APPLICATION FOR ROUTE PERMIT FOR THE NORTH ROCHESTER TO SKYWAY HIGH VOLTAGE TRANSMISSION LINE PROJECT

MPUC Docket No. E002/TL-26-135

April 28, 2026

Submitted by
Northern States Power Company, doing business as Xcel Energy
and Echo Zone LLC

Northern States Power Company, doing business as Xcel Energy
414 Nicollet Mall
Minneapolis, MN 55401

Echo Zone LLC
2801 Centerville Road
1st Floor PMB 160
Wilmington, DE 19808

This page is intentionally left blank.

TABLE OF CONTENTS

Contents

TABLE OF CONTENTS
(continued)

TABLE OF CONTENTS
(continued)

List of Appendices

List of Tables

List of Figures

1. EXECUTIVE SUMMARY

1.1 Introduction

Northern States Power Company, doing business as Xcel Energy, and Echo Zone LLC, a subsidiary of Google LLC (hereinafter, Google) (collectively, the Applicants), submit this Route Permit Application (Application) to the Minnesota Public Utilities Commission (Commission) for a Route Permit to construct the North Rochester to Skyway High Voltage Transmission Line (HVTL) Project (the Project). An application completeness checklist is provided in **Appendix A**. The Project consists of a new, approximately 1.2-mile-long, double-circuit, 345 kilovolt (kV) HVTL that will connect Xcel Energy's existing North Rochester Substation to new substation facilities located at the proposed Pine Island Industrial Planned Unit Development (PUD) development site (Development Site) near the city of Pine Island in portions of Sections 29 and 30, Township 109N, Range 15E, Goodhue County, Minnesota (**Figure 1.1-1 and Figure 1.1-2**; see also detailed Project maps in **Appendix B**). The Development Site (also known as Project Skyway) is undergoing independent permitting and approval processes with the City of Pine Island.

To accommodate the proposed double-circuit, 345 kV HVTL, Xcel Energy is planning to expand its existing North Rochester Substation to the north by approximately 11.3 acres (North Rochester Substation Expansion). Additionally, Google is proposing to construct and operate four smaller substation facilities (the Project Skyway Substations) within the Development Site. The North Rochester Substation Expansion will involve site preparation, grading, and installation of substation equipment; transmission line termination; associated facilities; security fencing; and associated connection to the existing North Rochester Substation. The North Rochester Substation Expansion is necessary to address current and future planned transmission line operational needs as part of Project Skyway and to provide future expansion capabilities to accommodate future transmission project connections. The existing North Rochester Substation and the North Rochester Substation Expansion area are located west of U.S. Highway 52, and the proposed Development Site is located east of U.S. Highway 52 (**Figure 1.1-2**).

Figure 1.1-1. Project Overview Map

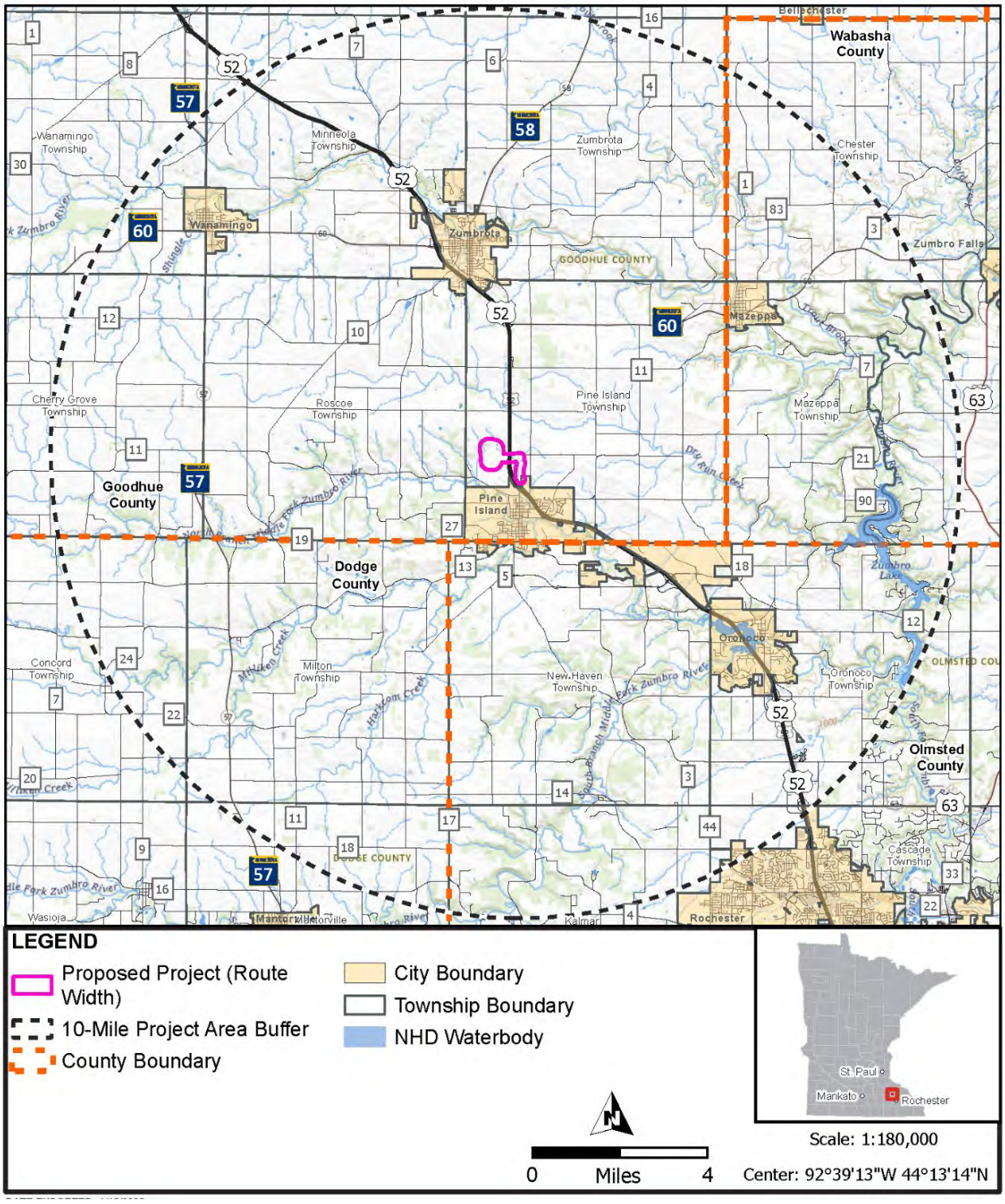
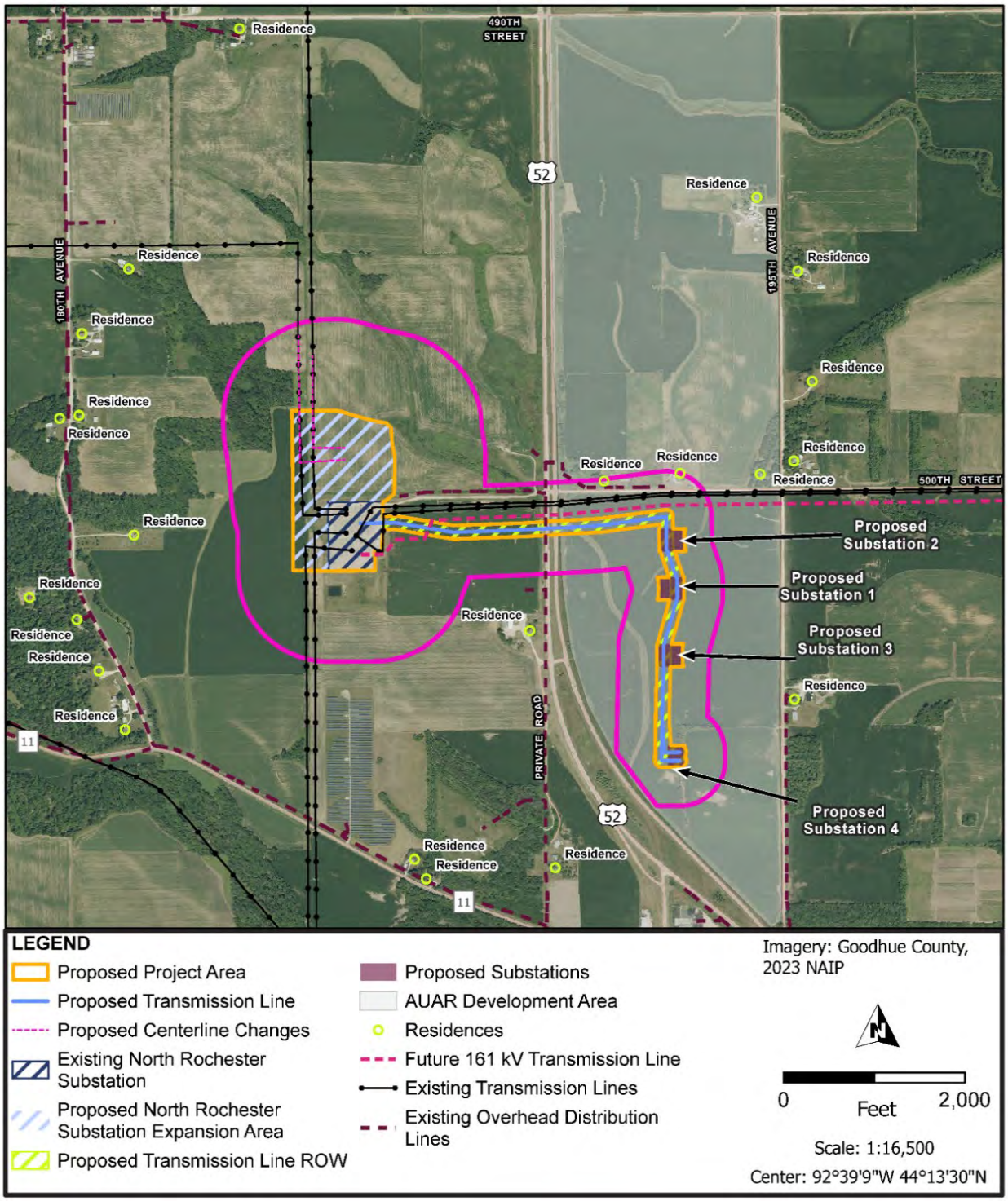


Figure 1.1-2. Project Area and Facilities Maps



1.2 Applicant Information and Project Ownership

Xcel Energy is a Minnesota corporation headquartered in Minneapolis, Minnesota, that is engaged in the business of generating, transmitting, distributing, and selling electric power and energy and related services in the states of Minnesota, North Dakota, and South Dakota. In Minnesota, Xcel Energy provides electric service to 1.5 million customers. Xcel Energy is a wholly owned utility operating company subsidiary of Xcel Energy Inc. and operates its transmission and generation system as a single integrated system with its sister company, Northern States Power Company, a Wisconsin corporation, known together as the NSP Companies. The NSP Companies are vertically integrated, transmission-owning members of Midcontinent Independent System Operator (MISO). The NSP Companies have over 46,000 conductor miles of transmission lines and approximately 550 transmission and distribution substations.

Ryan Companies, US, is the developer of Project Skyway. The co-applicant, Google, is the user and owner of Project Skyway Substations at the Development Site located east of the North Rochester Substation east of U.S. Highway 52.

The Project will be jointly owned by Xcel Energy and Google. Xcel Energy proposes to construct, own, and operate the approximately 1.2-mile-long, double-circuit, 345 kV HVTL and planned North Rochester Substation Expansion. Xcel Energy currently owns and operates the existing North Rochester Substation. Google proposes to construct, own, and operate four Project Skyway Substations as part of its proposed Development Site.

1.3 Permittees and Project Contacts

Xcel Energy and Echo Zone are the requested permittees for the Project. Contact information for each company is provided below.

For Xcel Energy, all correspondence relating to this Application should be directed to:

Jody Londo
Director, Regulatory & Strategic Analysis
Xcel Energy
401 Nicollet Mall
Minneapolis, MN 55401
612-216-7954
jody.l.londo@xcelenergy.com

Ellen Heine
Principal Siting and Permitting Agent
Xcel Energy
414 Nicollet Mall
Minneapolis, MN 55401
ellen.l.heine@xcelenergy.com

Lauren Steinhaeuser
Assistant General Counsel
Xcel Energy
414 Nicollet Mall, 401-8
Minneapolis, MN 55401
(612) 216-8274
lauren.steinhaeuser@xcelenergy.com

Regulatory Records
Xcel Energy
414 Nicollet Mall, 401-7
Minneapolis, MN 55401
Regulatory.records@xcelenergy.com

Valerie T. Herring
Taft Stettinius & Hollister LLP
2200 IDS Center
80 South 8th Street
Minneapolis, MN 55402
(612) 977-8400
vherring@taftlaw.com

For Google, all correspondence relating to this Application should be directed to:

Matthew Bock
Authorized Signatory
Kutak Rock
124 West Capitol Avenue, Suite 2000
Little Rock, Arkansas 72201-3740
(501) 975-3000
Matt.Boch@kutakrock.com

Allen Gleckner
Energy Market Development
Google LLC
2801 Centerville Road
1st Floor, PMB 160
Wilmington, DE 19808
legal-notices@google.com

Christy Brusven
Shantal Pai
Attorneys at Law
Fredrikson & Byron, P.A.
60 South Sixth Stree, Suite 1500
Minneapolis, MN 55402-4400
(612) 492-7000
cbrusven@fredlaw.com
spai@fredlaw.com

1.4 Project Need and Purpose

The Project is needed to provide double circuit 345/345 kV transmission capacity to serve Project Skyway[1] and provide power to four new substation facilities located at the Development Site near the city of Pine Island, Goodhue County, Minnesota (**Figure 1.1-1 and Figure 1.1-2**). To accommodate the proposed double-circuit, 345 kV HVTL, Xcel Energy is planning to expand its existing North

[1] See https://pineislandskyway.com/ (site visited on April 20, 2026). On April 14, 2026, Xcel Energy filed a petition in Docket No. E002/M-26-170 requesting Commission approval of an Electric Service Agreement and Interconnection Agreement that will allow Xcel Energy to provide electric service to Project Skyway.

Rochester Substation. Additionally, Goggle is proposing to construct and operate four substation facilities within the Project Skyway Development Site as part of this Project.

1.5 Regulatory Process

1.5.1 Certificate of Need Not Required

Minn. Stat. § 216B.243, subd. 2, states that "[n]o large energy facility shall be sited or constructed in Minnesota without the issuance of a Certificate of Need by the Public Utilities Commission..." The definition of "large energy facility" includes "any high-voltage transmission line with a capacity of 300 kilovolts or more and greater than one mile in length in Minnesota."[2]

However, because the Project is being proposed to serve a single customer at a single location, Project Skyway, pursuant to Minn. Stat. § 216B.243, subd. 8(2), a Certificate of Need is not required.

1.5.2 Route Permit

Minn. Stat. § 216I.05, subd. 2, provides that "[a] person is prohibited from constructing a high-voltage transmission line without a route permit issued by the [C]ommission." A high voltage transmission line is defined by Minn. Stat. § 216I.02, subd. 8, as "a conductor of electric energy and associated facilities that is (1) designed for and capable of operation at a nominal voltage of 100 kilovolts or more, and (2) is greater than 1,500 feet in length." Because the Project consists of a double-circuit, 345 kV transmission line that is 1.2 miles long, which is greater than 1,500 feet in length, a Route Permit from the Commission is required.

1.5.2.1 Standard Review Process

Minn. Stat. § 216I.07 provides a Standard Review Process for Route Permit applications for transmission lines with a capacity in excess of 300 kV and less than 30 miles in length in Minnesota. Because the Project is a double-circuit, 345 kV transmission line that is less than 30 miles in length, the Project qualifies for the Standard Review Process. An Environmental Impact Statement is not required under the Standard Review Process. Instead, an Environmental Assessment (EA) is incorporated into this Application, as required by Minn. Stat. § 216I.07, subd. 3.

Minn. Stat. § 216I.05, subds. 3 and 4 set forth the information that must be included in a Route Permit application. Under the Standard Review Process, an applicant is not required to propose alternative routes but must discuss other routes that were considered and rejected by the applicant.[3] Due to the short length of the Proposed Route, alternative routes were not evaluated for the Project.

[2] Minn. Stat. § 216B.2421, subd. 2(2).

[3] Minn. Stat. § 216I.05, subd. 3.

As required by Minn. Stat. § 216I.07, subd. 3, the Applicants prepared an EA, which is incorporated into this Application as Chapter 6. The EA contains "information regarding the proposed project's human and environmental impacts, and (2) address[es] mitigating measures for identified impacts. The environmental assessment is the only state environmental review document that must be prepared for the proposed project."[4]

1.5.2.2 Preapplication Coordination and Outreach

Minn. Stat. § 216I.05, subd. 5 requires that an applicant provide notice to each local unit of government within which a route is proposed, Minnesota Tribal governments, and State technical resource agencies. Preapplication coordination is discussed in Chapter 11, and records of this coordination are provided in **Appendix C.**

Minn. Stat. § 216I.05, subd. 6, requires that an applicant must provide a draft application to Commission staff for review. The Applicants provided a draft of this Application to the Commission on February 18, 2026. The Commission's review focuses on the application's completeness and provided clarifications that might help the Commission's review of the application. An application completeness checklist is provided in **Appendix A**; the Commission's March 27, 2026, Draft Application Review Comments letter, and the Applicants' response, are provided in **Appendix D.**

1.5.2.3 Notice of Application Filing

After an application is filed, the Commission determines whether the application is complete within 10 working days.[5] Upon the Commission's acceptance of this Application as complete, the Commission will provide notice in accordance with Minn. Stat. § 216I.05, subd. 8. This includes newspaper notice, notice to local governments and Tribes, and notices to landowners. To facilitate this notice, a list of the names of each owner whose property is within or adjacent to the Proposed Route, along with relevant contacts, including Tribal governments and regional and local government units, is included in **Appendix E.**

In addition, an electronic version of the Application will be available on eDockets under docket number TL-26-135.

1.5.2.4 Public Meeting

The Standard Review Process requires the Commission to schedule at least one public meeting near the proposed Project's location. The Applicants and the Commission will have representatives available at the public meeting(s). The purpose of the meeting is to provide information about the Project and permitting process, present key issues, and answer questions. Additionally, the

[4] Minn. Stat. § 216I.07, subd. 3.

[5] Minn. Stat. § 216I.05, subd. 7

Commission will gather information concerning the necessity of an EA addendum under Minn. Stat. § 216I.07, subd. 3.

1.5.2.5 Draft Route Permit

Once the public meeting has been held and after the public comment period closes, the Commission will prepare a draft Route Permit for the Project. The draft Route Permit will "identify the person or persons who are the permittee, describe the proposed project, and include proposed permit conditions."[6] The Commission can change the draft permit in any respect before final issuance or may deny the permit.[7] Receiving a draft Route Permit does not mean the Applicants can construct the Project.

1.5.2.6 EA Addendum

Minn. Stat. § 216I.07, subd. 3(b), states that "if after the public meeting the [C]ommission identifies other . . . routes or potential impacts for review, the [C]ommission must prepare an addendum to the [EA] that evaluates (1) the human and environmental impacts of the alternative... route, and (2) any additional mitigating measures related to the identified impacts consistent with the scoping decision." Should an EA addendum be necessary, the Commission will issue a scoping decision that identifies the topics to be studied in the addendum,[8] and Commission staff will prepare it.

1.5.2.7 Public Hearing

After the Commission issues a draft Route Permit and, if necessary, an EA addendum, a public hearing and associated comment period will be held to again solicit public input and to create an administrative record. The Commission will select a person to preside over the hearing, which, in practice, is usually an administrative law judge (ALJ) from the Court of Administrative Hearings. The Commission will establish the procedures to be followed at the hearing. The Applicants will be present at the hearing. Commission staff will be available to answer questions.[9]

Once the hearing is concluded, the ALJ will prepare a report based on the record. After the report is issued, the matter will come to the Commission for a decision. During an open meeting, the Commission will deliberate and decide the route for the Project, using the criteria set forth in Minn. Stat. 216I.05, subd. 11.

[6] Minn. Stat. § 216I.05, subd. 10.

[7] Minn. Stat. § 216I.05, subd. 10.

[8] Minn. Stat. § 216I.05, subd. 10(2).

[9] *See* Minn. Stat. § 216I.07, subd. 4.

1.5.2.8 Timing for Standard Review Process

A Route Permit under the Standard Review Process shall be issued 6 months after the Commission's determination that the Application is complete.[10] This timeframe may be extended up to 3 months for just cause or upon agreement by the applicant.[11] The permitting timeline for the Standard Review Process is shorter than the timeline required for the Major Review Process provided in Minn. Stat. § 216I.06.

[10] Minn. Stat. § 216I.07, subd. 5.

[11] Minn. Stat. § 216I.07, subd. 5.

This page is intentionally left blank.

2. PROJECT DESCRIPTION

The Project consists of a new, approximately 1.2-mile-long, double-circuit, 345 kV HVTL that will connect Xcel Energy's existing North Rochester Substation to the four new Project Skyway Substations located at the Development Site proposed as part of Project Skyway. The Project Skyway Substations are described as Skyway substation 1, Skyway substation 2, Skyway substation 3, and Skyway substation 4 (Skyway Substations 1-4). **Figure 1.1-2** above provides an overview of the proposed Project.

Project Skyway refers to an area encompassing approximately 482 acres located northeast of the city of Pine Island, partially in the city of Pine Island and Pine Island Township. Ryan Companies, US, is the developer working with the City to prepare the land for future development. The City Council adopted an Alternative Urban Areawide Review (AUAR) that outlined a framework for the development of two potential project types. The two project types studied in the AUAR were Mixed Technology Center/Light Industrial and Technology Center. The Technology Center development would consist primarily of data center facilities, technology services, research and development facilities, and other similar uses. Data centers are generally defined as free-standing warehouse type facilities that are used primarily for storage of computer systems and associated components, including applications and secure data. Research and development centers include a range of uses and may contain light fabrication, laboratory, limited warehousing, and office facilities. Typical light industrial uses include printing, material testing, warehousing, and assembly of data processing equipment.

To accommodate the proposed double-circuit, 345 kV HVTL, Xcel Energy's existing North Rochester Substation, which is approximately 10 acres in size, will be expanded to the north by approximately 11.3 acres. The proposed North Rochester Substation Expansion area, shown in **Figure 1.1-2**, includes additional area to accommodate site preparation, grading, and installation of substation equipment; transmission line termination and re-termination; security fencing; and associated connection to the existing North Rochester Substation. This Project is being proposed to serve a single utility customer, Project Skyway, described above.

2.1 Project Location and Land Control

The Project is located in Goodhue County near U.S. Highway 52 and 500th Street, north of the city of Pine Island. A double-circuit, 345 kV HVTL typically requires a 150-foot-wide right-of-way (ROW).

Xcel Energy has entered into a Purchase Option Agreement for the parcel where the North Rochester Substation Expansion will be located and have had productive conversations regarding acquisition of land rights for the transmission line on the property east of the substation, which could be in the form of an easement or acquisition of the land in fee. Ryan Companies, US, is acquiring all land rights necessary to construct the four Project Skyway Substations at the Development Site east of U.S. Highway 52, which Google will own and operate, as well as all lands necessary to construct and operate the proposed transmission line within the Development Site. Ryan Companies, US, will grant Xcel

Energy an easement over the land needed to construct and operate the proposed transmission line that connects to the Project Skyway Substations at the Development Site. Ryan Companies, US, has been coordinating with adjacent landowners as part of Project Skyway and will acquire all necessary land rights for the transmission line and substations that will be included in an easement to Xcel Energy.

Xcel Energy will work with the Minnesota Department of Transportation (MNDOT) to obtain a transmission line utility permit to cross U.S. Highway 52. A new driveway access on U.S. Highway 52 may also be needed for the proposed North Rochester Substation Expansion, and a permit from MNDOT will be required for this new driveway access. If needed, Xcel Energy would work with MNDOT for the driveway access permit. Xcel Energy is routing the proposed transmission line adjacent to existing transmission lines, which necessitates a certain offset distance between the transmission lines to meet operational safety requirements.

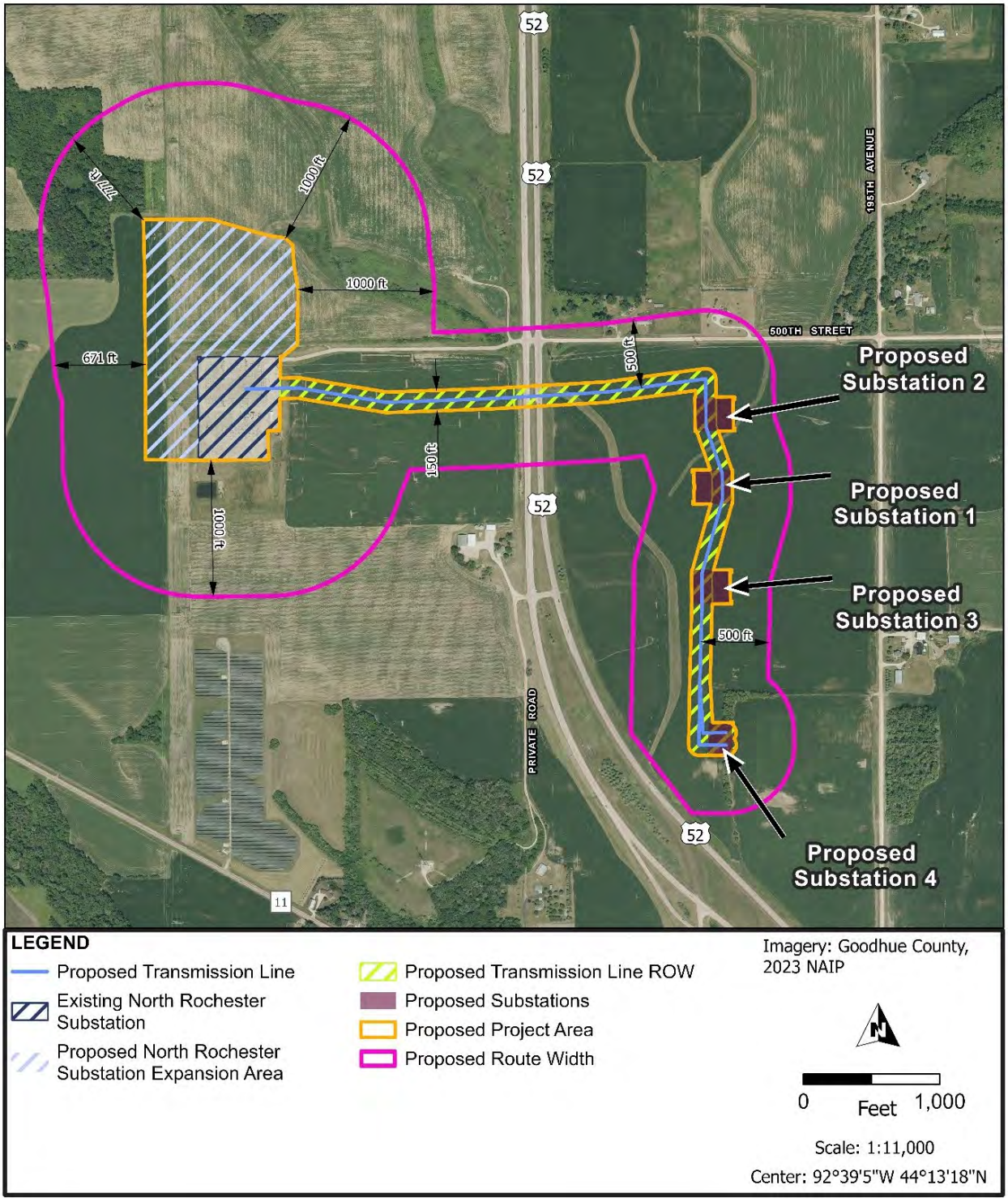
2.2 Transmission Line

2.2.1 Proposed Route Width

The route width is the area in which the Commission authorizes a permittee to place the proposed transmission line facilities. Minn. Stat. § 216I.02, subd. 15, defines a "route" as the location of an HVTL between two end points. Under this definition, a route may have a variable width of up to 1.25 miles. ROW is the specific area required for the easement for the transmission line. By requesting a route width that is wider than the ROW, the Applicants will have flexibility to make alignment adjustments during final design to work with landowners, avoid sensitive natural resources, and manage construction constraints as practical. The route width, in combination with the anticipated alignment, is intended to balance flexibility and predictability in the Commission's Route Permit.

The proposed route width for this Project, shown in **Figure 2.2-1**, varies based on the proposed facilities. The minimum proposed route width is 1,000 feet (500 feet on either side of the transmission line centerline) for the transmission line portions of the Project (**Figure 2.2-1**). An expanded route width is proposed around the North Rochester Substation, the planned North Rochester Substation Expansion, and the planned Project Skyway Substations (**Figure 2.2-1**). This varying width accommodates proposed new facilities as well as changes to existing transmission lines to connect to the expanded North Rochester Substation. The proposed route avoids prohibited routes (e.g., wilderness areas, parks, natural areas) identified in Minnesota Rules 7850.4300.

Figure 2.2-1. Proposed Route Width



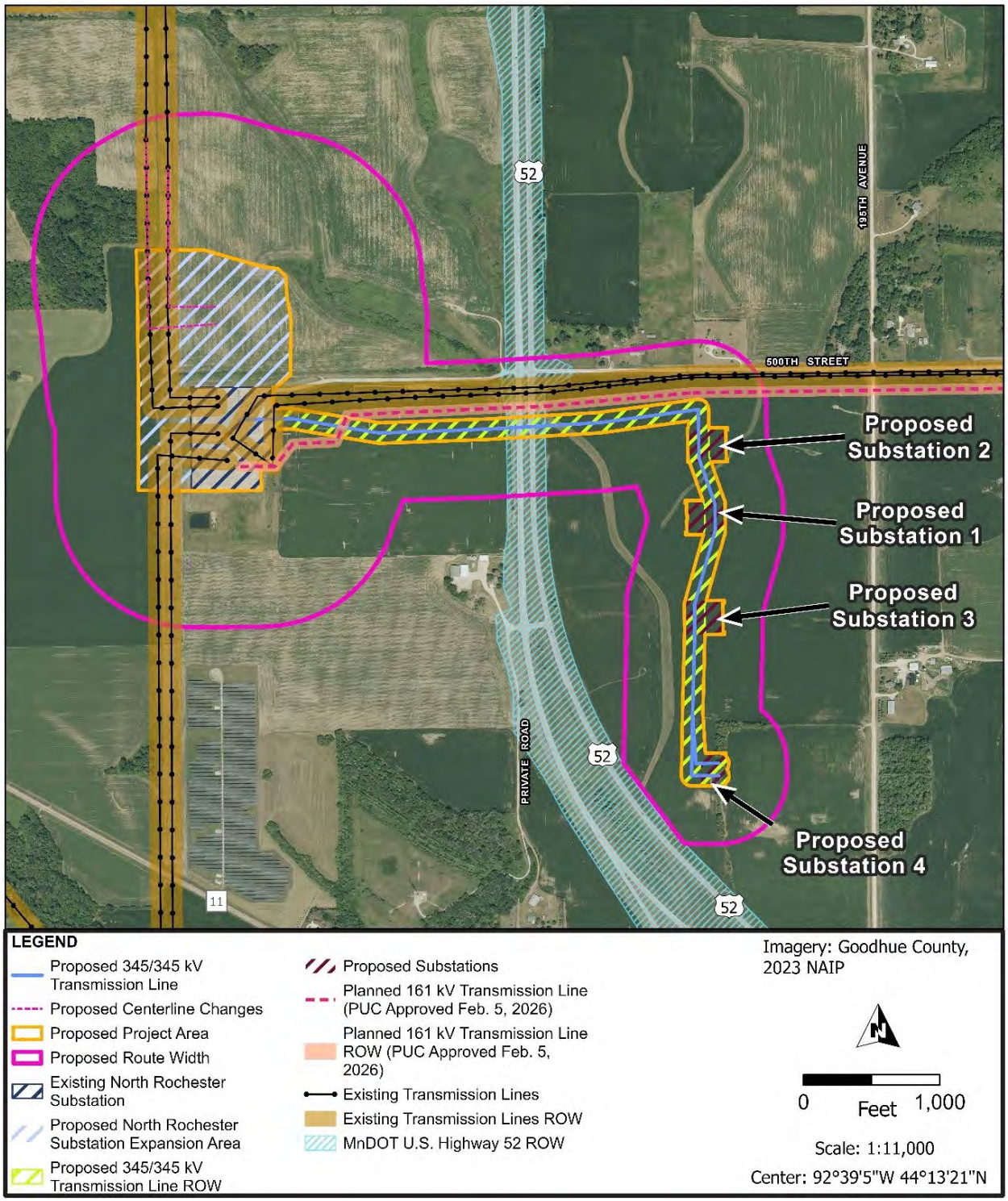
2.2.2 Proposed Right-of-Way

The proposed ROW is the area required for safe operation of the transmission line. The proposed ROW is within the proposed route width. The double-circuit, 345 kV HVTL portion of this Project requires a 150-foot-wide ROW. For this Project, Xcel Energy will acquire a 150-foot ROW for the proposed transmission line on both sides of U.S. Highway 52. On the west side of U.S. Highway 52, the proposed ROW is located along the south side and parallel to existing transmission line ROW (CapX2020 Hampton – LaCrosse 345 kV transmission line and the planned Mankato to Mississippi River 161-kV transmission line[12]) (see **Figure 2.2-2**), which the Commission approved verbally on April 14, 2026.[13]

[12] Commission Approved Project Overview Map (Feb. 17, 2026) (eDocket No. 20262-228228-01).

