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# ENVIRONMENTAL ASSESSMENT

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**In the Matter of the Application for a Route Permit for the  
Lake Yankton to Marshall Transmission Project**

**PUC Docket No. E002/TL-07-1407**



**Energy Facility Permitting  
85 7<sup>th</sup> Place East, Ste 500  
Saint Paul, MN 55101**

**May 30, 2008**



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**Responsible Governmental Unit**

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**ABSTRACT**

Northern States Power Company d/b/a Xcel Energy (Xcel Energy) filed an application with the Minnesota Public Utilities Commission (PUC or Commission) for a Route Permit for the Lake Yankton to Marshall Transmission Line Project (Project) on January 14, 2008, pursuant to the provisions of Minnesota Statutes Chapter 216E.

Xcel Energy proposes construction of an approximately 16 mile, 115,000 volt (115 kV) high voltage transmission line (HVTL) between the company's existing Lake Yankton Substation in Lyon County near Balaton and the existing Southwest Marshall Substation in Marshall. The proposed Project is required in order to accommodate wind energy on the Buffalo Ridge and resolve reliability issues in Marshall.

The Minnesota Department of Commerce (DOC), Office of Energy Security (OES), Energy Facilities Permitting (EFP) staff is responsible for preparing the Environmental Assessment (EA) required for the route permit Application.

The Application is being reviewed under the Alternative Review Process (Minnesota Rules 7849.5500) of the Power Plant Siting Act. Under the Alternative Review Process, an applicant is not required to propose any alternative sites or routes. The Department of Commerce (DOC) Energy Facility Permitting staff prepares an EA, and a public hearing is required. The PUC has six months to reach a decision under the Alternative Permitting Process from the time the application is accepted.

Persons interested in these matters can register their names on the Project Docket webpage at <http://energyfacilities.puc.state.mn.us/Docket.html?Id=19448> or by contacting Adam Sokolski, Energy Facilities Permitting, 85 7<sup>th</sup> Place East, Suite 500, St. Paul, Minnesota 55101, phone (651) 296-2096, e-mail: adam.sokolski@state.mnu.us Documents of interest can be found at the

above website or by going to <https://www.edockets.state.mn.us/EFiling/search.jsp> and entering “07-1407” as the search criteria.

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## 1.0 INTRODUCTION

Xcel Energy filed a route permit application with the Minnesota Public Utilities Commission (PUC or Commission) for the Lake Yankton to Marshall 115 kV transmission line project (the Project) on January 14, 2008. The proposed Project is the second of three transmission line route permit applications to be reviewed by the in 2008 for Xcel Energy's (Xcel) Buffalo Ridge Incremental Generation Outlet (BRIGO) transmission project.

The transmission lines which make up the BRIGO transmission project is part of a series of measures intended to increase transmission capacity to export wind energy generated on the Buffalo Ridge to Xcel Energy's customers. Xcel indicates that the three proposed BRIGO transmission lines will increase the transmission outlet capacity on the Buffalo Ridge from approximately 825 megawatts (MW) to approximately 1,175 MW and resolve electric reliability issues in the city of Marshall.

On September 14, 2007, the Minnesota Public Utilities Commission (PUC) issued a Certificate of Need (CON) for BRIGO. In its Order, the PUC required that Xcel file route permit applications for all the three BRIGO transmission lines by January 2008 and take necessary steps to have the lines constructed and in-service no later than spring 2009.<sup>1</sup>

The Minnesota Department of Commerce (Department), Office of Energy Security (OES), Energy Facility Permitting (EFP) unit is required to perform environmental review on applications for HVTL Route Permits to inform the PUC, which is the final decision-making body in these matters.

This Environmental Assessment (EA) addresses the environmental review requirements for the HVTL Route Permit. Chapter 1 provides specific information about the Project. Chapter 2 provides information on the regulatory procedure for the route permitting processes. Chapter 3 describes the proposed Project, including structure types, right-of-way requirements, and construction and maintenance procedures and identifies the human and environmental impacts of the proposed route. Chapter 4.0 analyzes the Project and route alternatives through Lake Marshall Township Sections 17 and 18. Chapter 5 identifies other permits and approvals required for the Project. Chapter 6 lists acronyms, abbreviations and definitions of terms used in this document.

## 1.2 Project Location

The proposed Project is located in Lyon County in the townships, ranges, and sections identified in Table 1.

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<sup>1</sup> See Minnesota Public Utilities Commission Docket E002/CN-06-154.

**Table 1 – Project Location**

Township, Range	Sections	Township Name
111N, 41W	13, 17, 18, 19	Lake Marshall
111N, 42W	23, 24, 25, 26, 35, 36	Lynd
110N, 42W	1, 2, 11, 12, 13, 14, 23, 24, 25, 26, 34, 35	Lyons
109N, 42W	2, 3, 10, 11, 15	Rock Lake

The length of the proposed transmission line route is approximately 16 miles. Xcel also proposes to install associated facilities including improvements to both substations to accommodate the new transmission line.

Xcel’s Application provides the following detailed description of its proposed route, and a color map can be found in Figure 1:

“The proposed route begins on the south end at the Lake Yankton Substation. The transmission line will proceed north along 210th Avenue paralleling the existing 115 kV transmission line for approximately 1,700 feet and continuing north to 160th Street. At 160th Street, the transmission line will run east for a mile to 220th Avenue. The 115 kV transmission line will go north following 220th Avenue for eight miles. The line will continue east along the section line (between Sections 24 and 25, Lynd Township) following a fence line for a mile, and then proceed north along 230th Avenue for another mile. The transmission line will continue north along a fence line in Section 18 of Lake Marshall Township until reaching a drainage ditch. The line will parallel the south side of the drainage ditch for approximately 5,000 feet, and then turn east and follow an unnamed gravel road to County State Ad Highway (“CSAH”) 7 (approximately 1,200 feet). The transmission line will turn south and parallel CSAH 7 for 600 feet. Single circuit poles will be used for this portion of the route. The line will then turn east and be placed in a utility easement obtained by MMU (“MMU Easement”) for approximately a half-mile (“MMU Shared Easement Area”) and enter the Southwest Marshall Substation from the south side. A copy of the Grant of Easement to MMU for the permanent 75-foot utility easement and a diagram of the MMU Easement are included in Appendix C.1. For this last segment, double circuit structures will be used.”

In its Application, Xcel Energy described several route alternatives it investigated as potential routes and rejected for various reasons. Several members of the public proposed that the OES EFP staff investigate in the EA the route alternatives described and rejected by Xcel in the Application in order to minimize the number of homes within 200 feet of the transmission line. EFP staff believe that it is reasonable to evaluate the proposed route alternatives to determine each alternative’s impact compared to the impact of the route proposed by Xcel Energy. Section

4.0 of the EA will evaluate alternatives A-1, B, C-1, C-2, D-1 and D-2 as described by Xcel in the Application.

In addition, Section 4.0 of the EA will cover one additional route alternative segment which was not evaluated in the Application to address concerns raised by the public. The alternative segment begins at the intersection of 240<sup>th</sup> Street and 230<sup>th</sup> Avenue, follows 240<sup>th</sup> Street east approximately one (1) mile until reaching the intersection of 240<sup>th</sup> Street and 240<sup>th</sup> Avenue (Lyon County Road 7). At this point, the alternative segment follows 240<sup>th</sup> Avenue (County Road 7) north approximately 1 mile to the intersection of 250<sup>th</sup> Street and 240<sup>th</sup> Avenue (County Road 7). At this point, the alternative segment could follow one of the three alternative segments discussed in the Application to the Marshall Substation.

Xcel is requesting a 400 foot wide route (200 feet each side of the centerline) for the entire route, except in Lake Marshall Township sections 17 and 18, where the utility requests a 200 foot route (100 feet each side of the centerline) in this section. Xcel proposes to construct transmission line primarily on private lands approximately 5 feet outside of the road rights-of-way it parallels where possible. Figure 1 identifies the Project location, the proposed route, and Figure 2 identifies the route alternatives through Lake Marshall Township Sections 17 and 18 evaluated in the EA.

### **1.3 Project Description**

Xcel Energy proposes to build a 115 kV high voltage transmission line (HVTL) from its Lake Yankton Substation to the Marshall Municipal Utilities (MMU) Southwest Marshall Substation. On January 14, 2008, Xcel Energy filed a route permit application for the Project.

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

#### ***Transmission Line Structures***

The transmission line proposed is 115 kV and will use 795 ACSS (aluminum conductor steel supported) conductor (wire) material. The line will be shielded with a 3/8 inch, high strength steel overhead shield wire for lightning protection.

The line will be designed to operate at a nominal voltage of 115 kV. During normal operations, voltage will deviate somewhat from nominal levels. The line will be a three-phase, 60 hertz (Hz) alternating current (AC).

Xcel Energy initially proposed in the Application to use 75-foot tall, steel, single circuit, horizontal post transmission line structures (poles) for the most of the Project and double circuit davit arm structures will be used for the final one-half mile prior to terminating at the Southwest

Marshall Substation. The span, or distance between each structure, was proposed to be about 400 feet. Representative examples of such structures were shown in the Application.

On May 13, 2008, Xcel Energy filed a letter with the PUC indicating that it has made a slight design modification and now proposes to use 90-foot tall, steel, single circuit, braced horizontal post transmission line structures for the Project. The span between each structure will average approximately 700 feet. This change allows for greater spacing between structures and requires approximately 50 fewer structures. Representative examples of such structures are shown in Figure 3. In addition, Xcel's May 13 letter indicated that the double circuit portion of the line is no longer necessary because Marshall Municipal Utilities (MMU) is no longer planning future transmission line in this location.<sup>2</sup>

Specific structure heights and span lengths may vary and exceed the average due to land use requirements and topography. Additional specialty structures may be required at corners and where longer spans or higher clearances are required.

Xcel Energy proposes directly imbed the proposed transmission line structures for the Project into the ground. Some specialty structures and the portions proposed for double circuit will be placed on concrete footings, which vary from 15 – 30 feet deep and 4 - 8 feet in width depending on the size of the structure, site specific conditions, and design requirements.

***Right-of-Way***

Xcel Energy has proposed a route for the 115 kV transmission line which parallels existing road rights-of-way (ROW) for nearly the entire length of the approximately 16-mile route. Xcel Energy proposes varying ROW widths consistent with the type of structure used and location of the route. A summary of the ROW requirements is presented in Table 2 and shown on the map found in Figure 1.

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<sup>2</sup> See <https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=5204284>

**Table 2 – ROW and Easement Requirements**

Project Component	Structure Type	Conductor	Average Structure Height (feet)	Average Span Length (feet)	ROW (feet)	Easement Width (feet)
115 kV Transmission Line Routed Adjacent to Public Road ROW	Steel, Single Circuit, Horizontal Braced Post	795 kcmil 26/7 ACSS	90	700	75	Up to 47.5
115 kV Transmission Line Routed Cross Country	Steel, Single Circuit, Horizontal Braced Post	795 kcmil 26/7 ACSS	90	700	75	75

***Construction Procedures***

Construction and mitigation practices are developed early in the project planning process and often rely on industry specific Best Management Practices (BMPs) that have been developed over the years in consultation with appropriate agencies and affected property owners. These BMPs have been developed for ROW clearance, erecting power poles, and stringing power lines. BMPs include schedules for activities, prohibitions, maintenance guidelines, inspection procedures, and other practices. For example, in the case of wetlands, such practices include avoiding wetlands, controlling soil loss, and minimizing the impacts on hydrologically connected surface and groundwater and on the plants and animals that the water supports.

Transmission structures are generally designed for installation at existing grades. Therefore, structure sites will not be graded or leveled, unless it is necessary to provide a reasonably level area for construction access and activities. Once construction is completed, any graded area will be restored to its original contour to the extent practicable.

Any structures located in poor or wet soil conditions may require a specially engineered foundation (such as a steel caisson) that would be vibrated into the ground. The poles will then be placed within the caisson.

After structures have been erected, conductors are installed by establishing stringing setup areas within the ROW. Conductor stringing operations will also require brief access to each structure to secure the conductor wire to the insulators or to shield wire clamps once final sag is established.

During construction, temporary removal or relocation of certain fences may occur, and installation of temporary (or permanent at land owner request) gates may be required. Xcel Energy will coordinate with the landowner for early harvest of crops where possible, and removal or relocation of equipment and livestock from the ROW may occur.

Limited ground disturbance at the structure sites is anticipated during construction. A main marshaling yard for secure, temporary storage of materials and equipment will be established on a temporary easement and will include sufficient space to lay down material and hardware. Disturbed areas will be restored to their original condition to the maximum extent practicable.

Post-construction reclamation activities include cleaning up all construction sites, including removing and disposing of debris; removing all temporary facilities, including access trails and staging and laydown areas; employing appropriate erosion control measures and reseeding disturbed areas.

Once construction is completed, affected landowners will be contacted by Xcel Energy to determine if any damage has occurred as a result of the utility's project. If damage has occurred to crops, fences, drainage tile or the property, Xcel Energy will compensate the landowner for the damages caused. An outside contractor may be contracted to restore the damaged property to as near as possible to its original condition.

#### ***ROW Maintenance***

After construction is complete, periodic access to the ROW of the transmission line will be required to perform inspections and conduct routine maintenance. Regular maintenance and inspections will be performed during the life of the facility to ensure its continued integrity. Periodic inspections will be performed by ground personnel. Inspections will be limited to the ROW. If problems are found during inspection, repairs will be assigned to construction crews.

