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

Docket # ET-2, E002/TL-09-246

April 8, 2009

VOLUME 1 OF 2

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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, 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 7849 to construct the Monticello to St. Cloud 345 kilovolt (kV) Transmission Line Project (Project or Monticello to St. Cloud 345 kV Project). The proposed 345 kV electrical transmission line will connect the Monticello Substation with a new substation, the Quarry Substation, to be located west of the city of St. Cloud. 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).

ES.2 NEED

The Project is designed to address three needs: local community reliability; regional reliability and generation outlet support. The demand for electric power in the St. Cloud area has exceeded the capability of the area's electrical system to reliably provide power during contingencies. The Project will provide sufficient additional capacity to meet the St. Cloud area's needs until approximately 2035 to 2040. The proposed 345 kV transmission line will also help improve the reliability of the bulk electric system serving Minnesota and portions of neighboring states. Finally, the Project provides a necessary 345 kV connection to the Twin Cities that will help facilitate additional generation development, including renewable generation, in eastern North Dakota and western Minnesota.

Applicants' request for a Certificate of Need for the Project and associated system connections is presently before the Commission. *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 Three CapX2020 345 kV Transmission Projects*, Docket No. ET-2, E-002, et al./CN-06-1115 (Certificate of Need Application). On February 27, 2009, Administrative Law Judge (ALJ) Beverly Heydinger issued her Findings of Fact, Conclusions and Recommendations and recommended approval of the Twin Cities to Fargo Project in a double circuit compatible configuration. *id.,* Findings of Fact, Conclusions and Recommendations at p. 3. A decision is expected in the spring of 2009.

ES.3 PROJECT DESCRIPTION

The proposed Monticello to St. Cloud 345 kV Transmission Line Project will be approximately 28 miles long, extending between the existing Monticello Substation in Monticello, Minnesota and a new substation, the Quarry Substation, to be located west of St. Cloud, Minnesota in unincorporated Stearns County. 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 in length 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.

This proposal also includes the construction of associated facilities. These facilities include the proposed Quarry Substation, necessary modifications at the existing Monticello Substation, and the interconnection of the existing St. Cloud to Sauk River 115 kV transmission line into the new Quarry Substation. The specific Project facilities are as follows:

- Monticello Substation – Modifications will be made at the existing Monticello Substation to accommodate the proposed 345 kV transmission line. Equipment to be installed includes 345 kV equipment (including switches, control panels, and circuit breakers), foundations and structures.

- Monticello 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. At this time, only one set of davit arms will be installed on the structures allowing current installation of a single circuit. The line will connect the existing Monticello Substation and the proposed Quarry Substation.

- Quarry Substation – The proposed Quarry Substation will be located west of the city of St. Cloud, Minnesota. The proposed 345/115 kV substation will be up to 15 acres in size to allow for the interconnection of the proposed 345 kV transmission line, an existing 115 kV transmission line, and future high voltage transmission lines.

- Connection of existing 115 kV transmission line – The existing St. Cloud to Sauk River 115 kV transmission line, located within the Proposed Quarry Substation Siting Areas and extending in an east-west to south-north direction, will be interconnected into the proposed Quarry Substation. The existing line enters the Proposed Quarry Substation Siting Areas

from the east, extends west, and then diverges directly north. The existing 115 kV line may need to be extended to interconnect with the substation depending on substation site selection.

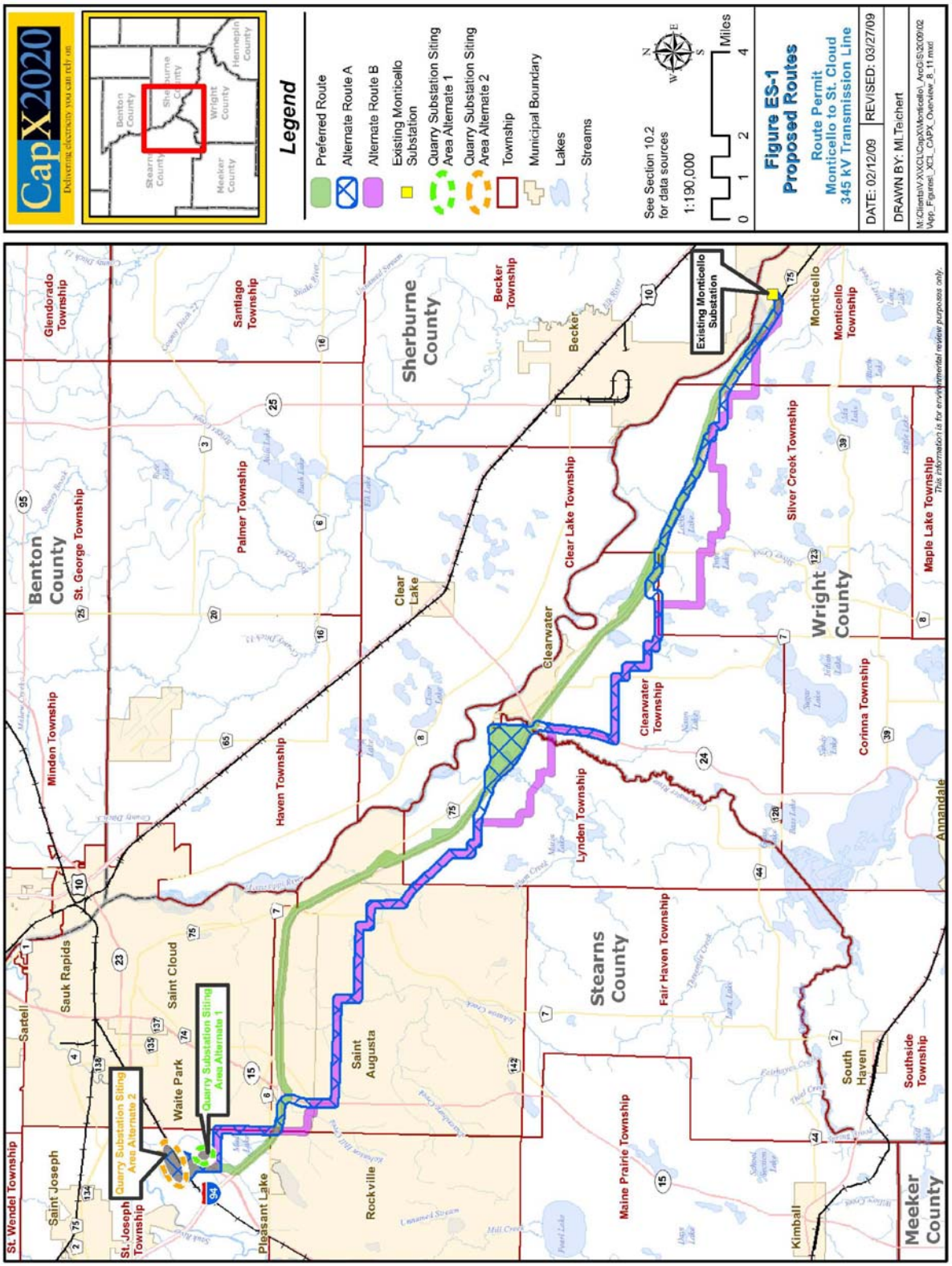
ES.4 PROPOSED ROUTES

This Application is submitted under the full permitting process. Minn. Stat. §216E.03 and Minn. R. 7849.5200-7849.5340. 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. 7849.5220, 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 a year 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 preliminary field reconnaissance throughout the Project study area to gather additional site-specific information, as well as ground-truth available information. Through this process, Applicants developed three routes: the Preferred Route, Alternate Route A, and Alternate Route B. All three routes 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 to accommodate site-specific considerations and substation interconnection.

Figure ES-1 depicts the proposed routes. A general description of the proposed routes follows Figure ES-1. An in-depth analysis of each route is presented in subsequent sections in this Application, and in the various appendices.

Figure ES-1. Proposed Routes

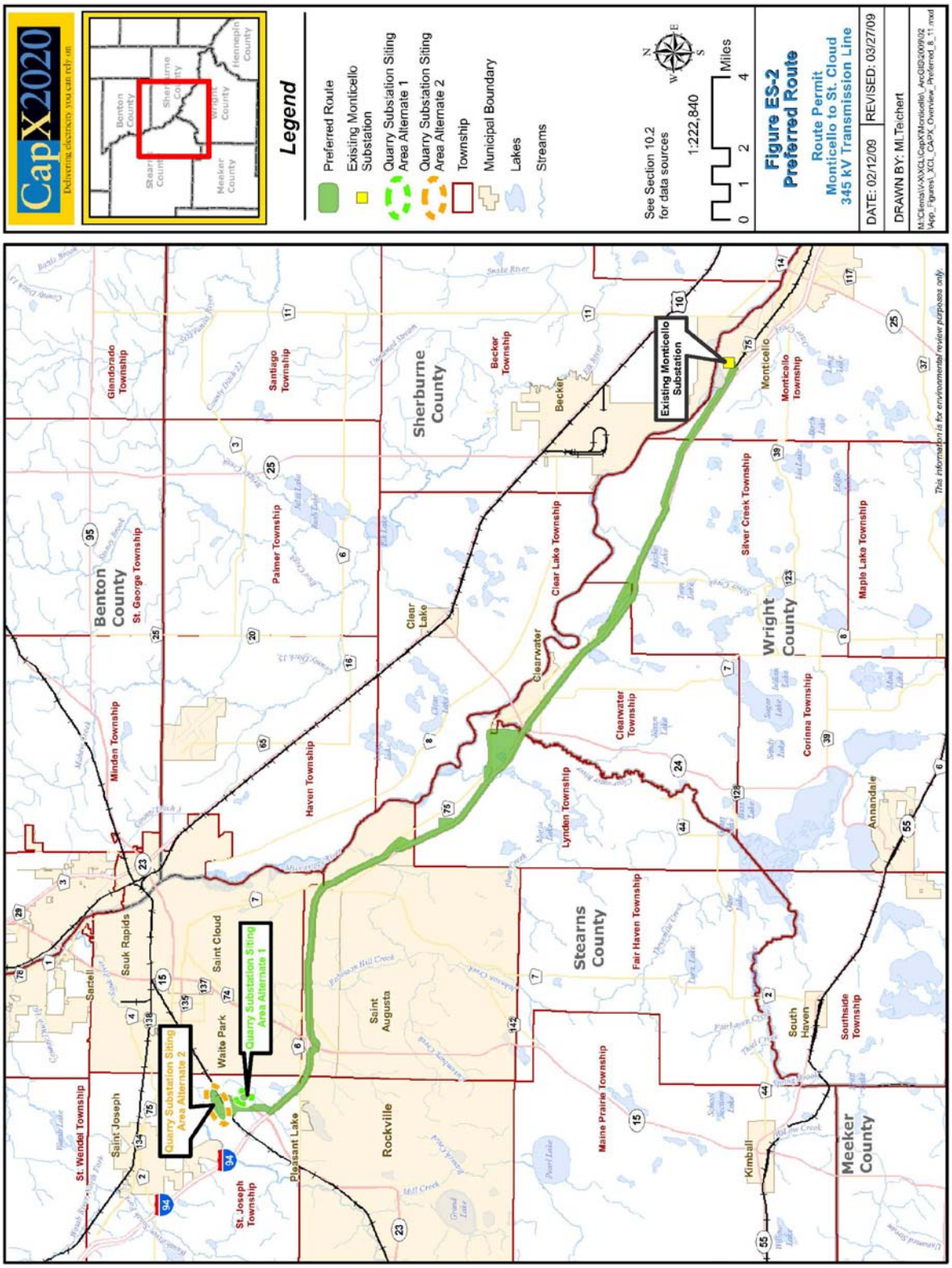


Preferred Route

The proposed 345 kV transmission line will interconnect with the existing Monticello Substation and the proposed new Quarry Substation. Two Proposed Quarry Substation Siting Areas have been identified for the Project. The Quarry Substation Siting Area Alternate 1 is generally located north of the intersection of Interstate 94 (I-94) and State Highway 23, east of Highway 23. The Quarry Substation Siting Area Alternate 2 is also generally located north of the intersection of I-94 and Highway 23, west of Highway 23.

The Preferred Route, illustrated in Figure ES-2, is approximately 28 miles in length and estimated to cost $54 million ($2008). After exiting the Monticello Substation and land owned by Northern States Power Company, the Preferred Route parallels County Road 75 and an abandoned railroad corridor for a short distance. The Preferred Route then mostly parallels the I-94 right-of-way until terminating at the Quarry Substation Siting Area Alternate 1. The Preferred Route is described in detail in Section 5.1.

Figure ES-2. Preferred Route



Alternate Route A

Alternate Route A is approximately 32 miles in length and is estimated to cost $65 million ($2008). After exiting the Monticello Substation on land owned by Northern States Power Company Alternate Route A parallels I-94 for a short distance. Alternate Route A then intermittently parallels I-94, various non-interstate roadways, property lines, and some areas where no existing linear features occur until terminating at the Quarry Substation Siting Area Alternate 1. Alternate Route A is described in detail in Section 5.2.

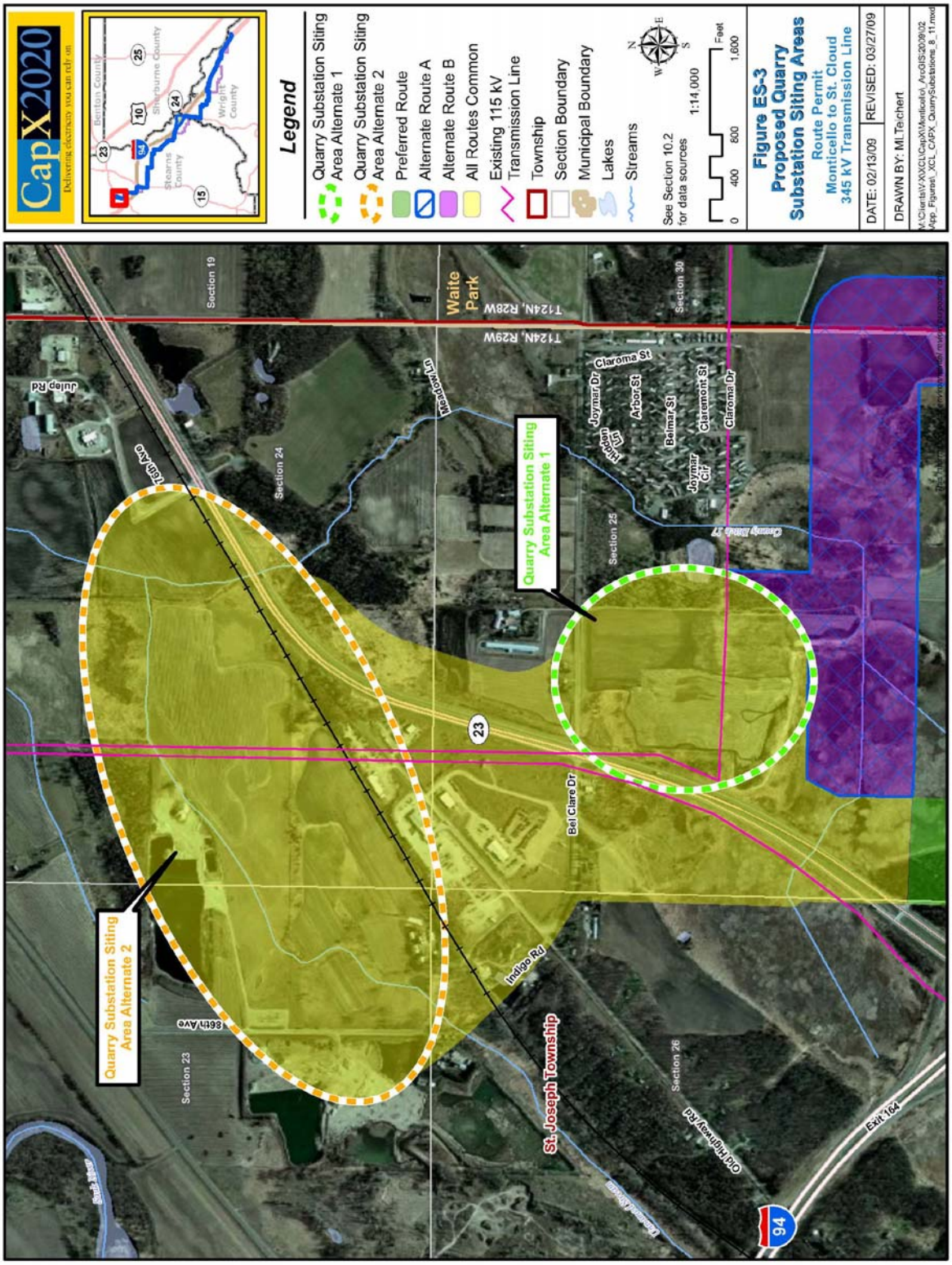
Alternate Route B

Alternate Route B is approximately 29 miles in length and the estimated cost is $72 million ($2008). After exiting the Monticello Substation on land owned by Northern States Power Company, Alternate Route B parallels an abandoned railroad corridor for a short distance. Alternate Route B then crosses I-94 and parallels various non-interstate roadways, property lines, and some areas where no existing linear features occur until terminating at the Quarry Substation Siting Area Alternate 1. Alternate Route B is described in detail in Section 5.3.

Quarry Substation (Proposed)

As identified above, two Proposed Quarry Substation Siting Areas have been identified for the Project. While Applicants have determined that either siting area is desirable, some preference has been identified for the southern-most of the two siting areas. Figure ES-3 depicts both Proposed Quarry Substation Siting Areas.

Figure ES-3. Proposed Quarry Substation Siting Areas



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. 7849. Preliminary proposed routes were derived from potential route alternatives. The preliminary proposed routes studied (also referred to as the "Open House III Routes") were based on geographic features and 1,000 feet in width, a width appropriate for transmission line routing. As priority options among the Open House III Routes were identified, Applicants refined their study and developed proposed alignments within the 1,000-foot-wide route corridors to minimize impacts. These route options were then compared based on impacts at the route-width level and measured from various alignments, rather than using the physical midpoint or centerline of the corridor. The information contained in this Application describes the calculated impacts based on various proposed alignments within the Proposed Routes subject to this Application. The Proposed Routes are nominally 1,000 feet in width for the majority of their length.

Through various phases of analysis, Applicants determined that the proximity of the transmission line facilities to existing transportation corridors has a significant effect on the overall impacts of the Project. In general, the overall impacts are minimized if the facilities are located immediately adjacent to existing roadways or interstates because the alignment maximizes the ability of the new facilities to share the existing right-of-way.

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 to 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 this process.

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. 7849.5910 (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 interstates, highways and railroads. This approach implements 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. Through the route development process, Applicants identified I-94 as a potential corridor for the Project. The Project will connect the Monticello Substation, which is located within 0.25 miles of I-94, with a new Quarry Substation to be located approximately 30 miles to the northwest and less than 1.5 miles from I-94. Like the Project, I-94 runs diagonally in a southeast-northwest orientation between St. Cloud and Monticello. After further analysis, Applicants concluded that the I-94 corridor is the best available existing infrastructure corridor to meet the needs of the Project consistent with the state's non-proliferation policy. As a result, Applicants incorporated the I-94 corridor into the Preferred Route.

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

Interstate Highway Corridors Present Special Issues for Consideration

MnDOT 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 MnDOT'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 attention working with the MnDOT 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 H). At those meetings, MnDOT, 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; including potential outcomes that will place poles at least 75 feet away from the I-94 right-of-way to ensure no right-of-way encroachment.

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

MnDOT has prepared guidelines permitting the longitudinal installation of utility facilities within 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).[1] This joint authority presents special challenges when considering routing a transmission line along an interstate highway. MnDOT *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*

[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.

Program Guide: Utility Adjustments and Accommodation on Federal-Aid Highway Projects, Sixth Edition, FHWA-IF-03-014, pp. B-54, B-60 (Jan. 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 MnDOT'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 encourage maximum optionality and 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 proposed alignments include: maximum interstate corridor sharing (five feet from the I-94 edge of right-of-way); minimum interstate corridor sharing (at least 25 feet from the I-94 edge of right-of-way); and no interstate corridor sharing (at least 75 feet from the I-94 edge of right-of-way). These options should provide the Commission, MnDOT, FHWA, other agencies and stakeholders with a broad spectrum of possible outcomes for consideration in this proceeding. Whether and how MnDOT's Accommodation Policy might apply to the proposed alignments continues to be discussed and Applicants will continue to work with MnDOT and FHWA to address their concerns to the maximum 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, but will primarily cross agricultural land. Applicants estimate that without corridor sharing, approximately 515 acres of permanent easements will be required for the proposed transmission line. In addition, Applicants are seeking up to 40 acres of land for the proposed Quarry Substation. 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, including an additional area within immediate proximity of each structure in agricultural areas. Section 8.0 provides an assessment of potential impacts and proposed mitigation measures associated with the proposed routes and associated facilities.

ES.6 REQUESTED ACTION

The information presented in this Application demonstrates that the Preferred Route best meets the applicable standards and criteria set forth in Minn. Stat. §216E.03, subd. 7, and Minn. R. 7849.5900 and 7849.5910. Implementation of the Project will support state goals to conserve resources,

[2]Available at http://www.fhwa.dot.gov/reports/utilguid/if03014.pdf.

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.

Applicants request that the Commission grant a Route Permit for the Preferred Route because it impacts fewer existing residences, makes better use of existing rights-of-way, minimizes impacts to agricultural land, minimizes impacts to natural resources, otherwise minimizes impacts to the human and natural environment, and is shorter in length than the other proposed routes. Additionally, the maximum interstate corridor sharing alignment within the Preferred Route is the shortest alignment, impacts less land, including agricultural land, and reduces overall costs.

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 ALJ will preside at a contested case hearing and make a recommendation to the Commission as to whether the Route Permit should be granted and, if so, for what route. As part of the routing proceeding, the Minnesota Department of Commerce, Office of Energy Security, Energy Facility Permitting Staff will 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. 7849.5200 through 7849.5340. The rule requirements are listed in Figure ES-4 below, with references indicating where the information can be found in this Application.

Figure ES-4. Route Permit Completeness Checklist

Authority	Required Information	Where
Minn. R. 7849.5220, 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;	Section 5.0
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. 7849.5220, Subp. 3;	See Minn. R. 7849.5220, Subp.3 (A)-(H) below.
F.	identification of land uses and environmental conditions along the proposed routes;	Sections 7.1 and 7.2
G.	the names of each owner whose property is within any of the proposed routes for the high voltage transmission line;	8.1, Appendix J
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, D
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
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 3.3.1

Authority	Required Information	Where
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. 7849.5220, Subp. 3	Environmental Information	
A.	a description of the environmental setting for each site or route;	Sections 7.2.1, 7.3.1, and 7.4.1
B.	a description of the effects of construction and operation of the facility on human settlement, including, but not limited to, public health and safety, displacement, noise, aesthetics, socioeconomic impacts, cultural values, recreation, and public services;	Sections 7.2.2, 7.3.2, and 7.4.2
C.	a description of the effects of the facility on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining;	Sections 7.2.3, 7.3.3, and 7.4.3
D.	a description of the effects of the facility on archaeological and historic resources;	Sections 7.2.4, 7.3.4, and 7.4.4
E.	a description of the effects of the facility on the natural environment, including effects on air and water quality resources and flora and fauna;	Sections 7.2.5, 7.3.5, and 7.4.5
F.	a description of the effects of the facility on rare and unique natural resources;	Sections 7.2.6, 7.3.6, and 7.4.6
G.	identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route;	Sections 7.2.5, 7.3.5, and 7.4.5
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 7.2, 7.3, and 7.4

1.0 INTRODUCTION

1.1 APPLICANTS AND STATEMENT OF OWNERSHIP

Xcel Energy, a Minnesota corporation headquartered in Minneapolis, 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 electricity 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 Monticello to St. Cloud 345 kV Transmission Line Project (Project or Monticello to St. Cloud 345 kV Project). The Project consists of a proposed 345 kV transmission line between the existing Monticello Substation and a new substation, the Quarry Substation, to be located west of the city of St. Cloud. The Project comprises the eastern portion of a larger 345 kV project between Fargo, North Dakota and the Twin Cities (Twin Cities to Fargo or Fargo to Monticello 345 kV Project). The western portion of the Fargo to Monticello 345 kV Project, the Fargo to St. Cloud 345 kV Project, will be permitted in a separate route permitting proceeding.

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 by the Fargo to Monticello 345 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 Twin Cities that will help facilitate additional generation development in eastern North Dakota and western Minnesota. Finally, the Monticello to St. Cloud 345 kV Project will address significant load serving issues in the St. Cloud area where the demand for power has exceeded the capability of the area's electrical system to reliably provide power during contingencies. The Project will provide sufficient additional capacity to meet the St. Cloud area's needs until approximately 2035 to 2040. The Project is expected to be in service in December 2011.

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 the southeast Twin Cities in Minnesota; 2) a 345 kV transmission line between the southeast Twin Cities 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 K). 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 an ownership stake 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 Monticello to St. Cloud 345 kV Project are provided in Figure 1-1 below:

Figure 1-1. Ownership Percentage of Participating Utilities

Utility	Ownership Percentage
Xcel Energy	36.1
Great River Energy	25.0
Minnesota Power	14.7
Missouri River Energy Services	11.0
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 Xcel Energy and Great River Energy, on behalf of themselves and on behalf of the other potential CapX2020 Project owners. Contact information for Xcel Energy and Great River Energy is shown below:

	Xcel Energy	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. 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)). Applicants filed an application with the Commission on August 16, 2007 for a Certificate of Need to construct three 345 kV transmission line projects in Minnesota. Applicants propose to construct the Twin Cities to La Crosse (now referred to as Hampton to LaCrosse), Twin Cities to Fargo (now referred to as the Monticello to St. Cloud 345 kV Project, subject to this Application, and the Fargo to St. Cloud 345 kV Project), and Brookings to Twin Cities (now referred to as Brookings County to Hampton) 345 kV projects in the following Certificate of Need application: 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 Three CapX2020 345 kV Transmission Lines, Docket No. ET-2, E-002, et al./CN-06-1115 (Certificate of Need Application).

The Commission referred the matter to the Office of Administrative Hearings for hearing before ALJ Beverly Heydinger. Prior to the evidentiary hearing, 19 public hearings were held in the areas where the three 345 kV projects are proposed, commencing on June 17, 2008, in Moorhead, Minnesota and ending July 2, 2008, in Rochester, Minnesota. An evidentiary hearing was held from July 14, 2008, to August 1, 2008; from August 11, 2008, to August 14, 2008; and from September 11, 2008, to September 18, 2008, in St. Paul, Minnesota.

On February 27, 2009, the ALJ submitted a report to the Commission containing her Findings of Fact, Conclusions of Law and Recommendation. In that report, the ALJ determined that certificates of need for the Fargo to Monticello 345 kV Project should be granted using double-circuit capable structures with only the first circuit being implemented at this time. Applicants anticipate that the Commission will decide on the Certificate of Need Application in the spring of 2009, prior to the issuance of any Route Permit.

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 located between the city of Monticello in Wright County and St. Joseph Township in Stearns County, Minnesota. Appendix A includes a Project overview map, which identifies the Project location (Project study area). The potentially affected townships and local government units (LGUs) are identified in Figure 2-1 below.

Figure 2-1. Affected Local Government Units

Cities[1,2]		
City of Clearwater		
City of Monticello		
City of St. Augusta		
City of St. Cloud		
City of Rockville		
City of Waite Park		
Township[1] / city Name	**Township and Range**	**Sections**
Clearwater	T122N, R26W	7, 17, 18, 19, 20
	T122N, R27W	1, 2, 3, 10, 11, 12, 13, 14, 15, 24
	T123N, R27W	34
Lynden	T122N, R27W	3, 4, 5
	T123N, R27W	18, 19, 20, 27, 28, 29, 30, 32, 33, 34
	T123N, R28W	24
Monticello	T122N, R25W	30, 31, 32, 33
Rockville	T123N, R28W	6
	T123N, R29W	1
	T124N, R29W	1, 36
Silver Creek	T122N, R25W	30, 31
	T122N, R26W	16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 36
St. Augusta	T123N, R27W	7, 8, 19
	T123N, R28W	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 24
	T123N, R29W	1
	T124N, R28W	31
	T124N, R29W	36
St. Joseph	T123N, R29W	1
	T124N, R28W	30, 31
	T124N, R29W	1, 24, 25, 26, 35, 36

Township[1] Name	Township and Range	Sections
Waite Park	T123N, R28W	1
	T124N, R28W	30, 31
	T124N, R29W	36

[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 to the LGUs listed in Figure 2-1 by letters dated August 27, 2008 which identified that Xcel Energy intended to apply for a Route Permit for the Project from the Commission. 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 H.

2.2 Project Proposal

Applicants propose to construct a 345 kV single circuit transmission line on double circuit capable poles from the existing Monticello Substation adjacent to the Monticello Nuclear Power Plant in Monticello to a new Quarry Substation to be located generally west of the city of St. Cloud. The proposed Quarry Substation will connect the new double circuit capable 345 kV transmission line with the existing 115 kV transmission system that serves the St. Cloud regional area.

The proposed facility improvements are required to alleviate community service reliability needs in the St. Cloud area and are part of the larger Fargo to Monticello 345 kV Project that will also improve load serving in the southern Red River Valley; add increments of transmission capacity to the network to support the continuing development of new generation, including renewable generation; and improve the overall reliability of the regional transmission system. The specific components of the Monticello to St. Cloud 345 kV Project are described below:

- Monticello Substation – Modifications will be made at the existing Monticello Substation to accommodate the proposed 345 kV transmission line. Equipment to be installed includes 345 kV equipment (including switches, control panels, and circuit breakers), foundations and structures.

- Monticello to St. Cloud 345 kV transmission line – The proposed line will be constructed primarily on single-pole, self weathering or galvanized steel double circuit 345 kV/345 kV

structures. Only one circuit will be installed as part of this Project. The line will extend from the existing Monticello Substation and terminate at the proposed Quarry Substation.

- Quarry Substation – The Quarry Substation is proposed to be located west of St. Cloud, Minnesota. The proposed 345/115 kV substation will be up to 15 acres in size to allow for the interconnection of the proposed 345 kV transmission line, an existing 115 kV transmission line, and future high voltage transmission lines. Equipment to be installed includes 345 and 115 kV equipment (including a transformer, switches, control panels, and circuit breakers), foundations and structures. The substation yard will require access roads.

- Connection of existing 115 kV transmission line – The existing St. Cloud to Sauk River 115 kV transmission line located within the Proposed Quarry Substation Siting Areas and extending in an east-west to south-north direction will be interconnected into the proposed Quarry Substation. The existing line enters the Proposed Quarry Substation Siting Areas from the east, extends west, and then diverges directly north. The existing 115 kV line may need to be extended to interconnect with the substation depending on substation site selection.

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" 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 established 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" approximately 1,000 feet in width for the majority of the Project. Roads, property boundaries, fence lines, and other routing opportunities typically are found in 0.25-mile intervals in the land use settings 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 0.25 miles in width, the intended feature that will be paralleled and associated land use features are more discernible. Applicants also request a route of up to 1.25 miles in width in five specific areas along the Proposed Routes, particularly along the I-94 corridor, and at the Proposed Quarry Substation Siting Areas. Figures 2-3 through 2-8 depict these areas.

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. 7849. The routes studied were 1,000 feet 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 various potential alignments or transmission line alignments within the 1,000-foot-wide routes. Through this exercise, Applicants determined that the proximity of the transmission line facilities to existing transportation corridors has a significant effect on the overall impacts of the Project. In general, the overall impacts are minimized if the facilities are located immediately adjacent to the existing highway or interstate because the alignment maximizes the ability of the new facilities to share the existing right-of-way, thereby minimizing the need for new or additional right-of-way.

Given that the routes are nominally 1,000 feet in width, Applicants identified and studied multiple alignments for those routes along the interstate corridor to better understand the potential for impacts. The alignments include: maximum interstate corridor sharing (five feet off the interstate edge of right-of-way); minimum interstate corridor sharing (at least 25 feet off the interstate edge of

right-of-way); and no interstate corridor sharing (at least 75 feet off the interstate edge of right-of-way).

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 state highways, including interstates; includes a summary of related MnDOT regulations that may have a bearing on the Commission's consideration of the alternatives; and provides a comparison of the Project's potential impacts based on the proposed alignments.

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-ways, 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. 7849.5910 (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 interstates, highways and railroads. This approach implements the state's policy of non-proliferation. Applicants identified I-94 as a potential corridor for the Project. Once Applicants obtain a Route Permit from the Commission, they will seek Utility Permits from MnDOT consistent with the Commission's action, to the extent such permits are required based on the proximity of the proposed line to MnDOT's right-of-way. Minn. R. 8810.3300.

2.3.2.2 INTERSTATE HIGHWAY CORRIDORS PRESENT SPECIAL ISSUES FOR CONSIDERATION

MnDOT 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 MnDOT'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 attention working with the MnDOT 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 H). At those meetings, MnDOT and its federal counterpart, the FHWA, raised concerns regarding the placement of transmission structures on or near the I-94 right-of-way, including potential outcomes that will place poles at least 75 feet away from the I-94 right-of-way to ensure no right-of-way encroachment.

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

MnDOT has prepared guidelines permitting the longitudinal installation of utility facilities within 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).[3] This joint authority presents special challenges when considering routing a transmission line along an interstate highway. MnDOT *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 (Jan. 2003) (emphasis added).[4]

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 MnDOT'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 encourage maximum optionality and to assist

[3]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.
[4]Available at http://www.fhwa.dot.gov/reports/utilguid/if03014.pdf.

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. These options should provide the Commission, MnDOT, FHWA, other agencies and stakeholders with a broad spectrum of possible outcomes for consideration in this proceeding. Whether and how MnDOT's Accommodation Policy might apply to the proposed alignments continues to be discussed and Applicants will continue to work with MnDOT and FHWA to address their concerns to the maximum 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 to 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 met with them numerous times. Applicants will serve copies of this Application on all such agencies and look forward to working with them throughout this process.

2.3.2.4 IDENTIFICATION OF ALIGNMENTS

To further inform the routing proceedings, Applicants have evaluated the potential impacts of the proposed 345 kV line based on multiple alignments within the proposed routes. First, Applicants analyzed impacts of the transmission line with the centerline placed at five feet from the edge of I-94 right-of-way. It is Applicants' typical practice to place new facilities along roads approximately five feet onto private right-of-way to maximize right-of-way sharing with the existing infrastructure and to ensure a permanent location for the poles. When constructed in this manner, the arms of transmission structures will overhang the road right-of-way. The amount of new or additionally required right-of-way will be minimized, as will potential impacts.

