

Northern States Power Company –
Wisconsin

Application for a Certificate of Authority
for the
Boot Lake to Chain O Lakes 34.5 kV
Transmission Line and Substation Project
To be Located in Vilas County, Wisconsin

PSC Docket No. 4220-CE-186

May 23, 2023



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Acronyms and Abbreviations

AC	alternating current
ACSR	aluminum conductor steel reinforced
AEA	Agricultural Enterprise Area
AFR	Application Filing Requirements
AIS	Agricultural Impact Statement
APE	area of potential effect
Applicant	Xcel Energy
Application	Joint Application to the PSC and WDNR for Certificate of Authority
ASNRI	areas of special natural resource interest
ATCP	Agriculture, Trade and Consumer Protection
ATV	all-terrain vehicle
BMPs	best management practices
CA	Certificate of Authority
CPCN	Certificate of Public Convenience and Necessity
CWA	Clean Water Act
DATCP	Department of Agriculture, Trade and Consumer Protection
EF	electrical field
ER	Endangered Resources
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FCL	Forest Crop Law
FPP	Farmland Preservation Program
GAP	Gap Analysis Project
GIS	Geographic Information System
kA	kilo-amperes
kcmil	thousand circular mils
kV	kilovolt
Merjent	Merjent, Inc.
MF	magnetic field
MFL	Managed Forest Law
MISO	Midcontinent Independent System Operator, Inc.
MVAR	megavolt ampere of reactive power
MW	megawatt
NCWRPC	North Central Wisconsin Regional Planning Commission
NERC	North American Electric Reliability Corporation
NESC	National Electric Safety Code
NEV	Neutral to Earth Voltage
NHCP	Natural Heritage Conservation Program
NHI	Natural Heritage Inventory
NR	Natural Resources
NRCS	Natural Resources Conservation Service

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NRHP	National Register of Historic Places
O&M	Operations & Maintenance
OHWM	ordinary high water mark
OPGW	optical ground wire
ORP	Outdoor Recreation Plan
Project	Boot Lake to Chain O Lakes Project
PSC or Commission	Public Service Commission of Wisconsin
PSS®E	Power System Simulator for Engineering
ROW	right-of-way
Substation Application Filing Requirements	<i>Application Filing Requirements for Substation Projects, Version updated 2022</i>
TCSB	temporary clear span bridge
Transmission Application Filing Requirements	<i>Application Filing Requirements for Transmission Line Projects in Wisconsin, Version October 2017</i>
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UTV	Utility Task Vehicle
WDNR	Wisconsin Department of Natural Resources
WHS	Wisconsin Historical Society
WisDOT	Wisconsin Department of Transportation
WRAM	Wisconsin Rapid Assessment Methodology
WWI	Wisconsin Wetland Inventory
Xcel Energy	Northern States Power Company, a Wisconsin corporation doing business as Xcel Energy

EXECUTIVE SUMMARY

Introduction

Northern States Power Company, a Wisconsin Corporation, dba Xcel Energy (Xcel Energy or Applicant), is proposing to construct a new 15.1-mile 34.5 kilovolt (kV) transmission line between Manitowish Waters and Presque Isle in Vilas County, Wisconsin, that would connect two new substations to be called Boot Lake Substation and Chain O Lakes Substation. The new substations would replace the existing Presque Isle Substation and Rest Lake Substation, both of which are nearing their end of life and do not have the necessary land rights to expand. The proposal is referred to as the Boot Lake to Chain O Lakes Project (Project). The new transmission line would be designed to meet current 69 kV electrical standards but would be operated at its existing 34.5 kV voltage. There is also an existing 3-phase distribution line that runs along County Highway W, between Rest Lake – Winchester – Presque Isle, in noncontiguous segments. The existing distribution line would be removed and ultimately rebuilt on the new 34.5 kV transmission poles as an underbuild design.

The Project requires a Certificate of Authority (CA) from the Public Service Commission of Wisconsin (PSC or Commission) and for permit authorization to discharge dredged and/or filled materials into wetlands and place temporary bridges across navigable waters from the Wisconsin Department of Natural Resources (WDNR). In this joint application to the PSC and WDNR, Xcel Energy is seeking authorization from the PSC and WDNR to construct the new 34.5 kV facilities.

This summary provides an overview of the proposal.

Proposed Facilities

Xcel Energy proposes constructing and placing in operation the following transmission line and substation facilities:

- A new 15.1-mile 34.5 kV transmission line that generally runs along County Highway W between Manitowish Waters and Presque Isle. The proposed route is presented in 23 segments.
- Removal of 8.1 miles of an existing 3-phase distribution line within the proposed Project right-of-way (ROW) that generally runs along County Highway W between Rest Lake – Winchester – Presque Isle in noncontiguous segments. There are also locations where the existing distribution line would be removed from eight distinct segments that are not within the new 34.5 kV transmission line ROW (Removal Segments 1 – 8). In both cases, the 3-phase distribution will ultimately be rebuilt on the new 34.5 kV transmission poles as an underbuild design.
- Removal of 0.3 mile of the Applicant's existing W3634 34.5 kV transmission line between the end of the new proposed transmission line south to the existing Presque Isle Substation (Removal Segment 9).

- Construction of two new 69 kV capable substations (Boot Lake and Chain O Lakes Substations).
- Removal of two existing 34.5 kV substations (Rest Lake and Presque Isle Substations)

Purpose and Necessity

The Applicant is proposing to construct a new 15.1-mile 34.5 kV transmission line in addition to substation upgrades to improve the electric system reliability in the Project area. The proposed Project will improve electrical service by enabling the system to transfer power from either direction, which will help to prevent outages from occurring. The existing electric system consists of two radial transmission systems which only deliver electricity in one direction and is unable to provide power if one of the radial transmission lines has an outage. The following describes the two existing radial systems:

- The first system in the north is a radial 88 kV transmission line coming from Norrie Substation in Ironwood Michigan. The 88 kV transmission line runs east for approximately 23 miles after which there is a step-down substation called Mine Road. This substation steps the voltage down to 34.5 kV. The 34.5 kV transmission line then proceeds south until it terminates at the Presque Isle Substation. This substation will be rebuilt on a new parcel of land and will be named Boot Lake.
- The second radial system toward the south comes from the Weber Lake substation which is roughly 4 miles northwest of Mercer, Wisconsin. This 34.5 kV transmission line begins at Weber Lake which proceeds southeast until it terminates at Rest Lake substation. This substation will be rebuilt and relocated on a new parcel and be named Chain O Lakes.

A connection from one system to the other will allow system operators to keep customers in service when there are planned or forced outages. In addition, having this transmission line will allow Xcel Energy to rebuild the transmission lines from Mine Road to Boot Lake and Weber Lake to Chain O Lakes while keeping customers in service and avoiding hot transmission line work.

Finally, related to the underbuild of the distribution line, approximately 1,500 customers in the Town of Presque Isle and about 2,500 customers in Manitowish Waters are served by single, radial distribution sources. There is no ability to tie either of these areas together; therefore, this Project would allow Xcel Energy to form a field tie between sources and improve distribution reliability so that three phase power could be provided from either direction.

Proposed Route

The proposed route consists of a new 15.1-mile 34.5 kV transmission line between Manitowish Waters and Presque Isle in Vilas County, Wisconsin, ultimately that would connect two new substations called Boot Lake Substation and the Chain O Lakes Substation. The route generally follows County Highway W northeast from the existing Rest Lake Substation for 14 miles until it

turns north and crosses over to the north/west side of County Highway W. The route parallels Thoma Drive, until it crosses the road into the new Boot Lake Substation. After leaving the Boot Lake Substation, the route continues northeasterly until it turns to the east crossing the South Branch of the Presque Isle River. The proposed route connects into the existing W3634 transmission line on the west side of County Highway B about 0.3 mile north of the existing Presque Isle Substation and 0.7 mile north of the intersection of County Highways W and B near the Town of Presque Isle.

Route Development

Xcel Energy identified general potential route corridors between established end points meeting the routing priorities defined in Wis. Stat. § 1.12(6). To develop the proposed route, Xcel Energy utilized a stepwise process which included consultation with the PSC, the WDNR, Vilas County, and other local authorities such as the Town of Presque Isle. The Company also relied heavily on the public participation process as described in Section 7.0, and the transmission line siting priorities established by the state of Wisconsin.

During initial route development Xcel Energy looked at other route options for the new transmission line. Because of the general remote nature, steep terrain, and the number of lakes, streams, and rivers throughout much of the Project area there are few existing linear corridors to follow between the new Chain O Lakes and Boot Lake substations. Some routes were considered early in the process but were eliminated prior to conducting detailed analysis because desktop analysis identified less impactful route alternatives. Xcel Energy used desktop mapping with available geographic data of environmental and infrastructure features as well as aerial photos to develop and evaluate initial routes. Field reviews were also conducted to better understand on the ground conditions for some of these routes. Appendix H provides a table that describes each route option evaluated and the reason why it was not selected to include in this Application.