[13] *In the Matter of the Application of Xcel Energy for a Certificate of Need and Route Permit for the Mankato – Mississippi 345 kV Transmission Line Project in Southeast Minnesota*, Docket No. E002/CN-22-532 and E002/TL-23-157, ORDER ADOPTING ADMINISTRATIVE LAW JUDGE REPORT AS MODIFIED, FINDING ENVIRONMENTAL IMPACT STATEMENT ADEQUATE, GRANTING CERTIFICATE OF NEED, AND ISSUING ROUTE PERMIT (April 14, 2026).

Figure 2.2-2. Proposed Right-of-Way



2.2.3 Proposed Alignment

The proposed alignment refers to the location of the poles and conductors within the proposed ROW. It is not the final alignment and is used to evaluate the proposed Project's potential environmental impacts.

The proposed alignment begins at Xcel Energy's existing North Rochester Substation on the west side of U.S. Highway 52, crosses U.S. Highway 52, and connects to the Project Skyway Substations within the Development Site, as shown in **Figures 1.1-2 and 2.2-1**..

2.2.4 Transmission Structures

The new double-circuit, 345 kV HVTL will consist of double-circuit, custom steel (assumed to be weathering), self-supporting structures with a vertical phase configuration. These include double-circuit and double-pole terminal deadends, double-circuit and single-pole tangent and/or angle structures with V-string insulators, and single-circuit and single-pole terminal deadends. Span lengths between the structures will vary from 150 to 975 feet. All foundations will be reinforced concrete drilled piers with an anticipated diameter range of 8 to 10 feet. Structure heights will range from 100 to 180 feet above ground. The base diameter range is 4 to 9 feet.

Specific structure sizing will be determined after a route permit is issued and detailed engineering design is initiated. A dead-end structure is used to change direction and/or wire tension on a transmission line. Dead-end structures are also used as "storm structures" to limit the number of structures damaged by a cascading effect due to higher line tensions when a structure is knocked down by a storm. Dead-end structures can use wood, wood laminate, direct steel embedded, or steel on concrete foundation structures and can have a larger cross section than the typical structures. The location of dead-end structures will be determined after a route permit is issued and final detailed engineering design is completed.

2.2.5 Conductors

The double-circuit, 345 kV HVTL structures will have six single-conductor attachments, which will be 3-phase double-bundled twisted pair 636 kcmil 26/7 ACSR "Grosbeak." There will be two shield wires per structure, which will be 0.555-inch diameter 48-fiber Optical Ground Wire (OPGW). The spans into the North Rochester Substation and Project Skyway Substations will both have two additional 3/8-inch EHS steel shield wires.

2.2.6 Construction Procedures

Construction will begin after necessary federal, State, and local approvals are obtained and property rights are acquired. Construction will follow the Applicants' best management practices (BMP) to mitigate and minimize temporary and permanent impacts on land and the environment. Construction typically progresses as follows:

- survey marking of the ROW;
- ROW clearing and access preparation;
- grading or filling, if necessary;
- installation of culverts or concrete foundations;
- installation of poles, insulators, and hardware;
- conductor stringing;
- installation of any aerial markers required by State or federal permits; and
- restoration/clean-up.

The Applicants will design the transmission line structures for installations at the existing grades. Where a site slope is required (typically on slopes exceeding 10 percent), working areas may be graded or leveled with fill. Construction will require the use of many different types of construction equipment, including tree removal equipment, mowers, cranes, backhoes, digger-derrick line trucks, drill rigs, dump trucks, front-end loaders, bucket trucks, bulldozers, flatbed tractor-trailers, flatbed trucks, pickup trucks, concrete trucks, helicopters, and various trailers or other hauling equipment. Excavation equipment is often on wheeled or track-driven vehicles. Construction crews will attempt to use equipment that minimizes impacts on land when opportunities are available.

Construction staging areas/laydown yards are usually established for transmission projects. Staging involves delivering the equipment and materials necessary to construct the new transmission line facilities. Construction of each segment will likely include two or more staging areas. Structures, conductors, matting, and other materials are delivered to staging areas and stored until they are needed for the Project.

The Applicants will evaluate construction access opportunities by identifying existing transmission line easements, roads, or trails that are near the approved route. When feasible, the Applicants will confine construction activities to the easement area. In certain circumstances, additional off-easement access may be required on a temporary basis. Permission will be obtained from property owners prior to using off-easement access.

Improvements to existing access or construction of new access may be required to accommodate construction equipment. Field approaches and roads may be constructed or improved. Where applicable, the Applicants will obtain permits for new access from local road authorities. The Applicants will also work with appropriate road authorities to ensure proper maintenance of roadways traversed by construction equipment.

After land rights have been secured and prior to any construction activities starting, landowners will be notified of the Project schedule and other related construction activities.

The first phase of construction will involve survey staking of the transmission line structure locations and edges of the ROW. Following staking, the ROW will be cleared of trees and other woody vegetation to ensure safe and reliable access to the transmission line during construction, restoration, operation, and maintenance.

After ROW clearing and access preparation has been completed, pole and foundation installation will begin. Structures for the Project will require drilled pier concrete foundations.

Drilled pier foundations are typically between 8 and 10 feet in diameter and are typically 20 to 60 feet deep, depending on soil conditions. An angle or dead-end structure may require a foundation up to 12 feet in diameter. The actual diameter and depth of the hole (and foundation) depend on structure design and soil conditions that are determined during the initial survey and soil testing phases. Concrete will be brought to the site by concrete trucks from a local concrete batch plant and filled around a steel rebar support cage and anchor bolts. Once the foundation is cured, the structure will be bolted to the foundation.

Structures will be moved from staging areas and delivered to the site of each foundation where they are assembled. Using a crane, the structure will be lifted and placed into position. Insulators and other hardware will be attached to the structure prior to placing it on the foundation.

Conductor stringing is the last major step of transmission line construction. Stringing setup areas are typically located at 2-mile intervals. These sites will be located within the ROW, when possible, or within temporary construction easements. Conductor stringing often uses helicopters to start the process. The helicopters pull a "sock-line" or high strength rope that is attached to the conductor wire through pulleys attached to the insulators on each structure. The conductor wire is pulled into place and sagged to meet design requirements that are compliant with good utility practice and minimum code clearances. This process requires brief access to each structure to secure the conductor wire to the insulator hardware and to fasten the shield wire on each structure. After conductor installation is complete, conductor marking devices will be installed, if required. These marking devices may include bird flight diverters or air navigational markers. The Applicants will work with the appropriate agencies to identify locations where marking devices need to be installed.

Where the transmission line crosses streets, roads, highways, or other energized conductors or obstructions, temporary guard or clearance poles may be installed before conductor stringing. The temporary guard or clearance poles ensure that conductors will not obstruct traffic or contact existing energized conductors or other cables during stringing operations and protects the conductors from damage if they were to fall during stringing.

These techniques are also used to reduce impacts on private property, including driveways, yards, and drain tiles.

2.2.6.1 Required Workforce

The Applicants anticipate that approximately 20 to 30 daily contract workers will be employed for the construction of the transmission line and North Rochester Substation Expansion. Xcel Energy will also have a construction supervisor onsite throughout the construction and restoration phases of transmission line and North Rochester Substation modifications. Xcel Energy typically hires contractors who pay their employees at or better than prevailing wages. No new permanent jobs will result from construction and operation of the transmission line. Operation and maintenance activities will be conducted by existing Xcel Energy staff.

2.2.7 Restoration Procedures

The Applicants have developed a draft Vegetation Management Plan (VMP) for this Project (**Appendix F**), which will be reviewed by the State interagency Vegetation Management Plan Working Group. The VMP describes the objectives and plans for restoring or replacing any vegetation damaged during the construction process. The Applicants will implement this VMP after construction is completed.

Crews will attempt to minimize ground disturbance whenever feasible, but areas will be disturbed during the normal course of work. Once construction is completed in an area, disturbed areas will be restored to their original condition, to the maximum extent feasible. In some areas along the ROW, temporary restoration may be required before the completion of construction per National Pollution Discharge Elimination System (NPDES) and Minnesota Pollution Control Agency (MPCA) construction permit requirements.

Ground-level vegetation disturbed or removed from the ROW during Project construction will be allowed to naturally reestablish to pre-construction conditions. Areas where significant soil compaction or other disturbances from construction activities occur will require additional assistance in reestablishing the vegetation stratum and controlling soil erosion. In these areas, the Applicants will use seed that is noxious weed free to reestablish vegetation.

After construction activities are complete, the Applicants will ensure that any damage caused by Project construction to Township, City, and County roads used will be restored to prior condition. The Applicant will meet with Township road supervisors, City road personnel, or County highway departments to address any issues that arise during construction with roadways to ensure the roads are adequately restored, if necessary, after construction is complete.

The Applicants will contact landowners after construction is complete to determine if the clean-up measures have been to their satisfaction and inquire if any other damage may have occurred. If damage has occurred to crops, fences, or the property, the Applicants will compensate the landowner. In some cases, an outside contractor may be hired to restore the damaged property as near as possible to its original condition.

2.2.8 Operation and Maintenance

Regular maintenance and inspections will be performed during the life of the transmission line to ensure its continued integrity. Generally, the Applicants will inspect the condition of the transmission line and structures once per year. Inspections will be limited to the ROW and to areas where off-ROW access is required due to ROW obstructions or terrain impediments. If problems are found during inspection, repairs will be performed and property restoration will occur, or the landowner will be provided reasonable compensation for any damage to the property.

ROW will be managed to remove vegetation that interferes with the operation and maintenance of the transmission line. Low-growing vegetation that will not interfere with the safe operation of, or access to, the transmission line may be allowed to reestablish in the ROW. The Applicants will use a wire zone/border zone practice for ROW clearing and maintenance. As a general practice, low-growing brush or smaller tree species will be allowable at the outer limits (e.g., the "border zone") of the easement area. Taller tree species that endanger the safe and reliable operation of the transmission facility will be removed. In developed areas, and to the extent practical, existing low-growing vegetation that will not pose a threat to the transmission facility or impede construction or maintenance may remain in the border zone, as agreed to during easement negotiations. The area below the outer conductors plus 10 to 15 feet (e.g., the "wire zone" or "clear zone") will be cleared of all shrubs and trees to ensure maintenance trucks can access the line and no vegetation interferes with the safe operation of the transmission line.

The National Electrical Safety Code (NESC) states that "vegetation that may damage ungrounded supply conductors should be pruned or removed." Trees beyond the easement area that are in danger of falling into the energized transmission line, could grow into the wire zone, or are otherwise deemed to be a hazard to the safe operation of the line (e.g., "danger trees") may be removed or trimmed to eliminate the hazard, if allowed by the terms in the easement. Danger trees are generally those that are dead, diseased, weak, or leaning toward the energized conductors. Tree trimming may be possible to minimize tree removal based on negotiations with individual landowners.

Xcel Energy's practice generally provides for the regular inspection of double-circuit, 345 kV HVTLs to determine if clearing is required. ROW clearing practices will include a combination of mechanical and hand clearing, along with herbicide application where allowed, to remove or control vegetation growth.

Estimated operation and maintenance costs and schedule for the approximately 1.2-mile-long transmission line are included in **Table 2.2-1**.

Table 2.2-1. Estimated Transmission Line Operation and Maintenance Costs

Inspection/Patrol Type	Cost/mile	Frequency
Helicopter Patrol	$100	Annual
Ground Patrol	$400	Every 4 years
Unplanned: Maintenance & Inspection	$150	Annual
Administrative Support	$50	Annual

2.3 North Rochester Substation and Expansion Area

The Project will include the expansion of the existing North Rochester Substation and new terminations of two existing transmission lines into the substation expansion area, as shown in **Figure 1.1-2**. Re-terminating these lines is necessary to accommodate the two new Project Skyway transmission lines within the existing substation footprint.

2.3.1 Substation Design

The existing North Rochester Substation occupies approximately 10 acres, which includes 5 breaker-and-a-half rows with capacity to accommodate up to 8 345 kV line terminations and 2 transformers. Xcel Energy proposes to expand the substation footprint directly to the north by approximately 11.3 acres, increasing the total site area to approximately 22 acres. The expansion area will be graveled and fenced to accommodate additional 345 kV lines entering the site and will add 6 new breaker-and-a-half rows, providing capacity for 10 additional line terminations. A second Electrical Equipment Enclosure (EEE) building will be constructed within the expanded footprint to support the new line terminations and associated protection and relaying equipment.

2.3.2 Construction Procedures

Construction will begin after necessary federal, State, and local approvals are obtained and property rights are acquired. For the North Rochester Substation Expansion, typical construction activities will include survey and staking, clearing vegetation, and excavation of the expansion area. Appropriate fill will be placed, as necessary, to provide a stable surface. Fencing will be installed to secure the substation area. Holes will be drilled and concrete will be poured for pier footings. Forms will be laid and concrete will be poured for slab foundations. Cable trays will be installed where communication and relay cables will be placed, as needed, for connection between the control building and equipment. Bus work and equipment will be installed on the foundations and erected. Control system modifications, if included at the substation, will be wired to onsite enclosures. Finally, the substation will be topped off with rock to grade.

2.3.2.1 Required Workforce

Xcel Energy anticipates that approximately 20 to 30 daily contract workers will be employed for the construction of the transmission line, North Rochester Substation Expansion, and modifications at

the North Rochester Substation. Xcel Energy will also have a construction supervisor onsite throughout the construction and restoration phases of transmission line and North Rochester Substation modifications. Xcel Energy typically hires contractors who pay their employees at or better than prevailing wages. No new permanent jobs will result from construction and operation of the North Rochester Substation Expansion. Operation and maintenance activities will be conducted by existing Xcel Energy staff.

2.3.3 Restoration Procedures

Areas that are not repurposed and temporary construction workspaces that are disturbed during construction, and that are located outside of the final footprint, will be restored to their original condition, to the maximum extent practicable. Post-construction restoration activities will include removing and disposing of debris, removing all temporary facilities (including staging and laydown areas), employing appropriate erosion control measures, reseeding areas disturbed by construction activities with vegetation similar to that which was removed with a seed mixture certified as free of noxious or invasive weeds, and restoring the areas to their original condition, to the extent possible. In cases where soil compaction occurs, the construction crew or a restoration contractor will use various methods to alleviate the compaction. The Applicants will implement the VMP during restoration activities.

2.3.4 Operation and Maintenance

Substations require a certain amount of maintenance to keep them functioning in accordance with accepted operating parameters and NESC requirements. Substation maintenance involves a variety of tests and inspections to ensure the proper functioning, safety, and reliability of the substation equipment that includes transformers, circuit breakers, batteries, protective relays, and other equipment. The specific tests conducted and the timing of these tests vary based on the type of equipment, the age of the equipment, industry standards, and manufacturer recommendations. Transformers, circuit breakers, batteries, protective relays, and other equipment need to be serviced periodically in accordance with the manufacturer's recommendations. The substation pad must be kept free of vegetation, and adequate drainage must be maintained. Xcel Energy will regularly inspect and maintain the substation to ensure its continued integrity. Substations are designed to operate for decades and only require moderate maintenance. Maintenance in the first several years of operation is expected to be minimal.

2.4 Project Skyway Substations

The Project will include the construction of the four Project Skyway Substations at the Development Site as part of Project Skyway.

2.4.1 Substation Design

The Project Skyway Substations will range in size from approximately 230 to 250 feet wide and 175 to 285 feet in length. In total, the Project Skyway Substations will have a 5.8-acre footprint. While routing and siting of the Project and associated facilities are mainly determined, the final location of the Project Skyway Substations will depend on the final Project's route and further coordination with Project Skyway development. The four Project Skyway Substations are proposed within a central utility corridor on the Project Skyway site and will serve the approximate 195-acre industrial/technology center campus. The substations consist of A-frame structures for 345 kV high voltage transmission and terminations, protection equipment, bus schemes, switches, breakers, controls, and transformers to output medium voltage to the industrial campus. The A-frame structures will be approximately 77 feet in height with primary bus work below measuring approximately 25 feet in height. Lightening masts will be located within the substation sites and measure approximately 90 feet in height. The substations will be located outdoors within fenced and gated enclosures. The primary surfacing will be gravel with multiple concrete pads and foundations for equipment. Access to each substation will be included with 20-foot-wide vehicular gates and 3-foot-wide pedestrian gates. Gravel surfacing will allow access into and through the substations. Lighting will be provided via overhead light poles surrounding each substation. Cast-in-place concrete retaining walls ranging in height from 0 to 12 feet above ground will be constructed at the end of the Project Skyway Substations to mitigate the elevation change across the Project Skyway site from east to west.

2.4.2 Construction Procedures

Construction will begin after necessary federal, State, and local approvals are obtained and property rights are acquired. The construction activities associated with the Project Skyway Substations are similar to what was described in Section 2.3.2. Construction will commence with surveying and staking the site and typically includes obtaining soil borings to confirm site characteristics. Appropriate fill will be placed, as necessary, to provide a stable surface. Fencing will be installed to secure the substation area. Holes will be drilled and concrete will be poured for pier footings. Forms will be laid and concrete will be poured for slab foundations. Cable trays will be installed where communication and relay cables will be placed, as needed, for connection between the control building and equipment. Bus work and equipment will be installed on the foundations and erected. Control system modifications, if included at the substation, will be wired to onsite enclosures. Finally, the Project Skyway Substation pads will be topped off with rock to grade.

2.4.2.1 Required Workforce

Google anticipates that 25 to 40 daily contract workers will be employed for the construction of the Project Skyway Substations at the Development Site. Operation and maintenance activities associated with the Project Skyway Substations will require three to five new permanent jobs.

2.4.3 Restoration Procedures

These substations are located within an area of greater industrial development. Areas that are not repurposed and temporary construction workspaces that are disturbed during construction, and that are located outside of the final footprint, will be restored according to the development plan. Post-construction restoration activities will include removing and disposing of debris, removing all temporary facilities (including staging and laydown areas), employing appropriate erosion control measures, reseeding areas disturbed by construction activities with vegetation similar to that which was removed with a seed mixture certified as free of noxious or invasive weeds, and restoring the areas to their original condition, to the extent possible. In cases where soil compaction occurs, the construction crew or a restoration contractor will use various methods to alleviate the compaction.

2.4.4 Operation and Maintenance

Substations require a certain amount of maintenance to keep them functioning in accordance with accepted operating parameters and the NESC requirements. The specific tests conducted and the timing of these tests varies based on the type of equipment, the age of the equipment, industry standards, and manufacturer recommendations. Transformers, circuit breakers, batteries, protective relays, and other equipment need to be serviced periodically in accordance with the manufacturer's recommendations. The substation pad must be kept free of vegetation and adequate drainage must be maintained. Skyway will regularly inspect and maintain the substation to ensure its continued integrity. Substations are designed to operate for decades and only require moderate maintenance. Maintenance in the first several years of operation is expected to be minimal.

2.5 Future Expansion

The design of the proposed Project accounts for future expansion of the transmission system in this area. In addition to accommodating re-terminations for the existing transmission lines, the expansion of the North Rochester substation has also been sized to allow for high voltage transmission projects that have been approved as part of the MISO Tranche 2.1, future MISO generation, and Xcel retail interconnection projects. The station will be built in a ring-bus configuration to help reliability and sustainability of these important projects that rely on consistent, uninterrupted service.

3. COST AND SCHEDULE

3.1 Estimated Project Costs

There are several main components to the cost of constructing facilities, such as permitting, engineering and design, ROW, materials, land, and construction. The construction costs for the Project will be paid for by Google. Estimated costs for the Project are anticipated to be between $198,000,000 and $248,000,000. Low and high capital expenditure costs associated with each Project component are described in **Table 3.1-1**. Costs may vary depending upon, among other things, the cost of materials and labor.

Table 3.1-1. Estimated Project Costs

Project Components	Low Capital Expenditures	High Capital Expenditures
Transmission Line (double-circuit, 345 kV HVTL)	$8,000,000	$10,000,000
Existing North Rochester Substation Modifications	$12,000,000	$16,000,000
North Rochester Substation Expansion Area	$58,000,000	$62,000,000
Project Skyway Substations (4)	$120,000,000	$160,000,000
Total Project Costs[a]	**$198,000,000**	**$248,000,000**

[a] There may be differences between the sum of the individual component amounts and Total Project Costs due to rounding.

3.2 Project Schedule

Table 3.2-1 summarizes the Project's preliminary schedule consistent with the milestones and timeframes set forth in Minn. Stat. Ch. 216I. This schedule is based on information known as of the date of filing and may be subject to change as further information develops or if there are delays in obtaining the necessary federal, State, or local approvals that are required prior to construction. The Applicants will provide any schedule updates during the proceeding.

Table 3.2-1. Preliminary Project Schedule

Milestone	Timeframe
Route Permit Application filed	April 2026
Written order issued	January 2027
Start of construction	May 2027
Project in-service	December 2029

This page is intentionally left blank.

4. OTHER PERMITS

4.1 Permits and Approvals Required

In addition to the Route Permit sought in this Application, several other permits, licenses, approvals, or consultations may be required to construct the Project, depending on final engineering and design or conditions encountered during construction. A list of the federal, State, and local permits that may be required for the Project is provided in **Table 4.1-1**. Any required permits will be obtained by the Applicants prior to construction. This list of permits/approvals is subject to change as Project development continues.

Table 4.1-1. Summary of Possible Permits, Licenses, Approvals, and Consultations

Administering Agency	Permit, Approval, or Consultation	Description
Federal		
U.S. Fish and Wildlife Services (USFWS)	Section 7 consultation on Threatened and Endangered Species under the Endangered Species Act	Applicants will assess whether the activity may affect any federally listed threatened, endangered, or proposed threatened and endangered species; designated critical habitat; or proposed critical habitat. The Applicants will coordinate with USFWS once design of the transmission line is complete.
U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS)	Farmland Protection Policy Act (FPPA)/Farmland Conversion Impact Rating	If it is determined that the Project will cause "unnecessary and irreversible conversion of farmland to nonagricultural uses," an FPPA form (AD-1006 or CPA 106) will be completed and filed with USDA/NRCS.
	Compliance with land enrolled in programs including Conservation Reserve Program (CRP), Wetland Reserve Program, and Grassland Reserve Program (GRP)	If land enrolled in these programs are crossed, Applicants will need to consult with NRCS on mitigation and/or permissions.
State		
Minnesota Public Utilities Commission	Route Permit	Under Minn. Stat. §216I.05, subd. 2, a Route Permit from the Commission is required for this Project.
Minnesota State Historic Preservation Office (MNSHPO)	Cultural Resources Consultation	The Applicants will consult MNSHPO to determine if there are any features eligible for listing in the National Register of Historic Places present within the Project Area or near the Project Area. Coordination with MNSHPO will be ongoing.

Administering Agency	Permit, Approval, or Consultation	Description
Minnesota Department of Natural Resources (MNDNR)	State-listed Endangered Species Consultation	Pursuant to Minnesota's Endangered Species Statute (Minn. Stat. § 84.0895), MNDNR is required to adopt rules designating species meeting the statutory definitions of endangered, threatened, or species of special concern and regulate treatment of these species. After receiving a Route Permit, the Applicants will consult with MNDNR regarding any Project-specific construction considerations related to Minnesota's Endangered Species Statute.
	Water Appropriation General Permit 1997-0005 (dewatering)	The General Permit 1997-0005 is administered by MNDNR for temporary water appropriations such as (but not limited to): dewatering, watering landscape, dust control, and hydrostatic testing.
	State National Heritage Information System (NHIS) Review	NHIS is a Minnesota data source that provides information on rare plants, animals, native plant communities, and rare features throughout the state. In consultation with MNDNR, a review of this data source will be conducted to determine potential Project-related impacts on rare plants, animals, native plant communities, and rare features.
Minnesota Board of Water and Soil Resources (BWSR)	Minnesota Wetland Conservation Act (MWCA) Approval(s)	MWCA is administered at the local level with oversight from BWSR in accordance with Minn. R. Ch. 8420. After consultation with BWSR, it will be determined whether a permit will be necessary.
Minnesota Pollution Control Agency (MPCA)	National Pollutant Discharge Elimination System (NPDES) Permit – Construction Stormwater Permit	MPCA requires an NPDES Permit for stormwater discharges associated with construction activities disturbing more than 1 acre of land. The Applicants will obtain the NPDES Permit prior to construction. To ensure compliance with the NPDES Permit, the Applicants will develop and implement a Stormwater Pollution Prevention Plan (SWPPP) to minimize discharge and sediment transport during storm events by taking proper precautions to contain soils on the site throughout construction and restoration of the Project.

Administering Agency	Permit, Approval, or Consultation	Description
Minnesota Department of Transportation	Access (Driveway) Permit	The Applicants will apply for an Access (Driveway) Permit (Form 1721) for using driveways and access points to trunk highways crossed or paralleled by the Project during construction and operation/maintenance. These permits will be obtained after the Applicants have been issued a Route Permit and prior to construction.
	Oversize/Overweight Permit	The Applicants will apply for oversize and/or overweight permits for all vehicles using State trunk highways during construction and operation of the Project. These permits are required for vehicle loads of excess height, length, and/or weight, although overlength utility poles may be exempt. Certain over-width and/or overlength loads require escorts, which the Applicants will arrange, as necessary. These permits will be obtained after the Applicants have been issued a Route Permit and prior to construction.
	Utility Accommodation on Trunk Highway ROW	A Utility Accommodation Permit (Form 2525) is required for the construction of utility facilities crossing or paralleling existing trunk highway ROW.
	Miscellaneous Work Permit for Trunk Highways	Required if temporary work occurs in a State road ROW.
Local		
County and/or Township	Overwidth/Overweight Load Permits, Road Crossing Permits, Driveway/Access Permits, Stormwater Permits, Utility Permit in County ROW	County permits often required for transmission lines include: a Utility Permit on County ROW, an Overwidth/Overweight Load Transportation Permit, and a Driveway/Access Permit. The Applicants will not apply for any local permits until after the Commission approves the Route Permit.
Other		
Existing Infrastructure Owners	Crossing Agreement	For each crossing, a ROW Crossing Agreement may be required (if applicable).

This page is intentionally left blank.

5. ALTERNATIVE SITES OR ROUTES CONSIDERED BUT REJECTED

No route alternatives were considered due to the Project endpoints, the short length of the proposed transmission line, and discussions with affected landowners.

This page is intentionally left blank.

6. ENVIRONMENTAL ASSESSMENT

Minn. Stat. 216I.07, subd. 3(a) requires that applications submitted under the Standard Review Process must prepare and submit an EA with the application. The EA provided in this section contains information regarding the Project's human and environmental impacts and addresses mitigating measures for identified impacts.

6.1 Methodology and Terms

A potential impact is the anticipated change to an existing condition caused either directly or indirectly by the construction and operation of a proposed project. Potential impacts can be positive or negative and short or long term. Impacts vary in duration and size, by resource, and across locations. In certain circumstances, potential impacts can accumulate incrementally, meaning that impacts from a proposed project would be in addition to on-the-ground impacts already occurring.

To provide appropriate context, the following terms and concepts are used to describe and analyze potential impacts:

- **Duration** impacts vary in length of time. Short-term impacts are generally associated with construction but might extend into the early operation phase. Long-term impacts are associated with operation. Permanent impacts extend beyond decommissioning and reclamation.

- **Size** impacts vary in size. To the extent possible, potential impacts are described quantitatively; for example, the number of impacted acres or the percentage of affected individuals in a population.

- **Uniqueness** resources are different, varying in type, extent, quality, and quantity. Common resources occur frequently, while uncommon resources are not ordinarily encountered.

- **Location** impacts are location dependent. For example, common resources in one location might be uncommon in another.

Impact intensity levels are described using qualitative terms, which are explained below. These terms are not intended as value judgments, but rather a means to establish a mutual understanding among readers.

- **Negligible** impacts do not alter an existing resource condition or function and are generally not noticeable to an average observer. These impacts generally affect common resources over the short term.

- **Minimal** impacts do not considerably alter an existing resource condition or function. Minimal impacts might, for some resources and at some locations, be noticeable to an average observer. These impacts generally affect common resources over the short or long term.

- **Moderate** impacts alter an existing resource condition or function and are generally noticeable to the average observer. Impacts might be spread out over a large area, making them difficult to observe but can be estimated by modeling. Moderate impacts can affect either common resources over the long term or permanently, or uncommon resources over the short or long term.

- **Significant** impacts alter an existing resource condition or function to the extent that the resource is impaired or cannot function. Significant impacts are likely noticeable or predictable to the average observer. Impacts might be spread out over a large area, making them difficult to observe but can be estimated by modeling. Significant impacts can affect common or uncommon resources and be of any duration.

Also discussed are opportunities to mitigate potential impacts. Mitigation means:

- **Avoiding** impacts altogether by not undertaking a certain project or parts of a project;

- **Minimizing** impacts by limiting the degree of magnitude of a project (e.g., reducing project size or moving a portion of the project); and

- **Rectifying** impacts by repairing, rehabilitating, re-creating, or restoring the affected environment.

Some impacts can be avoided or minimized; some might be unavoidable but can be minimized; others might be unavoidable and unable to be minimized but can be corrected. The level at which an impact can be mitigated might change the impact intensity level. Where applicable, this Application also discusses permit conditions included in the current version of the Commission's standard draft Route Permit. The actual permit conditions applied to this Project will be the result of the record developed in this proceeding.

6.2 Regions of Influence

Potential impacts on human and environmental resources are analyzed within specific geographic areas called regions of influence (ROI). An ROI is the geographic area where the Project might exert some influence and is used as the basis for assessing potential impacts. ROI vary by resource, as shown in **Table 6.2-1**. As necessary, potential impacts and mitigation measures beyond the identified ROI are discussed to provide appropriate context. Also, direct impacts within the ROI might cause indirect impacts outside the ROI. This Application uses the following ROI:

- **ROW:** the ROW is 150 feet wide (75 feet on each side of the anticipated transmission line alignment).
- **Project Area:** the transmission line ROW, the existing North Rochester Substation, proposed North Rochester Substation Expansion area, transmission line re-termination areas, and proposed Project Skyway Substation areas.
- **Route Width:** the route width is generally 1,000 feet wide (500 feet on each side of the anticipated transmission line alignment and 1,000 feet around the existing and planned North Rochester Substation Expansion areas).
- **Study Area:** within 1 mile of the anticipated alignment (i.e., a 2-mile-wide area centered on the anticipated alignment).
- **Goodhue County:** the county in which the Project will be constructed.