The ROW will be managed to remove vegetation that interferes with the operation and maintenance of the line. Vegetation management is typically reviewed on a three to five-year cycle. ROW clearing practices include a combination of mechanical and hand clearing, along with herbicide application to remove or control the growth of vegetation in some areas.

#### ***Lake Yankton and Southwest Marshall Substations***

Xcel Energy proposes to modify the Lake Yankton Substation to accommodate the new transmission line by installing additional equipment all within the existing substation fence. The additional equipment will include new 115 kV circuit breakers and associated disconnects, and a reconfigured bus 115 kV ring bus.

Xcel Energy proposes to modify the existing Southwest Marshall Substation. Improvements to the substation include additional equipment for the proposed 115 kV line, which will be placed entirely within the existing fence. The additional equipment will include new 115 kV breakers, disconnect switches, bus extensions, concrete foundations and additional protective equipment.

## 1.4 Sources of Information

Much of the information contained within this document was provided by the Xcel in the form of its route permit Application and correspondence.

Additional sources of information are listed below:

- Minnesota Pollution Control Agency (<http://www.pca.state.mn.us/>)
- Minnesota Department of Natural Resources (<http://www.dnr.state.mn.us/index.html>)
- Minnesota Department of Health (<http://www.health.state.mn.us/>)
- U. S. Environmental Protection Agency (<http://www.epa.gov/>)
- Electric Power Research Institute (<http://www.epri.com/default.asp>)
- U. S. Department of Agriculture Natural Resources Conservation (<http://soils.usda.gov/about/>)
- Minnesota Geological Survey (<http://www.geo.umn.edu/mgs/>)
- Department of Administration, State Demographic Center (<http://www.demography.state.mn.us/>)
- Federal Emergency Management Agency (<http://www.fema.gov/>)
- U. S. Department of Energy, Energy Information Administration (<http://eia.doe.gov/>)

## 2.0 REGULATORY PROCESS AND REQUIREMENTS

This Project requires two separate approvals from the Commission prior to being constructed: one determining the need for the project the transmission line and one determining the route of the transmission line.

*Certificate of Need.* The proposed 115 kV transmission line is a “large energy facility” because it is a transmission line operating at more than 115 kV and is greater than 10 miles long (Minnesota Statute 216B.2421, subd. 2(3)). A CON is required to be issued by the PUC for large energy facilities (Minnesota Statute 216B.243). On September 14, 2007, the PUC issued a CON for the BRIGO project, which includes the proposed Lake Yankton to Southwest Marshall transmission line.<sup>3</sup> In its Order, the PUC required that Xcel file route permit applications for all the three BRIGO transmission lines by January 2008 and take necessary steps to have the lines constructed and in-service no later than spring 2009.

*Route Permit.* In accordance with the Power Plant Siting Act a route permit is required before a high voltage transmission line (HVTL) can be constructed. The Act requirement became law in 1973 and is found in Minnesota Statutes Chapter 216E. The rules to implement the route permitting requirement for a HVTL are in Minnesota Rules Chapter 7849. A HVTL is defined as a conductor of electric energy and associated facilities designed for and capable of operating at a nominal voltage of 100 kilovolts or more either immediately or without significant modification.

Xcel Energy filed a route permit application with the PUC on January 14, 2008.<sup>4</sup> The route permit Application was accepted by the PUC on February 8, 2008.<sup>5</sup>

The Application is being reviewed under the Alternative Review Process (Minnesota Rules 7849.5500) of the Power Plant Siting Act. Under the Alternative Review Process, an applicant is not required to propose any alternative sites or routes. The Department of Commerce (DOC) Energy Facility Permitting (EFP) staff prepares a document called an Environmental Assessment (EA), and a public hearing is required.

In accordance with the rules applicable to this matter, the EFP staff held a public information/EA scoping meeting at the Lyon County Government Center in Marshall on March 4, 2008. This meeting provided the public with an opportunity to learn about the proposed project, to suggest other route alternatives, and to identify concerns that should be considered by the DOC EPF staff in preparing an EA. A public comment period on the scope of the EA closed on March 14, 2008. Approximately 25 people attended the public meeting.

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<sup>3</sup> See PUC Order: <https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=4772937>

<sup>4</sup> See Xcel Energy Route Permit Application: <http://energyfacilities.puc.state.mn.us/resource.html?Id=19457>

<sup>5</sup> See PUC Order Accepting Application:  
<https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=4931501>

### **Scoping Process**

The process the Department must follow in preparing the EA is set forth in Minnesota Rule 7849.5700. This process requires the Department to schedule a public meeting in the area of the proposed Project. The purpose of the meeting is to advise the public of the Project and to solicit public input into the scope of the environmental review. A “scope” is a determination of what needs to be assessed in the environmental review in order to fully inform decision-makers and the public about the possible impacts of a project or potential alternatives.

EFP staff received comments and questions regarding the Project’s proximity to homes; aesthetics; concern with safety, suggestions for alternative route segments in Lake Marshall Township Sections 17 and 18, and information about changes in Lyon County’s transportation plans and Marshall Municipal Utilities future transmission line plans.

The comment period for interested persons to comment on the project was open until March 26, 2008. Six written comments were received, including three comments proposing alternatives to the route proposed by Xcel Energy.

After these processes, EFP staff reviewed the public comments on the scope of the EA. Based on that review, the Director of the Office of Energy Security issued a Scoping Order on March 31, 2008, as required by rule.<sup>6</sup> The Scoping Decision is included in Appendix A of this EA.

In response to public comments, information on the following areas is included here: information on transmission line effects on electromagnetic fields is included in Section 3.14; information on aesthetic impacts is included in Section 3.3; information on construction practices is included in Section 2. A discussion of the alternatives proposed and alternatives evaluated in this EA is included in Section 4.

### **Public Hearing and PUC Determination of Route and Permit Conditions**

Following the release of this EA, a public hearing will be held in Marshall conducted in accordance with the requirements of the Power Plant Siting Act, Minnesota Statutes 216E.01 to 216E.18, and Minnesota Rules 7849.5500 to 7849.5720. The hearing will be presided over by an Administrative Law Judge (ALJ).

The EFP staff will be present at the hearing to make a brief presentation describing the Project, explain the process to be followed, and to introduce documents to be included in the record, including the Application, the EA, and relevant procedural documents. Representatives from Xcel Energy will be present to introduce evidence by way of testimony or exhibits and to answer questions. Members of the public will have an opportunity to ask questions of EFP staff and Xcel Energy representatives, to make oral statements or presentations, and to offer written comments and documents into the record.

After the close of the public comment period, the ALJ will provide the Department a written summary of testimony given at the hearing. Based on information in the record, including the

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<sup>6</sup> See OES Scoping Decision: <https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=5044934>

Route Permit Application, this EA, and public comments, EFP staff will prepare recommendations on a route and route permit with appropriate conditions. The PUC will make a final decision on the route and route permit after receipt of the complete record. A recently issued route permit (absent the route maps) is provided in Appendix B to illustrate the types of permit conditions that may be required. Permit conditions will vary between Projects to reflect the particulars of each route.

The PUC has six months to reach a decision under the Alternative Permitting Process from the time the Application is accepted. Copies of the application, along with other pertinent documents can be obtained through the DOC Project Manager and may be viewed at PUC web site: <http://energyfacilities.puc.state.mn.us/Docket.html?Id=19448>

### **3.0 ASSESSMENT OF IMPACTS AND MITIGATION MEASURES**

The construction of a transmission line involves both short and long-term impacts. An impact is a change in the status of the existing environment as a direct or indirect result of the proposed action. Direct impacts are caused by the action and occur at the same time and place. Indirect impacts are caused by the action and occur later or are further removed in distance, but are still reasonably foreseeable. Impacts may be negative or positive and temporary or permanent or long-lasting. Short-term impacts are generally associated with the construction phase of the Project and can include crop damage, soil compaction, and noise. Long-term impacts can exist for the life of the Project and may include land use restrictions or modifications.

There are a number of potential impacts associate with HVTLs that must be taken into account on any transmission line project. Minnesota Rule 7849.5910, identifies 14 factors that the PUC must consider when designating a route for a HVTL.

This section describes the potential impacts on resources and mitigation measures to minimize impacts from construction, operation and maintenance of the Project.

It may be possible to mitigate potential impacts by adjusting the proposed route, selecting a different type of structure or pole, using different construction methods, or implementing any number of post-construction practices. The PUC can require route permit applicants to use specific techniques to mitigate impacts or require certain mitigation thresholds or standards to be met through permit conditions.

#### **3.1 Socioeconomic**

Census data indicate that the populations within townships along the proposed route are 93 to 99 percent Caucasian and that minority populations make up a very small percentage of the population in the area. Per capita income in Lyon County and in the townships along the proposed route is lower than the Minnesota average.

The direct socioeconomic impacts of transmission lines generally fall into construction phase and long term operational impacts.

During the construction phase, impacts to social and economic resources are expected to be short-term in nature. Construction phase spending in the host communities may increase revenue for some local businesses. Hotels, restaurants, gas stations and grocery stores will likely cater to crews working on the transmission lines. Other local businesses, such as excavation contractors, ready-mix concrete and gravel suppliers, hardware stores, welding and machine shops, packaging and postal services and heavy equipment repair and maintenance service providers may benefit by supplying materials and services during the construction phase. Impacts to social services would likely be minimal due to the short-term nature of construction activities.

Long-term beneficial impacts from the proposed transmission lines and substation additions include increased local tax base resulting from the incremental increase in revenues from utility property taxes. The availability of more reliable electricity service in the area will have a positive effect on local businesses and the general public.

A secondary set of positive long term socioeconomic impacts can be expected to coincide with future wind energy development made possible by the BRIGO Project transmission lines. County, township and school districts will benefit directly from increased wind production tax revenues. Local landowners will receive revenues from wind rights leases and easements. Local residents or businesses may also decide to invest in wind farms resulting in further economic impacts.

Finally, the Project is designed to deliver additional electric supplies and improve electric reliability in the city of Marshall, which will have positive economic benefits.

### **3.2 Noise**

The direct impacts of noise created by transmission lines are associated with initial construction and long term operation of the facility. Noise will be generated by the construction of the HVTL; the construction noise will be predominantly intermittent sources originating from diesel engine driven construction equipment. Potential noise impacts will be mitigated by proper sound reduction equipment fitted to construction equipment and restricting activities conducted during nighttime hours.

Noise comprises a variety of sounds, of different intensities, across the entire frequency spectrum. Humans perceive sound when sound pressure waves encounter the auditory components in the ear. These components convert the pressure waves into perceivable sound. Noise is measured in decibels (dB).

Noise standards have been established by the Minnesota Pollution Control Agency (MPCA), Minnesota Rules Chapter 7030. The MPCA is the regulatory agency responsible for the enforcement of these standards. The standards are consistent with speech (hearing and conversation), annoyance, and sleep requirements for receivers within areas classified according to land use activities.

The MPCA has established various noise area classifications (NAC) and has established noise standards for each classification. The NAC area classification is based on the land use activity at the location of the receiver, and the NAC determines the applicable noise standard. Lower noise levels are required in residential areas, for example, than in industrial zones.

The four noise area classifications are: NAC-1, NAC-2, NAC-3, and NAC-4. Some of the land use activities under NAC-1 include household units, hospitals, religious services, correctional institutions, and entertainment assemblies. NAC-2 land use activities include mass transit

terminals, retail trade, and automobile parking. Some NAC-3 land uses include manufacturing facilities, utilities, and highway and street ROW. NAC-4, which has no noise limits, consists of undeveloped and under construction land use areas.<sup>7</sup>

Table 3 sets forth the Minnesota Noise Standards for the appropriate land use.

**Table 3 - Noise Standards by Noise Area Classification**

Noise Area Classification	Daytime		Nighttime	
	L <sub>50</sub>	L <sub>10</sub>	L <sub>50</sub>	L <sub>10</sub>
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

Distance is a main criterion for measuring the strength of noise. For every doubling of distance from the noise source, a decrease of 6dB occurs from isolated sources.

All the residences fall within NAC 1. The audible noise generated from the transmission lines is not expected to exceed the background noise levels nor the noise standards established for NAC 1.

### ***Corona Noise***

Corona can be defined as a type of localized discharge that results from high, non-uniform electric fields. At high voltages, corona produces visible light and audible noise. The level of noise or its loudness depends on conductor conditions, voltage level, and weather conditions. Generally, noise levels during operation and maintenance of transmission lines is minimal.<sup>8</sup>

Noise emission from a transmission line occurs during heavy rain and wet conductor conditions. In foggy, damp, or rainy weather conditions, power lines can create a subtle crackling sound due to the small amount of the electricity ionizing the moist air near the wires. During heavy rain the general background noise level, rain falling and wind blowing, is usually greater than the noise from the transmission line.

In these conditions, very few people are out near the transmission line. For these reasons audible noise is not noticeable during heavy rain. During light rain, dense fog, snow, and other times when there is moisture in the air, the proposed transmission lines will produce audible noise higher than rural background levels but similar to household background levels. During dry weather, audible noise from transmission lines is a barely perceptible, sporadic crackling sound.