After evaluation of the options described above and shown in Appendix A, Figure 3 Xcel Energy selected the proposed route.

Project Cost

Estimated Project costs of \$32.6 million (2023\$) reflect total project cost for the proposed transmission line, new substations, existing substation removals, and existing distribution removal. Project costs include: installation and removal costs of transmission lines and distribution costs; substation installation and removal; precertification costs, contingency reserve, and Allowance for Funds Used During Construction.

Estimated costs for construction of new lines and the removal of existing facilities are based on Xcel Energy historical data for similar 34.5 kV transmission and distribution projects. The development of project cost estimates also included on-the-ground site visits of the route

alternatives with representatives from civil and line construction, vegetation management, siting and land rights, engineering and project management, as well as desktop reviews.

Regulatory Approvals

In this Joint Application, Xcel Energy is seeking a CA from the Commission and permit authorization from the WDNR to discharge dredged and/or fill materials into wetlands and place temporary bridges across navigable waters.

The Project also will require approvals and permits from federal and state agencies and local units of government. A list of these permits is contained in Section 1.7.

Construction Schedule

The estimated construction duration of the new transmission line and substations is approximately one year. Construction is expected to begin in the 3rd Quarter of 2025 and be in-service by the 3rd Quarter of 2026, pending agency permits and authorizations. Relocation of the 3-phase distribution line and removal of the existing poles will be completed concurrently with installation of the new transmission line. The existing substations will be removed after the new transmission line and new substations are in service.

Conclusion

Based on the material included and referenced in this Joint Application and any subsequent material requested by the PSC or WDNR related to this Joint Application, Xcel Energy requests that the PSC issue a CA and any other approvals necessary, authorizing the construction of the Project and associated facilities along the proposed route. Xcel Energy also requests that WDNR issue all the permits and authorizations that may be required to construct the transmission facilities in the manner described in this Joint Application within 30 days after PSC issues its written order on the CA Application.

JOINT APPLICATION FOR A CERTIFICATE OF AUTHORITY

This Joint Application to the Public Service Commission of Wisconsin (PSC or Commission) and the Wisconsin Department of Natural Resources (WDNR) for a Certificate of Authority (CA; Application) has been prepared in accordance with the PSC and WDNR *Application Filing Requirements for Transmission Line Projects in Wisconsin*, Version October 2017 (Transmission Application Filing Requirements) and *Application Filing Requirements for Substation Projects*, Version updated 2022 (Substation Application Filing Requirement).

1.0 PROJECT OVERVIEW

1.1 Identify the owners and investors of the proposed project including their names, addresses, and percent of ownership (Wis. Admin. Code § PSC 111.55(6)).

Northern States Power Company, a Wisconsin corporation
1414 West Hamilton Avenue, PO Box 8
Eau Claire, Wisconsin 54702

Northern States Power Company, dba Xcel Energy (Xcel Energy, NSP, or Applicant), is a Wisconsin corporation and a vertically integrated public utility that provides electric generation, transmission, and distribution services in Wisconsin (including the Presque Isle, Winchester, and Manitowish Waters areas). Xcel Energy is obligated to provide adequate and reliable energy service that meets the needs of its customers. The facilities proposed for construction will be owned solely by Xcel Energy. Once constructed, Xcel Energy will perform the day-to-day operation of the facilities.

1.2 Provide contractual agreements between developer and utilities to construct, finance, lease, use or own transmission facilities.

Xcel Energy has not entered into any contracts with any developer to construct, finance, lease, use, or own the proposed transmission facilities.

1.3 Describe the location of the proposed project and its end points.

The Project proposed in this Application would construct a new 15.1-mile 34.5 kilovolt (kV) transmission line between Manitowish Waters and Presque Isle in Vilas County, Wisconsin, ultimately that would connect two new substations called Boot Lake Substation and the Chain O Lakes Substation. The new substations would replace the existing Presque Isle Substation and Rest Lake Substation. The proposal is referred to as the Boot Lake to Chain O Lakes Project (Project). The new transmission line would be designed to meet current 69 kV electrical standards but would be operated at its existing 34.5 kV voltage. Currently, 34.5 kV transmission lines are used in most places as distribution assets. However, the 34.5 kV transmission lines in Wisconsin have historically been transmission assets. Xcel Energy generally builds new 34.5 kV transmission

lines to 69 kV clearance and insulation standards in order to eventually eliminate 34.5 kV as a transmission voltage.

There is also an existing 3-phase distribution line that runs along County Highway W, between Rest Lake – Winchester – Presque Isle, in noncontiguous segments. The existing distribution line would be removed and ultimately rebuilt on the new 34.5 kV transmission poles as an underbuild design.

Figure 1.3-1 depicts the above components of the Project.

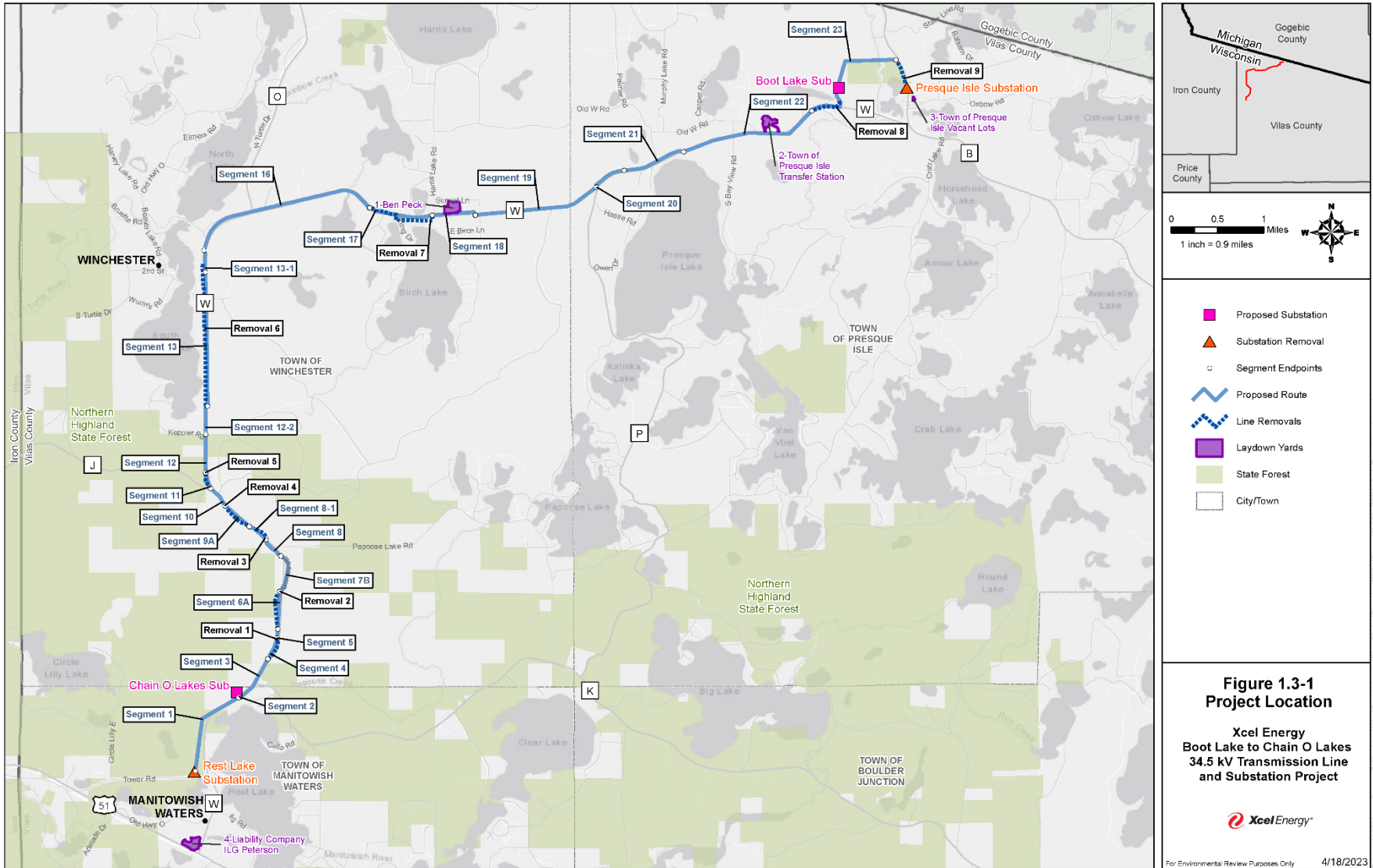
Describe the location of the proposed substation site(s).