Table 6.2-1. Regions of Influence

Resource Type	Resource Element	Region of Influence
Human Settlement	Aesthetics	Study Area
	Cultural Values	Goodhue County
	Displacement	Project Area
	Environmental Justice	Route Width
	Public Health and Safety	Project Area
	Noise	Study Area
	Public Services	Study Area
	Land Use and Zoning	Route Width
	Recreation	Study Area
	Socioeconomics	Goodhue County
	Property Values	Study Area
Land-Based Economies	Agriculture	Route Width
	Forestry	Study Area
	Mining	Route Width
	Tourism	Goodhue County
Archaeological and Historic Resources	Archaeological and Historic Resources	Project Area
Natural Resources	Air Quality	Study Area
	Geology	Project Area
	Groundwater	Route Width

Resource Type	Resource Element	Region of Influence
	Soils	Project Area
	Surface Water and Wetlands	Route Width
	Vegetation	Project Area
	Wildlife and Habitats (except birds)	Route Width
	Wildlife (birds)	Study Area
	Rare and Unique Natural Habitats	Protected species – Study Area Sensitive ecological resources – Route Width
	Greenhouse Gases	Goodhue County
	Climate Change and Resilience	Goodhue County

6.3 Environmental Setting

While the Project Area is located generally within an agricultural area north of the city of Pine Island (see **Figure 1.1-1** and **Appendix B**, Figures 2–5), it is currently undergoing planned use changes (see Section 1.1). The area contains electric transmission facilities (e.g., North Rochester Substation and associated existing HVTLs), transportation corridors (e.g., U.S. Highway 52, 500th Street), farmsteads, and rural residences. The city of Pine Island boundary overlaps the southeastern edge of the Project. However, as discussed in Section 2, the Project Skyway Development Site is undergoing annexation with the City of Pine Island and would be included within city limits. The nearest farmstead to the Project Area is located approximately 400 feet north of the Project on the east side of U.S. Highway 52; the nearest rural residence is located approximately 425 feet north of the Project on the east side of U.S. Highway 52; and the nearest recreational area (Goodhue County snowmobile trail) crosses the Project. One farmstead located approximately 1,800 feet southeast of the North Rochester Substation on the west side of U.S. Highway 52 is abandoned, and the Applicants understand that the owner is planning to sell the entire farm (i.e., house, structures, and fields).

Additionally, the state of Minnesota is divided into Ecological Provinces, Sections, and Subsections. Ecological land classifications, defined under the Ecological Classification System, are used to identify, describe, and map progressively smaller areas of land with increasingly uniform ecological features. Under this classification system, the Project is located in Eastern Broadleaf Forest Province (222), Paleozoic Plateau Section (222L), and the Rochester Plateau Subsection (222Lf).[14] The landscape within the Project Area is predominantly flat with areas of rolling plains associated with the above ecological land classifications with changes from past glacial activity and other ecological factors that affected the developing landscape over time. A description of human settlement patterns in the Project

[14] Minnesota Department of Natural Resources (MNDNR). 2025. Rochester Plateau Subsection. Online [URL]: https://www.dnr.state.mn.us/ecs/222Lf/index.html. Accessed: December 2025.

Area is provided in Section 6.4. Geology, soil types, topography, water resources, vegetation, wildlife, and ecosystems in the Project Area are discussed in Section 6.7.

6.4 Human Settlement

6.4.1 Aesthetics

The ROI for aesthetics is the Study Area. This section describes the existing aesthetics in the ROI in terms of the current visual landscape in and adjacent to the Project that may be affected by Project construction or new Project features added to the landscape. Aesthetics refers to the visual quality and character of an area as perceived by the viewer. A landscape's character is largely influenced by topography, vegetation, water resources, existing development, and infrastructure. Vegetation can influence the aesthetics of a landscape by acting as natural viewshed barriers to anthropogenic buildings, enriching the intrinsic beauty of areas that might otherwise be affected by human activities, and supporting wildlife, which adds its own allure to the environment.[15] Aesthetic values are inherently subjective and shaped by individual or collective human experiences. The importance of aesthetic values varies depending on factors such as perception, cultural values, historical context, and memory, which leads to diverse and unique responses across different people or groups.

The topography of the landscape within the Study Area is predominantly flat with areas of rolling plains. The landscape is primarily agricultural and characterized by fields, rural roads, farms, and homesteads. Rural buildings within the ROI are both inhabited and uninhabited. Portions of the ROI border wetlands, which are characterized by rolling basins or valleys.

The closest urban zone is the city of Pine Island, Minnesota. It is characterized by a higher concentration of industrial, municipal, and commercial features, including power lines and electrical substations, residential buildings, streets, and sidewalks. Additionally, the city of Pine Island includes parks, trails, and other recreational features that influence the visual character and enjoyment in the area.

6.4.1.1 Potential Impacts

Impacts on aesthetics will range from minimal to moderate, and possibly higher depending on the viewer. Aesthetic impacts are subjective and can vary depending on the viewer. The Applicants assessed impacts largely by reviewing the number of residences and opportunities to parallel existing ROW. Aesthetic impacts are typically greater in areas where there is no existing linear infrastructure present, such as other roadways or transmission lines. The Project will parallel an existing 345 kV transmission line owned and operated by Xcel Energy for 0.55 mile (45.8 percent) of its length, reducing potential impacts on aesthetic resources. The Project is expected to have transmission

[15] Inglis, N.C., Vukomanovic, J., Costanza, J. and Singh, K.K. 2022. From viewsheds to viewscapes: Trends in landscape visibility and visual quality research. Lanscape and Urban Planning, 224. Online [URL]: https://doi.org/10.1016/j.landurbplan.2022.104424. Accessed: November 2025.

structures with spans ranging from 150 to 975 feet, but this may vary depending on geological, environmental, or engineering constraints identified during detailed survey and engineering work, site review, and design.

Table 6.4-1 details the proximity to residences for each Project facility (i.e., the transmission line, North Rochester Substation Expansion, and the Project Skyway Substations). There are no residences within 300 feet of the transmission line's proposed alignment and two residences within 301 to 500 feet. The two residences are under contract and will be acquired by the developer prior to the start of construction of Project Skyway.

There are no residences within 500 feet of the North Rochester Substation site and expansion area and no residences within 500 feet of the Project Skyway Substations. There are no commercial or institutional buildings within 500 feet of the proposed Project.

Table 6.4-1. Proximity to Residences to the Project

Residence Proximity (feet)	Number of Residences		
	Transmission Line	North Rochester Substation Site & Expansion Area	Project Skyway Substations
0-75	0	0	0
76-150	0	0	0
151-300	0	0	0
301-500	2	0	0
Total Residences	**2**	**0**	**0**

The Project's transmission line structures and conductors would create aesthetic impacts. Paralleling existing ROW and linear features minimizes the amount of tree and vegetation clearing required for operation of the transmission line that would otherwise fragment the existing landscape.

The expansion of the North Rochester Substation would have a minimal aesthetic impact relative to existing human modifications to the landscape due to the presence of the existing substation. The construction of new substations at the Development Site would have an aesthetic impact but would be located within the larger Development Site.

Existing views of the Development Site include agricultural land and a few rural residences. The surrounding land uses to the north, east, and west are primarily agricultural and rural residential. Commercial and industrial land uses are located south of U.S. Highway 52. A residential subdivision is present southeast of the Development Site. The views of the Development Site from the subdivision are currently screened by a small, wooded area east of 195th Avenue, which is outside of the Development Site and would not be impacted by Project construction. No scenic views or vistas are within or adjacent to the Development Site. Development of agricultural land for the Project Skyway

Substations would have an impact on the visual appearance of the Development Site. The Development Site is likely to most heavily impact the views from the residential subdivision to the southeast and rural residences along the east side of 195th Avenue. It is anticipated that the Project Skyway Substations will be partially screened by the industrial and/or technology center infrastructure planned for the Development Site. The City of Pine Island will determine the need for additional screening to reduce visual impacts caused by such development.

There are two residences located between 301 and 500 feet of the Project. One existing transmission line, CapX2020 Hampton – La Crosse 345 kV transmission line, is located closer to these residences (within 200 feet) than the Project. The Project would not box in any parcels and would add a minimal aesthetic impact on these residences given the presence of existing transmission lines closer to the residences.

By routing along linear features and avoiding existing residences, where practicable, the Applicants have minimized impacts on the viewshed from residences to the greatest extent possible. However, given the relatively flat landscape in the ROI, the transmission line and substations would likely be visible from residents and passersby on local roadways who could experience more significant impacts.

6.4.1.2 Mitigation Measures

Measures to minimize potential impacts on aesthetic resources may include the following:

- Where feasible, the location of structures and other disturbed areas will be determined by considering input from landowners or land management agencies to minimize visual impacts.
- Structure types (designs) will be uniform, to the extent practical. In general, the Applicants anticipate using monopole steel structures ranging in height from approximately 100 to 180 feet.
- Structures will utilize custom steel (i.e., weathering, self-weathering steel) to have a dark brown matte finish to minimize sunlight reflections that could be visible to nearby landowners and commuters using nearby roadways.
- Care will be used to preserve the natural landscape; construction and operations will be conducted to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings. The Applicants do not anticipate clearing of trees and shrubs during operation of the Project.

Further, prior Route Permits issued by the Commission include conditions related to aesthetics that state:

- The Permittee shall consider input pertaining to visual impacts from landowners or land management agencies prior to final location of structures, ROW, and other areas with the potential for visual disturbance.

- The Permittee shall use care to preserve the natural landscape, minimize tree removal, and prevent any unnecessary destruction of the natural surroundings in the vicinity of the Transmission Facility during construction and maintenance.

- The Permittee shall work with landowners to locate the HVTL to minimize the loss of agricultural land, forest, and wetlands, and to avoid homes and farmsteads.

- The Permittee shall place structures at a distance, consistent with sound engineering principles and system reliability criteria, from intersecting roads, highways, or trail crossings.

- The Permittee shall remove and properly dispose of all construction waste and scrap from the right-of-way and all premises on which construction activities were conducted upon completion of each task. The Permittee shall remove and properly dispose of all personal litter, including bottles, cans, and paper from construction activities daily.

6.4.2 Cultural Values

The ROI for cultural values is Goodhue County. Cultural values are based on core principles and beliefs that form the foundation for community unity. The region was historically Dakota land; the first European explorers were French traders, soldiers, and missionaries. Other historic settlers included primarily Swedish, Norwegian, and western European peoples.[16] The ROI includes lands ceded by the Dakota in various treaties. In 1851, treaties were signed with the Dakota at Traverse des Sioux and Mendota. Eastern bands of the Dakota were coerced into signing away all their remaining lands in Minnesota and Iowa, comprising 35 million acres. These treaties covered all the land within the ROI.[17] Today, only the Prairie Island Indian Community owns property near the Project. They own lands southeast of the city of Pine Island along the east side of U.S. Highway 52.

The ROI is largely defined by the riverine landscape feeding lakes, large tracts of lush woods, and rolling farmland. The area's fertile land was what initially drove European settlement throughout the region, and agriculture continues to be the major industry. Cheese production was also a major industry in the region in the late nineteenth and early twentieth centuries. These cultural values are still celebrated annually at the Goodhue County Fair and the City of Pine Island Cheese Festival.

[16] Holmquist, June Drenning. 1981. They Chose Minnesota: A Survey of the State's Ethnic Groups. Chicago: Minnesota Historical Society Press.

[17] Minnesota Historical Society (MNHS). n.d. Minnesota Treaty Interactive. Online [URL]:: https://www.usdakotawar.org/history/treaties/minnesota-treaty-interactive. Accessed: October 2025.

To the south of the Project, the city of Pine Island has a robust system of parks and trails, including an aquatic center, community garden, and the Pine Island Golf Course.

Municipalities within the ROI include the city of Pine Island. It was given its name from the Dakota term "Wa-zu-wee-ta," which translates to Isle of Pines. The City of Pine Island was incorporated as a village in 1858. The community is located in Goodhue and Olmstead Counties. The Chicago Great Western Railway was built through the city of Pine Island in 1902, connecting Rochester to Zumbrota. The railroad was abandoned in the late 1960s and has since been converted into the Douglas Recreational Trail, which runs south from the city of Pine Island to Rochester. U.S. Highway 52 serves as a main route in the community. The city of Pine Island is situated along the Middle Fork of the Zumbro River. The North Branch of the Middle Fork of the Zumbro River generally divides the city of Pine Island into north and south. The north is generally where industries are located, which is the commercial downtown, and most residential areas, social institutions, and government buildings are located within the southern area.

Among the early European immigrants to the city of Pine Island were dairy producers from western Europe. By the early twentieth century, there were 30 to 40 small cheese factories in and around the city of Pine Island. The majority of these cheese producers later consolidated into the City of Pine Island Cheese Factory. To help the growth of this local industry, the City of Pine Island Business Club held its first annual Cheese Festival in September of 1936. The festival was put on hold during World War II but commenced again by 1949. The festival was moved to the summer, currently hosted in June, and has grown to include carnival rides, additional concessions, music, a dance, fireworks, and parade.[18] The city of Pine Island and the surrounding area maintain a sense of community through the continuation of the City of Pine Island Cheese Festival and other local events, including Winterfest and a farmers' market.

Current industries in the city of Pine Island include a Land O' Lakes plant, Ag Partners facility, an agricultural co-op with elevators, Lincoln Industries of Minnesota, a metal finishing company, and Progressive Tool and Manufacturing, all located near the north end of the city. The city of Pine Island continues to see steady growth. Since the 1980s, residential subdivisions have expanded to the northeast, southeast, and southwest.[19]

Within the downtown, the Pine Island Commercial Historic District is on Main Street between 2nd and 3rd Streets SE. This National Register of Historic Places (NRHP) potentially eligible district consists primarily of late 1890s brick commercial buildings that range from one to three stories in height. The district includes a concentration of two-story Italianate style commercial buildings featuring round and segmental arched windows and doors with elaborate iron or brick corbelled

[18] City of Pine Island. 2025.Pine Island Cheese Festival History. Online [URL]: https://pineislandcheesefestival.com/history-pine-island-cheese-festival/. Accessed: October 2025.

[19] Nationwide Environmental Title Research, LLC. n.d.Historic Aerials. Online [URL]: https://www.historicaerials.com/viewer. Accessed: October 2025.

cornices. The most elaborate buildings in the district have been listed in the NRHP individually, including the Bank of Pine Island, Opera House Block; Pine Island City Hall; and Fire Station.

A couple blocks southwest of downtown are some of the oldest residential properties in the city of Pine Island, specifically two houses built in the 1890s on the 300 block of 2nd Street SW that are listed in the NRHP individually. These Queen Anne style houses feature wrap-around porches, wood siding and shingles, and elaborate gable work.

6.4.2.1 Potential Impacts

Impacts on cultural values are negligible. Construction, operation, and maintenance of the Project are not expected to conflict with the cultural values within the ROI. The area is generally rural in nature with small historic municipal pockets and an agriculture-based economy. This character is anticipated to remain after construction. No aspects of the culture of the area are anticipated to be impacted significantly or changed as a result of the construction and operation of the Project.

6.4.2.2 Mitigation Measures

The Applicants do not propose additional mitigation measures specific to cultural values.

6.4.3 Displacement

For transmission lines, NESC standards require certain clearances between transmission line structures and buildings or structures within the ROW for safe operation of the transmission line. To comply with NESC standards and allow sufficient space for transmission line operation and maintenance, transmission lines are generally routed to avoid residences or other buildings within the ROW. Residences or other buildings located within the ROW that cannot be avoided are generally removed or displaced.

The ROI for displacement is the Project Area. The Applicants assessed potential displacement impacts by identifying buildings within the Project Area. There are no residential or non-residential structures (e.g., agriculture outbuildings) in the Project Area; therefore, no displacement of residential homes, non-residential structures, or businesses will occur as a result of this Project.

6.4.3.1 Potential Impacts

Impacts on buildings or structures are negligible. There are no residences or non-residential structures within the Project Area. No residences, structures, or businesses are expected to be displaced by the Project. The Project will be designed in compliance with local, State, and NESC standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings (including residences), strength of materials, and ROW widths.

6.4.3.2 Mitigation Measures

The Project routing and substation locations avoid displacement of residences, buildings, and businesses; therefore, no mitigation measures are proposed.

6.4.4 Environmental Justice

The ROI for environmental justice is census tracts associated with the Project's route width. This analysis identifies environmental justice communities located near the Project to determine if the Project would disproportionately affect environmental justice communities. The State of Minnesota has passed laws and established the MPCA's Environmental Justice Framework. Minn. Stat. §116B.065, subd. 1(d), defines environmental justice as:

> (1) the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies; and
>
> (2) in all decisions that have the potential to affect the environment of an environmental justice area or the public health of its residents, due consideration is given to the history of the area's and its residents' cumulative exposure to pollutants and to any current socioeconomic conditions that could increase harm to those residents from additional exposure to pollutants.

The Environmental Justice Framework states that the MPCA "expects the fair treatment and meaningful involvement of communities of color, Indigenous communities, and low-income communities in agency actions and decisions that affect them. It is the policy of the MPCA that an outcome of its work, in addition to protecting and improving the environment and public health, must address environmental justice concerns."[20] The MPCA has developed an environmental justice mapping tool that uses U.S. Census American Community Survey data from 2018 to 2022 to identify environmental justice communities within the State of Minnesota.[21]

According to Minn. Stat. § 216B.1691, subd. 1(e), an "environmental justice area" is defined as an area in Minnesota that, based on the most recent data published by the U.S. Census Bureau, meets one or more of the following criteria:

> (1) 40 percent or more of the area's total population is nonwhite;
>
> (2) 35 percent or more of households in the area have an income that is at or below 200 percent of the federal poverty level;

[20] Minnesota Pollution Control Agency (MPCA). 2022. Environmental Justice Framework. Online [URL]: https://www.pca.state.mn.us/sites/default/files/p-gen5-05.pdf. Accessed: November 2025.

[21] Minnesota Pollution Control Agency (MPCA). 2025. Understanding environmental justice in Minnesota. Online [URL]: https://experience.arcgis.com/experience/bff19459422443d0816b632be0c25228/page/Page/?views=EJ-areas. Accessed: November 2025.

(3) 40 percent or more of the area's residents over the age of 5 have limited English proficiency; or

(4) the area is located within Indian Country, as defined in United States Code (U.S.C.), title18, section 1151.

6.4.4.1 2020 U.S. Census Low Income and Minority Analysis

A demographic analysis of the census tracts in the ROI was conducted using the 2020 U.S. Census American Community Survey data. Low-income, race, and ethnicity population data were gathered for the State of Minnesota, Goodhue County, city of Pine Island, and the census tracts crossed by the Project.

- A census tract is determined to have a significant low-income and/or minority population when that population exceeds 50 percent of the county population or is "meaningfully greater" than the general population of the county.[22]
    - "Meaningfully greater" is defined as when the percentage of persons in poverty or minority population is at least 10 percentage points or higher than the respective county.
    - Minority population percentages were calculated by excluding those who self-reported as white (and no other race) and not Hispanic or Latino. Which means, the minority population includes those who self-reported as Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, some other race, being two or more races, or being Hispanic or Latino.

Table 6.4-2 presents non-white (i.e., minority) populations, low-income populations, and limited English proficiency (LEP) populations in the ROI and surrounding areas.

Table 6.4-2. 2020 Environmental Justice Area Census Data Analysis

State, County, Census Tract	Total 2020 Population	2020 Households Below Poverty Level (%)	2020 Percent Minority (%)	2020 Percent LEP Population (%)
State of Minnesota	5,707,390	9.3	19.2	2.2
Goodhue County	46,330	8.6	7.1	0.6
City of Pine Island	3,629	2.4	5.6	0.0
Census Tract 808	4,517	2.3	5.3	0.0
Block Group 1	533	--[a]	4.1	0.0

[22] Analysis based on previous methodology used by the U.S. Environmental Protection Agency (USEPA) to evaluate environmental justice populations using U.S. Census Data.

State, County, Census Tract	Total 2020 Population	2020 Households Below Poverty Level (%)	2020 Percent Minority (%)	2020 Percent LEP Population (%)
Block Group 2	692	--[a]	5.8	0.0
Block Group 3	442	--[a]	6.2	0.0

Source: U.S. Census. Bureau. 2020.[23,24,25]
[a] No data available

6.4.4.2 Minnesota Pollution Control Agency Analysis

The Applicants used the MPCA environmental justice mapping tool to identify environmental justice communities in the ROI. Census Tract 808 is the only tract within the ROI. Census Tract 808 is not an environmental justice community because it does not meet the MPCA's criteria discussed above for non-white populations, low-income populations, or LEP populations.[26] Census Tract 808 is also not within a federally recognized tribal area or areas recognized as tribal areas.

6.4.4.3 Potential Impacts

Impacts on environmental justice communities are negligible. Using the Minnesota definition of an "environmental justice area," an analysis of counties, cities, census tracts, and census block groups along the Proposed Route using 2020 U.S. Census data and the MPCA environmental justice mapping tool did not identify low-income or minority populations within the ROI or surrounding locations. Additionally, the percentage of LEP populations with limited ability to read, speak, write, or understand English is below the Minnesota definition of an environmental justice area within the ROI and surrounding locations, and the ROI does not span Indian country, as defined in 18 U.S.C. §1151. Therefore, the Project is not anticipated to disproportionately affect environmental justice communities or adversely affect any of the communities along the Project.

[23] U.S. Census Bureau. 2020. S1602: Limited English Speaking Households [Minnesota; Goodhue County, Minnesota, City of Pine Island Goodhue County Census Tract 808 and Block Groups 1, 2, and 3]. Online [URL]: https://data.census.gov. Accessed: November 2025.

[24] U.S. Census Bureau. 2020. 1702: Poverty Status in the Past 12 Months of Families [Minnesota; Goodhue County, Minnesota, City of Pine Island Goodhue County Census Tract 808]. Online [URL]: https://data.census.gov. Accessed: November 2025.

[25] U.S. Census Bureau. 2020. P8: Race [Minnesota; Goodhue County, Minnesota, City of Pine Island Goodhue County Census Tract 808 and Block Groups 1, 2, and 3]. Online [URL]: https://data.census.gov. Accessed: November 2025.

[26] Minnesota Pollution Control Agency (MPCA). 2025. Understanding environmental justice in Minnesota. Online [URL]: https://experience.arcgis.com/experience/bff19459422443d0816b632be0c25228/page/Page/?views=EJ-areas. Accessed: November 2025.

6.4.4.4 Mitigation Measures

The Project is not within environmental justice communities; therefore, no mitigation measures are proposed.

6.4.5 Public Health and Safety

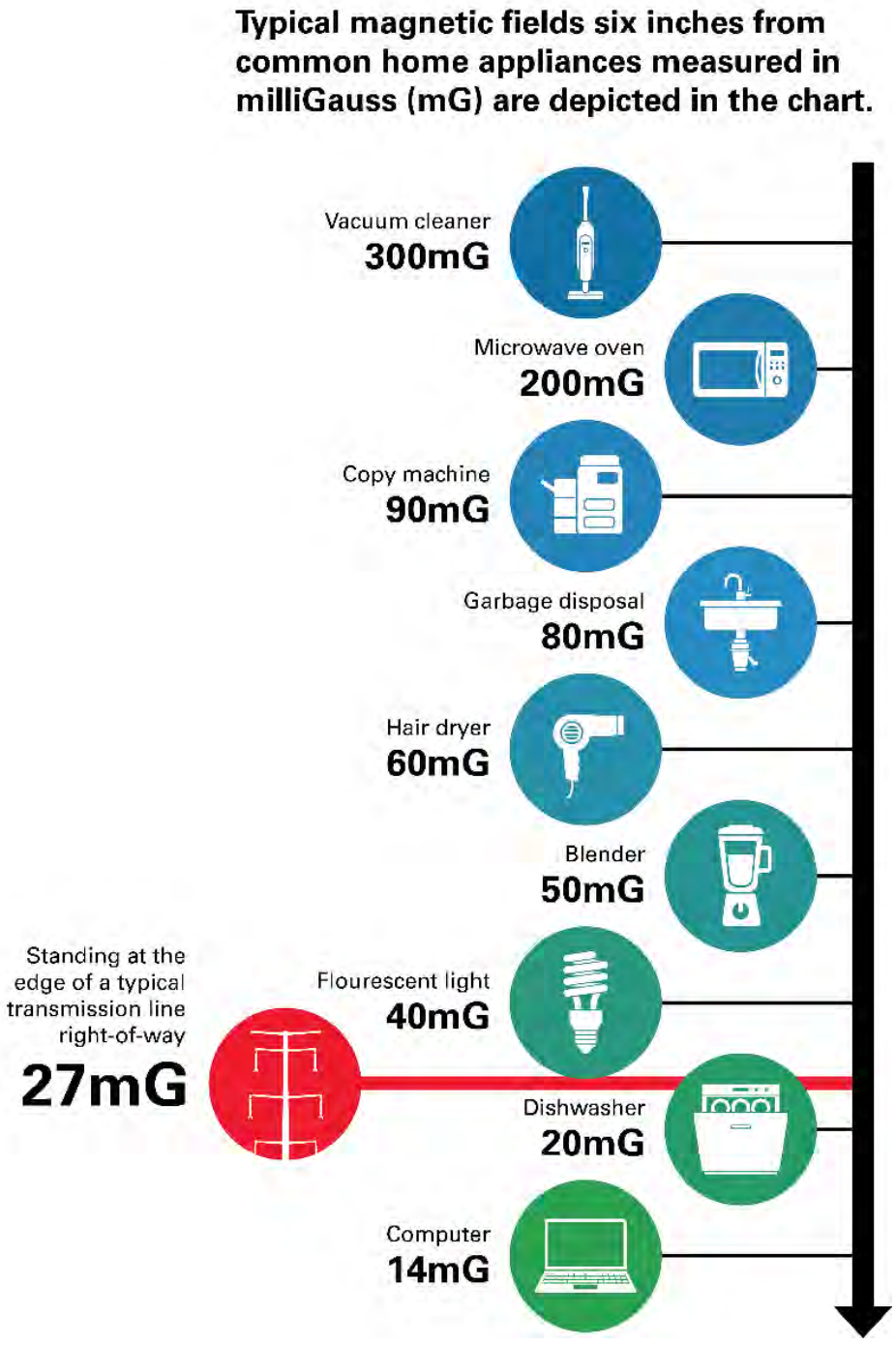
The ROI for public health and safety is the Project Area. Public health and safety will be a priority during the construction and operation of the Project. Safety concerns related to construction may include hazards associated with conductor stringing in public areas, movement of heavy equipment across roadways, and land clearing. Potential operational concerns include electrocution, fire, and outages.

Public emergency services are described in Section 6.4.7.

6.4.5.1 Electric and Magnetic Fields

Electric and magnetic fields (EMF) are invisible areas of energy associated with use of electrical power. For the lower frequencies associated with power lines (referred to as extremely low-frequency [ELF]), EMF should be considered separately—electric fields and magnetic fields, measured in kV/m and milligauss (mG), respectively. Typical magnetic fields are depicted in **Figure 6.4-1**.

Figure 6.4-1. Typical Magnetic Fields

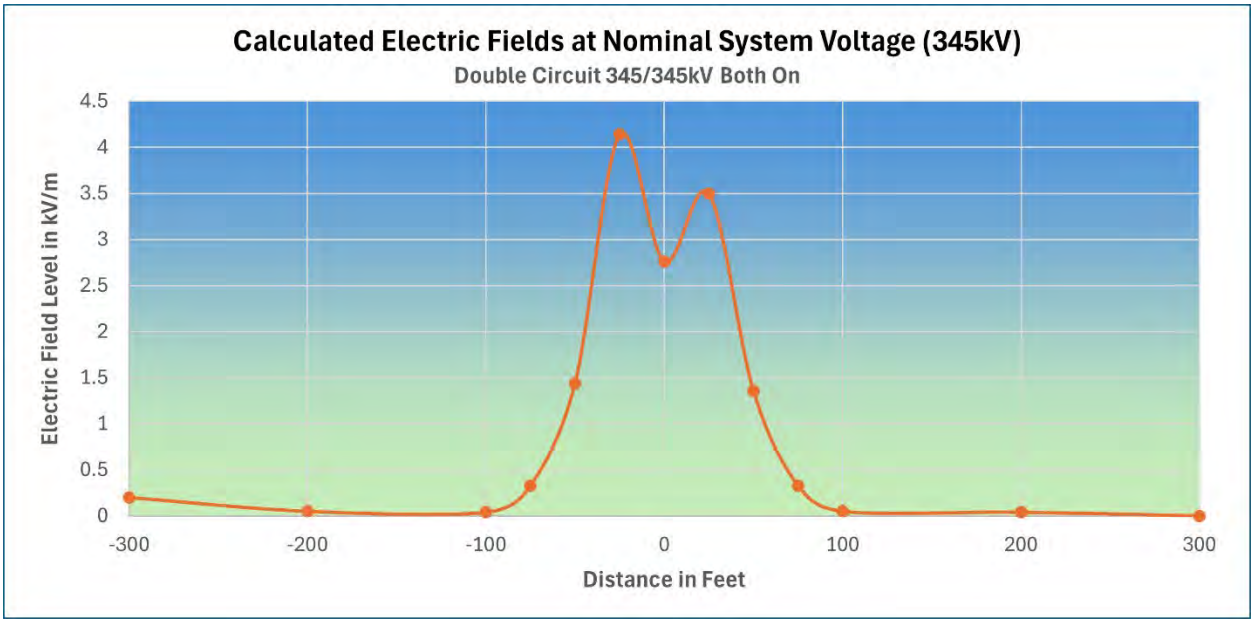


Electric fields are dependent on the voltage of a transmission line, and magnetic fields are dependent on the current carried by a transmission line. The strength of the electric field is proportional to the voltage of the line, and the intensity of the magnetic field is proportional to the current flow through the conductors. Transmission lines operate at a power frequency of 60 hertz (cycles per second).

6.4.5.2 Electric Fields

There is no federal standard for transmission line electric fields. However, the Commission has imposed a maximum electric field limit of 8 kV/m measured at 1 meter above the ground.[27] The standard was designed to prevent serious hazards from shocks when touching large objects parked under alternating current transmission lines of 500 kV or greater. **Figure 6.4-1** provides the electric fields at maximum conductor voltage for the proposed double-circuit, 345 kV HVTL. Maximum conductor voltage is defined as the nominal voltage plus 5 percent. The maximum electric field associated with the Project at various distances from the centerline, measured at 1 meter (3.28 feet) above ground, is shown in **Figure 6.4-1**.

Figure 6.4-2. Calculated Electric Fields (kV/m) for Proposed 345/345 Kilovolt Transmission Line Design (3.28 feet above ground)



As shown in **Figure 6.4-1**, the strength of an electric field diminishes rapidly as the distance from the conductor increases. The electric field values of all of the design options at the edge of the transmission line ROW and sample points beyond are shown in **Table 6.4-3**.[28]

[27] *In the Matter of the Route Permit Application for a 345 kV Transmission Line from Brookings County, S.D. to Hampton,* Docket No. ET2/TL-08-1474, ORDER GRANTING ROUTE PERMIT (Sept. 14, 2010) (adopting the Administrative Law Judge's Findings of Fact, Conclusions, and Recommendation at Finding 194).

[28] Electric field calculations are not provided for Project Skyway Substations because Project Skyway Substations will not be accessible to the public, and electric fields associated with the substations are anticipated to be similar to the 345 kV lines—and thus, well below the Commission's electric field limit.

Table 6.4-3. Electric Field Calculations Summary (kV/m)

Structure Type	Nominal Voltage	Distance to Proposed Centerline (feet)												
		-300	-200	-100	-75	-50	-25	0	25	50	75	100	200	300
345 kV/345 kV Double-Circuit Monopole	362 kV	0.2	0.05	0.04	0.33	1.44	4.14	2.76	3.5	1.36	0.33	0.05	0.04	0.02

6.4.5.3 Magnetic Fields

The projected magnetic fields for different structure and conductor configurations for the Project are provided in **Figure 6.4-2** and **Table 6.4-4**. Because magnetic fields are dependent on the current flowing on the line, magnetic fields were calculated for two different typical system conditions during the Project's first year in service (2029). These two scenarios are: (1) System Peak Energy Demand and (2) System Average Energy Demand. The System Peak Energy Demand current flow (estimated loading of 1100 MVA) represents the current flow on the line during the peak hour of system-wide energy demand. The System Average Energy Demand current flow (estimated loading of 660 MVA), represents the current flow on the line during a non-peak time (winter months) when there are high levels of wind generation and the transmission system is intact (i.e., no outages).