<sup>7</sup> <http://www.pca.state.mn.us/programs/noise.html>

<sup>8</sup> <http://www.clarkson.edu/~mcgrath/web.html>

### *Mitigation Measures*

No mitigation measures are necessary since there will be minimal corona or noise impacts from the Project.

## **3.3 Aesthetics**

The transmission line poles will be in contrast to the primarily rural, agricultural land along the proposed or alternative routes. It is possible that the transmission line will be visible to people in the communities of Balaton and Marshall. However, there are several electric transmission lines in the area which are similar or identical to the proposed transmission line. The proposed route follows existing roads and highways for the majority (86 percent) of its length and the transmission line structures will be visible to residents living near the route and to drivers using public roads adjacent to the route.

The visual impact of the new line may be less noticeable or incremental in the northern portions of the proposed and alternative routes, specifically in sections 17 and 18 of Lake Marshall Township. These areas contain two developments of homes and residences, several major state and county highways, and several existing transmission and distribution lines.

There are two cities near the proposed route and alternative routes: Balaton and Marshall. Balaton is approximately one mile south of the Lake Yankton Substation. The proposed transmission terminates at the Southwest Marshall Substation, which is at Marshall's southern boundary. The transmission line may be visible from parts of each city depending on elevation and the proximity of the transmission line to the viewer.

Although the transmission line and structures may contrast with some of the existing land uses, the proposed route and route alternatives utilize existing corridors and will avoid homes to the greatest extent practicable. Xcel Energy will work with landowners to identify concerns related to the transmission line, tree clearing and aesthetics. The final alignment of the transmission line could cross the public roads along the route several times in order to avoid homes and businesses.

### *Mitigation Measures*

Although the transmission line will be a contrast to surrounding land uses, Xcel Energy will work with landowners, as a permit condition if the PUC issues a Route Permit, to identify concerns related to the transmission line and aesthetics. In general, mitigation includes enhancing positive effects as well as minimizing or eliminating negative effects. Potential mitigation measures include:

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

- Care will be used to preserve the natural landscape; construction and operation will be conducted to prevent any unnecessary destruction of the natural surroundings in the vicinity of the work.
- To the extent practicable, rivers and streams will be crossed in the same location as existing transmission lines.
- To the extent practicable, new transmission lines will parallel existing transmission lines and other rights-of-way, to the extent that such actions do not violate sound engineering principles or system reliability criteria.

### 3.4 Recreation

There are several public recreational areas near, but not immediately along, the proposed route including the Garvin County Park and the Marshall Golf Club. In addition, there are several state Wildlife Management Areas (WMA) within one mile of the southern one-third (6 miles) of the proposed route. These WMAs include: Lake Yankton WMA, Happy Hollow WMA, Lyons WMA, Sodus WMA, Dayland WMA, and Ringneck Ravine WMA. The proposed transmission line will not directly cross or impact any public recreational area or WMA; however, the transmission line will be visible from portions of the recreational areas.

#### *Mitigation Measures*

No mitigation is required.

### 3.5 Transportation

Traffic along the proposed route is likely to increase temporarily during construction. Local motorists may be temporarily inconvenienced by the increase in construction vehicles on the roadways and possible delays in traffic. This impact is expected to last during the construction period of approximately 12 months. Traffic due to the construction workers could be expected to produce local impacts over a 30-minute period at the beginning and end of the day and each time a change in shift occurs.

In comments, the Lyon County Board of Commissioners identified two planned road construction projects in the general area near the proposed route and route alternatives.<sup>9</sup>

First, Lyon County indicates that the intersection of County State Aid Highway (CSAH) 7 and State Highway 23 will be reconstructed during the 2011-2012 construction season. It is possible that CSAH 7 will be realigned south of Highway 23 to accommodate the new interchange.

Second, Lyon County has identified 250<sup>th</sup> Street between State Highway 23 east to CSAH 35 as a future major collector road. 250<sup>th</sup> Street is currently a gravel, two lane township road. It will

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<sup>9</sup> <https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=5037430>

likely be upgraded, widened, and designated as a CSAH. The existing 66 foot wide ROW will be widened to 120 feet.

### ***Mitigation Measures***

During construction, no additional mitigation will be required because traffic levels may be slightly, but insignificantly, impacted during construction with no impacts anticipated during facility operation.

High voltage transmission lines are typically built adjacent to roads of all sizes and uses, and are generally compatible with roads and road expansion projects. Mitigation measures for the two road construction projects planned and described above include a range of measures. These include one or more of the following measures:

- avoiding routing the transmission line along CSAH 7 and 250<sup>th</sup> Street entirely,
- coordinating with the governmental units building the roads to place the transmission line outside of planned, wider road ROWs, or
- placing the transmission line outside of the existing road ROWs and moving the transmission line in the future should it be necessary to accommodate road reconstruction.

The operation of the transmission line will have no permanent impact on traffic patterns or levels.

## **3.6 Land Use**

The proposed route crosses lands which are primarily cultivated agricultural lands and is near some rural residential land uses. Lands along the proposed route are zoned as Agricultural by Lyon County. The area immediately adjacent to the Southwest Marshall Substation is designated at a Planned Growth Area by Lyon County.

Additional specific analysis of land use issues and comparison between the proposed route and alternatives is discussed in Chapter 4.0.

### **Commercial, Industrial and Residential**

There are a number of residences and businesses scattered along the proposed route with no concentrated areas of development along the route, with the exception of Lake Marshall Township Sections 17 and 18. These sections contain one large suburban residential development and concentrated residential development along the west side of CSAH 7.

### **Agriculture**

Lyon County's economy and land use are dominated by agriculture.

Xcel estimates that approximately 10 acres of agricultural land will be temporarily disturbed by construction of the proposed transmission line. Temporary impacts include soil rutting, compaction and crop damages resulting from construction equipment accessing and operating on agricultural lands.

Xcel estimates that less than one acre of agricultural land will be permanently removed from agricultural lands due to construction of the proposed line. Permanent impacts will occur due to the placement of the transmission line poles.

### ***Mitigation Measures***

Impacts to agricultural lands will be reduced and minimized by placing transmission line structures immediately adjacent to existing road ROW where practicable. Xcel Energy's proposed use of braced horizontal post transmission line structures along the route (including all alternatives) will limit impacts on agricultural lands by reducing the number of and increasing the distance between structures required compared with other types of transmission line structures.<sup>10</sup>

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, Xcel Energy proposes to place the transmission line structures on private lands within 10 feet from the edge of the roadway ROW. When possible, Xcel Energy will attempt to construct the transmission line before crops are planted or following harvest. Construction mats may be used to reduce soil compaction impacts. Xcel Energy 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.

### **Forestry and Mining**

There are no areas managed for forestry in or near the proposed route. The proposed route is located in what historically were prairie grasslands. Small woodlots, wind breaks and other non-commercial tree cover are present and concentrated near waterways and at homestead sites and a small number of acres may be cleared of trees.

There are no known commercial mining or sand and gravel operation near the proposed route. The proposed transmission line will not impact active mining operations.

### ***Mitigation Measures***

No mitigation measures will be required.

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<sup>10</sup> See <https://www.edockets.state.mn.us/Efiling/ShowFile.do?DocNumber=5204284>

### **Prohibited Sites**

The proposed route does not contain sites where high voltage transmission line routes are prohibited by Minnesota Statutes 216E.16 and Minnesota Rules 7849.5930 - 5940 including:

- National Parks;
- National historic sites and landmarks;
- National historic districts;
- National wildlife refuges;
- National monuments;
- National wild, scenic, and recreational river ways;
- State wild, scenic, and recreational rivers and their land use districts;
- State parks;
- Nature conservancy preserves;
- State Scientific and Natural Areas; and,
- State and national wilderness areas.

### **3.7 Topography, Soils and Geology**

Minimal impacts are anticipated to soils outside of the direct impact of the transmission line structures. Soil erosion control measures will be followed to minimize loss of topsoil; areas disturbed will be returned to their pre-construction condition. Route permits generally require that soils compacted by construction are restored by the utility after construction is complete.

Construction will result in no disturbances to the bedrock geology beneath the site. Soils exposed during construction may be vulnerable to erosion until stabilized. Some compaction of surface soils will result from the use of heavy construction equipment.

#### ***Mitigation Measures***

Xcel Energy has stated that best management practices (BMP) will be implemented during construction activities to reduce erosion, and minimize and repair soil compaction. No permanent impacts to the subsoil or geology within the proposed corridors are anticipated.

### **3.8 Flora and Fauna**

The majority of the proposed route crosses cultivated agricultural lands, with few residences scattered along the route. Row crops such as corn and soybean dominate the area. Impacts to trees and wind breaks may occur where the transmission line crosses natural waterways and near homesteads. Xcel Energy estimates that less than 1 acre of trees will be removed for the project.

There is a potential for temporary displacement of wildlife during construction and the loss of small amounts of habitat from the proposed route. Species that inhabit trees that will be removed and agricultural areas along the route will likely be displaced. Comparable habitat is adjacent to the route for both habitat types, and it is likely that these species would only be displaced a short distance.

Additionally, the electrocution of large birds, such as raptors, can be a concern with lower voltage distribution lines. Electrocution occurs when birds with large wingspans come in contact with two conductors or a conductor and a grounding device. Xcel Energy transmission line design standards provide adequate spacing to eliminate the risk of raptor electrocution, so there are no concerns about avian electrocution as a result of the Project.

### ***Mitigation Measures***

To minimize impacts to trees along the proposed route, Xcel Energy proposes the route primarily immediately adjacent to road ROW.

Displacement of fauna is anticipated to be temporary in nature. No long term population-level effects are anticipated; therefore, no mitigation is proposed.

Xcel Energy has been working with various state and federal agencies over the past 20 years to address these issues. In 2002, Xcel Energy, Inc.'s operating companies including Xcel Energy, entered into a voluntary memorandum of understanding (MOU) to work together to address avian issues throughout its territory. This includes the development of avian protection plans (APP) for each state Xcel Energy, Inc. serves. Currently, Xcel Energy, Inc. is finalizing the APP for Colorado and has begun on an APP in Minnesota. Standard reporting methods are also developed under development.

The primary methods Xcel Energy uses to address avian issues for transmission projects include:

- Working with the Minnesota Department of Natural Resources (DNR) to identify any areas that may require marking transmission line shield wires and/or using alternate structures to reduce collisions,
- Attempting to avoid areas known as major flyways or migratory resting spots.

## **3.9 Rare & Unique Natural Resources**

The DNR Natural Heritage and Nongame Research Program maintains a list of plants and animals considered rare in the state. At the request of Xcel Energy, DNR searched the Minnesota Natural Heritage database for known occurrences of rare species and natural communities near the proposed route. The DNR's search resulted in the identification of one Minnesota species of special concern, the Prairie Mimosa (*desmanthus illinoensis*), a native prairie plant species, which was last observed near the Lake Yankton Substation in 1954.

### *Mitigation Measures*

No mitigation is necessary.

## **3.10 Archaeological and Historic Features**

In September 2007, Xcel Energy's archaeological consultant reviewed the records at the Minnesota State Historical Preservation Office (SHPO) and conducted a Phase Ia Cultural Resources Survey, both of which indicate that no known historic or archaeological resources near the proposed route.

### *Mitigation Measures*

Impacts to previously identified resources are not anticipated as a result of the Project. In the event that an impact would occur, Xcel Energy would determine the nature of the impact and consult with the SHPO on whether or not the resource was eligible for listing in the NRHP.

Mitigation for impacts on NRHP eligible archaeological resources may include an effort to minimize impacts on the resource and/or additional documentation through data recovery.

If human remains should be encountered during the excavation and construction, such a discovery would be handled in a manner compliant with Minnesota's Private Cemeteries Act (Minnesota Statute 307.08).

## **3.11 Air Quality**

The only potential air emissions from a 115 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 115 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 project area presently meets all federal air quality standards.

Currently, both state and federal governments have regulations regarding permissible concentrations of ozone and oxides of nitrogen. The national standard is 0.08 ppm on an 8-hour

averaging period. The state standard is 0.08 ppm based upon the fourth-highest 8-hour daily maximum average in one year.

During construction there will be emissions from vehicles and other construction equipment and fugitive dust from ROW excavation and clearing activities. Temporary air quality impacts caused by the proposed construction-related emissions are expected to occur during this phase of activity.

### *Mitigation Measures*

There will be no significant adverse air quality impacts to the surrounding environment because of the short and intermittent nature of the emission and dust-producing construction phases. No mitigation measures are necessary for the construction of the transmission lines.

## **3.12 Water Resources (surface water/wetlands)**

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

A determination of the surface water resources was conducted by reviewing the United States Geological Survey (USGS) 7.5-minute quadrangle, the National Wetland Inventory (NWI) and the Public Waters Inventory (PWI) maps.

In its Application, Xcel Energy identified nine wetlands along the proposed route which may need to be spanned by the transmission line. The wetlands vary in size and characteristics, however most are freshwater emergent wetlands.

In addition, several public waters are along the proposed route, including the Cottonwood River, the Redwood River, Meadow Creek and their tributaries. Each will require a license to cross public waters from the DNR. Finally, portions of the proposed route and the route alternatives are within the designated 100-year floodplain in Lake Marshall Township Sections 17 and 18.

The proposed route is not expected to result in any substantial, permanent water quality impacts. Minimal temporary impacts to wetlands may occur from construction activities and access to the ROW. Minimal temporary impacts to wetlands may occur if these areas need to be crossed during construction of the transmission ROW. However, Xcel Energy would avoid crossing wetlands during construction to the greatest extent feasible.

