Environmental Assessment for the Proposed Structure Replacements on Existing 115 Kilovolt Transmission Line MPUC Docket No. E002/LR-10-641

Courtland Township
Nicollet County, Minnesota

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List of Acronyms Used in this Document

ACRONYMS	
BMPs	Best Management Practices
Commission	Minnesota Public Utilities Commission
dB dB(A)	Decibel Decibel, A-weighted
DNR	Minnesota Department of Natural Resources
EA	Environmental Assessment
EMF	Electromagnetic fields
EQB	Minnesota Environmental Quality Board
kV	Kilovolt
kV/m	Kilovolts per meter
MPCA	Minnesota Pollution Control Agency
NAC	Noise Area Classification
NPDES	National Pollutant Discharge Elimination System
ROW	Right-of-way
SHPO	State Historic Preservation Office
SWPPP	Stormwater Pollution Prevention Plan
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

1.0 Introduction

1.1 Proposed Project and Project Need

Northern States Power Company, a Minnesota corporation, d/b/a Xcel Energy (Xcel Energy) proposes to correct two H-frame transmission structures on an existing 115 kilovolt (kV) transmission line (Line #0837) located in Courtland Township, Nicollet County, Minnesota (the Project) (see Figure 1). The Project is necessary because the transmission structures, located in an unnamed water body, are beginning to settle and their foundations are unstable. They will be replaced by single-pole transmission structures. Two other H-frame transmission structures within the unnamed water body will be permanently removed. Lastly, two H-frame transmission structures located in upland areas will be replaced with two 5-pole transmission structures. A total of six transmission structures will be removed for the Project (see Figure 2).

Once complete, the proposed work will provide stable structures for the transmission line crossing the unnamed water body. It will also result in a net loss of two structures within the unnamed water body and a straighter, more in-line transmission line route across the Swan Lake Wildlife Management Area (Swan Lake WMA). After the structures are replaced and new conductors (transmission lines) are transferred to the new structures, the line voltage of 115kV will remain the same.

1.2 Project Location, Description, and Schedule

The proposed Project is located in Sections 29, 30, 31, and 32, Township 110N, Range 29W, in Courtland Township, Nicollet County, Minnesota (Figure 2).

The Project will entail the following construction activities:

- creating temporary access for removing existing structures and installing new structures;
- installing two concrete piling foundations within the unnamed water body upon which single pole structures (approximately 95 feet tall) will be mounted;
- direct imbedding two 5-pole structures on either side of the unnamed water body in upland areas (approximately 88 feet tall);
- restringing new conductors between the new structures (total distance between the new structures is approximately 3,100 feet);
- removing the four existing H-frame structures from the unnamed water body and two existing H-frame structures from the upland areas; and
- restoring site conditions.

Easement modifications have been agreed to by affected landowners which will allow and support the proposed new transmission line location, and which

will minimize overall line length, impacts to wetland areas, and minimize the possibility of future structure issues.

Project permitting was initiated in spring 2010 and is pending (see Section 2.0 below). Construction is planned to begin in the winter of 2010/2011 and be completed by spring 2011.

1.3 Project Cost Estimate

The approximate Project cost is $1,339,780.

2.0 Regulatory Framework

2.1 Permit Requirement

This Project falls under the Minnesota Power Plant Siting Act (Minnesota Statutes § 216E and Minnesota Rules Chapter 7850 for transmission projects over 100kV and requires a permit from the Minnesota Public Utilities Commission (Commission). However, for eligible projects, a utility may apply to the local unit of government that has jurisdiction over project for approval instead of applying to the Commission (see Minn. Rules 7850.5300). The proposed Project is eligible for local review.

The Nicollet County Environmental Services Department (County) agreed to act as the lead local unit of government with jurisdiction to approve the Project. The County was afforded the opportunity to relinquish its jurisdiction by requesting that the Commission assume jurisdiction, but has elected to maintain jurisdiction of the Project.

As required by Minn. Rules 7850.5300, Subp.3, Xcel Energy sent a Project notice to the Commission and to those persons on the Power Plant Siting General Notification list (see Appendix A). In addition, Xcel Energy sent a Project summary notice to all landowners adjacent to the Xcel Energy transmission line proposed to be rebuilt. On June 14, 2010, Xcel Energy sent a letter to the Minnesota Department of Commerce, Office of Energy Security (OES) indicating that it will seek local review for the Project (see Appendix C). A letter from OES dated June 15, 2010, confirming that the Commission received notification that Xcel Energy intends to seek local approval and authorizing local review of the Project is also included in Appendix C.