Applicants also evaluated the impacts if the poles were placed at least 25 feet from the edge of I-94 right-of-way. With this alignment, there will be no physical overhang by the arms of the pole or the conductors. However, under extreme wind conditions, the conductors could sway or "blow out" over the I-94 right-of-way. This type of minimal encroachment potential occurs when the wind essentially pushes the conductors sideways and up into the airspace above the right-of-way. It should be noted that blow out encroachment occurs, if at all, at least 75 feet above the ground. At no time will conductor blow out result in encroachment that will impact MnDOT's use of the roadway or right-of-way. The amount of new or additionally required right-of-way will still be less than if there were no corridor sharing.

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 edge of I-94 right-of-way in order to completely avoid MnDOT's right-of-way. The amount of new or additionally required right-of-way will be greatest.

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

Figure 2-2. Representative Alignments

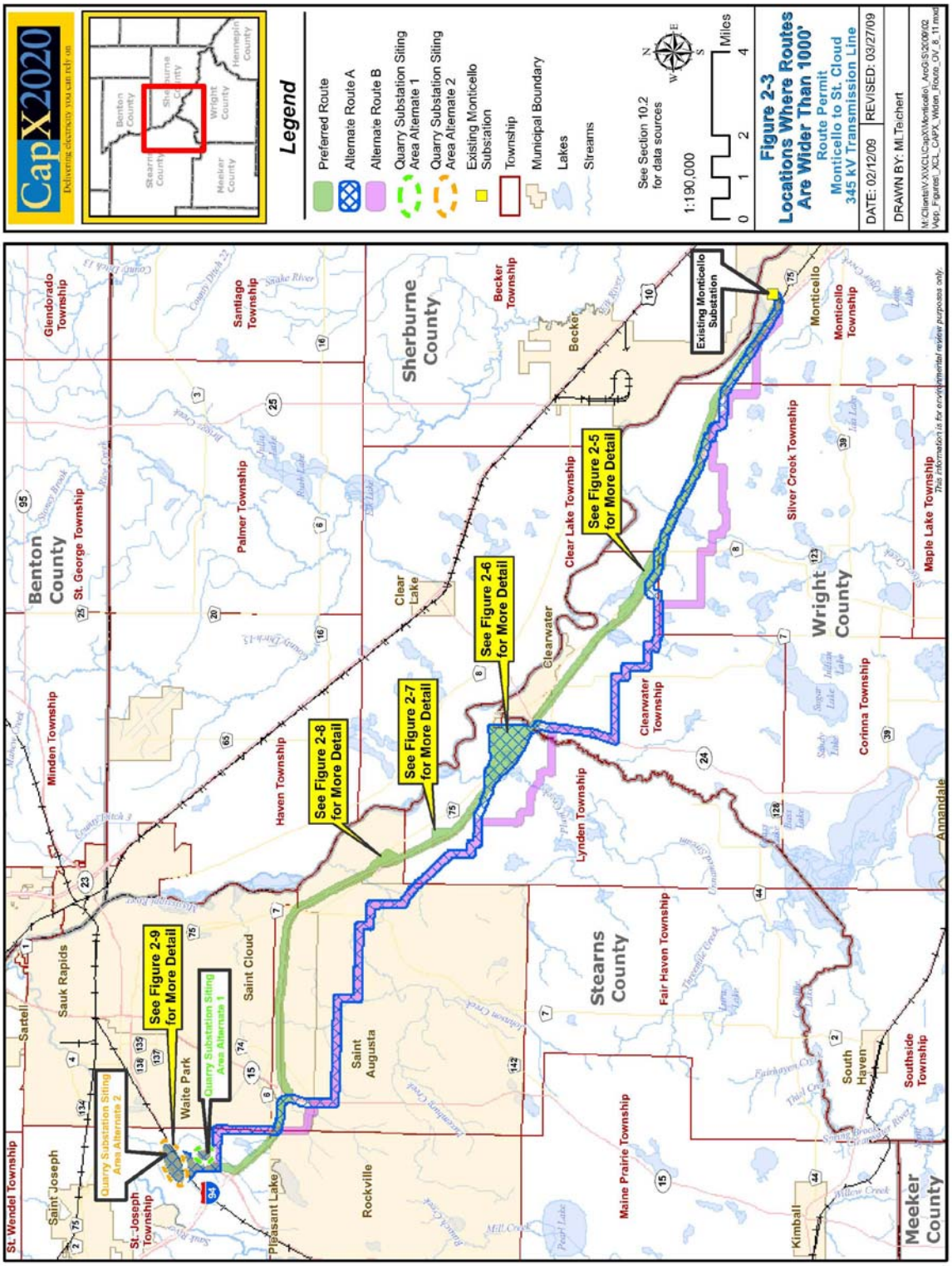
2.3.2.5 SUMMARY COMPARISON OF ALIGNMENTS

After identification of the three representative alignments, the alignments were comparatively evaluated. Charts provided in Appendix H summarize this comparison. The evaluation shows that generally, the farther away the line is from the interstate right-of-way, the greater the impacts. Additionally, the comparative evaluation shows that the Preferred Route has fewer overall impacts than Alternate Route A or Alternate Route B.

2.3.2.6 AREAS WHERE REQUESTED ROUTE WIDTH IS GREATER THAN 1,000 FEET

Applicants also request a route width of up to 1.25 miles in various areas to address site-specific considerations and interconnection at the Quarry Substation. Figure 2-3 provides an overview of the five 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 discussed in detail below.

Figures 2-4, 2-5, and 2-6 illustrate three locations where the Preferred Route exceeds 1,000 feet in width. The Preferred Route is up to 1.25 miles in width at these locations to retain the flexibility for structure placement near the I-94 right-of-way. In the event that Applicants are unable to place transmission structures less than 75 feet from the I-94 right-of-way, the proposed 345 kV transmission line will need to route further away from the I-94 right-of-way to avoid displacement of homes. The modified alignments, as depicted on Figures 2-4, 2-5 and 2-6 will be greater than 75 feet from the edge of I-94 right-of-way.

Figure 2-4. Location 1 – Preferred Route Exceeds 1,000 Feet in Width

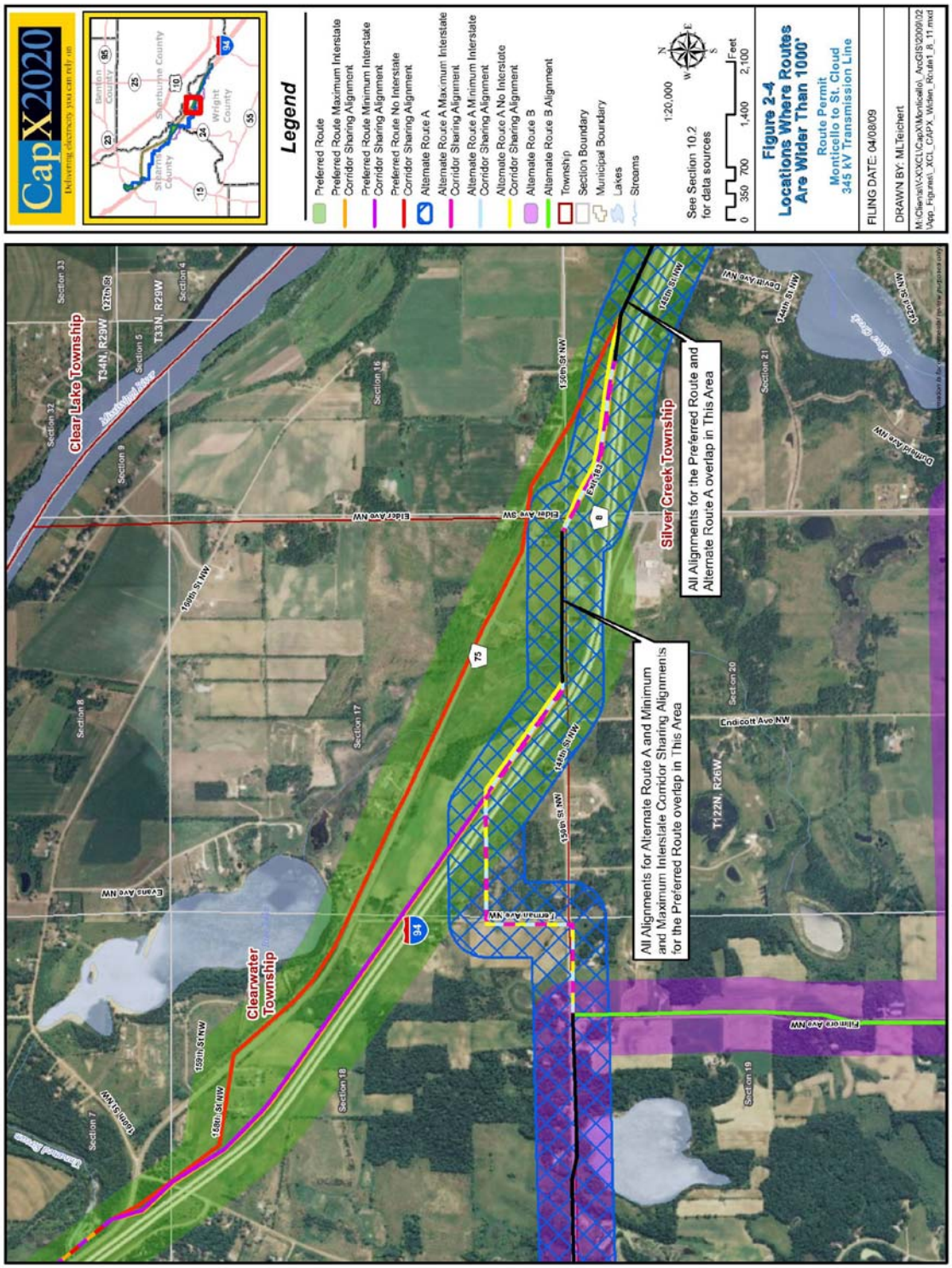


Figure 2-5. Location 2 – Preferred Route and Alternate Route A Exceed 1,000 Feet in Width

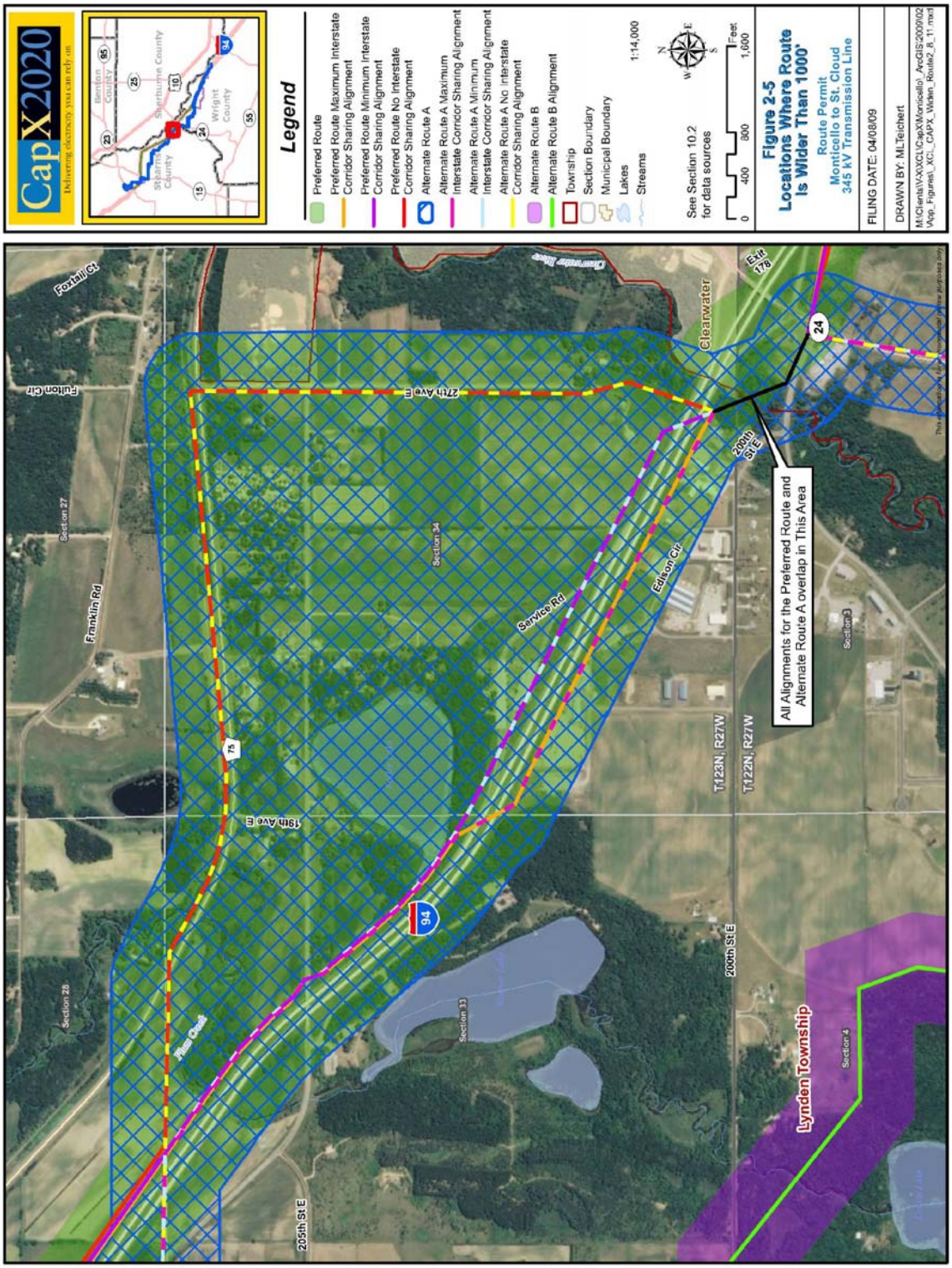


Figure 2-6. Location 3 – Preferred Route Exceeds 1,000 Feet in Width

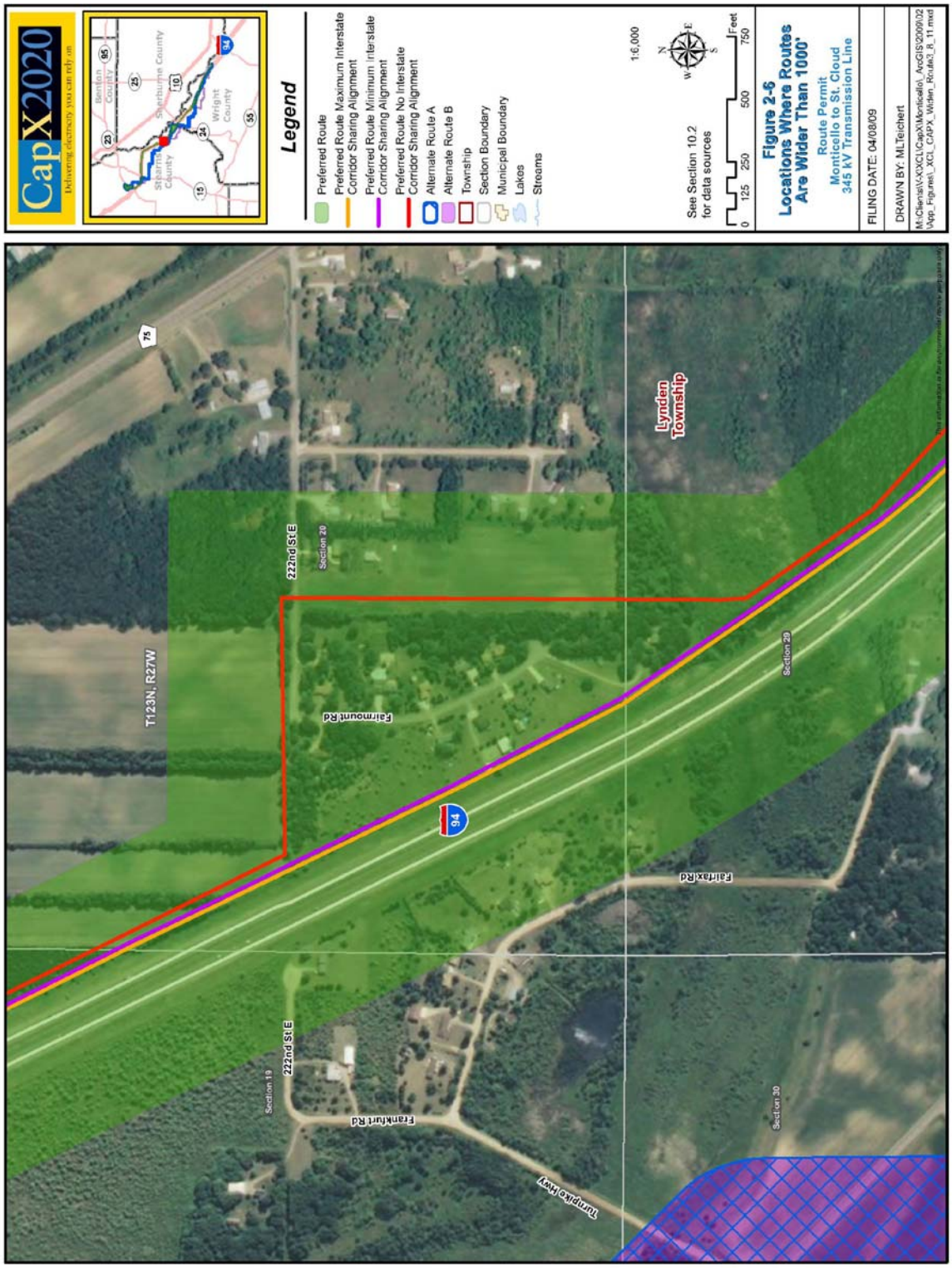


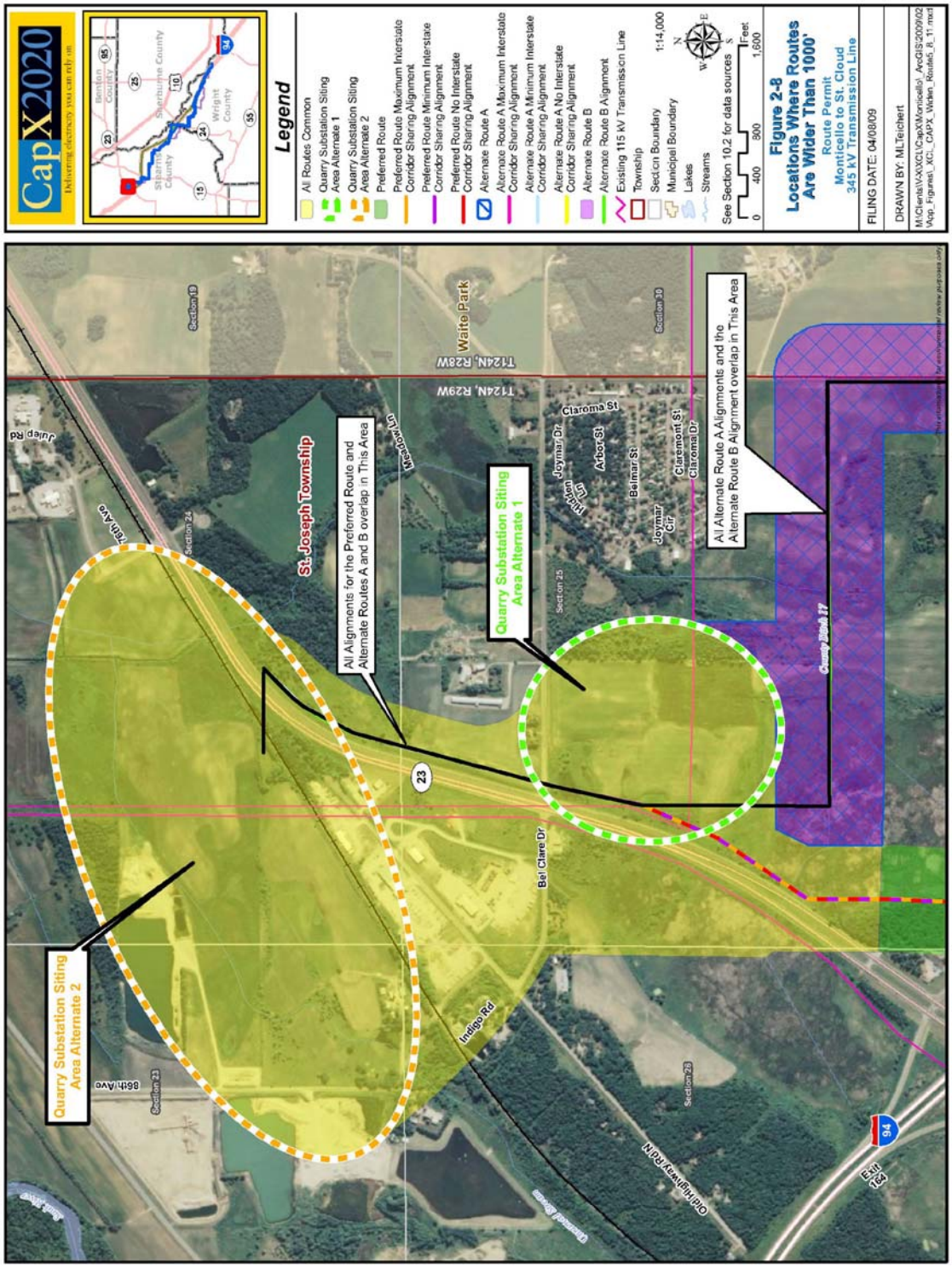
Figure 2-7 illustrates the fourth location where the Preferred Route exceeds 1,000 feet in width. The Preferred Route is up to 1.25 miles in width at this location as a result of the need to retain the flexibility to work with the existing Great River Energy 115 kV transmission line and MnDOT for structure placement either along or adjacent to the existing 115 kV transmission line, or along an existing road providing access to a non-residential unit at this location, and County Road 75.

Figure 2-7. Location 4 – Preferred Route Exceeds 1,000 Feet in Width

Quarry Substation (Proposed)

At the Proposed Quarry Substation Siting Areas, Applicants request a route up to 1.25 miles in width to allow for flexibility in substation interconnection.

Figure 2-8. Location 5 – Preferred Route, Alternate Route A, and Alternate Route B Exceed 1,000 Feet in Width



In summary, Applicants' proposed routes are generally 1,000 feet in width. In some areas, a route width of up to 1.25 miles is requested to due to site-specific considerations and to accommodate the Quarry Substation interconnection. By keeping the "route" at these widths, Applicants maintain the ability to work with landowners to develop detailed design and pole placement. If there is environmental or land use information that should cause the route to be narrowed further in some areas, Applicants anticipate affected parties will bring such information forward during this proceeding.

2.4 ASSOCIATED FACILITIES

The associated facilities for the Project include modifications at the existing Monticello Substation, construction of the proposed Quarry Substation, and the interconnection of the existing St. Cloud to Sauk River 115 kV electrical transmission line at the new Quarry Substation. No additional land is required for modifications to be made at the Monticello Substation. Applicants seek to acquire up to 40 acres for the proposed Quarry Substation to ensure adequate space for planned facilities, future transmission line interconnections and an area surrounding the proposed facility to minimize immediate encroachment with other existing or new land uses.

2.4.1 MONTICELLO SUBSTATION (EXISTING)

The existing Monticello Substation will be modified to allow for the interconnection of the proposed 345 kV transmission line. Equipment to be installed includes 345 kV equipment (including switches, control panels, and circuit breakers), foundations and structures.

2.4.2 QUARRY SUBSTATION (PROPOSED)

Construction of the proposed Quarry 345/115 kV Substation will require a graded, fenced area of up to six acres within a total area of up to 40 acres. As previously identified, Applicants have identified two Proposed Quarry Substation Siting Areas, both of which are comparable in their utility. The southern proposed site is the Quarry Substation Siting Area Alternate 1. The northern proposed site is the Quarry Substation Siting Area Alternate 2. The Quarry Substation Siting Area Alternate 1 is generally located west of St. Cloud, south and east of the existing railroad and northeast of the intersection of I-94 and State Highway 23. The Quarry Substation Siting Area Alternate 2 is generally located west of St. Cloud, north and west of the existing railroad, west of Highway 23, and generally northwest of the intersection of I-94 and Highway 23. Equipment to be installed includes 345 and 115 kV equipment (including a transformer, switches, control panels, and circuit breakers), foundations and structures. The substation yard will require access roads. The proposed Quarry Substation is discussed in more detail in Section 3.1.2.

2.4.3 Interconnection of Existing 115 kV Transmission Line

One of the major purposes of this Project is to improve reliability of service to the St. Cloud region by supplying an additional source to the existing 115 kV loop that serves the area. The existing 115 kV loop will be connected to the new Quarry Substation. Therefore, proximity to the existing St. Cloud to Sauk River 115 kV transmission line was a key consideration in substation site selection. This existing 115 kV line located within the Proposed Quarry Substation Siting Areas and extending in an east-west direction will be interconnected into the proposed Quarry Substation. The existing line enters the Proposed Quarry Substation Siting Areas from the east, extends west, and then diverges directly north. The existing 115 kV line may need to be extended to interconnect with the substation depending on substation site selection.

2.5 Project Schedule

Construction for the Project is expected to begin in the third quarter of 2010. Applicants anticipate a fourth quarter of 2011 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 Certificate of Need	Second Quarter 2009
Minnesota Route Permit	Second Quarter 2010
Environmental Permits	Third Quarter 2010
Engineering and Right-of-Way Acquisition	First Quarter 2011
Construction	Fourth Quarter 2011
In-Service	Fourth Quarter 2011
Post In-Service and Project Completion	Second Quarter 2012

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

Depending on the route selected, the Project will cost between $76.2 million and $93.5 million ($2008), depending on the route selected and summarized as follows:

Preferred Route Project Costs	
345 kV Transmission Line	$54,200,000
Monticello Substation Modifications	$7,800,000
Quarry Substation	$14,200,000
Total Project Costs:	$76,200,000
Alternate Route A Project Costs	
345 kV Transmission Line	$65,400,000
Monticello Substation Modifications	$7,800,000
Quarry Substation	$14,200,000
Total Project Costs:	$87,400,000
Alternate Route B Project Costs	
345 kV Transmission Line	$71,500,000
Monticello Substation Modifications	$7,800,000
Quarry Substation	$14,200,000
Total Project Costs:	$93,500,000

The costs identified above are based on the maximum interstate corridor sharing alignment as associated with the Preferred Route and Alternate Route A, and the single proposed alignment associated with Alternate Route B.

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.

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 strung above the electrical phases to prevent damage from lightning strikes. These cables are typically less than one inch in diameter. 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 transmission lines, including single steel pole structures and H-frame 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 or multiple pole structures will be required.

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 ACSS cables or conductors of comparable capacity. Each conductor is 954,000 circular mils or approximately 1.2 inches in diameter. Aluminum Conductor Steel Supported (ACSS) 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 will be installed for the Project.

Figure 3-2. Structure Design Summary

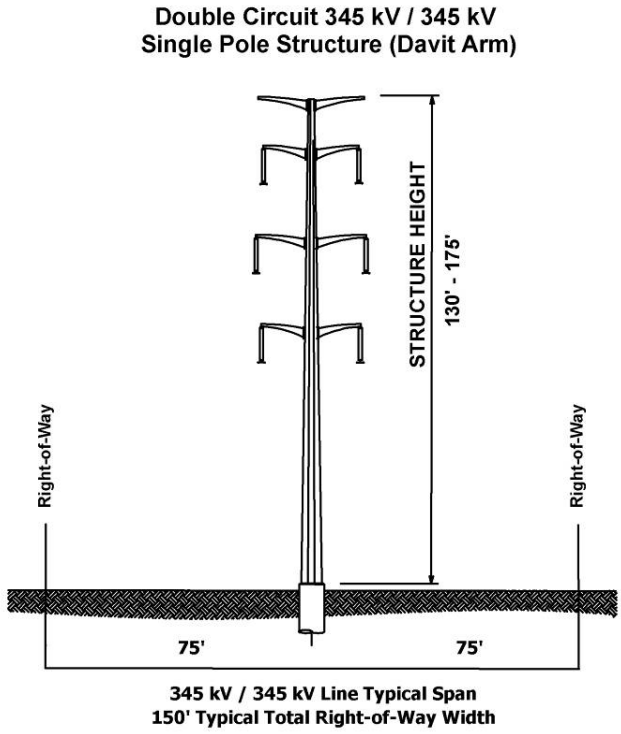
Line Type	Structure Type	Structure Material	Right-of-Way Width (feet)	Structure Height (feet)	Structure Base Diameter (inches)	Foundation Diameter (feet)	Span Between Structures (feet)
345 kV/345 kV Double Circuit	Single Pole Davit Arm	Steel	150 total	130-175	36-48 (tangent structures) 48-72 (angle structures)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

The proposed transmission line and substation 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.

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, and a representative photo, are 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 often be combined with the right-of-way needed for the transmission line. When paralleling existing right-of-way, 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, only 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. MnDOT) 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. 7849.5910.

3.1.2 SUBSTATION DESIGN

Monticello Substation (Existing)

The Monticello Substation is an existing substation adjacent to the Monticello Nuclear Power Plant in Monticello, Minnesota. No additional land or access is required for the necessary modifications at the Monticello Substation. Equipment to be installed includes 345 kV equipment (including switches, control panels, and circuit breakers), foundations and structures.

Quarry Substation (Proposed)

The Quarry Substation is a new substation proposed in the area around Minnesota State Highway 23 just north of I-94. Sites on both the east and west sides of Highway 23 are under consideration. Up to six acres of land will be graded and fenced during the initial construction. Access roads will be required for the site.

The Quarry Substation will be connected to the existing 115 kV transmission line running between the St. Cloud and Sauk River Substations.

Equipment being installed during the initial phase includes a 345 kV ring bus with three circuit beakers, two 345 kV line positions, 448 MVA, 345/115 kV transformer, 115 kV ring bus with three circuit breakers and two 115 kV line positions. The substation equipment being installed also includes the associated switches, bus work, foundations, steel structures and control equipment.

The substation will be configured to accommodate the future additions of the second circuit of the Monticello to St. Cloud 345 kV line and other future high voltage transmission lines. The fully developed substation will require a total graded and fenced area of up to 15 acres.

3.1.3 Design Options to Accommodate Future Expansion

The 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. Building the proposed line to operate as a single circuit line but constructed as a double circuit line will allow for maximizing the use of existing right-of-way and minimizing the timing associated with construction upon the installation of the future second circuit. Similarly, the proposed Quarry Substation will be designed to enable additional future transmission interconnections.

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 D.

Figure 3-4. Summary of Length of Existing Right-of-Way, Survey Lines, Natural Division Lines, and Agricultural Field Boundaries Paralleling the Proposed Routes

Route	Route Length	Right-of-Way Type		Field/Parcel Lines	None	Total Paralleled Length	% of Length Paralleled
		Transmission Line	Road				
Preferred Route	28.30	0.00	23.40	4.00	0.96	27.4	97
Alternate Route A	32.29	0.49	22.01	8.00	1.85	30.01	93
Alternate Route B	34.66	0.25	20.43	11.80	2.15	32.23	93

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 who 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 exactly 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.

If the landowner desires a second opinion on the fair market value of the property, the landowner may have an appraisal made. The landowner is reimbursed up to $500 toward the appraiser fee as long as the appraisal follows standard and accepted appraisal practices. Minn. Stat. §117.189.

In nearly all 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 Minn. Stat. §117. The process of exercising the right of eminent domain is called condemnation.

In the event of a condemnation, 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. 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 existing Monticello Substation. All modifications will be made inside the existing fenced area.

Applicants will acquire up to 40 acres for the proposed Quarry Substation. As the regulatory review process proceeds, Applicants' representatives will consult with the owners of parcels suitable for the substation to discuss the Project in detail prior to conducting any necessary surveys and soil investigation. Applicants will also develop more site-specific designs. Contacts with the owners of affected properties will continue and the negotiation and acquisition phase will begin for Applicants to obtain the necessary land or easement rights for the substation. Wherever possible, Applicants will seek to obtain necessary property rights through voluntary purchase.

During the acquisition phase, individual property owners will be advised as to the construction schedules, needed access to the site and any vegetation clearing required for the Project. The site will be cleared of the amount of vegetation necessary to construct, operate and maintain the proposed Quarry Substation. Also, any vegetation that is in the way of construction equipment may have to be removed.

Soil analysis at the substation site will be required to assist with the final design of the substation. Applicants will inform landowners at the initial survey consultation that these borings will occur. An independent geotechnical testing company will take and analyze these borings.

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 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.

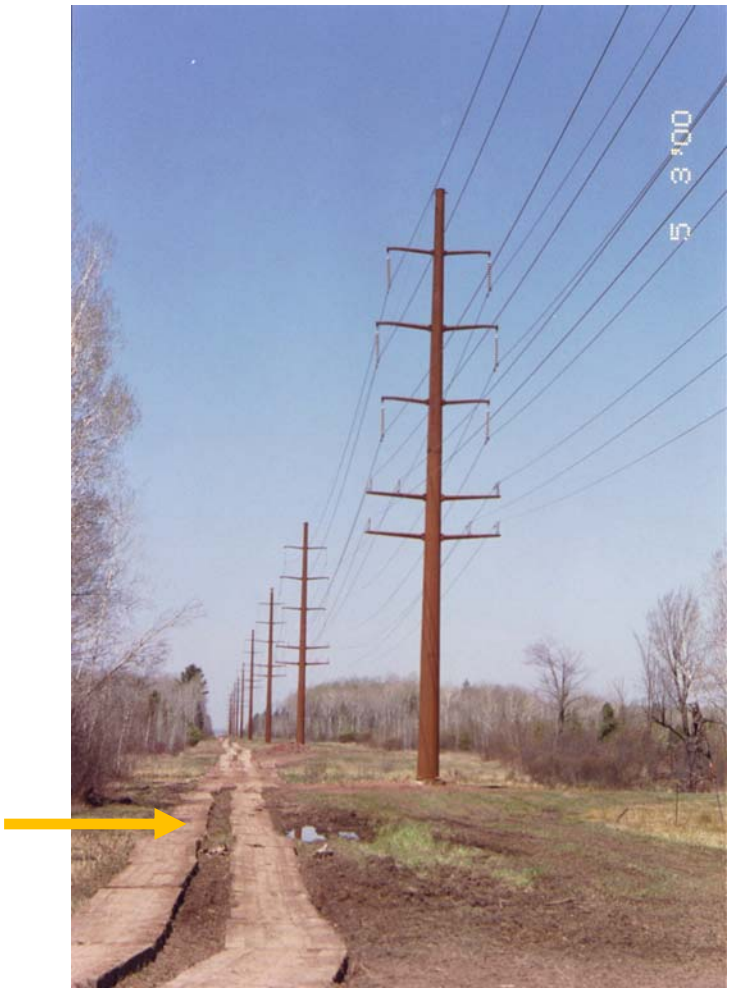
Figure 3-5. Clipping of Conductor to the Insulator

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 or more feet 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 that is not permitted, 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 Project 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 wetland areas 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 8.0.