The magnetic field values for the two scenarios were calculated at a point where the conductor is closest to the ground. The magnetic field data shows that magnetic field levels decrease rapidly as the distance from the centerline increases (proportional to the inverse square of the distance from source). In addition, because the magnetic field produced by the transmission lines is dependent on the current flow, the actual magnetic fields when the Project is placed in service will vary as the current flow on the line changes throughout the day.[29]

[29] Magnetic field calculations for the Project Skyway Substations are not provided here because the specific physical design of a substation is required for a software package to calculate representative magnetic fields, and that level of design is not yet available for the Project Skyway Substations. Magnetic fields associated with the Project Skyway Substations are anticipated to be similar to other existing 345 kV substations in Minnesota.

Figure 6.4-3. Calculated Magnetic Flux density (mG) for Proposed 345/345 Kilovolt Transmission Line Design (3.28 feet above ground)

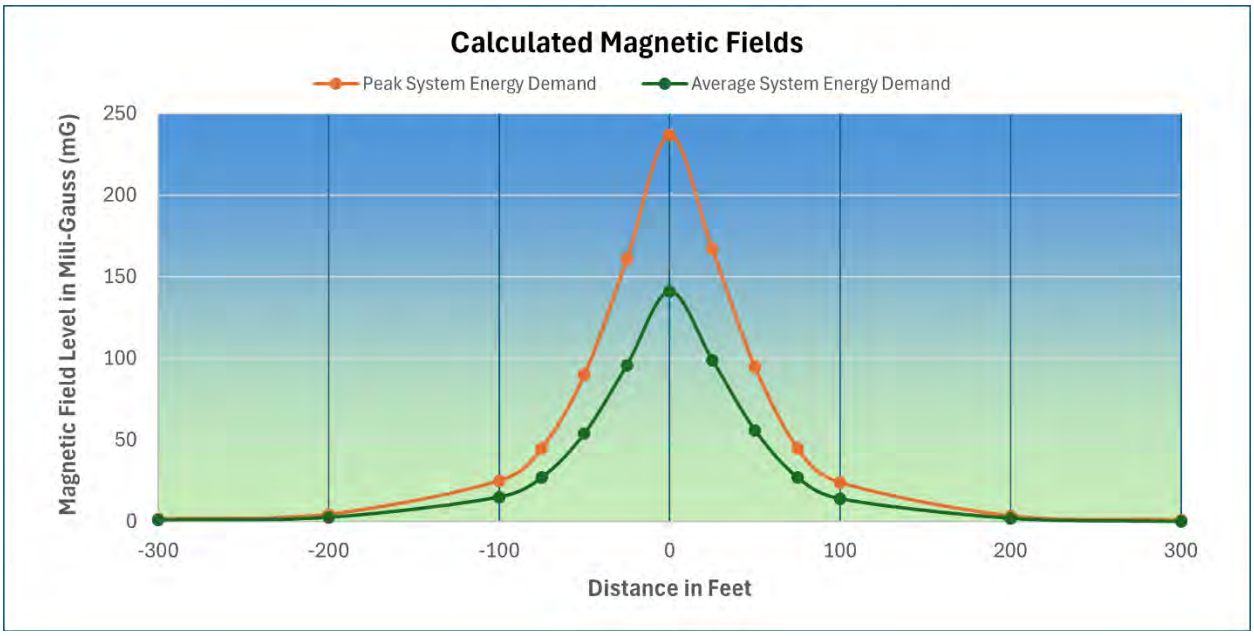


Table 6.4-4. Magnetic Field Calculation Summary (mG)

Structure Type	System Condition	Current (Amps)	Distance to Proposed Centerline (feet)												
			-300	-200	-100	-75	-50	-25	0	25	50	75	100	200	300
345 kV/345 kV Double-Circuit Monopole	Peak System Energy Demand (1100 MVA/1100 MVA)	1850/1850	1.5	4.5	25	45	90	161	237	167	95	45	24	3.5	1
	Average System Energy Demand (660 MVA/660 MVA)	1100/1100	1	2.6	15	27	54	96	141	99	56	27	14	2	0.6

There are presently no Minnesota regulations pertaining to magnetic field exposure. The Applicants will provide information to the public, interested customers, and employees so they can make informed decisions about magnetic fields. Such information includes the availability for measurements to be conducted for customers and employees upon request.

Considerable research has been conducted since the 1970s to determine whether exposure to power-frequency (60 hertz) magnetic fields causes biological responses and health effects. Public health professionals have also investigated the possible impact of exposure to EMF on human health for the past several decades. 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 health effects continues to be debated.

Since the 1970s, a large amount of scientific research has been conducted on EMF and health. This large body of research has been reviewed by many leading public health agencies, such as the U.S. National Cancer Institute, the U.S. National Institute of Environmental Health Sciences, and the World Health Organization (WHO), among others. These reviews do not show that exposure to electric power EMF causes or contributes to adverse health effects.

For example, in 2016, the U.S. National Cancer Institute summarized the research as follows:

> Numerous epidemiologic studies and comprehensive reviews of the scientific literature have evaluated possible associations between exposure to non-ionizing EMFs and risk of cancer in children (13–15). (Magnetic fields are the component of non-ionizing EMFs that are usually studied in relation to their possible health effects.) Most of the research has focused on leukemia and brain tumors, the two most common cancers in children. Studies have examined associations of these cancers with living near power lines, with magnetic fields in the home, and with exposure of parents to high levels of magnetic fields in the workplace. No consistent evidence for an association between any source of non-ionizing EMF and cancer has been found.[30]

Wisconsin, Minnesota, and California have all conducted literature reviews or research to examine this issue. In 2002, Minnesota formed an Interagency Working Group (Working Group) to evaluate the body of research and develop policy recommendations to protect public health from any potential problems resulting from high voltage transmission line EMF effects. The Working Group consisted of staff from various State agencies and published its findings in a White Paper on EMF Policy and

[30] National Cancer Institute, *Electromagnetic Fields and Cancer* (reviewed May 30, 2022), *available at* https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/electromagnetic-fields-fact-sheet (last accessed Feb. 23, 2023).

Mitigation Options in September 2002, (Minnesota Department of Health, 2002). The report summarized the findings of the Working Group as follows:

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

The Commission, based on the Working Group and WHO findings, has repeatedly found that "there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects."[31]

6.4.5.4 Stray Voltage and Induced Voltage

"Stray voltage" is a condition that can potentially occur on a property or on the electric service entrances to buildings from distribution lines connected to these buildings; not typically transmission lines as proposed in this Application. The term generally describes a voltage difference between two objects where no voltage difference should exist. More precisely, stray voltage is a voltage that exists between the neutral wire of either the service entrance or of premise wiring and grounded objects in buildings, such as barns and milking parlors. The source of stray voltage is a voltage that is developed on the grounded neutral wiring network of a building and/or the electric power distribution system.

Transmission lines do not, by themselves, create stray voltage because they do not connect directly to businesses or residences. Transmission lines, however, can induce voltage on a distribution circuit that is parallel and immediately under the transmission line. If the proposed transmission lines are parallel

[31] *In the Matter of the Application of Xcel Energy for a Route Permit for the Lake Yankton to Marshall Transmission Line Project in Lyon County*, MPUC Docket No. E002/TL-07-1407, Findings of Fact, Conclusions of Law and Order Issuing a Route Permit to Xcel Energy for the Lake Yankton to Marshall Transmission Project at 7-8 (Aug. 29, 2008); *see also In the Matter of the Application for a HVTL Route Permit for the Tower Transmission Line Project*, MPUC Docket No. ET2, E015/TL-06-1624, Findings of Fact, Conclusions of Law and Order Issuing a Route Permit to Minnesota Power and Great River Energy for the Tower Transmission Line Project and Associated Facilities at 23 (Aug. 1, 2007) ("Currently, there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects.").

or cross distribution lines, appropriate mitigation measures can be taken to address any induced voltages.

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

The power lines will be designed to meet or exceed minimum clearance requirements for electric fencing as specified by the NESC. Nonetheless, insulated electric fences used in livestock operations can be instantly charged with induced voltage from transmission lines. The induced charge may continuously drain to ground 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. The local electrical utility can provide site-specific information about how to prevent possible shocks when the charger is disconnected.

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

Vehicles or any conductive body located under HVTLs could be immediately charged with an electric charge. Without a continuous grounding path, this charge can provide a nuisance shock. Such nuisance shocks are rare events because vehicles are generally effectively grounded through tires. Modern tires provide an electrical path to ground because carbon black, a good conductor of electricity, is added to tires 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, the induced charge on vehicles will normally be continually flowing to ground unless the vehicle has unusually old tires or is parked on dry rock, plastic, or other surfaces that insulate them from the ground.

Buildings are permitted near transmission lines but are generally discouraged within the ROW because a structure under a line may interfere with the safe operation of the transmission facilities. For example, a fire in a building within the ROW could damage a transmission line. The NESC establishes minimum electrical clearance zones from power lines for the safety of the general public, and utilities often acquire easement rights that allow clear areas in excess of these established zones. Utilities may permit encroachment into that easement for buildings and other activities when they can be deemed safe and still meet the NESC minimum requirements. Metal buildings may have unique issues due to induction concerns. For example, conductive buildings near power lines of 200 kV or greater must be grounded properly. Any person with questions about a new or existing metal structure can contact the Applicants for further information about proper grounding requirements.

6.4.5.6 Potential Impacts

Impacts on public health and safety are anticipated to be negligible because the Project will be designed to meet or exceed local, state, NESC, and the Applicants' standards regarding ground clearance, crossing utilities clearance, building clearance, strength of materials, and ROW width.

6.4.5.7 Mitigation Measures

The Project will be designed in compliance with local, State, and NESC standards regarding ground clearance, crossing utilities clearance, building clearance, strength of materials, and ROW widths. Appropriate standards will be met for construction and installation, and all applicable safety procedures will be followed during and after installation. The transmission line will be equipped with protective devices to safeguard the public in the event of an accident, or if the structure or conductor falls to the ground. The protective devices include breakers and relays located where the line connects to the substation(s). The protective equipment will de-energize the line should such an event occur. In the event of an incident, the Project's emergency response plan will be implemented, and local emergency services will be contacted, as needed. Emergency services in the Project Area are discussed further in Section 6.4.7. In addition, the substation facilities will be fenced properly and accessible by authorized personnel only.

Because the Applicants do not expect electric and magnetic fields to be an issue along the Proposed Route, the Applicants do not propose additional mitigative measures specific to EMF.

Commission-issued Route Permits typically include standard conditions that require the Permittee to design the transmission line and associated facilities to meet or exceed all relevant local and State codes, NESC, and North American Electric Reliability Corporation requirements.

Route Permits from the Commission typically contain a standard condition that the Permittee shall design, construct, and operate the transmission line in such a manner that the electric field measured 1 meter above ground level immediately below the transmission line shall not exceed 8 kV/m. The Applicants have calculated the approximate electric field for the Project's transmission configuration and estimated the peak magnitude of electric field density to be 4.14 kV/m as shown in **Figure 6.4-1**.

6.4.6 Noise

The ROI for noise is the Study Area. MPCA defines noise as undesired sound.[32] Noise can vary in intensity and magnitude across the entire frequency spectrum. Higher to more moderate noise frequencies can typically be heard with greater ease than lower frequencies and are, therefore, generally given more "weight" for how intensely they can be perceived by the human ear. To account for the differences in how humans respond to sound and the variance in perception for high and low

[32] Minnesota Pollution Control Agency (MPCA). 2015. A Guide to Noise Control in Minnesota. Online [URL]: https://www.pca.state.mn.us/sites/default/files/pgen6-01.pdf. Accessed: November 2025.

frequencies, an "A-weighted decibel" (dBA) scale is frequently used, which logarithmically approximates relative human perceptions of loudness. It is commonly accepted that an increase of 3 dBA is considered barely perceptible to the average listener, but an increase of 10 dBA is perceived as a doubling of loudness, and an increase of 20 dBA is a quadrupling of loudness.[32,33] Additionally, as dBA rises, human hearing is more likely to be damaged.

When considering cumulative noise impacts in an environment with several sources of noise, if there is a difference of greater than 10 dBA between noise sources, there will be no additive effect and only the louder source will contribute to noise. Therefore, noise levels associated with quiet sources can be barely perceptible compared to ambient noise levels and may not increase existing background noise.[34] **Table 6.4-5** shows noise levels associated with common, everyday sources, providing context for the noise sources discussed below.

Table 6.4-5. Common Noise Sources and Levels[32]

Sound Pressure Level (dBA)	Noise Source
110	Rock band at 5 meters
100	Jet flyover at 300 meters
90	Gas lawnmower at 1 meter
80	Food blender at 1 meter
70	Vacuum cleaner at 3 meters
60	Normal speech at 1 meter
50	Dishwasher next room, quiet urban daytime
40	Library, quiet urban nighttime
30	Bedroom at night
20	Quiet rural nighttime
10	Broadcast recording studio
0	Threshold of hearing

MPCA has established standards for the regulation of noise levels for residential, commercial, and industrial areas. The audible land use activities associated with residential, commercial, and industrial land have been grouped together into Noise Area Classifications (NAC) under Minn. R. parts 7030.0040 and 7030.0050, shown in **Table 6.4-6**. Each NAC has been assigned daytime (7 a.m. to

[33] Federal Highway Administration (FHWA). 2018. Final Report Techniques for Reviewing Noise Analyses and Associated Noise Reports. 6.1.2018. Online [URL]: https://www.fhwa.dot.gov/Environment/noise/resources/reviewing_noise_analysis/fhwahep18067.pdf. Accessed: November 2025.

[34] Canadian Centre for Occupational Health and Safety. 2019. Noise – Basic Information. Fact sheet last revised 2019-11-26. Online [URL] https://www.ccohs.ca/oshanswers/phys_agents/noise/noise_basic.pdf. Accessed: November 2025.

10 p.m.) and nighttime (10 p.m. to 7 a.m.) noise limits for land use activities. Under MPCA guidelines, "L10" means the sound level, expressed in dBA, which is exceeded 10 percent of the time for a 1-hour survey as measured by test procedures approved by the commissioner, and "L50" means the sound level, expressed in dBA, which is exceeded 50 percent of the time for a 1-hour survey. L10 and L50 describe the limiting levels of sound established on the basis of present knowledge for the preservation of public health and welfare used for determining compliance with Minn. R. 7030.0050.

Table 6.4-6. Minnesota Noise Standards

Noise Area Classification	Daytime (7a – 10p)		Nighttime (10p – 7a)	
	L_{50}	L_{10}	L_{50}	L_{10}
1: Residential and Other Sensitive Uses	60	65	50	55
2: Non-Residential Uses (typical Commercial)	65	70	65	70
3: Non-Residential Uses (typical Industrial, Agricultural)	75	80	75	80
4: Undeveloped Uses	N/A	N/A	N/A	N/A

Source: Minn. R. 7030.0050.

Land use types in the ROI include residential, commercial, industrial, and recreational (**Table 6.4-7**).

Table 6.4-7. Land Use Types in the ROI

Land Use Type/Receptor	Distance (miles)	Count
Residential	<0.25	2
	0.26 – 0.50	5
	0.51 – 0.75	42
	0.76 – 1	107
	Subtotal	155
Commercial	<0.25	0
	0.26 – 0.50	1
	0.51 – 0.75	7
	0.75 – 1	3
	Subtotal	11
Industrial	<0.25	0
	0.26 – 0.50	1
	0.51 – 0.75	5
	0.76 – 1	9
	Subtotal	15

Land Use Type/Receptor	Distance (miles)	Count
Recreational	0.94	1
	Total	182

6.4.6.1 Potential Impacts

Noise Related to Construction

Noise levels during construction activities will range from minimal to moderate and are anticipated to be short-term and intermittent. Construction noise typically includes intermittent noise associated with operation of heavy equipment and transport of equipment and personnel to and from construction sites during daytime hours. Noise related to construction ranges from minimal to significant depending on equipment type, and duration may vary depending on the type of construction activity. Construction equipment noise levels will typically be less than 85 dBA at 50 feet when equipment is operating at full load and will occur when equipment is operating.[35] Residents living near the construction of the Project could be temporarily affected by noise occurring during construction activities. Upon completion of construction activities, noise associated with construction equipment will cease.

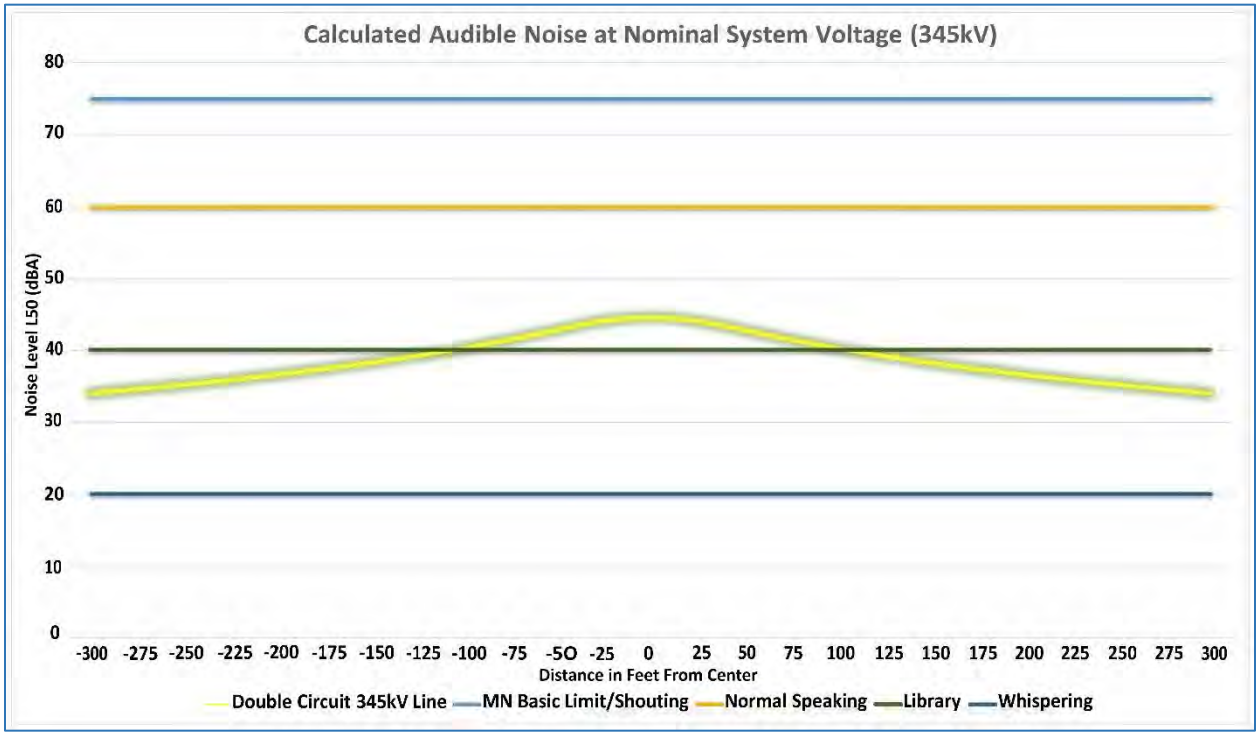
Noise Related to Operation of the Transmission Lines

Noise levels during operation and maintenance of the Project's transmission line will generally be minimal. Transmission conductors can produce noise under certain conditions. The level of noise depends on conductor conditions, voltage level, and weather conditions. Noise emission from a transmission line occurs during certain weather conditions. In foggy, damp, or rainy weather, 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 background noise level of the rain is usually greater than the noise from the transmission line. As a result, people do not normally hear noise from a transmission line during heavy rain. During light rain, dense fog, snow, and other times when there is moisture in the air, transmission lines will produce audible noise equal to approximately household background levels. During dry weather, audible noise from transmission lines is barely perceptible by humans.

The Applicants anticipate that NAC 3 is likely to apply to the large majority of the transmission line. NAC 3 has a daytime L50 limit of 75 dBA and a nighttime L50 limit of 75 dBA. As shown in **Figure 6.4-3**, the proposed 345 kV line will be below Minnesota limits.

[35] U.S. Federal Highway Administration. 2006. FHWA highway construction noise handbook. No. DOT-VNTSC-FHWA-06-02; FHWA-HEP-06-015. Online [URL]: https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook00.cfm. Accessed: November 2025.

Figure 6.4-4. Noise Chart



Noise Related to Operation of the Existing and Expanded North Rochester Substation and Project Skyway Substations

Noise levels during operation and maintenance of the Project's substations will generally be minimal. Transformer or shunt reactor "hum" is the dominant noise source at substations if such equipment exists. At substations without transformers or shunt reactors, only infrequent noise sources would exist, such as the opening and closing of circuit breakers or the operation of an emergency generator. Typical substation design is such that noise produced by these sources does not reach beyond the substation property. Like the transmission lines themselves, Project substations will comply with the MPCA noise standards set forth in Minn. R. 7030.0040.

6.4.6.2 Mitigation Measures

Noise associated with construction of the Project will be temporary in nature. To mitigate noise impacts associated with construction activities, work will generally be limited to daytime hours between 7 a.m. and 7 p.m. on weekdays. The Applicants will work with applicable stakeholders in the event construction becomes necessary outside of these hours. Heavy equipment will also be equipped, as required by local ordinances, with sound attenuation devices, such as mufflers, to minimize the daytime noise levels.

Operational noise levels are expected to be well below the State noise limits at receptors; therefore, the Project is not anticipated to contribute to an exceedance of noise standards, and no mitigation is

proposed. In the rare case that the substations cannot be designed where noise does not reach beyond the substation property because space is limited, noise reduction designs, such as sound walls placed around transformers to reduce the distance the sound can travel, will be applied as necessary.

Commission-issued Route Permits typically require permittees to comply with MPCA noise standards and limit construction and maintenance activities to daytime working hours, to the extent practicable.

6.4.7 Public Services and Transportation

The ROI for public services and transportation is the Study Area. This section provides information about public services, including police, fire, and ambulance services; hospitals; water and wastewater services; school districts; utilities; and other public services. Section 6.4.7.9 discusses potential Project impacts on these public services and Section 6.4.7.10 discusses mitigation measures for those impacts.

6.4.7.1 Emergency Services and Communication

Police, fire, and ambulance services are provided by emergency response and law enforcement in nearby cities and counties. The Goodhue County sheriff's department provides law enforcement services for the city of Pine Island. Most law enforcement in proximity to the Study Area is centered around urban settings where higher human populations and crime are typically concentrated.

Fire departments would provide emergency fire response services to the Project. Fire services are provided by city and community fire departments in the Study Area. Pine Island has a volunteer fire department that serves the city of Pine Island and surrounding townships.

The Study Area falls within the Zumbrota Area Ambulance Service district, which will provide emergency medical response services to the Project. Combined fire and ambulance services will be provided by the Pine Island Volunteer Fire Department. The Mayo Medair Ambulance Service in Rochester provides emergency helicopter transport for patients in areas within a 150-mile radius surrounding the Mayo Clinic in Rochester.

Allied Radio Matrix for Emergency Response (ARMER) towers are a network of radio towers and radio transmission equipment used for emergency response services throughout Minnesota, including the Study Area.

There are seven hospitals and clinics that offer emergency services within a 25-mile radius of the Project. Details regarding the clinic and hospital distance from the Project are shown in **Table 6.4-8**.

Table 6.4-8. Hospitals and Clinics Within 25 miles of the Project

Hospital Name	City	Approximate Distance from Proposed Route (miles)	Heliport ID (if applicable)
Olmsted Medical Center – Pine Island	Pine Island	0.32	N/A
Olmsted Medical Center – Northwest Clinic and Urgent Care	Rochester	10.62	N/A
Mayo Clinic Hospital – Saint Mary's Campus	Rochester	15.76	99MN
Mayo Clinic Hospital – Methodist Campus	Rochester	15.78	MN56
Olmsted Medical Center Hospital	Rochester	16.83	N/A
Mayo Clinic Health System – Cannon Falls	Cannon Falls	21.20	3MN8
Mayo Clinic Health System – Red Wing	Red Wing	23.10	97MN

Several hospitals near the Project offer emergency air transport, including the Mayo Clinic Hospital, Saint Mary's Campus, located in Rochester (Heliport ID 99MN); Mayo Clinic Hospital, Methodist Campus (Heliport ID MN56); Mayo Clinic Health System, Cannon Falls (Heliport ID 3MN8); and Mayo Clinic Health System, Red Wing (Heliport ID 97MN) with associated heliports that may be used for emergency medical services in the Study Area.

6.4.7.2 Utilities

Existing electric utilities in the Study Area are provided by Xcel Energy. The Project transmission line parallels existing Xcel Energy transmission lines for approximately 0.55 mile.

Water and wastewater services provide clean drinking water and access to sewage treatment, which are critical to maintaining public health. Municipal water and wastewater services are provided to residences and businesses within the city and township in the Study Area. In rural areas, residents typically use private septic systems and wells. Because the majority of the Project is primarily in a rural area beyond the boundary of the city of Pine Island, most residences have private septic systems. Goodhue County has septic programs that conduct inspection services, issue permits, and oversee installation and maintenance of private septic systems and wells.

6.4.7.3 Public Communications

Operation of transmission lines can interfere with technology that produces amplitude modulation (AM) radio frequency signals, including radio stations, televisions, cellular phones, and Global Positioning System (GPS) devices. Overhead transmission lines are designed to not cause radio or television interference under typical operating conditions. Corona, as well as spark discharge, from transmission line conductors can generate electromagnetic "noise" at the same frequencies that some

radio and analog television signals are transmitted.[36] This noise can cause interference with the reception of these signals, depending on the frequency and strength of the radio and television signal. Interference from a spark discharge source can be found and corrected. The following paragraphs provide a summary of devices that may be impacted by operation of the Project.

6.4.7.4 Radio

AM and frequency modulation (FM) radio broadcasting stations that operate or can be heard within the Study Area include (but are not limited to):

- Minnesota Public Radio KLSE (90.7 FM Rochester)
- Minnesota Public Radio KZSE (91.7 FM Rochester)
- Rochester Public Radio KRPR (89.9 FM Rochester)
- KFAN Sports Radio (1270 AM Rochester)
- The Ticket KOLM (1520 AM Rochester)
- Laser KRCH (101.7 FM Rochester)

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

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

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

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

[36] Full power television stations were required by the DTV Delay Act, Public Law No: 111-4, to cease broadcasting signals by June 12, 2009.

6.4.7.5 Television

Television interference is rare but may occur when a large transmission structure is aligned very close to the receiver and between the receiver and a weak distant signal, creating a shadow effect. If television or radio interference is caused by or from the operation of the proposed facilities in those areas where good reception is presently obtained, the Applicants will take necessary action to restore reception to the present level, including the appropriate modification of receiving antenna systems, if deemed necessary.

There are seven television channels broadcast in the Study Area.[37] Television broadcasts are received from local stations within the Study Area, the Twin Cities Metro area, and other cities in Minnesota and neighboring states.

6.4.7.6 Cellular Phone

There are no registered cellular phone towers located within the Study Area. Cellular phone service providers beyond the Study Area include, but are not limited to, AT&T, Verizon Wireless, and T-Mobile, which offer service in the area and have stores located in Rochester and Zumbrota.

6.4.7.7 Global Positioning System

GPS technology uses satellites to provide precise location information across the surface of the earth, functioning independently of internet or telephone operations. GPS applications are used by a range of industries and public sectors, including agriculture, aviation, defense, education, Global Information System (GIS) services, and public recreation. GPS technology is likely used throughout the Project Area.

GPS signals operate in certain UHF bands between 1.1 and 1.6 GHz. Similar to cellular phones, the EMF from transmission lines will not impact GPS signal reception. However, the structures and conductors may have effects like trees, buildings, or other line-of-sight obstructions. GPS devices continuously pull signals from multiple satellites, not just one. If farming equipment has a GPS unit, the equipment should work properly when underneath the transmission line with a similar degree of accuracy as when not near a transmission line. Transmission line poles can occasionally partially block line-of-sight communications between ground-based, Real-Time Kinematic positioning GPS base stations and roving equipment. There is the potential for a signal to be blocked temporarily, but it should be expected to come back within a few seconds as the farm equipment continues to move past the pole. Alternatively, as with any other line-of-site obstruction, this issue can be overcome by relocating the base stations or using repeater stations.

[37] Federal Communications Commission. *DTV Reception Maps*. https://www.fcc.gov/media/engineering/dtvmaps. Accessed February 2026.

6.4.7.8 Transportation

The Study Area includes several roadways. The description of these features and a discussion of potential impacts from construction and operation of the Project is presented below.

Roadways

The Study Area includes multiple roadways. The proposed transmission line for the Project crosses one U.S. trunk highway, U.S. Highway 52. Roads are depicted on the detailed route maps (**Appendix B).**

A review of the Minnesota 2026–2029 State Transportation Improvement Program[38] and Pine Island Comprehensive Plan[39] indicates there are no roadway improvement projects planned along road sections crossed or bordered by the Project. However, in discussion with MNDOT staff, Xcel Energy learned that MNDOT is planning a southbound Highway 52 resurfacing project in 2028. The southbound lanes will be closed and there will be one lane of traffic northbound and southbound on the northbound lanes during this project.

Table 6.4-9. Trunk Highway Crossings along the Proposed Route

Lat/Long	MNDOT Trunk Highway Name	Crossing Length (feet)	Collocated (Yes/No)	Collocation Length (feet)
44.2232244/-92.6506709	U.S. Highway 52	284	No	N/A

Annual Average Daily Traffic (AADT) volumes were obtained for U.S. Highway 52. Average daily traffic volumes are generally high in the Study Area.

Table 6.4-10. Annual Average Daily Traffic on Trunk Highways Crossed by or Co-Located with the Proposed Route

Highway	Measurement Location	AADT, vehicles per day	Traffic Count Year
U.S. Highway 52	Northwest of CSAH11 (Center Dr) Northeast of Pine Island	29,194	2024

Source: MNDOT 2025.[40]

[38] Minnesota Department of Transportation. 2025. State of Minnesota 2026-2029 State Transportation Improvement Program (STIP). Online [URL]: https://www.dot.state.mn.us/planning/program/stip.html. Accessed: November 2025.

[39] City of Pine Island. 2025. Pine Island 2045 Comprehensive Plan. Online [URL]: https://pineislandmn.gov/comperhensive. Accessed: November 2025.

[40] Minnesota Department of Transportation. 2025. State of Minnesota 2026-2029 State Transportation Improvement Program (STIP). Online [URL]: https://www.dot.state.mn.us/planning/program/stip.html. Accessed: November 2025.

Impacts on roadways are anticipated to be temporary during construction of the proposed Project and minor to moderate depending on the form of transportation and location.

Railroads

There are no rail lines crossed by the Project or located within the Study Area.

Airports and Airstrips

Operation of transmission facilities can pose safety concerns near airports and airstrips. Airports, as defined by the State and Federal Aviation Administration (FAA), are areas of land or water that are used or intended to be used for the landing and takeoff of aircraft, and includes the surrounding area used or intended to be used for airport buildings and facilities (14 Code of Federal Regulations [CFR] Part 1, §1.1 and Minn. R. 8800.0100, subp. 3). As aircraft take off and land at airports, transmission lines can pose hazards or affect maneuverability of aircraft if the structures encroach into the airspace. Federal Aviation Regulation (FAR) Part 77 and Minn. R. 8800.1200 establish height guidelines for any structures that could endanger aircraft, which includes structures exceeding 200 feet above ground level (AGL) or the airport elevation (whichever is greater). These guidelines impose stricter regulations for structures within a maximum distance of 20,000 feet (3.78 miles) of a public use or military airport.

A complete description and copy of the FAA and Minnesota Airport Zoning Standards can be found at 14 CFR Part 77 and Minn. Rules 8800.1100. Additionally, all structures 200 feet AGL must be marked and lighted in accordance with FAA Advisory Circular 70/7460-1K, Obstruction Marking and Lighting.

Aerial crop dusting, which involves spraying fertilizers, herbicides, and pesticides from specialized aircraft, is an important part of agricultural activities in Minnesota and may occur along various fields within the Study Area during construction and operation of the proposed Project. Aircraft used in aerial applications may use airstrips in and surrounding the Project.