During construction, there is the possibility of sediment reaching surface waters as the ground is disturbed by excavation, grading and construction traffic. Xcel Energy will be required to employ erosion control BMPs and adhere to the terms and conditions of the National Pollution Discharge Elimination System (NPDES) permits and Stormwater Pollution Prevention Plan

(SWPPP) during construction to protect topsoil and adjacent water resources, and to minimize soil erosion and trap it before it reaches surface water resources.

After construction, maintenance and operation activities for substation or transmission line facilities are not expected to have an adverse impact on surface water quality.

### ***Mitigation Measures***

Standard erosion control measures and BMPs will be utilized to minimize potential impacts.<sup>11</sup> An NPDES permit and SWPPP will be required to be prepared for the Project.

Xcel Energy will be required to 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. Practices may include containing excavated material, protecting exposed soil and stabilizing restored soil. Xcel Energy would avoid major disturbance of individual wetlands and drainage systems during construction. This would be done by spanning wetlands and drainage systems where possible. When it is not possible to span the wetland, Xcel Energy would draw on several options during construction to minimize impacts:

- When possible, construction would be scheduled during frozen ground conditions.
- Crews would attempt to access the wetland with the least amount of physical impact to the wetland (e.g., shortest route).
- The structures would be assembled on upland areas before they are brought to the site for installation.
- When construction during winter is not possible, plastic mats would be used where wetlands would be impacted.

No additional mitigation is necessary.

## **3.14 Human Health and Safety**

Proper safeguards will need to be implemented for construction and operation of the facility. The Project would be designed to comply with local, state, NESC and Xcel Energy standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials and ROW widths. Xcel Energy construction crews and/or contract crews would comply with local, state, NESC and Xcel Energy standards regarding installation of facilities and standard construction practices. Established Xcel Energy and industry safety procedures would be followed during and after installation of the transmission line. This would include clear signage during all construction activities.

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<sup>11</sup> <http://www.pca.state.mn.us/publications/wq-strm2-05.pdf>

The transmission line would be equipped with protective devices to safeguard the public from the transmission line if an accident occurs and a structure or conductor falls to the ground. The protective devices are breakers and relays located where the transmission line connects to the substation. The protective equipment would de-energize the transmission line, should such an event occur. In addition, the substation facilities would be fenced and access limited to authorized personnel.

### **Electric and Magnetic Fields**

Voltage transmitted through any conductor produces both an electric field and a magnetic field in the area surrounding the wire. The electric field associated with HVTLs extends from the energized conductors to other nearby objects. The magnetic field associated with HVTLs surrounds the conductor. Together, these fields are generally referred to as electromagnetic fields, or EMF. These effects decrease rapidly as the distance from the conductor increases.

#### ***Electric Fields***

Voltage on any wire (conductor) produces an electric field in the area surrounding the wire. The electric field associated with a high voltage transmission line extends from the energized conductors to other nearby objects such as the ground, towers, vegetation, buildings and vehicles. The electric field from a transmission line gets weaker as one moves away from the transmission line. Nearby trees and building material also greatly reduce the strength of transmission line electric fields.

The intensity of electric fields is associated with the voltage of the transmission line and is measured in kilovolts per meter (kV/M). Transmission line electric fields near ground are designated by the difference in voltage between two points (usually 1 meter). Table 4 provides the electric fields at maximum conductor voltage for the proposed transmission lines. Maximum conductor voltage is defined as the nominal voltage plus five percent.

The proposed 115 kV transmission line would have a maximum magnitude of electric field density of approximately 1.113 kV/M underneath the conductors, one meter above ground level. This is significantly less than the maximum limit of 8 kV/M which has been a permit condition imposed by the PUC in other High Voltage Transmission Line (HVTL) applications. The permit standard was designed to prevent serious hazard from shocks when touching large objects parked under extra HVTL of 345 kV or greater.

High intensity electric fields can have adverse impacts on the operation of pacemakers and implantable cardioverter/defibrillators (ICD). Interference to 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 ICDs, have indicated that electric fields below 6 kV/meter are unlikely to cause interactions affecting operation of most of their devices.

**Table 4 – Calculated Electric Fields (kV/m) for Proposed Transmission Line  
 (3.28 feet above ground)**

Type	Voltage	Distance to Proposed Centerline								
		300'	200'	100'	-37.5'	0'	37.5'	100'	200'	300'
Single Circuit 115 kV Single Steel Pole w/ Horizontal Braced Arm	121kV	0.005	0.012	0.047	0.296	1.113	0.285	0.053	0.013	0.006

Older unipolar designs are more susceptible to interference from electric fields. Research has indicated that the earliest evidence of interference was in electric fields ranging from 1.2 to 1.7 kV/meter.

Table 4 above shows that the electric fields for the Project are well below levels at which modern bipolar and older unipolar devices are susceptible to interactions with electric fields. Recent research 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 would return to its normal operation when the person moves away from the source of the interference.

***Magnetic Fields***

Current passing through any conductor, including a wire, produces a magnetic field in the area around the wire. The magnetic field associated with a high voltage transmission line surrounds the conductor and decreases rapidly with increasing distance from the conductor. The magnetic field is expressed in units of magnetic flux density, expressed as milligauss (mG).

**Table 5 - Calculated Magnetic Fields (milligauss) for Proposed 115 kV Transmission Line Design (3.28 feet above ground)**

Type	Condition	Distance to Proposed Centerline								
		-300'	-200'	-100'	-37.5'	0'	37.5'	100'	200'	300'
Single Circuit 115 kV Single Steel Pole w/ Horizontal Braced Arm	Normal	0.16	0.33	1.16	5.46	16.53	5.93	1.12	0.28	0.12
Single Circuit 115 kV Single Steel Pole w/ Horizontal Braced Arm	Peak	0.26	.36	1.94	9.10	27.59	9.90	1.88	0.47	0.20

The calculated magnetic flux density table (see Table 5 above), provides the estimated magnetic fields based on the proposed lines and structure designs. The expected magnetic fields for the structure type and voltage have been calculated at various distances from the center of the pole.

It can be noted that magnetic fields are not singularly associated with power lines. Every person has exposure to these fields to a greater or lesser extent throughout each day, whether at home or in schools and offices. The following table contains field readings for a number of selected, commonly encountered items. These reading represent median readings, meaning one might expect to find an equal number of readings above and below these levels.

**Table 6 - Magnetic Fields (milligauss) From Common Home and Business Appliances**

Type	Distance From Source in Feet			
	0.5	1	2	4
Computer Display	14	5	2	-
Fluorescent Lights	40	6	2	-
Hairdryer	300	1	-	-
Vacuum Cleaners	300	60	10	1
Microwave Oven	200	40	10	2
Conventional Electric Blanket	39.4 peak 21.8 average			
Low EMF Electric Blanket	2.7 peak .09 average			

*Source: EMF In Your Environment, EPA 1992*

### ***Stray Voltage***

Stray voltage is defined as a natural phenomenon that can be found at low levels between two contact points in any animal confinement area where electricity is grounded. As required by code, electrical systems, including farm systems and utility distribution systems, must be grounded to earth to ensure continuous safety and reliability. Inevitably, some current flows through the earth at each point where the electrical system is grounded, and a small voltage develops. This voltage is called neutral-to-earth voltage (NEV). When a portion of this NEV is measured between two objects that may be simultaneously contacted by an animal, it is frequently called stray voltage. Stray voltage is not electrocution, ground currents, EMF or earth currents.

Stray voltage has been raised as a concern on some dairy farms because it can impact operations and milk production. Problems are usually related to the distribution and service lines directly serving the farm or the wiring on a farm. In those instances when transmission lines have been shown to contribute to stray voltage, the electric distribution system directly serving the farm or

the wiring on a farm was directly under and parallel to the transmission line. These circumstances are considered in installing transmission lines and can be readily mitigated.

### ***Potential Impacts***

Many years of research on the biological effects of electric fields have been conducted on animals and humans. No association has been found between exposure to electric fields and human disease. The possible effect of EMF exposure on human health has been a matter of public concern over the past few years. While the general consensus is that electric fields pose no risk to humans, the question of whether exposure to magnetic fields can cause biological responses or even health effects continues to be the subject of research and debate.

The most current and exhaustive reviews of the health effects from power-frequency fields conclude the evidence of health risk is weak and do not support the allegation of a major public health danger. The National Institute of Environmental Health Sciences (NIEHS) issued its final report on June 15, 1999, following six years of intensive research. The NIEHS concluded that the scientific evidence that extra low frequency EMF exposures pose any health risk is weak. The NIEHS was the lead government agency in directing and carrying out a congressionally mandated research program on EMF.

The Minnesota Department of Health (MDH) issued *An Assessment of Health Effects Research on Electric and Magnetic Fields* in January of 2000. The MDH concluded there is not a cause and effect relationship between magnetic fields and any biological response.

*...the current body of evidence does not show that exposure to these fields is a health hazard. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and magnetic fields produce cancer or any other adverse human health effect.*

*The current body of research lacks fundamental evidence to support a cause and effect relationship between magnetic fields and childhood leukemia. This conclusion is based on laboratory studies, which have failed to demonstrate adverse health effects or a plausible biological mechanism of causation (in vivo and in vitro).*

*As with many other environmental health issues, the possibility of a health risk from EMF cannot be entirely dismissed. The MDH considers it prudent public health policy to continue to monitor the EMF research and to support prudent avoidance measures, such as providing information to the public regarding EMF sources and exposure.*

There are currently no federal or Minnesota exposure standards for magnetic fields. Florida and New York are the only two states in the country that have set standards for magnetic field exposure (150 milligauss limit in Florida and 200 milligauss limit in New York). These

exposure limits were not based on scientific analysis, but in response to maintaining transmission systems within historic levels.

Past decisions have reflected that the scientific data does not show any significant risk of health effects due to exposure to magnetic fields. Policy decisions have continued to support the construction of electric infrastructure, taking into consideration the most recent information available on the issue.

Most recently, the World Health Organization provided an update, issuing Fact sheet N°322, *Electromagnetic fields and public health: Exposure to extremely low frequency fields*, June 2007. In many studies, a weak, statistical link between exposure to EMF and incidence of childhood leukemia has been noted. Additionally, some epidemiologic studies making a regression analysis of leukemia cases have found a statistical association. A similar link has not been noted with other types of cancer. In its report, after reviewing recent studies, WHO concludes that laboratory evidence does not support these findings:

*... epidemiological evidence is weakened by methodological problems, such as potential selection bias. In addition, there are no accepted biophysical mechanisms that would suggest that low-level exposures are involved in cancer development. ... Additionally, animal studies have been largely negative. Thus, on balance, the evidence related to childhood leukaemia is not strong enough to be considered causal. ... Regarding long-term effects, given the weakness of the evidence for a link between exposure to ELF magnetic fields and childhood leukaemia, the benefits of exposure reduction on health are unclear.*

### ***Mitigation Measures***

Xcel Energy routinely provides information on the issue to the public, interested customers and employees. This information contains references to studies, and provides data to help explain the relative impact of transmission line exposure to other EMF exposures most people experience throughout the day at home or at work. Xcel Energy also provides measurements for landowners, customers and employees who request them. In addition, Xcel Energy would use structure designs that minimize magnetic field levels and, where practicable, site facilities in locations affecting the fewest number of people.

### **3.15 Radio and TV Interference**

Corona on transmission line conductors can generate electromagnetic noise at frequencies at which radio and television signals are transmitted. This noise can cause interference (primarily with AM radio stations and the video portion of TV signals) with the reception of these signals depending on the frequency and strength of the radio and television signal. However, this interference is often due to weak broadcast signals or poor receiving equipment.

If interference occurs because of the power line, the electric utility is required to remedy problems so that reception is restored to its original quality.

***Mitigation Measures***

No interference issues are anticipated with this Project.

## 4.0 ASSESSMENT OF ALTERNATIVES AND IMPACTS IN LAKE MARSHALL TOWNSHIP SECTIONS 17 and 18

For the most part, impacts from the proposed route and route alternatives in Lake Marshall Township sections 17 and 18 evaluated in this EA are quite similar. Except for minor short-term impacts during construction, there are no impacts to air quality or to noise experienced in the Project Area anticipated from the Project. Impacts with respect to aesthetics, recreation, archaeological and historic features, human health and safety, radio and TV reception, soils and geology, and fauna are anticipated to be the same for all alternatives evaluated. Impacts to land use and agriculture vary among the proposed route and route alternatives in Lake Marshall Township sections 17 and 18. Areas where there is some variation in impacts among alternatives are summarized by route alternative in Table 7 and in the text below. Each route alternative is shown on Figure 2.

**Table 7 – Lake Marshall Sections 17 and 18 Route Alternative Analysis**

Criteria	Proposed Route	Alternative A-1	Alternative B	Alternative C-1	Alternative C-2	Alternative D-1	Alternative D-2	DOC 240 <sup>th</sup> St/ Hwy 7 Alternative
Residences within 100 feet	0	0	4	1	1	1	1	0
Residences within 100-200 feet	0	12	0	8	6	1	1	6
Businesses within 200 feet	1	0	2	0	0	0	1	*
Length existing or natural corridor (feet)	8,878	12,575	8,915	8,733	6,210	7,782	6,917	10,560
Length across agricultural land (feet)	2,900	0	2,089	3,990	4,427	3,642	5,068	0.0
Est. length cross country (miles)	2.0	0.55	1.65	0.75	1.0	2.10	2.18	0.0
Total Length (miles)	2.23	2.31	2.08	2.40	2.01	2.16	2.26	2.00

\* - No businesses appear to be present, all structures appear to be homes.