2.2 Environmental Assessment Requirement

In accordance with Minn. Rules 7850.5300 Subp.5, an Environmental Assessment (EA) prepared by the local unit of government with jurisdiction over the Project must be completed. The EA contains information on the human and environmental impacts of the proposed Project and addresses methods to mitigate such impacts.

When the EA is complete, the County must publish a notice in the Minnesota Environmental Quality Board (EQB) Monitor that the EA is available for review by the public, how a copy of the EA document may be reviewed, that the public may comment on the EA document, and the procedure for submitting comments to the County. A final decision on the Project cannot be made by the County until at least ten days after the notice of EA availability appears in the EQB Monitor.

2.3 Public Participation and Scoping of Environmental Assessment

On July 8, 2010, the County notified the public in the New Ulm Journal, Lafayette Ledger and St. Peter Herald newspapers of a public hearing and request for comments on the Project. In that notice, the County indicated that the Planning and Zoning Advisory would hold a public meeting on the Project on July 19, 2010, to obtain input on the Project and the scope of the EA (see Appendix B). Public comments pertaining to the Project can be found in Appendix B.

2.4 Zoning Permit

Nicollet County will issue a zoning permit for "transmission lines over 35KV" no sooner than 10-days following publication of the completed EA in the EQB Monitor.

3.0 Engineering Design, Right-of-Way Acquisition, and Construction

3.1 Engineering Design

Overall construction activity for the Project will span approximately 3,100 feet (see Figure 2). The structure replacements within the water body will be galvanized steel single poles, approximately 95 feet tall, mounted on concrete foundations supported by steel piles (see Figure 3 and Figure 4). Pile supported concrete foundations were chosen because of their strength characteristics for supporting transmission lines over long spans and their ability to withstand the forces of ice build-up.

The new dead-end 5-pole structures to be installed in upland areas on either end of the Project will serve to transition the transmission lines from the new long span single pole section to the existing shorter span H-frame structures outside the Project area. The 5-pole structures will be directly imbedded, guyed wood poles ranging from 74 to 88 feet tall (see Figures 5 and 6).

3.2 Right-of-Way Acquisition

The new transmission line right-of-way (ROW) will be a straighter, more in-line route than the existing ROW (Figure 2). The new alignment will result in

to fewer structures. To accommodate the new ROW, all necessary easement modifications have been acquired with local landowners. These modifications will allow and support the new transmission line location.

When the necessary permits have been acquired, and shortly before construction, individual property owners will be contacted to update previously provided information regarding the construction schedules, access to the site and vegetation clearing required for the Project. The ROW will be cleared of the amount of vegetation necessary to construct, operate and maintain the new alignment for the transmission line. Standard practice is to remove any vegetation that is a danger to the transmission line when at a mature height. Also, any vegetation that is in the way of construction equipment may have to be removed. For this Project, clearing will only be necessary for the vegetation growing on the perimeter of the unnamed water body.

It is expected that some excess soil will be excavated during the construction process for the two structure foundations located within the unnamed water body. Any excess soil will be offered to the landowners or removed and disposed of at an approved site. Upon completion of construction activities, landowners will be contacted to determine if any additional restoration due to construction damage is necessary.

3.3 Construction and Maintenance Procedures

3.3.1 Construction

Construction will comply with the latest industry standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, clearance to waterways, ROW widths, erecting pole structures, and stringing of transmission line conductors, as applicable.

Erosion control methods will be implemented to minimize runoff during construction in non-frozen conditions. The utilities or approved contractors will perform transmission line construction in compliance with local, state, National Electrical Safety Code, and industry standards.

Construction is planned to be performed under frozen conditions. The 115 kV transmission lines and structures located within the unnamed water body will be constructed on the frozen water surface accessed via ice roads built by the construction crew. If the ice roads thaw prior to completion, or winter conditions are not conducive to ice formation, the work will be finished using modular barge construction.