The new Chain O Lakes Substation will be located on the north/west side of County Highway W, about 0.2 mile southwest of the intersection of County Highway W and County Highway K and about 1.3 miles north of Manitowish Waters in T42N, R5E, Section 4.

The new Boot Lake Substation will be located about 0.2 mile north of the intersection of County Highway W and Thoma Drive, about 0.6 mile west of Presque Isle, in T44N, R6E, Section 33.

The Project will also remove the existing Rest Lake and Presque Isle Substations that are near the end of their useful life and replace them with the two new substations as described above. The two existing substations cannot be expanded or rebuilt in their current locations due to limitations in the existing license agreement or physical limitations. The Rest Lake Substation is sited on a 0.10-acre parcel of land owned by the State of Wisconsin within the Northern Highland State Forest and the existing license agreement does not allow expansion of the facility footprint. The Presque Isle Substation is located on a 0.23-acre parcel between County Highway W on the east and a steep bluff drop approximately 30 feet to the west. The site does not have ample space between the highway and steep bluff drop to build a new substation. The existing substations will be removed, and the areas will be restored to blend with the existing surroundings.

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1.4 Provide a list of all cities, villages, and townships and their respective counties that the proposed project, any associated facilities, and any potential construction activities would cross or potentially impact.

The proposed transmission line is located entirely within Vilas County, Wisconsin. The townships crossed or potentially impacted include:

- Manitowish Waters
- Winchester
- Presque Isle

Provide the city, village, and/or township and counties of the proposed substation sites and any other areas of proposed construction activities.

The new Chain O Lakes Substation and the existing Presque Isle Substation (to be removed) are in Presque Isle Township. The new Boot Lake Substation and the existing Rest Lake Substation (to be removed) are in Manitowish Waters Township.

1.5 PSC Review

Through this Application and pursuant to Wis. Stat. §§ 30.025, Xcel Energy hereby applies to the WDNR for a Utility Permit covering the permits and authorizations necessary to construct the proposed Project.

Through the pre-application process required by Wisconsin law, the Applicant conferred with the PSC and WDNR to assess the Project's scope and persons potentially interested in this Project. Xcel Energy has also been made aware of the information that it is required to submit as part of this Application and the timing for submitting the information.

The Project is not contingent upon or part of a project under another docket number. Xcel Energy is not seeking an expedited review for the Project under Wis. Stat. § 196.491(3b)(a).

1.5.1 State if the application is for a Certificate of Authority (CA) or a Certificate of Public Convenience and Necessity (CPCN) under Wis. Stat. §§ 196.49 and 196.491.

The application is for a CA together with any other authorizations needed to construct the proposed Project.

1.5.2 Identify the expected type of Commission action under Wis. Admin Code § PSC 4.10.

The Project is categorized as a Type III action pursuant to Wis. Admin. Code § PSC 4.10(3).

Discuss if the proposed substation is contingent or part of a transmission or generation project under another docket.

The Project is not contingent upon or part of a project under another docket number. Xcel Energy is not seeking an expedited review for the Project under Wis. Stat. § 196.491(3b)(a).

1.5.3 State if the project qualifies for the CPCN exemption under Wis. Stat. § 196.491(4)(c)1m.

The Project does not qualify for the CPCN exemption under Wis. Stat. § 196.491(4)(c)1m because it does not meet the threshold for a CPCN.

1.5.4 State if the applicant is seeking an expedited review for the project under Wis. Stat. § 196.491(3b)(a).

The Applicant is not seeking an expedited review for the Project under Wis. Stat. § 196.491(3b)(a).

1.6 Project Details and Project Area Information

Provide general descriptions of each of the proposed routes and the project area, including the following:

Xcel Energy proposes constructing and placing in operation the following transmission line and substation facilities:

- A new approximately 15-mile 34.5 kV transmission line with a 3-phase distribution underbuild design that generally runs along County Highway W between Manitowish Waters and Presque Isle. The proposed route is presented in 23 segments (refer to Table 1.6-1 in Section 1.6.7 below).
- Removal of approximately 8.1 miles of an existing 3-phase distribution line within the proposed Project right-of-way (ROW) that generally runs along County Highway W between Rest Lake – Winchester – Presque Isle in noncontiguous segments. There are also locations where the existing distribution line would be removed from eight distinct segments that are not within the new 34.5 kV transmission line ROW (Removal Segments 1 – 8). In both cases, the 3-phase distribution will ultimately be rebuilt on the new 34.5 kV transmission poles as an underbuild design.
- Removal of 0.3 mile of the existing W3634 34.5 kV transmission line between the end of the new proposed transmission line and the Presque Isle Substation (Removal Segment 9).

- Constructing two new 69 kV capable Substations (Boot Lake and Chain O Lakes Substation).
- Removal of two existing 34.5 kV Substations (Rest Lake and Presque Isle Substations)

1.6.1 The location of route(s) and associated facilities

The new transmission line would begin at Structure 1, which is adjacent to the existing Rest Lake Substation. The transmission line travels north for about 0.5 mile before turning to the northeast toward County Highway W at Structure 12 and by Structure 15 the transmission line begins to parallel the north/west side of the County Highway W ROW. The route continues to parallel County Highway W until it connects to the new Chain O Lakes Substation about 0.2 mile southwest of the intersection of County Highway W and County Highway K. Structures 22 through 24 are located within the Chain O Lakes Substation boundaries. After leaving the new substation, the transmission line continues to parallel the north/west side of County Highway W between Structures 25 and 49, then crosses to the south/east side of the road between Structures 50 and 51.

Starting at Structure 51 the transmission line moves further east away from the County Highway W ROW to parallel the west side of Brunell Road until it crosses to the north/west side of the road between Structures 58 and 59. Between Structures 59 and 63 the transmission line moves further west away from the County Highway to parallel Town Garage Road, then crosses back to the south/east side of the road between Structures 63 and 64. The transmission line continues to parallel County Highway W crossing back and forth from the south/east side to the north/west side of the road and back again eight times between Structures 68 and 69, 76 and 77, 81 and 82, 98 and 99, 129 and 130, 194 and 195, 214 and 215, and 228 and 229.

By Structure 229 the transmission line is following the south/east side of County Highway W and is set back about 50 to 100 feet from the road ROW between Structures 229 and 257. By Structure 258, the transmission line begins to parallel the road ROW again until it turns north at Structure 263 and crosses over to the north/west side of the road. The transmission line parallels Thoma Drive for about 200 feet, then turns to the northwest crossing Thoma Drive between Structures 255 and 256. The transmission line travels along the west side of Thoma Drive until Structure 269 where it crosses the road into the new Boot Lake Substation; Structures 270 and 271 would be located within the new substation. After leaving the Boot Lake Substation, the transmission line continues northeasterly until Structure 277 where it turns to the east eventually crossing the South Branch of the Presque Isle River between Structures 284 and 285. The transmission line ends at Structure 287 on the west side of County Highway B about 0.3 mile north of the existing Presque Isle Substation and 0.7 mile north of the intersection of County Highways W and B near the Town of Presque Isle.

The existing 3-phase distribution and 34.5 kV transmission lines would be removed by dropping the wires to the ground in sections and spooling them up with equipment from one end. Poles in

upland areas would be excavated and removed in one piece followed by backfilling, tamping the holes and reseeding. Poles located in wetlands or softer soils would be accessed using low ground pressure equipment like an Argo or on mats to prevent ground disturbance. The structure would then be cut with a chainsaw just below the ground line to avoid further unnecessary disturbance to wetland areas.

The eight distinct distribution removal segments that do not follow the proposed Project ROW are between Structures 35 and 40, 42 and 50, 64 and 68, 70 and 76, 82 and 86, 98 and 127, 174 and 186, and 257 and 263. Details on the footprints associated with the new transmission line and distribution line removal are provided in Sections 1.6.7 and 5.5.2.

The Chain O Lakes Substation will be located on the north/west side of County Highway W, about 0.2 mile southwest of the intersection of County Highway W and County Highway K and about 1.3 miles north of Manitowish Waters in T42N, R5E, Section 4. See Appendix C, Figure 1 for the location and size of the proposed substation.

The new Boot Lake Substation will be located about 0.2 mile north of the intersection of County Highway W and Thoma Drive, about 0.6 mile west of Presque Isle, in T44N, R6E, Section 33. See Appendix C, Figure 2 for the location and size of the proposed substation.

1.6.2 The footprints of associated facilities.

The new Chain O Lakes Substation would include a fenced-in gravel pad of approximately 0.44 acre, no stormwater retention pond, and a total disturbed area of 0.96 acre. The substation would be partially located within two parcels: an approximately 8.5-acre parcel that is owned by NKB Investments, LLC and an approximately 3.4-acre parcel that is owned by Power Co. Lake Superior District. Xcel Energy has obtained an Option to Purchase approximately 4 acres of the 8.5-acre parcel from NKB Investments, LLC. If the Project is approved, Xcel Energy will purchase the property to ensure adequate space for the new substation. Driveway access to the substation would be built from County Highway W. See Appendix C, Figure 1 for the location and size of the proposed substation.