The EFP staff define "cross country" as areas where the route does not run along existing rights-of-way, including existing roads, electric lines, or other existing linear infrastructure.

### **Xcel Proposed Route**

The proposed route has the fewest homes and businesses immediately adjacent to the route (0-200 feet). The proposed route has no homes within 200 feet. The proposed route would be within 200 feet of 1 business. Several comments from residents of the 42 home Klien Addition, a suburban style subdivision in the northwestern quarter section of section 18, Lake Marshall Township, have expressed the opinion that the proposed route is too close to homes in this area. Other landowners along the proposed route have commented that the proposed route bisects private parcels along Minnesota Highway 23 planned for development in the near future.<sup>12</sup> The proposed transmission line route and alignment is approximately 600-700 feet from the back side of the nearest homes in the Klien Addition.

Portions of the proposed route are within the 100-year floodplain, particularly in the northern half of Lake Marshall Township Section 18.

The proposed route (and Alternative B) in Lake Marshall Township Section 17 runs cross country in undeveloped drainage and floodplain areas for approximately one mile. This section of the route contains no existing road, transmission, distribution or other existing ROW, however, the route is proposed along the border of cultivated fields and lowlands or wetland areas.

### **Alternative A-1**

Alternative A-1 is approximately 800 feet longer than the proposed route. Rather than running cross country through Section 17, Lake Marshall Township, A-1 follows 250<sup>th</sup> Street east 1 mile to CSAH 7, where it turns north and runs parallel to the west side of CSAH 7 for approximately 0.75 mile. At this point, Alternative A-1 turns east and runs cross country 0.5 mile along a ditch and field line to the Southwest Marshall Substation. The last 0.5 mile portion of the alternative is used by the proposed route, A-1, B, and D-1.

Alternative A-1 has the greatest number of homes immediately adjacent to the route (0-200 feet). Alternative A-1 contains no homes within 100 feet, 12 homes between 100- 200 feet, and no businesses within 200 feet of the proposed centerline of the route, which is the centerlines of 250<sup>th</sup> Street and CSAH 7. Most of the homes in Alternative A-1 are located along the west side of CSAH 7 north of 250<sup>th</sup> Street and south of Highway 23. Only one home is located on the east side of CSAH 7, and it is likely that the transmission line could cross to the western side of the road for a short distance to avoid that home. Electric distribution lines are present along 250<sup>th</sup> and CSAH 7.

In comments filed on May 5, 2008, Marshall Municipal Utilities (MMU) indicated that it no longer plans to build a future transmission line along CSAH 7 south of Highway 23 and north of 250<sup>th</sup> Street.<sup>13</sup> MMU would not object to the Lake Yankton to Marshall transmission line route

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<sup>12</sup> See public comments: <https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=5017775>

<sup>13</sup> See MMU comments dated May 2, 2008 at:  
<https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=5176334>

along CSAH 7 in this area. MMU indicates that it may be able to assign the easements it has acquired for this future transmission line to Xcel Energy in this area.

In comments filed on March 24, 2008, Lyon County indicated that it is planning to convert 250<sup>th</sup> Street to a County State Aid Highway in this area.<sup>14</sup> When this occurs, the 250<sup>th</sup> Street ROW will increase from 60 feet wide to 120 feet wide. Routing the transmission line along 250<sup>th</sup> Street (common for alternative A-1, C-1, and C-2) may be appropriate, but may require additional consultation and coordination with Lyon County.

### **Alternative B**

Alternative B is virtually identical to Xcel Energy's proposed route, but rather than running cross country in the northeastern quarter of Section 17, Lake Marshall Township, Alternative B runs along 257<sup>th</sup> Street, which is about 500 feet (one tenth of a mile) south of the proposed route. There are 4 homes within 100 feet and 1 business within 200 feet of the centerline of 257<sup>th</sup> Street and Alternative B. All of the homes along 257<sup>th</sup> Street are located on the south side of the street. While this alternative may have fewer impacts on future development of land than the proposed route, the transmission line would be very close (approximately 75 – 125 feet) to the homes and business along 257<sup>th</sup> Street.

Comments received from landowners in the Klien Addition and others in the area oppose this route due to its proximity to homes in the Klien Addition and along 257<sup>th</sup> Street.

### **Alternative C-1**

Alternative C-1 runs along 250<sup>th</sup> Street starting at 230<sup>th</sup> Avenue, east approximately 1.5 miles until it turns north at approximately the half section line in Section 17, Lake Marshall Township. At this point the route turns north and runs approximately 0.75 mile across farm fields before terminating at the Southwest Marshall Substation.

Alternative C-1 has 1 home within 100 feet, 8 homes between 100-200 feet and no businesses within 200 feet. Alternative C-1 is approximately 950 feet longer than Xcel's proposed route, but runs cross country for a shorter distance (0.75 mile vs. 2.25 miles). The 0.75 mile cross-country portion of Alternative C-1 runs across actively cultivated fields and could adversely impact these fields.

Because Alternative C-1 runs along 250<sup>th</sup> Street, it shares the same potential transportation impacts as Alternative A-1 and C-2.

Public comments filed to date have generally been supportive of this alternative.

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<sup>14</sup> See Lyon County comments dated March 18, 2008 at:  
<https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=5037430>

### **Alternative C-2**

Alternative C-2 runs along 250<sup>th</sup> Street starting at 230<sup>th</sup> Avenue, east approximately 1.0 mile until it meets CSAH 7, where the route then turns northeast and travels cross country approximately 1.0 mile to the Southwest Marshall Substation.

Alternative C-2 has 1 home within 100 feet, 6 homes between 100-200 feet and no businesses within 200 feet. Alternative C-2 is approximately 1,150 feet shorter than Xcel's proposed route and runs cross country for a shorter distance (approx 1.0 mile vs. 2.25 miles). Alternative C-2 runs diagonally across approximately 1.0 mile of cultivated farmland, which may result in greater impacts to farmland when compared to Xcel's proposed route and Alternative C-1 route due to the longer distance on farmlands and diagonal route across farm fields.

Because Alternative C-2 runs along 250<sup>th</sup> Street, it shares the same potential transportation impacts as Alternative A-1 and C-1.

Public comments filed to date have generally been supportive of this alternative.

### **Alternative D-1**

Alternative D-1 follows the same route as Xcel's proposed route cross country for approximately the first 0.66 mile, but rather than running cross country in the northeastern quarter of Section 17, Lake Marshall Township, Alternative D-1 runs cross country due east along the half section line in Section 17, then across CSAH 7 to the half section line in Section 18. At this point, Alternative D-1 turns north approximately 0.25 mile to the Southwest Marshall Substation. There is 1 home within 100 feet, 1 home between 100-200 feet, and no businesses within 200 feet of the centerline of the route. Alternative D-1 runs across agricultural lands for nearly its entire approximately 2.10 mile length which may result in greater impacts to farmlands when compared to Xcel's proposed route.

Two public comments supportive of and no comments opposing this alternative were received.

### **Alternative D-2**

Alternative D-2 follows the same route as Alternative D-1 up to the point D-2 crosses CSAH 7. At this point, Alternative D-2 turns northeast across farm fields approximately 0.25 mile, then follows the same route as Xcel's proposed route and Alternatives A-1 and B to the Southwest Marshall Substation. There is 1 home within 100 feet, 1 home between 100-200 feet, and 1 business within 200 feet of the centerline of the route. Alternative D-2 is approximately 200 feet longer than Xcel's proposed route. Alternative D-2 runs cross country across agricultural lands for nearly its entire approximately 2.25 mile length which may result in greater impacts to farmlands when compared to Xcel's proposed route.

Two public comments supportive of and no comments opposing this alternative were received.

### **DOC 240<sup>th</sup> Street/Highway 7 Alterative**

The DOC 250<sup>th</sup> Street/Highway 7 Alterative was not evaluated in the Application, but is an attempt by the EFP staff to address concerns raised by the public and provide a route alternative that avoids the potential transportation impacts to 250<sup>th</sup> Street. The alternative segment begins at the intersection of 240<sup>th</sup> Street and 230<sup>th</sup> Avenue, follows 240<sup>th</sup> Street east approximately 1 mile until reaching the intersection of 240<sup>th</sup> Street and 240<sup>th</sup> Avenue (Lyon County Road 7). At this point, the alternative segment follows 240<sup>th</sup> Avenue (County Road 7) north approximately 1 mile to the intersection of 250<sup>th</sup> Street and 240<sup>th</sup> Avenue (County Road 7). At this point, the alternative segment could follow any one of the three alternative segments discussed in the Application to the Marshall Substation.

The DOC 250<sup>th</sup> Street/Highway 7 Alterative adds no length to the overall project or alternatives. There are no homes within 100 feet, 6 homes between 100-200 feet, and no known businesses within 200 feet of the centerline of the route. The lands along the alternative route are agricultural lands. It appears that the transmission line could run along either side or cross the roads in this route to avoid homes. There are three potential crossings of wetlands or water bodies along this route alternative. Because the line would be built on private lands immediately adjacent to the road ROW, the route would have the same agricultural impacts per mile as the rest of the transmission line.

## **5.0 OTHER PERMITS AND APPROVALS REQUIRED**

Table 8 contains a list of the anticipated permits and associated environmental approvals required for the Lake Yankton to Marshall transmission line project. Compliance with the terms of all applicable and relevant regulatory permits and approvals will be a condition of any Route Permit issued by the PUC.

**Table 8 – Potentially Required Permits**

<b>Permit</b>	<b>Jurisdiction</b>
Utility Permits	State, County, Township
Licence to Cross Public Lands or Waters	MDNR
Oversize Loads Permits	State, County, Township, City
Driveway/Access Permits	County, Township, City
Route Permit (Alternative Process)	PUC
NPDES Permit	MPCA

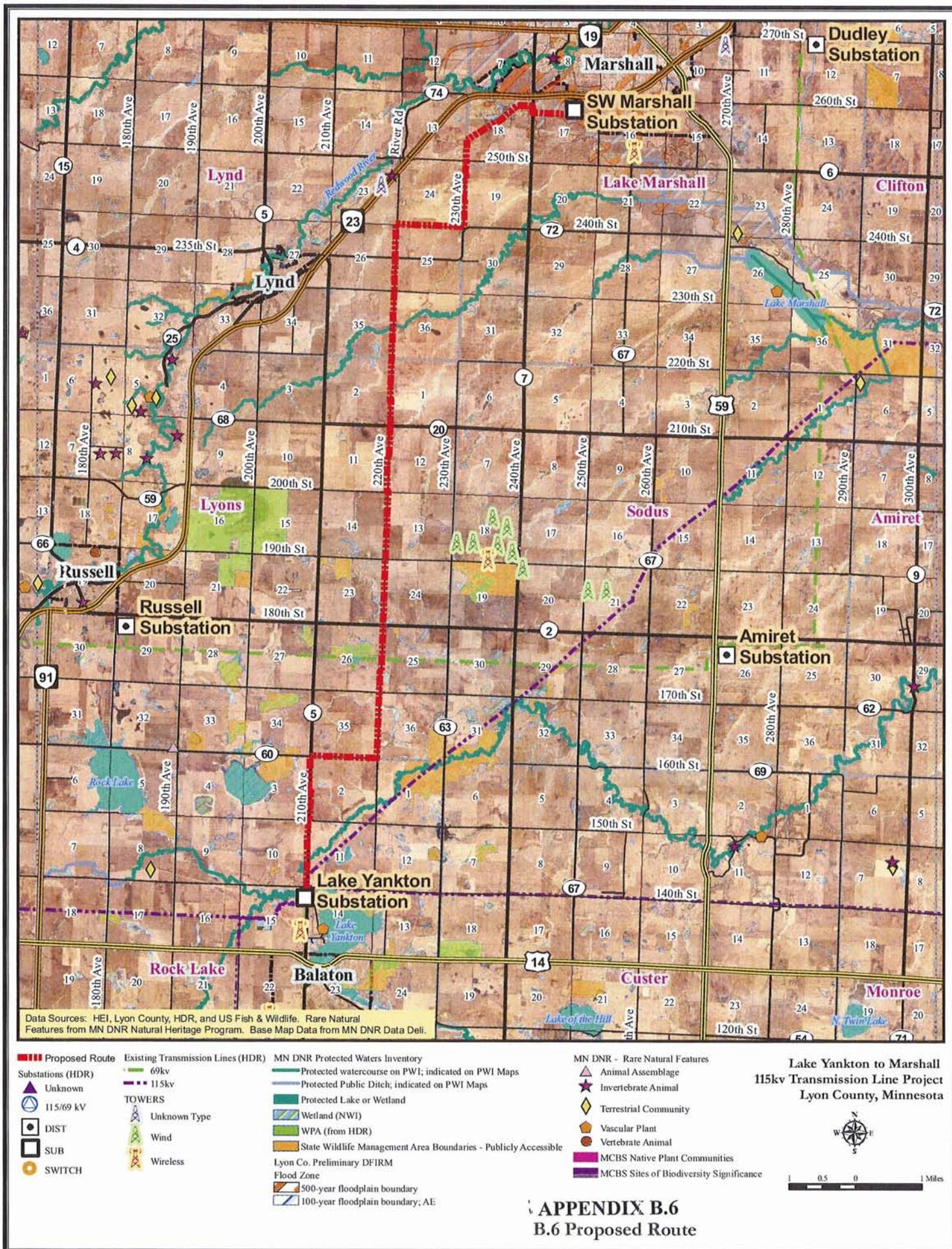
## 6.0 ACRONYMS, ABBREVIATIONS and DEFINITIONS

