Although previously presented information was provided, the main focus of the meetings was the new information. This new information included the presentation of refined corridors for the Fargo to St. Cloud 345 kV Project, including the rationale associated with how they were developed.

Attendees were able to attend anytime during the hosted timeframe and obtain information, and share information, at key topic stations. Interactive GIS stations were utilized to allow attendees to view their property or properties with regard to the refined corridors. Maps were also developed, for all attendees who were interested in receiving one.

Notification

Invitation newsletters were sent to approximately 37,000 landowners within the project corridors. An additional 365 landowners were added to the newsletter mailing list as a result of preliminary routing analysis efforts. In addition to the invite contained in the CapX2020 newsletter, a public open house notification flyer was handed out to all attendees at the preceding RWG 2 meetings. Advertisements announcing the public meetings were published in 18 local newspapers. Additionally, the open house was announced on the Project website (www.CapX2020.com), which was referenced on all public information pieces, including brochures and newsletters.

Meeting Summary

The Phase II open houses were attended by 443 members of the public. A total 88 comment forms were received as a result of the Phase II open houses and a summary of these comments and identified concerns is provided below. In addition to comments submitted by individuals, comments made by attendees were also recorded by CapX2020 facilitators.

Summary of Comment Forms Received from the Phase II Public Meetings

- Land use – property devaluation and planned development
- Agricultural use – power lines interfering with operations
- Visual impacts on natural surroundings
- Effects on health
- Where the proposed line will be located
- Loss of trees
- Proximity to homes
- Making use of existing transmission line routes
- Continuing to communicate with the public
- Costs
- Siting criteria
- Interference with TV, radio, and cell phones
- Currently hosting a transmission line or pipeline and don't want to host anything else
- Wobegon Trail and bike trails should not be considered
- Impacts to the environment including lakes, wetlands, animals and vegetation

Throughout the public participation process, representatives of the CapX2020 utilities continued to meet with key stakeholders and, upon individual request, with landowners and local groups or organizations.

8.5 PHASE III – PRELIMINARY POTENTIAL ROUTE ALTERNATIVES

8.5.1 ROUTING WORK GROUP 3

The third RWG Meeting for the Fargo to St. Cloud 345 kV Project occurred on May 22, 2008 in Alexandria at the Holiday Inn and in Wahpeton, North Dakota at the Eagles Club. This meeting provided CapX2020 an opportunity to discuss the identified preliminary potential route alternatives for the Fargo to St. Cloud 345 kV Project.

Objectives and Approach

The objective of the third RWG Meeting was to present and discuss the preliminary potential route alternatives for the Fargo to St. Cloud 345 kV Project.

The presentation included welcome and introductions, a review of the RWG 2 Meetings, an overview of the regulatory process, presentation and discussion of the preliminary potential route alternatives, an open discussion, a review of the next steps in the process, and a question and answer session.

Meeting Summary

For the meetings conducted on May 22, 2008 in Alexandria and Wahpeton, the invite list consisted of 272 invitees. Of the invitees, 37 attended.

8.5.2 PHASE III PUBLIC MEETINGS

The Phase III open houses for the Fargo to St. Cloud 345 kV Project occurred June 2-5, 2008. Five meetings were conducted. The purpose of the open houses was to present and discuss the preliminary potential route alternatives. The following sections discuss the overview and objectives, and summary of the meetings.

Objectives and Approach

The objectives of the Phase III open houses were to continue to solicit public participation and input as well as to present and discuss the preliminary potential route alternatives for the Fargo to St. Cloud 345 kV Project.

Attendees were able to attend anytime during the hosted timeframe and obtain information, and share information, at key topic stations. Interactive GIS stations were utilized to allow attendees to view their property or properties with regard to the preliminary potential route alternatives. Maps were developed for all attendees who were interested in receiving one.

Notification

Invitation letters were sent to over 37,000 landowners within the project corridors. These invitees included individuals, groups, and agencies identified as having property located within the project corridors. Advertisements announcing the public meetings were published in 18 local newspapers**.** Additionally, the open house was announced on the Project website (www.CapX2020.com) which was referenced on all public information pieces including brochures and newsletters.

Meeting Summary

The Phase III open houses were attended by 305 members of the public. A total 48 comment forms were received as a result of the Phase III open houses and a summary of these comments and identified concerns is provided below. In addition to comments submitted by individuals, comments made by attendees were also recorded by CapX2020 facilitators.