Monticello Substation (Existing)

No additional land is required for modifications at the existing Monticello Substation. All modifications will be made inside the existing fenced area.

Quarry Substation (Proposed)

Construction is planned to begin once required approvals are obtained and property acquisition is complete. A detailed construction schedule will be developed based upon the availability of crews, weather conditions, spring load restrictions on roads and any specific area restrictions in place to minimize construction impacts.

Up to six acres of land will be graded to construct the substation. Once the site is graded, a perimeter fence will be erected to secure the site. Concrete foundations will be poured to support the substation equipment and the control house. After grading, fencing and foundation work have been completed, the substation and control house erection will commence. Applicants will also construct permanent access roads to provide for ingress and egress for its substation operating personnel and equipment maintenance.

Erosion control methods will be implemented to minimize runoff during construction. Applicants will comply with all local, state, NESC, and internal standards regarding clearance to ground, clearance to other utilities in the area, clearance to buildings, and other applicable standards.

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 maximum 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 the 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 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 fields (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 (Aug. 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 (Aug. 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 (Aug. 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, 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).

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 assure 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

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/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.

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. Figure 3-10 provides magnetic fields at the expected peak and average current flows as projected for the year 2011.

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
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

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.

3.4.4 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 a rare event 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 collocating the new facilities with existing facilities on common structures was not feasible because of reliability and safety. Numerous 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 the 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 the 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 the capability to add a second circuit at a later date.

Some stakeholders have inquired about whether the new 345 kV segments could be "triple circuited" with an existing transmission line. In addition to the reliability consideration outlined above, triple circuit structures pose additional maintenance safety issues. Operating a bucket truck on a de-energized line and performing inspection and maintenance duties increases the chances of incidental contact with the adjacent energized line. Depending on the physical circumstances, it may be necessary to de-energize all three lines when performing maintenance on one of the lines. The de-energization of all circuits will require analysis to ensure adequate system reliability. In addition, if all lines are not de-energized, the energized line(s) could induce stray voltage on the de-energized line(s), which will require additional grounding measures for appropriate personnel safety.

Because of these reliability and safety concerns, utilities 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 was driven by an extensive public participation and agency coordination effort. Almost 40,000 addresses in the overall Fargo to Monticello project study area received regular mailings, which informed landowners of the Project, described opportunities to be involved in the routing 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 Minnesota Rule 7849.5910 (and reflected in Minn. Stat. §216E.03, subd. 7) to develop the Proposed Routes. This process is described below. Additional supporting information is provided in Appendix D.

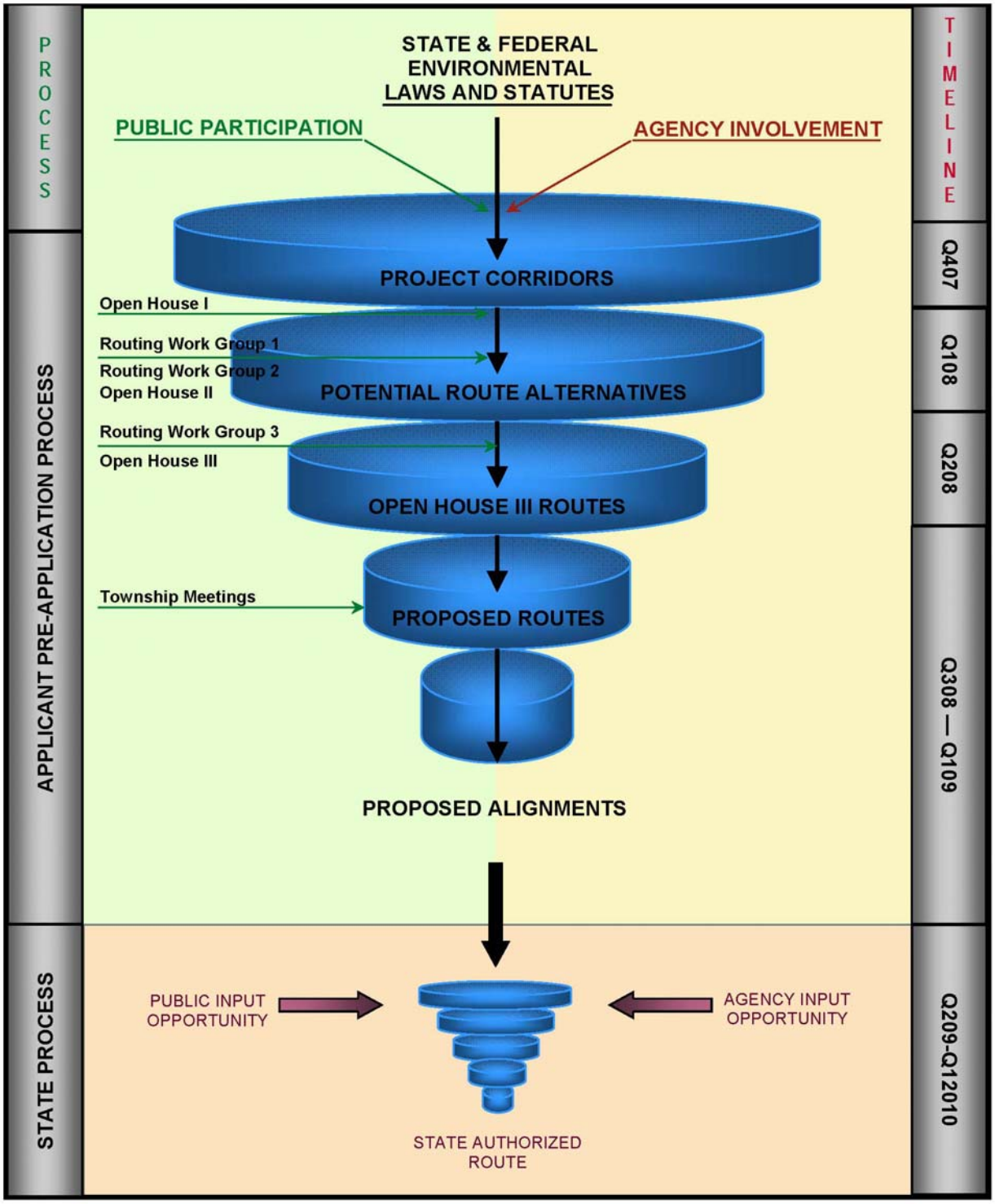
4.1 SUMMARY OF ROUTE DEVELOPMENT SELECTION PROCESS

Applicants began their analysis by collecting GIS data from local, state and federal agencies; data repositories; or other data sources within the project corridors that had been identified. 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.

Three milestone stages associated with route development were identified. These included a Project overview and discussion of Project need, development of potential route alternatives, and selection of Proposed Routes. Transitioning from the project corridors to the development of potential route alternatives first required a discussion of the siting criteria to be used for comparative analysis. The siting criteria, which coincide with Minn. R. 7849.5910, 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 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. For example, landowners commented on the location of existing electrical transmission facilities and a proposed interchange. A landowner helped identify where an existing 115 kV transmission line had been relocated on his property. Proposed transportation infrastructure projects were identified by a number of landowners and stakeholders. Further, the consensus of stakeholder and public participants 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 into potential route alternatives which were generally 1,000 feet in width, preliminary proposed routes (also referred to as the "Open House III Routes"), and ultimately the Proposed Routes subject to this Application. The total number of segments or opportunities studied for route development and selection well exceeds 300 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 a year 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, as well as ground-truth available information. Through this process, Applicants developed three routes: the Preferred Route, Alternate Route A, and Alternate Route B. All three 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 to accommodate site-specific considerations and substation interconnection.

4.2 Regulatory Framework and Guiding Principles

The primary set of principles guiding the route selection process were the factors set forth in Minnesota Rule 7849.5910:

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.

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. 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 ROUTE CORRIDORS

The preliminary proposed routes (also referred to as the "Open House III Routes") studied were 1,000 feet in width, based on geographic features, which was deemed appropriate for transmission line routing. The Open House III Routes were presented to stakeholders and the general public at the final stakeholder working group meeting and subsequent open houses. Following these public meetings, Applicants met several times with MnDOT 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 whom had participated. The consensus of stakeholder and public participants 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. MnDOT and FHWA representatives stated their concerns with routing the proposed line nearer to the I-94 right-of-way and crossing the interstate with the proposed line.

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 proposed alignments include: maximum interstate corridor sharing (five feet from the I-94 edge of right-of-way); minimum interstate corridor sharing (at least 25 feet from the I-94 edge of right-of-way); and no interstate corridor sharing (at least 75 feet from the I-94 edge of right-of-way).

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, MnDOT'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 MnDOT 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 a significant effect on the overall impacts of the

Project. In general, the overall impacts are minimized if the facilities are located immediately adjacent to existing roadways or interstates because the alignment maximizes the ability of the new facilities to 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 potential route alternatives, the selection of Proposed Routes, and the identification of proposed alignments within the final 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 Minnesota Department of Natural Resources (MDNR) provided information on native plant communities, sites with biodiversity significance, streams and lakes, wildlife management areas and rare natural features. The United States Fish and Wildlife Service (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:

- 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, field lines and property lines, where an existing corridor (*e.g.*, fence line, drainage ditch or access road) is present;

- 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 D.

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 is as follows:

- Sharing road right-of-way and following existing property lines and fence lines helped to minimize land use impacts, particularly land uses such as existing residential use and agricultural use. Approximately 60 percent of the Preferred Route shares road right-of-way.

- Impacts to existing residences are minimized; and

- Environmental impacts are minimized to the extent feasible.

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

4.4.1 PROJECT CORRIDORS

The first step in the route development process was the identification of project corridors. Project corridors were developed for the overall Fargo to Monticello 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 for multiple means of connectivity or contiguous parallel of existing transportation and transmission corridors, as well as other existing linear features such as property lines, within the regional area. 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 overall 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 Project and resulting benefits. Section 8.0 describes the public participation process in greater detail.

4.4.2 Potential Route Alternatives

The development of potential route alternatives 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.

Environmental Siting Criteria

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. 7849.5910 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.

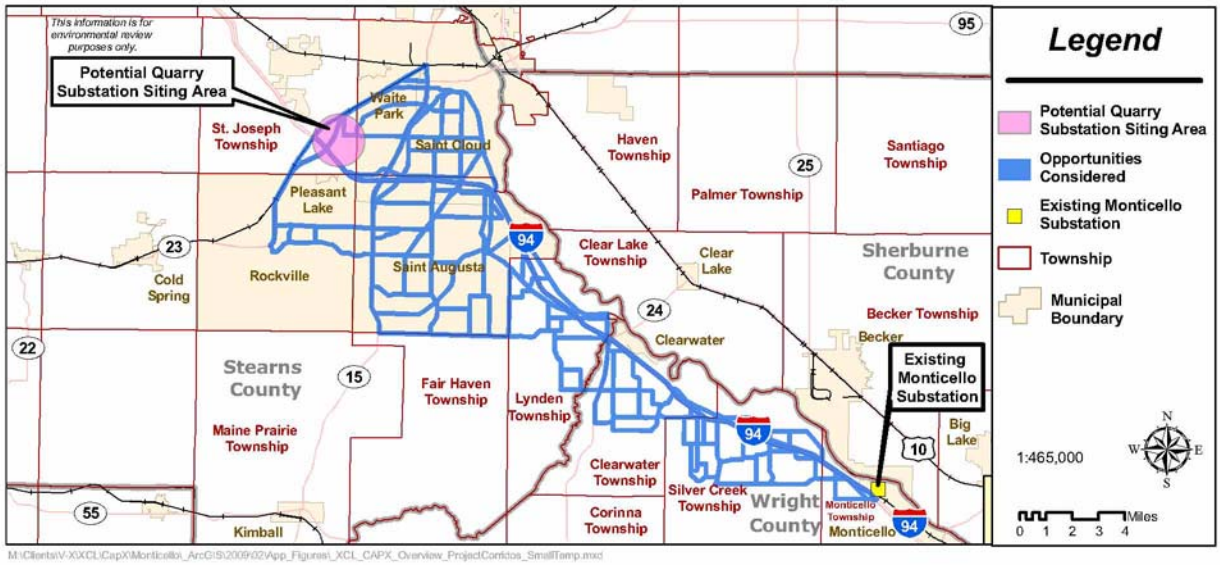
Data and information associated with the environmental siting criteria were collected and incorporated into GIS. A geospatial database was developed. The opportunities and sensitivities were then mapped. The composite mapping of the opportunities and sensitivities occurring within the Fargo to Monticello 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 Monticello 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 Project would be divided into the Monticello to St. Cloud and Fargo to St. Cloud 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 Fargo to Monticello Project. They were also asked to identify the key factors to be considered in the route development and selection process. As previously identified, the consensus of those that attended these meetings 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.

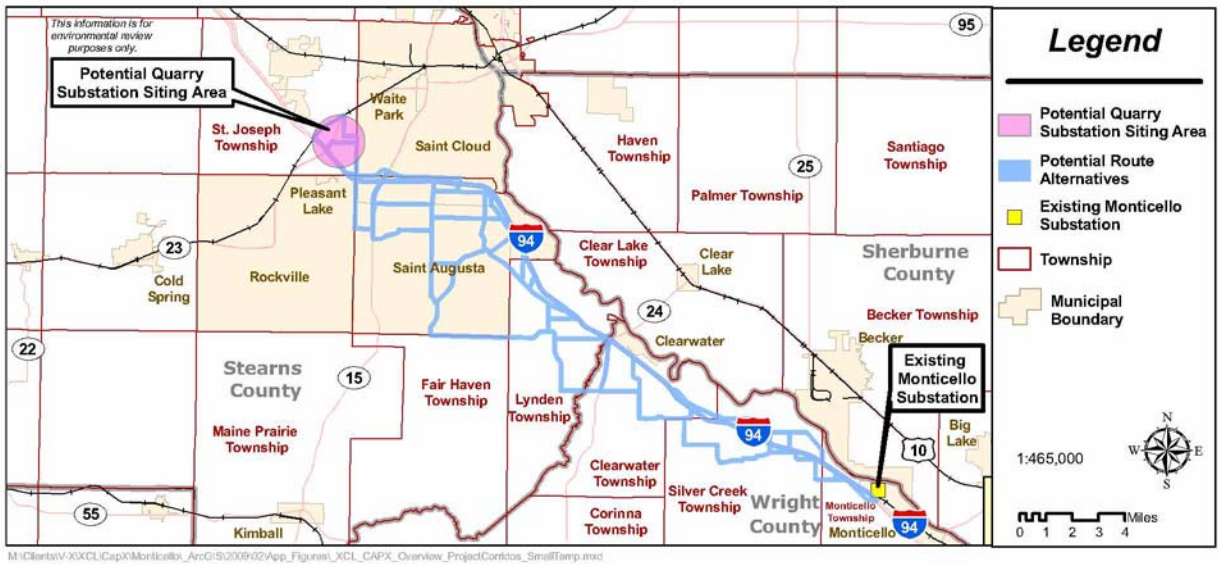
Figure 4-3. Opportunities to be Further Studied (Study Corridors)



Comparative Analysis

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 would require a greater estimated number of angle structures, was removed from further consideration. The remaining study corridors were carried forward as the potential route alternatives. Figure 4-4 below depicts the potential route alternatives.

Figure 4-4. Potential Route Alternatives



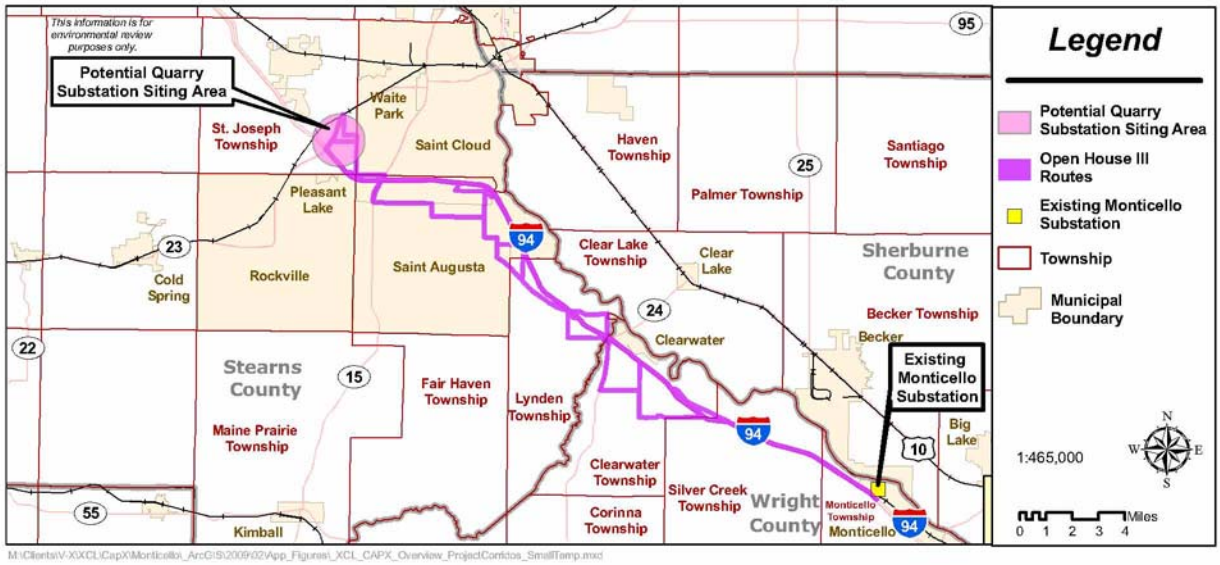
The potential route alternatives, and the methodology as to how they were developed, were presented to stakeholders and the general public at a second series of stakeholder working group meetings and a second series of open houses in March 2008.

4.4.3 Proposed Routes

Similar to the development of the potential route alternatives, the Proposed Routes 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 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 potential route alternative having a greater number of existing residences within proximity, or would 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 would avoid the displacement of existing residences. Therefore, to avoid displacing homes, these route alternatives were either removed from consideration or modified as appropriate. Also, because the location of the new substation in the St. Cloud area was still not identified, an additional route option was added to allow for more substation interconnection flexibility. The remaining route alternatives were carried forward as the Open House III Routes. Figure 4-5 below depicts the Open House III Routes.

Figure 4-5. Open House III Routes



The Open House III Routes were those routes that were initially identified as proposed routes and presented to stakeholders and the general public at a third series of stakeholder working group meetings and open houses in May 2008. The methodology or rationale associated with the development of the Open House III Routes was also presented.

4.4.4 Proposed Alignments

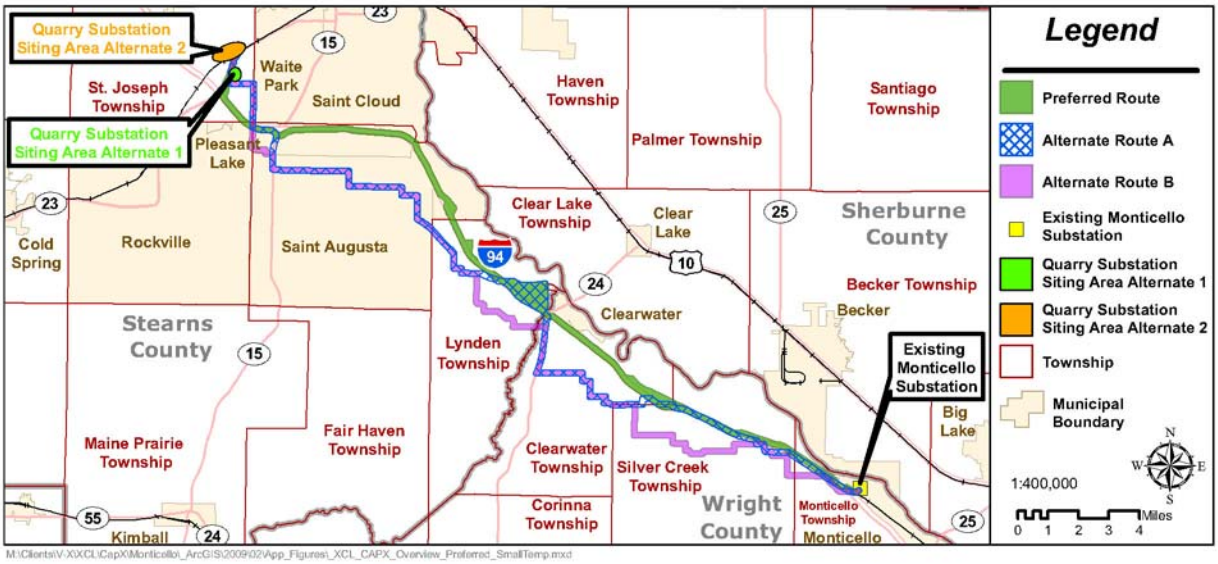
Subsequent to the third phase of the public participation process, Applicants participated in various meetings with MnDOT and the FHWA. During these meetings, MnDOT and the FHWA identified concerns associated with placing the proposed 345 kV transmission line along I-94. To assist in the analysis of 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 proposed alignments include: maximum interstate corridor sharing (five feet from the I-94 edge of right-of-way); minimum interstate corridor sharing (at least 25 feet from the I-94 edge of right-of-way); and no interstate corridor sharing (at least 75 feet from the I-94 edge of right-of-way).

Figure 4-6. Sample View of Proposed Alignments

4.4.5 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 existing Monticello Substation and the Proposed Quarry Substation Siting Areas. More than 300 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 D. Figure 4-7 below depicts the Proposed Routes.

Figure 4-7. Proposed Routes



4.4.6 Route Alternatives Removed from Consideration

In addition to the Proposed Routes described in this Application, Applicants also evaluated and rejected over two-thirds of more than 300 segments. The route alternatives that were rejected included various segments along mostly secondary roadways, property lines, or cross-country route options where sensitive routing criteria 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 D.

4.5 Substation Site Selection

The identification of the Proposed Quarry Substation Siting Areas was largely based on the following considerations:

- Proximity to the load center within the greater St. Cloud area;
- Land within the general area, up to 40 acres in size, that could accommodate the proposed Quarry Substation and the interconnection of future transmission lines;
- Proximity to the existing St. Cloud to Sauk River 115 kV transmission line that will be interconnected with the proposed Quarry Substation;
- Availability of existing access to the site;
- Site suitability from a constructability perspective, as well as with regard to the potential for environmental impacts and required permitting;
- Site control feasibility; and
- Proximity to less compatible land uses such as developed residential use areas.

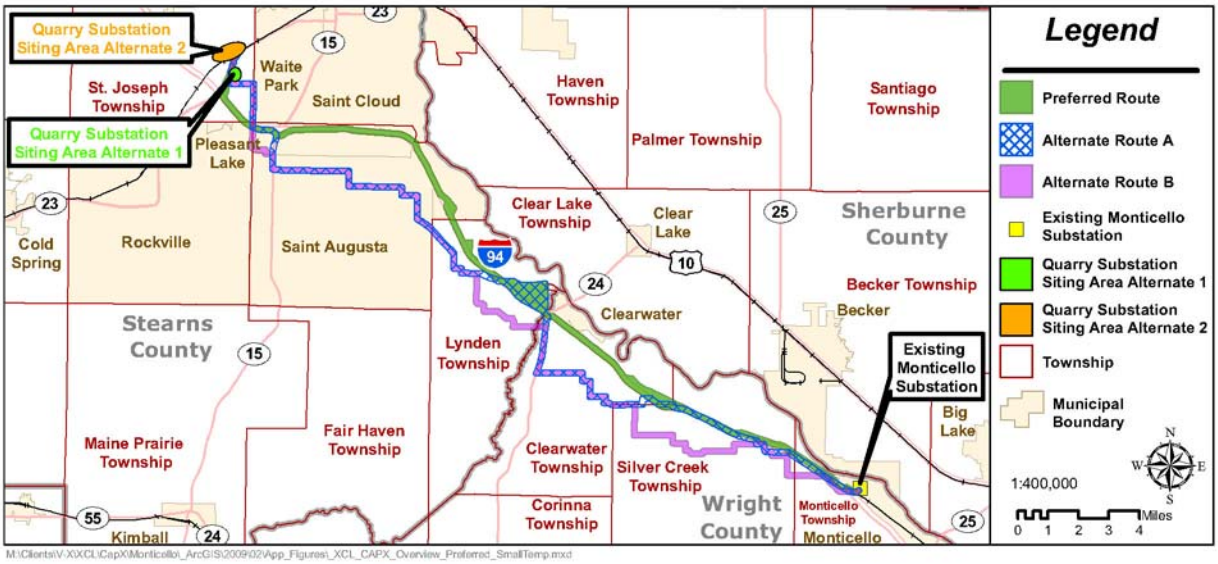
Following a desktop assessment and review through field and aerial reconnaissance, it was determined that the two Proposed Quarry Substation Siting Areas best met these considerations to locate a new substation in the St. Cloud area. Both siting areas are located within the St. Cloud area, include an area large enough to accommodate the future expansion of the proposed Quarry Substation, and are located immediately near the existing St. Cloud to Sauk River 115 kV transmission line. Both siting areas can be readily accessed although the northern siting area, the Quarry Substation Siting Area Alternate 2, is superior from an access perspective. The northern siting area includes an area that has been used previously and continues to be used for aggregate mining. While the northern siting area may be considered more compatible for a proposed substation from a land use perspective, past aggregate mining activities within the area may suggest additional constructability considerations. While the southern siting area, the Quarry Substation Siting Area Alternate 1, may not have the same constructability considerations, this area is also nearer to a residential use area. The southern siting area is approximately 1,000 feet from a nearby residential use area. However, an existing tree line occurs between the residential use area and the southern siting area. Based on these various considerations and data that is presently available, Applicants have identified a preference for the southern siting area. Both siting areas will, however,

sufficiently accommodate the proposed Quarry Substation and as new data becomes available regarding land use, wetlands, and soils, the preference could be modified.

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 chapter describes in more detail the Monticello to St. Cloud 345 kV Project Proposed Routes. The Proposed Routes include the Preferred Route, Alternate Route A, and Alternate Route B. 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, which are also depicted on Figure 5-1 below. The route descriptions begin at the existing Monticello Substation and end at the Quarry Substation Siting Area Alternate 1. Detailed route maps are provided in Appendices B and C.

Figure 5-1. Proposed Routes



5.1 PREFERRED ROUTE AND PROPOSED QUARRY SUBSTATION SITES

The Preferred Route connects the existing Monticello Substation and the proposed Quarry Substation, paralleling the I-94 corridor for the majority of its length. As discussed in Sections 2.3 and 4.3, multiple alignments associated with the Preferred Route were also identified. The proposed alignments within the Preferred Route include an alignment that allows for maximum interstate corridor sharing (located five feet from the edge of the I-94 right-of-way); an alignment that allows for minimum interstate corridor sharing (located at least 25 feet from the edge of the I-94 right-of-way); and an alignment that involves no interstate corridor sharing (located at least 75 feet from the edge of the I-94 right-of-way).

Through various phases of analysis, Applicants determined that the proximity of the transmission line facilities to existing transportation corridors has a significant effect on the overall impacts of the Project. In general, the overall impacts are minimized if the facilities are located immediately adjacent to existing roadways or interstates because this alignment maximizes the ability of the new facilities to share the existing right-of-way.

While the Preferred Route is at least 1,000 feet in width, existing linear features of which Applicants intend to parallel occur within the Preferred Route. For the purpose of clearly describing the Preferred Route, the existing linear features that will be paralleled by the proposed 345 kV transmission line are identified for reference. The requested route width is based on a distance of 500 feet on either side of these linear features for a total width of at least 1,000 feet. Locations where Applicants seek additional route width are discussed in detail in Section 2.3.2.6.

5.1.1 PREFERRED ROUTE

The description of the Preferred Route includes a discussion of the location of the maximum interstate corridor sharing alignment. Applicants recognize that other alignments with a lesser degree of corridor sharing will be in the same general location but will be adjusted depending on the final selection.

The Preferred Route, shown in Figure 5-2, extends southwest from the existing Monticello Substation, on property currently owned by Northern States Power Company, until intersecting an abandoned railroad corridor. The Preferred Route then extends along the abandoned railroad corridor to the northwest. The maximum corridor sharing alignment will extend along the southwest side of the abandoned railroad corridor.

East of Barton Avenue NW, the Preferred Route parallels County Road 75 for a short distance, crosses the road, and then continues along County Road 75 until just east of Clementa Avenue NW.

The maximum corridor sharing alignment will move from the northeast side of County Road 75 to the southwest side, and then continue along the southwest side of the road.

Before reaching Clementa Avenue NW, the Preferred Route crosses County Road 75 and parallels I-94 for a short distance, crossing back across County Road 75 west of Clementa Avenue NW, and then continuing along County Road 75. The maximum corridor sharing alignment will move from the southwest side of County Road 75 to the northeast side of I-94, and then back to the northeast side of County Road 75.

Just east of Elder Avenue NW, the Preferred Route again crosses County Road 75 to extend along I-94. The maximum corridor sharing alignment moves from the southwest side of the abandoned railroad corridor to the northeast side of I-94, to the north side of 150th Street NW, and back to the northeast side of I-94. The Preferred Route will be up to 1.25 miles in width in this general area. Figure 2-4 depicts this area in greater detail.

Just past Grover Avenue NW, the Preferred Route crosses County Road 75 and extends along the road for a short distance until crossing back across County Road 75 to resume parallel with I-94. The maximum corridor sharing alignment moves from the northeast of I-94 to the northeast side of County Road 75, and back to the northeast side of I-94.

Where County Road 7 is parallel to I-94, the maximum corridor sharing alignment moves from the northeast side of I-94 to the southwest side for a short distance. The alignment then returns to the northeast side of I-94 just west of the Stearns County and Wright County boundary.

From this point to just west of the intersection of I-94 and County Road 143, the Preferred Route will be up to 1.25 miles in width in this general area. Figure 2-5 depicts this area in greater detail. The maximum corridor sharing alignment in this area follows the northeast side of I-94.

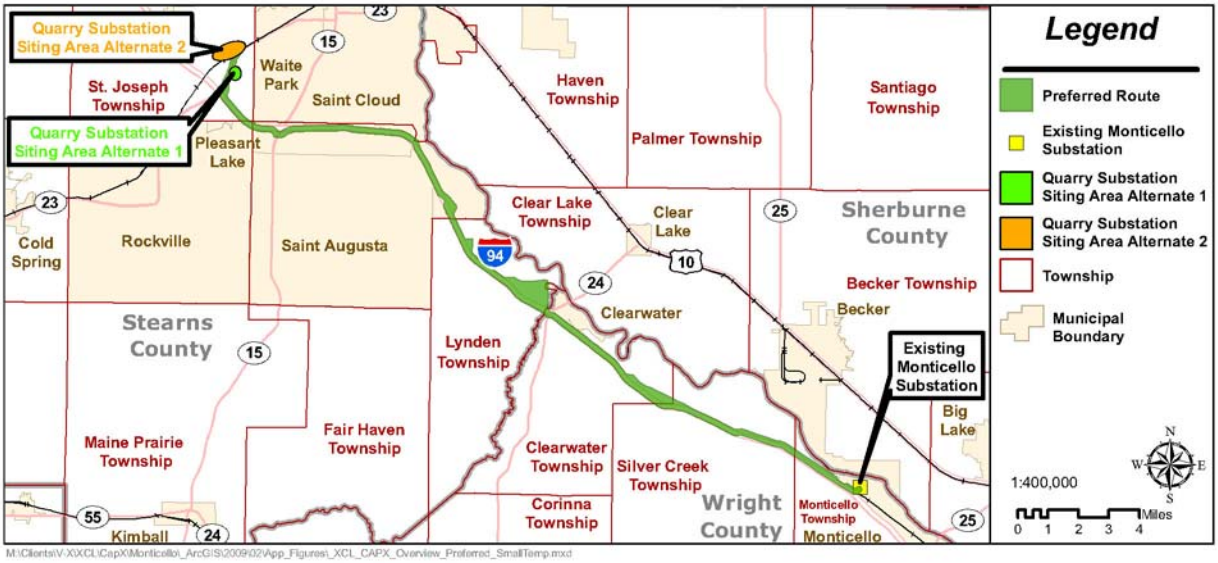
Just east of 222nd Street E, the Preferred Route will be up to 1.25 miles in width until 222nd Street E. Figure 2-6 depicts this area in greater detail. The maximum corridor sharing alignment in this area follows the northeast side of I-94.

From 222nd Street E to Glenn Carlson Drive, the Preferred Route follows the northeast side of I-94. From Glenn Carlson Drive to just east of 240th Street, the Preferred Route will be up to 1.25 miles in width. Figure 2-7 depicts this area in greater detail. The maximum corridor sharing alignment in this area follows the northeast side of I-94 until 8th Avenue. The alignment will then follow 8th Avenue until just past the intersection of 8th Avenue and County Road 75. From this intersection, the alignment extends west for a short distance before following the northeast side of I-94.

Just east of Cooper Avenue S, the maximum corridor sharing alignment moves from the northeast side of I-94 to the southwest side for a short distance and then back to the northeast side of I-94. Just west of County Road 136, the alignment crosses again from the northeast side of I-94 to the southwest side. East of County Road 6, the alignment crosses to the northeast side of I-94.

At the intersection of State Highway 23 and I-94, the Preferred Route extends north along Highway 23 to the Quarry Substation Siting Area Alternate 1. The maximum corridor sharing alignment parallels the northeast side of I-94 and the east side of Highway 23 until terminating at the Quarry Substation Siting Area Alternate 1.