There are no airports or airstrips within approximately 20,000 feet (3.78 miles) of the ROW for the proposed Project. The Nietz airstrip is approximately 9.7 miles southeast of the Project, and the closest airport is the Rochester International Airport located in Rochester, MN, approximately 22.5 miles southeast of the Project.

Other Public Services

There is one school district, Pine Island Public School District (ISD 255), crossed by the Proposed Route.

Other public services in proximity to the Study Area include public works and utility departments who design and maintain public infrastructure, including sanitary sewers and water mains, sidewalks, streets,

public parks and trails, and public landscaping. Public facilities include parks, community gardens, an ice rink, and public pickleball and tennis courts.

6.4.7.9 Potential Impacts

Emergency Services and Communication

Impacts on law enforcement, fire services, medical services, water and wastewater services, school districts, utilities, and other public services are expected to be negligible during construction and operation of the Project.

Construction and operation of the proposed transmission line may pose a risk to workers through incidents resulting from the operation of heavy equipment, falls, and equipment-use related injuries. The Applicants will ensure workers follow all safety standards to the maximum extent practicable.

Utilities

Damage to utility pipelines or water lines are expected to be negligible because transmission lines will be designed to span the existing ROW of underground utilities.

Public Communications

Impacts on radio, television, cellular phones, or GPS units are expected to range from negligible to minimal during the construction and operation of the Project.

Corona and electrical spark discharge (gap discharge) from transmission line conductors can generate noise at the same frequency that some AM radio signals are transmitted and can, therefore, result in some noise interference. AM radio interference generally occurs directly below transmission lines and will dissipate rapidly with increased distance from the transmission line ROW. Signals for FM radio are generally high enough to not be influenced by corona or gap discharge.

Television broadcast frequencies (digital and satellite) are typically not impacted by operation of transmission lines because signals are high enough to not be influenced by corona-generated interference. In particular, digital and satellite television transmissions are not affected by corona-generated noise because they are dependent on packets of binary information or transmitted in the Ku band of radio frequencies (12,000 to 18,000 megahertz [MHz]). Digital and satellite transmissions are more likely to be affected by multi-path reflections (shadowing) generated by nearby transmission structures. In addition, line-of-sight interference from transmission line structures can affect satellite television transmissions. The use of shielded coaxial cable for cable television transmittals generally makes them insusceptible to interference from electromagnetic noise. Interference to digital and satellite signals as a result of the Project is not anticipated.

Cellular phone signals use an ultra-high frequency, generally around 900 MHz, which is significantly higher than the range of electromagnetic noise generated by transmission line conductors. GPS signals

operate at a higher frequency as well, within the range of 1,225 to 1,575 MHz. Because both cellular phone signals and GPS operate at frequencies outside the range of electromagnetic noise generated by transmission line conductors, the risk of interference is negligible.

Transportation

Impacts on transportation are expected to be minimal to moderate and short term. Project construction could impact roadways and result in temporary closures, lane closures, traffic delays, and increased traffic volumes due to the presence and movement of personal and construction vehicles by Project construction employees. Lane closures and traffic management may pose safety concerns to workers and the public as active traffic and workers move throughout the construction space. Lane closures could range from minutes to hours, depending on the width of the ROW and extent of the construction activity. Additionally, construction along roadways can increase dust as grading occurs, which can obscure road lines or vision. Concerns related to construction along roadways or trails would be temporary and localized to areas where active construction is underway.

The Proposed Route does not cross any rail lines; therefore, no impacts on rail lines are anticipated.

There are no airports or airstrips within approximately 20,000 feet (3.78 miles) of the ROW for the Proposed Route and, therefore, no impacts on airports or airstrips are anticipated.

Other Public Services

Overall, public services are not anticipated to be impacted by construction and operation of the Project.

6.4.7.10 Mitigation Measures

Because no impacts on public services are anticipated, no mitigation is proposed. The Applicants will coordinate with local emergency services to ensure that emergency access to areas near construction activities is maintained. In the event an incident does occur, local emergency services will be contacted, which should be available in all areas of the proposed Project.

The Applicants will notify Gopher State One-Call of all proposed excavations to identify underground utilities. If a pipeline or water line must be spanned during construction of the Project, the Applicants will use soil preserving BMPs, such as construction matting over underground utilities, when using heavy equipment.

The Applicants will contact utility providers, businesses, or residents near the construction area to notify them of potential impacts and prevent damage to public utilities.

If transmission line operation results in interference to AM radio stations, modification of the receiving antenna system can restore reception.

If interference to digital and satellite signals were to occur from multi-path reflections or line-of-sight interference, such interference can be mitigated by use of an outdoor antenna to improve digital signals or by moving the affected satellite antenna to a slightly different location.

Where road interruptions must occur, impacts on safety during construction will be mitigated by limiting construction traffic to the Project ROW and existing access points, to the maximum extent feasible. Temporary closures in rural areas should not significantly impact transportation because rural areas typically have low traffic levels and normal traffic flows can be rerouted. Dust along grading areas near roadways or trails will be managed and reduced through proper use of BMPs (e.g., soil matting, wetting), which will reduce the potential for dust. Where roads must be used for construction access, the Applicants will utilize appropriate safety measures, such as use of safety signage, installation of temporary barrier structures, and employing spotters during clearing or stringing activities.

Once construction along or crossing a roadway is completed, the Applicants will confirm that roads used for access during construction are returned to either the condition they were in or better before ROW clearing began, and road(s) will be reopened to allow normal traffic flow. The Applicants will meet with MNDOT, County highway departments, Township road supervisors, and/or City road personnel to address any issues that occur during roadway construction.

The Applicants will apply for utility permits for work within roadway ROW under Minnesota Rules 8810.3100-8810.3600 and applicable County and City ordinances for roads crossed or bordered by the Project. The Applicants will work with MNDOT and local municipalities to ensure the proposed alignment meets utility guidelines, will not interfere with routine roadway maintenance, and will not adversely impact conditions of existing roadway ROW. If a new driveway access from U.S. Highway 52 to the expanded North Rochester Substation area is required, Xcel Energy will work with MNDOT to obtain the required permit.

Commission-issued Route Permits typically include standard conditions that directly mitigate impacts on public services, public utilities, and transportation, including:

- During construction, the Permittee shall minimize any disruption to public services or public utilities. To the extent disruptions to public services or public utilities occur, these shall be temporary, and the Permittee shall restore service promptly. Where any impact on utilities has the potential to occur, the Permittee shall work with both landowners and local entities to determine the most appropriate mitigation measures if not already considered as part of the Route Permit. The Permittee shall cooperate with MNDOT, County, and City road authorities to develop appropriate signage and traffic management during construction.

- The Permittee shall advise the appropriate governing bodies having jurisdiction over all state, county, city, or township roads that will be used during the construction phase of the Transmission Facility. Where practical, existing roadways shall be used for all activities associated with construction of the Transmission Facility. Oversize or overweight loads

associated with the Transmission Facility shall not be hauled across public roads without required permits and approvals.

6.4.8 Land Use and Zoning

The ROI for land use and zoning is the route width. Land use within the ROI is rural, consisting primarily of cultivated crops with scattered areas of low intensity development. **Table 6.4-11** details the land use types within the ROI.

Table 6.4-11. Land Use Types within the ROI

Land Use Type	Route Width (Acres)	Percent of Route Width
Barren Land	9.4	2.8
Cultivated Crops	291.5	88.5
Deciduous Forest	5.3	1.6
Developed, Low Intensity	9.0	2.7
Developed, Medium Intensity	1.2	0.4
Developed, Open Space	5.1	1.6
Evergreen Forest	0.9	0.3
Hay/Pasture	3.5	1.1
Mixed Forest	3.5	1.1
Woody Wetlands	0.2	0.05
Total[a]	**329.5**	**100.0**

[a] Addendums may not sum due to rounding.

The Project Area is subject to zoning ordinances associated with Goodhue County and the city of Pine Island. The Goodhue County Comprehensive Plan was adopted in 2016.[41] The northern portion of the ROI is currently zoned by Goodhue County as Agricultural Protection (A1), and the southern portion is zoned by Goodhue County as Agricultural (A3) (Figure 5 in **Appendix B**).[41]

A small portion in the southeastern portion of the ROI is currently zoned by the City of Pine Island as an Agricultural District (AG) (Figure 5 in **Appendix B**). The City of Pine Island Comprehensive Plan was adopted in 2025.[42] The plan identifies the need for more commercial development along U.S. Highway 52 due to the anticipated increase in population. As a result of the plan, the portion of

[41] Goodhue County. 2016. Goodhue County Comprehensive Plan 2016. Online [URL]: https://goodhuecountymn.gov/files/county_ordinances/comprehensive_plan.pdf. Accessed: November 2025.

[42] City of Pine Island. 2025. Pine Island 2045 Comprehensive Plan. Online [URL]: https://pineislandmn.gov/vertical/Sites/%7B52A5D060-3422-4069-8E86-A961C2752B7F%7D/uploads/Amended_Pine_Island_Comprehensive_Plan_2024_(rev._1.21.2025).pdf. Accessed: November 2025.

the ROI located west of U.S. Highway 52 is guided as commercial and the portion of the ROI located east of U.S. Highway 52 is guided as industrial.

The portion of the Project east of Highway 52 is located within an Orderly Annexation Area between the City of Pine Island and Pine Island Township. Ryan Companies, US, submitted an application for final plat and zoning to the City of Pine Island, and as part of the application, requested the eastern portion of the Project Area be annexed into the city of Pine Island.[43] Project Skyway received conditional approvals on January 20, 2026, from Pine Island for annexation and rezoning, which includes a Conditional Use Permit (CUP) for a Planned Unit Development (PUD) for industrial uses and a final plat. However, the State's 30-day annexation review will only begin after the developer pays the required reimbursement in lieu of taxes upon closing on acquisition of the property. The zoning approvals, including the CUP and PUD, will become effective once the annexation is complete. This is anticipated to be in the summer of 2026.

The route width lies within the Zumbro River Watershed (HUC 07040004) and is included in the planning area of the Watershed Alliance for the Greater Zumbro Comprehensive Watershed Management Plan.[44] Applicants will abide by all necessary stormwater erosion and prevention measures to ensure consistency with stormwater management goals laid out in the abovementioned plan.

6.4.8.1 Potential Impacts

Impacts on land use are expected to range from negligible to minimal. The Applicants reviewed available zoning information for the county and municipalities crossed by the Project, and the Project is anticipated to be consistent with authorized uses within the affected zoning areas crossed. The Project predominantly crosses areas currently zoned as agricultural within the ROI. Transmission lines and associated facilities are typically either permitted or conditional uses in areas zoned as agricultural, and transmission lines and substations currently exist in these areas within and adjacent to the ROI. The Project does not cross scenic river, shoreland, or floodplain management districts that would require special land use provisions.

As discussed above, a portion of the land east of Highway 52 in the Project Area is currently being rezoned from agricultural to light industrial with a PUD overlay, which will allow for transmission line and substation uses. Existing land uses along the transmission line would experience short-term

[43] Ryan Companies US Inc. 2025. Pine Island Industrial Planned Unit Development Submittal Narrative. [URL]: https://pineislandmn.gov/vertical/sites/%7B52A5D060-3422-4069-8E86-A961C2752B7F%7D/uploads/Pine_Island_Industrial_PUD_Narrative.pdf; Revised Rezone Application. Jan. 9, 2026. [URL]: https://pineislandmn.gov/vertical/sites/%7B52A5D060-3422-4069-8E86-A961C2752B7F%7D/uploads/Revised_Rezone_Application_-_Signed.pdf.

[44] Watershed Alliance for the Greater Zumbro. 2021. Comprehensive Watershed Management Plan; 2022-2031. Online [URL]: https://www.olmstedcounty.gov/sites/default/files/2021-12/Zumbro_CWMP_Final_11242021.pdf. Accessed: November 2025.

impacts during construction. Constructing the transmission line and substations will cause changes to the underlying land use from mostly agricultural areas to a utility corridor. Constructing the Project is not anticipated to wholly transform existing land use. For example, planting agricultural crops or using the transmission line ROW west of Highway 52 for grazing land is generally not precluded. Therefore, the construction and operation of the Project are not expected to have significant impacts on land use.

6.4.8.2 Mitigation Measures

Project impacts on planning and zoning are anticipated to be negligible. When construction is complete, Project workspaces would be restored. Land uses are consistent with the safe and reliable operation of the Project. The Applicants do not propose additional mitigation measures specific to land use and zoning.

6.4.9 Recreation

The ROI for recreation is the Study Area. Few recreation resources are present within the ROI; these include the Goodhue County snowmobile trail, Douglas State Trail, and the Zumbro River State Water Trail. Common recreational activities that occur in the ROI include hiking, biking, horseback riding, snowmobiling, canoeing, and paddleboarding.[45,46,47,48]

The Project spans the Goodhue County snowmobile trail (Trail Number 317), which is maintained by Zumbrota Covered Bridge Riders (Figure 3 in **Appendix B**).[49] Snowmobile trails are used frequently for recreational activities during the winter.

A portion of the Douglas State Trail is within the Study Area, located approximately 0.94 mile south of the Project Area (0.86 mile from the route width). The Douglas State Trail is a 12.5-mile-long, multi-use trail beginning in Rochester and ending in the city of Pine Island.[50] The Project does not cross any portion of the Douglas State Trail.

[45] Minnesota Department of Natural Resources (MNDNR). 2025. Douglas State Trail. Online [URL]: https://www.dnr.state.mn.us/state_trails/douglas/index.html. Accessed: October 2025.

[46] Minnesota Department of Natural Resources (MNDNR). 2025. Snowmobiling. Online [URL]: https://www.dnr.state.mn.us/snowmobiling/index.html. Accessed: October 2025.

[47] Minnesota Department of Natural Resources (MNDNR). 2025. Minnesota State Water Trails. Online [URL]: https://www.dnr.state.mn.us/watertrails/index.html. Accessed: October 2025.

[48] Pine Island Golf Course. 2025. Welcome to Pine Island Golf Course. Online [URL]: https://pineislandgolf.com/. Accessed: October 2025.

[49] Minnesota Department of Natural Resources (MNDNR). 2025. Find Snowmobile Trails. Online [URL]: https://www.dnr.state.mn.us/snowmobiling/interactive_map/index.html. Accessed: November 2025.

[50] Minnesota Department of Natural Resources (MNDNR). 2025. Douglas State Trail. Online [URL]: https://www.dnr.state.mn.us/state_trails/douglas/index.html. Accessed: November 2025.

The North Branch Middle Fork Zumbro River, which is part of the Zumbro River State Water Trail, is within the Study Area, located approximately 0.45 mile south of the Project Area (0.35 mile from the route width).[51] The Project does not cross any portion of the Zumbro River or Zumbro River State Water Trail.

There are no local wildlife areas, parks, federal or State forests, U.S. Fish and Wildlife Services (USFWS) national wildlife refuges,[52] MNDNR Wildlife Management Areas (WMA) or Scientific and Natural Areas (SNAs),[53] state parks,[54] state scenic byways,[55] state forests,[56] fairgrounds, or other recreational areas within the Study Area.

6.4.9.1 Potential Impacts

Impacts on recreation are anticipated to be minimal and would mostly be related to the North Rochester Substation Expansion because it will cross a portion of the Goodhue County snowmobile trail. Construction and operation of the rest of the Project is not anticipated to affect public access to any of the nearby recreational areas identified. Disturbance of the Goodhue County snowmobile trail would be minimal and localized to proposed North Rochester Substation Expansion areas.

Most impacts would be minimal and temporary during the construction phase of the Project. Temporary impacts may include tree clearing, use of heavy equipment (noise and fugitive dust), and lighting that may disturb wildlife, habitat, natural areas, and user enjoyment.

Once constructed, the Project would result in visual impacts due to the presence of built features introduced to the landscape. Operational noise is expected to be negligible from the Project and is not anticipated to affect recreationalists.

6.4.9.2 Mitigation Measures

Impacts on recreation would mostly be related to the North Rochester Substation Expansion because it will cross a portion of the Goodhue County snowmobile trail. Xcel Energy will attempt to avoid or

[51] Minnesota Department of Natural Resources (MNDNR). 2025. Zumbro River segments and maps. Online [URL]: https://www.dnr.state.mn.us/watertrails/zumbroriver/segments-maps.html#map1. Accessed: November 2025.

[52] U.S. Fish and Wildlife Service (USFWS). n.d. Locations. Online [URL]: https://www.fws.gov/locations?state_name=%5B%22Minnesota%22%5D. Accessed: November 2025.

[53] Minnesota Department of Natural Resources (MNDNR). 2025. Recreation Compass. Online [URL]: https://www.dnr.state.mn.us/maps/compass.html?mapext=-96.469484+48.369784+-96.463603+48.373699. Accessed: December 2025.

[54] Minnesota Department of Natural Resources (MNDNR). 2025. Find a state park by location. Online [URL]: https://www.dnr.state.mn.us/state_parks/map.html. Accessed: November 2025.

[55] Minnesota Department of Transportation (MNDOT). n.d. Minnesota Scenic Byways. Online [URL]: https://www.dot.state.mn.us/scenicbyways/. Accessed: December 2025.

[56] Minnesota Department of Natural Resources (MNDNR). 2025. State Forests Location Map. Online [URL]: https://www.dnr.state.mn.us/state_forests/map.html. Accessed: December 2025.

limit trail closures, to the maximum extent practicable, and will use conductor support structures for safety guides over roads or utilize helicopters for stringing , where possible. Construction impacts will be temporary and the use of BMPs to limit noise and fugitive dust during construction will effectively mitigate their effects. Xcel Energy will work with applicable stakeholders to find an alternative route for the Goodhue County snowmobile trail.

6.4.10 Socioeconomics

The ROI for socioeconomics is Goodhue County.

6.4.10.1 Population and Economic Profile

Table 6.4-12 provides socioeconomic characteristics of the state of Minnesota, Goodhue County, and the city of Pine Island based on 2010 and 2020 U.S. Census data. The median household income in Goodhue County in 2020 was approximately $4,048 lower than the state of Minnesota, although Goodhue County had a lower unemployment rate and fewer people that live in poverty than the state.

Table 6.4-12. Socioeconomic Characteristics U.S. Census Bureau 2010 and 2020 Data

Location	Total 2020 Population	2020 Households Below Poverty Level (%)	2020 Minority (%)	2020 Median Household Income	2020 Unemployment Rate (%)	2020 Largest Employment Industries
State of Minnesota	5,707,390	9.3	19.2	$73,382	3.80	Manufacturing, Health Care, Retail
Goodhue County	46,330	8.6	7.1	$69,334	3.60	Manufacturing, Health Care, Retail
Pine Island City	3,629	2.4	5.6	$72,292	3.80	No Data Available

Source. U.S. Census Bureau. 2010, 2020. American Community Survey.

6.4.10.2 Local Economy and Labor Force

The Project is located in Goodhue County, and the closest population center to the Project is the city of Pine Island. Goodhue County is part of the Minnesota Department of Employment and Economic Development (DEED) Region 10 Economic Development Region, which includes Dodge, Fillmore, Freeborn, Goodhue, Houston, Mower, Olmsted, Rice, Steele, Wabasha, and Winona Counties.[57] Goodhue County is the 20th largest of Minnesota's 87 counties and is the 43rd fastest-growing county

[57] Minnesota Department of Employment and Economic Development (DEED). 2025. Southeast Region. Online [URL]: https://mn.gov/deed/data/regional-lmi/southeast-lmi.jsp. Accessed: December 2025.

in Minnesota.[58] Goodhue County added 1,716 jobs between 2020 and 2024, representing an increase of 8.7 percent, and there are currently 21,338 jobs in Goodhue County.[58] The top industries in Goodhue County are manufacturing (21.8% of total jobs), health care and social assistance (13.1% of total jobs), retail trade (10.0% of total jobs), and accommodation and food services (9.5% of total jobs).[58]

6.4.10.3 Potential Impacts

Potential Project impacts on socioeconomics are expected to be positive, but minimal. The construction and operation of the Project is expected to have minimal long-term impacts on local (county and municipal) economies due to the relatively short-term time frame of construction. Construction of the Project will last approximately 2.5 years and will employ 24 to 27 construction workers, plus Project Skyway Substation workers. The Project will support multiple employment sectors (i.e., utilities, construction, manufacturing) and provide employment opportunities during the duration of construction and operation. During construction, local businesses may experience increases in revenue due to increased purchase of goods and services. Local construction crew expenditures will result in temporary, positive impacts on local economies.

Long-term benefits of the Project include ensuring continued, reliable electric service for industrial development serviced by the Project and economic benefits through incremental increases in revenues from utility property taxes. The benefits apply to the local community regardless of economic status, race, and personal identification.

6.4.10.4 Mitigation Measures

The Applicants will pay prevailing wages for applicable construction jobs. Because no adverse socioeconomic impacts are anticipated, no additional mitigation measures are proposed.

Commission Route Permits typically require permittees, their contractors, and subcontractors to pay no less than prevailing wage as defined in Minn. Stat. § 177.42.

6.4.11 Property Values

The ROI for property values is the Study Area. There are two residences within 500 feet of the HVTL. Residences near the Project are further summarized in Section 6.4.1.1.

6.4.11.1 Potential Impacts

Impacts on property values that result from power line construction have been studied for over 50 years, focusing primarily on residential, agricultural, and undeveloped properties as opposed to

[58] Minnesota Department of Employment and Economic Development (DEED). 2025. Goodhue County Profile. Online [URL]: https://mn.gov/deed/assets/052725_goodhue_tcm1045-407638.pdf. Accessed: December 2025.

commercial or industrial properties. A literature review (Jackson and Pitts 2010[59]) examined 17 studies on the relationship between transmission lines and property values to compare their results and to develop some general conclusions. The studies evaluated impacts from transmission lines ranging from 69 kV to 345 kV.

Upon completion of their review of the studies, Jackson and Pitts (2010[57]) concluded the following:

> "The studies reviewed…generally pointed to small or no effects on sales prices due to the presence of electric transmission lines. Some studies found an effect, but this effect generally dissipated with time and distance. The effects that were found ranged from approximately 2% to 9%. Most studies found no effect and in some cases a premium was observed."

The impact on property values from the presence of an HVTL is influenced by a complex interaction of factors. Most of these factors are parcel-specific: condition, size, improvements, acreage, and neighborhood characteristics; the proximity to schools, parks, and other amenities; and the presence of existing infrastructure (e.g., highways, railways, power lines). The presence of a HVTL becomes one of many interacting factors that could affect a specific property value. Because of this, it is difficult to measure how much and the numerous ways that HVTL and property values are correlated. The change in a property's value alone may not capture the overall loss or gain.

Every landowner has a unique relationship and sense of value associated with their property. Thus, a landowner's assessment of potential impacts on their property's value is often a deeply personal comparison of the property before and after a proposed project is constructed. These judgements, however, do not necessarily influence the market value of a property. Rather, appraisers assess a property's value by looking at the property after a project is constructed. Moreover, potential market participants likely see the property independent of the changes brought about by a project; therefore, they do not take the before and after into account the same way a current landowner might.

6.4.11.2 Mitigation Measures

Impacts on property values can be mitigated by reducing aesthetic impacts by collocating the transmission line with existing infrastructure, and landowners will be compensated for any easements. The Applicants do not propose additional mitigative measures specific to property values.

6.5 Land-Based Economies

6.5.1 Agriculture

The ROI for agriculture is the route width. Agriculture (i.e., cultivated crops) is the predominant land cover in the route width (Figure 4 in **Appendix B**). According to the U.S. Department of Agriculture's

[59] Jackson and Pitts, 2010. The Effects of Transmission Lines on Property Values: A Literature Review. Journal of Real Estate Literature. Volume 18, No 2.

(USDA) 2022 Census of Agriculture, there are 1,406 farms in Goodhue County with an average farm size of 300 acres.[60] The total crop sales ($339,139,000) for the farms in Goodhue County account for a larger percentage of the total agricultural product market value compared to livestock sales ($256,474,000).[60]

Farmland soils in the Project Area and route width were assessed using the USDA Natural Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) Database. The USDA-NRCS SSURGO Database identifies farmland soils based on three categories, which are subject to protection under the Farmland Protection Policy Act (FPPA). These categories include prime farmland, prime farmland when drained, and farmland of statewide importance. Prime farmland is defined by the NRCS as land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pasture, woodland, or other lands) (NRCS, 7 CFR Part 657). Urbanized land and open water cannot be designated as prime farmland. Prime farmland typically contains few or no rocks, is permeable to water and air, is not excessively erodible or saturated with water for long periods, and is not subject to frequent or prolonged flooding during the growing season. Prime farmland when drained includes soils that have the potential to be prime farmland but require drainage or hydrologic alteration to achieve high productivity.

NRCS also recognizes farmland of statewide importance, which includes soils that are nearly prime but are not as productive due to permeability, slope, erosion potential, or some other soil property. Farmlands of statewide importance have the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated and managed according to acceptable farming methods.

Farmland soils, including prime farmland, prime farmland when drained, and farmland of statewide importance crossing the Project Area and route width are presented in **Table 6.5-1**.

[60] U.S. Department of Agriculture (USDA). 2022. Census of Agriculture Goodhue County Profile. Online [URL]: https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Minnesota/cp27049.pdf. https://www.nass.usda.gov/AgCensus/Accessed: October 2025.

Table 6.5-1. Summary of Farmland Soils

	Project Area (acres)	Project Area (%)	Route Width (acres)	Route Width (%)
All areas are prime farmland	51.4	79.2	226.2	68.7
Farmland of Statewide Importance	12.7	19.5	66.1	20.1
Prime Farmland if Drained	0.0	0.0	0.3	0.1
Prime Farmland if protected from Flooding	0	0	14.8	4.5
Not Prime Farmland	0.9	1.3	22.1	6.7
Total[a]	**64.98**	**100.0**	**329.5**	**100.0**

Note: Soils may have more than one characteristic.
[a] Addendums may not sum due to rounding.

The Conservation Reserve Enhancement Program (CREP) is part of the Conservation Reserve Program (CRP), which is a land conservation program established by the USDA and administered by the Farm Service Agency (FSA) that pays farmers a yearly rental fee for agreeing to take environmentally sensitive land out of agricultural production in an effort to improve environmental health and quality.[61] Minnesota implemented the CREP to target State-identified, high-priority conservation issues by offering payments to farmers and agricultural landowners to retire environmentally sensitive land using the Reinvest in Minnesota (RIM) Reserve Program.[62] Enrollment in the CRP and CREP is voluntary. No agricultural areas along the route width of the Project are part of CREP or RIM.

There are no center pivot irrigation systems present in the route width. No organic farms will be impacted by the Project.[63] There are no registered apiaries within 1 mile of the Route Width.[64]

Aerial crop dusting, which involves spraying fertilizers, herbicides, and pesticides from specialized aircraft, is an important part of agricultural activities in Minnesota and may occur along various fields

[61] U.S. Department of Agriculture (USDA). Undated. Conservation Reserve Enhancement Program (CREP). Online [URL]: https://www.fsa.usda.gov/resources/programs/conservation-reserve-enhancement-program-crep. Accessed: November 2025.

[62] Minnesota Board of Water and Soil Resources (BWSR). 2025. Reinvest in Minnesota Overview. Online [URL]: https://bwsr.state.mn.us/reinvest-minnesota-overview. Accessed: November 2025.

[63] U.S. Department of Agriculture (USDA). Organic Integrity Database. Online [URL]: https://organic.ams.usda.gov/integrity/. Accessed: December 2025.

[64] Minnesota Department of Agriculture (MDA). 2025. Minnesota Apiary Registry. Online [URL]: https://mn.beecheck.org/map. Accessed: December 2025.

surrounding the Project Area during construction and operation of the Project. As discussed in Section 6.4.7.8, there are no public or private airports or airstrips within approximately 20,000 feet (3.78 miles) of the ROW for the Project.

6.5.1.1 Potential Impacts

West of U.S. Highway 52, impacts on agriculture are expected to be negligible. East of U.S. Highway 52, impacts on agriculture are expected to be moderate to significant because there are planned land use changes within the Project Skyway site. Temporary construction impacts on agricultural land could include soil compaction and rutting, accelerated soil erosion, crop disturbance, disruption to normal farming activities, and introduction of noxious weeds. Construction could occur throughout the year, with structures being constructed outside of growing and harvest seasons. During winter, impacts are not anticipated to affect agricultural activities because crop fields are unplanted and the ground is frozen.

6.5.1.2 Mitigation Measures

The Applicants intend to acquire land rights required for operation and maintenance of the Project, as further described in Section 2.1. Lands within the Project Skyway site are expected to be rezoned to light industrial (with a PUD overlay), as described in Section 6.4.8, and agricultural specific mitigation measures are not expected to be utilized in that area.

The Applicants will work with individual landowners through the easement process to verify the locations of existing drain tile, if present, and determine measures to avoid and minimize impacts on drain tile infrastructure.

For lands remaining in agricultural production, the Applicants will implement an Agricultural Impact Mitigation Plan (AIMP) and reasonably restore and/or compensate landowners, as appropriate, for damages caused as a result of transmission line construction and as outlined in the AIMP (**Appendix G**). Xcel Energy will work with landowners to determine whether to restore land and/or compensate landowners after discussions with them. The Applicants will also implement a VMP to reduce impacts on agriculture, as appropriate (**Appendix F**). As a result of mitigation as described in the referenced plans, impacts are not likely to be significant.

Route Permits issued by the Commission typically contain the following mitigation measures relevant to agriculture:

- The Permittee shall work with landowners to locate the high-voltage transmission line to minimize the loss of agricultural land.
- Where practical, existing roadways shall be used for all activities associated with construction.

- The Permittee shall implement reasonable measures to minimize erosion and sedimentation during construction and shall employ perimeter sediment controls, protect exposed soil by promptly planting, seeding, using erosion control blankets and turf reinforcement mats, stabilizing slopes, protecting storm drain inlets, protecting soil stockpiles, and controlling vehicle tracking. Contours shall be graded, as required, so that all surfaces provide for proper drainage, blend with the natural terrain, and are left in a condition that will facilitate re-vegetation and prevent erosion. All areas disturbed during construction shall be returned to pre-construction conditions.

- The Permittee shall restrict pesticide use to those pesticides and methods of application approved by the Minnesota Department of Agriculture (MDA), Minnesota Department of Natural Resources (MDNR), and the U.S. Environmental Protection Agency (USEPA). Selective foliage or basal applications shall be used when practicable. All pesticides shall be applied in a safe and cautious manner so as not to damage adjacent properties, including crops, orchards, tree farms, apiaries, or gardens.

- The Permittee shall employ best management practices to avoid the potential introduction and spread of invasive species on lands disturbed by construction activities. The Permittee shall develop an Invasive Species Prevention Plan and file it with the Commission at least 14 days prior to the pre-construction meeting. The Permittee shall comply with the most recently filed Invasive Species Prevention Plan.

- The Permittee shall take all reasonable precautions against the spread of noxious weeds during all phases of construction. When utilizing seed to establish temporary and permanent vegetative cover on exposed soil, the Permittee shall select site appropriate seed certified to be free of noxious weeds. To the extent possible, the Permittee shall use native seed mixes.

- The Permittee shall avoid, promptly repair, or replace all drainage tiles broken or damaged during all phases of the project's life, unless otherwise negotiated with the affected landowner.

- The Permittee shall limit temporary easements to special construction access needs and additional staging or lay-down areas required outside of the authorized right-of-way. Temporary space shall be selected to limit the removal and impacts on vegetation. The Permittee shall obtain temporary easements outside of the authorized transmission line right-of-way from affected landowners through rental agreements.

- The Permittee shall restore the right-of-way, temporary workspaces, access roads, abandoned right-of-way, and other public or private lands affected by construction of the project. Restoration within the right-of-way must be compatible with the safe operation, maintenance, and inspection of the transmission line.

- The Permittee shall fairly restore or compensate landowners for damage to crops, fences, private roads and lanes, landscaping, drain tile, or other damage sustained during construction.