Summary of Comment Forms Received from the Phase III Open House

- Land use – property devaluation and planned development
- Agricultural use – power lines interfering with operations

- Visual impacts on natural surroundings
- Effects on health both human and livestock
- Where the proposed line will be located
- Loss of trees
- Proximity to homes
- Making use of existing transmission line routes
- Continuing to communicate with the public
- Interference with runways and existing structures.
- Siting criteria
- Interference with TV, radio, and cell phones
- Currently hosting a transmission line or pipeline and don't want to host anything else
- Wobegon Trail corridor should be considered
- Impacts to the environment including lakes, wetlands, animals and vegetation.

Throughout the public participation process, representatives of the CapX2020 utilities continued to meet with key stakeholders and, upon individual request, with landowners and local groups or organizations.

8.6 PHASE IV – REFINED POTENTIAL ROUTE ALTERNATIVES

8.6.1 PHASE IV PUBLIC MEETINGS

The Phase IV open houses for the Fargo to St. Cloud 345 kV Project occurred between July 27th and August 3, 2009. A total of seven meetings were conducted. The purpose of the open houses was to present and discuss the preliminary potential route alternatives. The following sections discuss the overview and objectives, and summary of the meetings.

Objectives and Approach

The objectives of the Phase IV open houses were to continue to solicit public participation and input as well as to present and discuss the refined potential route alternatives for the Fargo to St. Cloud 345 kV Project.

Attendees were able to attend anytime during the hosted timeframe and obtain information, and share information, at key topic stations. Interactive GIS stations were utilized to allow attendees to view their property or properties with regard to the refined potential route alternatives. Maps were developed for all attendees who were interested in receiving one.

Notification

Invitation letters were sent to over 37,000 landowners within the project corridors. These invitees included individuals, groups, and agencies identified as having property located within the project corridors. Advertisements announcing the public meetings were published in 18 local newspapers**.** Additionally, the open house was announced on the Project website (www.CapX2020.com) which was referenced on all public information pieces including brochures and newsletters.

Meeting Summary

The Phase IV open houses were attended by a total of 439 members of the public. A total of 96 comment forms were received as a result of the Phase IV open houses and a summary of these comments and identified concerns is provided below. In addition to comments submitted by individuals, comments made by attendees were also recorded by CapX2020 facilitators.

Summary of Comment Forms Received from the Phase IV Open Houses

- Land use – property devaluation and planned development
- Agricultural use – power lines interfering with operations
- Visual impacts on natural surroundings
- Effects on health

- Where the proposed line will be located
- Proximity to homes
- Making use of existing transmission line routes and road corridors
- Continuing to communicate with the public
- Costs
- Stray voltage
- Impacts to businesses
- Siting criteria
- Interference with TV, radio, and cell phones
- Substation location
- Currently hosting a transmission line or pipeline and don't want to host anything else
- Wobegon Trail corridor should be considered
- Impacts to the environment including lakes, wetlands, animals and vegetation.

Throughout the public participation process, representatives of the CapX2020 utilities continued to meet with key stakeholders and, upon individual request, with landowners and local groups or organizations.

8.7 AGENCY CONTACTS

The following sections describe the various agency meetings that have taken place as part of the agency involvement effort. Any future involvement, coordination, or correspondence will be provided to the Commission, as appropriate.

8.7.1 UNITED STATES FISH AND WILDLIFE SERVICE

The Project team has met with the USFWS on four occasions between February 2008, June 2008, June 2009, and September 2009. Discussions with the USFWS have focused on collecting information related to the location of existing federally owned lands and easements, as well as federally funded lands or easements, and the potential for affect to these lands and resulting permitting requirements. Meeting summaries are provided in Appendix I.

8.7.2 UNITED STATES ARMY CORPS OF ENGINEERS

The Project team met with the USACE in May 2008 and June 2009 to discuss permitting considerations associated with impacts to wetlands and waterways. Meeting summaries are provided in Appendix I.

8.7.3 MINNESOTA DEPARTMENT OF NATURAL RESOURCES

The MDNR Natural Heritage and Non-game Research Program database was accessed as recently as January 2009 to review the Project study area for state threatened and endangered species, and rare and unique natural features.

The MDNR Waters Division was contacted regarding Applicant's proposed Project. They acknowledged that MDNR public waters may be affected by the Project. However, projects such as the proposed 345 kV transmission line exhibit little or no impact to the public watercourses as long as standard MDNR Lands and Mineral license protocols are followed.

A total of six meetings were conducted with various divisions of the MDNR between February and September 2009. Discussions with MDNR have centered around collecting information related to the location of existing state owned lands, as well as federally funded state lands or easements, the potential for affect to these lands. Meeting summaries are provided in Appendix I.