Figure 5-2. Preferred Route



5.1.2 QUARRY SUBSTATION SITING AREA ALTERNATE 1

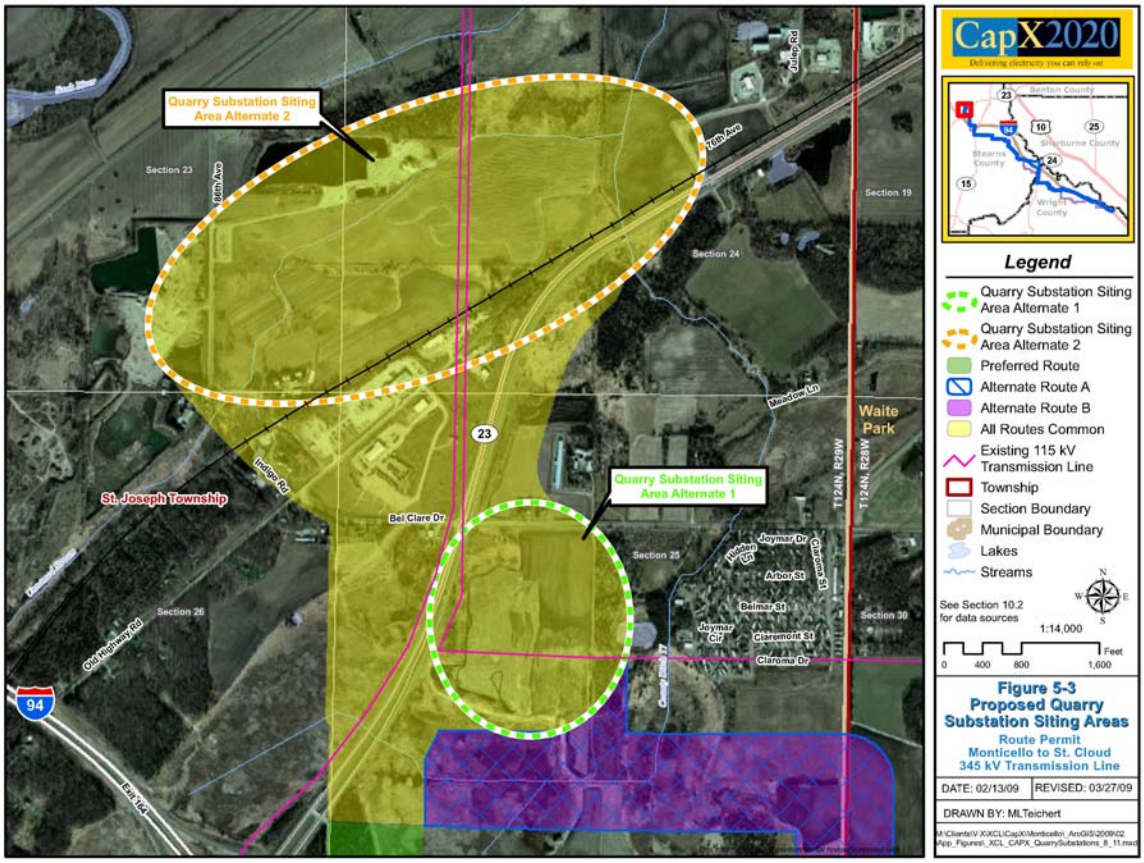
The Quarry Substation Siting Area Alternate 1 is located along the east side of State Highway 23 approximately 0.5 miles northeast of the I-94 and Highway 23 interchange. Both Proposed Quarry Substation Siting Areas are depicted on Figure 5-3 below. Up to 40 acres will be acquired for the proposed Quarry Substation. The width of any of the Proposed Routes will be up to 1.25 miles in width in the vicinity of the Quarry Substation Siting Area Alternate 1 to allow for substation interconnection flexibility.

5.1.3 QUARRY SUBSTATION SITING AREA ALTERNATE 2

The Quarry Substation Siting Area Alternate 2 is located along the north side of State Highway 23 approximately one mile northwest of the I-94 and Highway 23 interchange. The width of any of the

Proposed Routes will be up to 1.25 miles in width in the vicinity of the Quarry Substation Siting Area Alternate 2 to allow for substation interconnection flexibility.

Figure 5-3. Proposed Quarry Substation Siting Areas



5.2 ALTERNATE ROUTE A

Similar to the Preferred Route, Alternate Route A is at least 1,000 feet in width. There are existing linear features that occur within Alternate Route A of which Applicants intend to parallel. For the purpose of clearly describing Alternate Route A, the existing linear features that will be paralleled by the proposed 345 kV transmission line are identified for reference. The requested route width is based on a distance of 500 feet on either side of these linear features for a total width of at least 1,000 feet. The Alternate Route A maximum corridor sharing alignment, which maximizes interstate corridor sharing when located immediately adjacent and at least five feet from the edge of the I-94 right-of-way, will extend along these features. Locations where Applicants seek additional route width are discussed in detail in Section 2.3.2.6.

Alternate Route A extends southwest from the existing Monticello Substation, on property currently owned by Northern States Power Company, until intersecting an abandoned railroad corridor. Alternate Route A then extends along the abandoned railroad corridor for a brief distance before crossing I-94. Alternate Route A extends along I-94 to the northwest. The maximum corridor sharing alignment will move from the southwest side of the abandoned railroad corridor to the southwest side of I-94.

Alternate Route A diverges from I-94 at 135th Street NW and extends west along 135th Street NW. Alternate Route A then extends north and west along Baker Avenue NW, and then north along Barton Avenue NW for a short distance before resuming parallel with I-94. The maximum corridor sharing alignment will move from the southwest side of I-94 to the north side of 135th Street NW. The alignment then crosses 135th Street NW to the south side of the road, continuing along the west and south side of Baker Avenue NW. The alignment moves from the south side of Baker Avenue NW to the west side of Barton Avenue NW, and then to the southwest side of I-94.

Just southeast of Curtis Avenue NW, Alternate Route A crosses I-94 to then extend along County Road 75. The maximum corridor sharing alignment moves from the southwest side of I-94 to the northeast side of County Road 75.

Alternate Route A crosses County Road 75 east of Elder Avenue NW and then extends along I-94. The maximum corridor sharing alignment moves from the northeast side of County Road 75 to the northeast side of I-94.

West of Elder Avenue NW, Alternate Route A crosses I-94 and extends west to Ferman Avenue NW. Alternate Route A extends south along Ferman Avenue NW, west along 150th Street NW, and north along Grover Avenue NW. The maximum corridor sharing alignment moves from the northeast side of I-94 to the west side of Ferman Avenue NW. The alignment then extends along the south side of 150th Street NW before crossing to the north side of the road. The alignment continues along the north side of 150th Street NW and then along the east side of Grover Avenue NW.

Alternate Route A extends west for a short distance, north, and then back west to County Road 7. The maximum corridor sharing alignment moves from the east side of Grover Avenue NW to extend west, north, and back west to County Road 7.

Alternate Route A extends north along County Road 7 and west along 160th Street NW. The maximum corridor sharing alignment moves from the east side of County Road 7 to the south side of 160th Street NW for a short distance, crosses to the north side of the road, and then crosses back to the south side of the road.

At the intersection of State Highway 24 and 160th Street NW, Alternate Route A extends north along Highway 24. The maximum corridor sharing alignment moves from the south side of 160th Street NW to the east side of Highway 24.

Alternate Route A crosses Highway 24 to then extend to the northwest along I-94. The maximum corridor sharing alignment moves from the east side of Highway 24 to the southwest side of I-94, and then crosses to the northeast side of I-94 south of where County Road 143 intersects I-94. The route width of Alternate Route A will be up to 1.25 miles in width in this general area. Figure 2-5 depicts this area in greater detail.

North of where County Road 143 intersects I-94, Alternate Route A crosses I-94 and extends northwest along County Road 143. The maximum corridor sharing alignment moves from the northeast side of I-94 to the southwest side of County Road 143. Just east of County Road 44, Alternate Route A then extends west from County Road 143 for a short distance, briefly north, west again for a short distance, and then north to County Road 44. The alignment moves west for a short distance from the southwest side of County Road 143, briefly north, west for a short distance, and then north to County Road 44.

Alternate Route A extends to the northwest along County Road 44. The maximum corridor sharing alignment extends along the southwest side of County Road 44. Southeast of the intersection of County Road 44 and County Road 7, Alternate Route A extends north for a short distance, west along 238th Street and crossing County Road 7, briefly north, and then west to 41st Avenue. The alignment extends north from the southwest side of County Road 44 to 238th Street. The alignment then extends west along the north side of 238th Street and north along an existing 115 kV transmission line after crossing County Road 7. The alignment then extends briefly north along the existing 115 kV transmission line, and west to 41st Avenue.

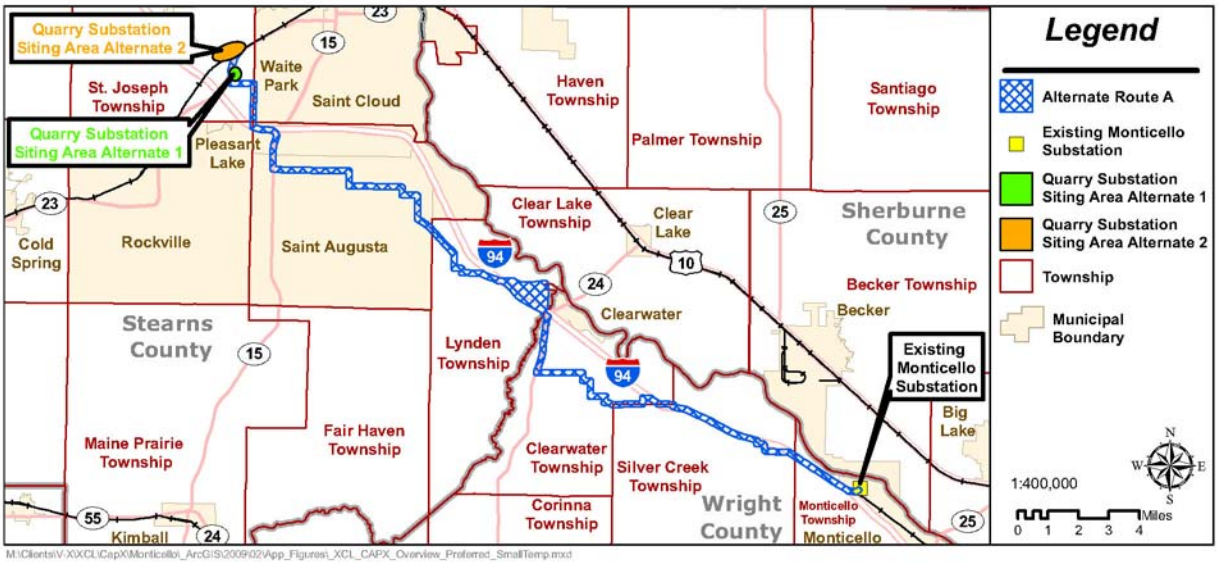
Alternate Route A extends north along 41st Avenue to County Road 115. The maximum corridor sharing alignment extends along the east side of 41st Avenue. Alternate Route A and its alignment then extend west to State Highway 15.

Upon reaching Highway 15, Alternate Route A extends north along the highway to the I-94 and Highway 15 interchange where Alternate Route A then extends west along I-94. The maximum corridor sharing alignment extends along the west side of Highway 15 and the southwest side of I-94.

Alternate Route A diverges from I-94 and extends north along County Road 137. The maximum corridor sharing alignment moves from the southwest side of I-94 to the east side of County Road 137 for a short distance, crosses to the west side of County Road 137, and continues north along the road. At a point generally northeast of the State Highway 23 and I-94 interchange, Alternate Route

A extends west to Highway 23 and then slightly north to the Quarry Substation Siting Area Alternate 1. The alignment will be located along the east side of Highway 23 until terminating at the Quarry Substation Siting Area Alternate 1.

Figure 5-4. Alternate Route A



5.3 ALTERNATE ROUTE B

Similar to the Preferred Route and Alternate Route A, Alternate Route B is at least 1,000 feet in width. There are existing linear features that occur within Alternate Route B of which Applicants intend to parallel. For the purpose of clearly describing Alternate Route B, the existing linear features that will be paralleled by the proposed 345 kV transmission line are identified for reference. The requested route width is based on a distance of 500 feet on either side of these linear features for a total width of at least 1,000 feet. Locations where Applicants seek additional route width are discussed in detail in Section 2.3.2.6.

Alternate Route B, shown on Figure 5-5, extends southwest from the existing Monticello Substation, on property currently owned by Northern States Power Company, until intersecting an abandoned railroad corridor. Alternate Route B then extends along the abandoned railroad corridor for a brief distance before extending west across I-94 until 127th Avenue NE. Alternate Route B then extends northwest and west along 127th Avenue NE until 135th Street NW. The Alternate Route B alignment moves from the west side of the abandoned railroad corridor, west across I-94, to the northeast side of 127th Avenue NE. The alignment crosses 127th Avenue NE and extends along the southwest side of the road until the road turns west. Where 127th Avenue NE extends to the west, the alignment will extend along the south side of the road, cross to the north side for a brief distance, and then

back to the south side until the intersection of 127th Avenue NE and 135th Street NW (also identified as Aladdin Avenue NW in this area).

Before 135th Street NW turns west, Alternate Route B diverges from the road and extends west along a property line for a short distance before extending back north to converge again with 135th Street NW. At 135th Street NW, which becomes Baker Avenue NW, Alternate Route B extends west, north, and west again along Baker Avenue NW. The Alternate Route B alignment extends along the west side of the 135th Street NW for a short distance, west along a property line and back north along a property line to converge again with 135th Street NW, which becomes Baker Avenue NW. The alignment extends along the south side of Baker Avenue NW and 137th Street NW to Clementa Avenue NW.

At Clementa Avenue NW, Alternate Route B extends south along Clementa Avenue NW and then west along 135th Street NW. The Alternate Route B alignment extends south along the east side of Clementa Avenue NW and then west for a brief distance along property lines until the intersection of 135th Street NW and Crofoot Avenue NW.

Alternate Route B then extends west along 135th Street NW, then south for a brief distance along Dempsey Avenue NW, then west along 134th Street NW. The Alternate Route B alignment follows the north side of 135th Street NW for a short distance before crossing over to the south side of the road. The alignment then follows the south side of the road until Dempsey Avenue NW, where it extends south along the east side of Dempsey Ave NW. The alignment then extends along the north side of 134th Street NW.

East of the intersection of 134th Street NW and County Road 8, Alternate Route B extends north and then west until County Road 8. The Alternate Route B alignment extends northwest for a short distance before turning west along a property line for a short distance. The alignment then extends north and west along property lines to County Road 8.

Alternate Route B extends west along 140th Street NW until Fillmore Avenue NW, where it then extends north along Fillmore Ave NW until 150th Street NW. The Alternate Route B alignment will follow the north side of 140th Street NW until Fillmore Ave NW where it will turn north and follow the west side of Fillmore NW for a short distance, before crossing to the east side of Fillmore Ave NW and following the road until 150th Street NW.

Alternate Route B extends west along 150th Street NW, and north along Grover Avenue NW. The Alternate Route B alignment extends along the south side of 150th Street NW before crossing to the north side of the road. The alignment continues along the north side of 150th Street NW and then along the east side of Grover Avenue NW.

Alternate Route B extends west for a short distance, north, and then back west to County Road 7. The Alternate Route B alignment moves from the east side of Grover Avenue NW to extend west, north, and back west to County Road 7.

Alternate Route B extends north along County Road 7 and west along 160th Street NW. The Alternate Route B alignment moves from the east side of County Road 7 to the south side of 160th Street NW for a short distance, crosses to the north side of the road, and then crosses back to the south side of the road.

At the intersection of State Highway 24 and 160th Street NW, Alternate Route B extends north along Highway 24. The Alternate Route B alignment moves from the south side of 160th Street NW to the east side of Highway 24.

Alternate Route B follows Highway 24 north until it intersects with County Road 7 just south of I-94. Alternate Route B then extends west until 195th Street E where it continues to follow 195th Street E for a short distance. The Alternate Route B alignment extends along the east side of Highway 24 until it intersects County Road 7 where it turns west and follows a property line until 195th Street E where it extends along the north side of 195th Street E for a short distance.

Alternate Route B then extends north, then west, then northwest until 200th Street E. The Alternate Route B alignment parallels a property line from 195th Street E north for a short distance before turning west following another property line, and then extends cross country in a northwest direction for a short distance.

Alternate Route B then follows 200th Street E until County Road 44, where it turns north and follows County Road 44 until 203rd Street. The route extends west along 203rd Street until County Road 44, then turns north and follows County Road 44 until just south of the intersection with County Road 143. The Alternate Route B alignment follows the north side of 200th Street E until County Road 44 where it follows the east side of County Road 44 until 203rd Street. The alignment then turns and follows the north side of 203rd Street until County Road 44, where it extends along the east side of County Road 44 until just south of the intersection with County Road 143.

Just east of County Road 44, Alternate Route B then extends west from County Road 143 for a short distance, briefly north, west for a short distance, and then north to County Road 44. The Alternate Route B alignment moves west for a short distance from the southwest side of County Road 143, briefly north, west for a short distance, and then north to County Road 44.

Alternate Route B extends to the northwest along County Road 44. The Alternate Route B alignment extends along the southwest side of County Road 44. Southeast of the intersection of County Road 44 and County Road 7, Alternate Route B extends north for a short distance, west

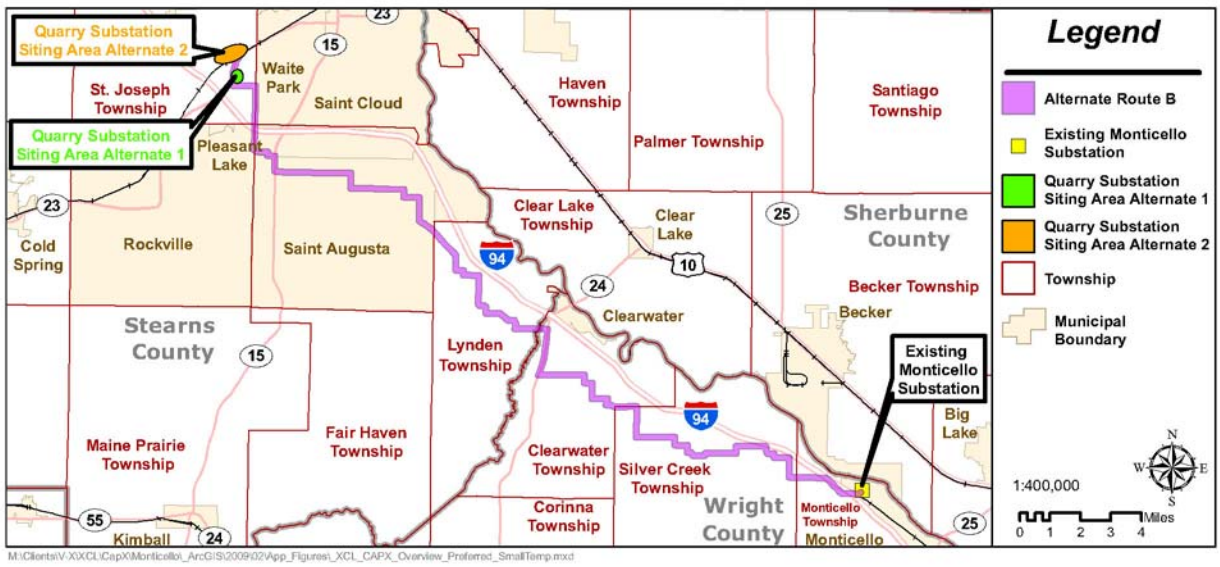
along 238th Street and crossing County Road 7, briefly north, and then west to 41st Avenue. The Alternate Route B alignment extends north from the southwest side of County Road 44 to 238th Street. The alignment extends west along the north side of 238th Street and then north along an existing 115 kV transmission line after crossing County Road 7. The alignment then extends briefly north along the existing 115 kV transmission line, and then west to 41st Avenue.

Alternate Route B extends north along 41st Avenue to County Road 115. The Alternate Route B alignment extends along the east side of 41st Avenue. Alternate Route B and its alignment then extend west to State Highway 15.

Upon reaching Highway 15, Alternate Route B extends north along the highway until just north of 250th Street. Alternate Route B then extends west along a property line until County Road 137. The Alternate Route B alignment extends along the west side of Highway 15.

Alternate Route B then extends north along County Road 137 until I-94 where it crosses I-94 and continues along County Road 137. The Alternate Route B Alignment extends along the east side of County Road 137 south of I-94. The Alternate Route B alignment then follows the east side of County Road 137 north of I-94 before moving to the west side for a short distance. At a point generally northeast of the State Highway 23 and I-94 interchange, Alternate Route B extends west to Highway 23 and then slightly north to the Quarry Substation Siting Area Alternate 1. The Alternate B alignment extends along the east side of Highway 23 until terminating at the substation siting area.

Figure 5-5. Alternate Route B



6.0 RATIONALE FOR SELECTING PREFERRED ROUTE

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 the Alternate Routes because it impacts fewer homes, makes better use of existing rights-of-way, minimizes impacts to agricultural land uses, minimizes impacts to natural resources and archaeological sites, and is shorter in length. Because the Preferred Route is shorter in length, it impacts less land, including agricultural land, and is less costly.

Applicants also analyzed the potential impacts associated with various alignments in response to concerns raised by MnDOT and the FHWA. Applicants concluded that the nearer the proposed 345 kV transmission line is to the I-94 right-of-way (maximum corridor sharing), the lesser the overall impact and, in particular, the lesser the potential for impact to existing residences. While an alignment farther away from the I-94 right-of-way will still allow for impacts to existing residences to be minimized, additional interstate crossings would be necessary to do so.

Applicants selected three Proposed Routes: the Preferred Route, Alternate Route A, and Alternate Route B. There are multiple alignments associated with the Preferred Route and Alternate Route A.

Figure 6-1 summarizes Applicants' application of the factors set forth in Minn. R. 7849.5910 to the Preferred Route and Alternate Routes. The summary provided in Figure 6-1 is based on the maximum corridor sharing alignment, associated with both the Preferred Route and Alternate Route A, in further comparison to Alternate Route B.

Figure 6-1. Summary Comparison of Proposed Routes

Factor	Preferred Route	Alternate Route A	Alternate Route B	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	Will likely affect visual quality and aesthetics within close proximity of the transmission line; parallels the Mississippi River and a scenic byway for a portion of the route; is located within a State Wild and Scenic River District for a portion of the route. Recreational resources are also located nearby. There are 62 homes within 500 feet of the Preferred Route maximum interstate corridor sharing alignment.	Will likely affect visual quality and aesthetics within close proximity of the transmission line; parallels the Mississippi River and a scenic byway for a portion of the routes; is located within a State Wild and Scenic River District for a portion of the route. Recreational resources are also located nearby. There are 85 homes within 500 feet of the Alternate Route A maximum interstate corridor sharing alignment.	Will likely affect visual quality and aesthetics within close proximity of the transmission line; parallels the Mississippi River and a scenic byway for a portion of the route; is located within a State Wild and Scenic River District for a portion of the route. Recreational resources are also located nearby. There are 120 homes within 500 feet of the Alternate Route B alignment.	All three routes impact aesthetics similarly. The Preferred Route parallels the Mississippi River, a scenic byway, and a State Wild and Scenic River District for a slightly longer distance than Alternate Routes A and B, and is located closer in proximity. There are less homes within 500 feet of the Preferred Route alignment than Alternate Routes A or B.
Cultural Values	No impacts to cultural values are anticipated.			
Recreation	Nearby recreational resources include a State Wild and Scenic River District, several parks, a county trail and a scenic byway. There are two Scientific and Natural Areas, but no Wildlife Management Areas or Waterfowl Production Areas within one mile of the Preferred Route. No direct impacts on recreation are anticipated.	Nearby recreational resources include a State Wild and Scenic River District, several parks, a county trail and a scenic byway. There are two Scientific and Natural Areas and one Wildlife Management Area, but no Waterfowl Production Areas within one mile of Alternate Route A. No direct impacts on recreation are anticipated.	Nearby recreational resources include a State Wild and Scenic River District, several parks, a county trail and a scenic byway. There are two Scientific and Natural Areas and one Wildlife Management Area, but no Waterfowl Production Areas within one mile of Alternate Route B. No direct impacts on recreation are anticipated.	All three routes would impact recreational resources similarly.
Public Services	No impacts to Public Services are anticipated.			
Effects on Public Health and Safety				
Public Health and Safety	The Applicants will ensure that all safety requirements are met during the construction and operation of the proposed transmission line and associated facilities.			

Factor	Preferred Route	Alternate Route A	Alternate Route B	Summary
Effects on Land-based Economies				
Agriculture	Based on the Preferred Route maximum interstate corridor sharing alignment, approximately 4.5 acres of permanent impacts to agriculture are anticipated for construction of the transmission line.	Based on the Alternate Route A maximum interstate corridor sharing alignment, approximately 3.5 acres of permanent impacts to agriculture are anticipated for construction of the transmission line.	Based on the Alternate Route B alignment, approximately 3.9 acres of permanent impacts to agriculture are anticipated for construction of the transmission line.	The Preferred Route would impact 0.9 less acres than Alternate Route A and 1.3 less acres than Alternate Route B when comparing the various alignments.
Forestry	No impacts to economically important forestry will occur.			
Tourism	No impacts to tourism are anticipated.			
Mining	There are two aggregate mines located within 0.25 miles of the Preferred Route. One of these is inactive. There are also bedrock quarries located near where the Preferred Route approaches the Proposed Quarry Substation Siting Area Alternate 2.	There are four aggregate mines located within 0.25 miles of Alternate Route A. Two of the mines are prospected mines. There are also bedrock quarries located near where Alternate Route A approaches the Proposed Quarry Substation Siting Area Alternate 2.	There are three aggregate mines located within 0.25 miles of Alternate Route B. One of these is an inactive pit and the other two are prospected pits. There are also bedrock quarries located near where Alternate Route B approaches the Proposed Quarry Substation Siting Area Alternate 2.	There are the least number of aggregate mining resources located near the Preferred Route. There is the same amount of bedrock mining resources located near all three Proposed Routes. The Proposed Quarry Substation Siting Area Alternate 2 hosts an area previously used and still used for aggregate mining.

Factor	Preferred Route	Alternate Route A	Alternate Route B	Summary
Effects on Archaeological and Historic Resources				
Archaeological Resources	Based on the Preferred Route maximum interstate corridor sharing alignment, there are eight known archaeological sites within 500 feet of the alignment.	Based on the Alternate Route A maximum interstate corridor sharing alignment, there are seven known archaeological sites within 500 feet of the alignment.	Based on the Alternate Route B alignment, there is one known archaeological site within 500 feet of the alignment.	Although there are a greater number of known archaeological sites associated with the Preferred Route and Alternate Route A, there is an increased potential for impact to the archaeological site associated with Alternate Route B due to the site's location within the route. The known sites associated with the Preferred Route and Alternate Route A are mostly located near the exterior portions of the routes.
Historic Resources	Based on the Preferred Route maximum interstate corridor sharing alignment, there are nine known historic sites within 500 feet of the alignment.	Based on the Alternate Route A maximum interstate corridor sharing alignment, there are six known historic sites within 500 feet of the alignment.	Based on the Alternate Route B alignment, there are two known historic sites within 500 feet of the alignment.	Alternate Route B has the potential to affect the fewest number of known historic sites.
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	Approximately 1,540 square feet of wetlands and approximately two acres of forested wetlands will be impacted within the right-of-way of the Preferred Route maximum interstate corridor sharing alignment. The Preferred Route has 12 stream crossings.	Approximately 1,045 square feet of wetlands and approximately three acres of forested wetlands will be impacted within the right-of-way of the Alternate Route A maximum interstate corridor sharing alignment. Alternate Route A has 16 stream crossings.	Approximately 1,320 square feet of wetlands and approximately three acres of forested wetlands will be impacted within the right-of-way of the Alternate Route B alignment. Alternate Route B has 16 stream crossings.	The Preferred Route has fewer direct wetland impacts and crosses fewer streams than both Alternate Route A and Alternate Route B.

Factor	Preferred Route	Alternate Route A	Alternate Route B	Summary
Flora	No habitat will be removed from Wildlife Management Areas, Scientific and Natural Areas, USFWS Waterfowl Production Areas or USFWS easements. A total of six Minnesota County Biological Survey Sites of Biodiversity Significance will be crossed.	No habitat will be removed from Wildlife Management Areas, Scientific and Natural Areas, USFWS Waterfowl Production Areas or USFWS easements. A total of six Minnesota County Biological Survey Sites of Biodiversity Significance will be crossed.	No habitat will be removed from Scientific and Natural Areas, USFWS Waterfowl Production Areas or USFWS easements. One Wildlife Management Area (Hoglund WMA) is crossed by Alternate Route B. No removal of habitat from it is anticipated as it is along the very edge of the route. A total of six Minnesota County Biological Survey Sites of Biodiversity Significance will be crossed.	Although no habitat would be removed from Wildlife management Areas, Scientific and Natural Areas, USFWS Waterfowl Production Areas or USFWS easements, it is likely that the impacts to flora outside these lands would be the least for the Preferred Route as it is the shortest route and it parallels the most existing right-of-way.
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.	There is a potential for temporary displacement of wildlife during construction and for loss of small amounts of habitat in Alternate Route B; 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 of similar type for all three Proposed Routes; however, it is likely they would be the least for the Preferred Route as it is the shortest route.
Effects on Rare and Unique Natural Resources				
Rare and Unique Natural Resources	A total of 10 state-listed threatened, endangered or candidate species were identified within one mile of the Preferred Route.	A total of 11 state-listed threatened, endangered or candidate species were identified within one mile of Alternate Route A.	A total of 11 state-listed threatened, endangered or candidate species were identified within one mile of Alternate Route B.	The Preferred Route has fewer recorded threatened, endangered, or candidate species than Alternate Route A or Alternate Route B.
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, Alternate Route A, and Alternate Route B maximize energy efficiencies and mitigate adverse environmental effects. The new substations are designed to accommodate facility additions in the future.			
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 all three Proposed Routes.			

Factor	Preferred Route	Alternate Route A	Alternate Route B	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 96% of the Preferred Route maximum interstate corridor sharing alignment uses or parallels existing right-of-way, survey lines, natural division lines or agricultural field lines. Approximately 320 acres of new right-of-way would be required for the Preferred Route maximum interstate corridor sharing alignment.	Approximately 94% of the Alternate Route A maximum interstate corridor sharing alignment uses or parallels existing right-of-way, survey lines, natural division lines or agricultural field lines. Approximately 406 acres of new right-of-way would be required for the Alternate Route A maximum interstate corridor sharing alignment.	Approximately 94% of the Alternate Route B alignment uses or parallels existing right-of-way, survey lines, natural division lines or agricultural field lines. Approximately 458 acres of new right-of-way would be required for the Alternate Route B alignment.	The Preferred Route uses or parallels the greatest length of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries. The Preferred Route will also require the least amount of new right-of-way.
Use of Existing Transportation, Pipeline and Electrical Transmission Systems or Right-of-Ways				
Existing transportation, pipeline and electrical transmission systems or right-of-ways	Approximately 83% of the Preferred Route maximum interstate corridor sharing alignment follows the rights-of-way of existing transportation, pipeline and electrical transmission systems.	Approximately 70% of the Alternate Route A maximum interstate corridor sharing alignment follows the rights-of-way of existing transportation, pipeline and electrical transmission systems.	Approximately 60% of the Alternate Route B 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	All three 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 is approximately 28 miles in length. The Preferred Route project costs are estimated at $76.2 million ($2008 dollars).	Alternate Route A is approximately 32 miles in length. Alternate Route A project costs are estimated at $87.4 million ($2008 dollars).	Alternate Route B is approximately 35 miles in length. Alternate Route B project costs are estimated at $93.5 million ($2008 dollars).	The shorter length of the Preferred Route (four miles shorter than Alternate Route A and seven miles shorter than Alternate Route B) contributes to the lower overall cost of the Project.
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. The 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 fewer acres of land.

Factor	Preferred Route	Alternate Route A	Alternate Route B	Summary
Route Specific	Based on the Preferred Route maximum interstate corridor sharing alignment, approximately 2.6 acres of permanent agricultural land impact is anticipated.	Based on the Alternate Route A maximum interstate corridor sharing alignment, approximately 3.5 acres of permanent agricultural land impact is anticipated.	Based on the Alternate Route B alignment, approximately 3.9 acres of permanent agricultural land impact is anticipated.	
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 three Proposed Routes.			The Preferred Route is shorter in length and is anticipated to require fewer poles that Alternate Route A or Alternate Route B.
Route Specific	The Preferred Route is approximately 28 miles in length and will require approximately 149 poles.	Alternate Route A is approximately 32 miles in length and will require approximately 170 poles.	Alternate Route B is approximately 35 miles in length and will require approximately 182 poles.	

Based on this comparison, Applicants concluded that the Preferred Route, and specifically the maximum interstate corridor sharing alignment, best conserves natural resources, minimizes environmental impacts, and minimizes 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 costs of the mitigative measures proposed are considered nominal.

Certain impacts are more appropriately measured from a fixed location, such as an alignment. The impacts include, for example, impacts to existing residences, which were measured based on the maximum interstate corridor sharing alignment. Other factors, such as land use classifications, are more appropriately analyzed at the 1,000-foot route width level. Throughout this section, both types of measurements are described depending on the specific impact.

With regard to associated facilities of the Project, the existing St. Cloud to Sauk River 115 kV transmission line extends into the two Proposed Quarry Substation Siting Areas. Since potential impacts were assessed for the larger substation siting areas, there is no separate discussion of potential impacts specifically associated with interconnecting the existing line at the proposed Quarry Substation.

7.1 REGIONAL DESCRIPTION OF ENVIRONMENTAL SETTING

The Proposed Routes extend northwest from the city of Monticello and traverse the city of Monticello and Silver Creek and Clearwater Townships in Wright County and the cities of Rockville, St. Augusta, St. Cloud, and Waite Park and Lynden and St. Joseph Townships in Stearns County. Existing land use in the area is predominantly agricultural or undeveloped land; however, low density, single-family, or rural residential uses also occur. Interspersed commercial and industrial uses occur along I-94 and other existing roadways. Local zoning districts traversed by the Proposed Routes include mostly agricultural-related classifications although residential, commercial, and industrial zoning districts are also affected.

Topography

Stearns and Wright Counties lie in the northern rim of the Central Plains region, with more than 15,000 lakes and extensive wetlands, rivers, and streams. This portion of Minnesota was covered by glacial ice over 15,000 years ago. The landscape resulting from glaciation is characterized by young plains, moraines, lakes, and lacustrine beds.

The topography in the Project area is relatively level to sloping land with elevations ranging from 950 to 1030 feet. The corridor parallels the Mississippi River, and crosses the Clearwater River at the Clearwater interchange along I-94. There are two distinct physiographic areas within the Central Plains region. The Project study area mostly lies in the Anoka Sand Outwash plain. The Anoka Sand Outwash Plain was formed from outwash from glacial melt waters.

Pre-settlement vegetation was primarily brush, oak trees, and jack pine trees. The primary present-day land use is sod, supporting vegetable agriculture crops, and some open or barren areas. Peat and muck areas have been drained to grow crops on these rich soils. The majority of the regional area encompasses pasture and cropland for corn, mineral sod, soybeans, oats, and spring wheat. Dense residential land use within the Project study area is primarily limited to the St. Cloud and Monticello incorporated areas, with dispersed rural residential uses occurring throughout the area. Concentrations of trees surround the farmsteads along I-94 and sporadic pockets of wooded areas are also present. The primary tree cover within the Project area occurs near the Mississippi Rivers which consists of oak, ash, maple, and elm trees.

GEOLOGY

The regional surficial geology primarily includes ground moraines and out wash plains deposited by glaciers. The moraines are primarily sand, silt and clay mixtures with rock. Glacial outwash and alluvium are present along the Mississippi River. Alluvium is also associated with other area streams and rivers. The glacial outwash is primarily shallow sand and gravel deposits in glacial melt water channels. The alluvium is composed of shallow surficial sand and gravel deposits and located along main drainages.