Construction access will be from the west and east sides of 541st Street and are shown on Figure 7. Planned access route #1 (on the

west side of 541st Street) will be along the road/driveway to the cultivated field on the Eckstein property and then proceeding southward thru the field to the new ROW. After reaching the new ROW, an ice road will be built to access new structure 152 and for the removal of existing structures 150 and 151. An alternative to access route #1 would be from 551st Street, then proceeding east along the ROW to the unnamed water body and then onto an ice road leading to the various structure locations. Access to new structure 148 will be from a short ice road that will be built directly off the west side of 541st Street.

Access to existing structures 147 – 149, and new structure 147 on the east side of 541st Street, will be along access route #2 (Kuester property) which starts at a field access point just east of 541st Street. From here, the route proceeds north to the unnamed water body and then along the southern shoreline of the unnamed water body eastward to the ROW. An ice road will then be constructed to access, and remove, existing structure 148 and 149. Access to new structure 147 will be from the existing ROW

During construction, limited ground disturbance at the structure sites is expected to occur. Disturbed areas will be restored to their original condition to the maximum extent practicable and as negotiated with the landowner. Post-construction activities include:

- removing and disposing of debris;
- removing all temporary facilities (including staging and laydown areas);
- employing appropriate erosion control measures;
- reseeding and mulching areas disturbed by construction activities with vegetation similar to that which was removed; and,
- restoring the areas to their original condition to the extent possible.

In locations where excessive soil compaction has occurred, Xcel Energy will use various methods to correct or amend the over-compacted soil to the extent possible and as negotiated with applicable landowners.

3.3.1.1 Work Within the Unnamed Water Body

The pile foundations located in the unnamed water body will be installed using a coffer dam. Piles will be driven down into the bed of the water body with a concrete pile cap poured to extend above the water line. Construction equipment will access the work sites via the aforementioned

ice roads for excavation, drilling, coffer dam installation, and concrete placement. The single pole structures will be assembled in sections using equipment staged on the ice road.

If the ice is no longer able to support the construction equipment, efforts will be shifted to modular barge construction. Modular barge construction will consist of the same activities with equipment and workers located on sections of barges tied together after they are placed into the water. No grading will be required unless it is necessary to provide a level area for construction access and related activities.

3.3.1.2 Work on Land

The 115kV transmission lines and associated 5-pole structures located on upland areas will be constructed at grade elevations. Therefore, no pole structure locations will require grading unless it is necessary to provide a level area for construction access and related activities.

Typical wood pole structures will require a drilled hole 10 to 15 feet deep and 3 to 4 feet in diameter for each pole. Pole structures in wet environments or angle structures may require additional foundation support, typically consisting of a concrete foundation or placement of the pole base inside a vertical galvanized steel culvert.

Poles will be delivered to either the staked pole location or a Project storage yard. If the poles are delivered to a staked site, they will be placed on the ROW out of the clear zone of any adjacent roadways or designated pathways. Insulators and other hardware are typically attached while the pole is on the ground. The pole is then lifted, placed, and imbedded into the pre-drilled hole in the ground surface.

Two guy wires will be used to support each pole of the new 5-pole structures. The guy wires will be staked on either side of the pole running in a direction parallel to the transmission line (see Figures 8 and 9). Every effort was made to design the guying distance to be as short as possible to minimize the impact on farming activities around the structures.

Once the structures have been erected, conductors will be installed by establishing stringing setup areas within the

ROW. The stringing setup areas will typically be established on each side of the unnamed water body, adjacent to the five-pole wood structures. Conductor stringing operations also require brief access to each structure to secure the conductor wire to the insulators or to install shield wire clamps once final sag is established. Temporary guard or clearance poles may be installed, as needed, over existing distribution or communication lines, streets, roads, highways, railways or other obstructions (if any) after any necessary notifications are made or permits obtained. This ensures that conductors will not obstruct traffic or contact existing energized conductors or other cables as well as protect the conductors from damage.

3.3.2 Swan Flight Diverters

Xcel Energy will install swan flight diverters using a 40-foot spacing staggered on each parallel shield wire, resulting in an appearance of 20-foot spacing for the portion of the transmission line between structures 147 and 152.

3.3.3 Maintenance

Xcel Energy will periodically use the transmission line ROW to perform inspections, maintain equipment, and repair any damage. Xcel Energy will also access the ROW to conduct vegetation management related activities.