8.7.4 MINNESOTA STATE HISTORIC PRESERVATION OFFICE

As recently as May 2009, the Minnesota SHPO Archaeological and Architectural database records were accessed to determine if any known or suspected archaeological sites or historic standing structures occur in the Project Area. Applicants will continue to coordinate with the SHPO.

8.7.5 MINNESOTA DEPARTMENT OF TRANSPORTATION

Applicants contacted Mn/DOT to provide the agency with information about the proposal and an opportunity to comment on the transmission line improvements prior to filing this Application. In light of the inclusion of the I-94 right-of-way corridor as an option, Applicants specifically sought Mn/DOT's views on the available options and their relative impacts. Applicants have met with Mn/DOT and the FHWA on multiple occasions. The results of this coordination effort are outlined in section 2.0. Meeting summaries are provided in Appendix I.

8.7.6 MINNESOTA DEPARTMENT OF AGRICULTURE

Applicants contacted the Minnesota Department of Agriculture to provide the agency with an opportunity to discuss the Project prior to filing this Application. Together with the Department of Agriculture and other parties, Applicants have developed an Agricultural Impact Mitigation Plan. A copy of the final Plan is included in Appendix I.

8.7.7 LOCAL GOVERNMENT UNITS

Applicants have met with the various potentially affected cities and townships within Wright and Stearns Counties prior to and as part of the route development and selection process. Upon the

identification of the final Proposed Routes, Applicants commenced a series of meetings with the potentially affected townships to ensure that landowners that may be affected by the Project were aware of the location of the Proposed Routes. Meeting summaries are provided in Appendix I.

9.0 PERMITS AND APPROVALS

The Project will be constructed in Minnesota. Applicants will be required to obtain additional permits or approvals from federal, state, and local agencies prior to construction of the facilities. A list of potential permits and other approvals that may be required for the Project are presented in Figure 9-1.

Figure 9-1. Potential Permits and Approvals

Agency/Department	Permit/Approval
Federal	
U.S. Fish and Wildlife Service	Endangered Species Act Coordination/Consultation
	Migratory Bird Treaty Act and Eagle Protection Act Coordination/Consultation
U.S. Army Corps of Engineers	Section 404 Regional General Permit
U.S. Federal Aviation Administration	17 C.F.R. Part 77 Review
U.S. Department of the Treasury, Bureau of Alcohol, Tobacco, Firearms and Explosives	Explosive User's Permit
State	
Minnesota Pollution Control Agency	National Pollutant Discharge Elimination System – General Permit Authorization to Discharge Stormwater Associated with Construction Activity
	Section 401 CWA, Water Quality Certification
Minnesota Department of Agriculture	Implemenation oversight/coordination associated with the Agricultural Impact Mitigation Plan
Minnesota Department of Health	Variance, Wellhead Protection
Minnesota Department of Natural Resources	Minnesota Endangered Species Act Coordination/Consultation
	License to Cross Public Waters or state Lands
Minnesota State Historic Preservation Office	Section 106 Consultation, National Historical Preservation Act
Minnesota Department of Transportation	Utility Permit
Local	
Minnesota Board of Soil and Water Resources – Local Governmental Units	Minnesota Wetland Conservation Act Compliance
Affected County and Local Jurisdiction or Planning Department, Department of Transportation	Roadway Access, Crossing, or Encroachment Permits
	Over-Weight/Width Permits
Other	
State or Federal Conservation Easement Programs	Coordination or approval to cross enrolled lands

9.1 FEDERAL PERMITS

U.S. Fish and Wildlife Service

Applicants will consult with the USFWS regarding the potential for occurrence of federally protected species or their habitats in accordance with the Endangered Species Act. Applicants will also consult with the USFWS to minimize impacts on migratory birds and other species of concern during construction of the Project.

U.S. Army Corps of Engineers

A Section 404 permit is required from the USACE under the CWA for discharges of dredged or fill material into waters of the United States. A permit will be required for the Project if the placement of poles or other disturbances within wetlands cannot be avoided. Applicants will apply for these permits upon at least near final engineering and design. Applicants anticipate that the Project will adhere to the provisions of a Regional General Permit (RGP) for impacts to wetlands and waterways.

U.S. Federal Aviation Administration

Notice to and review by the FAA is required for structures 200 feet and greater in height, or when the structure height will exceed a slope requirement in relation to airport runways or heliports as defined in 14 C.F.R. Part 77. Applicants will submit the required notices to the FAA for review upon near final engineering and design, as necessary or appropriate.