The new Boot Lake Substation would include a fenced-in gravel pad of approximately 0.51 acre and 0.20-acre stormwater retention pond with a total impacted area of approximately 1.35 acres within a 25.7-acre parcel that is currently owned by Leonard G. Thoma. If the Project is approved, Xcel Energy will purchase property to ensure adequate space for the new substation. Driveway access to the substation would be built from Tomah Road. See Appendix C, Figure 2 for the location and size of the proposed substation.

The Rest Lake Substation is located about 0.1 mile northwest of the intersection of County Highway W and Tower Road in T42N, R5E, Section 5. The fenced area of the existing Rest Lake Substation is approximately 0.05 acre in size. An additional 1.0 acre of upland temporary workspace, including an existing 0.5 acre parking lot, beyond the existing fenceline may be

required for removal of the substation equipment. See Appendix A, Figure 4 for the location and size of the existing Rest Lake Substation.

The Presque Isle Substation is located about 0.1 mile north of the intersection of County Highway B and School Loop Road in T44N, R6E, Section 34. The fenced area of the existing Presque Isle Substation is approximately 0.04 acre in size. An additional 0.5 acre of temporary workspace beyond the existing fenceline may be required for removal of the substation equipment. See Appendix A, Figure 4 for the location and size of the existing Presque Isle substation.

1.6.3 Generalized Geology, Topography, Land Cover, and Land Use

Wisconsin has been divided into five natural geological regions, with three considered to be upland areas and two being lowland. The general boundaries of the areas were predominantly established based upon the type of the underlying bedrock. The Project is located within the Northern Highland region. The Northern Highland region is an upland area characterized by moderately large hills and valleys with numerous small glacial kettle lakes and flowages, as well as bogs and forested wetlands. Upland areas are generally forested or developed (e.g., cities, roads) and seasonal homes along the shores of the region's kettle lakes are prevalent. White and red pine used to dominate the Northern Highland Region, but forestry operations cleared much of the pine forests and aspen and other trees are now more common.

The topography of the Project vicinity is variable with elevations ranging from 1,601 to 1,701 feet above mean sea level. Land cover in the Project area is predominantly forested and developed (i.e., roads), with permanent and seasonal residences near lakes and waterways scattered along the route. Land Use is predominately undeveloped lands and developed lands (roads and railroad) with public lands (e.g., Northern Highland American Legion State Forest) also being crossed. Public lands are displayed on Appendix A, Figure 8.

The Chain O Lakes Substation site is currently a mix of forested wetland, upland forest, and developed in the U.S. Geological Survey (USGS) Gap Analysis Project (GAP) data (USGS, 2019) and is zoned as Community Business District 3 and requires a Conditional Use Permit from Manitowish Waters Township. The Boot Lake Substation site is currently classified as developed and upland forest land and the site is zoned as Community Business which includes substations as a permitted use.

The existing Rest Lake Substation is classified as forested wetland in the USGS GAP data and the Presque Isle Substation is classified as developed. In reality, land use at both existing substation sites is developed but will ultimately be removed and restored.

1.6.4 Any special or unique natural or cultural resources.

The following summarizes special or unique natural resources that the proposed route crosses. Most of these features are addressed in more detail in other sections of this Application such as Sections 5.4 (Impact Tables), 6.1 (Forested Lands), 6.8 (Floodplains), 7.7 (Parks and Recreation)

and 8.0 (WDNR Wetland/Waterway Permitting). There are no known mapped culturally sensitive sites within the proposed Project areas, though some known mapped culturally sensitive sites are within one mile of the Project (see Section 6.4). Natural resources are shown on maps provided in Appendix A, Figure 5.

1.6.5 Areas of residential concentrations and urban centers

The Project route does not cross municipal boundaries of nearby cities or towns such as Presque Isle, Winchester, or Manitowish Waters. However, seasonal residences and resorts are present between County Highway W and lakes in the area including Boot Lake, Presque Isle Lake, Birch Lake, Tamarack Lake, North Turtle Lake, South Turtle Lake, and Rest Lake.

1.6.6 Transmission configurations (Such as single-circuit or double-circuit with existing line, overhead or underground, conductor replacement or new construction, etc.).

The new transmission line would be a new overhead single-circuit 34.5 kV transmission line with distribution underbuild.

1.6.7 The proposed project right-of-way (ROW).

The new 15.1-mile 34.5 kV transmission line will be constructed along 23 segments that generally overlap the 30-foot-wide ROW of the existing 3-phase distribution line where present; in areas of overlap, the new proposed ROW would be expanded to 75 feet. However, in eight locations, the ROW for the new transmission line will diverge from the existing distribution line corridor and a new 75-foot-wide corridor will be constructed. The 3-phase distribution will be removed from the existing 30-foot-wide corridor and will be underbuilt on the new 34.5 kV structures in the new 75-foot-wide corridor. Removal Segment 9 is in reference to the removal of 0.3 mile of the existing W3634 34.5 kV transmission line between the end of the new proposed transmission line and the Presque Isle Substation. These removal segments are described further in Section 1.6 and depicted on Figures 1 and 4 of Appendix A. The proposed route for the transmission line also overlaps various other utility ROWs and road ROWs along its length (see Table 1 of Appendix B). Table 1.6-1 describes the start and end points for each segment of the new transmission line.

Segment	Structures	Overlap or Greenfield	Removal Segment
1	1 to 21	Overlap	
2	21 to 25	Greenfield with Small Areas of Overlap	
3	25 to 35	Overlap	
4	35 to 40	Greenfield	Removal Segment 1
5	40 to 42	Overlap	
6A	42 to 50	Greenfield	Removal Segment 2
7B	50 to 58	Overlap	

Table 1.6-1 Comparison of Existing Line Corridor and New Transmission Line Corridor			
Segment	Structures	Overlap or Greenfield	Removal Segment
8	58 to 64	Overlap	
8-1	64 to 68	Greenfield with Small Areas of Overlap	Removal Segment 3
8-1	68 to 69	Overlap	
9A	69 to 76	Greenfield	Removal Segment 4
10	76 to 82	Overlap	
11	82 to 83	Overlap	Removal Segment 5
11	83 to 85	Greenfield	Removal Segment 5
11	85 to 86	Overlap	Removal Segment 5
12	86 to 93	Overlap	
12-2	93 to 98	Overlap	
12-2	98 to 99	Overlap	Removal Segment 6
13	99 to 126	Greenfield	Removal Segment 6
13-1	126 to 127	Greenfield	Removal Segment 6
13-1	127 to 130	Greenfield	
16	130 to 174	Overlap	
17	174 to 176	Greenfield	Removal Segment 7
17	176 to 179	Overlap	Removal Segment 7
17	179 to 186	Greenfield	Removal Segment 7
18	186 to 195	Overlap	
19	195 to 214	Greenfield	
20	214 to 220	Overlap	
21	220 to 229	Greenfield	
22	229 to 257	Overlap	
23	257 to 263	Greenfield with Small Areas of Overlap	Removal Segment 8
23	263 to 287	Greenfield	
N/A	287 to Existing Presque Isle Substation	N/A	Removal Segment 9

Xcel Energy is working to obtain deeds and land records for parcels along the proposed route that will verify the extent of the existing rights of way (roads, railroads, distribution lines). For the purposes of this Application, Xcel Energy has made assumptions on existing ROW widths to determine corridor sharing.

1.7 Other Agency Correspondence/Permits/Approvals

1.7.1 Provide copies of all official correspondence between the applicant and all state, federal, or local government agency as described in the *Introduction, page v.*

Copies of Xcel Energy’s correspondence with governmental agencies concerning the Project are included in Appendix D. Details on Xcel Energy’s community outreach, including coordination with agencies, are discussed in Section 7.1.

1.7.2 Provide a list of all state and federal permits/approvals that would be required for this project and their status.

All anticipated state and federal permits and approvals required for this Project and their status are listed in Table 1.7-1. WDNR wetland and waterway permits and approvals are further discussed in Section 8.0.