The regional depth to bedrock generally ranges from zero to 50 feet. The uppermost bedrock is Mesozoic and Ordovician of age. The Mesozoic bedrock is primarily siltstone, sandstone, and shale. The Ordovician bedrock is primarily porphyritic granodiorite.

Mineral resources in the regional area consist of shallow sand and gravel deposits in moraines, outwash, and alluviums. The locations of former sand and gravel pits shown on topographic maps and in the Stearns and Wright county soil surveys indicate that most exploitable aggregate resources in the area occur along rivers and streams

Land Cover and Native Vegetation

The State of Minnesota follows the National Hierarchical Framework of Ecological Units for developing an Ecological Classification System (ECS) for ecological mapping and landscape classification. The state is divided into four ecological provinces, 10 sections and 26 subsections.

Provinces are defined units of land using major climate zones, native vegetation, and biomes such as prairies, deciduous forests, or boreal forests. The Proposed Routes are mostly within the province classified as the Eastern Broadleaf Forest. Sections are units within provinces defined by origin of glacial deposits, regional elevation, distribution of plants, and regional climate. The Proposed Routes traverse the Minnesota and northeastern Iowa Morainal Section. Subsections are units within sections defined using glacial deposition processes, surface bedrock formations, local climate, topographic relief, and the distribution of plants, especially trees. The Proposed Routes traverse three subsections. The Proposed Routes traverse the Big Woods, Minnesota River Prairie, and Hardwood Hills subsections.

Specific land cover classifications include:

- Cropland,
- Grassland,
- Wooded and forested land,
- Open water,
- Open land and natural areas,
- Urban and vacant land, and
- Wetlands.

Wetland areas are described as those areas meeting three indicative criteria (soils, hydrology, and vegetation). Wetland areas are discussed in more detail below. Non-wetland areas are those that neither meet wetland criteria, nor are they open water areas (lakes, streams, and rivers). Vegetation within non-wetland and upland areas consists of plants adapted to soils under aerobic conditions, whereas wetland vegetation is typically adapted to anaerobic soil conditions.

Cropland may be defined as land used for the production of cultivated crops or used for pasturing livestock. Sub-classifications for this cover type include wheat, corn, sugar beets, hay, soybeans, small grains, and pasture. Cropland may also include lands enrolled in the USDA Conservation Reserve Program.

The Prairie Parkland province covered much of the State of Minnesota. This original prairieland was the eastern edge of the Great Plains and was part of the northern tallgrass prairie. Deciduous forests

occurred along the north and eastern edges of the prairie. A few small tracts of remnant prairie still occur in western and southern Minnesota.

Several wooded and forested land cover areas within the regional area include dry, mesic, and wet forests. These forest community types vary depending on the hydric characteristics of the soil. Dry forests are dominated by white, black, and pin oaks; bitternut hickory; and red maple. Mesic stands will be comprised of red, white and/or bur oaks; sugar maple; basswood; green ash; bitternut hickory; big tooth aspen; and butternut. Wet forest areas are typically associated with larger river systems and occur on floodplains. Dominant species consist of green ash, slippery red rock elms, silver maples, cottonwood, black willow, American elm, and bur oak. Black ash, American hornbeam, ironwood, boxelder, hackberry, and basswood are subdominant species.

Open lands and natural areas occur throughout the regional area. Open lands and natural areas include federal Wildlife Production Areas (WPAs) and state Wildlife Management Areas (WMAs), scientific and natural areas, state parks, state trails, and county biological survey sites of significance. In addition, county land and parks and local parks and other open space along with privately owned open land such as golf courses also comprise the open lands and natural areas classification.

Urban and vacant land consists of areas of concentrated populations and intensive use. Much of the land is covered by structures (residences, commercial, industrial, and governmental) and hosts various forms of infrastructure.

The remaining native vegetation types occurring within the regional area are typical for the subsections they are located in, as described above. The Big Woods and Hardwood Hills subsections contain fragmented and limited contiguous segments of wooded and forest tracks. Undisturbed wooded or forested areas are rare. Some small remnants of natural/native prairie occur. Undisturbed wetland areas within the Project study area contain mostly native vegetation. Disturbed wetlands may contain non-native vegetation such as reed canary grass, hybrid cattail, and others.

Since European settlement of the region in the 1800s, forested areas, native grass prairies, and wetlands have been largely disturbed, altered, or destroyed. The original vegetation as identified by Marschner includes areas of hardwood forest, brush land, and prairie. Much of the area has been converted to cropland, resulting in the loss of much of the original vegetation. Wetland loss has also occurred over most of the Project study area due to drainage and filling activities for agricultural and other uses. The majority of the area has less than 50% of its pre-settlement wetlands remaining.

Wildlife

Common wildlife species found within the regional area include large and small mammals, songbirds, waterfowl, raptors, reptiles, and amphibians. Figure 7-1 presents a list of common

mammal species that may occur within the area. Figure 7-2 lists the common bird species that may occur within the area.

Figure 7-1. Common Mammal Species that May Occur in Central Minnesota

Common Name	Scientific Name	Common Name	Scientific Name
Opossum	*Didelphis marsupialis*	White-footed mouse	*Peromyscus leucopus*
Arctic Shrew	*Sorex arcticus*	Meadow vole	*Microtus pennsylvanicus*
Masked shrew	*Sorex cinereus cinereus*	Prairie vole	*Microtus ochrogaster*
Northern Water Shrew	*Sorex palustris*	Boreal Redback Vole	*Clethrionomys gapperi*
Pygmy shrew	*Sorex hoyi*	Muskrat	*Ondatra zibethicus*
Northern short-tailed shrew	*Blarina brevicauda*	Southern bog lemming	*Synaptomys cooperi*
Eastern mole	*Scalopus aquaticus*	Norway rat	*Rattus norvegicus*
Starnose Mole	*Condylura cristata*	House mouse	*Mus musculus*
Little brown myotis	*Myotis lucifugus*	Meadow jumping mouse	*Zapus hudsonius*
Keen's myotis	*Myotis keenii*	Woodland Jumping Mouse	*Napaeozapus insignis*
Silver-haired bat	*Lasionycteris noctivagans*	Coyote	*Canus latrans*
Eastern pipistrelle	*Pipistrellus subflavus*	Red fox	*Vulpes vulpes*
Big brown bat	*Eptesicus fuscus*	Gray fox	*Urocyon cinereoargenteus*
Red bat	*Lasiurus borealis*	Raccoon	*Procyon lotor*
Hoary bat	*Lasiurus cinereus*	Least weasel	*Mustela nivalis*
Eastern cottontail	*Sylvilagus floridanus*	Long-tailed weasel	*Mustela frenata*
Whitetail Jackrabbit	*Lepus townsendi*	Shorttail Weasel	*Mustela erminea*
Eastern chipmunk	*Tamias striatus*	Mink	*Mustela vison*
Woodchuck	*Marmota monax*	River Otter	*Lutra canadensis*
Thirteen-lined ground squirrel	*Spermophilus tridecemlineatus*	Badger	*Taxidea taxus*
Richardson's Ground Squirrel	*Citellus richardsoni*	Striped skunk	*Mephitis mephitis*
Gray squirrel	*Sciurus carolinensis*	Spotted Skunk	*Spilogale putorius*
Fox squirrel	*Sciurus niger*	Bobcat	*Lynx rufus*
Red Squirrel	*Tamiasciurus hudsonicus*	White-tailed deer	*Odocoileus virginianus*
Northern Flying Squirrel	*Glaucomys sabrinus*	Mule Deer	*Odocoileus hemionus*
Northern Grasshopper Mouse	*Onychomys leucogaster*	Southern flying squirrel	*Glaucomys volans*
Western harvest mouse	*Reithrodontomys megalotis*	Plains Pocket Gopher	*Geomys bursarius*
Black Bear	*Ursusu americanus*	Beaver	*Castor canadensis*
Deer mouse	*Peromyscus maniculatus*		

Source: Burt and Grossenheider,1976.

Figure 7-2. Common Bird Species that May Occur in Central Minnesota

Common Name	Scientific Name	Common Name	Scientific Name
Pied-billed grebe	*Podilymbus podiceps*	Tufted titmouse	*Baeolophus bicolor*
Eared Grebe	*Podiceps nigricollis*	White-breasted nuthatch	*Sitta carolinensis*
Red -necked Grebe	*Podiceps grisegena*	Wild Turkey	*Meleagris gallapavo*
Western Grebe	*Aechmophorus occidentalis*	Ruffed Grouse	*Bonasa umbellus*

Common Name	Scientific Name	Common Name	Scientific Name
Double crested Cormorant	*Phalacrocorax auritus*	Ring Necked Pheasant	*Phasianus colchius*
Canada goose	*Branta canadensis*	Gray Partridge	*Perdix perdix*
American black duck	*Anas rubripes*	Red-breasted nuthatch	*Sitta canadensis*
Mallard	*Anas platyrhynchos*	Brown creeper	*Certhia americana*
Pintail	*Anas acuta*	House wren	*Troglodytes aedon*
American Wigeon	*Anas americana*	Carolina wren	*Thryothorus ludovicianus*
Wood Duck	*Aix sponsa*	Marsh wren	*Cistothorus palustris*
Lesser Scaup	*Aythya affinis*	Sedge wren	*Cistothorus platensis*
Redhead	*Aythya americana*	Golden-crowned kinglet	*Regulus satrapa*
Northern Shoveler	*Anas clypeata*	Blue-gray gnatcatcher	*Polioptila caerulea*
Ruddy Duck	*Oxyura jamaicensis*	Brown thrasher	*Toxostoma rufum*
Ring-Necked Duck	*Aythya collaris*	Gray catbird	*Dumetella carolinensis*
Gadwell	*Anas strepera*	Northern mockingbird	*Mimus polyglottos*
American Coot	*Fulica americana*	Eastern bluebird	*Sialia sialis*
Green Winged Teal	*Anas crecca*	American robin	*Turdus migratorius*
Blue-winged teal	*Anas discors*	Wood thrush	*Hylocichla mustelina*
Canvasback	*Aythya valisineria*	Loggerhead shrike	*Lanius ludovicianus*
Bufflehead	*Bucephala albeola*	Cedar waxwing	*Bombycilla cedrorum*
Common gallinule	*Gallinula chloropus*	Red-eyed vireo	*Vireo olivaceus*
White Pelican	*Pelecanus erythrorhynchos*	Warbling vireo	*Vireo gilvus*
Forster's Tern	*Sterna forsteri*	Yellow Throated Vireo	*Vireo flavifrons*
Black Tern	*Chlidonias niger*		
Franklin's Gull	*Larus pipixcan*		
Herring gull	*Larus argentatus*	Black and white warbler	*Mniotilta varia*
Ring-billed gull	*Larus delawarensis*	Cerulean warbler	*Dendroica cerulea*
Great blue heron	*Ardea herodias*	Chestnut-Sided Warbler	*Dendroica tigrina*
Black-crowned night heron	*Nycticorax nycticorax*	American redstart	*Setophaga ruticilla*
Green heron	*Butorides virescens*		
Least bittern	*Ixobrychus exilis*	Blue-winged warbler	*Vermivora pinus*
American bittern	*Botaurus lentiginosus*	Yellow warbler	*Dendroica petechia*
Virginia rail	*Rallus limicola*	Golden Winged Warbler	*Vermivora chrysoptera*
King rail	*Rallus elegans*		
Sora	*Porzana carolina*	Common yellowthroat	*Geothlypis trichas*
Killdeer	*Charadrius vociferus*		
American woodcock	*Scolopax minor*	Louisiana waterthrush	*Seiurus motacilla*
Common snipe	*Gallinago gallinago*	Ovenbird	*Seiurus aurocapillus*
Upland sandpiper	*Bartramia longicauda*	Brewer's blackbird	*Euphagus cyanocephalus*
Spotted sandpiper	*Actitis macularia*	Yellow Headed Blackbird	*Xanthocephalus xanthocephalus*
Wilson's phalarope	*Phalaropus tricolor*	Red-winged blackbird	*Agelaius phoeniceus*
Sharp-shinned hawk	*Accipiter striatus*	Brown-headed cowbird	*Molothrus ater*
Cooper's hawk	*Accipiter cooperii*	Rusty blackbird	*Euphagus carolinus*
Northern goshawk	*Accipiter gentilis*	Common grackle	*Quiscalus quiscula*
Northern harrier	*Circus cyaneus*	Bobolink	*Dolichonyx oryzivorus*
Red-tailed hawk	*Buteo jamaicensis*	Eastern meadowlark	*Sturnella magna*
Red-shouldered hawk	*Buteo lineatus*	Western meadowlark	*Sturnella neglecta*
Swainson's Hawk	*Buteo swainsoni*	European starling	*Sturnus vulgaris*
Rough Legged Hawk	*Buteo lagopus*	Orchard oriole	*Icterus spurius*
Broad-winged hawk	*Buteo platypterus*	Baltimore oriole	*Icterus galbula*
Turkey vulture	*Cathartes aura*	Scarlet tanager	*Piranga olivacea*
American kestrel	*Falco sparverius*	House sparrow	*Passer domesticus*
Short-eared owl	*Asio flammeus*	Dickcissel	*Spiza americana*

Common Name	Scientific Name	Common Name	Scientific Name
Eastern screech owl	*Megascops asio*	Northern junco	*Junco hyemalis*
Great horned owl	*Bubo virginianus*	Northern cardinal	*Cardinalis cardinalis*
Long-eared owl	*Asio otus*	American Goldfinch	*Carduelis tristis*
Barred owl	*Strix varia*	Purple finch	*Carpodacus purpureus*
Snowy Owl	*Nyctea scandiaca*	Pine siskin	*Carduelis pinus*
Burrowing Owl	*Athene cunicularia*	Snow Bunting	*Plectrophenax nivalis*
Saw-whet owl	*Aegolius acadicus*	Indigo bunting	*Passerina cyanea*
Mourning dove	*Zenaida macroura*	Rose-breasted grosbeak	*Pheucticus ludovicianus*
Yellow-billed cuckoo	*Coccyzus americanus*	Eastern towhee	*Pipilo erythrophthalmus*
Black-billed cuckoo	*Coccyzus erythropthalmus*	White-throated sparrow	*Zonotrichia albicollis*
Common nighthawk	*Chordeiles minor*		
Whip-poor-will	*Caprimulgus vociferus*	Chipping sparrow	*Spizella passerina*
Ruby-throated hummingbird	*Archilochus colubris*	Field sparrow	*Spizella pusilla*
Belted kingfisher	*Ceryle alcyon*	Swamp sparrow	*Melospiza georgiana*
Red-headed woodpecker	*Melanerpes erythrocephalus*	American tree sparrow	*Spizella arborea*
Pileated woodpecker	*Dryocopus pileatus*	Lark sparrow	*Chondestes grammacus*
Common flicker	*Colaptes auratus*	Clay Colored Sparrow	*Spizella pallid*
Red-bellied woodpecker	*Melanerpes carolinus*	Grasshopper sparrow	*Ammodramus savannarum*
Yellow Bellied Sapsucker	*Sphyrapicus varius*	Song sparrow	*Melospiza melodia*
Downy woodpecker	*Picoides pubescens*	Vesper sparrow	*Pooecetes gramineus*
Hairy woodpecker	*Picoides villosus*	Savannah sparrow	*Passerculus sandwichensis*
Eastern kingbird	*Tyrannus tyrannus*	Henslow's sparrow	*Ammodramus henslowii*
Western Kingbird	*Tyrannus verticalis*	LeConte's Sparrow	*Ammospiza leconteii*
Great crested flycatcher	*Myiarchus crinitus*	Tree swallow	*Tachycineta bicolor*
Eastern pewee	*Contopus virens*	Rough-winged swallow	*Stelgidopteryx serripennis*
Eastern phoebe	*Sayornis phoebe*	Bank swallow	*Riparia riparia*
Acadian flycatcher	*Empidonax virescens*	Chimney swift	*Chaetura pelagica*
Least flycatcher	*Empidonax minimus*	American crow	*Corvus brachyrhynchos*
Willow flycatcher	*Empidonax traillii*	Blue jay	*Cyanocitta cristata*
Horned lark	*Eremophila alpestris*	American Avocet	*Recurvirostra Americana*
Purple martin	*Progne subis*	Marbled Godwit	*Limosa fedoa*
Cliff swallow	*Petrochelidon pyrrhonota*	Black-capped chickadee	*Poecile atricapilla*
Barn swallow	*Hirundo rustica*		

Source: Peterson 1980.

Several species of reptiles and amphibians may occur within the Project study area. Reptiles may occur in most habitat types with the amphibians occupying the moist to wet environments including wetlands, ponds, ditches, and riparian areas. Figure 7-3 provides a list of reptiles and amphibians that may occur in the area.

Figure 7-3. Common Reptile and Amphibian Species that May Occur in Central Minnesota

Common Name	Scientific Name	Common Name	Scientific Name
Blue-Spotted Salamander	*Ambystoma laterale*	Northern Water Snake	*Nerodia sipedon*
Tiger Salamander	*Ambystoma tigrinum*	Smooth Green Snake	*Opheodrys vernalis*
Mudpuppy	*Necturus maculosus*	Queen Snake	*Regina septemvittata*
Eastern Newt	*Notophthalmus viridescens*	Brown Snake	*Storeria dekayi*
American Toad	*Bufo americanus*	Redbelly Snake	*Storeria occipitomaculata*
Spring Peeper	*Pseudacris crucifer*	Eastern Hognose Snake	*Heterodon platirhinos*

Common Name	Scientific Name	Common Name	Scientific Name
Grey Treefrog Complex	*Hyla versicolor- chrysoscelis*	Western Hognose Snake	*Heterodon nasicus*
Western Chrous Frog	*Pseudacris triseriata*	Plains Garter Snake	*Thamnophis radix*
Bullfrog	*Rana catesbeiana*	Common Garter Snake	*Thamnophis sirtalis*
Green Frog	*Rana clamitans*	Bullsnake	*Pituophis catenifer*
Pickerel Frog	*Rana palustris*	Northern Prairie Skink	*Eumeces septentrionalis*
Northern Leopard Frog	*Rana pipiens*	Snapping Turtle	*Chelydra serpentina*
Great Plains Toad	*Bufo cognatus*	Common Map Turtle	*Graptemys geographica*
Wood Frog	*Rana sylvatica*	Painted Turtle	*Chrysemys picta*
Mink Frog	*Rana septentrionalis*	Blanding's Turtle	*Emydoidea blandingii*
Canadian Toad	*Bufo hemiophyrys*	Spiny Shoftshell	*Apalone spinifera*

Source: Tekiela, Stan 2003.

Wetlands and Waterways

Wetlands within central Minnesota possess a wide variety of characteristics and landscape position. The wide variety of characteristics is due to diversity in vegetation, hydrology, and soils. Unique environmental and biotic characteristics add to the overall regional diversity and production of aquatic invertebrates and vertebrate wildlife. Wetlands are critical to the region for flood control and water quality management. Wetland areas within the region also support recreational opportunities such as hunting, fishing, trapping, bird watching, and photography.

Hydrology for wetlands is as diverse as the types of wetlands present with the area. The hydrology follows many different sources including surface waters, groundwater, or a combination of the two. Hydrology is dependant on watershed acreage, amount of rainfall an area receives, and flood occurrences. Hyrdology influences the size of wetlands.

Plant communities within the extensive number of wetlands are dynamic and continually changing as a result of short and long-term fluctuations in water levels, wet-dry cycles, and human disturbance. Some wetlands, such as floodplains, have extensive inundation for long periods during the early growing season and then receive little hydrological input. Other wetlands are inundated seasonally, have hydrology at or above the surface for most of the growing season, or are permanently inundated. Hydrologic conditions determine the composition and extent of plant communities present. In Minnesota, there are eight types of wetlands as defined by the USFWS Circular 39 (Shaw and Fredine 1956) classification. The eight types of wetlands are 1) seasonally flooded basin, 2) wet meadow, 3) shallow marsh, 4) deep marsh, 5) shallow open water, 6) shrub swamp, 7) wooded swamps, and 8) bogs. Of these wetland types, most are found within the Project study area.

Jurisdictional Wetlands

For jurisdictional purposes, the U.S. Army Corps of Engineers (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 under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

The USACE and the State of Minnesota use three characteristics of wetlands when making wetland determinations: vegetation, soil, and hydrology. Unless an area has been altered or is a rare natural situation, all three indicators must be present during a specific portion of the growing season for an area to be a wetland. 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 they were developed in conditions where soil oxygen was limited by the presence of saturated soil for long 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 types and soils that occur in the area.

Wetlands perform many important hydrologic functions, such as floodwater storage, maintaining stream flows, slowing and storing floodwaters, stabilizing stream banks, nutrient removal and uptake, and groundwater recharge. A number of wetland classification systems have been developed, but the Cowardin et al. (1979) and the Circular 39 classification methods are the most widely recognized systems and have been used for wetland classification within the regional area.

Cowardin Classification

Palustrine

Palustrine wetlands are non-tidal and tidal-freshwater wetlands in which vegetation is predominantly trees (forested wetlands); shrubs (scrub-shrub wetlands); persistent or non-persistent emergent, erect, rooted herbaceous plants (persistent and non-persistent-emergent wetlands); or submersed and (or) floating plants (aquatic beds). Palustrine wetlands also include intermittently to permanently flooded open-water bodies of less than 20 acres in which water is less than 6.6 feet deep. Palustrine wetlands can be further divided based on the dominant plant life form or the physiography and composition of the substrate (e.g., aquatic bed, emergent, forested, scrub-shrub, unconsolidated bottom, or unconsolidated shore) and the seasonal water regime (e.g., intermittently exposed, semi-permanently flooded, seasonally flooded, saturated, or temporarily flooded).

Palustrine wetlands within the corridor occur in a variety of forms, size, depth, and type/classification. The wetlands can range from a few feet across and only inches deep, to basins 500 acres in size with depths of up to six feet. Most of the plants within the small to medium sized

seasonal wetlands support facultative wetland species (FACW) interspersed with a few obligate (OBL) species in the deeper portions of the basin.

Riverine

Riverine wetlands are non-tidal and tidal-freshwater wetlands within a channel. Vegetation, when present, is predominantly non-persistent emergent plants (non-persistent-emergent wetlands), or submersed and (or) floating plants (aquatic beds), or both. Riverine wetlands, defined by their close associations with perennial streams, occur along stream channels and are often associated with riparian areas. These areas are also supported by groundwater drainage associated with floodplains and by periodic flooding events. Riverine wetlands are divided into categories based on the nature of the adjacent stream (e.g., upper perennial or intermittent). Riverine wetlands can be further divided based on the dominant plant life form of the physiography and composition of the substrate (e.g., unconsolidated bottom unconsolidated shore, or streambed) and the seasonal water regime (e.g., permanently flooded, semi-permanently flooded, seasonally flooded, or temporarily flooded).

There are three types of stream systems in the region: perennial, intermittent, and ephemeral. Perennial streams have visible water flowing above the streambed year-round; intermittent streams have water that appears both above and below the streambed; and ephemeral streams or watercourses flow only in response to precipitation. Vegetation growing along intermittent streams often has access to the water table or at least a greater quantity of soil moisture due to the proximity of the water table. Therefore, this creates distinct hydrologic characteristics and vegetation composition differences that distinguish intermittent streams from ephemeral streams. Generally, only perennial and intermittent streams can support riparian areas, while ephemeral streams generally do not possess the hydrologic conditions that allow riparian vegetation to grow. Although water flows down ephemeral streams periodically, the water table does not occur sufficiently close to the soil surface to allow hydrophytic vegetation to become established. Vegetation growing along ephemeral watercourses may occur in greater densities or grow more vigorously than vegetation in the adjacent uplands, but generally there are no dramatic compositional differences between the two.

Circular 39 Classification

Type 1: Seasonally Flooded Basin, Floodplain Forest

Wetlands in seasonally flooded basins or forest floodplains include soils covered with water, or soil waterlogged during variable seasonal periods but usually well-drained during much of the growing season. This type is found both in upland depressions and in overflow bottomlands. In uplands, basins or flats may be filled with water during periods of heavy rain or melting snow. Vegetation varies greatly according to season and duration of flooding: from bottomland hardwoods to herbaceous plants. Where the water has receded early in the growing season, smartweeds, wild millet, fall panicum, redroot cyperus, and weeds (i.e. marsh elder, ragweed, and cockleburs) are likely

to occur. Shallow basins that are submerged only temporarily usually develop little or no wetland vegetation.

Type 2: Wet Meadow, Fresh Wet Meadow, Wet to Wet-Mesic Prairie, Sedge Meadow, and Calcareous Fen
Wet meadow, fresh wet meadow, wet to wet-mesic prairie, sedge meadow, and calcareous fen wetlands include soils usually without standing water during most of the growing season, but waterlogged within at least a few inches of the surface. Meadows may fill shallow basins, sloughs, or farmland sags, or these meadows may border shallow marshes on the landward side. Vegetation includes grasses, sedges, rushes and various broad-leaved plants. In the North, representative plants are sedges, rushes, redtop, reedgrasses, manna grasses, prairie cordgrass, and mints. Other wetland plant community types include low prairies, sedge meadows, and calcareous fens.

Type 3: Shallow Marsh
Shallow marsh wetlands include soil usually waterlogged early during the growing season and often covered with as much as six inches or more of water. Shallow marshes may nearly fill shallow lake basins or sloughs, or may border deep marshes on the landward side. Seep areas on irrigated lands often develop as shallow marshes. Common vegetation includes grasses, bulrushes, spikerushes, and various other marsh plants such as cattails, arrowhead, pickerelweed, and smartweeds.

Type 4: Deep Marsh
Deep marsh wetlands include soil usually covered with six inches to three feet or more of water during the growing season. Deep marshes may completely fill shallow lake basins, potholes, limestone sinks and sloughs, or they may border open water in such depressions. Vegetation includes cattails, reeds, bulrushes, spikerushes and wild rice. In open areas, pondweeds, naiads, coontail, watermilfoils, waterweeds, duckweed, water lilies, or spatterdocks may occur.

Type 5: Shallow Open Water
Shallow ponds and reservoirs include water depths less than 10 feet deep and fringed by a border of emergent vegetation similar to open areas of Type 4. Vegetation (mainly at water depths less than six feet), includes pondweeds, naiads, wild celery, coontail, watermilfoils, muskgrass, waterlilies, and spatterdocks.

Type 6: Shrub Swamp; Shrub Carr, Alder Thicket
In areas of shrub swamp, shrub carr, and alder thicket, the soil is usually waterlogged during the growing season and is often covered with as much as six inches of water. Shrub swamps occur mostly along sluggish streams and occasionally on floodplains. Vegetation includes alders, willows, buttonbush, dogwoods and swamp-privet.

Type 7: Wooded Swamps; Hardwood Swamp, Coniferous Swamp
In areas of wooded swamps, the soil is waterlogged at least to within a few inches of the surface during the growing season and is often covered with as much as one foot of water. Wooded swamps occur mostly along sluggish streams, on old riverine oxbows, on floodplains, on flat uplands, and in very shallow lake basins. Forest vegetation includes tamarack, arborvitae (cedar), black spruce, balsam fir, red maple, and black ash. Deciduous swamps frequently support beds of duckweeds, smartweeds, and other herbs.

Type 8: Bogs; Coniferous Bogs, Open Bogs
Bogs include soil usually waterlogged and supporting a spongy covering of mosses. Bogs occur mostly in shallow lake basins, on flat uplands and along sluggish streams. Vegetation is woody or herbaceous or both. Typical plants are heath shrubs, sphagnum moss, and sedges..

Type 9: Riverine
Riverine systems (rivers, creeks and streams) are contained in natural or artificial channels periodically or continuously containing flowing water. Upland islands or palustrine wetlands may occur in the channel, but they are not part of the riverine system.

Waters of the United States

Section 404 of the Clean Water Act of 1977 regulates activities that result in discharge of dredged, fill, or excavated material into Waters of the United States. The lateral limits of jurisdiction in those waters may be divided into three categories. The categories include the territorial seas, tidal waters, and non-tidal waters.

Potential wetland sites were identified within the Project study area using USFWS data coverages. The numerous topographical depressions and basins that capture surface runoff, or are within reach of shallow subsurface waters, generally support palustrine emergent wetlands (e.g., freshwater marshes, wet meadows, potholes, and open water).

Prehistoric and Historic Settlement

The Proposed Routes are in the upper Mississippi Valley of east central Minnesota. This broad till plain region, south of the Mississippi River, is dotted with pothole lakes. Prehistoric and historic settlement will tend to occur most often near reliable sources of water and routes of transportation, which will include navigable rivers and lakes.

Prehistoric Context

Prehistoric archaeological sites in east central Minnesota span from the Paleoindian period beginning shortly after the retreat of the Pleistocene ice sheets into the early periods of historic accounts of the region in the 17th and 18th centuries. Prehistoric cultures are grouped into four broad cultural traditions: Paleoindian (10,000 to 6000 BC), Archaic (6000 to 800 BC), Woodland (800 BC to Historic), and Oneota/Plains Village (AD 900 to Historic). There are varying interpretations of when the Historic period began. The earliest, widely acknowledged written accounts referring to the region and the tribes that inhabited the region date to the 1630s. However, first-hand written accounts reflecting sustained, although still rather limited, European incursions into the region emerged later in the century. The first extensive written account of the region was produced in France in 1683. In general, the period from the early 1600s to sustained American settlement in the mid-1800s is referred to as the Contact period. Some scholars refer to the earlier decades of indirect and poorly documented contact as the Protohistoric period.

The Paleoindian tradition (ca. 13,000 through 8000 B.P.) is characterized by relatively mobile groups of hunter-gatherers that migrated into the region as glaciers retreated from the Upper Midwest. The better known sites of this period are recognized by the presence of distinctive lanceolate projectile points, bifacially flaked stone knives, large scrapers and simple choppers. This period is sparsely represented in the region and no sites with Paleoindian components were identified in the records search for the Project study area. An in situ site of this period will be considered extremely significant.

The transition to Archaic adaptations (ca. 8000 through 2500 B.P.) was incremental. It is somewhat misleading to end the Paleoindian and begin the Archaic at 8000 B.P., because the adaptations overlapped or graded into one another. The characteristic lanceolate projectile points of the Paleoindian tradition were replaced by stemmed and notched forms, and pecked and ground stone implements become increasingly common. Late in this period copper implements also appeared. In general there is a continued reliance on large game hunting, but there is also evidence of increasingly diversified technologies for hunting, fishing, foraging, woodworking and plant processing. Characteristic tool forms and use of raw materials become more regional in this period and there is evidence of larger or regularly reused habitation areas along the margins of lakes and rivers. Only one component of this period was identified in the records search for the Project study area.

The emergence of the Woodland tradition (ca. 2500 through 300 B.P.) was marked by evidence of selective manipulation and domestication of plants. There was an increased occupation of stream and lake junctions and the development of ceramics. Another pattern that became frequent, although not ubiquitous in this period, was the use of earthworks in association with mortuary activity. Away from the major river valleys this adaptive pattern continued into the historic period,

coexisting with the Oneota and Plains Village cultures. Identified prehistoric cultural components in the study area are dominated by the Woodland period.

Oneota and Plains Village tradition (ca. 1000 through 300 B.P.) occupations began to appear along the major river valleys and other bodies of water. These areas include the Minnesota and Mississippi Rivers and their larger tributaries, and larger lakes. The Oneota tradition is related to the Mississippian tradition along the middle Mississippi River. This period was characterized by large village settlements based on a mix of agriculture, gathering and large game hunting. This pattern continued into the historic period, and many of the named groups of the early contact periods conformed to this pattern. In the Contact period, settlements of the Woodland, Oneota, and Plains Village traditions coexisted with the emerging Plains Equestrian tradition. The areas around the rivers, larger streams and many lakes of central Minnesota are rich in prehistoric archaeology.

Historic Context

As early historic accounts of the region became fairly clear, the regional area was mostly occupied by the Santee Dakota (Sisseton, Wahpeton, Mdewakanton, and Wahpekute). However, the Chippewa (or Ojibwa) were moving into the region during this period and by the mid-1700s, they occupied the northeast portions of the state. By the late 1600s, French fur traders were in the region, followed by English and American traders. By the early 1800s, sustained Euroamerican settlement, rather than frontier trading posts, accelerated in the region, marked by or encouraged by the establishment of Fort Snelling at the confluence of the Minnesota and Mississippi Rivers.

Minnesota's history begins with the fur trade. French explorers entered the region in the interests of the fur trade, first exploring the extent of the Great Lakes and then discovering the upper Mississippi River. The first detailed account of the area was written in 1683 by a French missionary who had been held captive by the Dakota. Emboldened by the fur trade, the Chippewa advanced into Minnesota, and the Dakota moved to the south and west. In the late 1700s, Spain claimed the Louisiana Territory (including portions of Minnesota) in a settlement with France, and the British Empire expanded its fur trade holdings into northern Minnesota. In 1783, after the American Revolution, the newly formed United States nominally gained control of Minnesota east of the Mississippi (the Northwest Territories), and in 1803 the Louisiana Purchase included Minnesota west of the Mississippi. However, the United States did not effectively manifest its presence in Minnesota until the Dakota piece treaty of 1815.

Wisconsin Territory, including Minnesota, was formed in 1836. Minnesota remained a fur trading frontier until the emergence of the lumber industry after the Dakota and Chippewa land cessions of 1837. Early agricultural settlement also began in this period. Over the next decade Saint Paul, Saint Anthony (Minneapolis), and Stillwater became Minnesota's first towns. Wisconsin became a state in 1848 leaving eastern Minnesota without a government until the Minnesota Territory was formed the

following year. Settlement of the Minnesota Territory increased. More land was ceded by the Dakota and Chippewa, and by 1850, wheat had become a major commercial crop in the territory. Over the next decade there was a virtual explosion in settlement in Minnesota, spurred on in the later half of the decade by newspaper promotions. In 1858, Minnesota became the 32nd state.

Minnesota's economy remained heavily focused on lumber and wheat. The state did not honor federal land treaties with the Indians, and an escalating conflict referred to as the Dakota Conflict ensued. There were a series of bloody confrontations in 1862. That same year, the first operational line of the Minneapolis and Saint Paul Railway was completed. From this small beginning, railroads, agriculture and the lumber industry grew together.

What had first connected the resources of Minnesota to world markets in the fur trade was its location at the west end of Lake Superior and along navigable portions of the Mississippi and Minnesota Rivers. In the early years of immigration, these were also the main routes of bulk transportation that made the lumber industry and agriculture profitable. Early market agriculture depended on these routes for comparatively rapid transportation of agricultural products and for bringing in homesteaders and farm labor. River settlements such as Minneapolis and Saint Paul continued to prosper, and new settlements emerged along the rivers. Goods and materials also had to be transported overland between the waterways, and wagon roads like the Red River Trails were established across Minnesota. By 1856, a way station along the Red River Trails from Saint Paul to Pembina at the Canadian border had grown large enough to be incorporated as the city of St Cloud. The towns of Monticello and Clearwater were also established along the Mississippi River in the mid-1850s. Clearwater, at the confluence of the Clearwater and Mississippi Rivers, boasted a water-powered lumber mill and two water-powered flour mills. The cable ferry across the Mississippi River at Clearwater was also an important early crossing.