4.0 Assessment of Environmental Impacts and Mitigation

The proposed Project consists of replacement of existing structures, stringing new conductor between the new structures, and removing old structures. Therefore, impacts to the environment are expected to be minimal and short-term, with little mitigation required. Xcel Energy will minimize environmental impacts during construction of the Project by employing best management practices (BMPs) where needed. A Surface Water Pollution Prevention Plan (SWPPP) will not be required for the Project as less than one acre of land will be disturbed.

Correspondence relative to environmental conditions in the Project area and responses received from state and federal agencies that reviewed the Project are provided in Appendix C.

4.1 Description of Environmental Setting

The Project is located in the Minnesota River Prairie subsection of the North Central Glaciated section of the Prairie Parkland province. The Minnesota River Prairie subsection boundaries coincide with large till plains flanking the Minnesota River. This subsection is characterized by a gently rolling ground moraine about 60 miles wide, (Minnesota River Prairie Subsection. 2010. August 15, 2010 <www.dnr.state.mn.us>). This type of moraine has topography that is level to gently rolling. Elevations in the Project area range in elevation between 990 to 1010 feet above mean sea level.

Bedrock geology in this subsection is mainly covered by 100 to 400 feet of glacial drift (Minnesota River Prairie Subsection, Bedrock Geology. 2010. August 15, 2010 <www.dnr.state.mn.us>). The bedrock is mainly comprised of cretaceous shales, sandstones, and clays.

The dominant soils here tend to be well- to moderately well-drained loamy soils formed in gray calcareous till of Des Moines lobe origin. These loamy soils can be characterized as Udolls and Aquolls on relatively level topography, generally with 15 feet or less of local relief (Minnesota River Prairie Subsection, Soils. 2010. August 15, 2010 <www.dnr.state.mn.us>). Annual precipitation ranges from 25 inches in the west to 30 inches in the east. Growing-season precipitation is 11 to 13 inches and the length of growing is approximately 147 to 152 days. Eleven percent of annual precipitation falls between November and February (Midwest Climate Center 1992).

Presettlement vegetation in this subsection was primarily tallgrass prairie, with many islands of wet prairie (Minnesota River Prairie Subsection, Presettlement vegetation. 2010. August 15, 2010 <www.dnr.state.mn.us>). The typical present day use of the land is agriculture, with few remnant stands of tallgrass prairie.

The proposed Project transmission line corridor is located in the Shoreland Zoning District of Nicollet County (see Nicollet County Zoning Map, Figure 10). Except for the water body at Swan Lake WMA, which is used for hunting, fishing and trapping, the surrounding lands are primarily utilized for agricultural purposes. Farming activities produce cash and feed crops such as corn, soybeans, hay, alfalfa, and occasionally sweet peas and sweet corn (Nicollet County).

4.2 Effects on Human Settlement

The Project involves replacement of certain existing transmission structures and line replacement, resulting in minimal impacts on human settlement. The new guy wire configuration (Figures 8 and 9) for each of the five-pole structures will run parallel to the transmission line and consequently may

require the lessees to farm around them when the properties on each side of the line are commonly operated. (The effects of farming around the lines would be, essentially, eliminated if the separate properties were not commonly operated as the guy wires would then be located at the ends of the fields.) Xcel Energy has designed the guy wire distances as short as possible, as well as located the line along section and property lines, to allow for the maximum amount of land to be put into agricultural use. The property owners have been provided an opportunity to review and discuss structure placements, including guy wire installations, involved in the project, both at the time of easement acquisition as well as subsequently. The lessee has also had an opportunity to review and discuss structure placements.

4.2.1 Displacement

Constructing the new structures and transferring the transmission lines to the new structures will not displace any residence or business, and the Project will not affect any public services. Therefore, no impacts from displacement are expected from this Project.

4.2.2 Noise

Noise is comprised of 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 these pressure waves into perceivable sound. Transmission conductors (lines) and transformers at substations produce noise under certain conditions. The level of noise or its loudness depends on conductor conditions, voltage level, and weather conditions.

Noise is measured in units of decibels (dB) on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more "weight". The A-weighted scale (dBA) corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA, the A-weighted sound level recorded in units of decibels. A noise level change of 3 dBA is barely perceptible to human hearing. A 5-dBA change in noise level, however, is clearly noticeable. A 10-dBA change in noise level is perceived as a doubling of noise loudness, while a 20-dBA change is considered a dramatic change in loudness.