Table 1.7-1 State and Federal Permits and Approvals			
Agency	Activity	Permit Type	Status
FEDERAL AGENCIES			
U.S. Army Corps of Engineers (USACE)	Impacts on Waters of the U.S.	Section 404 of Clean Water Act (CWA)	Applicant will apply for coverage under Section 404 on the authorized route.
	Archaeological Review	Section 106 National Historic Preservation Act	A Cultural Resources assessment has been prepared as part of this Application. Applicant will submit information to USACE once a route has been authorized.
U.S. Fish and Wildlife Service (USFWS)	Federally listed rare species review and activities near eagle nests	Endangered Species Act; Bald and Golden Eagle Protection Act	Applicant has conducted a review of rare species and eagle nests in the Project area and will continue to coordinate with the agency.
STATE AGENCIES			
Department of Agriculture, Trade and Consumer Protection (DATCP)	Potential use of eminent domain on more than 5 acres of any farm operation	Agricultural Impact Statement (AIS)	Exempt per Wis. Stat. § 32.035(2) and 196.491(1)(f), as the Project is designed for operation of less than 100 kV

Table 1.7-1 State and Federal Permits and Approvals			
Agency	Activity	Permit Type	Status
Wisconsin Historical Society (WHS)	Site Preparation and Grading	Approval of Archaeological Surveys (Wis. Stat. § 44.40 and Section 106 of National Historic Preservation Act)	A cultural resources assessment has been prepared for this Application.
Wisconsin Department of Natural Resources (WDNR)	Discharge of Dredged or Fill Material into Wetlands	Wetland Individual Permit under Ch. 281.36, Wis. Stats. and NR 103 and 299, Wis. Admin. Code	See Section 8.0.
	Placement of Temporary Clear Span Bridges over Navigable Waters	Waterway Crossing Permit under Ch. 30.123, Wis. Stats. and NR 102 and 320, Wis. Admin. Code	See Section 8.0
	Ground disturbance in excess of one acre	Construction Site Stormwater General Permit under NR 216, Wis. Admin. Code	See Section 10.0

1.7.3 Local Permits

1.7.3.1 For CA applications, provide a list of all local permits and/or ordinances that apply to the proposed project and the status of those permits.

Xcel Energy will apply for these permits and other authorizations governed by local ordinances (county, town, village, or city), as required after the PSC authorizes the Project route. These permits include road crossing and road weight limit permits. All anticipated local permits and approvals required for this Project are listed in Table 1.7-2.

Table 1.7-2 Local Permits and Approvals		
Agency	Activity	Permit Type
Vilas County	Conduct, Operate, and Maintain Utilities within County Highway ROW	County Highway Utility Permit
	Conducting Work within County Highway ROW	Work in ROW Permit
	Oversize Loads or Excessive Weights on County Highways	Overweight/Width Permit
	To Construct a Driveway within County Highway ROW	Driveway Access Permit
	Conducting Work in Shoreland Areas	Shoreland Alteration Permit

Table 1.7-2 Local Permits and Approvals		
Agency	Activity	Permit Type
Manitowish Waters Township	To Construct the Chain O Lakes Substation within the Community Development 3 District	Conditional Use Permit

1.7.3.2 For CPCN applications and applications filed under the Wis. Stat. § 196.491(4)(c)1m exemption, provide a list of local permits and/or ordinances that would apply to the proposed construction activities, if the exemption did not apply.

Not applicable.

1.7.4 Railroad ROWs

1.7.4.1 Identify route segments that cross or share railroad ROWs.

The Project does not cross or share ROW with railroads.

1.7.4.2 Identify the owners of the railroad ROWs.

Not applicable.

1.7.4.3 Identify abandoned railroad ROWs that are crossed or shared by route segments.

Not applicable.

1.7.4.4 Provide documentation, if possible, that the proposed ROW crossing or sharing is acceptable to the company.

Not applicable.

1.7.5 Pipeline ROWs

1.7.5.1 Identify route segments the cross or share any pipeline ROWs.

The Project will not cross or share any pipeline ROWs (National Pipeline Mapping System, 2023).

1.7.5.2 Identify the owners of the ROW property or easements, as applicable.

Not applicable.

1.7.5.3 Provide documentation, if possible, that the proposed ROW crossing or sharing is acceptable to the company.

Not applicable.

1.7.6 Wisconsin Department of Transportation (WisDOT) ROWs

The Project does not cross or share ROW with any state or federal highways. As such, permits from the Wisconsin Department of Transportation (WisDOT) will not be needed. Permits to cross or share ROW with County Highways will be obtained from the Vilas County Highway Department.

1.7.6.1 Identify route segments that cross or share WisDOT ROW easements and/or properties.

Not applicable.

1.7.6.2 Supply documentation, if possible, that the proposed ROW crossing of sharing is acceptable to the agency.

Refer to Letter of Support from Vilas County Highway Commissioner (Appendix D).

1.8 Construction Schedule and Sequence

1.8.1 Provide the anticipated general construction schedule, identifying any potential seasonal or regulatory construction constraints.

The estimated construction duration of the new transmission line and substations is approximately one year. Construction is expected to begin in the 3rd Quarter of 2025 and be in-service by the 3rd Quarter of 2026, pending agency permits and authorizations. Relocation of the 3-phase distribution line and removal of the existing poles will be completed concurrently with installation of the new transmission line. The existing substations will be removed after the new transmission line and new substations are in service.

Xcel Energy has not identified any regulatory constraints to the construction schedule at this time other than town road restrictions during spring break-up. County Highway W is a four-season road with no road restrictions. Due to the hilly terrain in the Project area, and the large amount of snowfall during typical winters, there may be times when conditions on the ROW, particularly locations not adjacent to roads, are not accessible to construction equipment, and it may be necessary to adjust the schedule to accommodate these conditions.

Xcel Energy anticipates constructing the Project according to the following schedule provided in Table 1.8-1:

Table 1.8-1 Construction Schedule	
Project Activity	Preliminary Date
PSC CA and WDNR Utility Permit Application Submittal	Q2 2023
PSC CA Approval - Anticipated	Q2 2024

Table 1.8-1 Construction Schedule	
Project Activity	Preliminary Date
WDNR Utility Permit Issuance - Anticipated	Q3 2024
Start Transmission Line Construction	Q3 2025
Project In-Service	Q3 2026

Xcel Energy is aware that the Commission sometimes conditions CAs on construction starting within one year of the date of the Final Decision. Based on the construction schedule laid out above, Xcel Energy requests that the Commission provide the Company additional flexibility on any order points relating to the start of construction and authorize construction by construction spread, as identified by Xcel Energy, provided that all necessary permits are obtained for a construction spread before work begins on that construction spread.

1.8.2 Generally discuss any generation or transmission outage constraints that may have to be accommodated.

Xcel Energy plans to operate the existing W3626 34.5 kV and W3634 34.5 kV transmission lines while the new section of transmission line between Boot Lake and Chain O Lakes is being constructed. This transmission line's primary purpose is to allow power to flow from one 34.5 kV system to another in the case of an outage. Therefore, there are not any anticipated major outages to either 34.5 kV transmission line as this is a completely new line section. There may be a short outage (less than one day) while this new transmission line is cut in at either Boot Lake or Chain O Lakes, however this will be finalized when an outage plan is created.

There may be short outages for customers at Boot Lake and Chain O Lakes when the new substations are cut in from the old Presque Isle and Rest Lake substations. These outages will be kept to an absolute minimum to reduce customer outages.

1.9 Project Maps

Consistent with the Application Filing Requirements and consultation with state agencies, a set of Project maps is provided in Appendix A, Figures 1 through 8.

Map figures included:

- Figure 1 – Project Location
- Figure 2 – Existing Transmission System
- Figure 3 – Routes Considered
- Figure 4 – Project Related Data
- Figure 5 – Environmental Data
- Figure 6 – Land Use

Figure 7 – Zoning

Figure 8 – Public Lands and Recreation Areas and Trails

The maps showing the proposed route and other Project data are provided on aerial photographs and include Environmental, Parcel, Land Use and Existing Utility/Infrastructure data. The maps in Appendix A also contain environmental information required to support WDNR wetland and waterway permitting activities. Xcel Energy is providing separately to the Commission, in electronic format, Geographic Information System (GIS) data files supporting the mapping.

1.10 ESRI ArcGIS Data Files

All Project maps were created using ESRI ArcGIS 10.8. Xcel Energy will also provide the Commission a spreadsheet listing all GIS data sources, a description of the data, and the date the data was generated or collected around the same time the application is submitted.

1.11 Mailing Lists

Mailing lists of key stakeholders and all affected private and public landowners located within 0.5 mile of the Project’s proposed transmission centerline, including properties on both sides of a roadway regardless of distance, will be provided in electronic format as Microsoft Excel spreadsheets and shared with PSC staff around the same time the application is submitted. The data includes all the required information listed in the filing requirements Sections 1.11.1 through 1.11.3

The landowner list provided is based on publicly available tax roll and spatial data recently acquired from Wisconsin Statewide Parcel Data (V8) for the preparation of this Joint Application. Over the life of a project, owners may change. Xcel Energy has made its best efforts, however, to use the most accurate information available. This includes some updates to the list after receiving updated information from affected landowners (change of address, additional owner, etc.). Xcel Energy held a virtual open house on December 15, 2022 and an in-person open house on January, 26 2023 and notified all landowners within 0.5-mile of each route option.