6.5.2 Forestry

The ROI for forestry is the Study Area. The Applicants are not aware of any commercial forest operations in the Study Area. Additionally, there are no State-managed forest land within the ROI.[65]

6.5.2.1 Potential Impacts

Because there are no known commercial forestry operations in the ROI, there are negligible impacts on commercial forestry operations from the construction and operation of the Project. Impacts on wooded lands are expected to range from negligible to minimal because of prudent routing that minimizes tree clearing, to the extent feasible.

Impacts on forest resources will occur at locations where trees need to be cleared within the ROW. For potential impacts on vegetation, see Section 6.7.5.1.

6.5.2.2 Mitigation Measures

The Project will not impact commercial forestry operations; therefore, no mitigation is proposed.

6.5.3 Mining

The ROI for mining is the Project's route width. Mining does not comprise a major industry in the vicinity of the Project. There are no mining operations within the ROI.[66] According to US-Mining, a private data repository that provides information on mines and mining operators in the U.S., and review of 2025 Google Earth aerial imagery, the closest mining quarry is located 3.9 miles west of the Project and supplies crushed aggregate materials.[67]

The Minnesota Department of Revenue collected $195,925 in aggregate material production tax from Goodhue County in 2024.[68] Aggregate material includes sand, gravel, crushed rock, limestone, and granite, among others.

---

[65] Minnesota Department of Natural Resources (MNDNR). 2025. Minnesota Geospatial Commons, MNDNR Forest Inventory. Online [URL]: https://gisdata.mn.gov/dataset/biota-dnr-forest-inventory. Accessed: December 2025.

[66] Minnesota Department of Natural Resources (MNDNR). 2016. Minnesota Mine Sites: Active Mines, Advanced Projects of Iron Ore, Metallic Minerals, Industrial Minerals, and Selected Construction Aggregates-January 2016. Online[URL]: https://files.dnr.state.mn.us/lands_minerals/mpes_projects/minnesota_mine_sites_and_advanced_minerals_projects_january2016.pdf. Accessed: December 2025.

[67] US-Mining. 2025. Goodhue County, MN Mines. Online[URL]: http://www.us-mining.com/minnesota/goodhue-county. Accessed: October 2025.

[68] Minnesota Department of Revenue. 2025. Aggregate Materials Tax. Online [URL]: https://www.revenue.state.mn.us/aggregate-materials-tax. Accessed: December 2025.

6.5.3.1 Potential Impacts

Impacts on mining would be negligible because there are no mining operations within the Project's route width.

6.5.3.2 Mitigation Measures

The Project will not impact mining operations; therefore, no mitigation measures are proposed.

6.5.4 Tourism

The ROI for tourism is Goodhue County. Tourism in Goodhue County consists of county fairs, outdoor recreation, and a historical society.[69] In 2024, visitors in Goodhue County spent a total of $120 million in the tourism industry on lodging ($36.9 million), food and beverage ($28.6 million), recreation ($17.1 million), retail ($18.6 million), and transportation ($18.8 million including both ground and air transportation).[70] In the same year, the tourism industry in Goodhue County had 1,056 direct jobs, $35.1 million in direct income, $7.9 million in direct State tax revenue, and $3.9 million in direct local tax revenue.[70]

6.5.4.1 Potential Impacts

Impacts on tourism are anticipated to be negligible to minimal. Construction of the Project is not anticipated to affect available tourism opportunities. Impacts on tourism will be similar to those related to recreation (Section 6.4.9) and aesthetics (Section 6.4.1) and will be related mostly to Project construction, which will be temporary and confined to specific areas not located near tourist amenities.

6.5.4.2 Mitigation Measures

Project impacts on the tourism economy are anticipated to be negligible to minimal; therefore, no mitigation measures are proposed.

6.6 Archaeological and Historic Resources

6.6.1 Previous Surveys

The ROI for archaeological and historic resources is the Project Area. The Applicants have conducted two Phase I Archaeological Surveys for the Project. Ryan Companies, US, contracted Stantec Consulting Services, Inc. (Stantec) to conduct a Phase I Archaeological Reconnaissance Survey of the 482-acre Development Site, which includes the location of the Project Skyway Substations. A literature

[69] Goodhue County. 2025. About Goodhue County, Minnesota. Online [URL]: https://goodhuecountymn.gov/about/. Accessed: December 2025.

[70] Explore Minnesota. 2025. Tourism and the Economy. Online [URL]: https://mn.gov/tourism-industry/research/tourism-and-the-economy.jsp. Accessed: December 2025.

review conducted prior to fieldwork identified no previously recorded archaeological sites within the Development Site area. Three previously recorded, above-ground historic resources (GD-PIT-00030, XX-RRD-CGW045, and XX-RRD-CGW006) are located within the Development Site area. All three of the previously recorded, above-ground historic resources have been previously determined not eligible for inclusion in the NRHP; as such, the Project will have no impact on the resources. The Development Site is within the mapped boundary of the Catholic Cemetery (MN Cemetery ID 20716), a historic cemetery mapped at the township-level and identified through archival research only. Additional archival research conducted by Stantec indicates that the actual location of the cemetery is south of the city of Pine Island and outside of the Development Site.

Stantec conducted a Phase I Archaeological Reconnaissance Survey from April 28–30 and June 9, 2025. Survey methods included pedestrian survey and shovel testing. No new archaeological sites were identified in the Development Site. No evidence of the Catholic Cemetery was identified in the Development Site. Based on the archival review and the results of the field survey, the Catholic Cemetery is likely not within the Development Site. No properties listed in the National or State Registers of Historic Places will be affected by the Project. Stantec recommends that there are no known or suspected archaeological properties in the area that will be affected by the Project. No further archaeological work is recommended, should the Project proceed as planned.

Xcel Energy contracted HDR to conduct a Cultural Resources Literature Review and Phase I Archaeological Survey for the remaining areas of potential construction disturbance, including the North Rochester Substation Expansion area and 150-foot-wide transmission line ROW up to its connection with the Project Skyway Substations at the southeastern end of the transmission line (**Appendix H**). Prior to the field survey, HDR conducted a Cultural Resources Literature Review in October 2025 by reviewing records maintained by the Minnesota Office of the State Archaeologist (OSA) available via the online portal and the MNSHPO in Minnesota's Statewide Historic Inventory Portal (MNSHIP). These files were reviewed to identify previously reported archaeological sites within 1 mile of the North Rochester Substation Expansion area and transmission line ROW (Archaeological Review Area) and previously inventoried architectural history properties within 0.25 mile of the North Rochester Substation Expansion area and transmission line ROW (Architectural History Review Area). There are no previously recorded archaeological sites and two known cemeteries within the Archaeological Review Area. Neither of these known cemeteries are located within the North Rochester Substation Expansion area or transmission line ROW. There are seven previously inventoried architectural history properties within the Architectural History Review Area, and three of these intersect with the North Rochester Substation Expansion area and/or transmission line ROW. These three architectural history properties are determined by MNSHPO to be Not Eligible for listing in the NRHP, State Register of Historic Places, or the Historic Sites Network. A copy of the Cultural Resources Literature Review (**Appendix H**), along with a completed Request for Project Review form, will be submitted to the MNSHPO.

HDR conducted a Phase I Archaeological Reconnaissance Survey of the North Rochester Substation Expansion area and transmission line ROW on October 29, 2025. The existing North Rochester Substation was not surveyed. No cultural materials were identified. HDR recommends the Project, as proposed, does not require any further cultural resources work.

6.6.2 Potential Impacts

Impacts on archeological or historical resources are expected to be negligible. The Project will have no negative effects on any eligible or potentially eligible buried cultural resources. Based on the results of the architectural history background research, there are no properties within the Project Area or Architectural History Review Area that are listed in the NRHP, State Register of Historic Places, or the Historic Sites Network. Therefore, the Project, as proposed, will have no negative effects on historic architectural history properties. The Phase I Archaeological Reconnaissance Survey is included as **Appendix H**.

6.6.3 Mitigation Measures

The Applicants will prepare an Unanticipated Discoveries Plan prior to construction of the Project. If any archaeological sites are identified during construction, work will be stopped and MNSHPO staff consulted as to how to proceed. If human remains are encountered during construction activities, all ground-disturbing activity will cease, and local law enforcement and appropriate agencies will be notified per Minn. Stat. § 307.08.

Commission-issued Route Permits typically include standard conditions that require the Permittee to make every effort to avoid impacts on archaeological and historic resources when constructing a project. If a resource is encountered, the Permittee shall consult with MNSHPO, the State Archaeologist, the Minnesota Indian Affairs Council (MIAC), and any Tribal Historic Preservation Officers (THPO) that have requested to be notified. Where feasible, avoidance of the resource is required. Where not feasible, mitigation must include an effort to minimize project impacts on the resource consistent with MNSHPO and State Archaeologist requirements. Prior to construction, the Permittee shall train workers about the need to avoid cultural properties, how to identify cultural properties, and procedures to follow if undocumented cultural properties, including gravesites, are found during construction. If human remains are encountered during construction, the Permittee shall immediately halt construction and promptly notify local law enforcement and appropriate State agencies. The Permittee shall not resume construction at such location until authorized by local law enforcement, the State Archaeologist, or MIAC.

6.7 Natural Resources

6.7.1 Air Quality

The ROI for air quality is the Study Area. Section 109(b) of the Clean Air Act (CAA) requires that USEPA establish National Ambient Air Quality Standards (NAAQS) that "require to protect" public

health and welfare (42 U.S.C. 7401 et seq.; 40 CFR Part 50). The CAA identifies two classes of NAAQS: primary standards, which are limits set to protect the public health of the most sensitive populations, such as asthmatics, children, and the elderly, and secondary standards, which are limits set to protect public welfare, such as protection against visibility impairment or damage to vegetation, wildlife, and structures. USEPA has promulgated NAAQS for six criteria pollutants: ozone (O_3), particulate matter (PM_{10}/$PM_{2.5}$), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), and lead (Pb). Individual states implement the CAA through State Implementation Plans.

USEPA and state agencies operate a system of air quality monitoring stations throughout the country. Readings from these stations are compared to the NAAQS as a way to classify the air quality of the area surrounding the monitoring stations. Areas of the country that do not meet the NAAQS are classified as "non-attainment" areas. Regions that were classified as non-attainment and have improved their air quality to meet the NAAQS are considered to be in "maintenance." Areas of the country that are not represented by a monitoring station are considered "unclassifiable." Unclassifiable areas are considered to be in attainment with the NAAQS.

Compliance with the national and State air quality standards in the state of Minnesota is assessed at the county level. USEPA designated all the counties within the Proposed Route to be in attainment for all NAAQS[71].

6.7.1.1 Emissions Related to Construction

Construction of the Project will result in intermittent and temporary emissions of criteria pollutants. The emissions generally include dust generated from soil-disturbing activities, such as earthmoving and wind erosion associated with ROW clearing and construction, combustion emissions from construction machinery engines, and indirect emissions attributable to construction workers commuting to and from work sites and other material hauling during construction. These emissions would be dependent upon weather conditions, the amount of equipment at any specific location, and the period of operation required for construction at that location. Air pollutants from construction equipment will be limited to the immediate vicinity of the construction area and will be temporary. Therefore, it is not anticipated that construction activities will independently cause or significantly contribute to an emission level that alters the attainment status for any of the NAAQS.

The amount of dust generated would be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic, vehicle types, and road surface characteristics. Emissions would be greater during dry periods and in areas where fine-textured soils are subject to surface activity. If construction activities generate problematic dust levels, the Applicants may employ construction-related practices to control fugitive dust, such as application of water or other

[71] U.S. Environmental Protection Agency (USEPA). 2025a. Minnesota Nonattainment/Maintenance for Each County by Year for all Criteria Pollutants. Green Book. Online [URL]: https://www3.epa.gov/airquality/greenbook/anayo_mn.html. Accessed: October 2025.

commercially available dust control agents on unpaved areas subject to frequent vehicle traffic, reducing the speed of vehicular traffic on unpaved roads, and covering open-bodied haul trucks. It is assumed that the contractor will achieve at least 50 percent PM_{10} control efficiency through a variety of fugitive dust control measures.

Table 6.7-1 and **Table 6.7-2** summarize the estimated potential emissions of criteria pollutants from construction activities for the Project, including transmission line and substation facility work, respectively (see Section 6.7.8 below for information on greenhouse gas [GHG] emissions associated with the Project). Construction emissions are calculated based on typical counts of diesel-fueled construction equipment, expected hours of operation, and estimated vehicle miles traveled. Fugitive dust emissions assume an area of disturbance of 82 acres. Supporting emission calculations are provided in **Appendix J**.

Table 6.7-1. Estimated Potential Emissions from the Transmission Line (ton/year)

Construction Components	NO_x[a]	CO	VOC[a]	SO_2	PM_{10}	$PM_{2.5}$
Year 2027						
Off-Road Engine Emissions	15.52	8.68	0.78	0.01	0.51	0.51
Fugitive Dust Emissions	-	-	-	-	26.16	2.62
On Road Emissions	<0.01	0.33	0.01	<0.01	0.16	0.04
Year 2027 Total	15.54	9.01	0.79	0.01	26.84	3.17
Year 2028						
Off-Road Engine Emissions	22.82	12.76	1.14	0.01	0.75	0.75
Fugitive Dust Emissions	-	-	-	-	39.24	3.92
On Road Emissions	0.03	0.47	0.02	<0.01	0.23	0.06
Year 2028 Total	22.85	13.23	1.16	0.01	40.22	4.73
Year 2029						
Off-Road Engine Emissions	17.59	9.84	0.88	0.01	0.58	0.58
Fugitive Dust Emissions	-	-	-	-	30.22	3.02
On Road Emissions	0.02	0.34	0.01	<0.01	0.18	0.05
Year 2029 Total	17.61	10.18	0.89	0.01	30.98	3.65

a NOx = oxides of nitrogen; VOCs = volatile organic compounds.

Table 6.7-2. Estimated Potential Emissions from the Substation Facilities (ton/year)

Construction Components	NO_x[a]	CO	VOC[a]	SO_2	PM_{10}	$PM_{2.5}$
Year 2027						
Off-Road Engine Emissions	12.77	7.24	0.64	0.01	0.44	0.44
Fugitive Dust Emissions	-	-	-	-	3.83	0.38
On Road Emissions	0.05	0.97	0.04	<0.01	0.40	0.10
Year 2027 Total	12.83	8.21	0.68	0.01	4.67	0.92
Year 2028						
Off-Road Engine Emissions	12.82	7.27	0.64	0.01	0.44	0.44
Fugitive Dust Emissions	-	-	-	-	3.83	0.38
On Road Emissions	0.05	0.92	0.04	<0.01	0.40	0.10
Year 2028 Total	12.87	8.19	0.68	0.01	4.67	0.92
Year 2029						
Off-Road Engine Emissions	9.07	5.15	0.45	<0.01	0.31	0.31
Fugitive Dust Emissions	-	-	-	-	2.78	0.28
On Road Emissions	0.04	0.81	0.03	<0.01	0.37	0.09
Year 2029 Total	9.11	5.96	0.49	<0.01	3.45	0.68

a NOx = oxides of nitrogen; VOCs = volatile organic compounds.

6.7.1.2 Emissions Related to Operation

During operation of the proposed transmission line and substation facilities, air emissions would be minimal. Small amounts of NO_X and ozone will be created due to the corona from the operation of transmission lines. The production rate of ozone due to corona discharges decreases with humidity and less significantly with temperature. Rain causes an increase in ozone production but also accelerates the decay of ozone. Ozone production by HVTLs is not detectable during fair weather above ambient conditions. Ozone production under wet-weather conditions is detectable with special efforts but will result in emissions below the NAAQS and, therefore, is considered insignificant.

A small amount of ozone will be created due to corona from the operation of transmission lines. A corona signifies a loss of electricity, so the Applicants have engineered the transmission lines to limit corona. During operation, corona effects will be minimized by using good engineering practices, such as using bundled conductors.

Design of the transmission line also influences ozone production rate. The production rate decreases significantly as the conductor diameter increases and is greatly reduced for bundled conductors over single conductors. Conversely, the production rate of ozone increases with applied voltage. The emission of ozone from the operation of a transmission line of the voltages proposed for the Project is not anticipated to have a significant impact on the environment.

Emissions will be generated during routine inspection and maintenance activities. Xcel Energy will perform an annual aerial inspection of the line. Once every 4 years, crews will visually inspect the lines from the ground. Additionally, vegetation maintenance will generally occur once every 4 years. Routine inspections and maintenance activities will not have a significant impact on ambient air quality.

The Project does not include any large stationary sources or emission producing facilities, so an air permit will not be required.

6.7.1.3 Potential Impacts

Impacts on air quality are expected to be minimal and short term. Construction of the Project will result in intermittent and temporary emissions of criteria pollutants. These emissions generally include dust generated from soil-disturbing activities, such as earthmoving and wind erosion associated with ROW clearing and construction machinery, and indirect emissions attributable to construction workers commuting to and from work sites during construction. These emissions will be dependent upon weather conditions, the amount of equipment at any specific location, and the period of operation required for construction at that location. Air pollutants from the construction equipment will be limited to the immediate vicinity of the construction area and will be temporary. Therefore, it is not anticipated that construction activities will independently cause or significantly contribute to an emission level that alters the air pollution score or attainment status for any of the NAAQS.

During operation of the line and substation, air emissions would be minimal. Air pollutant emissions would come from infrequent vehicle or helicopter use during routine operation and maintenance and any combustion of diesel from maintenance equipment. A small amount of ozone will be created due to corona from the operation of transmission lines, as discussed in Section 6.7.1.2. Given the small impact during operation of the line, no mitigation measures are proposed.

6.7.1.4 Mitigation Measures

Fugitive dust emissions generated during construction would be minimized and controlled by MPCA under Minn. R. 7011.0150. The contractor shall use common BMPs for controlling fugitive dust, which may include watering and chemical suppressants. Vegetative ground cover with proper maintenance can also reduce fugitive dust in open areas. Vehicles should reduce speeds when traveling on unpaved roads; wash, sweep, or vacuum paved roads as necessary; use tracking mats at access points; and cover open-bodied haul trucks. For frequent travel on unpaved roads, consider paving or adding gravel to reduce silt content.

No mitigation measures are proposed during operation of the project because air emissions will be minimal.

6.7.2 Geology and Groundwater

6.7.2.1 Geology

The ROI for geology is the Project Area. Surface geology in the ROI is dominated by pre-last glacial from the most recent Wisconsinian glaciation. Loamy diamicton to pebbly sediments deposited by ice of the Browerville formation is most prevalent.[72] Deposits of postglacial floodplain alluvium, which is deposited by modern streams, is also present within the Project Area. The Project Area is underlain by bedrock formed primarily during the Ordovician periods in the Paleozoic Era.[73] Bedrock in the Project Area consists of shale, sandstone, and limestone.[74]

The Karst Feature Inventory, maintained by MNDNR and the University of Minnesota, contains reported and verified karst features and was queried to identify karst features within the Project Area. Surface karst features include, but are not limited to, sinkholes, caves, stream sinks, and karst springs, which occur primarily in Minnesota where 50 feet or less of unconsolidated material overlies carbonate bedrock or sandstone. No surface karst features were identified in this data within the Project Area.[75] The closest surface karst features were identified within the city of Pine Island.

Elevations range from about 1,016 feet above sea level (asl) to 1,090 feet asl within the Project Area and from 1,012 feet asl to 1,148 feet asl within the route width. Topography within the Project Area is predominately flat with areas of rolling plains.

The Project Area's seismic risk is very low because it is within an area rated as less than 2-percent chance of damage from natural or human-induced earthquake in 10,000 years.[76]

[72] Lusardi, Barbara A.; Gowan, Angela S.; McDonald, Jennifer M.; Marshall, Katherine J.; Meyer, Gary N.; Wagner, Kaleb G. (2019). S-23 Geologic Map of Minnesota Quaternary Geology. USGS. Online [URL]: https://conservancy.umn.edu/items/49a5c319-0b36-4502-9d5f-e64f283d5003. Accessed: October 2025.

[73] University of Minnesota. 2025a. Bedrock Geology. Online [URL]: https://cse.umn.edu/mgs/bedrock-geology. Accessed: October 2025.

[74] University of Minnesota. 2025b. Glacial Geology. Online [URL]: https://cse.umn.edu/mgs/glacial-geology. Accessed: October 2025.

[75] MNDNR. 2025. Karst Feature Inventory. Online [URL]: https://arcgis.dnr.state.mn.us/portal/apps/webappviewer/index.html?id=9df792d8f86546f2aafc98b3e31adb62. Accessed: October 2025.

[76] U.S. Geological Survey (USGS). 2025. Frequency of Damaging Earthquake Shaking Around the U.S. Online [URL]: https://www.usgs.gov/media/images/frequency-damaging-earthquake-shaking-around-us. Accessed: October 2025.

6.7.2.2 Groundwater

The ROI for groundwater is the Project's route width. Minnesota is divided into six groundwater providences that are distinguished by the thickness, lateral extent, permeability, and porosity of the underlying bedrock. Aquifers within these provinces include bedrock and unconsolidated sediments, such as clay, sand, and gravel, that allow for lateral and vertical water movement within and between the component layers of the aquifer. The Karst Province is the source of water for the Project Area.[77] The Karst Province is characterized by a thin glacial sediment overlaying thick carbonate and sandstone bedrock prone to conduits, sinkholes, and caves.

USEPA defines a Sole Source Aquifer (SSA)[78] as an aquifer that supplies at least 50 percent of the drinking water consumed in an area. Localities within the range of these aquifers have limited options for drinking water supplies apart from the SSA,[79] and if the SSA is contaminated, it could create a significant hazard to public health. No SSAs have been identified within the route width. [80]

Under the Safe Drinking Water Act, Minnesota lists Wellhead Protection Areas (WHPA) where contaminants have the potential to infiltrate and pollute groundwater sources.[81] WHPAs for public and community water-supply wells are delineated based on existing groundwater flow models or by using calculations based on a projected 10-year water demand, the effective porosity of the associated aquifer, and the length of the proposed well screen. A search for WHPAs in the Minnesota Department of Health (MDH) database indicated that the route width crosses the Pine Island WHPAs.

The Minnesota County Well Index (CWI),[82] maintained by the Minnesota Geological Survey (MGS) in cooperation with MDH, provides a complete, up-to-date list of well locations in Minnesota. A search of the CWI index found no wells within the route width.

[77] Minnesota Department of Natural Resources (MNDNR). 2021. Minnesota Groundwater Province 2021. Online [URL]: https://files.dnr.state.mn.us/waters/groundwater_section/mapping/provinces/2021-provinces.pdf. Accessed: October 2025.

[78] U.S. Environmental Protection Agency (USEPA). 2025b. Map of Sole Source Aquifer Locations. Online [URL]: https://experience.arcgis.com/experience/1bfab371d71e4b868fc9ae7df62a16fe. Accessed: October 2025.

[79] Minnesota Department of Health. 2025a. Source Water Protection Web Map Viewer. Online [URL]: https://experience.arcgis.com/experience/14825b159b2e4dc686736d98e39ebce7. Accessed: October 2025.

[80] U.S. Environmental Protection Agency (USEPA). 2025c. Overview of the Drinking Water Sole Source Aquifer Program. Online [URL]: https://www.epa.gov/dwssa/overview-drinking-water-sole-source-aquifer-program. Accessed: October 2025.

[81] Minnesota Department of Health (MDH). 2025c. Source Water Protection. Online [URL]: https://www.health.state.mn.us/communities/environment/water/swp/mapviewer.html. Accessed: October 2025.

[82] Minnesota Department of Health (MDH). 2025b. Minnesota Well Index. Online [URL]: https://mnwellindex.web.health.state.mn.us/. Accessed: October 2025.

6.7.2.3 Potential Impacts

Impacts on geology are expected to be minimal. Constraints due to geology are not expected to impact the design, construction, or operation of the Project. The North Rochester Substation Expansion, and Project Skyway Substations will require grading to create level pads. Limited, if any, grading will occur within the proposed transmission line ROW.

Impacts on groundwater are expected to be minimal. Construction and operation of the transmission line and substations have the potential to impact groundwater through temporary, construction-related impacts. Because there are no wells along the route width, the Project is not anticipated to impact groundwater resources. Any impacts on groundwater resources would be localized, short-term, and would not affect any underlying aquifer.

6.7.2.4 Mitigation Measures

The Applicants will conduct geotechnical analyses, where appropriate, to evaluate whether karst areas are present at structure locations, and micrositing and structure foundation design will account for the presence of karst and the potential for dewatering, as needed. If geotechnical analyses determine that temporary dewatering or water appropriations would be required, the Applicants will coordinate with MNDNR to obtain the necessary permits. The MPCA Construction Stormwater Permit contains mitigation measures for stormwater runoff when karst features are known or suspected to be present on site. If geotechnical analyses determine karst features are present where construction will occur, the Applicants will comply with MPCA stormwater requirements and prohibit infiltration of stormwater runoff within 1,000 feet up-gradient or 100 feet down-gradient of active karst features.

The Applicants will conduct geotechnical investigations of the Project Area to identify shallow depth to aquifer areas and will continue to work with landowners to identify springs and wells near the proposed Project. If shallow depth aquifer areas are discovered, the Applicants will use specialty structures that require wider, shallower excavation areas to avoid impacts on groundwater resources.

Commission standard permit conditions presented in Section 6.7.3.2 for surface water and wetlands are also protective of groundwater resources.

6.7.3 Soils

The ROI for soils is the Project's Area. Soil information for the Project was obtained from the USDA-NRCS SSURGO Database.[83] Soils mapped within the Project Area consist predominantly of silt loam (**Table 6.7-3**). The drainage classes of these soils range from poorly drained to well drained. Exposed soils have a slight to severe erosion hazard, which indicates the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface. A rating of "slight" indicates that

[83] U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2019. Web Soil Survey. Online [URL]: https://websoilsurvey.nrcs.usda.gov/app/. Accessed: November 2025.

erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures could be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Table 6.7-3. Summary of Soil Characteristics within the Project Area and Route Width

Soil Type	Drainage Class	Erosion Hazard of Forest Roads and Trails	Project Area (Acres)	Route Width (Acres)
Barremills silt loam, drainageway, 1 to 5 percent slopes, occasionally flooded	Well drained	Moderate	3.76	39.5
Bassett-Kasson complex, 6 to 12 percent slopes, eroded	Moderately well drained	Moderate	0.0	0.7
Dakota silt loam, 0 to 3 percent slopes	Well drained	Slight	4.1	23.6
Downs-Hersey complex, 12 to 18 percent slopes, moderately eroded	Moderately well drained	Severe	0.9	14.6
Downs-Hersey complex, 2 to 6 percent slopes	Well drained	Moderate	27.6	87.1
Downs-Hersey complex, 6 to 12 percent slopes, moderately eroded	Well drained	Severe	12.7	65.4
Downs-Hersey, bedrock substratum, complex, 12 to 18 percent slopes, moderately eroded	Well drained	Severe	0.0	0.1
Fayette-Hersey, bedrock substratum, complex, 18 to 25 percent slopes, moderately eroded	Well drained	Severe	0.0	3.2
Joy-Ossian, occasionally flooded, complex, 1 to 5 percent slopes	Somewhat poorly drained	Moderate	0.0	14.8
Joy silt loam, 1 to 3 percent slopes	Somewhat poorly drained	Slight	8.5	24.9
Kasson silt loam, 2 to 6 percent slopes	Moderately well drained	Moderate	0.0	8.3
Richwood silt loam, 1 to 6 percent slopes	Well drained	Moderate	3.9	24.8
Shandep-Cylinder complex, 0 to 2 percent slopes	Poorly drained	Slight	0.0	0.3

Soil Type	Drainage Class	Erosion Hazard of Forest Roads and Trails	Project Area (Acres)	Route Width (Acres)
Vasa silt loam, 1 to 4 percent slopes	Moderately well drained	Moderate	3.5	18.1
Winneshiek-Waucoma complex, 18 to 35 percent slopes	Well drained	Severe	0.0	4.3
		Total[a]	**64.98**	**329.5**

[a] Addendums may not sum due to rounding.

The topography within the Project's ROW is predominantly flat with areas of rolling plains. U.S. Geological Survey (USGS) topographic data for the Project is depicted in Figure 6 in **Appendix B** with elevations ranging from approximately 1,012 feet above mean seal level (AMSL) to 1,148 feet AMSL. Upward slopes in elevation are located at the northwest corner of the Project's route width. Soils and topography at 2-foot intervals are depicted in Figure 11 in **Appendix B**.

6.7.3.1 Potential Impacts

Impacts on soil are expected to be moderate. Transmission line and substation projects have the potential to impact soils during the construction (short-term) and operation (permanent) stages of a project. Construction may require some amount of grading to provide a level surface for safe operation of construction equipment. In addition, potential topsoil and subsoil mixing may result from the excavation, stockpiling, and redistribution of soils during installation of transmission line structures and substation components. Localized soil erosion, compaction, and topsoil and subsoil mixing could affect revegetation within temporary work areas. Construction of a substation would result in permanent impacts on soils for that facility's operational lifetime.

Temporary impacts on soils will occur during the construction of the transmission line. During construction, soil compaction and localized soil erosion may occur during clearing and grading of temporary work areas.

Construction work within the substation site will include site preparation, including grading and installation of substructures and electrical equipment. Installation of concrete foundations and embedments for equipment will require the use of trenching machines, concrete trucks and pumpers, vibrators, forklifts, boom trucks, and large cranes. The limit of disturbance will be within the footprint of the substations for both the foundation equipment and the concrete delivery trucks.

6.7.3.2 Mitigation Measures

Impacts on soils along the transmission line would be temporary and minor and would be mitigated through the proper use and installation of BMPs, such as minimizing the number of vehicles trips, use of silt fencing or other effective sediment controls, and segregation of topsoil and subsoil. The

Applicants will implement measures to reduce soil compaction and will commit to decompaction of soils during restoration of temporary workspaces, including travel lanes.

All topsoil from the substation footprint will be removed to a pre-established suitable location for storage. The storage area will be near the site where the soil was removed, accurately located (GPS boundary, soil depth), and graded to facilitate revegetation. Subsoil will be removed, if necessary, to an acceptable pre-established and approved area for storage.

The Applicants will also develop an SWPPP that complies with MPCA rules and guidelines; implementation of the protocols outlined in the SWPPP will minimize the potential for soil erosion during construction of the transmission line and substations. Other potential construction impacts on soils will be reduced through implementation of the VMP and the AIMP (see **Appendices F and G**, respectively).

The Applicants will implement measures to reduce soil compaction and commit to decompaction of soils during restoration of temporary workspaces. Landowners will be compensated accordingly for any localized crop damage that may occur through implementation of the VMP and the AIMP (see **Appendices F and G**, respectively).

Commission-issued Route Permits include standard conditions that the Permittee shall implement erosion prevention and sediment control practices recommended by the MPCA Construction Stormwater Program. If construction of the project disturbs more than 1 acre of land or is sited in an area designated by the MPCA as having potential for impacts on water resources, the Permittee shall obtain an NPDES/State Disposal System Construction Stormwater Permit from the MPCA that provides for the development of an SWPPP that describes methods to control erosion and runoff.

The Permittee shall also implement reasonable measures to minimize erosion and sedimentation during construction and shall employ perimeter sediment controls; protect exposed soil by promptly planting, seeding, and using erosion control blankets and turf reinforcement mats; stabilizing slopes; protecting storm drain inlets; protecting soil stockpiles; and controlling vehicle tracking. Contours shall be graded, as required, so that all surfaces provide for proper drainage, blend with the natural terrain, and are left in a condition that will facilitate re-vegetation and prevent erosion. All areas disturbed during construction of the Project shall be returned to pre-construction conditions.

6.7.4 Surface Water and Wetlands

The ROI for surface waters and wetlands is the Project's route width. Hydrologic features in the Project Area and along the proposed route width are shown in the maps in **Appendix B**. The Project lies within the Zumbro River Watershed within the Lower Mississippi River Basin.[84]

6.7.4.1 Surface Waters

Section 404 of the CWA establishes a program to regulate the discharge of dredged or fill material into Waters of the U.S. (WOTUS) which encompass all waterways and waterbodies that are permanent and navigable or are relatively permanent bodies of water connected to traditional interstate navigable waters. Navigable waters are designated by USACE and regulated under Section 10 of the Rivers and Harbors Act of 1899. Under the CWA, no dredged or fill material may be permitted in WOTUS if the nation's waters are significantly degraded or a practicable alternative exists that is less damaging to the aquatic environment. Ryan Companies, US, engaged Kjolhaug Environmental Services (KES) to conduct a wetland delineation of the Project Skyway site in Spring 2024 and prepare a report (dated May 15, 2024). Based on the Notice of Decision (NOD) (dated July 9, 2024) of the KES work, the swales in the Project Skyway site are not considered WOTUS because they do not meet the definition (see **Appendix K**).