Table 1 shows noise levels associated with common, everyday sources. Noise levels for a 115kV transmission line would typically be between 0 and 20 dBA, depending on the weather.

In Minnesota, state rules have been established to regulate noise levels by land use types. Land uses such as picnic areas, churches or commercial land are assigned to an activity category based on the type of activities occurring in each respective land use. Activity categories are then categorized based on their sensitivity to traffic noise. The Noise Area Classification (NAC) is listed in the Minnesota Pollution Control Agency (MPCA) noise regulations to distinguish the categories.

Noise emission from a transmission line increases during heavy rain and wet conductor conditions. In foggy, damp, or rainy weather conditions, power lines can create a crackling sound due to the small amount of electricity ionizing the moist air near the wires. During heavy rain, the general background noise level is usually greater than the noise from the transmission line and few people would be out near the transmission line. As a result, people do not normally notice audible noise from a transmission line during heavy rain. This is confirmed by calculated levels during a heavy rain (one inch per hour) that shows noise levels for a 115 kV line at less than 25% of the most sensitive state NAC (NAC 1). During light rain, dense fog, snow, and other times when there is moisture in the air, transmission lines will produce audible noise at approximately household background levels. During dry weather, audible noise from transmission lines is barely perceptible.

Replacement of certain pole structures and transfer of the existing 115kV transmission line to these new structures will not increase or decrease existing noise levels associated with the transmission line of this Project. Therefore, no impacts from noise are expected from this Project.

4.2.3 Aesthetics

The existing 115kV line is visible in the Project area, and it has been located here since 1954. The existing line was sited to avoid wet areas in the vicinity of the Swan Lake WMA. As such, the existing transmission line is not in straight alignment.

After the Project is completed, aesthetics of the area will be greatly improved for several reasons. First, the existing H-frame structures will be removed and replaced by galvanized steel structures that have a more modern appearance. Secondly, spans between the new single pole structures will be increased resulting in two less structures after the existing H-frame structures are removed. Finally, since the corrected transmission line will run straight through the water body, a cleaner visual appeal will result.

4.2.4 Cultural Values

Agriculture and farm-related business are central to the economy of Nicollet County and is prevalent in the Project area. As mentioned above, the two 5-pole structures and associated guying (ten for each structure) will be located on actively cultivated land. Except for the two 5-pole structures and associated guy wires, no other impacts are anticipated to cultural activities.

4.2.5 Recreation

There are several recreation areas in the Project vicinity including many units related to the Swan Lake WMA, including the Courtland West Unit, where construction activities will take place. The recreation opportunities here include hunting for deer, pheasant, and waterfowl. In addition, wildlife viewing opportunities exist for both wetland and forest species. Fishing is another recreational activity available at the Courtland West Unit.

Although some hunting seasons will still be open, construction will not interfere with a hunter's ability to recreate. Construction activities should not impact fishing in the area.

4.2.6 Public Services

Several public service utilities serve the area and have underground services that run along 541st Street (County Rd 12) according to Gopher State One Call. New Ulm Telecom and Redwood County Telephone have telephone services located here. Brown County Rural Electric Company has electric distribution lines that run underground along the road as well.

Although Xcel Energy does not expect any excavation activities near the roadway where the utilities area located, the construction crew will be contacting Gopher State One Call to mark existing services prior to working in the area. There is no public water or sanitary sewer services in the Project area, thus no mitigation is needed.

4.2.7 Transportation

The proposed Project shall have minimal impact on local roads. Although access to the new structure 148 will be from 541st Street (County Rd 12), temporary road closures or lane restrictions will be minimal and are not currently anticipated. Road related permits will be acquired as needed from the township or County prior to any work

activities which may affect roadways. Traffic control will be handled by Xcel Energy construction crews as needed.

4.2.8 Socioeconomics

Courtland Township is dependant on the agricultural economy that is prevalent throughout the County. The upgraded transmission line will ensure that reliable electrical service will continue to serve this industry, region and surrounding communities.

There will be a work crew of 6 to 12 men working on the various construction phases of the Project, and consequently, there will be a small temporary positive impact on the local community due to revenue created from expenditures (local community services, restaurants, construction materials) by the construction crew. Long term positive socioeconomic impacts will occur because the reliability of electrical service will increase as a result of replacing these structures.