This application will be mailed to three libraries in the Project vicinity, including the Frank B Koller Memorial Library, the Winchester Public Library, and the Presque Isle Community Library. The addresses for these libraries are included in Appendix D.

1.11.1 Provide a Microsoft Excel mailing list in an acceptable format that is able to be cross-referenced to GIS parcel data as described in the *Introduction pages iii-iv.*

The mailing list will be provided in an acceptable format that is able to be cross-referenced to GIS parcel data.

1.11.2 Identify the source of the information contained in the mailing lists and discuss the potential for inaccuracies in the data set (new development, poor data, etc.)

Refer to Section 1.11.

1.11.3 Provide a list of libraries that the application will be mailed to.

Refer to Section 1.11.

2.0 PROJECT NEED ANALYSIS

2.1 Project Need

***Transmission line:* Describe the purpose or need for the project with supporting data.**

The Applicant is proposing a new 34.5 kV transmission line in addition to substation upgrades to improve the electric system reliability in the Project area. The existing electric system consists of two radial transmission systems which only deliver electricity in one direction and is unable to provide power if one of the radial transmission lines have an outage. The proposed Project will improve electrical service in the Project area by enabling the system to transfer power from either direction, which will help to prevent outages from occurring. This project is estimated to improve reliability for approximately 5,000 customers. An Interruption Report from April 2023 that illustrates the issues caused by outages in this area is provided in Appendix E.

The existing system consists of two radial systems. The first system in the north is a radial 88 kV transmission line coming from Norrie Substation in Ironwood Michigan. The 88 kV transmission line runs east for about 23 miles after which there is a step-down substation called Mine Road which steps the voltage down to 34.5 kV. The 34.5 kV transmission line then proceeds south until it terminates at the Presque Isle Substation. This substation will be rebuilt on a new parcel of land and will be named Boot Lake.

The second radial system toward the south comes from the Weber Lake substation which is roughly 4 miles northwest of Mercer, Wisconsin. This 34.5 kV transmission line begins at Weber Lake which proceeds southeast until it terminates at Rest Lake substation. This substation will be rebuilt and relocated to a new parcel named Chain O Lakes.

As the above paragraphs state, having a connection from one system to another will allow system operators to keep customers in service while there are planned or forced outages. In addition, having this transmission line will allow Xcel Energy to rebuild the lines from Mine Road to Boot Lake and Weber Lake to Chain O Lakes while keeping customers in service and avoiding hot transmission line work.

Approximately 1,500 customers in the Town of Presque Isle are served by a single, radial distribution source, and about 2,500 customers in Manitowish Waters are served by another single, radial distribution source. There is no ability to tie either of these areas together. This Project would allow Xcel Energy to form a field tie between distribution sources and improve distribution reliability because three phase power could be provided from either direction.

To establish this feeder tie, the Applicant is proposing a distribution feeder extension utilizing the new transmission structures. This provides a less obtrusive solution and requires maintenance of only one corridor.

Substation: Describe the purpose or need for the project with supporting data. Provide a project one-line diagram showing the proposed electrical changes to the system. Discuss system configuration alternatives considered and the reasons as to why they were rejected.

Both Presque Isle and Rest Lake substations are at the end of their useful life. They both are located on small parcels which Xcel Energy does not have rights to expand upon. In addition, the current locations have space limitations which would not allow such expansion. In order to build a new transmission line between these two locations, new substations would need to be constructed in order to accommodate the new 34.5 kV transmission line.

Because both systems are radial in nature, if there is a transmission outage, residential customers would be without power. For this reason, there are not any alternatives which fulfill the Project need. Below is the system one line diagram after the proposed project is in service (Figure 2.1-1).

2.2 Transmission Network Alternatives

Provide transmission system alternative studies, including alternative costs, based on current NERC and MISO transmission planning and operating standards.

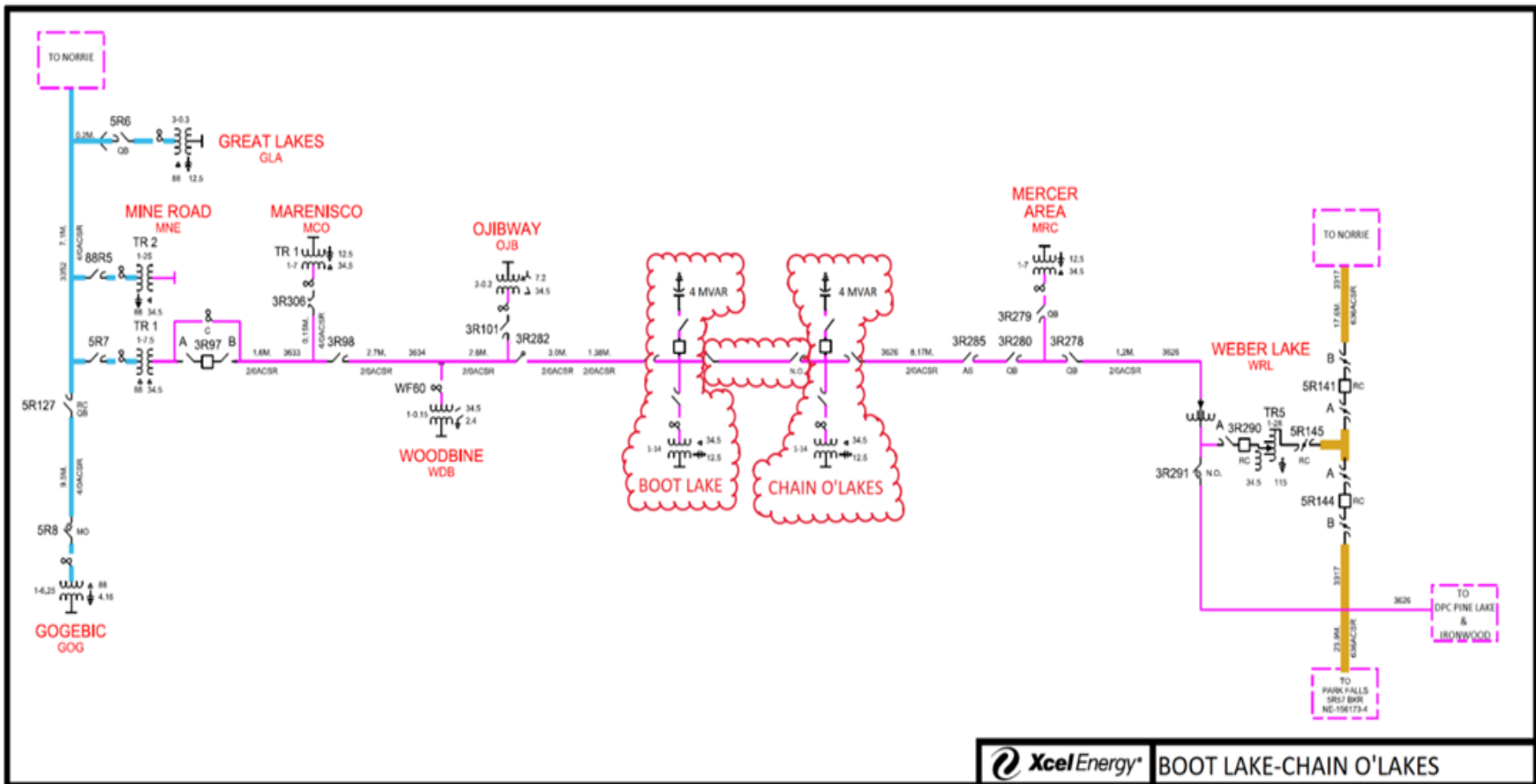
As described above, because this project was not based on North American Electric Reliability Corporation (NERC) or NSP Planning Criteria, this project does not fix a transmission planning need. However, the Boot Lake to Chain O Lakes project does fix a local reliability need. As the transmission system stands today, the 34.5 kV transmission lines from Weber Lake to Rest Lake and from Mine Road to Presque Isle are both radial and serve residential customers. This means with outages on either of these sections, Xcel Energy residential customers are cut off from power.

An alternative to the proposed solution is detailed in section 2.2.2.

2.2.1 Describe the proposed solution.

The proposed solution to the problem of two radial 34.5 kV transmission systems is to tie them together with a new 34.5 kV transmission line. This transmission line will allow for power to be delivered in both directions between Weber Lake Substation and Mine Road Substation. This proposed solution will also give us the opportunity to rebuild sections of both transmission lines without performing hot transmission line work. As described above in the substation section, both Rest Lake and Presque Isle substations are at the end of their usable life, have no land rights and could not easily accept a new transmission line. For these reasons as a part of this project, both substations will be rebuilt in order to fix the aging infrastructure, gain land rights for our assets and enable the substations to accept a new transmission line. The Presque Isle substation will be replaced with Boot Lake 34.5 kV substation while Rest Lake will be replaced with Chain O Lakes substation.