Beginning in the 1830s, a new technology of bulk transportation had emerged in the eastern states. The new railroads were not as strongly affected by weather and water levels as barges and steamboats, could travel at night, and could haul comparatively large loads at unheard of speeds as high as 20 miles per hour. Railroads first connected established markets, and then began to spread away from waterways in response to the demands of industries such as lumber and mining. Beginning with the completion of the Minneapolis and Saint Paul Railway in 1862, local and regional railroads grew in Minnesota. Many of the early railroads connected established cities and towns along the waterways and wagon roads. The principal rail lines radiated from Minneapolis-Saint Paul along the Mississippi River and Duluth on Lake Superior. At the same time, entrepreneurs were developing plans to connect major centers across the continent and to profit from lumber and mining resources in areas remote from major markets. Industry and commerce attracted railroad development, and in turn the railroads promptly promoted tourism in Minnesota. The role of railroads in Minnesota history is summarized in the historic context section of the Railroads in Minnesota, 1862-1956, Multiple Property Documentation Form (Schmidt, et al. 2007). The railroads

have gone through numerous mergers, acquisitions, bankruptcies, and name changes over the years. The major remaining operators west of Minneapolis-Saint Paul are the Burlington Northern Santa Fe and the Canadian Pacific SOO Line. St Cloud is an important hub of the Burlington Northern Santa Fe. Several historic branches of the Great Northern Railway, now owned by the Burlington Northern Santa Fe, traverse the regional area.

The lumber industry and agriculture depended heavily on the railroad to connect to major markets and to expand into new areas for production. The railroads actively encouraged settlement and cultivation. Before the railroad, wholesale middlemen bought grain from the farmers by the sack and transported it by horse and wagon to the river towns where it was loaded on boats. With the arrival of the railroad, grain was loaded by the carload at railheads and shipped to major markets. Production areas and towns competed to bring the railroads, and the railroads promoted expansion and settlement. Many of the railroad routes were developed by small companies that were financed by or later acquired by larger companies. In 1889, many of the small early railroads and merged companies in east-central Minnesota were consolidated and reorganized as the Great Northern Railway. The Great Northern Railway remained the major operator in this part of Minnesota until it merged with the Chicago, Burlington and Quincy, the Northern Pacific, and the Spokane, Portland and Seattle in 1970 to form the Burlington Northern Railroad. In 1878, the Great Grasshopper Plague devastated the wheat industry, and Minnesota farms were forced to diversify, but they still depended heavily on the railroads. In 1884, iron mining emerged as a major industry that depended on the bulk transportation of the railroads and that will play a major role in the Minnesota economy for nearly a century. Like the lumbering industry, the major centers of the iron ore industry were in northern Minnesota. Each of these economic contexts is addressed in the Railroads Multiple Property Documentation Form (Schmidt, et al. 2007). Inter-related multiple property historic contexts have also been prepared for agriculture, lumbering, the iron ore industry, tourism and recreation, and urban centers.

In the 1890s, innovations in the internal combustion engine and the automobile foreshadowed a new era in transportation. The automobile began as a novelty and material possession of the wealthy, but innovations in assembly line production and the introduction of the Model T Ford in 1908 made automobiles affordable to a much larger proportion of the population. Demands of automobile enthusiasts and bicyclists resulted in maintained public highways. Additional innovations in internal combustion engines and the semi-trailer resulted in the development of the diesel tractor-trailer (or semi). By 1920, tractor trailers competed with the railroads for most freight traffic and buses and automobiles were dominating passenger traffic. Roads and highways now competed with the railroads as key transportation routes, and new roads could be developed more cheaply and more easily than rail lines. This competition in combination with the Great Depression resulted in serious financial difficulties for the railroads.

Minnesota, its railroads, and its roads and highways grew together. Much of the historical archaeology of Minnesota can be found along the interconnecting branches of these networks. Engineering and architectural designs are manifested in the structures and associated buildings of these transportation corridors and the corridors were integral to many economic and historical developments. Rural historical cultural resources in central Minnesota are dominated by agriculture, tourism, and associated transportation networks.

7.2 PREFERRED ROUTE AND ASSOCIATED FACILITIES

7.2.1 LOCAL DESCRIPTION OF ENVIRONMENTAL SETTING

The local area is generally representative of the environmental setting within the regional area. The Preferred Route extends northwest from the city of Monticello to a proposed substation, the Quarry Substation, to be located west of the city of St. Cloud. The Proposed Quarry Substation Siting Area Alternate 1 is located near the intersection of County Road 23 and I-94. Existing land uses crossed by the Preferred Route predominantly include undeveloped agricultural land, however low density or single-family residential uses also occur. Commercial and industrial uses occur at various locations along the I-94 corridor. The local area is zoned as general agricultural, agricultural/residential, and suburban/residential.

7.2.2 HUMAN SETTLEMENT

7.2.2.1 PUBLIC HEALTH AND SAFETY

Transmission Line

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 the MnDOT 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 Minnesota State Statute and 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. 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, Section 3, Section 15 identifies obstruction criteria for a VOR facility. Subsections D and E detail 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. Therefore, the transmission line structures proposed for the Project of 130 feet 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.

Several airports are located on the north side of I-94. The closest of these is the Pilots Cove Airport in Monticello, which is 3.5 miles east of the Monticello Substation. The airport serves Monticello and Sherburne County and has a north-south-oriented, 2,550-foot turf runway. Leaders Clear Lake Airfield is located in Clear Lake, 4.1 miles from the Preferred Route. The airport is open to the public and has an asphalt and turf runway, 3,000 feet long, oriented north-south. Both of these airports are privately owned. The largest airport is the St. Cloud Municipal Airport located east of St. Cloud and 5.4 miles from the Preferred Route. The St. Cloud Airport has two runways oriented northwest-southeast and northeast-southwest. The Project will not be close enough to have any impacts on these airports.

South of I-94, a private landing strip registered with the FAA called the Seven Hills Airport is within proximity of the Preferred Route near the northeast corner of Stearns County.

Quarry Substation (Proposed)

As identified above, circuit breakers and relays will be located in the substation to safeguard the public in the event of some public health and safety risk. Further, substation facilities will be properly fenced and accessible only by authorized personnel.

No impacts to airports, landing strips, and airplane safety are anticipated at the Proposed Quarry Substation Siting Areas since neither location is within proximity of an airport or identified landing strip.

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.

7.2.2.2 COMMERCIAL, INDUSTRIAL, RESIDENTIAL LAND USE

Transmission Line

The Preferred Route primarily follows I-94, though other co-location opportunities including an existing 115 kV transmission line, state highways, other roads and property lines also are utilized. Zoning or land use classifications within the area crossed by the Preferred Route is summarized in Figure 7-4 below.

Figure 7-4. Preferred Route Zoning and Land Use Summary

Zoning/Land Use Classification	Percent (%) Crossed by Preferred Route
Agricultural	79.3
Special Protection Agriculture	<1
Residential	5.8
Industrial	7.7
Recreational / Open Space / Park	3.6
Commercial / Business / Institutional / Public	2.4
County Identified Municipal	<1

The Preferred Route crosses Wright and Stearns Counties, affecting the cities of Monticello, Clearwater, and St. Cloud, as well as their neighboring townships. Areas zoned or classified for agriculture are affected most by this route, as a significant portion (79 percent) of the route crosses agricultural lands. Areas zoned for or classified as residential use (six percent) are also crossed in both counties. While residential land is less affected than agricultural land, it is still considered a primary affected land use. The Preferred Route also crosses a considerable amount of land zoned

for industrial uses (eight percent), largely in Stearns County. Recreational lands (four percent) are affected minimally by the Preferred Route. Commercially zoned or classified areas (two percent) crossed by the Preferred Route primarily include businesses along the I-94 corridor. No transitional growth areas are affected by the Preferred Route.

Quarry Substation (Proposed)

The Quarry Substation Siting Area Alternate 1 consists mostly of lands zoned or classified as agricultural use. The Quarry Substation Siting Area Alternate 2 consists of lands zoned or classified for agricultural and industrial use. The surrounding land use for both Proposed Quarry Substation Siting Areas is generally agricultural and industrial. Applicants are seeking up to 40 acres for the proposed Quarry Substation. The Quarry Substation Siting Area Alternate 1 is located approximately 1,000 feet west of an existing residential use area.

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.

7.2.2.3 DISPLACEMENT

Transmission Line

NESC and Applicants' standards require certain clearances between transmission line facilities and buildings 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 107 residences are located within Preferred Route corridor, the proposed 345 kV transmission line will be designed so that all existing residences are located outside of the required right-of-way, to the extent feasible. Figure 7-5 below identifies the number of known residences within various distances from the maximum corridor sharing alignment within the Preferred Route. A number of non-residential structures are within immediate proximity of the maximum corridor sharing alignment within the Preferred Route and may be directly affected by the required right-of-way. These include up to eight non-residential buildings, which may be displaced.

Figure 7-5. Residences within Proximity of the Maximum Corridor Sharing Alignment of the Preferred Route

Proximity (Feet)	Preferred Route
Right-of-way Required	150 (feet in width)
Residences 0-75	0
Residences 75-150	3
Residences 150-300	22
Residences 300-500	37
Total Residences	62
Density (Homes/Mile)	2.2

Although there are existing residences located within the Proposed Quarry Substation Siting Areas, the substation will ultimately be located within the approved siting area so as to avoid the displacement of existing residences and otherwise minimize the potential for impacts to existing residences to the extent feasible.

Quarry Substation (Proposed)

Although there are existing residences located immediately within or within proximity of the Proposed Quarry Substation Siting Areas, no displacement is anticipated as the selection of the final substation site will avoid displacing existing residences to the extent feasible.

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 of the line, to the extent feasible.

7.2.2.4 NOISE

Transmission Line

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 7-6 below provides noise levels associated with common, everyday sources and places the magnitude of noise levels discussed here in context.

Figure 7-6. 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. As such, the Project will not have significant noise effects for the surrounding area.

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 Minnesota Pollution Control Agency (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 7-7 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 7-7. 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 lines were 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 7-8 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 7-8. 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

Quarry Substation (Proposed)

Noise associated with substations includes the operation of transformers and switchgear. Transformers produce a constant low-frequency humming noise while switchgear produces an impulsive or short duration noise during infrequent activation of the circuit breakers. Equipment at the proposed Quarry Substation would not include a transformer as part of this Project. Due to the infrequent operation of the switchgear, the noise generated will be considered temporary in nature and not predicted to exceed the MPCA Noise Limits.

Mitigative Measures

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

7.2.2.5 RADIO, TELEVISION, CELLULAR PHONE, AND GPS INTERFERENCE

Transmission Line

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.

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.

Quarry Substation (Proposed)

No radio, television, cellular phone, and GPS interference is anticipated as a result of the construction of the Quarry Substation.

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 that had good reception before the Project was built, satisfactory reception can be obtained by appropriate modification of the receiving antenna system. 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.

7.2.2.6 AESTHETICS

Transmission Line

The Project study area contains a variety of scenic settings, primarily within open space, parks, and some recreational use areas such as golf courses. These areas are located within the municipal boundaries of communities along the proposed routes, and in unincorporated Wright and Stearns Counties. Several county parks located in close proximity to I-94 offer a variety of outdoor recreational opportunities in scenic settings.

The Mississippi River is the dominant natural landform in the vicinity of the project, and is in close proximity to some portions of the Preferred Route, primarily northwest of Monticello. The river between the cities of St. Cloud and Monticello was designated as a state Wild and Scenic River in 1973. The Minnesota Wild and Scenic Rivers Act preserves and protects rivers that possess outstanding scenic, recreational, natural, historical, scientific and similar values (MDNR, 2004). The segment between St. Cloud and Clearwater is a designated Scenic river, and the segment between Clearwater and Monticello is a designated Recreational river.

Most of the Mississippi River is more than one mile from the Preferred Route. The Preferred Route is located outside of the designated Scenic corridor. A small portion of the Preferred Route, northwest of Monticello, is within the designated Recreation corridor. However, the ultimate location of the proposed 345 kV transmission line is intended to be outside the designated Recreation corridor.

Sensitive Viewpoints

Sensitive viewing areas and viewpoints are critical viewpoints from which a Project facility will be seen by members of the public who have a concern for scenic resources. Potential sensitive viewpoints along the Preferred Route occur primarily in communities with views of the route corridor, from I-94, from county roads and state highways in Wright County, and from county parks and other recreational use areas.

The portion of the Preferred Route near the city of Monticello is within an industrial/commercial area, and will not be visible from any residences within the municipal boundaries. Several residential subdivisions are located near the municipal boundaries of Monticello, Clearwater, and Waite Park. Additionally, there are dispersed rural residential use areas occur throughout the Preferred Route corridor.

There are four Wright County parks that are located within one mile of the Preferred Route that may provide views of the transmission line. These include: 1) Clearwater Wayside County Park, located in the town of Clearwater next to the west side of County Road 75, one mile north of I-94; 2) Marcus Zumbrunnen County Park, located one half mile south of I-94, next to the west side of County Road 8; 3) Harry Larson Regional Park, located one mile south of I-94, next to the east side of County Road 111; and 4) Montissippi Regional Park, located in the city of Monticello, one half mile north of I-94 and two miles west of Monticello (Wright County, 2008).

In addition, the Preferred Route along I-94 is within the viewshed of the Eagle Trace Golfers Club, which is located in Clearwater one quarter mile north of the interstate. County Road 75 is a designated scenic byway, named the Great River Road, as it traverses the Project study area. Motorists on the Great River Road will have foreground views of the Preferred Route where the proposed 345 kV transmission line will parallel the road.

The proposed 345 kV transmission line will result in substantial changes to existing landscapes from the addition of new single steel poles into the existing natural landscape as seen from sensitive viewpoints. The addition of new 345 kV transmission line in new transmission line right-of-way will introduce new elements of line, form, color, and texture into the existing landscape. New transmission structures will introduce straight, vertical lines and color contrasts under certain lighting conditions. Color and textural contrasts will also result from areas disturbed by vegetation removal surrounded by the natural landscape.

Tree removal within the right-of-way will result in the most noticeable visual impact. Potential effects in forested areas that will result from tree removal will be the contrast of a linear edge of a cleared corridor through stands of trees. Other vegetation will be permanently removed at structure locations and areas of new permanent access.

Visual impacts generated by proposed electric transmission line installation and operation will be experienced by travelers on I-94, state highways, county roads, and local roads, users of parks and other recreation facilities located near the proposed transmission line corridor, and within the direct line of sight of residents in municipalities, residential subdivisions, and rural residences. Because most of the proposed transmission line will be located next to transportation routes, travelers on roadways will experience most of the visual impact from the Project.

The proposed 345 kV transmission line will be within the foreground distance zone (the viewshed for a distance up to 0.5 miles from the viewpoint) of sensitive viewpoints on roadways, and at residences and recreation areas located along the proposed routes. The transmission line will also be visible from some sensitive viewpoints in the middleground distance zone (0.5 to 4 miles), but will also be screened from view at many locations because of intervening trees and man-made structures.

Most of the proposed transmission line will be within the immediate foreground views of travelers on I-94 and numerous Wright County roads that connect rural areas in the county with the interstate. The 345 kV poles and conductors will be obvious in the foreground distance zones to motorists on the roadways, and will add an industrial component to the predominantly rural landscape.

In Wright County, the Clearwater Wayside County Park is located less than 0.25 mile east of the Preferred Route. Dense stands of tree will screen most views of the transmission line from the park. Intervening tree stands in the Harry Larson Regional Park will also block views of the transmission line. The transmission line will be within the foreground distance zone of the Montissippi Regional Park. Portions of the line may be visible from some areas of the park, and tree cover does not consistently screen views to the south of the I-94 corridor.

Quarry Substation (Proposed)

Both Proposed Quarry Substation Siting Areas are located along State Highway 23. This is an area with industrial and commercial properties and a substation will not be out of place. Although a mobile home park is located near the Proposed Quarry Substation Siting Area Alternate 1, it is separated by vegetation, which will serve a visual screen.

Mitigative Measures

Although the line will be a contrast to some surrounding land uses, the Applicant has identified the route that maximizes the use of existing corridors and avoids homes to the greatest extent practicable. The Applicant will work with landowners to identify concerns related to the transmission line.

7.2.2.7 SOCIOECONOMIC

Transmission Line and Quarry Substation (Proposed)

The Project is in the upper Mississippi Valley of east central Minnesota. The area of study for the socioeconomic analysis includes Stearns, Sherburne, and Wright Counties in central Minnesota. The Proposed Routes are located entirely in Stearns and Wright Counties; however, communities in Sherburne County are included in the analysis because they are located in close proximity and will likely experience effects on local employment and economies from the construction and operation of the proposed Project. Some contractors and construction workers required for the Project may reside in Sherburne County.

Socioeconomic factors analyzed include population, income, poverty, and employment. U.S. Census data for 2000 and 2006 was obtained at the community and township level to characterize the area along the Preferred Route and within the Proposed Quarry Substation Siting Areas. These datasets were compared to county and state data, as demonstrated below in Figure 7-9.

Figure 7-9. Population Characteristics

Location	Population	White or Caucasian	Black or African American	Asian	Other Races	Hispanic or Latino
Preferred Route[a]	31,820	30,804 97.4 %	104 0.2 %	418 1.0 %	572 1.4 %	477 1.1 %
Sherburne County	64,417	62,308 96.7 %	550 0.9 %	372 0.6 %	1,187 1.8 %	709 1.1 %
Stearns County	133,166	127,832 96.0 %	1,110 0.8 %	2,104 1.6 %	2,120 1.6 %	1,827 1.4 %
Wright County	89,986	88,055 97.9 %	235 0.3 %	393 0.4 %	1,303 1.5 %	994 1..1%
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 %

[a]Data includes Monticello, Monticello Township, Silver Creek Township, Clearwater, Clearwater Township, Lynden Township, St. Augusta Township, Rockville Township, St. Joseph Township, and Waite Park.

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

The three-county area is located between St. Cloud and the Twin Cities (Minneapolis and St. Paul). The population of Stearns County is concentrated in the St. Cloud area, which is 65 miles northwest of downtown Minneapolis. St. Cloud is the largest city near the proposed routes. Development in St. Cloud is expanding southeast while the Twin Cities are expanding northwest. Considerable growth is expected in the three-county area between these two metropolitan areas, in part because the area is located within commuting distance of St. Cloud and the Twin Cities along I-94. The Minnesota Demographic Center projects continuation of this growth trend over the next 30 years and indicates

that the Sherburne County population will grow by 89 percent, Stearns County by 33 percent, and Wright County by 54 percent between 2000 and 2030 (St. Cloud Area Economic Development Partnership, 2007).

According to the U.S. Census Bureau (U.S. Census Bureau, 2000), the majority of the population the Project area is white, as shown in Figure 7-9 above. None of the communities within the Project area counties contain disproportionately high minority populations or low-income populations. The Preferred Route and the Project area counties contain a lower percentage of minority populations than the state.

Figure 7-10 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 was nearly 17 percent smaller in Stearns County than the state per capita income. Sherburne and Wright Counties had higher per capita incomes but were still below the state level. An explanation for the low per capita income of the Project area counties relative to the state is presented by the St. Cloud Area Economic Development Partnership, which indicates that the population in the St. Cloud area is younger than the state. Younger individuals tend to have lower incomes due to educational commitments, part-time jobs and entry-level positions. The poverty level rate of 8.7 percent for Stearns County was also larger than the state poverty rate of 7.9 percent and nearly twice the poverty rates of Sherburne and Wright Counties. The per capita income for the area crossed by the Preferred Route was an average of the three counties and the poverty rate was closer to Sherburne and Wright Counties than to Stearns County or the state.

Figure 7-10. Economic Characteristics

Location	Per Capita Income	Percentage of Individuals Below Poverty Level
Preferred Route[a]	$20,336	5.2
Sherburne County	$21,322	4.4
Stearns County	$19,211	8.7
Wright County	$21,844	4.7
State of Minnesota	$23,198	7.9
[a]Data includes Monticello, Monticello Township, Silver Creek Township, Clearwater, Clearwater Township, Lynden Township, St. Augusta Township, Rockville Township, St. Joseph Township, and Waite Park.		

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 Stearns County in terms of

employment is trade, transportation and utilities, which employs nearly 27 percent of the workforce. The second largest industry in terms of employment is manufacturing, employing 19 percent of the workforce. Finally, education and health care is the third largest sector of employment, with roughly 17 percent of the workforce. Compared to Minnesota, Stearns County is slightly more concentrated in the manufacturing industry.

Figure 7-11 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 7-11. Population and Economic Characteristics Based on 2006 Census Data

Location	Total Population	White Population	Minority Population	Hispanic or Latino (of any race) Population	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
Sherburne County	85,025	95.8	4.2	1.8	26,823	6.7
Stearns County	144,443	94.4	5.6	1.7	22,948	14.1
Wright County	114,806	95.7	4.3	1.9	26,008	7.2

[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

Temporary housing, consisting of apartment rentals, hotels, motels, and campgrounds, is abundant in the St. Cloud area. Proximity to the Minneapolis and St. Paul area, which is approximately 70 miles from St. Cloud, ensures a large supply of vacant temporary housing.

The construction and operation of the transmission lines is expected to have minimal influence on the local (county and municipal) economies. In terms of payroll earnings and construction expenditures, the economic benefit from the Project will be small relative to the regional economy of St. Cloud, which is the major center of economic activity for the three-county area.

Up to 50 workers will be required for transmission line construction. An additional 25 workers may be required for substation construction. The transmission crews are expected to spend approximately 12 months constructing the transmission line and 16 months constructing the

substation. Multiple construction crews are anticipated. During construction, there will be a minor positive impact on the local community due to the expenditures of the construction crews. 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.

7.2.2.8 CULTURAL VALUES

Transmission Line

Cultural values include those perceived community beliefs or attitudes in a given area which will provide a framework for the unity of each social group. The communities along the opportunity corridors value their pioneer roots, the history of their settlement, and their predominately agricultural economy. 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 dairy professions. The area has a diversified agricultural mix of livestock and crops including corn, soybeans, oats, spring wheat, and dairy and beef cattle. Manufacturing opportunities are centered on food and agriculture. Attractions in the area include the Mississippi River, the Hoglund State WMA, and Quarry Park State Scientific Natural Area (SNA), all located near the opportunity corridors. WMAs are managed for wildlife production and are open to public hunting and wildlife watching. SNAs are part of a program that preserves natural features and rare resources of exceptional scientific and educational value. Construction of the proposed transmission line is not expected to conflict with the cultural values along the opportunity corridors.

The Monticello to St. Cloud area was originally an important gateway for commerce to the Twin Cities using the Mississippi River for transport; eventually, the railroad and roadways also became a means for transporting goods. Today, the region is an important center for education, health care, commerce, industry, and agriculture.

Quarry Substation (Proposed)

No impacts to cultural values are anticipated as a result of the construction of the proposed Quarry Substation.

Mitigative Measures

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

7.2.2.9 RECREATION

Transmission Line

Recreational opportunities in the Project vicinity include those offered by the state, counties, and cities. The State of Minnesota offers a number of state parks, forests, trails, scientific and natural areas, and WMAs. These are supplemented by parks and recreational programs offered by local governments.

Segments of the Mississippi River are designated either "scenic" or "recreational" through the Minnesota Wild and Scenic Rivers Program. The river is designated as "scenic" from St. Cloud to Clearwater, and "recreational" from Clearwater to Monticello. Through the Wild and Scenic Rivers program, a management plan was adopted that protects the river and sets rules for the management of land along the river corridor. The river is also a designated Canoe and Boating Route from St. Cloud through the Project area. The Mississippi River also provides scenic driving opportunities. The Great River Road, a national scenic byway, runs for more than 500 miles along the river. The Great River Road follows County Road 75 through the Project study area. The Preferred Route follows Wright County Road 75 for almost six miles.

In addition, a system of trails parallels I-94 through most of the Project study area. The Mississippi River Trail is also planned through the area, although the specific route has not been finalized. Parks and other recreational areas in proximity to or traversed by the Preferred Route are described below from east to west.

There are no parks in or along the Preferred Route in Monticello; however, several parks are located in proximity to the Project's eastern terminus. The city/Xcel ball fields are located just east of the Project terminus on West River Street, adjacent to I-94. The 14-acre softball complex includes four lighted ball fields with support facilities.

Montissippi Park is a Wright County park located to the east of the Xcel energy nuclear generating facility, adjacent to the Mississippi River. The 170-acre park offers a variety of recreational opportunities.

Marcus Zunbrunnen County Park is located on County Road 8 approximately 0.5 mile south of I-94. The Wright County Park includes a hiking trail and picnic site.

Warner Lake County Park is located adjacent to and south of I-94 west of Clearwater in Stearns County. This park features a campground shelter, picnic shelter, trails and a swimming beach.

Quarry Substation (Proposed)

No impacts to recreation resources are anticipated as a result of the construction of the proposed Quarry Substation.

Mitigative Measures

No impacts on recreation are anticipated, and therefore, no mitigative measures are proposed.

7.2.2.10 PUBLIC SERVICES

Transmission Line

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 (Monticello, St. Cloud, and Waite Park) offer the typical range of public services, including police and fire protection, water and sewer services, garbage collection, and street maintenance.

Through the Wright County Road Department and Stearns County Public Works Department, 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. MnDOT also has responsibility for planning and funding roadway improvements, including interstate highways, U.S. Highways, and state trunk highways.

Figure 7-12 lists the main roads that the Preferred Route will follow and traffic data, if available, for those roads.

Figure 7-12. Average Annual Daily Traffic for Select Roads of which the Preferred Route will Parallel

Road	Existing Average Annual Daily Traffic	Parallel Length (miles)
150th Street NW	NA	0.4
County Road 75	NA	5.9
I-94	39,000 to 51,000[a]	19.5
State Highway 23	15,000	1.1

Source: Minnesota Department of Transportation, 2006-2007.

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

[a]The traffic volume decreases from east (Monticello) to west (St. Cloud) along I-94.

I-94 carries a high volume of traffic which decreases by about 20 percent from Monticello to St. Cloud. State Highway 23 is a relatively busy state highway. Traffic volume data is not available for County Road 75 and 150th Street NW.

There are several highway projects funded or proposed in proximity to the Preferred Route. I-94 improvements involve installation of median cable guard rails from west of the Project study area to State Highway 15. This improvement project is funded for construction in 2009. Interstate signage in portions of the area is scheduled for replacement beginning in 2009. Also on I-94, concrete pavement rehabilitation from the Stearns/Wright county line to east of Monticello is scheduled for 2011.

The I-94 and State Highway 10 Interregional Connection is a partially new roadway proposed north and east of Clearwater. The freeway design includes a new interchange with I-94 approximately 1.6 miles southeast of the existing I-94 interchange with County Road 24. Although the environmental review process for the project is complete, construction is not scheduled to until 2015 through 2023. Construction is subject to change depending on funding priorities.

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 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.

Several airports are located on the north side of Interstate I-94. The closest of these is the Pilots Cove Airport in Monticello, which is 3.5 miles east of the Monticello Substation. The airport serves Monticello and Sherburne County and has a north-south-oriented, 2,550-foot turf runway. Leaders Clear Lake Airfield is located in Clear Lake, 4.1 miles from the Preferred Route. The airport is open to the public and has an asphalt and turf runway, 3,000 feet long, oriented north-south. Both of these airports are privately owned. The largest airport is the St. Cloud Municipal Airport located east of St. Cloud and 5.4 miles from the Preferred Route. The St. Cloud Airport has two runways oriented northwest-southeast and northeast-southwest. The Project will not be close enough to have any impacts on these airports.

South of I-94, a small privately used landing strip known as the Seven Hills Airport is within proximity of the Preferred Route near the northeast corner of Stearns County. Seven Hills Airport is considered a personal-use airport under state law. As a personal-use airport, state regulations require that the Seven Hills Airport must be of sufficient length and width and the approaches sufficiently clear of obstacles to permit safe operation of the aircraft intended to use it. Minn. R. 8800.2200. However, Minnesota statutes do not regulate obstructions to personal-use airports. Further, there are no FAA regulations with regard to airports such as Seven Hills as FAA obstructions standards apply only to airports available for public or military use. 14 C.F.R. §77.21(c). No impacts to the Seven Hills Airport are anticipated.

Quarry Substation (Proposed)

Both Proposed Quarry Substation Siting Areas encompass Southwest Beltway's West and Central Corridors.

Mitigative Measures

The Preferred Route and the Quarry Substation are not expected to impact any public services. Applicants will work 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.

7.2.3 LAND-BASED ECONOMICS

7.2.3.1 AGRICULTURE

Transmission Line

According to the U.S. Department of Agriculture (U.S. Department of Agriculture, 2009), in 2007 there were 265,376 acres of farm land (63 percent of total land) in Wright County and the market value of agricultural products sold was $140 million. In 2007, Stearns County had 708,284 acres of farm land (82 percent of total land) and the market value of agricultural products sold was $519 million. Primary crops in the area are corn, soybeans, oats, and spring wheat. The general area is mostly planted in corn and soybeans.

Seventy-nine percent of lands occurring within the Preferred Route corridor is zoned for agriculture, including less than one percent for special protection agriculture. Permanent impacts on agricultural land can include loss of agricultural land due to pole placement. These permanent impacts associated with the Preferred Route represent approximately 2.6 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 permanent access, and other work areas. Temporary impacts are estimated at approximately 113 acres, based on a rate of one acre per pole.

Quarry Substation (Proposed)

The Quarry Substation will have permanent impacts on agricultural land because a minimum of six acres will be permanently removed from existing land uses, including agricultural use.

Mitigative Measures

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. 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.

7.2.3.2 FORESTRY

Transmission Line

Forest resources, notably existing tree stands, are present along the Preferred Route. The corridor for the Preferred Route will cross 567 acres of wooded lands. The wooded areas are located primarily on privately held lands. Warner Lake County Park, located along the Preferred Route, west of Clearwater, is publicly owned and encompasses 241 acres of woods, Warner Lake, roads, trails, and a nature center. 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 trees within these woodlands is second or third growth. 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 7.2.5.3.

Quarry Substation (Proposed)

No forest resources are present at either of the Proposed Quarry Substation Siting Areas.

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.

7.2.3.3 TOURISM

Transmission Line

The proposed routes are not located near any tourist attractions.

Quarry Substation (Proposed)

The Proposed Quarry Substation Siting Areas are not located near any tourist attractions.

Mitigative Measures

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

7.2.3.4 MINING

Transmission Line

According to a MnDOT aggregate source information database (MnDOT, 2007) two aggregate mines are located within 0.25 mile of the Preferred Route corridor. One of these, near the town of Hasty, is inactive. The other is near Clearwater in the NE ¼ of the SW ¼ of Section 33, Township 123 N, Range 27 W.

In the St. Cloud area, bedrock quarries are common. Based on the USGS topographic map for the area, the closest quarries to the Project include one located north of the I-94 and State Highway 23 interchange about 0.2 mile from the Preferred Route corridor and 0.1 mile from the Quarry Substation Siting Area Alternate 2. This quarry is 0.3 mile from the Quarry Substation Siting Area Alternate 1. A second quarry is located within 0.3 mile of the Preferred Route corridor and Quarry Substation Siting Area Alternate 2 but greater than 0.5 mile from the Quarry Substation Siting Area Alternate 1.

Quarry Substation (Proposed)

Aggregate mining has previously and continues to occur within the area encompassed by the Quarry Substation Siting Area Alternate 2.

Mitigative Measures

The Preferred Route will not pass close enough to any mines to have an impact on mining operations, and therefore, no mitigative measures are proposed. Aggregate mining that has previously and continues to occur within the Quarry Substation Siting Area Alternate 2 suggests some constructability considerations.

7.2.4 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Transmission Line

As recently as January 2009, the Minnesota State Historic Preservation Office (SHPO) Archaeological and Architectural database records were accessed to determine if the existence of any known or suspected archaeological sites or historic standing structures are located within the Project study area. Based on the preliminary review of the Project Area, it was determined there are known sites in the general vicinity of the Project. Currently, Applicants do not anticipate impacts to previously or newly identified resources as a result of the Project. The Applicant plans to avoid

impact to any newly discovered resources by adjusting pole spacing to span any resources, as appropriate or feasible. In the event that an impact will occur, the Applicant 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 when received.

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

Only four archaeological sites are within 500 feet of the maximum corridor sharing alignment within the Preferred Route. Of these, one site represents a historic artifact scatter and structural ruin that is eligible for listing on the NRHP. The remaining sites represent prehistoric isolated finds or artifact scatters dating to the Woodland period. Project planning and engineering efforts will strive to avoid these sites. No other previously recorded archeological resources have been identified within 500 feet of either side of the maximum corridor sharing alignment within the Preferred Route (Figure 7-13).

Figure 7-13. Archaeological Resources within 500 Feet of the Preferred Route Maximum Corridor Sharing Alignment

Site Type	Within 500 Feet of the Maximum Corridor Sharing Alignment	Eligible or Listed
Prehistoric Lithic Scatter	1	0
Prehistoric Artifacts	2	0
Prehistoric Earthwork	1	1
Prehistoric Single Artifact	4	1
Subtotal	8	2
Historic Documentation	1	0
Historic Artifacts and Ruins	2	0
Historic Ruins	6	0
Subtotal	9	0
Total	17	2

Two historic architecture properties were previously recorded are located within 500 feet of the Preferred Route maximum corridor sharing alignment in Wright and Stearns counties. One site is a bridge while no information is provided for the second site relating to its function. These properties have not been evaluated for listing on the NRHP. Project planning and engineering effort will strive to avoid both historic structures.

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.

No historic landscapes have been identified within the Project area. If a historic landscape is identified prior to construction, consultation with appropriate parties will be initiated and consideration will be given to the Project-related impacts.

Quarry Substation (Proposed)

Applicants recognize that the list of known resources is limited to those identified through surveys in specific locations, often tied to urban and rural development and infrastructure. The available background information at the Proposed Quarry Substation Siting Areas concludes a limited extent of previous archaeological site inventories. Archaeological inventories within the two areas have not been conducted, so it is not possible to quantify the entirety of the potential archaeological impacts and use that information as a component of this impact assessment.

There are no archaeological sites or historic architectural properties immediately within either Proposed Quarry Substation Siting Area. There are no historic landscapes associated with either area.

Currently, Applicants do not anticipate impacts to previously or newly identified resources as a result of the construction of the proposed Quarry Substation. 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.

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. Four 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, the Applicant does not anticipate impacts to previously or newly identified resources as a result of the Preferred Route. The Applicant 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, the Applicant 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.