In Minnesota, additional MNDNR regulations may apply to lakes, rivers, streams, and ditches designated as Public Waters Inventory (PWI) waters,[85] which are basins, watercourses, and wetlands that meet the criteria set forth in Minn. Stat. § 103G.005, subd. 15. Projects that have the potential to alter the course, current, or cross section of a PWI basin, watercourse, or wetland require a MNDNR Public Waters Work Permit (Minn. Stat. § 103G.245). Surface waters in the Project Area and along the route width are shown in Figure 9 in **Appendix B**. It should be noted that the swales located on the Project Skyway site are identified on the National Wetland Inventory as "intermittent streams"; however, as detailed in the May 15, 2024 KES delineation report and the subsequent NOD dated July 9, 2024, the grassed swales do not contain a defined channel, bed, or bank features; lack erosional gullies or other preferential surface flow pathways; and do not contain surface water or evidence of saturation. An additional delineation was completed by HDR Engineering, Inc. of the route width in October 2025 (see **Appendix K**), and it confirmed that the grassed swales do not meet the criteria for wetlands because they lack sufficient hydrophytic vegetation, hydric soils, and hydrological indicators.

[84] Minnesota Department of Natural Resources (MNDNR). 2025. Minnesota's Watershed Basins. Online [URL]: https://www.dnr.state.mn.us/watersheds/map.html. Accessed: December 2025.

[85] Minnesota Department of Natural Resources (MNDNR). 2025. Public Waters (PW) Basin and Watercourse Delineations. Online [URL]: https://gisdata.mn.gov/dataset/water-mn-public-waters. Accessed: November 2025.

There are no Federal Emergency Management Agency (FEMA)[86] floodplains within the Project Area or route width (Figure 7 in **Appendix B**). The nearest floodplain is more than 1,000 feet southwest of the route width.

Section 303(d) of the Federal Clean Water Act requires that states publish a list every 2 years of streams and lakes that do not meet their designated uses because of impairments. The 303(d) list is based on violations of water quality standards and listed waters described as impaired. In Minnesota, the MPCA has authority over determining 303(d) waters. Based on the MPCA's 2024 list, no impaired waters are crossed by the ROW. The nearest impaired water is the Middle Fork, Zumbro River, which is approximately 1 mile from the ROW. The Middle Fork, Zumbro River (AUID 07040004-973) is considered impaired, but a Total Maximum Daily Load study was approved by the U.S. Environmental Protection Agency. It is considered impaired for Aquatic Recreation Quality.

6.7.4.2 Wetlands

Two MNDNR NWI[87] wetlands totaling 0.81acre were mapped within the route width (Figure 8 in **Appendix B**). The wetland types include Type 1 – seasonally flooded (0.75 acre) and Type 3 – shallow marsh (0.06 acre) wetlands. Based on the MNDNR Hydrography Dataset,[88] five intermittent streams and an overland pond (25007100) were mapped within the route width (Figure 9 in **Appendix B**). An MNDNR hydrography water feature was mapped in the northwestern portion of the route width (Figure 9 in **Appendix B**). No PWI basins, watercourses, or wetlands were mapped within the route width. A PWI watercourse, the Zumbro River, was mapped within 1 mile of the route width (Figure 9 in **Appendix B**) and the nearest PWI water basin (Shady Lake) is more than 5.2 miles from the Project Area.

Two wetlands totaling 0.07 acre were identified within the ROW based on an October 2025 field wetland delineation[89] (Figure 9 in **Appendix B**). These wetlands are Type 2 – wet meadows dominated by the non-native and invasive reed canary grass (*Phalaris arundinacea*). No other surficial water resources were identified within the ROW. The wetland delineation report is included as **Appendix K**.

[86] Federal Emergency Management Agency (FEMA). 2024. FEMA's National Flood Hazard Layer (NFHL) Viewer. Online [URL]: https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd. Accessed: November 2025.

[87] Minnesota Department of Natural Resources (MNDNR). 2019. National Wetland Inventory for Minnesota. Online [URL]: https://gisdata.mn.gov/dataset/water-nat-wetlands-inv-2009-2014. Accessed: November 2025.

[88] Minnesota Department of Natural Resources (MNDNR). 2025. DNR Hydrography Dataset. Online [URL]: https://gisdata.mn.gov/dataset/water-dnr-hydrography. Accessed: November 2025.

[89] HDR. 2025. Wetland Delineation Report: Skyway Transmission Project. Prepared for Xcel Energy. Pp. 1-30.

6.7.4.3 Calcareous Fens, Karst, and Springs

No calcareous fens, karst features, or springs were mapped within the ROW. No calcareous fens or springs were mapped within the route width. While no surface karst features were identified within the Project Area, and the nearest was identified in the city of Pine Island (see Section 6.7.2, Geology), the route width was mapped within a region that is prone to karst feature development.[90] Areas that are mapped within a region that is prone to karst feature development may or may not have karst features present. The nearest calcareous fen was mapped 11.6 miles from the ROW.[91] The nearest spring was mapped 3.4 miles from the ROW.[92]

6.7.4.4 Potential Impacts

Impacts on surface water and wetlands are expected to be negligible to minimal. FEMA designated floodways, 100-year, or 500-year floodplains will not be spanned by Project transmission lines, nor will any transmission line structures be placed within these floodways or floodplains.

There are no lakes or streams within or crossed by the ROW. There were two Type 2 – wet meadow wetlands totaling 0.07 acre identified within the ROW. The Project has been designed to avoid impacts on these wetlands via spanning.

Indirect impacts on surface waters may occur from erosion and stormwater runoff. Runoff from rain events and snow melt has the potential to carry sediment and pollutants to surface waters (and groundwater). Vegetation removal and earth moving during Project construction may amplify stormwater runoff issues. Stormwater management is regulated by MPCA. The Applicants will develop an SWPPP that complies with MPCA rules and guidelines. Implementation of the protocols outlined in the SWPPP will minimize impacts on wetlands, streams, and floodplains during construction of Project infrastructure. Contractors will use BMPs, including silt fences and temporary stabilization, as applicable, during construction to minimize any impacts on surface water resources within the ROW, route width, or near the route width.

Construction of the Project is not anticipated to cause any waterbody or watercourse to be newly listed as impaired. It is unlikely that construction activities would result in increased turbidity to waterbodies or watercourses from sedimentation due to the distance from the ROW to these water features and the use of sediment and erosion control BMPs. Potential impacts on karst features and mitigation of such are described in Sections 6.7.2.1 and 6.7.2.2.

---

[90] Minnesota Department of Natural Resources. 2025. Minnesota Regions Prone to Surface Karst Feature Development. Online [URL]: Minnesota Regions Prone to Surface Karst Feature Development - Resources - Minnesota Geospatial Commons. Accessed: January 2026.

[91] Minnesota Department of Natural Resources. 2021. Identification List of Known Calcareous Fens. Pp. 1-8.

[92] Minnesota Department of Natural Resources. 2025. Springs of Minnesota. Online [URL]: https://gisdata.mn.gov/dataset/env-mn-springs-inventory. Accessed: January 2026.

6.7.4.5 Mitigation Measures

Wetland impact avoidance measures to be implemented in the design and construction of the Project include siting and routing Project infrastructure such that direct permanent impacts on wetlands are avoided. As applicable, the Applicants and their contractors will use erosion and sediment control BMPs, such as sediment barriers and weed-free mulch, near wetlands to minimize runoff during construction. Erosion and sediment control structures will be inspected, maintained, repaired, or replaced, as needed.

If needed, wooden or composite construction mats will be used in wetland areas if it is not possible to perform construction activities during periods of frozen ground.

Route Permits issued by the Commission typically contain the following mitigation measures relevant to surface waters and wetlands:

- The Permittee shall develop wetland impact avoidance measures and implement them during construction. Measures shall include spacing and placing the power poles at variable distances to span and avoid wetlands, watercourses, and floodplains. Unavoidable wetland impacts because of the placement of poles shall be limited to the immediate area around the poles. To minimize impacts, the Permittee shall construct in wetland areas during frozen ground conditions where practicable and according to permit requirements by the applicable permitting authority. When construction during winter is not possible, the Permittee shall use wooden or composite mats to protect wetland vegetation.

- The Permittee shall contain soil excavated from the wetlands and riparian areas and not place it back into the wetland or riparian area. The Permittee shall access wetlands and riparian areas using the shortest route possible to minimize travel through wetland areas and prevent unnecessary impacts. The Permittee shall not place staging or stringing set up areas within or adjacent to wetlands or water resources, as practicable.

- The Permittee shall restore wetland and water resource areas disturbed by construction activities to pre-construction conditions in accordance with the requirements of applicable State and federal permits or laws and landowner agreements. The Permittee shall meet the USACE, MNDNR, BSWR, and local units of government wetland and water resource requirements.

6.7.5 Vegetation

The ROI for vegetation is the Project Area. Based on the USGS's National Land Cover Database (NLCD),[93] vegetation and landcover within the Project Area and route width is predominantly cultivated cropland, with minor portions of barren land and developed land (**Table 6.7-4**).[94] Vegetation and land cover types are shown in Figure 4 in **Appendix B**.

Table 6.7-4. Land Cover Types and Proposed Impacts Within the Project Area

	Project Area (acres)	Project Area (%)	Route Width (acres)	Route Width (%)
Barren Land	9.2	14.1	9.4	2.8
Cultivated Crops	54.9	84.5	291.5	88.5
Deciduous Forest	0.0	0.0	5.3	1.6
Developed, Low Intensity	0.5	0.7	9.0	2.7
Developed, Medium Intensity	0.2	0.3	1.2	0.4
Developed, Open Space	0.2	0.3	5.1	1.6
Evergreen Forest	0.0	0.0	0.9	0.3
Hay/Pasture	0.0	0.0	3.51	1.1
Mixed Forest	0.0	0.0	3.5	1.1
Woody Wetlands	0.0	0.0	0.2	0.1
Total[a]	**64.98**	**100.0**	**329.5**	**100.0**

[a] Addendums may not sum due to rounding.

6.7.5.1 Potential Impacts

Potential impacts from the Project are anticipated to be minimal but long term. The transmission line ROW largely follows existing ROW through agricultural land, therefore limiting vegetation clearing. Construction of the Project Skyway Substations and expansion of the North Rochester Substation would result in permanent impacts primarily on agricultural land for the facility's operational lifetime (see Section 6.5.1 concerning agricultural impacts and mitigation). Permanent and temporary impacts on vegetation within the Project Area are provided in **Table 6.7-5**.

[93] U.S. Geological Survey (USGS). 2025. Annual National Land Cover Database (NLCD) Collection 1 Products (ver. 1.1, June 2025). Online [URL]: https://www.usgs.gov/data/annual-national-land-cover-database-nlcd-collection-1-products-ver-11-june-2025. Accessed: November 2025.

[94] Vegetation types were identified via a desktop review.

Table 6.7-5. Permanent and Temporary Vegetation Impacts

	Temporary Impacts (acres)	Permanent Impacts (acres)
Deciduous Forest	0	0
Evergreen Forest	0	0
Mixed Forest	0	0
Woody Wetlands	0	0
Total[a]	**0**	**0**

[a] Addendums may not sum due to rounding.

Localized soil erosion, compaction, and mixing of topsoil and subsoil within temporary work areas may affect revegetation.

Construction and maintenance activities have the potential to result in the introduction or spread of noxious weeds. Noxious weeds, which are regulated under Minn. Stat. Ch. 18, can be introduced to new areas through the propagation of material, such as roots or seeds transported by contaminated construction equipment. In general, noxious weed species establish more quickly on disturbed soil surfaces than existing native vegetation and have the potential to displace existing vegetation, without proper controls in place.

6.7.5.2 Mitigation Measures

Vegetation that is removed during construction outside of the ROW will be allowed to regrow or will be restored per the SWPPP and VMP (**Appendix F**).

The Applicants will follow the BMPs described in the VMP and AIMP (see **Appendices F and G**) as well as the SWPPP, which will be developed prior to construction to mitigate potential vegetation impacts.

Route Permits issued by the Commission typically contain the following mitigation measures relevant to vegetation:

- Where practical, existing roadways shall be used for all activities associated with construction.
- The Permittee shall minimize the number of trees to be removed in selecting the ROW specifically preserving, to the maximum extent practicable, windbreaks, shelterbelts, living snow fences, and vegetation in areas, such as trail and stream crossings, where vegetative screening may minimize aesthetic impacts, to the extent that such actions do not violate sound engineering principles or system reliability criteria.
- The Permittee shall remove tall growing species located within the transmission line ROW that endanger the safe and reliable operation of the transmission line. The Permittee shall leave undisturbed, to the extent possible, existing low growing species in the ROW or replant such

species in the ROW to blend the difference between the ROW and adjacent areas, to the extent that the low growing vegetation that will not pose a threat to the transmission line or impede construction.

- The Permittee shall employ BMPs to avoid the potential introduction and spread of invasive species on lands disturbed by construction activities. The Permittee shall develop an Invasive Species Prevention Plan and file it with the Commission at least 14 days prior to the pre-construction meeting. The Permittee shall comply with the most recently filed Invasive Species Prevention Plan.

- The Permittee shall take all reasonable precautions against the spread of noxious weeds during all phases of construction. When utilizing seed to establish temporary and permanent vegetative cover on exposed soil, the Permittee shall select site-appropriate seed certified to be free of noxious weeds. To the extent possible, the Permittee shall use native seed mixes.

6.7.6 Wildlife and Habitats

The ROI for wildlife and habitat (except birds) is the Project's route width. The ROI for wildlife including birds is the Study Area. Common wildlife species that have the potential to occur in the Study Area, which includes the route width, include those that use woodlands, wetlands, hay/pasturelands, or cultivated cropland habitats in rural agricultural settings, as described in **Table 6.7-6**.

Table 6.7-6. Common Wildlife Species That May Occur Within the Study Area

Common Name	Scientific Name	Habitat
Mammals		
Deer mouse	*Peromyscus maniculatus*	Forests, grasslands, and cultivated cropland.
White-tailed deer	*Odocoileus virginianus*	Forests, grasslands, prairies, cultivated cropland, wetlands, pasturelands, shrub/scrub, and suburban and rural areas.
Gray squirrel	*Sciurus carolinensis*	Hardwood forests, wooded parks, and residential areas.
Coyote	*Canis latrans*	Forests, grasslands, prairies, cultivated cropland, wetlands, pasturelands, shrub/scrub, and urban, suburban, and rural areas.
Red fox	*Vulpes vulpes*	Forests, grasslands, prairies, cultivated cropland, wetlands, pasturelands, shrub/scrub, and urban, suburban, and rural areas.
Eastern cottontail	*Sylvilagus floridanus*	Forest edge habitat, open areas, grasslands, shrub/scrub, and suburban and rural areas.
Striped skunk	*Mephitis mephitis*	Woodlands, grasslands, cultivated cropland, and suburban and rural areas.
Raccoon	*Procyon lotor*	Forests, grasslands, prairies, cultivated cropland, wetlands, pasturelands, shrub/scrub, and urban, suburban, and rural areas.

Common Name	Scientific Name	Habitat
Birds		
Wild turkey	*Meleagris gallopavo`*	Woodlands, forest edge habitat, grasslands, meadows, cultivated cropland, riparian areas, and urban, suburban, and rural areas.
Red-tailed hawk	*Buteo jamaicensis*	Open forest, forest edge habitat, grasslands, meadows, fields, cultivated cropland, and urban, suburban, and rural areas.
American robin	*Turdus migratorius*	Woodlands, forest edge habitat, grasslands, meadows, cultivated cropland, and urban, suburban, and rural areas.
Brown-headed cowbird	*Molothrus ater*	Forest edge habitat, grassland, shrub/scrub, prairies, fields, pastures, orchards, and suburban and rural areas.
Ring-necked pheasant	*Phasianus colchicus*	Forest edge habitat, grasslands, open fields, brushy meadows, wetlands, cultivated cropland, pastures, and rural areas.
Red-winged blackbird	*Agelaius phoeniceus*	Wetland edges, wet meadows, marshes, wet areas with dense vegetation, brushy fields, shrub/scrub, and cultivated cropland.
Mallard	*Anas platyrhynchos*	Ponds, lakes, streams, rivers, parks, and cultivated cropland.
Amphibians		
American toad	*Anaxyrus americanus*	Woodlands, grasslands, suburban and rural areas, and freshwater ponds and marshes.
Tiger salamander	*Ambystoma tigrinum*	Woodlands, grasslands, prairies, marshes, swamps, and suburban and rural areas.
Northern leopard frog	*Lithobates pipiens*	Grasslands, wetlands, wet meadows, ponds, marshes, and slow-moving streams with abundant vegetation.
Reptiles		
Painted turtle	*Chrysemys picta*	Lakes, ponds, marshes, and slow-moving rivers and streams with aquatic vegetation. Nests in adjacent upland areas.
Snapping turtle	*Chelydra serpentina*	Lakes, ponds, marshes, and slow-moving rivers and streams with aquatic vegetation. Nests in adjacent upland areas.
Common garter snake	*Thamnophis sirtalis*	Woodlands, fields, grasslands, prairies, wetlands, meadows, marshes, ponds, and suburban and rural areas near water sources.

Important Bird Areas (IBA) are natural resource sites identified by the National Audubon Society that are considered the most important for birds.[95] There were no mapped National Audubon Society IBAs within the Study Area.

[95] National Audubon Society. No date. Important Bird Areas interactive map. Online [URL]: https://gis.audubon.org/portal/apps/sites/?_gl=1*oen4tk*_gcl_au*MTA4MDM2Mzk1OS4xNzU5NDIxNTAy*_ga*MjA0NDI5OTAxMC4xNzU5NDIxNTAz*_ga_X2XNL2MWTT*czE3NjE1Njk5OTQkbzMkZzAkdDE3NjE1Njk5OTQkajYwJGwwJGgw#/nas-hub-site. Accessed: November 2025.

There were no state parks,[96] state forests,[97] state migratory waterfowl feeding and resting areas,[98] state WMAs,[99] or SNAs[100] mapped within 1 mile of the route width. There were no federal Waterfowl Production Areas, national wildlife refuges, or federal forests[101] mapped within 1 mile of the route width.

There are two State-managed marginal cropland–perpetual conservation easements within 1 mile of the route width. One is located approximately 0.3 mile east of the route width and the other is approximately 0.8 mile southwest of the route width (Figure 3 in **Appendix B**).

6.7.6.1 Potential Impacts

There is minimal potential for the permanent displacement of wildlife and loss of habitat from construction of the Project. Wildlife that inhabits natural areas within the route width could be impacted in the short term within the immediate area of construction. Multiple variables influence the level of impacts on wildlife, including the size of the animal, its habitat preference, its mobility, and its behavioral traits, such as tolerance to disturbance, denning/nesting habits, and periods of activity. Larger or more mobile animals, such as white-tailed deer, red foxes, and birds, will be able to vacate the immediate area of construction. Some of these animals will be permanently displaced and others may return upon Project completion. Small or less mobile animals, such as reptiles, amphibians, and small mammals, may be more affected by construction due to their inability to vacate a construction area. Aquatic species should not be permanently impacted because the Project will span any wetlands or watercourses and any potential temporary impacts on these resources or adjacent riparian areas will be returned to preconstruction conditions. Additionally, these animals will be typical of those found in agricultural settings and will not incur population level effects due to construction.

Raptors, waterfowl, and other bird species might be affected by the construction and placement of the transmission line. Potential collisions with the transmission line pose a risk of injury or death to bird species. These impacts often involve waterfowl species and larger birds, such as raptors, which

[96] Minnesota Department of Natural Resources (MNDNR). 2025. State Parks, Recreation Areas, and Waysides. Online [URL]: https://gisdata.mn.gov/dataset/bdry-dnr-lrs-prk. Accessed: November 2025.

[97] Minnesota Department of Natural Resources (MNDNR). 2025. State Forest Statutory Boundaries and Management Units. Online [URL]: https://gisdata.mn.gov/dataset/bdry-state-forest. Accessed: November 2025.

[98] Minnesota Department of Natural Resources (MNDNR). 2025. Migratory Waterfowl Feeding and Resting Areas. Online [URL]: https://gisdata.mn.gov/dataset/env-migratory-waterfowl-areas. Accessed: November 2025.

[99] Minnesota Department of Natural Resources (MNDNR). 2025. Publicly Accessible State Wildlife Management Areas. Online [URL]: https://gisdata.mn.gov/dataset/bdry-dnr-wildlife-mgmt-areas-pub. Accessed: November 2025.

[100] Minnesota Department of Natural Resources (MNDNR). 2025. Scientific and Natural Area Units. Online [URL]: https://gisdata.mn.gov/dataset/bdry-scientific-and-nat-areas. Accessed: November 2025.

[101] U.S. Fish and Wildlife Service (USFWS). 2025. USFWS National Realty Boundaries. Online [URL]: https://gis-fws.opendata.arcgis.com/datasets/745ed874c1394da3a9aae50267c9e049_0/explore. Accessed: November 2025.

are at additional risk of being electrocuted if their large wingspans contact parallel conductors as they land or take off from a tower.

No impacts on National Audubon Society IBAs, state parks, state forests, state migratory waterfowl feeding and resting areas, state WMAs, SNAs, federal Waterfowl Production Areas, national wildlife refuges, or federal forests are expected during Project construction and operation. Also, impacts on the two State-managed conservation easements within 1 mile of the route width are not expected during Project construction or operation.

6.7.6.2 Mitigation Measures

To mitigate impacts on potential bird strikes and electrocutions, the Project will be constructed according to Avian Power Line Interaction Committee (APLIC) recommended guidelines to reduce the potential for avian collisions. No additional mitigation measures are proposed.

Commission-issued Route Permits typically include standard conditions that apply to wildlife and habitat:

- The Permittee shall minimize the number of trees to be removed in selecting the ROW, specifically preserving, to the maximum extent practicable, windbreaks, shelterbelts, living snow fences, and vegetation in areas, such as trail and stream crossings, where vegetative screening may minimize aesthetic impacts, to the extent that such actions do not violate sound engineering principles or system reliability criteria.

- The Permittee shall, in cooperation with MDNR, identify areas of the transmission line where bird flight diverters will be incorporated into the transmission line design to prevent large avian collisions attributed to visibility issues. Standard transmission design shall incorporate adequate spacing of conductors and grounding devices in accordance with APLIC standards to minimize the risk of electrocution to raptors.

6.7.7 Rare and Unique Natural Habitats

The ROI for protected species is the Study Area and the ROI for sensitive ecological resources is the Project's route width. Rare and Unique Resources include plant and animal species listed at the federal or State level as endangered or threatened. Federally listed endangered or threatened species are protected under the Endangered Species Act (ESA) of 1973, administered by USFWS. State-listed endangered and threatened species are protected under Minn. Stat. 84.0895, administered by MNDNR. Additionally, rare and unique resources include plant and animal species listed as proposed or candidate listings at the federal level, and as special concern at the State level. These species are not legally protected by federal or State laws; however, USFWS or MNDNR are typically notified of potential impacts on these species. Bald (*Haliaeetus leucocephalus*) and golden (*Aquila chrysaetos*) eagles are protected under the Bald and Golden Eagle Protection Act of 1940. Most bird species and their nests are, in general, protected by the Migratory Bird Treaty Act of 1918.

In addition to plant and animal species, rare and unique resources include natural resource sites administered by federal or State agencies, including the following:

- Minnesota Biological Survey (MBS) sites of biodiversity significance;[102]
- MNDNR native plant communities (NPC);[103]
- MNDNR railroad ROW prairies;[104] and
- MNDNR Native Prairie Bank easements.[105]

Seven MNDNR NPCs were mapped within 1 mile of the route width. There are five elm (*Ulmus* spp.) – ash (*Fraxinus* spp.) – basswood (*Tilia* spp.) terrace forests within 1 mile of the route width (Figure 10 in **Appendix B**). There is also a southern terrace forest and sugar maple (*Acer saccharum*) – basswood – bitternut hickory (*Carya cordiformis*) forest within 1 mile of the route width (Figure 10 in **Appendix B**). The seven MNDNR NPCs are associated with five MBS sites of biodiversity significance (Figure 10 in **Appendix B**). The five MBS sites include two rated as having high, one rated as having moderate, and two rated as having below biodiversity significance. There were no MNDNR railroad ROW prairies or MNDNR Native Prairie Bank easements mapped within 1 mile of the route width.

Based on a review of the MNDNR Natural Heritage Information System data (LA2025-046), there were no records of rare species within the route width. There were records of two State special concern species, two State threatened species, and a State endangered species within 1 mile of the route width. The five species include the State special concern Ozark minnow (*Miniellus nubilus*) and creek heelsplitter mussel (*Lasmigona compressa*), State threatened glade mallow plant *(Napaea dioica*) and ellipse mussel (*Venustaconcha ellipsiformes*), and State endangered Blanchard's cricket frog (*Acris blanchardi*). Under Minn. R. 84.0895, Protection of Threatened and Endangered Species, no species designated as State-endangered or State-threatened may be taken without a permit from MNDNR. Species with a special concern designation are not protected under Minnesota Rules.

This review does not represent a comprehensive survey but provides an overview of the species that may occur in the vicinity of the ROW and route width. On April 13, 2026, the Applicants submitted a formal MNDNR natural heritage information request (**Appendix I**).

---

[102] Minnesota Department of Natural Resources (MNDNR). 2025. MBS Sites of Biodiversity Significance. Online [URL]: https://gisdata.mn.gov/dataset/biota-mcbs-sites-of-biodiversity. Accessed: November 2025.

[103] Minnesota Department of Natural Resources (MNDNR). 2025. MNDNR Native Plant Communities. Online [URL]: https://gisdata.mn.gov/dataset/biota-dnr-native-plant-comm. Accessed: November 2025.

[104] Minnesota Department of Natural Resources (MNDNR). 2017. MCBS Railroad Rights-of-Way Prairies. Online [URL]: https://gisdata.mn.gov/dataset/biota-mcbs-railroad-prairies. Accessed: November 2025.

[105] Minnesota Department of Natural Resources (MNDNR). 2018. Minnesota Native Prairie Bank map. Pp. 1. Online [URL]: https://files.dnr.state.mn.us/destinations/snas/NPBstatemap.pdf. Accessed: November 2025.

- Ozark minnow (*Miniellus nubilus*) – State special concern species.
    - In Minnesota, the species only occurs in the southeastern portion of the state and is restricted to the Zumbro, Root, and Cedar Rivers and their tributaries. They occur in slow current reaches of clear, small- to medium-sized streams near gravel or pebble riffles. As a State special concern species, Ozark minnows are not afforded legal protections. Based on an October 2025 field visit, suitable Ozark minnow habitat was not available within the ROW. The intermittent streams within the route width do not provide suitable habitat for the Ozark minnow.
- Creek heelsplitter mussel (*Lasmigona compressa*) – State special concern species.
    - This species occurs in low numbers within rivers throughout the state, including the Zumbro River. They occur in creeks, small rivers, and upstream reaches of large rivers on sand, fine gravel, and mud substrates. They may prefer areas with swift currents and water depths ranging from 1 to 3 feet. As a State special concern species, creek heelsplitters are not afforded legal protections. Based on an October 2025 field visit, suitable creek heelsplitter mussel habitat was not available within the ROW. The intermittent streams within the route width do not provide suitable habitat for the creek heelsplitter.
- Glade mallow (*Napaea dioica*) – State threatened.
    - In Minnesota, the species occurs in the southeastern portion of the state in full sun to full shade areas along streambanks, terrace forests, and floodplains of small- to medium-sized streams. Based on an October 2025 field visit, suitable glade mallow habitat was not available within the ROW. There is potentially suitable habitat along the intermittent stream (MAJ-070420965) where it traverses the wooded area located in the northwestern portion of the route width.
- Ellipse mussel (*Venustaconcha ellipsiformes*) – State threatened.
    - The species is known to occur in the Cannon, Zumbro, Root, Cedar, and Upper Iowa River systems in southern Minnesota. The species occurs in headwater reaches of rivers in gravel riffles and silty areas along stream banks. Based on an October 2025 field visit, suitable ellipse mussel habitat was not available within the ROW. The intermittent streams within the route width do not provide suitable habitat for the ellipse mussel.
- Blanchard's cricket frog (*Acris blanchardi*) – State endangered.
    - The species occurs in the southern portion of the state. Breeding and summer habitat includes permanent water bodies (i.e., ponds and backwaters of streams and rivers).

They overwinter in underground burrows near water bodies. Based on an October 2025 field visit, suitable Blandchard's cricket frog habitat was not available within the ROW. The intermittent streams, wetlands, and the overland pond (25007100) within the route width do not appear to provide suitable permanent water habitat for Blanchard's cricket frog.

Based on the April 13, 2026, USFWS Information for Planning and Consultation (IPaC) system data (see **Appendix I**), the federally endangered northern long-eared bat (*Myotis septentrionalis*), federally threatened prairie bush-clover (*Lespedeza leptostachya*), proposed threatened monarch butterfly (*Danaus plexippus*), and non-essential experimental population of whooping crane (*Grus americana*) may occur within the route width.

Only species with federal endangered or threatened status are protected by USFWS under the ESA. Species with proposed status are under consideration for listing and protection under the ESA but have not yet been designated by USFWS as endangered or threatened.

The "experimental" designation for the whooping crane means that the populations potentially present have been reintroduced outside their current range, but within their historic range. This population of whooping crane is considered non-essential for the continued existence of the species. USFWS has not designated critical habitat for any of the species identified in the USFWS IPaC.

- Northern long-eared bat – Federally endangered and State special concern species.
    - Suitable summer habitat for northern long-eared bats includes wooded areas that contain potential roost sites and adjacent habitats where they traverse or forage (i.e., wetlands or fields). Northern long-eared bats use suitable summer habitat during their active season (i.e., April 15 to October 31). During their inactive season (i.e., November 1 to April 14, inclusive), northern long-eared bats hibernate in caves or mines. Potential roost sites include live or dead trees 3 inches in diameter at breast height or greater that have exfoliating bark, cracks, crevices, or cavities. Individual trees with suitable characteristics that are within 1,000 feet of other wooded habitat may be considered potential roost sites. There are known northern long-eared bat hibernacula and a maternity roost tree in Goodhue County.[106] The known hibernacula and maternity roost tree(s) are more than 13 miles from the route width. There was a limited amount of wooded habitat within the ROW that may provide suitable foraging habitat for northern long-eared bats.[107] Karst features were not mapped within the

[106] Minnesota Department of Natural Resources (MNDNR) and U.S. Fish and Wildlife Service (USFWS). 2021. Townships containing documented northern long-eared bat (NLEB) maternity roost trees and/or hibernacula entrances in Minnesota. Pp. 1-5.

[107] Merjent. 2025. Federally Listed Species Habitat Survey: Skyway-North Rochester Substation Expansion Memo. Prepared for Xcel Energy. Pp. 1-19.

ROW. However, wooded habitat that may provide suitable roosting and foraging habitat for northern long-eared bats was identified within the route width. Karst features were also mapped within the route width. The Project may affect, but is not likely to adversely affect, the northern long-eared bat.