U.S. Department of the Treasury, Bureau of Alcohol, Tobacco, Firearms and Explosives

Permits or licenses from the Bureau of Alcohol, Tobacco, Firearms and Explosives may be required if bedrock is encountered during placement of transmission line structures or substation footings. In the event that explosives are necessary, Applicants will ensure that their contractor(s) have obtained the appropriate permits or licenses for handling or use of explosives.

9.2 STATE OF MINNESOTA PERMITS

Minnesota Department of Natural Resources

Applicants will consult the MDNR Division of Ecological Resources regarding the potential for occurrence of threatened or endangered species, and their habitats, that may be affected by the Project.

The MDNR Division of Lands and Minerals regulates utility crossings over or under public lands and waters identified on MDNR Public Waters and Wetlands maps. A Utility Crossing License from

the MDNR is required under Minn. Stat. §84.415 and Minn. R. Ch. 6135. Applicants will submit license applications to the MDNR upon at least near final engineering and design.

The MDNR also regulates water appropriation activities that exceed 10,000 gallons per day or a total of one million gallons per year under Minn. R. 6115.0620. Applicants will obtain authorization for the Project under MDNR's General Permit 1997-2005 for Temporary Projects, only as necessary, for activities such as construction site dewatering.

Minnesota Pollution Control Agency

An NPDES Permit from the MPCA is required for stormwater discharges associated with ground disturbing construction activities equal to or greater than one acre. A requirement of the permit is to develop and implement a SWPPP, which includes implementation of construction best management practices intended to establish sediment and erosion control and minimize discharge of pollutants. Applicants will prepare a SWPPP for the Project and submit an application to the MPCA to obtain permit coverage under General Permit No. MN R100001 prior to beginning construction activities.

Section 401 water quality certification may be required for activities that may result in a discharge to waters of the United States. This certification ensures that projects will comply with state water quality standards according to the CWA. The MPCA has waived Section 401 certification requirements for projects authorized under the USACE RGP. Applicants will apply for certification from the MPCA in the event that the Project would not adhere to the provisions of a Section 404 RGP.

Minnesota Department of Agriculture

Together with the Department of Agriculture and other parties, Applicants have developed an Agricultural Impact Mitigation Plan. A copy of the final Plan is included in Appendix I. The Agricultural Impact Mitigation Plan includes provisions intended to avoid, mitigate, or to provide compensation for negative impacts on agricultural lands.

Minnesota Department of Health

Wellhead protection areas are administered by the Minnesota Department of Health under the state wellhead protection rule (Minn. R. 4720.5100-4720.5590). The potential for impacts to areas within a wellhead protection area may require a variance subject to review and approval by the Department of Health.

Minnesota State Historic Preservation Office

Applicants have consulted with the SHPO to determine if features eligible for listing in the National Record of Historic Places are present within the area encompassed by the Proposed Routes. Applicants will continue to coordinate with the SHPO.

Minnesota Department of Transportation

Once the Commission issues a Route Permit, Applicants must obtain a Utility Permit from Mn/DOT for construction, placement, or maintenance of utility lines adjacent to or across state highway, including interstate, rights-of-way.

9.3 LOCAL PERMITS

Once the Commission issues a Route Permit, zoning and land use regulations and rules are preempted. Minn. Stat. §216E.10, Subd. 1. Other typical local approvals associated with transmission line construction are listed below.

Minnesota Board of Soil and Water Resources

The Minnesota Wetland Conservation Act is administered at the local level with oversight from the Minnesota Board of Water and Soil Resources in accordance with Minn. R. Ch. 8420. The Project may require a permit under these rules if permanent impacts to wetlands cannot be avoided. Applicants will consult the appropriate local agencies upon at least near final design and engineering.

Other Local Permits

Road Crossing Permits

These permits may be required to cross or occupy county, township and city road rights-of-way.

Over-Width Load Permits (County, Township, City)

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

Driveway/Access Permits (County, Township, City)

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

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11.0 DEFINITIONS

Alignment	A potential centerline within a route, but not necessarily the physical center of a route, along which transmission structures could be located.
Avian	Of or relating to birds.
A-weighted Scale	The sensitivity range for human hearing.
Caisson	A watertight structure within which construction work is carried on under water.
Circuit	An electrical path.
Conductor	A material or object that permits an electric current to flow easily.
Conductor	1) A wire or combination of wires suitable for carrying an electrical current. Conductors may be insulated or bare. 2) Any material that allows electrons to flow through it.
Corona	The breakdown or ionization of air in a few centimeters or less immediately surrounding conductors.
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.
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.
Hydrocarbons	Compounds that contain carbon and hydrogen, found in fossil fuels.
Insulator	A device that is used to electrically isolate a conductor or electrical device from ground or a different electrical potential.
Ionization	Removal of an electron from an atom or molecule.
Kilovolt	1,000 volts; 345 kV = 345,000 volts.
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.
Preferred Route Segment Alternative	A corridor segment between 400 feet and 1.25 miles in width, but generally 1,000 feet in width, that diverges from the Preferred Route for some distance and then rejoins the same route; or, a corridor that connects a portion of the Preferred Route to a portion of Alternate Route A. In either case, this corridor segment provides an alternative to only a portion of the Preferred Route.
Proposed Route	A route proposed by Applicants. The Proposed Routes include the Preferred Route, Alternate Route A, and five Preferred Route Segment Alternatives.