7.2.5 NATURAL ENVIRONMENT

7.2.5.1 AIR QUALITY

Transmission Line

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.

Quarry Substation (Proposed)

The potential for air quality impacts as a result of the construction of the proposed Quarry Substation would include some considerations similar to the proposed 345 kV transmission line.

Mitigative Measures

The Applicant anticipates nominal impacts to air quality, therefore no mitigative measures are proposed.

7.2.5.2 WATER RESOURCES

Transmission Line

Surface Waters

Numerous surface water resources including lakes, rivers, streams, and wetlands are located along the Proposed Routes (see Appendix C). Major named surface waters within the Preferred Route corridor include Warner, Locke, and Fish Lakes and the Clearwater River. The largest surface water body along this route is Locke Lake. In order to avoid impacts associated with the crossing of Locke Lake, the Preferred Route parallels the north side of I-94.

Several small or unnamed streams also occur along the Preferred Route. Some rivers and streams are designated 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. Public Waters also include some lakes and wetlands. The Applicant will obtain utility crossing licenses from the MDNR for PWI waters crossed. Water features crossed by the Preferred Route corridor are summarized in Figure 7-14. Waterbodies listed in the PWI are denoted in these tables.

Figure 7-14. Waterbodies Crossed by the Preferred Route

Waterbody Name	Number of Crossings	PWI Stream
Silver Creek	1	Yes
Unnamed Tributary to Rice Lake	1	No
Fish Creek	1	No
Clearwater River	1	Yes
Plum Creek	1	Yes
Johnson Creek	1	Yes

Waterbody Name	Number of Crossings	PWI Stream
Unnamed Tributary to Johnson Creek	1	Yes
County Ditch 14	1	Yes
Unnamed Tributary to Mud Lake	2	No
County Ditch No. 17	1	Yes
Unnamed Tributary to County Ditch No. 17	1	No

Section 303(d) of the federal Clean Water Act (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. In Minnesota, the MPCA has jurisdiction over determining 303(d) waters. The only waterbody on this list that is crossed by the Project includes the Clearwater River, which is listed as having affected aquatic life due to low levels of dissolved oxygen. The only impairment that could potentially be generated by the Project is increased turbidity due to increased sedimentation from construction activities.

Section 401 of the CWA grants state agencies the authority to require certification of compliance with state and federal water quality regulations. In Minnesota, the MPCA implements Section 401 and will grant Project certification.

The Federal Emergency Management Agency (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, function and maintenance of the transmission structures could be affected within the floodplain during a flood event. Approximately 27.6 acres of FEMA-designated floodplain occur within the Preferred Route corridor and are shown on the route maps in Appendix B.

Wetlands

Wetlands are important resources for flood abatement, wildlife habitat, and water quality. In Minnesota, wetland are protected under Minnesota's Wetland Conservation Act (WCA), and by the MDNR for those areas identified as PWI wetlands. A wetland permit is required from the USACE under Section 404, and a license to cross PWI wetlands is required from the MDNR. This Project may not require a permit under WCA by definition (Minn. R. 8420.0110 Subpart 18) or by exemption (R. 8420.0122 Subpart 6). Coordination with affected LGUs and/or the Board of Water and Soil Resource (BWSR) is required for the WCA determination.

NWI maps, produced by the USFWS maps based on aerial photographs and NRCS soil surveys, were used to estimate impacts on wetlands that could occur. Wetlands listed on NWI maps may be inconsistent with current wetland conditions; however, NWI maps are the best available data for

wetland resources within the Project area. The figure below includes a summary of wetlands crossed by the Preferred Route.

The most common wetland type crossed by the Project is palustrine emergent wetlands. These are seasonally and/or temporarily flooded areas which cover approximately 5.7 percent of the Preferred Route. Each wetland type, representing primarily palustrine ecological systems, is briefly described below.

Figure 7-15. NWI Wetlands Crossed by the Preferred Route

Wetland Type	Total Wetlands		MDNR PWI Wetlands
	Count	% of Route	
Palustrine emergent	124	9.2	12
Palustrine forested	9	0.7	0
Palustrine scrub-shrub	21	1.2	1
Palustrine unconsolidated bottom semipermanently flooded	19	0.3	4
Lake	6	1.0	2
Riverine	1	<1	0
Total	**180**	**12.4**	**19**

Quarry Substation (Proposed)

Both the Proposed Quarry Substation Siting Areas have NWI wetlands present within the boundaries. The Quarry Substation Siting Area Alternate 2 also has two waterbodies flowing through the boundaries, one of which is included in the Minnesota PWI. All wetland and waterbody features identified will be avoided to the extent feasible and fenced off by installing erosion control devices (e.g., silt fence, straw bales) to ensure that sediment does not enter the water feature.

Because all rivers, streams, and ditches will be spanned by transmission structures or avoided (if possible), a limited number of structures will be located within these features and impacts on rivers, streams, or ditches will be minimized. Indirect impacts could include sedimentation reaching surface waters during construction due to ground disturbance by excavation, grading, construction traffic, and dewatering of holes drilled for transmission structures. This could temporarily degrade water quality due to turbidity. These impacts will be avoided and minimized using appropriate sediment control practices and construction practices. These practices will be detailed in the National Pollutant Discharge Elimination System (NPDES) permit and Stormwater Pollution Prevention Plan (SWPPP) that will be completed prior to the start of construction. Once the Project is completed, there will be no significant impact on surface water quality because wetland impacts will be minimized and mitigated, disturbed soil will be restored to previous conditions or better, and the

amount of land area converted to an impervious surface will be small. As discussed above, the Applicant will seek Section 401 certification from the MPCA.

Applicants will maintain sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent water resources and minimize soil erosion. Construction will be completed according to NPDES permit requirements.

Waterways will not be crossed by construction equipment unless necessary and the appropriate local state, and or federal agencies will be consulted. Where waterways must be crossed to string new conductors and shield wires, workers may walk across, use boats, or drive equipment across ice in the winter. These construction practices will help to prevent soil erosion and ensure potential fueling and lubricating of equipment will occur at a sufficient distance beyond the construction limits.

Temporary impacts on wetlands may occur if they need to be crossed during construction of the transmission line. No staging or stringing setup areas will be placed within or adjacent to water resources, to the extent feasible. Applicants will avoid major disturbance of individual wetlands and drainage systems during construction to the extent feasible. This will be done by spanning wetlands and drainage systems, where possible. When it is not possible to span the wetland, Applicants will draw on several options during construction to minimize impacts.

Permanent impacts on wetlands will take place where structures must be located within wetland boundaries. Wetland impacts due to permanent structure placement will result in approximately 55 square feet of permanent impacts per standard single-pole structure. Temporary impacts will total one acre per span of transmission line. Wetland vegetation will be restored following construction. Access roadways will be designed to minimize wetland impacts by locating the areas of roadways near the edges of wetland areas, minimizing the width of the access roadways and construction material (gravel) where possible. The Applicant will obtain necessary permits or approvals.

Vegetation maintenance procedures under transmission lines prohibit trees from establishing. Existing trees must be removed throughout the entire right-of-way, including forested wetlands. Wetland mitigation for conversion of forested wetlands to non-forested wetlands may be required.

Applicants have identified that approximately five poles will need to be placed in wetlands, resulting in approximately 275 square feet (or less than 0.01 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 8.3 acres within the Preferred Route corridor. Approximately 2.1 acres of PFO wetlands will undergo a permanent vegetation type change to PEM or PSS vegetation.

Structures in FEMA floodplains displace an amount of permeable surface within the floodplain. Across the Preferred Route, approximately two structures will be placed within FEMA floodplains, using 110 square feet, for permanent structure foundations. Impacts of structures within FEMA floodplains are not anticipated to have an effect on flooding.

In addition, Minn. Stat. §84.415 requires the Applicant to obtain a license from the MDNR for passage of any utility over, under, or across public waters.

Numerous surface water resources including lakes, rivers, streams and wetlands are located along the proposed routes. Major named surface waters within Preferred Route corridor include Warner, Locke and Fish Lakes and the Clearwater River. Several small or unnamed streams also occur along Preferred Route. All of the major surface waters listed here are MDNR protected waters. Numerous wetlands are also present within the Preferred Route corridor.

There are several NWI wetlands and water bodies along Preferred Route. The largest surface water body along this route is Locke Lake. In order to avoid impacts associated with the crossing of Locke Lake, Preferred Route parallels the north side of I-94. The NWI wetlands are listed above in Figure 7-14.

Mitigative Measures

Applicants will follow standard erosion control measures identified in the MPCA's Stormwater Best Management Practices Manual, such as using silt fencing to minimize impacts to adjacent water resources.

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

- When possible, construction will be scheduled during frozen ground conditions;
- Crews will attempt to access the wetland with the least amount of physical impact to the wetland (*i.e.*, shortest route);
- The structures will be assembled on upland areas before they are brought to the site for installation; and

- When construction during winter is not possible, construction mats will be used where wetlands will be impacted.

7.2.5.3 FLORA

Transmission Line

The Project area occurs within one Ecological Classification System (ECS) unit, as described by the MDNR and USFWS: the Eastern Broadleaf Forest (ECOMAP 1993). Within this ECS unit, the Project occurs within three subsections: Big Woods, Hardwood Hills, and Anoka Sandplain. The subsections were dominated by maple (*Acer* sp.) - basswood (*Tilia americana*) forests, and interspersed with oak (*Quercus* sp.) savannas, tallgrass prairies, and oak forests (MDNR 2009). Woodlands and forests dominated sites where fire was uncommon, including species such as sugar maple (*Acer saccarum*), basswood, American elm (*Ulmus americana*), and northern red oak (*Quercus rubra*). Silver maple (*Acer saccarinium*) forests still occupy the active floodplains, while silver maple, cottonwood (*Populus deltoides*), box-elder (*Acer negundo*), green ash (*Fraxinus pensylvanica*), and slippery elm (*Ulmus rubra*) grow near rivers where flooding is infrequent (MDNR 2005). Wet depressions create conditions suitable for marshes, wet meadows, shrub/scrub wetlands, and wet prairies. As a result of settlement and farming in the 1800s, most of the historic prairie has been converted to agriculture. The dominant plant species in the agriculture areas are corn (*Zea mays*) and soybeans (*Glycine max*); in the grazed areas, dominant vegetation includes introduced grasses, such as smooth brome (*Bromus inermis*) and sorghum (*Sorghum vulgare*). Similarly, woodland trees were removed and land was converted to agriculture. For a discussion on impacts on agriculture, see Section 7.2.3.1.

Throughout the general Project area, there are several areas where native vegetation occurs naturally or is managed. Designated habitat or conservation areas include managed lands such as MDNR WMAs and USFWS WPAs and easements, and unmanaged areas include MDNR-designated Minnesota County Biological Survey (MCBS) biodiversity significance and rare native habitats and communities. These resources provide habitat for native vegetation, wildlife and rare and unique resources. There are no sections of the Preferred Route which cross WPAs, USFWS easements, or WMA lands.

MCBS data were reviewed to determine if there were areas with moderate, high, or outstanding biodiversity significance in the Project area. Areas with moderate biodiversity significance are those containing significant occurrences of rare species and/or moderately disturbed native plant communities and landscape that have a strong potential for recovery. Areas with high biodiversity significance contain sites with very good 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.

Noxious weeds are regulated under Minn. Stat. §18. Noxious weeds can rapidly overtake native vegetation and severely degrade habitat quality. Cropland suffers losses in productivity following noxious weed infestations. Noxious weeds can be introduced to new areas through propagating material like roots or seeds transported by contaminated construction equipment. Disturbed soil surfaces allow noxious weeds to establish and out-compete existing vegetation. Eleven species of primary noxious weeds are recognized and prohibited by Minn. R. 1505.0730 (see Figure 7-16). The Minnesota Noxious Weed Law also defines and lists 49 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. The Applicant will continue to work with the state and counties crossed to identify locations along the Project corridor where invasive species may occur.

Figure 7-16. Minnesota Prohibited Noxious Weeds

Common Name	Scientific Name
Mustard, garlic	*Alliaria petiolata (Bieb.)* (formerly *alliaria officinalis)*
Hemp	*Cannabis sativa*
Plumeless Thistle	*Carduus acanthoides (L.)*
Musk Thistle	*Carduus nutans (L.)*
Canada Thistle	*Cirsium arvense (L.) Scop.*
Bull Thistle	*Cirsium vulgare (Savi) Tenore*
Field Bindweed	*Convolvulus arvensis*
Leafy Spurge	*Euphorbia esula (L.)*
Purple Loosestrife	*Lythrum salicaria, virgatum,* or any combination
Perennial Sowthistle	*Sonchus arvensis (L.)*
Poison Ivy	*Toxicodendron radicans (Ktze.)* (formerly *rhus radicans)*

Quarry Substation (Proposed)

The land use within both Proposed Quarry Substation Siting Areas are generally agricultural, therefore the flora at these locations are not likely to be very diverse. Although NWI wetlands occur within both site locations, it appears from a review of recent aerial photography that they have both been previously disturbed by agricultural activities or actively cultivated. Applicants will work with the appropriate agencies should sensitive habitats exist at these locations to minimize disturbance.

Mitigative Measures

Flora throughout most of the Project area is typical of that normally found in an agricultural setting. The majority of the route will occur along existing rights-of-way, including roads, and also often

adjacent to cultivated row crops. Impacts on native vegetation are not anticipated to substantially disrupt vegetative community quality or function. Applicants will span areas containing native communities wherever possible. Applicants will also work to avoid and minimize direct impacts on habitat and conservation areas as possible. Temporary impacts on flora will take place most intensively at the structure locations where borings will take place and spoils will be stored. Permanent impacts are estimated at 55 square feet per pole. Temporary impacts are estimated at one acre per span. Staging areas and stringing areas will also temporarily impact flora across the route. Grading could occur at the staging areas if they are not located in previously disturbed sites. In forested areas, clearing for access roads and staging areas will be limited to only those trees necessary to permit the passage of equipment. Temporary access roads will be removed and the area restored to its original condition.

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. Collocating 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.

Applicants will continue to work with the MDNR and USFWS to avoid or minimize 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. The Applicant 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, the Applicant 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.

7.2.5.4 FAUNA

Transmission Line

Wildlife throughout the Project area consists of birds, mammals, fish, reptiles, amphibians, mussels, and insects, both resident and migratory, 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 *(Mustilidae* family), porcupine *(Erethizon dorsatum)* and rabbit *(Sylvilagus* spp.*)*. Common birds include songbirds, hawks such as red-tailed hawk (*Buteo jamaicensis*), cooper's hawk (*Accipter cooperii*), waterfowl, and game birds such as pheasant *(Phasianus colchinus)* and turkey *(Meleagus gallopavo)* (MDNR AniMap 2008; Tester 1995).

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 easements, and unmanaged areas including MDNR-designated MCBS biodiversity significance and rare native habitats and communities were analyzed within Preferred Route corridor.

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 intensively used landscapes. Federally-owned or operated lands include NWRs, WPAs, and USFWS easements. NWRs are owned and managed by the USFWS to conserve important natural resources. No sections of the Preferred Route include WPAs, WMAs, or NWR lands.

The Migratory Bird Treaty Act (MBTA) 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 (BCC). Migratory birds and BCC are an important component of biodiversity in North America. Many species are known to occur in the Project area in a variety of habitats, grasslands, and wetlands. Additionally, the 1940 Bald and Golden Eagle Protection Act (16 USC 668-668C) 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.

Quarry Substation (Proposed)

As described above, the land use associated with both Proposed Quarry Substation Siting Areas is mostly agricultural. The Project will expect impacts on wildlife at these locations to be minimal due to the abundance of similar adjacent habitat. Permanent impacts on wildlife could take place at substation locations where 40 acres of land for the both the Preferred and Alternate Substations, will be changed from existing land uses, most likely agricultural, to the developed substation area.

Construction will displace wildlife; however additional impacts on wildlife are not expected. However, the Applicant will work with the appropriate agencies should sensitive wildlife or their habitats exist at these locations to minimize disturbance.

Mitigative Measures

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.

Temporary impacts to fauna will take place most intensively at the structure locations (requiring one acre per span of transmission line) where borings will take place and spoils will be stored. Staging areas and stringing areas will also temporarily impact fauna within the Project construction area. Grading could occur at the staging areas if they are not located in previously disturbed sites. Clearing for access roads will be limited as much as possible and will be at maximum 20 feet wide. In forested areas, clearing will be limited to only those trees necessary to permit the passage of removed and the area restored to original condition.

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 typically due to the larger size of conductors associated with transmission lines compared to distribution lines, transmission line conductors are more visible. 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. Construction impacts to these areas will be minimized as much as possible in coordination with the MDNR.

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. The Applicant's 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.

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.

Game species are not likely to be negatively affected by this Project. Because no sections of the Preferred Route include WPA or WMA managed lands, and native habitats will be spanned wherever feasible, impacts to these species' habitat will be small. Similarly, because transmission line routing avoids direct impacts on lakes and rivers, impacts on fisheries will be small. Any impacts, temporary or permanent, are unlikely to affect population levels of these species.

The Applicant 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 shield wires and/or to use alternate structures to reduce the likelihood of collisions. Also, the Applicant has routed the Preferred Route such that the majority is co-located with existing rights-of-way that have been previously disturbed; therefore, minimizing additional tree clearing that could increase fragmentation.

To mitigate possible impacts to wildlife, the Applicant will avoid areas known as major flyways or migratory resting spots, and span designated high quality wildlife habitat areas wherever feasible. 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. In areas where complete spanning is not possible, the Applicant 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.

In 2002, Xcel Energy, entered into a voluntary Memorandum of Understanding (MOU) 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 MOU.

7.2.6 RARE AND UNIQUE NATURAL RESOURCES

Transmission Line

This section discusses the threatened and endangered species protected under Minn. Stat. §84.895, and under Section 7 of the Endangered Species Act. Critical habitat and unique natural resources

such as SNAs are also identified and discussed. The MDNR and USFWS have been involved in the pre-application coordination effort regarding these resources. Table 6.2.6-1 lists the documented occurrences of state and federally listed species identified within a 1 mile buffer of the route corridor. These resources were identified using the MDNR Natural Heritage Information System (NHIS). Threatened and endangered species are often found within high quality rare and unique habitats and features (e.g., SNAs), which could also be identified using NHIS. Many of the threatened and endangered species identified in the Project area are associated with wetland and other habitats associated with water resources. River species of mussels are encountered in major rivers within the 1 mile buffer, particularly the Mississippi River, which is not crossed by the Project.

In addition to the rare and unique habitats that are identified by NHIS, the MDNR MCBS data documents high quality native habitats. The MCBS data were reviewed to determine if there were areas with moderate, high, or outstanding biodiversity significance within the Project area. Areas with medium biodiversity significance are those containing significant occurrences of rare species and/or moderately disturbed native plant communities and landscape that have a strong potential for recovery. Areas with high biodiversity significance contain sites with very good 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. There are no occurrences of MCSB outstanding significance areas crossed by the Project, 103.5 acres designated as high significance, and 14.7 acres designated as having moderate significance. As discussed above, WMAs, WPAs, National Widlife Refuges (NWRs), and USFWS easements often have native or restored habitats that could harbor threatened and endangered species, however, the Preferred Route does not cross any of these land designations.

The following discussions focus on federal and state protected species and rare and unique communities within 1 mile of the Preferred Route corridor. While state non-status species may occur, they are outside the focus of this discussion. Species protected under state statute are those listed as special concern, threatened, and endangered.

The search of the MDNR's NHIS showed that one state-listed threatened species (Blanding's turtle, *Emydoidea blandingii)* is known to occur within the Preferred Route corridor. The review of the NHIS database within 1 mile of the route corridor identified a total of 10 different species. There were no occurrences of federally listed species; one state-listed endangered species, two state-listed threatened species, and seven different species of special concern documented within a one mile area of the Preferred Route corridor (See Figure 7-17). No critical habitat occurs within one mile of the Preferred Route corridor.

Figure 7-17. Preferred Route Rare and Unique Resources

Common Name	Scientific Name	Number of Occurrences	MN Status	State Rank*
Birds				
Acadian Flycatcher	*Empidonax virescens*	2	SC	S3
Bald Eagle	*Haliaeetus leucocephalus*	4	SC	S3
Cerulean Warbler	*Dendroica cerulea*	2	SC	S3
Peregrine Falcon	*Falco peregrinus*	1	THR	S2
Red-Shouldered Hawk	*Buteo lineatus*	1	SC	S3
Amphibians				
Blanding's Turtle	*Emydoidea blandingii*	6	THR	S2
Invertebrates				
Black Sandshell	*Ligumia recta*	5	SC	S3
Plants				
Butternut	*Juglans cinerea*	1	SC	S3
Hill's Thistle	*Cirsium hillii*	2	SC	S3
Tubercled Rein-orchid	*Platanthera flava var. herbiola*	18	END	S1

* In Minnesota, a rank is assigned to the natural community type, which reflects the known extent and condition of that community. Ranks range from S1 (in greatest need of conservation action in the state) to S5 (secure under present conditions) to SU (undetermined, more information is needed).
** There are no documented federally listed species occurring within 1 mile of the Preferred Route.

Quarry Substation (Proposed)

Applicants have reviewed the NHIS for species occurrences within one mile of the Proposed Quarry Substation Siting Areas. There are no NHIS occurrences within either site; however there are two state special concern mussel species that are known to occur within the Sauk River over 0.5 mile from the alternate location. The Applicant will not expect impacts on these species to occur due to lack of appropriate habitat within at the alternate site location.

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.

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 Best Management Practices (BMPs) are not employed. Therefore, the Applicant will work to span rivers, streams, and wetlands throughout the Project area, implement appropriate BMPs, 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, a survey will be conducted to determine the presence of special status species or suitability of habitat for such species, and coordination will occur with the appropriate agencies to avoid and minimize any associated impacts.

7.3 ALTERNATE ROUTE A

7.3.1 LOCAL DESCRIPTION ENVIRONMENTAL SETTING

The local area is generally representative of the environmental setting within the regional area. Specific to Route Segment 2, the proposed routes extend northwest from CR 8 and traverse the Clearwater Township in Wright County until terminating within vicinity of the city of Clearwater. Existing land use in the area is predominantly undeveloped agricultural land however low density or single-family residential uses also occur along CR 75. Commercial uses are prevalent along I-94. The local area is zoned as agricultural, general commercial, and light industrial.

7.3.2 HUMAN SETTLEMENT

7.3.2.1 PUBLIC HEALTH AND SAFETY

As explained previously, regardless of the route ultimately selected, the Project will be designed in compliance 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, NESC 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.

Mitigative Measures

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

7.3.2.2 COMMERCIAL, INDUSTRIAL, RESIDENTIAL LAND USE

The transmission line along Alternate Route A primarily utilizes I-94 like the Preferred Route but also makes more use of property lines and includes more cross country segments and county roads. Other components such as existing 115 kV lines are taken into consideration as well. See map in Appendix H for reference. Zoning of the area crossed by Alternate Route A is summarized in Figure 7-18.

Figure 7-18. Alternate Route A Zoning and Land Use Summary

Zoning/Land Use Classification	Percent (%) Crossed by Alternate Route A
Agricultural	87.0
Special Protection Agriculture	2.1
Residential	1.8
Industrial	4.4
Recreational / Open Space / Park	2.7
Commercial / Business / Institutional / Public	0.9
County Identified Municipal	1.0

Alternate Route A, like the Preferred Route, crosses Wright and Stearns Counties affecting the cities of Monticello, Clearwater, and St. Cloud 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 (87 percent compared to 79 percent). In addition, two percent of land within the Alternate Route A corridor is zoned for special protection agriculture. Although Alternate Route A affects more properties zoned residential and recreational in proximity to the previously listed cities, the total areas zoned residential and recreational within the corridor (two percent and three percent, respectively) are less than for the Preferred Route (six percent and four percent, respectively). Property lines are utilized more in these areas, as are recreational areas and parks, much of which are also zoned residential.

Commercial zoning classifications along Alternate Route A reflect businesses along the I-94 corridor and businesses within the cities and townships that Alternate Route A crosses. Commercial and industrial land uses are not as prominent along Alternate Route A (one and four percent, respectively) compared to the Preferred Route (two and eight percent, respectively). Similar to the Preferred Route, no transitional growth areas are affected by Alternate Route A, and minimal county-identified municipal areas are affected.

Mitigative Measures

Existing land uses in proximity to the 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 7.2.3.1. Minor permanent impacts on land use will be incurred due to the small loss of land around each pole. As indicated below, the Applicant 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.

7.3.2.3 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 106 residences are within the Alternative Route A corridor, as indicated below. This is comparable to the Preferred Route. The line will be designed so that all existing residences are located outside of the right-of-way. However, a number of non-residential structures will be within the right-of-way. These include up to nine commercial buildings, which may be displaced. This is comparable to the number of commercial structures expected to be displaced by the Preferred Route.

Figure 7-19. Residences within 500 Feet of the Alternate Route A Maximum Corridor Sharing Alignment

Proximity (Feet)	Alternate Route A
Right-of-Way Required	150 (feet in width)
Residences 0-75	0
Residences 75-150	21
Residences 150-300	38
Residences 300-500	26
Total Residences	85
Density (Homes/Mile)	2.6

Mitigative Measures

No residence displacement will occur, but a number of commercial buildings would be displaced. Owners will be compensated in accordance with land acquisition requirements as previously discussed.

7.3.2.4 NOISE

See Section 7.2.2.4 for an explanation of noise emission in general and in relation to the proposed transmission line and Quarry Substation.

7.3.2.5 TELEVISION AND RADIO INTERFERENCE.

See Section 7.2.2.5 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.

7.3.2.6 AESTHETICS

Aesthetic resources and potential impacts associated with Alternate Route A are similar to those described above for the Preferred Route. Because Alternate Route A will cross more residential area, there would be an increased potential for visual impacts.

Mitigative Measures

Although the line will be a contrast to some surrounding land uses, Alternate Route A maximizes the use of existing corridors and avoids homes to the greatest extent practicable. Applicants will work with landowners to identify concerns related to the transmission line.

7.3.2.7 SOCIOECONOMIC

Socioeconomic impacts associated with Alternate Route A would be similar to those identified in Section 7.2.2.7.

7.3.2.8 CULTURAL VALUES

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

7.3.2.9 RECREATION

Recreational resources and potential impacts associated with Alternate Route A are similar to those described above for the Preferred Route in Section 7.2.2.9. However, in Clearwater there is one additional city-owned park in proximity to Alternate Route A. Cedar South Park is a new, 16-acre park located west of County Road 7 in the Cedar South subdivision. The neighborhood park has playground equipment and open space with additional park development planned.

Mitigative Measures

No impacts are anticipated to recreational resources, and therefore, no mitigative measures are proposed.

7.3.2.10 PUBLIC SERVICES

Consideration of public services associated with Alternate Route A is similar to those described above for the Preferred Route. Figure 7-20 lists the main roads that the Preferred Route will follow and traffic data, if available, for those roads.

Figure 7-20. Average Annual Daily Traffic for Selected Roads Parallel to Alternate Route A

Alternate Route A	Existing Average Annual Daily Traffic	Parallel Length (miles)
135th Street NW, Silver Creek Township	NA	0.6
137th Street NW, Silver Creek Township	NA	0.2
150th Street NW, Clearwater Township	NA	1.7
160th Street NW, Clearwater Township	220 [a]	1.5
238th Street, St. Augusta	NA	0.3
27th Avenue E, Lynden Township	NA	0.7
41st Avenue, St. Augusta	NA	0.5
Baker Avenue NW, Silver Creek Township	NA	0.3
Stearns County Road 115	1,450	0.3
Stearns County Road 137	390	1.3
Stearns County Road 143	350	0.6
Stearns County Road 44	1,550	1.7
Wright County Road 7	690 [a]	0.3
Stearns County Road 75	2,300	1.0
Wright County Road 75	3,300 [a]	0.9
Ferman Avenue NW, Silver Creek Township, Clearwater Township	NA	0.2
Grover Avenue NW, Clearwater Township	NA	0.2
I-94, Wright County, Stearns County	39,000 to 51,000 [b]	5.7
State Highway 15, Stearns County	6,600	1.2
State Highway 23, Stearns County	15,000	0.7
State Highway 24, Wright County	17,800	2.0

Source: Minnesota Department of Transportation, 2006-2007
NA: Traffic data are not available for this roadway segment.
[a]Traffic data from 2004.
[b]The traffic volume decreases from east (Monticello) to west (St. Cloud) along I-94.

The amount of Alternate Route A that is adjacent to I-94 is reduced by about 70 percent compared to the Preferred Route. Although the route is not directly adjacent to the I-94 corridor, it still closely follows the Preferred Route.

As discussed in Section 7.2.2.10, several highway projects are planned or proposed along I-94 between Monticello and St. Cloud. None of these projects will affect Alternate Route A.

Compared to the Preferred Route, Alternate Route A will be the same distance or slightly farther away from the three publicly used airports.

South of I-94, a small privately used landing strip known as the Seven Hills Airport is within proximity of the Preferred Route near the northeast corner of Stearns County. Seven Hills Airport is considered a personal-use airport under state law. As a personal-use airport, state regulations require that the Seven Hills Airport must be of sufficient length and width and the approaches sufficiently clear of obstacles to permit safe operation of the aircraft intended to use it. Minn. R. 8800.2200.

However, Minnesota statutes do not regulate obstructions to personal-use airports. Further, there are no FAA regulations with regard to airports such as Seven Hills as FAA obstructions standards apply only to airports available for public or military use. 14 C.F.R. §77.21(c). No impacts to the Seven Hills Airport are anticipated.

Mitigative Measures

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

7.3.3 LAND-BASED ECONOMICS

7.3.3.1 AGRICULTURE

Agricultural characteristic and conditions in the Project area are described in Section 7.2.3.1. Eighty seven percent of the corridor for Alternative Route A is zoned for agriculture, including two percent for 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 represent less than 3.5 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 permanent access, and other work areas. Temporary impacts are estimated at approximately 152 acres, based on a rate of 1 acre per pole.

Mitigative Measures

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 intend 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 time is necessary, disturbance to farm soil from access to each structure location will be minimized by using the shortest access route. This may require construction of temporary driveways between the roadway and the structure, but will limit traffic on fields between structures. Construction mats may also be used to minimize impacts on the access paths and in construction areas.

7.3.3.2 FORESTRY

Forest resources, notably existing tree stands, are present along Alternate Route A. The corridor for Alternate Route A will cross 739 acres of forested land. The forest resources are located primarily on privately held lands. Like the Preferred Route, the corridor for Alternate Route A will cross Warner Lake County Park in Clearwater (see Section 7.2.3.2). In general, impacts on forest resources will occur at locations where trees will be cleared within the right-of-way.

Mitigative Measures

No impacts on commercial forest resources will occur. Impacts on forested lands have been minimized by designing the route to avoid wooded areas to the extent feasible.

7.3.3.3 TOURISM

Alternate Route A is not located near any tourist attractions.

Mitigative Measures

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

7.3.3.4 MINING

According to a MnDOT aggregate source information database (MnDOT, 2007), four aggregate mines are located within 0.25 mile of the Alternate Route A corridor. Two of these are the same as described for the Preferred Route in Section 7.2.3.4. The other two consist of a "prospected pit" near St. Augusta and an inactive pit near St. Cloud. A prospected pit may or may not be an active pit. The prospected pit is located in the NE ¼ of the SW ¼ of Section 13, Township 123 N, Range 28 W.

Mitigative Measures

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

7.3.4 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Three archaeological sites are located within 500 feet of either side of the maximum corridor sharing alignment within Alternate Route A. Because of its proximity to the Preferred Route, two of these previously recorded archaeological resources have been discussed previously. The third site represents a locality that was identified from historic documentation. Of these three, one site represents a historic artifact scatter and structural ruin that is eligible for listing on the NRHP. The

remaining two sites have not been evaluated for listing on the NRHP. Project planning and engineering effort will strive to avoid these sites.

Figure 7-21. Archaeological Resources within 500 Feet of the Alternate Route A Maximum Corridor Sharing Alignment

Site Type	Within 500 Feet of the Maximum Corridor Sharing Alignment	Eligible or Listed
Prehistoric Lithic Scatter	1	0
Prehistoric Artifacts	1	0
Prehistoric Earthwork	1	1
Prehistoric Single Artifact	3	1
Subtotal	6	2
Historic Documentation	1	0
Historic Artifacts and Ruins	1	0
Historic Ruins	4	0
Subtotal	6	1
Total	12	3

Because of its proximity to the Preferred Route, two of the four previously recorded historic architecture properties within 500 feet of Alternate Route A are discussed previously. These properties have not been evaluated for listing on the NRHP. Project planning and engineering effort will strive to avoid historic structures.

Historic Landscapes

No historic landscapes have been identified within the Project area. If a historic landscape is identified prior to construction, consultation with appropriate parties will be initiated and consideration will be given to the Project-related impacts.

Mitigative Measures

Mitigative measures would be similar to those described above for the Preferred Route.

7.3.5 NATURAL ENVIRONMENT

7.3.5.1 AIR QUALITY

As discussed previously, both state and federal governments have regulations regarding permissible concentrations of ozone and oxides of nitrogen. Similarly to the Preferred Route, the area near Alternate Route A presently meets all federal air quality standards.

The only potential air emissions from a 345 kV transmission line result from corona and are limited. However, 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 on 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.

7.3.5.2 WATER RESOURCES

Surface Waters

The surface water resources crossed by Alternate Route A are listed below and identified on the detailed route maps in Appendices B and C.

During construction there is the possibility of sediment reaching surface waters as excavation, grading, and construction traffic disturb the ground. However, once the Project is complete it will have no impact on surface water quality.

Figure 7-22. Waterbodies Crossed by Alternate Route A

Waterbody Name	Number of Crossings	PWI Stream
Silver Creek	1	Yes
Unnamed Tributary to Rice Lake	1	No
Fish Creek	1	No
Clearwater River	1	Yes

Waterbody Name	Number of Crossings	PWI Stream
Plum Creek	1	Yes
Unnamed Tributary to Johnson Creek	1	No
Johnson Creek	3	Yes
Robinson Hill Creek	1	Yes
Unnamed Tributary to Robinson Hill Creek	1	Yes
Unnamed Tributary to Robinson Hill Creek	1	Yes
Unnamed Tributary to Robinson Hill Creek	1	No
County Ditch No. 14	1	Yes
County Ditch No. 17	1	Yes
Unnamed Tributary to County Ditch No. 17	1	No

Wetlands

Similar to the Preferred Route, Alternate Route A was reviewed for NWI wetlands occurring within the 1,000-foot-wide corridor. A summary of NWI wetlands crossed within the Alternate Route A corridor is shown below.