- Prairie bush-clover – Federally and State threatened.
    - Prairie bush-clover occurs on undisturbed remnant prairies or previously mowed, burned, cultivated, or grazed tallgrass prairie habitats. In southeastern Minnesota, it occurs on the upper slopes of dry sand-gravel or bluff prairies. There was no prairie habitat within the ROW or the route width. The Project will have no effect on the prairie bush-clover.
- Monarch butterfly – Proposed threatened under the Federal ESA with a corresponding 4(d) rule that would allow for certain types of take.
    - Monarch butterflies occur in prairies, grasslands, gardens, urban greenspaces, and the borders of cultivated fields. This species requires milkweed (*Asclepias* spp.) host plants for larvae and abundant floral resources for adults. Important floral resources include flowering plants, such as milkweeds, blazing stars (*Liatris* spp.), asters (*Symphyotrichum* spp.), sunflowers (*Helianthus* spp.), and thistles (*Cirsium* spp.). Because milkweed and important floral resources may occur within the ROW and route width, the Project may affect, but is not likely to jeopardize, the monarch butterfly. If the status of the monarch changes to threatened in the future, further assessment or coordination with USFWS may be required.
- Whooping crane – Non-essential, experimental population at the federal level.
    - The eastern migratory population of whooping crane are considered non-essential to the continued existence of the species. Individuals from this population rarely occur in Minnesota. Whooping cranes use a variety of habitats, including marshes, wetlands, pastures, and flooded agricultural fields, but they avoid areas with tall structures (i.e., trees and buildings) and areas near roads. There is cultivated cropland in the ROW and route width and hay-pastureland within the route width that may provide suitable foraging habitat for whooping cranes. However, it is unlikely that whooping cranes would occur within the ROW or route width due to the proximity of tall structures (i.e., trees, utility poles, substation) and roads (i.e., U.S. Highway 52). The Project is unlikely to jeopardize the non-essential, experimental population of whooping crane.

6.7.7.1 Potential Impacts

Impacts on rare and unique natural habitats are expected to be negligible. There were no MBS sites of biodiversity significance, MNDNR NPCs, MNDNR railroad ROW prairies, or MNDNR Native Prairie Bank easements mapped within the ROW, route width, or immediately adjacent to the route width. No impacts on the MBS sites of biodiversity significance or MNDNR NPCs within 1 mile of the route width are expected during Project construction or operation.

Impacts on suitable monarch butterfly habitat may occur during Project construction. However, there are currently no legal protections for the monarch butterfly or its habitat. If the monarch is federally listed as threatened, the need for mitigation will be reevaluated, as appropriate.

There is no suitable prairie bush-clover habitat available within the route width; therefore, no impacts are anticipated. Impacts on whooping cranes are not expected.

Suitable habitat is not available for the Ozark minnow, creek heelsplitter, ellipse mussel, or Blanchard's cricket frog within the route width and, therefore, no impacts are anticipated. Suitable glade mallow habitat is not available within the ROW. There is potentially suitable glade mallow habitat along the intermittent stream (MAJ-070420965) where it traverses the wooded area in the northwestern portion of the route width. No direct impacts on potentially suitable glade mallow habitat are expected during Project construction or operation, and soil and erosion BMPs will minimize or avoid any indirect impacts on the species or its habitat.

6.7.7.2 Mitigation Measures

As the above-described resources are not expected to be impacted, mitigation measures are not currently proposed.

The Applicants will avoid impacts on federal- and State-listed species to the maximum extent practicable and will coordinate with the appropriate federal or State agency in the unlikely event of unavoidable impacts on listed species. Tree removals or limbing activities will occur from August 16 to May 31 (inclusive), to the greatest extent practicable, to avoid impacts during the northern long-eared bat pup-rearing season.

6.7.8 Greenhouse Gases

The ROI for GHGs is Goodhue County. Some of the most abundant gases in the atmosphere are known as GHGs. The most common GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases. GHGs are known to trap heat in the Earth's atmosphere by absorbing light energy and emitting a portion of released energy back toward Earth. The amount of energy absorbed by 1 ton of a GHG over a given period is known as the Global Warming Potential (GWP). The order of common GHGs by GWP from lowest to highest is CO_2, CH_4, N_2O, and

fluorinated gases.[108] For ease of comparison, GWPs are calculated relative to the energy absorption of 1 ton of CO_2. Emission of a given GHG is normalized using the GWP; the resultant value is referred to as carbon dioxide equivalent (CO_2e).

The State of Minnesota is taking significant action to reduce the amount of GHG emissions produced in the state. Minnesota has experienced a 14 percent reduction in GHG emissions across all industry sectors between 2005 and 2022.[109] Construction of the Project will result in temporary minor GHG emissions from fuel combustion in construction equipment, commuter vehicles, and delivery trucks. **Table 6.7-7 and Table 6.7-8** summarize the estimated potential emissions of GHG from construction activities for the Project. Emissions were calculated using the Minnesota Environmental Quality Board's 2025 Climate Calculator tool (**Appendix I**). The applicable emission sources for the transmission line and substation facilities are material inputs, transportation of material inputs, employee commuting, construction equipment, land use change, and construction waste. As material quantities were not available at the time of calculation, the material inputs, transportation of material inputs, and construction waste categories were not selected for inclusion. Land use change is not expected to substantially increase GHG emissions, so this category was also omitted. Vehicle and equipment emissions were calculated and are based on typical counts of diesel-fueled construction equipment, expected hours of operation, and the number of workers and associated trip length. It is not anticipated that construction activities will independently cause or significantly contribute to an emission level that results in a violation of NAAQS. At the completion of construction activities, all construction-related air impacts will cease.

Table 6.7-7. Preliminary Estimate: Greenhouse Gas Emissions from Construction of the Transmission Line

Construction Components	CO_2e (short tons)
Off-Road Engine Emissions	4,364
Commuter and Delivery Vehicles	72
Total	4,436

Notes:
CO_2e – carbon dioxide equivalent
CH_4 – methane; 1 short ton CH_4 = 28 short tons CO_2e
N_2O – nitrous oxide; 1 short ton N2O = 265 short tons CO_2e
CO_2e = carbon dioxide equivalent
Source: 40 CFR 98 Table A-1: https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98#Table-A-1to-Subpart-A-of-Part-98.

[108] U.S. Environmental Protection Agency (USEPA). 2024. Understanding Global Warming Potentials. Online [URL]: https://www.epa.gov/ghgemissions/understanding-global-warming-potentials. Accessed: December 2025.

[109] Minnesota Pollution Control Agency (MPCA) and DOC. January 2025. Greenhouse gas emissions in Minnesota 2005-2022. Online [URL]: Greenhouse gas emissions in Minnesota 2005-2022 Legislative Report. Accessed: December 2025.

Table 6.7-8. Preliminary Estimate: Greenhouse Gas Emissions from Construction of the Substation Facilities

Construction Components	CO_2e (short tons)
Off-Road Engine Emissions	936
Commuter and Delivery Vehicles	36
Total	972

Notes:
CO_2 – carbon dioxide
CH_4 – methane; 1 short ton CH_4 = 28 short tons CO_2e
N_2O – nitrous oxide; 1 short ton N2O = 265 short tons CO_2e
CO_2e = carbon dioxide equivalent
Source: 40 CFR 98 Table A-1: https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98#Table-A-1to-Subpart-A-of-Part-98.

Similar to air quality, GHG emissions will be generated during routine inspection and maintenance activities. Xcel Energy will perform an annual aerial inspection of the line. Once every 4 years, crews will visually inspect the lines from the ground. Additionally, vegetation maintenance will generally occur once every 4 years. Emissions from vehicle and helicopter use will be infrequent and will not have a significant impact on operational GHG emissions. Upon construction completion, the disturbed area will be restored and revegetated. Therefore, there are no anticipated GHG emissions from any permanent land use change along the transmission line route.

Sulfur hexafluoride (SF_6), a GHG, is used as an insulating material in substation breakers. Under normal operations, the SF_6 remains contained in the breakers and is not released to the atmosphere. More generally, operational emissions related to the Project are not anticipated beyond minor and incidental vehicle emissions associated with Project inspection and maintenance.

6.7.8.1 Potential Impacts

The Project's impacts on GHG emissions would be negligible. Minnesota's GHG emissions totaled 126,140,738 metric tons (139,046,197 short tons) of CO_2e in 2022.[110] Accordingly, the preliminary estimate of Project GHG emissions identified here would be negligible compared to emissions in Minnesota.

During operation, emissions would come from infrequent vehicle or helicopter use during routine operation and maintenance and any combustion of diesel from maintenance equipment.

[110] Minnesota Pollution Control Agency (MPCA). 2025. Minnesota's greenhouse gas emissions and statutory goals. Online [URL]: Workbook: Minnesota Greenhouse Gas Inventory. Accessed: December 2025.

6.7.8.2 Mitigation Measures

GHG emissions generated during construction and routine operation and maintenance activities will be minimal. Vehicle emissions will be mitigated by limiting idling to only times when necessary. Construction equipment will be required to have proper tuning and maintenance to ensure good working order.

During operation, the Applicants will monitor the SF_6 gas levels in the breakers as part of the routine monitoring of substation equipment. When gas losses are detected, the SF_6 will be extracted to a separate tank to allow the breaker to be repaired. Any gas collected from decommissioned breakers will be shipped offsite for recycling.

6.7.9 Climate Change and Resilience

The ROI for climate change and resilience is Goodhue County. Climate change is the change in global or regional climate patterns over time. Over the past century, Minnesota's climate has been changing and will continue to do so. Noticeable effects in the future may include warmer periods during winter and at night, increased precipitation and heavier downpours, increased summer heat, and the potential for longer dry spells.[111]

The Project is not located within a mapped floodplain. Potential impacts associated with floodplains are discussed in Section 6.7.4.

From 1980 to 2025, Goodhue County experienced an increase in the average annual temperature of 0.62 degrees Fahrenheit (°F)/decade and annual precipitation decreased by 0.01 inch/decade.[112] During the same period, the overall drought severity index shows a trend of 0.28/decade using the Self-Calibrated Palmer Drought Severity Index (scPDSI). The scPDSI is a meteorological drought index that measures the departure of moisture. Negative scPDSI values indicate drought conditions, positive values indicate wet conditions, and values near zero indicate normal conditions.[113] Goodhue County experienced drought conditions 1989, 1990, and 2004. In all other years from 1980 to 2025, Goodhue County experienced normal to wet conditions.[112]

The Minnesota Environmental Assessment Worksheet Guidance: Developing a Carbon Footprint and Incorporation Climate Adaptation and Resilience Projections estimates the occurrence of extreme

[111] Minnesota Department of Natural Resources (MNDNR). 2025. Climate Trends. Online [URL]: https://www.dnr.state.mn.us/climate/climate_change_info/climate-trends.html. Accessed: December 2025.

[112] Minnesota Department of Natural Resources (MNDNR). 2025. Minnesota Climate Trends. Online [URL]: https://arcgis.dnr.state.mn.us/ewr/climatetrends/. Accessed: October 2025.

[113] FUCHS, Brian. *Palmer Drought Severity Index (PSDI and scPDSI)*. May 2012.

heat, drought, wildlife, and flooding hazards into the 2040s.[114] To provide conservative estimates, the Applicants used the "higher emissions" category for Goodhue County. Estimates are associated with an increase or decrease from the baseline period of 1976 to 2005 in Goodhue County.

The number of days with a maximum temperature above 90, 95, and 100°F could increase by 17.1 days, 6.6 days, and 1.2 days; respectively. Average annual total precipitation may increase 1.7 inches and days with precipitation (i.e., wet days) and days with no precipitation (i.e., dry days) may both increase by 1 day. The number of days per year with total precipitation exceeding 1 inch may increase by 0.7 day. Given this increase in precipitation, metrics related to wildfire potential remain steady.

6.7.9.1 Potential Impacts

The Project's impacts on climate change and resilience would be negligible. While total precipitation is expected to increase, models indicate that precipitation totals over 1 inch are not expected to increase significantly over current levels. Therefore, increased risks associated with flooding are not anticipated. Wildfire risks are not anticipated to increase over future conditions. Other climate change impacts may occur, such as increased temperatures and high winds. Electric transmission equipment can withstand the anticipated increases in temperature, and changes in weather patterns are accounted for in the Project design.

6.7.9.2 Mitigation Measures

The Project will be routed and engineered to be resilient under changing climatic factors, including increased average temperatures and changes in precipitation intensities and quantities. High temperatures can affect the sagging of a transmission line conductor and its thermal tolerance. However, the transmission lines would be built to North American Electric Reliability Corporation (NERC) reliability standards to address thermal limitations.

Final structure placement will consider the Project ROW slope to avoid areas with steeper terrain and associated risks of erosion and landslides. Upon construction completion, the disturbed area will be restored and revegetated. The transmission line will be maintained following or exceeding NERC reliability standards that address vegetation management, including the increase of noxious weeds that could occur from changed conditions that allow them to spread.

6.8 Unavoidable Impacts

Minn. Stat. § 216I.05, subdivision 4(a)(9), requires that an application include "a list that identifies human and natural environmental effects that are unavoidable if the facility is approved at a specific site or route." The Project will be designed, constructed, and operated in a manner that mitigates

[114] U.S. Climate Resilience Toolkit. 2025. Climate Mapping For Resilience and Adaption. Online [URL]: https://livingatlas.arcgis.com/assessment-tool/explore/details. Accessed: January 2026.

potential impacts to the greatest extent possible. However, even with mitigation measures, there will be impacts that cannot be avoided. These impacts are distinct based on the phase of the Project: construction or operation.

A detailed discussion of the Project's environmental impacts, as well as the mitigation measures that will be used to minimize impacts is presented in Sections 6.1 through 6.7 of this Application. Environmental impacts that would be minimized by the use of mitigation measures, but not entirely avoided, are provided below. Most of these unavoidable impacts will occur during construction of the Project and resolve with the completion of construction.

Unavoidable impacts associated with Project construction include:

- Increased traffic on roads in the vicinity of the Project and potential short-term traffic delays on public roadways.
- Visual disturbance to nearby residents and recreationalists.
- Noise emitted from vehicles and equipment during construction that will be audible to neighboring landowners and recreationalists.
- Temporary impacts on agricultural operations, such as crop losses, soil compaction, and erosion.
- Vegetation clearing that could result in minor amounts of habitat loss.
- Temporary disturbance to and displacement of wildlife, as well as direct impacts on wildlife inadvertently struck or crushed during structure placement or other construction activities.
- Minor air quality impacts due to construction vehicle emissions and fugitive dust.

Unavoidable impacts associated with Project operation include:

- Changes to existing aesthetics of landscape (from predominantly agricultural to transmission line or substation), which will be visible from local roadways and parcels.
- Physical impacts on land use and change in land cover where the permanent Project structures exist and/or where the ROW requires vegetation maintenance.
- Injury or death of avian species that collide with, or are electrocuted by, conductors.
- Continued maintenance of tall-growing vegetation within the ROW to comply with NESC requirements.

6.9 Irreversible and Irretrievable Impacts

Minn. Stat. § 216I.05, subdivision 11(b)(11), requires the Commission to consider "irreversible and irretrievable commitments of resources" when determining whether to issue a Route Permit. An irreversible impact occurs when a commitment of resources is impossible or very difficult to redirect to a different future use and an irretrievable impact occurs when a commitment of resources is not recoverable for later use by future generations.

Irreversible impacts include the land required to construct the Project. While the land underlying the North Rochester Substation, North Rochester Substation Expansion area, and the Development Site could be restored to agricultural use or some other land use, tall growing woody vegetation could revegetate within the transmission line ROW, and certain Project components could be reused or recycled—this is unlikely to happen in the reasonably foreseeable future (e.g., 50 years).

Irretrievable impacts associated with the Project are related to construction activities. The use of aggregate, concrete, fuel, human labor, steel, water, wood, and other consumable resources is irretrievable.

6.10 Cumulative Potential Effects

Minn. R. 4410.0200, subp. 11(a), defines "cumulative potential effects" as the "effect on the environment that results from the incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources, including future projects actually planned or for which a basis of expectation has been laid, regardless of what person undertakes the other projects or what jurisdictions have authority over the projects."

The cumulative effects analysis considered the potential effects of other actions as described in relevant public documents. The scope of the cumulative effects analysis from included consideration of local government units depends in part on the availability of comprehensive land use plans and information about other projects. For this assessment, other projects were identified from information publicly available from the City of Pine Island, Goodhue County; MNDOT; MISO; Minnesota Public Utilities Commission; Federal Energy Regulatory Commission; and the Minnesota Environmental Quality Board.

6.10.1 Geographic Scope

The geographic scope of this analysis generally included the ROI for the different resources, as described in **Table 6.2-1**. Other projects' effects, when combined with those of this Project, could result in a cumulative effect. Projects located outside of the geographic scope were not evaluated because their potential to contribute to a cumulative effect diminishes with increasing distance from the Project; thus, they are outside the environmentally relevant area.

6.10.2 Reasonably Foreseeable Future Actions

In general, "reasonably foreseeable" future projects are proposed projects or developments that have applied for a permit from a local, State, or federal authority, or planned projects that have been publicly announced, such as in comprehensive plans. Other foreseeable future actions may also be identified by agencies or based on known trends, such as population changes. Projects must also have sufficiently detailed information available to contribute to the understanding of cumulative potential effects to be considered in the analysis.

Reasonably foreseeable future actions within the geographic scope of the Project are described in **Table 6.10-1**.

Table 6.10-1. Current and Reasonably Foreseeable Future Actions

Plans, Programs, or Project	Description	Type	Source
Project Skyway ***(Under review for and annexation, rezoning, platting, and related permitting)***	Project Skyway refers to an area encompassing approximately 482 acres located east and within the Project Area, partially in the city of Pine Island. Ryan Companies, US, is a developer working with the City to prepare the land for future development. An Alternative Urban Areawide Review (AUAR) was adopted by the city council which outlined a framework for the development of two potential project types. The two studied project types were General Light Industrial and Technology Center. At present, a single data center is planned on about 88 acres, with an approximately 2,850,000-square-foot data center building. Google is also applying for an Option D air permit from MPCA for less than 50 MWs of related backup generation at the site.	Development (A portion of the AUAR area is being planned for industrial development, including a data center campus, into a data center facility, which houses computing infrastructure, including servers, storage systems, networking equipment and other components necessary to store, process, and distribute large amounts of data.)	Project Skyway - Pine Island, MN (City of Pine Island website) See also Home - Project Skyway (Ryan Companies, US website)
U.S. Highway 52 - Pine Island to Oronoco Construction ***Planned***	MNDOT plans to improve U.S. Highway 52 from near the Highway 60 interchange to north of Rochester. The work includes resurfacing southbound U.S.	Road and Bridge Construction	https://talk.dot.state.mn.us/hwy-52-pine-island-oronoco

Plans, Programs, or Project	Description	Type	Source
	Highway 52, constructing a new frontage road to help with safety and access, replacing a culvert bridge north of the city of Pine Island, raising southbound U.S. Highway 52 to reduce the risk of flooding near the middle fork of the Zumbro River, and minor bridge repair work on the 5th St NW bridge over U.S. Highway 52 in Oronoco, and over U.S. Highway 52 south of Oronoco. Construction is anticipated to begin in spring 2028.		
Mankato-Mississippi River Transmission Project (MMRTP) *Permitted. Written order pending.*	Xcel Energy, Dairyland Power Cooperative, Rochester Public Utilities, and Southern Minnesota Municipal Power Agency are proposing to construct an approximately 130-mile-long, 345 kV transmission line between the Wilmarth substation in Mankato and the Mississippi River and a new, approximately 20-mile-long, 161-kV transmission line between the North Rochester Substation near the city of Pine Island and an existing transmission line northeast of Rochester. Construction is anticipated in 2026–2030.	Transmission Line	https://mmrtproject.com/
Pleasant Valley - North Rochester-Hampton Transmission Project (MISO LRTP #25) *In Permitting*	Xcel Energy, Great River Energy, Dairyland Power Cooperative, Southern Minnesota Municipal Power Agency, and the City of Rochester are proposing to construct a 345 kV transmission line that will double-circuit the existing Hampton-North Rochester and Pleasant Valley to North Rochester transmission lines. The Route Permit application is anticipated to be filed in 2027.	Transmission Line	https://www.misoenergy.org/planning/long-range-transmission-planning/ https://www.poweronmidwest.com/pv-nr-hampton/
Pleasant Valley to North	Xcel Energy and Great River Energy are proposing to	Transmission Line	https://www.misoenergy.org/planning/long-

Plans, Programs, or Project	Description	Type	Source
Rochester Transmission Project (MISO LRTP # 24) *In Development*	construct a 765-kV transmission line from the Pleasant Valley Substation to the North Rochester Substation. The Route Permit application is anticipated to be filed in 2027.		range-transmission-planning/ https://www.poweronmidwest.com/pv-nr-hampton/
Gopher to Badger Link Project (North Rochester to Columbia (MISO LRTP #26) *In Development*	Xcel Energy and Dairyland Power Cooperative are proposing to construct a 765-kV transmission line that will run from the North Rochester Substation to the MN/WI border. The Route Permit application is anticipated to be filed in fall of 2026.	Transmission Line	https://www.misoenergy.org/planning/long-range-transmission-planning/ https://gophertobadgerlink.com/

6.10.3 Resource Effects

The surrounding environment already includes various modifications, such as residential homes, transmission lines, highways, county roads, and a substation. By paralleling existing infrastructure as much as possible, the Project minimizes the potential for cumulative effects by minimizing the creation of new transmission corridors and the overall potential for resource effects. **Table 6.10-2** summarizes the length of each existing linear infrastructure paralleled.

Table 6.10-2. Existing Linear Infrastructure Paralleling the Project

	Project
Paralleling Existing Transmission (miles)	0.55
Total Linear Feature Sharing (miles)	**0.55**
Total Linear Feature Sharing (percent)	**45.83**

The Project and the projects listed in **Table 6.10-1** are anticipated to affect similar resources and have the following impacts:

- Conversion of land use and land cover (i.e., agricultural land);
- Construction-related noise;
- Visual impacts from construction activities;
- Construction-related traffic;
- Criteria pollutant and GHG emissions from construction activities;

- Soil compaction and erosion; and
- Vegetation clearing.

The Project and the other projects listed in **Table 6.10-1** would follow federal, State, and local regulations and minimize environmental impacts to the extent practical. The impacts during construction of any of the individual projects would not be significant. The Project would minimize impacts on these resources during construction, as described in the sections above, and is not anticipated to have cumulative impacts on human or natural resources within the geographic scope.

During operation, the U.S. Highway 52 - Pine Island to Oronoco Construction project is not expected to contribute to cumulative long-term impacts. The transmission line projects and the proposed Project may have the following impacts during operation and maintenance:

- Visual impacts;
- Potential for interference with AM radio signals;
- Minimal criteria pollutant and GHG emissions from operation and maintenance activities;
- Maintenance of tall-growing vegetation, including trees; and
- Potential for avian collisions.

The Project will minimize impacts on these resources during operations as described in the sections above and is not anticipated to have cumulative impacts on human or natural resources within the geographic scope.

7. AGENCY, TRIBAL, LOCAL GOVERNMENT, AND PUBLIC OUTREACH

This section describes outreach efforts conducted by the Applicants and discusses pre-application involvement by Tribal, federal, State, and local agencies, and the Applicants' public information outreach efforts.

7.1 Agency and Tribal Coordination

The Applicants initiated an outreach campaign to Tribal contacts and federal, State, and local public agencies through Project notification letters. In these letters, the Applicants introduced the Project, requested input and comments on potentially affected resources, and included a Project overview map showing the Proposed Route. As needed, the Applicants either met with, or continued corresponding with, stakeholders who responded to the outreach letters and associated Project information. Correspondence of outreach efforts are included in **Appendix C** and are summarized below.

The Project introduction letters included a Project overview map showing the Proposed Route. In the letter, the Applicants provided preliminary Project details and a potential timeline for major Project milestones. The Applicants also requested input from the federal and State agencies with respect to the resources under their jurisdiction as well as the identification of federal and State permits and/or approvals that may be potentially required for the Project.

7.1.1 Native American Tribal Nations

On November 6, 2025,[115] the Applicants sent initial outreach letters to federally recognized Tribes in Minnesota and Tribes that may have ancestral interest in the Minnesota county crossed by the Project. A list of the Tribes that were notified is included in **Table 7.1-1** and an example of the letter is included in **Appendix C**.

[115] Letters were sent out on November 6, 2025, but were dated November 5, 2025.

Table 7.1-1. Native American Tribal Nation Correspondence

Native American Tribal Nation	Date (s) of Initial Outreach Letter and Correspondence
Bois Forte Band of Chippewa	November 6, 2025; April 21, 2026
Fond du Lac Band of Lake Superior Chippewa	November 6, 2025; April 21, 2026
Grand Portage Band of Lake Superior Chippewa	November 6, 2025; April 21, 2026
Leech Lake Band of Ojibwe	November 6, 2025; December 8, 2025
Lower Sioux Indian Community	November 6, 2025; April 21, 2026
Mille Lacs Band of Ojibwe	November 6, 2025; April 21, 2026
Prairie Island Indian Community	November 6, 2025
Red Lake Band of Chippewa Indians	November 6, 2025; April 21, 2026
Shakopee Mdewakanton Sioux Community	November 6, 2025; November 19, 2025
Upper Sioux Community	November 6, 2025; April 21, 2026
White Earth Nation	November 6, 2025 ; April 21, 2026
Apache Tribe of Oklahoma	November 6, 2025
Cheyenne and Arapaho Tribes, Oklahoma	November 6, 2025
Flandreau Santee Sioux Tribe of South Dakota	November 6, 2025
Fort Belknap Indian Community of the Fort Belknap Reservation of Montana	November 6, 2025
Ho-Chunk Nation of Wisconsin	April 22, 2026
Iowa Tribe of Kansas and Nebraska	November 6, 2025
Menominee Indian Tribe of Wisconsin	November 6, 2025
Santee Sioux Nation, Nebraska	November 6, 2025
Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, South Dakota	November 6, 2025
Spirit Lake Tribe, North Dakota	November 6, 2025
Winnebago Tribe of Nebraska	April 22, 2026

On November 6, 2025, a representative from the Shakopee Mdewakanton Sioux contacted the Applicants and noted that they had no concerns about the proposed Project. On November 19, 2025, the Shakopee Mdewakanton Sioux noted that they had no concerns, but an update to their address was needed. By letter dated December 8, 2025, the THPO of the Leech Lake Band of Ojibwe confirmed that the Leech Lake Band of Ojibwe does not have any recorded historic properties within the area. The THPO also noted that "should any human remains or suspected human remains be encountered, all work shall cease and the following personnel should be notified immediately: County Sheriff's Office, Office of the State Archaeologist, and the Leech Lake Band of Ojibwe along with other interested parties."

Xcel Energy has regular quarterly meetings the Prairie Island Indian Community (PIIC) Tribal Council and Project status updates were provided at the January and April quarterly meetings. In addition, a meeting was held in mid-April with representatives from PIIC, Xcel Energy, Ryan Companies and Google as an introduction to the Project team. The Applicants will continue to keep the PIIC updated as the process moves forward.

In accordance with Minn. Stat. § 216I.05, Subd. 3(b)(16) and as defined under section 10.65, Subd. 2 regarding outreach with Minnesota Tribal Governments on April 21, 2026, the Applicants sent follow up emails to the eight Minnesota Tribes who had not responded to the initial outreach. The emails noted the plan to file a route permit application, offered to meet to discuss the Project and provide additional detail, and requested confirmation of receipt. The Applicants will follow up with any non-responding Tribes via telephone and will document these outreach steps.

7.1.2 Federal Agencies

The Applicants sent initial outreach letters on November 6, 2025,[116] to the federal agencies listed in **Table 7.1-2** below. As needed, the Applicants have completed follow-up correspondence with USACE and USFWS regarding the Project. See **Appendix C** for copies of key correspondence with applicable agencies.

Table 7.1-2. Federal Agency Correspondence

Federal Agency	Date(s) of Initial Outreach Letter and Correspondence
U.S. Army Corps of Engineers	November 6, 2025; November 7, 2025
U.S. Fish and Wildlife Service	November 6, 2025; November 13, 2025; December 1, 2025
Federal Aviation Administration	November 6, 2025; November 20, 2025
U.S. Department of Agriculture	November 6, 2025
U.S. Bureau of Indian Affairs	November 6, 2025
U.S. Environmental Protection Agency	November 6, 2025

7.1.2.1 U.S. Army Corps of Engineers

USACE responded to the Project Notification letter on November 7, 2025, noting that the Applicants should submit a permit application with the impacts identified. They also noted that the Applicants may request a pre-application meeting. The Applicants responded on November 7, 2025, noting that they will review and continue coordinating as needed for the Project.

[116] Letters were sent out on November 6, 2025, but were dated November 5, 2025.

7.1.2.2 U.S. Fish and Wildlife Service

USFWS responded to the Project Notification letter on November 13, 2025, noting that the migratory bird program has no feedback other than to follow the APLIC guidance for transmission lines and to reach out if there are any eagle nests or eagle-related issues. On December 1, 2025, USFWS noted that they see no other resource concerns but noted that an IPaC should be filled out to assist in the environmental review.

7.1.2.3 Federal Aviation Administration

FAA responded to the Project Notification letter on November 20, 2025, suggesting that a filing should be done at the Obstruction Evaluation/Airport Airspace Evaluation Analysis to get an official determination letter that no penetration will happen.

7.1.3 State Agencies

The Applicants sent initial outreach letters to the State agencies listed in **Table 7.1-3**. As needed, the Applicants have completed follow-up correspondence regarding the Project. See **Appendix C** for copies of key correspondence with applicable state agencies.

Table 7.1-3. State Agency Correspondence

State Agency	Date(s) of Initial Outreach Letter and Correspondence
Minnesota Association of Soil and Water Conservation	November 6, 2025
Minnesota Board of Water and Soil Resources	November 6, 2025
Minnesota Department of Agriculture	November 6, 2025
Minnesota Department of Health	November 6, 2025
Minnesota Department of Natural Resources	November 6, 2025
Minnesota Department of Transportation	November 6, 2025; November 11, 2025; November 12, 2025; November13, 2025
Minnesota Pollution Control Agency	November 6, 2025
Minnesota State Historic Preservation Office	November 6, 2025; November 13, 2025; November 14, 2025; December 8, 2025

7.1.3.1 Minnesota Department of Transportation

The Applicants have had ongoing discussions with MNDOT about Project details and addressing any initial questions or concerns of MNDOT.

Subsequent to the initial outreach, the Applicants followed up with MNDOT on November 11, 2025, requesting information on whether a Project-specific Early Notification Memo (ENM) form will be issued. On November 12, 2025, MNDOT responded and requested a kick-off meeting and noted that they will supply a Project-specific ENM form. On November 13, 2025, MNDOT sent a formatted ENM form for the Applicants to use for requesting MNDOT review for use in the application.

The Applicants will continue to coordinate with MNDOT as the routing process moves forward.

7.1.3.2 Minnesota State Historic Preservation Office

MNSHPO responded to the Project notification letter on November 13, 2025, providing the contact information for the specific MNSHPO reviewer for MPUC-related projects and gave information on how to submit the Project for formal review. On November 14, 2025, the Applicants responded and confirmed that they will submit the Project to the formal MNSHPO review process at a later time. On December 8, 2025, MNSHPO noted that an archaeological literature review and survey assessment along with a review of the Minnesota Statewide Historic Inventory Portal (MnSHIP) of the Project Area will help determine if the Project has the potential to affect archaeological sites. The Applicants will continue to coordinate with MNSHPO.

7.1.4 Local Government Units

The Applicants also corresponded with several Local Government Units (LGU) leading up to the filing of this Application. On November 6, 2025, the Applicants sent an initial outreach letter to the LGUs describing the Project and requesting comments (see **Table 7.1-4** and **Appendix C**). Details regarding in-person or virtual meetings requested by the LGUs are described below.

Table 7.1-4. Local Government Unit Correspondence

Local Government Unit	Date (s) of Initial Outreach Letter and Correspondence
Counties	
Goodhue County	November 6, 2025, December 1, 2025
Cities and Townships	November 6, 2025
City of Pine Island	November 6, 2025
Pine Island Township	November 6, 2025; November 13, 2025
Other LGUs	
Goodhue Soil & Water Conservation District	November 6, 2025; November 7, 2025

A representative for Goodhue County emailed their comments and questions on December 1, 2025. The Applicants responded that they were reviewing and preparing a response, which will be sent when completed.

A representative from Pine Island Township emailed their concerns on November 13, 2025, about the substation expansion and the possible drainage problems that could impact the agricultural field to the west. The Applicants responded and requested a meeting to further discuss the concerns.

A representative from the Goodhue Soil & Water Conservation district emailed their concerns on November 7, 2025, regarding a wetland boundary that is near the proposed substation expansion area. Applicants responded and noted that a delineation will be done in that area.