Raptor	A member of the order Falconiformes, which contains the diurnal birds of prey, such as the hawks, harriers, eagles and falcons.
Right-of-Way	The land rights that must be acquired to safely construct, operate, and maintain an electrical line.
Route	A corridor between 400 feet and 1.25 miles in width, but generally 1,000 feet in width, between the Project's two geographic endpoints in Minnesota. These endpoints include the new Quarry Substation and the Red River. Applicants have identified two routes, the Preferred Route and Alternate Route A.
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.
Span	The distance between two supporting structures.
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.
Ultraviolet Radiation	A portion of the electromagnetic spectrum with wavelengths shorter than visible light.
Voltage	Electric potential or potential difference expressed in volts.
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.

12.0 ACRONYMS

Following is a list of acronyms used in this Application:

AC	Alternating current
ACSS	Aluminum Core Steel Supported
ALJ	Administrative Law Judge
APLIC	Avian Power Line Interaction Committee
APP	Avian protection plan
ASR	Antenna Structure Registration
AWOS	Automated weather observation stations
BCC	Birds of conservation concern
BMPs	Best management practices
BWSR	(Minnesota) Board of Water and Soil Resources
CRP	Conservation Reserve Program
CWA	Clean Water Act
dBA	A-weighted sound level in decibels
ECS	Ecological Classification System
EIS	Environmental Impact Statement
EMF	Electric and magnetic fields
EPA	Environmental Protection Agency
EPRI	Electric Power Research Institute
FAA	Federal Aviation Administration
FACW	Facultative wetland species
FAR	Federal aviation regulation
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FSA	Farm Service Agency
GIS	Geographic information system
GPS	Global positioning system
GNIS	Geographic Names Information System
HUC	Hydrologic Unit Code
HVTL	High voltage transmission line
I-94	Interstate 94
IBI	Index of Biological Integrity
IEEE	Institute of Electronics and Electrical Engineers
kV	Kilovolt

kV/m	Kilovolts per meter
LGU	Local government unit
ma	Milliamperes
MBTA	Migratory Bird Treaty Act of 1918
MCBS	Minnesota County Biological Survey
MDNR	Minnesota Department of Natural Resources
mG	MilliGauss
MN	Minnesota
Mn/DOT	Minnesota Department of Transportation
MOU	Memorandum of Understanding
MPCA	Minnesota Pollution Control Agency
MPUC	Minnesota Public Utilities Commission
MRO	Midwest Reliability Organization
NAC	Noise Area Classification
NAIP	National Agriculture Imagery Program
ND	North Dakota
NERC	North American Electric Reliability Corporation
NESC	National Electric Safety Code
NHIS	Natural Heritage Information System
NIEHS	National Institute of Environmental Health Sciences
NLCD	National Land Cover Dataset
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSBP	National Scenic Byway Program
NSPM	Northern States Power Company, a Minnesota corporation
NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
OBL	Obligate
PCB	Polychlorinated Biphenyls
PDA	Project Development Agreement
PEM	Palustrine emergent (wetland)
PEER	People for Environmental Enlightenment and Responsibility
PFO	Palustrine forested (wetland)
ppm	Parts per million
PPSA	Power Plant Siting Act
PSCW	Public Service Commission of Wisconsin

PSS	Palustrine scrub-shrub (wetland)
PUB	Palustrine unconsolidated bottom (wetland)
RGP	Regional General Permit
PWI	Public Waters Inventory
RIM	Re-invest in Minnesota
RWG	Routing Work Group
SHPO	Minnesota State Historic Preservation Office
SNA	Scientific and Natural Area
SWPPP	Storm Water Pollution Prevention Plan
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOR	Very high frequency Omnidirectional Range
VOR/DME	Very High Frequency Omnidirectional Range/Distance Measuring Equipment
VORTAC	Very High Frequency Omnidirectional Range/Tactical Aircraft Control
WHO	World Health Organization
WMA	Wildlife Management Area
WPA	Waterfowl Production Area