ACSS	Aluminum Conductor Steel Supported
BMP	best management practice
COE	Corps of Engineers
Commission	Minnesota Public Utilities Commission
CON	Certificate of Need
CSAH	County State Aid Highway
CWI	Minnesota County Well Index
dB	decibels
dBA	A-weighted sound level recorded in units of decibels
DNR	Department of Natural Resources
DOC	Department of Commerce
EA	Environmental Assessment
EFP	Department of Commerce Energy Facilities Permitting
EMF	electromagnetic field
EPA	United States Environmental Protection Agency
EQB	Environmental Quality Board
G	Gauss
HVTL	high voltage transmission line
Hz	Hertz
kV	kilovolt
kV/M	Kilovolt per meter
MCBS	Minnesota County Biological Survey
MDH	Minnesota Department of Health
mg/L	milligrams per liter – equivalent to parts per million (ppm)
MN DNR	Minnesota Department of Natural Resources
MN DOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
NAC	noise area classification
NERC	North American Electric Reliability Council
NESC	National Electrical Safety Code
NEV	Neutral-to-Earth Voltage
NIEHS	National Institute of Environmental Health Sciences
NPDES	National Pollution Discharge Elimination System
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
ppm	parts per million
PUC	Public Utilities Commission
PWI	Public Waters Inventory
ROW	Right-of-Way
SFD	Swan Flight Diverter

SHPO	State Historic Preservation Office
SNA	Scientific and Natural Area
SWPPP	Stormwater Pollution Prevention Plan
USDA	United States Department of Agriculture
USDOE	United States Department of Energy
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WPA	Waterfowl Production Area
WMA	Wildlife Management Area
WSR	Wild and Scenic River

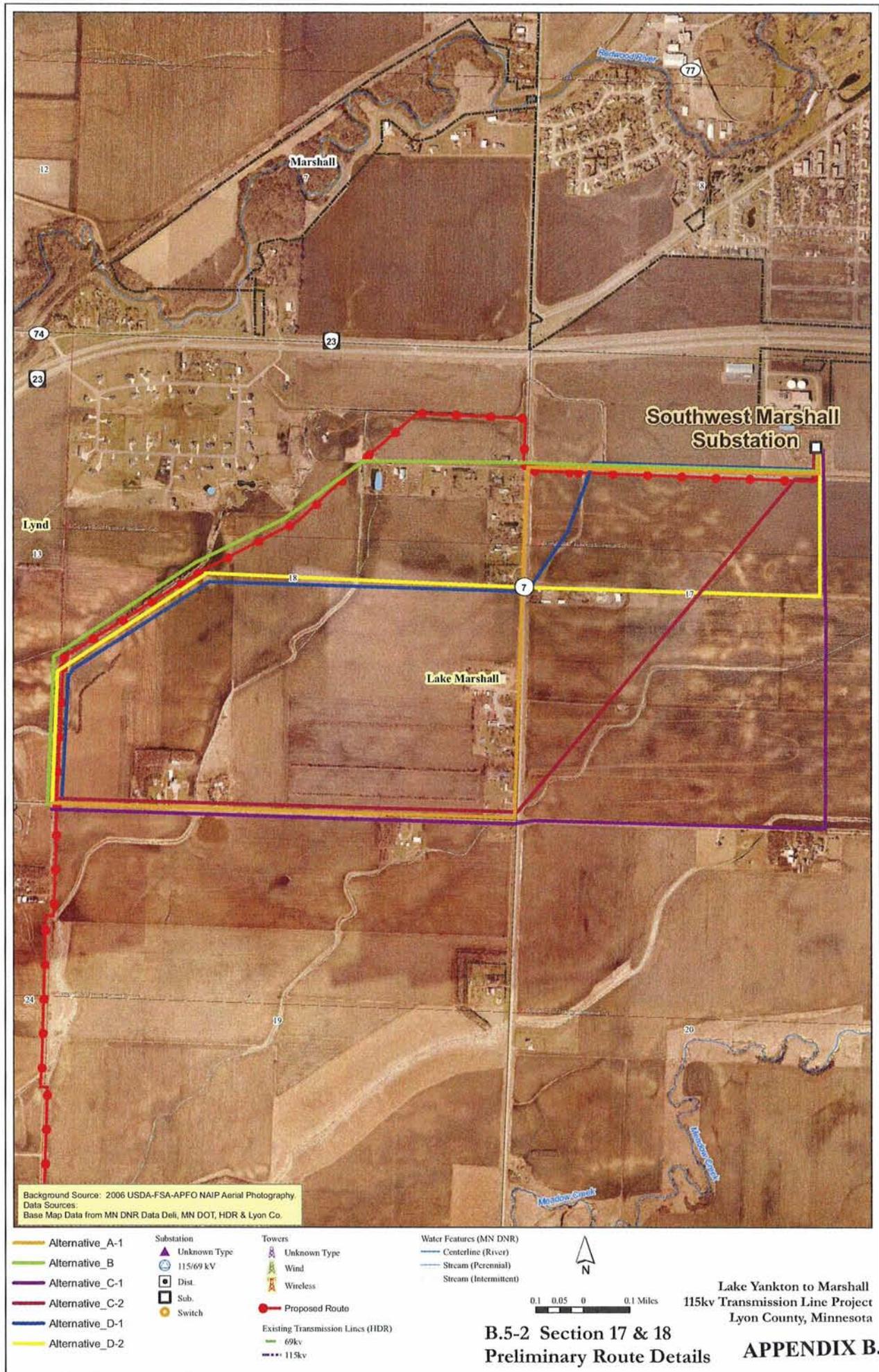
**FIGURES**

FIGURE 1



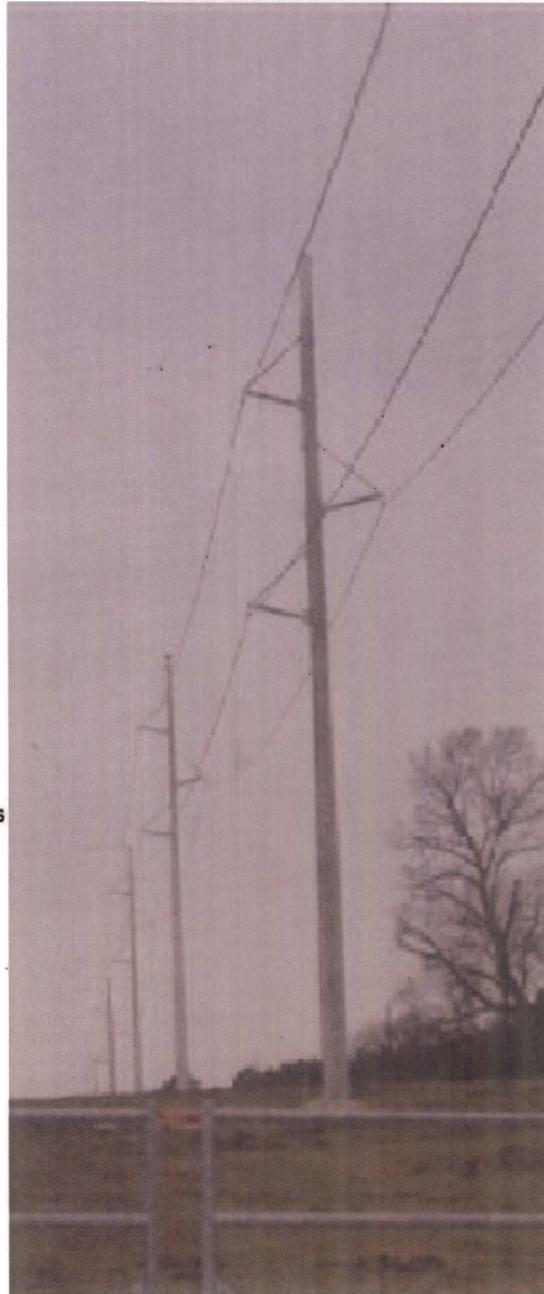
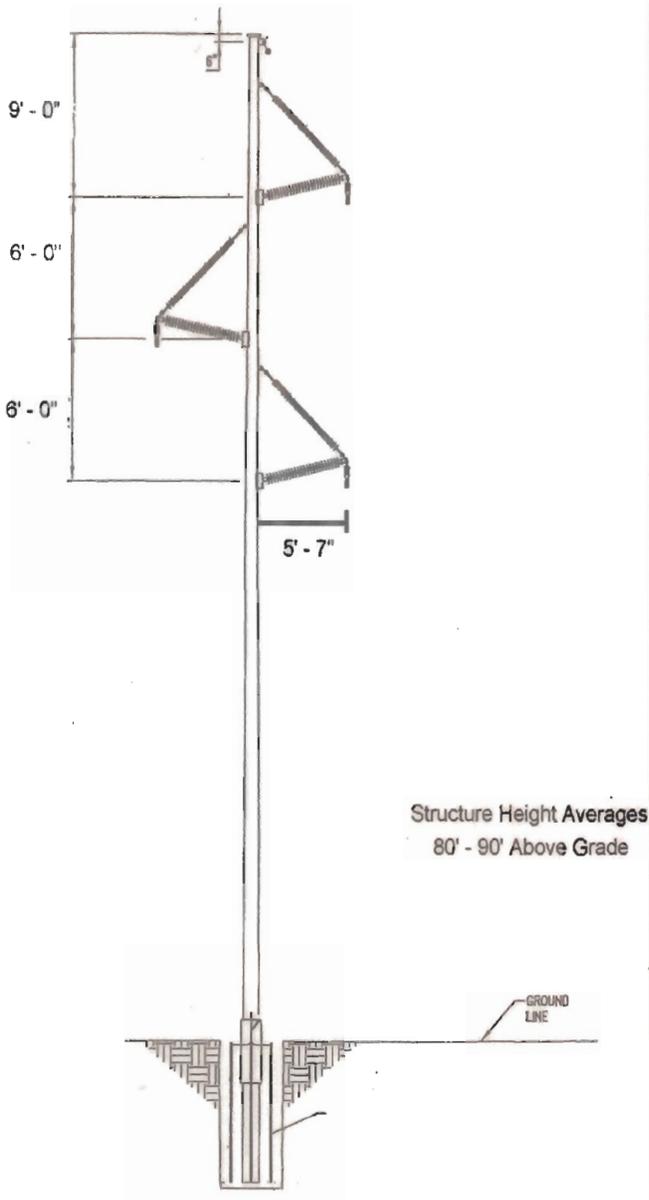
APPENDIX B.6  
 B.6 Proposed Route

**FIGURE 2**



### FIGURE 3

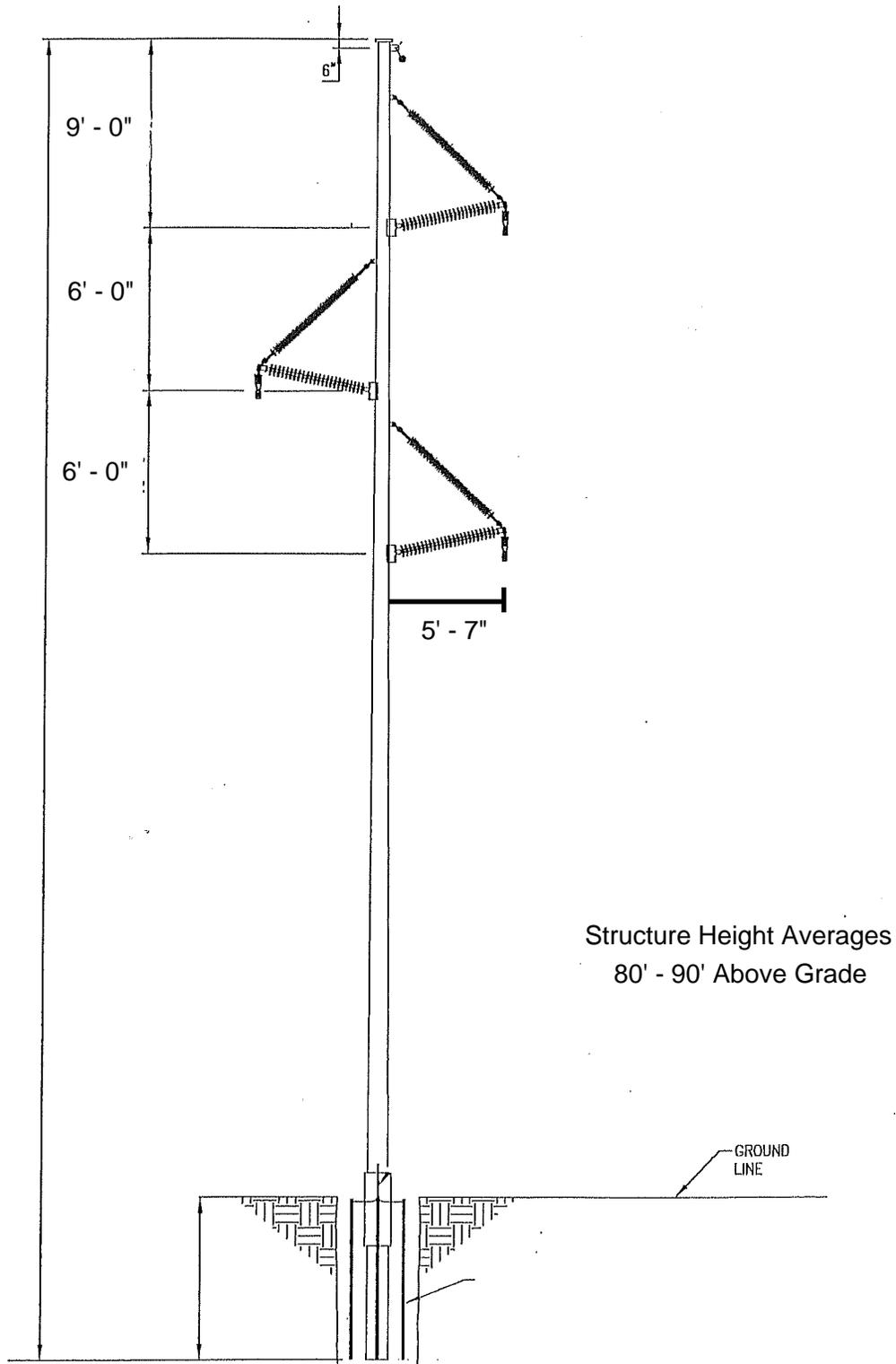
Proposed structure dimensions and photograph.