As along the Preferred Route, the most common wetland type crossed by the route is palustrine emergent wetlands. These are seasonally and/or temporarily flooded areas which cover approximately 7.9 percent of Alternate Route A. See Section 7.2.5.2 for a description of each wetland type, representing primarily palustrine ecological systems.

Figure 7-23. NWI Wetlands Crossed by Alternate Route A

Wetland Type	Total Wetlands		MDNR PWI Wetlands
	Count	% of Route	
Palustrine emergent	169	8.8	16
Palustrine forested	10	0.3	1
Palustrine scrub-shrub	15	0.7	3
Palustrine unconsolidated bottom semipermanently flooded	31	0.5	5
Lake	5	1.0	3
Riverine	1	<1	0
Total	231	11.3	28

<u>Mitigative Measures</u>

Applicants have concluded three poles will likely need to be placed in wetlands, resulting in approximately 165 square feet 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 5.8 acres within the Alternate A Route corridor. Approximately 2.7 acres of PFO wetlands will undergo a permanent vegetation type change to PEM or PSS vegetation.

Alternate Route A will cross approximately 10.7 acres of FEMA-designated floodplain (see route maps in Appendix B). Structures in FEMA floodplains displace an amount of permeable surface within the floodplain. No permanent structure foundations will be placed within FEMA floodplains; therefore, impacts from structures within FEMA floodplains will not have any effect on flooding.

See Section 7.2.5.2 for a detailed discussion for potential construction-related impacts and mitigation for wetland resources.

7.3.5.3 FLORA

Alternate Route A occurs within the same ECS unit and subsections as the Preferred Route: Big Woods, Hardwood Hills, and the Anoka Sandplain. Similar to the Preferred Route, there are no sections of Alternate Route A which cross WPAs, USFWS easements, NWRs, or WMA lands.

Refer to Section 7.2.5.3 for a detailed discussion on vegetation that may occur along the Project corridor, impacts, and proposed minimization measures.

7.3.5.4 FAUNA

As discussed in Section 7.2.5.4, there is a potential for temporary displacement of wildlife during construction and the loss of small amounts of habitat from the Project. Comparable habitat is adjacent to the route for habitat types that occur in the area, therefore, it is likely that species will only be displaced a short distance.

The Applicant will avoid areas known as major flyways or migratory resting spots, and span designated high quality wildlife habitat areas, wherever feasible. Also, Alternate Route A has been routed, to the extent possible, to be co-located with existing rights-of-way to minimize additional tree clearing that could increase fragmentation. However, this route is only 92 percent co-located, which is 3 percent less than the Preferred Route.

See Section 7.2.5.4 for a detailed discussion on wildlife in the Project area and potential impacts that could occur and minimization measures proposed in sensitive areas.

7.3.6 RARE AND UNIQUE NATURAL RESOURCES

This section focuses on federal and state protected species and rare and unique communities within one mile of the Alternate Route A corridor. See Section 7.2.6 for a detailed discussion of resources used and methodology to identify rare and unique natural resources for this Project. While state

non-status species may occur, they are outside the focus of this discussion. Species protected under state statute are those listed as special concern, threatened, and endangered.

The search of the MDNR's NHIS showed that one state-listed threatened species (Blanding's turtle, *Emydoidea blandingii)* is known to occur within the Alternate Route A corridor. The review of the NHIS database within one mile of the route corridor identified a total of 11 different species. There were no occurrences of federally listed species; one state-listed endangered species, three state-listed threatened species, and seven different species of special concern documented within a one mile area of the Alternate Route A corridor. No critical habitat occurs within one mile of Alternate Route A.

Figure 7-24. Alternate Route A Rare and Unique Resources

Common Name	Scientific Name	Number of Occurrences	MN Status	State Rank*
Birds				
Acadian Flycatcher	*Empidonax virescens*	2	SC	S3
Bald Eagle	*Haliaeetus leucocephalus*	3	SC	S3
Cerulean Warbler	*Dendroica cerulea*	3	SC	S3
Peregrine Falcon	*Falco peregrinus*	1	THR	S2
Trumpeter Swan	*Cygnus buccinator*	1	THR	S2
Red-Shouldered Hawk	*Buteo lineatus*	3	SC	S3
Amphibians				
Blanding's Turtle	*Emydoidea blandingii*	5	THR	S2
Invertebrates				
Black Sandshell	*Ligumia recta*	4	SC	S3
Creek Heelsplitter	*Lasmigona compressa*	1	SC	S3
Plants				
Hill's Thistle	*Cirsium hillii*	2	SC	S3
Tubercled Rein-orchid	*Platanthera flava var. herbiola*	4	END	S1

*In Minnesota, a rank is assigned to the natural community type, which reflects the known extent and condition of that community. Ranks range from S1 (in greatest need of conservation action in the state) to S5 (secure under present conditions) to SU (undetermined, more information is needed).

7.4 Alternate Route B

7.4.1 Local Description Environmental Setting

The local area is generally representative of the environmental setting within the regional area. Specific to Alternate Route B, the proposed routes extend northwest from County Road 8 and traverse the Clearwater Township in Wright County until terminating within vicinity of the city of

Clearwater. Existing land use in the area is predominantly undeveloped agricultural land however low density or single-family residential uses also occur along County Road 75. Commercial uses are prevalent along I-94. The local area is zoned as agricultural, general commercial, and light industrial.

7.4.2 HUMAN SETTLEMENT

7.4.2.1 PUBLIC HEALTH AND SAFETY

As explained Section 7.2.3.1, regardless of the route ultimately selected, the Project will be designed in compliance 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. The Applicant's construction crews and/or contract crews will comply with local, state, NESC 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.

Mitigative Measures

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

7.4.2.2 COMMERCIAL, INDUSTRIAL, RESIDENTIAL LAND USE

Unlike the Preferred Route, the transmission line along Alternate Route B is designed to avoid co-location with I-94 by making use of property lines, cross country segments, and county roads. Other components such as existing 115 kV lines are taken into consideration as well. Zoning for the area crossed by the Alternate Route B is summarized below.

Figure 7-25. Alternate Route B Zoning and Land Use Summary

Zoning/Land Use Classification	Percent (%) Crossed by Preferred Route
Agricultural	87.9
Special Protection Agriculture	1.9
Residential	3.5
Industrial	3.9
Recreational / Open Space / Park	1.5
Commercial / Business / Institutional / Public	<1
County Identified Municipal	1.0

The zoning percentages for Alternate Route B are almost identical to those of Alternate Route A, as discussed in Section 7.3.2.2. The residential zoned land crossed is slightly higher at 4 percent (compared to two percent for Alternate Route A) and the recreational zoned land crossed is slightly lower at two percent (compared to three percent for Alternate Route A).

Mitigative Measures

Existing land uses in proximity to Alternate Route B 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 previously. Minor permanent impacts on land use will be incurred due to the small loss of land around each pole. 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.

7.4.2.3 DISPLACEMENT

As explained in Section 7.2.3.3, NESC and Company standards require certain clearances between transmission line facilities and buildings for safe operation of the transmission line. The Applicant acquires 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 118 residences are within the Alternative Route B corridor, as indicated below. This is 11 residences more than for the Preferred Route. The line will be designed so that all existing residences are located outside of the right-of-way. However, a number of non-residential structures may be displaced, including up to two commercial buildings.

Figure 7-26. Residences within 500 Feet of the Alternate Route B Alignment

Proximity (Feet)	Alternate Route B
right-of-way Required	150 (feet in width)
Residences 0-75	0
Residences 75-150	30
Residences 150-300	51
Residences 300-500	39
Total Residences	120
Density (Homes/Mile)	3.5

Mitigative Measures

No residence displacement will occur, but several non-residential buildings, including residential outbuildings and commercial buildings will need to be moved or acquired by the Applicant. Owners will be compensated in accordance with state and federal land acquisition requirements as previously discussed.

7.4.2.4 NOISE

See Section 7.2.2.4 for an explanation of noise emission in general and in relation to transmission lines.

Like the Preferred Route, the residences in proximity to Alternate Route B will fall within NAC 1. As discussed in Section 7.2.3.4, the noise generated from the transmission lines is not expected to exceed the background noise levels and will therefore not be audible at any receptor location. Any audible noise will be well below the MPCA noise standards established for NAC 1.

Mitigative Measures

No noise impacts are anticipated as a result of Alternate Route B, and therefore, no mitigative measures are proposed.

7.4.2.5 TELEVISION AND RADIO INTERFERENCE

See Section 7.2.2.5 for a discussion of television and radio interference related to transmission lines. Conditions along Alternate Route B will be similar to those along the Preferred Route.

Mitigative Measures

No widespread interference to television or radio reception is anticipated. If isolated radio or television interference occurs because of the transmission line, the Applicant will work with the affected landowner to restore reception to pre-Project quality.

7.4.2.6 AESTHETICS

Aesthetic resources and potential impacts associated with Alternate Route B are similar to those described above for the Preferred Route. Because Alternate Route B will cross more residential area, greater visual impacts will occur. In some areas, windrows of trees follow property lines where Alternate Route B will be located. These trees will need to be removed, resulting in further visual impacts. This alternative will have a greater impact on aesthetics than either the Preferred Route or Alternate Route A.

Mitigative Measures

Although the line will be a contrast to some surrounding land uses, Alternate Route B follows existing corridors and avoids homes to the greatest extent practicable while avoiding the I-94 corridor. The Applicant will work with landowners to identify concerns related to the transmission line.

7.4.2.7 SOCIOECONOMIC

Socioeconomic considerations associated with Alternate Route B are the same as those described above for the Preferred Route in Section 7.2.2.7.

7.4.2.8 CULTURAL VALUES

The cultural values discussion for the Preferred Route in Section 7.2.2.8 applies to Alternate Route B as well.

7.4.2.9 RECREATION

Recreational resources and potential impacts associated with Alternate Route B are similar to those described above for the Preferred Route in Section 7.2.2.9.

7.4.2.10 PUBLIC SERVICES

Consideration of public services associated with Alternate Route B is similar to those described above for the Preferred Route. Figure 7-27 lists the main roads that the Preferred Route will follow and traffic data, if available, for those roads.

Figure 7-27. Average Annual Daily Traffic for Selected Roads Parallel to Alternate Route B

Road	Existing Average Annual Daily Traffic	Parallel Length (miles)
127th Street NE, Monticello Township, Silver Creek Township	NA	1.9
134th Street NW, Silver Creek Township	NA	0.4
135th Street NE, Silver Creek Township	NA	0.7
137th Street NE, Silver Creek Township	NA	1.0
140th Street NW, Silver Creek Township	NA	1.3
150th Street NW, Clearwater Township, Silver Creek Township	NA	1.0
160th Street NW, Clearwater Township	220 [a]	1.5
195th Street E, Lynden Township	NA	0.4
200 Street NW, Lynden Township	NA	0.5
238th Street W, St. Augusta	NA	0.3
41st Avenue, St. Augusta	NA	0.5
Aladdin Avenue NW, Silver Creek Township	NA	0.6
Baker Avenue NW, Silver Creek Township	NA	0.3
Clementa Avenue NW, Silver Creek Township	390 [a]	0.2
Stearns County Road 115	1,450	0.3
Stearns County Road 137	390	1.8
Stearns County Road 44	1,550	3.1
Wright County Road 7	690 [a]	0.3
Wright County Road 8	1.550 [a]	0.3
Dempsey Avenue NW, Silver Creek Township	NA	0.1
Fillmore Avenue NW, Clearwater Township, Silver Creek Township	NA	1.0
Grover Avenue NW, Clearwater Township	NA	0.2
State Highway 15, Stearns County	6,600	0.5
State Highway 23, Stearns County	15,000	0.7
State Highway 24, Wright County	17,800	1.5

Source: Minnesota Department of Transportation, 2006-2007

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

[a]Traffic data from 2004.

By design, none of Alternate B is co-located with I-94. It also follows roads with lower traffic volumes than Alternate Route A and has a greater length that does not parallel any road than Alternate Route A.

As discussed previously, several highway projects are planned or proposed along I-94 between Monticello and St. Cloud. None of these projects will affect Alternate Route B.

Compared to the Preferred Route, Alternate Route B will be farther away from the three publicly used airports described previously. South of I-94, a small privately used landing strip known as the Seven Hills Airport is within proximity of the Preferred Route near the northeast corner of Stearns County. Seven Hills Airport is considered a personal-use airport under state law. As a personal-use

airport, state regulations require that the Seven Hills Airport must be of sufficient length and width and the approaches sufficiently clear of obstacles to permit safe operation of the aircraft intended to use it. Minn. R. 8800.2200. However, Minnesota statutes do not regulate obstructions to personal-use airports. Further, there are no FAA regulations with regard to airports such as Seven Hills as FAA obstructions standards apply only to airports available for public or military use. 14 C.F.R. §77.21(c). No impacts to the Seven Hills Airport are anticipated.

Mitigative Measures

It is not anticipated that Alternate Route B will impact public services, and therefore, no mitigative measures are proposed.

7.4.3 LAND-BASED ECONOMICS

7.4.3.1 AGRICULTURE

Agricultural characteristic and conditions in the Project area are described in Section 7.2.3.1. Eighty-nine percent of the corridor for Alternative Route B is zoned for agriculture, including 2 percent for 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 B represent less than 3.9 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 permanent access, and other work areas. Temporary impacts are estimated at approximately 168 acres, based on a rate of 1 acre per pole.

Mitigative Measures

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, the Applicant intends to place the poles approximately 5 feet from the road right-of-way. When possible, the Applicant will attempt to construct the transmission line before crops are planted or following harvest. The Applicant 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 time is necessary, disturbance to farm soil from access to each structure location will be minimized by using the shortest access route. This may require construction of temporary driveways between the roadway and the structure, but will limit traffic on

fields between structures. Construction mats may also be used to minimize impacts on the access paths and in construction areas.

7.4.3.2 FORESTRY

Forest resources, notably existing tree stands, are present along Alternate Route B. The corridor for Alternate Route B will cross 953 acres of forested land. The forest resources are located primarily on privately held lands. Like the Preferred Route, the corridor for Alternate Route B will cross Warner Lake County Park in Clearwater (see Section 7.2.3.2); however the corridor will cross the southwest corner of the park. In general, impacts on forest resources will occur at locations where trees will be cleared within the right-of-way.

Mitigative Measures

No impacts on commercial forest resources will occur. Impacts on forested lands have been minimized by designing the route to avoid wooded areas to the extent feasible.

7.4.3.3 TOURISM

Alternate Route B is not located near any tourist attractions.

Mitigative Measures

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

7.4.3.4 MINING

According to a MnDOT aggregate source information database (MnDOT, 2007), three aggregate mines are located within 0.25 mile of the Alternate Route B corridor. One of these is an inactive pit near St. Cloud, which is within the Alternate B corridor. The other two consist of "prospected pits" near St. Augusta and the town of Hasty. A prospected pit may or may not be an active pit. The prospected pit by St. Augusta is located in the NE ¼ of the SW ¼ of Section 13, Township 123 N, Range 28 W. The prospected pit near Hasty is in the NE ¼ of the NE ¼ of Section 29, Township 122 N, Range 26 W. This mine is located within the corridor for Alternate Route B. Additionally, the USGS topographic map depicts the Alternate Route B corridor crossing a gravel pit southwest of the city of Augusta.

Mitigative Measures

No impacts to mining are anticipated and therefore, no further mitigative measures are proposed.

7.4.4 Archaeological and Historic Resources

Only one archaeological site is within 500 feet of the Alternate Route B alignment. A second site was recorded based off of historic documentation and its location has not been field verified. Until the site is investigated, it has not been evaluated for listing on the NRHP. Project planning and engineering effort will strive to avoid the site. No other previously recorded archeological resources have been identified within 500 feet of the Alternate Route B.

Figure 7-28. Archaeological Resources within 500 Feet of the Alternate Route B Alignment

Site Type	Within 500 Feet of the Alternate Route B Alignment	Eligible or Listed
Historic Documentation	1	0
Subtotal	1	0
Public	1	0
Miscellaneous or Unlisted	1	0
Subtotal	2	0
Total	3	0

Only two previously recorded historic architecture properties are within 500 feet of Alternate Route B. Neither property has been evaluated for listing on the NRHP. Project planning and engineering effort will strive to avoid historic structures.

Historic Landscapes

No historic landscapes have been identified within the Project area. If a historic landscape is identified prior to construction, consultation with appropriate parties will be initiated and consideration will be given to the Project-related impacts.

Mitigative Measures

Mitigative measures would be similar to those described above for the Preferred Route.

7.4.5 Natural Environment

7.4.5.1 Air Quality

As previously discussed, both state and federal governments have regulations regarding permissible concentrations of ozone and oxides of nitrogen. Similarly to the Preferred Route, the area near Alternate Route B presently meets all federal air quality standards.

The only potential air emissions from a 345 kV transmission line result from corona and are limited. However, 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 on the surrounding environment will be minimal because of the short and intermittent nature of the emission and dust-producing construction phases.

Mitigative Measures

The Applicant anticipates nominal impacts on air quality, therefore no mitigative measures are proposed.

7.4.5.2 WATER RESOURCES

Surface Waters

The surface water resources crossed by Alternate Route B are listed below and identified on the detailed route maps in Appendices B and C.

During construction there is the possibility of sediment reaching surface waters as excavation, grading, and construction traffic disturb the ground. However, once the Project is complete it will have no impact on surface water quality. See Section 7.2.5.2 for a detailed discussion for potential construction-related impacts and mitigation for surface water.

Figure 7-29. Waterbodies Crossed by Alternate Route B

Waterbody Name	Number of Crossings	PWI Stream
Silver Creek	1	Yes
Fish Creek	1	No
Clearwater River	1	Yes
Plum Creek	1	Yes
Unnamed Tributary to Johnson Creek	1	No
Johnson Creek	3	Yes
Robinson Hill Creek	1	Yes
Unnamed Tributary to Robinson Hill Creek	1	Yes
Unnamed Tributary to Robinson Hill Creek	1	Yes
Unnamed Tributary to Robinson Hill Creek	1	No
County Ditch No. 14	1	Yes
Unnamed Tributary to County Ditch No. 14	1	No
County Ditch No. 17	1	Yes
Unnamed Tributary to County Ditch No. 17	1	No

Wetlands

Similarly to the Preferred Route, Alternate Route B was reviewed for NWI wetlands occurring within the 1,000-foot-wide corridor. A summary of NWI wetlands crossed within the Alternate Route B corridor is shown in the table below.

As along the Preferred and Alternate A Routes, the most common wetland type crossed by the route is palustrine emergent wetlands. These are seasonally and/or temporarily flooded areas which cover approximately 9.7 percent of Alternate Route B. See Section 7.2.5.2 for a description of each wetland type, representing primarily palustrine ecological systems.

Figure 7-30. NWI Wetlands Crossed by Alternate Route B

Wetland Type	Total Wetlands		MDNR PWI Wetlands
	Count	% of Route	
Palustrine emergent	187	10.5	9
Palustrine forested	10	0.4	1
Palustrine scrub-shrub	19	1.2	1
Palustrine unconsolidated bottom semipermanently flooded	39	<1	2
Lake	2	<1	2
Riverine	0	0	0
Total	**257**	**13.0**	**15**

Mitigative Measures

The Applicant calculates that four poles will need to be placed in wetlands, resulting in approximately 220 square feet 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 7.3 acres within the Alternate B Route corridor. Approximately 3.2 acres of PFO wetlands will undergo a permanent vegetation type change to PEM or PSS vegetation.

Alternate Route B will cross approximately 7.8 acres of FEMA-designated floodplain (see route maps in Appendix C). Structures in FEMA floodplains displace an amount of permeable surface within the floodplain. No permanent structure foundations will be placed within FEMA floodplains; therefore, impacts from structures within FEMA floodplains will not have any effect on flooding.

See Section 7.2.5.2 for a detailed discussion for potential construction-related impacts and mitigation for wetland resources.

7.4.5.3 FLORA

Alternate Route B occurs within the same ECS unit and subsections as the Preferred and Alternate A Routes: Big Woods, Hardwood Hills, and the Anoka Sandplain. Alternate Route B does not cross any WPAs, USFWS easements, or NWRs, however, it does cross a small section of Hoglund WMA in Wright County. Should this route be selected, the Applicant will work with the MDNR to avoid and minimize impacts to any sensitive habitats.

See Section 7.2.5.3 for a detailed discussion on vegetation that may occur along the Project corridor, impacts, and proposed minimization measures. See Section 7.2.3.1 for a discussion on potential impacts on agriculture.

7.4.5.4 FAUNA

As discussed in Section 7.2.5.4, there is a potential for temporary displacement of wildlife during construction and the loss of small amounts of habitat from the Project. Comparable habitat is adjacent to the route for habitat types that occur in the area, therefore, it is likely that species will only be displaced a short distance.

The Applicant will avoid areas known as major flyways or migratory resting spots, and span designated high quality wildlife habitat areas, wherever feasible. Also, Alternate Route B has been routed, to the extent possible, to be co-located with existing rights-of-way to minimize additional tree clearing that could increase fragmentation. However, this route is only 91 percent co-located, which is 4 percent less than the Preferred Route.

See Section 7.2.5.4 for a detailed discussion on wildlife in the Project area and potential impacts and minimization measures proposed in sensitive areas.

7.4.6 Rare and Unique Natural Resources

This section focuses on federal and state protected species and rare and unique communities within 1 mile of the Alternate Route B corridor. See Section 7.2.6 for a detailed discussion of resources used and methodology to identify rare and unique natural resources for this Project. While state non-status species may occur, they are outside the focus of this discussion. Species protected under state statute are those listed as special concern, threatened, and endangered.

The review of the NHIS database within one mile of the route corridor identified a total of 11 different species. There were no occurrences of federally listed species; one state-listed endangered species, three state-listed threatened species, and seven different species of special concern documented within a one mile area of the Alternate Route B corridor. No critical habitat occurs within one mile of the Alternate Route B corridor.

Figure 7-31. Alternate Route B Rare and Unique Resources

Common Name	Scientific Name	Number of Occurrences	MN Status	State Rank*
Birds				
Acadian Flycatcher	*Empidonax virescens*	2	SC	S3
Bald Eagle	*Haliaeetus leucocephalus*	2	SC	S3
Cerulean Warbler	*Dendroica cerulea*	6	SC	S3
Peregrine Falcon	*Falco peregrinus*	1	THR	S2
Trumpeter Swan	*Cygnus buccinator*	1	THR	S2
Red-Shouldered Hawk	*Buteo lineatus*	4	SC	S3
Amphibians				
Blanding's Turtle	*Emydoidea blandingii*	5	THR	S2
Invertebrates				
Black Sandshell	*Ligumia recta*	3	SC	S3
Creek Heelsplitter	*Lasmigona compressa*	1	SC	S3
Plants				
Hill's Thistle	*Cirsium hillii*	1	SC	S3
Tubercled Rein-orchid	*Platanthera flava var. herbiola*	4	END	S1

*In Minnesota, a rank is assigned to the natural community type, which reflects the known extent and condition of that community. Ranks range from S1 (in greatest need of conservation action in the state) to S5 (secure under present conditions) to SU (undetermined, more information is needed).

See Section 7.2.6 for a detailed discussion on the potential impacts that could occur and mitigative measures proposed in sensitive areas.

8.0 PUBLIC PARTICIPATION AND AGENCY INVOLVEMENT

8.1 IDENTIFICATION OF LAND OWNERS

Potentially affected landowners within and adjacent to the Proposed Routes are identified in Appendix J. There are 366 landowners associated with the Preferred Route, 316 landowners associated with Alternate Route A, and 279 landowners associated with Alternate Route B.

8.2 COMMUNITY OUTREACH OVERVIEW

8.2.1 INTRODUCTION

The project corridors that had been identified for the Fargo to Monticello 345 kV Project also comprised the area 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 community outreach effort.

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 development of the public participation plan for the Fargo to Monticello Project took shape. Project-specific coordination with key stakeholders continued and the methodology and approach to route development and selection, while also more formally engaging stakeholders and the general public in a broader scale public participation process, was established. The public participation process specific to the Project is discussed below.

8.2.2 METHODOLOGY AND APPROACH

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 H.

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 encouraging the participation of various stakeholders. These stakeholders represent local constituents and perceptions within the Project study area. The RWG forum includes 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 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

The three milestone phases of route development and selection identified for the Project included Phase I – Project Overview and Need, Phase II – Potential Route Alternatives, and Phase III – Proposed Routes. However, the routes presented to stakeholders and the general public during Phase III of the public participation process were further refined and an additional route to be carried forward was identified. The preliminary proposed routes became the Open House III Routes and the routes identified in this Application are the final Proposed Routes.

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.

Phase II – Potential Route Alternatives

Phase II first involved the presentation of the methodology and approach for 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, subject to this Application, and the Fargo to St. Cloud 345 kV Project 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. As a result, Phase II also included the presentation of potential route alternatives associated with the Monticello to St. Cloud 345 kV Project. Applicants sought feedback regarding the potential route alternatives.

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 – Proposed Routes

Phase III involved the presentation of the preliminary proposed routes, now referred to as the Open House III Routes, and the rationale as to how they were developed. Applicants sought feedback regarding the Open House III Routes.

The community outreach component of Phase III included a series of RWG meetings and open houses at various locations throughout the Project study area.

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 the 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 the environmental siting criteria.

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. 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, 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. A total of 11 meetings were facilitated.

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 Project newsletters.

Meeting Summary

The Phase I open houses were attended by a total of 582 members of the public. A total of 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 – POTENTIAL ROUTE ALTERNATIVES

Phase II first involved the presentation of the methodology and approach for route development and selection. This included the identification of the environmental 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, subject to this Application, and the Fargo to St. Cloud 345 kV Project 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 allow 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. As a result, Phase II also included the presentation of potential route alternatives associated with the Monticello to St. Cloud 345 kV Project. Applicants sought feedback regarding the potential route alternatives.

The community outreach component of Phase II included a series of RWG meetings and open houses at various locations throughout the overall area. Eight RWG meetings and seven open houses were facilitated.

8.4.1 ROUTING WORK GROUP 1

The first series of the RWG meetings, Routing Work Group 1, were conducted over a four day period from January 28 to January 31, 2008. 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 overall 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 Project and its 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.

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 areas sensitive to them in the transmission line routing process. The attendees were divided into groups of five or six individuals. Each group, led by a facilitator, was asked to list general areas that are sensitive to them in the transmission line routing process. These general areas were written down by the facilitator on a 36 by 44 inch poster board, with no order of priority given to any of the areas listed.

The second interactive exercise incorporated the work completed as part of the first interactive exercise. The list of general areas of sensitivity generated by the meeting participants were presented to the entire group as part of an active 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 total invitees and 66 actual attendees at the RWG 1 meetings.

8.4.2 ROUTING WORK GROUP 2

The second series of RWG Meetings consisted of four meetings conducted over a three day period from March 4 to March 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 included the discussion of the need to separate the Fargo to Monticello Project into the Monticello to St. Cloud 345 kV Project and the Fargo to St. Cloud 345 kV Project due to the critical timing associated with the in-service date in the St. Cloud area. The location of Monticello to St. Cloud Potential Route Alternatives, as well as an overview of the rationale

associated with the development of these routing options, was also presented. 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 Monticello to St. Cloud potential route alternatives, 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 introduction of the Monticello to St. Cloud potential route alternatives. The presentation of information and interactive exercises 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. Each group, led by a facilitator, was asked to participate in routing a line on a fictitious map. This map had many of the same characteristics and land features as the overall area. For example, it depicted farmland, center pivot irrigation, airports, wildlife areas, lakes, highways and towns. A number of sensitivities with a relatively high density were mapped between the two interconnection points. The groups worked together to identify a route within this fictitious study area. Each team then presented their route and the rationale for the 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 overall area. There were more than 320 total invitees and 58 actual attendees at the RWG 2 meetings.

8.4.3 PHASE II PUBLIC MEETINGS

The second phase of open houses occurred on March 18 through March 20, 2008 and March 25 through March 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 Project area into the two separate projects, the criteria to be used and the sequence of steps associated with route

development and selection, and the identification of the Monticello to St. Cloud potential route alternatives.

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 the Monticello to St. Cloud potential route alternatives, 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 Monticello to St. Cloud potential route alternatives. 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 RWG 2 Meetings held on March 4, 5, and 6, 2008. 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 the Project brochure and Project newsletters.

Meeting Summary

The Phase II open houses were attended by a total of 443 members of the public. A total of 88 comment forms were received as a result of the Phase II open houses and a summary of these comments and 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 – PROPOSED ROUTES

8.5.1 ROUTING WORK GROUP 3

The third RWG Meeting for the Monticello to St. Cloud 345 kV Project occurred on May 21, 2008 in Clearwater, MN at the Eagle Trace Golfers Club, 1100 NW Main Street. This meeting provided CapX2020 an opportunity to discuss its proposed routes and substation siting area for the Monticello to St. Cloud 345 kV Project.

Objectives and Approach

The objective of the third RWG Meeting was to present the proposed route options and substation area for the Monticello to St. Cloud 345 kV Project.

The presentation included welcome and introductions, a review of the March RWG 2 Meetings, an overview of the regulatory process, presentation of the proposed route options and substation area for the Monticello to St. Cloud 345 kV Project, an open discussion, the next steps in the process, and a question and answer session.

Meeting Summary

For the meeting conducted on May 21, 2008 in Clearwater, Minnesota, the invite list consisted of 87 invitees. Of the invitees, 23 people had confirmed their attendance in advance of the meeting and 18 actually attended.

8.5.2 PHASE III PUBLIC MEETINGS

The Phase III open house for Monticello to St. Cloud occurred on May 29, 2008 in Clearwater, MN at the Eagle Trace Golfers Club, 1100 NW Main Street. The purpose of the open house was to present the proposed routes and substation siting areas. The following sections discuss the overview and objectives, and summary of the meeting.

Objectives and Approach

The objectives of the Phase III open house were to continue to solicit public participation and input as well as to present the proposed route options and substation area for the Monticello 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 proposed route options and substation area for the Monticello to St. Cloud 345 kV Project. Maps were developed for all attendees who were interested in receiving one.

Notification

Invitation letters were sent to landowners within the Project notice corridors. These invitees included individuals, groups, and agencies identified as having property located within the notice 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 the Project brochure and Project newsletters.

Meeting Summary

The Phase III open house was attended by a total of 166 members of the public. A total of 29 comment forms were received as a result of the Phase III open house and a summary of these comments and 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.

8.5.3 CITY/TOWNSHIP MEETINGS

As described above, subsequent to the third phase of open houses, the Open House III Routes were refined and an additional route that would be carried forward was identified. Three routes were carried forward as the Proposed Routes, which are subject to this Application. While various city and township representatives had participated in the RWG meetings or attended previous open houses, Applicants began meeting with the potentially affected cities and townships subsequent to the identification of the final Proposed Routes in an effort to ensure that those along the Proposed Routes were aware of the location of the routes, as well as to update the cities and townships on Project developments since the third phase of open houses in the spring of 2008. The cities and townships facilitated public notification for these meetings. The meetings included brief presentations, general discussion, and question and answer sessions. Comments and perceptions shared by participants in the meetings that occurred prior to the filing of this Application were consistent with the themes previously identified. Preferences to route the proposed 345 kV transmission line nearer to the interstate right-of-way and to minimize the potential for impacts to residential and agricultural uses were shared by those participating in these meetings.

8.6 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.

8.6.1 UNITED STATES FISH AND WILDLIFE SERVICE

The Project team has met with the U.S. Fish and Wildlife Service on four occasions between February 2008 and June 2008. Discussions with the USFWS have centered around 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 H.

8.6.2 UNITED STATES ARMY CORPS OF ENGINEERS

The Project team met with the U.S. Army Corps of Engineers in May 2008 to discuss permitting considerations associated with impacts to wetlands and waterways. Meeting summaries are provided in Appendix H.

8.6.3 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 the 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 five meetings were conducted with various divisions of the MDNR between February and May 2008. Discussions with MDNR have centered around collecting information related to the location of existing state owned lands, as well as federally funded lands or easements, the potential for affect to these lands. Meeting summaries are provided in Appendix H.

8.6.4 MINNESOTA SHPO

As recently as January 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.

8.6.5 MINNESOTA DEPARTMENT OF TRANSPORTATION

Applicants contacted MnDOT 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 MnDOT's views on the available options and their relative impacts. Applicants have met with MnDOT and the FHWA on multiple occasions. The results of this coordination effort are outlined in Section 2.0. Meeting summaries are provided in Appendix H.

8.6.6 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. Applicants are working with the Department of Agriculture and other parties to develop an Agricultural Impact Mitigation Plan.

8.6.7 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 H.

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 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 Clean Water Act, Water Quality Certification
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 Clean Water Act 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 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

A National Pollutant Discharge Elimination System (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 Storm Water Pollution Prevention Plan (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 Clean Water Act. The MPCA has waived Section 401 certification requirements for projects authorized under the USACE Regional General Permit RGP-3-MN. Applicants will apply for certification from the MPCA in the event that the Project would not adhere to the provisions of a Section 404 Regional General Permit.

Minnesota Department of Agriculture

Applicants are developing an Agricultural Impact Mitigation Plan for the Project in cooperation with the Minnesota Department of Agriculture. The Agricultural Impact Mitigation Plan will include provisions intended to avoid, mitigate, or to provide compensation for negative impacts on agricultural lands. The final plan will be incorporated into the Route Permit upon issuance.

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 MnDOT for construction, placement, or maintenance of utility lines adjacent to or across state highway or 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

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.
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.
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
APP	Avian protection plans
AWOS	Automated weather observation stations
BCC	Birds of conservation concern
BMPs	Best management practices
BWSR	Minnesota Board of Water and Soil Resources
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
GIS	Geographic information system
HVTL	HVTL
I-94	Interstate 94
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
MnDOT	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
NERC	North American Electric Reliability Corporation
NESC	National Electric Safety Code
NHIS	Natural Heritage Information System
NIEHS	National Institute of Environmental Health Sciences
NRHP	National Register of Historic Places
NSPM	Northern States Power Company, a Minnesota corporation

NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
OBL	Obligate
PDA	Project Development Agreement
PPM	Parts per million
PWI	Public Waters Inventory
SHPO	Minnesota State Historic Preservation Office
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
VOR	Very high frequency omnidirectional radio range
WMA	Wildlife Management Area
WPA	Waterfowl Production Area

APPENDIX A

Project Overview Map

APPENDIX B

Detailed Aerial Photography Project Maps

APPENDIX C

Detailed Topographic Project Maps

APPENDIX D

Information Related to All Routes Considered

APPENDIX E

Alignment Comparison Impact Table

APPENDIX F

Human Settlement Maps and Information

APPENDIX G

Archaeological and Historic Resources, and Threatened and Endangered Species Maps and Information

APPENDIX H

Agency Coordination and Public Participation Process Information

APPENDIX I

Summary of Public Comments

APPENDIX J

Landowners Associated with the Preferred Route

APPENDIX K

Project Development Agreement