4.3 Effects on Public Health and Safety

No impacts to public health and safety are anticipated from this Project. All facilities will be constructed in accordance with applicable standards, including the National Electric Safety Code and other industry standards. Construction personnel will be required to follow Occupational Safety and Health Administration regulations. Other safety measures such as warning signs, fencing, and gates will be utilized as needed.

4.3.1 Electric and Magnetic Fields (EMF)

The term electromagnetic fields (EMF) refers to electric and magnetic fields that are coupled together, such as in high frequency radiating fields. For the lower frequencies associated with power lines, EMF should be separated into electric fields and magnetic fields. Transmission lines operate at a frequency of 60 hertz (cycles per second), which is in the non-ionizing portion of the electromagnetic frequency spectrum. Fields are considered ionizing when they cause electrons to eject from their orbits around a normal atom. Ionization will typically occur with frequencies in the range of 10^{16} to 10^{22} hertz.

The most recent and exhaustive studies of the health effects from power frequency fields conclude that the evidence of health risk from EMF is weak. Some of these studies are listed below:

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

- National Institute of Environmental Health Sciences. January, 1995. *Questions and Answers about EMF: Electric and Magnetic Fields Associated with the use of Electric Power.* Washington, D.C.: U.S. Dept. of Energy, 1995.

- The Minnesota State Interagency Working Group on EMF Issues, September, 2002. *EMF White Paper on Electric and Magnetic Field. (EMF) Policy and Mitigation Options.*

4.3.2 Electric Fields

The intensity of electric fields is proportional to the voltage of the line and is measured in kilovolts/meter (kV/m). Electric fields of transmission lines above ground are designated by the difference in voltage between two points (usually one meter or 3.28 feet).

There is no federal standard for transmission line electric fields. However, the EQB has imposed a maximum electric field limit of 8 kV/m measured at one meter (3.28 feet) above ground.

Table 2 provides the calculated electric fields at maximum operating voltage for the proposed transmission line (obtained from 'ENVIRO', a software program licensed by the Electric Power Research Institute, Inc.). Maximum operating voltage is defined as 105 percent of the nominal voltage, which in this case is 121 kV.

As indicated in Table 2, the maximum electric field in the Applicants' proposed 115 kV is 0.96kV/m, which is well under the maximum limit of 8kV/m that has been a permit condition imposed by EQB in other transmission line routing proceedings.

4.3.3 Magnetic Fields

Magnetic fields arise from the flow of electricity (current) in the transmission line. The intensity of the magnetic field is related to the current flow through the conductors. The magnetic field associated with the transmission line surrounds the conductor and rapidly decreases as the distance from the conductor increases. Magnetic field density is expressed in the unit of gauss or milligauss.

Table 3 provides a summary of the magnetic field calculations associated with each line of the project (obtained from 'ENVIRO', a software program licensed by the Electric Power Research Institute, Inc.).

These calculations are based on the summer peak current and average flow projected for the year 2011 under normal system conditions (system intact). The peak magnetic field values are calculated at a point directly under the transmission line and where the conductor is closest to the ground. The same method is used to calculate the magnetic field at the edge of the right-of-way.

4.3.4 Stray Voltage

Stray voltage is a condition that can occur on the electric service entrances to structures from distribution lines, not transmission lines. More precisely, stray voltage is a voltage that exists between the neutral wire of the service entrance and grounded objects in buildings such as barns and milking parlors. Transmission lines do not, by themselves, create stray voltage because they do not connect to businesses or residences. Transmission lines, however, can induce stray voltage on a distribution circuit that is parallel to and immediately under the transmission line. Appropriate measures will be taken to prevent stray voltage problems when the transmission lines proposed in this Application are parallel to or cross distribution lines.

Insulated electric fences used in livestock operations can pick up an induced charge from transmission lines. Usually, the induced charge will drain off when the charger unit is connected to the fence. When the charger is disconnected either for maintenance or when the fence is being built, shocks may result. Potential shocks can be prevented by using a couple of methods: i) one or more of the fence insulators can be shorted out to ground with a wire when the charger is disconnected or ii) an electric filter can be instilled that grounds out charges induced from a power line while still allowing the charger to be effective.