**SINGLE CIRCUIT W/ BRACED POST INSULATORS**  
Xcel Energy - Lake Yankton-Marshall, 115kV

2145176v1

**FIGURE 4**



**SINGLE CIRCUIT W/ BRACED POST INSULATORS**  
Xcel Energy - Lake Yankton-Marshall, 115kV

**APPENDIX A**



**In the Matter of the Application for a Route  
Permit for the Lake Yankton – Marshall  
115 kilovolt Transmission Line Project**

**ENVIRONMENTAL ASSESSMENT  
SCOPING DECISION  
PUC Docket No. E002/TL-07-1407**

The above matter has come before the Director of the Department of Commerce Office of Energy Security (OES) for a decision on the scope of the Environmental Assessment (EA) to be prepared on the proposed Xcel Energy Lake Yankton – Southwest Marshall 115 kilovolt (kV) Transmission Line Project Lyon County, Minnesota.

Xcel Energy proposes to build an approximately 15.7 mile, 115,000 volt high voltage transmission line (HVTL) between its existing Lake Yankton Substation near Balaton to the existing Marshall Southwest Substation in Marshall. The proposed route runs parallel to road rights of way for nearly its entire length between these existing substations

The OES Energy Facilities Permitting (EFP) staff held a public information and EA scoping meeting on March 4, 2008, at the Lyon County Government Center to discuss the project with the public and to solicit input into the scope of the EA to be prepared. A public comment period on the scope of the EA closed on March 14, 2008. Approximately 25 people attended the public meeting. Five comment letters were received, including three comments proposing alternatives to the route proposed by Xcel Energy.

Having reviewed the matter, consulted with the EFP staff, and in accordance with Minnesota Rule 7849.5700, I hereby make the following Scoping Decision:

### **MATTERS TO BE ADDRESSED**

The Environmental Assessment on the Xcel Energy Lake Yankton – Southwest Marshall 115 kV Transmission Line Project will address and provide information on the following matters:

#### **A. GENERAL DESCRIPTION OF THE PROPOSAL**

1. Purpose of the Transmission Line
2. Project Location and Environmental Setting
3. Engineering and Operation Design
  - a. Transmission Line and Structures
  - b. Transmission Capacity
  - c. Construction Procedures
  - d. Right-of-Way Maintenance

## **B. IMPACTS AND MITIGATIVE MEASURES**

1. Human Settlements
2. Noise
3. Aesthetics
4. Recreation
5. Transportation
6. Land Use
7. Prime Farmland
8. Soils and Geology
9. Flora
10. Fauna
11. Archaeological and Historic Features
12. Air Quality
13. Surface Water
14. Wetlands
15. Human Health and Safety to include Electric and Magnetic Fields (EMF)
16. Potential for radio, television and cell phone interference from transmission lines

## **C. ALTERNATIVE ROUTES**

In its Application, Xcel Energy described several route alternatives it investigated as potential routes and rejected for various reasons. Several members of the public proposed that the OES EFP staff investigate in the EA the route alternatives described and rejected by Xcel in the Application in order to minimize the number of homes within 200 feet of the transmission line. EFP staff believe that it is reasonable to evaluate the proposed route alternatives to determine each alternative's impact compared to the impact of the route proposed by Xcel Energy. The EA will evaluate alternatives A-1, B, C-1, C-2, D-1 and D-2 as described by Xcel in the Application.

In addition, the EA will cover one additional route alternative segment which was not evaluated in the Application to address concerns raised by the public. The alternative segment begins at the intersection of 240<sup>th</sup> Street and 230<sup>th</sup> Avenue, follows 240<sup>th</sup> Street east approximately one (1) mile until reaching the intersection of 240<sup>th</sup> Street and 240<sup>th</sup> Avenue (Lyon County Road 7). At this point, the alternative segment follows 240<sup>th</sup> Avenue (County Road 7) north approximately 1 mile to the intersection of 250<sup>th</sup> Street and 240<sup>th</sup> Avenue (County Road 7). At this point, the alternative segment could follow one of the three alternative segments discussed in the Application to the Marshall Substation.

## **D. IDENTIFICATION OF PERMITS**

The Environmental Assessment will include a list of permits that will be required for construction of the Project.

### ISSUES OUTSIDE THE SCOPE OF THE EA

The Environmental Assessment will not consider the following matters:

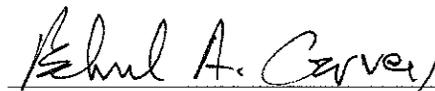
1. The manner in which land owners are paid for transmission right-of-way easements, as that is outside the PUC jurisdiction.
2. Any alternatives not described specifically in this Scoping Decision.
3. Whether a different size or different type of transmission line should be built.
4. The no-build option regarding the High Voltage Transmission Line or routes other than those noted herein.
5. The impacts of specific energy sources, such as carbon outputs from coal-generated facilities or environmental impacts from a wind generation installation.

### SCHEDULE

The EA shall be completed and available by May 2008. A public hearing will be held in Marshall after the EA has been issued and notice served.

Signed this 27 day of March, 2008

STATE OF MINNESOTA  
DEPARTMENT OF COMMERCE  
OFFICE OF ENERGY SECURITY



Edward A. Garvey, Deputy Commissioner and  
Director

## **APPENDIX B**

**ROUTE PERMIT FOR CONSTRUCTION OF A HIGH  
VOLTAGE TRANSMISSION LINE  
IN**

**MURRAY AND NOBLES COUNTIES, MINNESOTA**

**ISSUED TO  
NORTHERN STATES POWER COMPANY d/b/a XCEL  
ENERGY**

**PUC DOCKET No. E002/TL-07-1233**

In accordance with the requirements of Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7849, this Route Permit is hereby issued to:

**NORTHERN STATES POWER COMPANY d/b/a XCEL  
ENERGY**

Northern States Power Company, d/b/a Xcel Energy (hereinafter referred to as Xcel Energy), is authorized by this route permit to construct a new 115 kilovolt (kV) high voltage transmission line between the Fenton Substation in Murray County and the Nobles County Substation in Nobles County, a distance of approximately 23 miles. Xcel Energy is authorized to make modifications at the Fenton Substation and the Nobles County Substation to accommodate the new 115 kV transmission line.

The transmission line shall be built within the route identified in this permit and as portrayed on the attached official route map, and in compliance with the conditions specified in this permit.

Approved and adopted this \_\_\_\_\_ day of  
May, 2008

BY ORDER OF THE COMMISSION

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Burl W. Haar,  
Executive Secretary

## **I. ROUTE PERMIT**

The Minnesota Public Utilities Commission (Commission) hereby issues this route permit to Xcel Energy (Permittee) pursuant to Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7849. This permit authorizes Xcel to construct approximately 23 miles of 115 kilovolt (kV) high voltage transmission line (HVTL) and make equipment modifications at the Fenton Substation and Nobles County Substation accommodate the new 115 kV transmission line.

## **II. PROJECT DESCRIPTION**

Xcel Energy is authorized to build a 23-mile, 115 kV transmission line and add associated electrical equipment necessary for connection of the permitted line at the existing Fenton and Nobles County substations.

The transmission line authorized by this permit will utilize bundled 795 aluminum conductor steel supported (ACSS) conductors. The line will be constructed on steel transmission structures (poles). Xcel Energy is authorized to use steel, single circuit transmission line structures with davit arms designed to carry 115 kV conductor throughout the approved route. In addition, Xcel Energy is authorized to install larger galvanized steel, single circuit, davit arm transmission line structures designed to carry 345 kV conductor on a limited basis between the Fenton Substation and Minnesota Trunk Highway 91, as well as, at locations where taller poles are necessary to cross other existing transmission lines and where the line is required to achieve longer spans to cross wetlands and bodies of water.

Specialty transmission line structures including, but not limited to, steel or laminated wood post structures on concrete foundations are authorized for long spans, road or waterway crossings, and when circumstances require.

## **III. DESIGNATED ROUTE**

The route designated by the Commission in this permit comprises the segments as described in detail below, as analyzed in the EA, and shown on the Official Route Map attached to this permit. In an effort to maximize Xcel Energy's ability to accommodate individual landowners' needs, a route width of 200 feet on either side of the stated route centerline (centerline of adjacent roads) is approved (400 foot total width). The approved right-of-way (ROW) width is 42.5-feet where the route is adjacent to existing road ROW or clear zones, and up to 75-feet wide where the route travels "cross-country." Where Xcel will install taller 135-145 foot structures, the approved ROW is 80-feet when parallel to existing road ROW and up to 150-feet wide where the route travels "cross country."

***Description of Route (See attached map)***

Starting at the Fenton Substation, the transmission line route will exit the west side of the substation and run south along 70<sup>th</sup> Avenue for approximately 1.35 miles to 11<sup>th</sup> Street. At 11<sup>th</sup> Street, the line will turn west and follow 11<sup>th</sup> Street approximately one-half mile to the half section line of Section 31, Fenton Township, Murray County. At this point, the line turns south, runs approximately one mile cross country along on the east side of the fence line and on the Kluis and Vanpersem properties in Section 31 to the 1<sup>st</sup> Street (Murray County Road 71 and Nobles County Road 72) and Minnesota Trunk Highway 91 intersection. The line will continue south along Highway 91 for approximately 8 miles to 180<sup>th</sup> Street (Nobles County Road 68), where it will turn east along 180<sup>th</sup> Street (Nobles County Road 68) for approximately 4 miles to Hesselroth Avenue. At Hesselroth Avenue the line will run south for approximately one mile to 190<sup>th</sup> Street and then turn east along 190<sup>th</sup> Street for approximately 4.5 miles to approximately one half-mile east of County Road 25. At this point, the proposed line will turn south and cross one half-mile of an agricultural field owned by Xcel Energy. The line then turns east several hundred feet and terminates at the Nobles County Substation. The centerline of the approved route is the road centerline where the line is parallel to existing roads.

Fenton Substation and Nobles County Substation Associated Facilities: Associated facilities including four new 115 kV circuit breakers, disconnects, a five position ring bus, and new concrete foundations to support substation equipment will be installed at the Fenton Substation. Associated facilities at the Nobles County Substation including a new 345 kV/115 kV transformer, two 345 kV breakers, four 115 kV breakers, a 345 kV 5 position ring bus and new concrete foundations to support substation equipment will be installed at the Nobles County Substation.

The proposed transmission lines will be designed to meet or surpass all relevant local and state codes, and North American Electric Reliability Council (NERC) and Xcel Energy standards. Appropriate standards will be met for construction and installation, and all applicable safety procedures will be followed during and after installation.

#### **IV. PERMIT CONDITIONS**

The Permittee shall comply with the following conditions during construction of the transmission line and associated facilities and the life of this permit.

**A. Plan and Profile.** At least 14 calendar days before right-of-way preparation for construction begins, the Permittee shall provide the Commission with a plan and profile of the right-of-way and the specifications and drawings for right-of-way preparation, construction, cleanup, and restoration for the transmission line. The Permittee may not

commence construction until the 14 days has expired or until the Commission has advised the Permittee in writing that it has completed its review of the documents and determined that the planned construction is consistent with this permit. If the Permittee intend to make any significant changes in its plan and profile or the specifications and drawings after submission to the Commission, the Permittee shall notify the Commission at least five days before implementing the changes. No changes shall be made that would be in violation of any of the terms of this permit.