Figure 2.1-1: System One-line Diagram for the Project



This solution is also preferred because this transmission line creates a backbone for a looped system in this region. If this transmission line is built, it will allow the company to slowly rebuild the line sections from Weber Lake to Chain O Lakes and from Boot Lake to Mine Road. Once these sections are rebuilt, the long-term goal is to operate this region at 69 kV as the higher voltage allows for less voltage loss over the roughly 32 miles of transmission line. Without this transmission line, both systems in the north and the south will stay radial in nature. The surrounding region is a very remote part of Wisconsin and Michigan. When outages occur restoration can take considerable amount of time, especially in the winter. For this reason, the proposed solution is to build a new 34.5 kV transmission line tying the two systems together to build for the future a looped system which will allow customers in the area a more reliable system.

2.2.1.1 Identify and describe any transmission line facilities that would be added or altered for this project. Include one-lines where appropriate.

A new transmission line will be constructed between the new Boot Lake and Chain O Lakes substations. This line will be a 34.5 kV transmission line which will be operated normally open with a plan to be operated normally closed once the other 34.5 kV transmission lines are rebuilt in the future. Apart from this new line section between Boot Lake and Chain O Lakes, there will not be any other line sections altered.

2.2.1.2 Identify and describe any transmission line facilities that would be added or altered for this project. Include one-lines where appropriate.

Boot Lake substation will be the new substation replacing Presque Isle substation. This substation will include a distribution transformer and will serve the customers currently served from Presque Isle. The existing substation is at its end of useable life, has limited land rights and is in a location that is unable to be expanded.

Chain O Lakes substation will be the new substation replacing Rest Lake substation. This substation also will include a distribution transformer and will serve the customers currently served from Rest Lake. The existing substation is at its end of useable life, has limited land rights and is in a location that is unable to be expanded.

Both substations will have four megavolt ampere of reactive power (MVAR) of capacitor banks which will help keep voltages to acceptable levels when serving power from the north or the south.

Apart from these two new substations and the retirement of Rest Lake and Presque Isle, there will be no other altered substations.

2.2.1.3 Identify and describe any substation facilities that would be added or altered for this project. Include electric schematics where appropriate. Substation Filing Requirements may also apply.

2.2.2 Discuss the viable Alternatives considered.

Xcel Energy considered two options that would increase the overall reliability for customers in the study area. Both options are detailed in Table 2.2-1 below as well as the paragraph below.

Table 2.2-1: Viable Alternatives Considered	
Option 1 Proposed Project	<ul style="list-style-type: none"> • Build a new 34.5 kV transmission line between Boot Lake (Presque Isle) and Chain O Lakes (Rest Lake) substations • Roughly 15 miles of new 34.5 kV transmission line • Rebuild Presque Isle substation in a new location which will be named Boot Lake • Rebuild Rest Lake substation in a new location which will be named Chain O Lakes
Option 2 Alternative Project	<ul style="list-style-type: none"> • Rebuild W3352 88 kV from Norrie to Great Lakes to Mine Road substation • Rebuild W3634 from Mine Road to Presque Isle substation • Rebuild W3626 from Weber Lake to Rest Lake substation • 19 miles of rebuilt W3352 • 11 miles of rebuilt W3634 • 12 miles of rebuilt W3626

For both options, Xcel Energy prepared planning level cost estimates solely for the purpose of assessing the relative cost of one option to the other.

Table 2.2-2: Planning Level Cost Estimates	
Option	Cost¹
Option 1 - Proposed Project	\$20 M
Option 2 - Alternative Project	\$41 M
¹ The Planning Level Cost Estimates do not include other relevant permitting, construction adder, and indirect costs. The total Project cost for each option could be greater than the Planning Level Cost Estimates shown above.	

It is important to note the alternative option also does not address the end of life for Presque Isle and Rest Lake substations as that would be a distribution driven project.

The alternative discussed by the project team was to rebuild the 88 kV and 34.5 kV systems in order to “harden” them against outages. The transmission lines from Norrie to Great Lakes to Mine Road 88 kV, Mine Road to Presque Isle 34.5 kV and from Weber Lake to Rest Lake 34.5 kV are the lines which would be rebuilt and hardened (Figure 2.2-1). The reason this option was not chosen is because both systems are radial, there is no way to keep customers in service during construction of the transmission lines. The only avenue to pursue would be to rebuild these

transmission line sections while the lines are energized or “hot”. Hot work is not preferred as it adds significant cost and is more dangerous for line workers. This option would harden the local systems so they would in theory have fewer potential outages. However, it would be more expensive to rebuild these transmission lines than if an outage could be taken. In addition, it does not keep customers in service if there is an outage on any of these sections of transmission lines.

2.2.3 For the discussion of the Proposed Solution and viable Alternatives include the following, as appropriate:

2.2.3.1 Provide relevant regional studies of transmission networks solutions.

There was no regional analysis completed as part of this project due to the lack of regional transmission lines in the study area. The study area consists solely of 34.5 kV and 88 kV load serving transmission lines. Thus, the impacts of the preferred option as well as the alternative option are negligible and therefore a full regional analysis was not needed.

2.2.3.2 Provide details of the reliability and performance benefits of each network solution studied, as available.

Currently, there are no NERC or NSP Planning Criteria violations related to these lines. This Project is driven by local reliability concerns which are partially caused by poor conditions on the radial load serving transmission lines to both the Presque Isle and Rest Lake substations. The fact that the lines are aging means they are more likely to have outages due to insulator or pole failure. This Project will allow service to these areas from two directions and enable the existing system to be rebuilt without taking outages or doing hot work. The second option will not allow load to be served in either direction, but it will harden the transmission system to help prevent future outages. Both options assessed provide reliable transmission service to the area and meet NERC and NSP Planning Criteria requirements.

Additional information can be found in the Transmission Planning Study in Appendix F.

2.2.3.3 Supply the electrical losses for each alternative, peak MW and annual GWH estimates.

The net system losses are shown below for each option. Using the publicly available Midcontinent Independent System Operator, Inc. Rates for Open Access Transmission Tariff Schedule 9, the costs of the losses are shown below in Table 2.2-3. The March 2023 Network rates for NSP are \$61,375.9576/megawatts (MW) per year. The annual losses are taken from the summer peak models used in the Transmission Planning Study and given dollar amounts using the rate above.

Table 2.2-3: Estimated Net Losses by Option – Weber Lake to Rest Lake & Mine Road to Presque Isle		
Option	2025 Net Losses (MW)	Annual Cost
Preferred Option	-0.29	\$17,800
Alternative Option	-0.29	\$17,800

2.2.3.4 For generator interconnections, supply the detailed short circuit, stability and thermal analysis studies that have been performed. There must be some initial studies performed in order for the application to be complete.

This Application does not include a generator interconnection. Therefore, these studies are not applicable.

2.2.3.5 For new distribution substations, supply the information from the Load Serving Entity on the need and alternatives considered. Those issues include existing conditions, voltage profiles, line capacities, outages, load growth, alternate substation feed pickup capability, etc.

Both Rest Lake and Presque Isle substations are at the end of their useful life. Most if not all equipment in the substations is at the end of life, including the transformers. The Rest Lake substation was built in the 1960s and Presque Isle substation was built in the 1970s. Based on NSP Distribution Planning Criteria, the feeders at these substations would have N-0 issues as the 12.5kV feeders are loaded over 75 percent; however, the primary driver of these substation replacements are age and condition. At this time, there are no alternate distribution backups for these substations and the loads here are not growing significantly.

2.3 Local Transmission, Distribution and Distributed Resource Alternatives

2.3.1 Describe local transmission, distribution, and distributed resource alternatives that have been studied and rejected for the proposed project. Local alternatives can include but are not limited to:

- **An upgrade of existing transmission circuits with larger capacity conductors**
- **Installation of capacitor banks**
- **Installation of new substation equipment**
- **New operating guides**
- **Smaller and less expensive line/s in other locations.**
- **Distribution networking and upgrades**
- **Distributed resources, including solar and other distributed resources**

An upgrade of existing transmission circuits with larger capacity conductors

Xcel Energy looked at “hardening” the surrounding area in order to reduce the potential for outages in the area. However, it would be more costly to perform hot work on these transmission lines in addition to the fact that it would not eliminate the risk that a line outage would affect customers.

Installation of capacitor banks

Both Boot Lake and Chain O Lakes substations will include capacitor banks. Installing capacitors does not negate the need for a transmission line to be a backup source for Xcel Energy customers in the case of an outage.

Installation of new substation equipment

This project includes two new substations which will replace Presque Isle and Rest Lake. Installing new substations does not negate the need for a transmission line to be a backup source for Xcel Energy customers in the case of an outage.