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

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

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

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

Xcel Energy does not expect any issues or problems related to stray voltage for the Project.

4.4 Effects on Land-based Economics

4.4.1 Agriculture

The existing H-frame structures and new 5-pole structures that will be removed and constructed, respectively, are located on agricultural land. Because construction and removal activities will take place during winter months, minimal impacts to farmland are anticipated.

4.4.2 Mining and Forestry

There are no mining or forested areas in the vicinity of the Project. Therefore, no impacts to mining and forestry resources are expected from the Project.

4.4.3 Tourism

There are no tourist attractions in the vicinity of the Project. Therefore, no impacts to tourism are expected from the Project.

4.5 Effects on Archaeological and Historic Resources

On February 1, 2010, Xcel Energy contacted the Minnesota Historical Society (MHS) to obtain comments regarding cultural resources in the Project area. In a reply dated March 5, 2010, the MHS concluded that there are no properties listed on the National or State Registers of Historic Places, and no known or suspected archaeological properties in the area that will be affected by the

Project (Appendix C). Therefore, no impacts to archaeological or historical resources are expected from the Project.

4.6 Effects on the Natural Environment

4.6.1 Air Quality

As transmission lines do not appreciably affect air quality, there will be no long-term environmental impacts to air quality from the construction of the Project or operation of the transmission line.

During the construction and removal of structures, and transferring of transmission lines to new structures, there will be temporary and limited emissions from vehicles and other construction equipment and possibly some fugitive dust from ROW clearing. Minor, temporary air quality impacts caused by the proposed construction-related emissions are expected to occur. However, fugitive dust emission will be mitigated by constructing during winter months.

4.6.2 Water Quality

The Project crosses one Minnesota Department of Natural Resources (DNR) Public Water called 57W. Xcel Energy has applied to the DNR for a license to cross that public water (Appendix C). In addition, Xcel Energy has applied to the DNR for a license to cross public lands (Swan Lake WMA, Appendix C). Figure 11 shows the Project relative to the public water and land crossings.

The US Army Corps of Engineers (USACE) was contacted regarding the Project. In a reply letter dated May 13, 2010 (Appendix C), the USACE indicated that the described work is authorized by RGP-03-MN, provided the Standard Conditions are followed.

The USDA General Soil Map Unit Name for the area where the 5-pole structures will be located is the Lester loam, 2 to 6 percent slopes. The single pole structures are located in water, presumably underlain by a loamy soil type.

Although some construction work will take place within the unnamed water body at Swan Lake WMA, minimal impacts to water resources are anticipated. Impacts will be reduced because of the use of coffer dams which tend to localize water turbidity and the spread of sedimentation to other parts of the water body.

4.6.3 Flora and Fauna

The Project area has only a few areas with any natural vegetation and those areas are on the perimeter of the unnamed water body. The vegetation is primarily comprised of woody stemmed shrubs growing on the shoreline and cattails growing in the water. Small game and deer can found in the Project area.

There will be some brush clearing necessary to access the ice surface from the west and east sides of the Project area. Although there will be a small loss to vegetative cover as a result of the brush clearing, impacts to wildlife habitat will be minimal overall.

4.6.4 Rare and Unique Natural Resources

The Minnesota DNR and the United States Department of the Interior Fish and Wildlife Service (USFWS) were contacted regarding vegetation and wildlife resources in the vicinity of the Project.

A letter received from the Minnesota DNR dated August 11, 2010 (Appendix C) included an Index Report citing two occurrences of rare features within a 1-mile radius of the proposed project. The DNR does not believe the proposed Project will negatively affect any known occurrences of those rare features. However, they have asked Xcel Energy to contact the DNR Regional Environmental Assessment Ecologist, Kevin Mixon, to discuss any concerns he may have regarding the WMA crossing and to inform him of any construction schedule changes.

In a reply email dated July 19, 2010 (Appendix C), the USFWS concluded that “there are no federally protected species under the Endangered Species Act (ESA) within Nicollet County, Minnesota”.

5.0 Regulatory Permits and Approvals Required

Permit requirements or approvals anticipated for this Project and the status of each are shown in Table 4. Agency correspondence related to the Project can be found in Appendix C.

TABLES

FIGURES

APPENDIX A

Notice Lists

APPENDIX B

EA Scoping Letter and Public Comments

APPENDIX C

Agency Correspondence