## **B. Construction Practices.**

- 1. Application.** The Permittee shall follow those specific construction practices and material specifications described in the Xcel Energy Application to the Commission for a route permit, dated October 17, 2007, and as described in the EA unless this permit establishes a different requirement, in which case this permit shall prevail.
- 2. Field Representative.** At least 10 days prior to commencing construction, the Permittee shall advise the Commission in writing of the person or persons designated to be the field representative for the Permittee with the responsibility to oversee compliance with the conditions of this Permit during construction. The field representative's address, phone number, and emergency phone number shall be provided to the Commission and shall be made available to affected landowners, residents, public officials and other interested persons. The Permittee may change its field representative at any time upon written notice to the Commission.
- 3. Cleanup.** All waste and scrap that is the product of construction shall be removed from the area and properly disposed of upon completion of each task. Personal litter, including bottles, cans, and paper from construction activities shall be removed on a daily basis.
- 4. Vegetation Removal.** The Permittee shall minimize the number of trees to be removed in selecting the right-of-way (ROW). As part of construction, low growing brush or tree species are allowable at the outer limits of the easement area. To the extent practical, low growing vegetation that will not pose a threat to the transmission facility or impede construction should remain in the easement area.
- 5. Erosion Control.** The Permittee shall implement reasonable measures to minimize runoff during construction and shall plant or seed non-agricultural areas that were disturbed where structures are installed.
- 6. Temporary Work Space.** The Permittee shall limit temporary easements to special construction access needs and additional staging or lay-down areas required outside of the authorized ROW.

**7. Restoration.** The Permittee shall restore the ROW, temporary work spaces, access roads, abandoned ROW, and other private lands affected by construction of the transmission line. Restoration within the ROW must be compatible with the safe operation, maintenance, and inspection of the transmission line.

Xcel Energy shall work with landowners, the DNR, and local wildlife management programs to restore and maintain the right-of-way to provide useful and functional habitat for plants, nesting birds, small animals and migrating animals and to minimize habitat fragmentation in a manner consistent with inspection and safe maintenance of the right-of-way.

Within 60 days after completion of all restoration activities, the Permittee shall advise the Commission in writing of the completion of such activities.

**8. Notice of Permit.** The Permittee shall inform all employees, contractors, and other persons involved in the construction of the transmission line of the terms and conditions of this permit.

**C. Periodic Status Reports.** Upon request, the Permittee shall report to the Commission on progress regarding finalization of the route, design of structures, and construction of the transmission line. The Permittee need not report more frequently than quarterly.

**D. Complaint Procedure.** Prior to the start of construction, the Permittee shall submit to the Commission the company's procedures to be used to receive and respond to complaints. The procedures shall be in accordance with the requirements set forth in the complaint procedures attached to this permit.

**E. Notification to Landowners.** The Permittee shall provide all affected landowners with a copy of this permit at the time of the first contact with the landowners after issuance of this permit. Xcel Energy shall contact landowners prior to entering the property or conducting maintenance along the route and avoid maintenance practices, particularly the use of fertilizer or pesticides, inconsistent with the landowner's or tenant's use of the land.

Xcel Energy shall work with landowners to locate the HVTL on their property to minimize the loss of agricultural land, forest, and wetlands, with due regard for proximity to homes and property lines.

**F. Completion of Construction.**

**1. Notification to Commission.** At least three days before the line is to be placed into service, the Permittee shall notify the Commission of the date on

which the line will be placed into service and the date on which construction was complete.

**2. As-Builts.** Upon request of the Commission, the Permittee shall submit copies of all the final as-built plans and specifications developed during the project.

**3. GPS Data.** Within 60 days after completion of construction, the Permittee shall submit to the Commission, in the format requested by the Commission, geo-spatial information (GIS compatible maps, GPS coordinates, etc.) for all above ground structures associated with the transmission lines, each switch, and each substation connected.

#### **G. Electrical Performance Standards.**

**1. Grounding.** The Permittee shall design, construct, and operate the transmission line in such a manner that the maximum induced steady-state short-circuit current shall be limited to five milliamperes rms alternating current between the ground and any non-stationary object within the ROW, including but not limited to large motor vehicles and agricultural equipment. All fixed metallic objects on or off the ROW, except electric fences that parallel or cross the right-of-way, shall be grounded to the extent necessary to limit the induced short circuit current between ground and the object so as not to exceed one milliampere rms under steady state conditions of the transmission line and to comply with the ground fault conditions specified in the National Electric Safety Code (NESC).

**2. Electric Field.** The transmission line shall be designed, constructed, and operated in such a manner that the electric field measured one meter above ground level immediately below the transmission line shall not exceed 8.0 kV/m rms.

**3. Interference with Communication Devices.** If interference with radio or television, satellite or other communication devices is caused by the presence or operation of the transmission line, the Permittee shall take whatever action is prudently feasible to restore or provide reception equivalent to reception levels in the immediate area just prior to the construction of the line.

#### **H. Special Conditions**

**1. Archaeological and Historic Resources.** Xcel Energy shall make every effort to avoid impacts to identified archaeological and historic resources when installing the HVTL on the approved route. In the event that an impact would occur, the Applicants will consult with State Historic Preservation Office (SHPO) and invited consulting parties. Where feasible, avoidance of the resource is required. Where not feasible, mitigation for project-related impacts on National

Register of Historic Properties (NRHP)-eligible archaeological and historic resources must include an effort to minimize project impacts on the resource.

**2. Wetlands/Water Resources.** Wetland impact avoidance measures that shall be implemented during design and construction of the transmission line will include spacing and placing the power poles at variable distances to span and avoid wetlands. Unavoidable wetland impacts as a result of the placement of poles shall be limited to the immediate area around the poles. To minimize impacts, construction in wetland areas shall occur in the winter. If necessary, wooden or composite mats will be used to protect wetland vegetation. All requirements of the USACE (wetlands under federal jurisdiction), MDNR (Public Waters/Wetlands), and County (wetlands under the jurisdiction of the Minnesota Wetland Conservation Act) shall be met.

Impacts to floodplains, in particular the placement of power pole structures, shall be avoided to the maximum extent possible by placing these structures above the floodplain contours outside of the designated floodplain, and by spanning the floodplain with the transmission line.

If construction activities at the substation and switching station will result in the disturbance of one acre or more of soils, a National Pollutant Discharge Elimination System (NPDES) stormwater permit will be required. Erosion control measures and Best Management Practices (BMPs) shall be followed during these activities.

**3. Accommodation of Existing and Planned Infrastructure.** Xcel Energy is required to work with the townships and counties along the route to accommodate their concerns regarding drain tiles, pole depth and placement in relationship to existing roads and road expansion plans.

**4. Federally-endangered Topeka Shiner.** To prevent sedimentation in streams inhabited by the federally-endangered (state special concern) Topeka shiner (*Notropis topeka*), Xcel Energy shall employ best management practices as described in the U.S. Fish and Wildlife Service “Recommendations for Projects Affecting Waters Inhabited by Topeka Shiners in Minnesota,” which is attached to this permit. Transmission line structures will be placed at locations to allow the transmission line conductor to span Kanaranzi Creek and any other creek designated as critical habitat for the species.

## **I. Other Requirements.**

**1. Applicable Codes.** The Permittee shall comply with applicable North American Electric Reliability Council (NERC) construction standards and requirements of the National Electric Safety Code (NESC) including clearances to

ground, clearance to crossing utilities, clearance to buildings, ROW widths, erecting power poles, and stringing of transmission line conductors.

**2. Other Permits.** The Permittee shall comply with all applicable state rules and statutes. The Permittee shall obtain all required local, state and federal permits for the project and comply with the conditions of these permits. A list of the required permits is included in the permit application and the environmental assessment. The Permittee shall submit a copy of such permits to the Commission upon request.

**3. Pre-emption.** Pursuant to Minnesota Statutes 216E.10, subdivisions 1 and 2, this route permit shall be the sole route approval required to be obtained by the Permittee and this permit shall supersede and preempt all zoning, building, or land use rules, regulations, or ordinances promulgated by regional, county, local and special purpose government.

**J. Delay in Construction.** If the Permittee have not commenced construction or improvement of the route within four years after the date of issuance of this permit, the Commission shall consider suspension of the permit in accordance with Minnesota Rule 7849.5970.

## **V. PERMIT AMENDMENT**

The permit conditions in Section IV. may be amended at any time by the Commission. Any person may request an amendment of the conditions of this permit by submitting a request to the Commission in writing describing the amendment sought and the reasons for the amendment. The Commission will mail notice of receipt of the request to the Permittee. The Commission may amend the conditions after affording the Permittee and interested persons such process as is required.

## **VI. TRANSFER OF PERMIT**

The Permittee may request at any time that the Commission transfer this permit to another person or entity. The Permittee shall provide the name and description of the person or entity to whom the permit is requested to be transferred, the reasons for the transfer, a description of the facilities affected, and the proposed effective date of the transfer. The person to whom the permit is to be transferred shall provide the Commission with such information as the Commission shall require to determine whether the new Permittee can comply with the conditions of the permit. The Commission may authorize transfer of the permit after affording the Permittee, the new permittee, and interested persons such process as is required.

## **VII. REVOCATION OR SUSPENSION OF THE PERMIT**

The Commission may initiate action to revoke or suspend this permit at any time. The Commission shall act in accordance with the requirements of Minnesota Rules part 7849.6010 to revoke or suspend the permit.

**PUBLIC UTILITIES COMMISSION  
COMPLAINT REPORT PROCEDURES FOR  
HIGH VOLTAGE TRANSMISSION LINES**

**1. Purpose**

To establish a uniform and timely method of reporting complaints received by the Permittee concerning the Permit conditions for site preparation, construction, cleanup and restoration, and resolution of such complaints.

**2. Scope**

This reporting plan encompasses complaint report procedures and frequency.

**3. Applicability**

The procedures shall be used for all complaints received by the Permittee.

**4. Definitions**

**Complaint:** - A statement presented by a person expressing dissatisfaction, resentment, or discontent as a direct result of the HVTL and associated facilities. Complaints do not include requests, inquiries, questions or general comments.

**Telephone Complaint:** - A person presenting a Complaint by telephone shall indicate whether the Complaint relates to (1) a substantive Routing Permit matter, (2) a HVTL location matter, or (3) a compensation matter. All callers must provide the following information when presenting a Complaint by telephone: (1) name; (2) date and time of call; (3) phone number; (4) email address (if available); (5) home address; (6) parcel number.

**Substantial Complaint:** – Written complaints alleging a violation of a specific Route Permit condition that, if substantiated, could result in Permit modification or suspension pursuant to the applicable regulations.

**Person:** - An individual, partnership, joint venture, private or public corporation, association, firm, public service company, cooperative, political subdivision, municipal corporation, government agency, public utility district, or any other entity, public or private, however organized.

**5. Responsibilities**

Everyone involved with any phase of the HVTL is responsible to ensure expeditious and equitable resolution of all complaints. It is therefore necessary to

establish a uniform method for documenting and handling complaints related to this HVTL project. The following procedures will satisfy this requirement:

- A. The Permittee shall document all complaints by maintaining a record of all applicable information concerning the complaint, including the following:
  1. Name of the Permittee and project.
  2. Name of complainant, address and phone number.
  3. Precise property description or tract numbers (where applicable).
  4. Nature of complaint.
  5. Response given.
  6. Name of person receiving complaint and date of receipt.
  7. Name of person reporting complaint to the PUC and phone number.
  8. Final disposition and date.
- B. The Permittee shall assign an individual to summarize complaints for transmittal to the PUC.

## 6. Requirements

The Permittee shall report all complaints to the PUC according to the following schedule:

**Immediate Reports:** - All substantial complaints shall be reported to the PUC by phone or by e-mail the same day received or on the following working day for complaints received after working hours. Such reports are to be directed to HVTL Permit Compliance at the following:  
[DOC.energypermitcompliance@state.mn.us](mailto:DOC.energypermitcompliance@state.mn.us) or 1-800-657-3794. Voice messages are acceptable.

**Monthly Reports:** - By the 15th of each month, a summary of all complaints, including substantial complaints received or resolved during the proceeding month. Such summaries shall be sent to Dr. Burl W. Haar, Executive Secretary, Minnesota Public Utilities Commission, Metro Square Building, 121 7<sup>th</sup> Place East, Suite 350, St. Paul, MN 55101-2147. A copy of each complaint shall be sent to Permit Compliance, Minnesota Department of Commerce, 85 7<sup>th</sup> Place East, Suite 500, St. Paul, MN 55101-2198.

**Unresolved Complaints:** - The permittee shall submit all unresolved complaints to the PUC for resolution by the PUC, where appropriate, no later than 45 days after the date of the submission.

## **7. Complaints Received by the PUC**

Copies of complaints received directly by the PUC from aggrieved persons regarding site preparation, construction, cleanup, restoration, operation and maintenance shall be promptly sent to the Permittee.

**Initial Screening:** - Commission Staff shall perform an initial evaluation of unresolved Complaints submitted to the Commission. Complaints raising substantive Routing Permit issues shall be processed and resolved by the Commission. Staff shall notify Xcel Energy and the Complaining person if it determines that the Complaint is a Substantial Complaint. With respect to such Complaints, each party shall submit a written summary of its position to the Commission no later than ten days after receipt of the Staff notification. Staff shall present Briefing Papers to the Commission, which shall resolve the Complaint within twenty days of submission of the Briefing Papers.

**Condemnation/Compensation Issues:** - If the Commission's Staff initial screening determines that a Complaint raises issues concerning the just compensation to be paid to landowners on account of Xcel Energy's acquisition of HVTL easements, Staff shall recommend to the Executive Secretary that the matter be resolved under the provisions of Minnesota Statutes, Chapter 117. If the Executive Secretary concurs, he shall so report to the Commission and the matter shall be dealt with in the HVTL condemnation proceedings as an issue of just compensation.