New operating guides

A new operating guide does not negate the need for a transmission line to be a backup source for Xcel Energy customers in the case of an outage.

Smaller and less expensive line/s in other locations.

Because these systems are radial, no other transmission projects will achieve the same goals for the local system.

Distributed resources, including solar and other distributed resources

This project will be a normally open line to begin with and will be utilized to rebuild sections of Mine Road to Boot Lake and Weber Lake to Chain O Lakes. However, long term this transmission line will be the backbone of a future normally closed loop which will radically improve the system reliability for the area. If a distributed energy resources solution were pursued, this area would still be two radial systems.

2.3.2 Explain why the options were not selected.

The reasons why these options were not chosen are included above.

2.4 Non-Transmission and Alternative Substation Options

Discuss the potential for non-transmission options to the identified problem, as prioritized in Wis. Stat. §§ 1.12(4) and 196.025(1)(ar).

Non-transmission alternatives were looked at for this application. Because Xcel Energy has a goal of 80 percent carbon reduction from 2005 levels by 2030 and 100 percent reduction by 2050, carbon-based resources were not studied. Below in section 2.4.1 a non-transmission option is discussed at a high level.

2.4.1 Noncombustible renewable energy resources

Noncombustible renewable energy resources were examined as an option for this Project; however, they were dismissed. Because the fundamental problem in this area is the lack of a backup transmission line to the study area, adding renewable resources does not address this problem. Typically, utilities are not allowed to operate a localized “island” because of difficulty controlling load and generation on a small scale as well as issues with system protection. If new renewable resources were added at Boot Lake and Chain O Lakes substations for instance, an outage on a radial element would disconnect the residential customers as well as the renewable resource. For this reason, noncombustible renewable energy resources were dismissed as a viable option.

2.4.2 Combustible renewable energy resources

Currently, there is no planned new utility scale combustible renewable energy generation in the study area. A combustible renewable energy generator would not meet the reliability need to provide a backup transmission line for both radial systems.

2.4.3 Nonrenewable combustible energy resources in the following order:

2.4.3.1 Natural gas

As discussed above in section 2.4, because Xcel Energy has a goal of 80 percent carbon reduction from 2005 levels by 2030 and 100 percent reduction by 2050, carbon-based resources were not studied. There are no planned utility scale natural gas generating stations in the Manitowish Waters or Presque Isle areas.

2.4.3.2 Oil or coal with a sulphur content of less than 1%

As discussed above in section 2.4, because Xcel Energy has a goal of 80 percent carbon reduction from 2005 levels by 2030 and 100 percent reduction by 2050, carbon-based resources were not studied. There are no planned utility scale natural gas generating stations in the Manitowish Waters or Presque Isle areas.

2.4.3.3 All other carbon-based fuels

As discussed above in section 2.4, because Xcel Energy has a goal of 80 percent carbon reduction from 2005 levels by 2030 and 100 percent reduction by 2050, carbon-based resources were not studied. There are no planned utility scale natural gas generating stations in the Manitowish Waters or Presque Isle areas.

2.5 No-Build Options

Discuss no-build options and their potential electrical supply and environmental impacts.

Pursuing the no build option would not fix the issue seen today where a single transmission outage can disconnect residential customers until the transmission line is restored. For this reason, the no build option was dismissed.

2.6 Energy Conservation and Efficiency and Load Response

Provide an analysis of the ability of energy conservation and efficiency and load response to reduce, alter, or eliminate the need for this project. Analysis should include:

2.6.1 A description of the energy conservation and efficiency and load response programs and services available to customers in the project area.

Focus on Energy is the statewide energy efficiency and renewable energy program in Wisconsin. Focus on Energy has residential and business programs that include providing incentives for customers to purchase energy efficient products or to use renewable resources. Customers can voluntarily choose to participate in these programs. Wisconsin's electric and gas utilities fund Focus on Energy through gas and electric rates.

2.6.2 An indication of the amount of additional energy efficiency and demand response, not already included in the forecast, needed to reduce, alter, or eliminate the need for this project.

Since the Project is driven by the two radial systems not having a backup transmission line, additional energy efficiency or demand response will not reduce, alter or eliminate the need for this project.

2.6.3 A discussion of the feasibility of achieving the level of energy efficiency and demand response identified in Section 2.6.2.

As noted in Section 2.6.2, no level of energy efficiency and demand response can meet the need for the Project.

2.7 For Market Efficiency Projects:

Provide the scenario(s) analyses that details adjusted production cost benefits or other market attributes that show the cost and the benefits of the proposed project and/or alternatives. Benefits should include a present value analysis with cumulative tables for the life of the project.

The proposed Project is not a Market Efficiency Project.

2.8 Modeling Information

2.8.1 For all projects submit network modeling information from PSSE or PowerWorld for steady-state power flow solutions. If submitting data from PSSE, submit the *.raw file. If submitting data from PowerWorld, submit the *.pwb file.

Power System Simulator for Engineering (PSS®E) models were used for analysis in the Planning Analysis. Data files for PSS®E reliability analysis supporting the Transmission Planning Study contained in Appendix F are provided separately with a request for confidentiality.

In the Boot Lake to Chain O Lakes Planning Study (see Appendix F), the power flow models employed were developed by Midcontinent Independent System Operator, Inc. (MISO). The base study model for this analysis was the 2027 summer peak model used in the 2022 MISO Transmission Expansion Planning Annual Assessment. The base model was then modified to include the project changes as it pertains to each option. The program used for this analysis was PSS®E Version 34.

2.8.2 On an individual application basis, as requested by the assigned engineer, provide the computer network simulation(s) data input files, output files, and/or output summaries.

Xcel Energy will provide Commission engineers with this information. Because the analysis and software are proprietary and confidential and contain Critical Energy/Electric Infrastructure Information, the data will be submitted with a request for confidential treatment.

2.9 Area Load Information (Transmission Line and Substation)

Submit historical peak load by substation, if available, for the study area for at least the past ten years. In the cases where coincident peak load data is not available by substation, provide annual peak load data by substation. Indicate for each substation whether the load data is coincident peak or annual peak. Explain each component of the forecasted load with quantitative detail. Any changes in the projected growth rates over the forecast period should be fully explained. Area load information requirements will be discussed at the pre-application consultations. Based on the need and scope of the proposed project, different historical data may be required.

Table 2.9-1 shows the actual peak loads in the Project area in 2019 and the projected peak loads 2023-2029 which are based on the past peak loads. The peak load data for these substations are collected via manual readings and have not been updated to the Applicant’s electronic data systems since 2019. Xcel Energy is currently gathering historical data from 2020-2022 and will soon provide this information to the Commission under separate cover. It is important to note, however, that this Project is not driven by projected non-coincident loads increasing in the area. This Project is needed because the substations in the study area only have one transmission source to their respective areas. This problem is increased by the aging condition of these existing lines. The age and condition of transmission lines plays a role in increased insulator and pole failures which can cause customer outages. This new transmission line will allow for the company to serve customers during these types of unplanned outages and allow the rebuilding of the existing circuits without dangerous hot work. These loads are provided for information only and have no bearing on the Project need.

Loads (MW)	Actual Peak Loads	Projected Peak Loads						
	2019	2023	2024	2025	2026	2027	2028	2029
Mercer	4.49	4.45	4.45	4.45	4.46	4.46	4.46	4.46
Rest Lake (Chain O Lakes)	4.73	5.75	5.75	5.75	5.76	5.76	5.77	5.77
Presque Isle (Boot Lake)	2.74	2.71	2.71	2.71	2.71	2.72	2.72	2.72
Ojibwa	0.37	0.47	0.47	0.47	0.47	0.47	0.47	0.47
Marenisco	2.24	3.31	3.31	3.31	3.31	3.31	3.32	3.32

Table 2.9-1: Actual and Projected Peak Loads								
Loads (MW)	Actual Peak Loads	Projected Peak Loads						
	2019	2023	2024	2025	2026	2027	2028	2029
TOTALS	14.57	16.69	16.69	16.69	16.70	16.72	16.73	16.73

2.10 Regional Transmission Organization Information

2.10.1 For regional projects, supply the cost benefit analysis and the likely cost allocation per the Midwest ISO’s filings.

The proposed Project is not a regional project, so cost allocation does not apply.

2.10.2 Description of applicable transmission tariffs

The proposed Project is not a regional project; there are no applicable regional tariffs.

2.10.3 Provide transmission service agreements, if applicable.

This provision is not applicable to this proceeding.

3.0 MAGNETIC FIELDS

3.1 Submit the estimate magnetic field data in PSC Table 6 from the following magnetic field profiles:

Estimated magnetic field data including the information described in items 3.1.1 – 3.1.4 (predominant transmission line configurations, unique structure types, existing transmission lines affected, and each circuit configuration) is included in Appendix G and has been submitted to the PSC in an electronic spreadsheet.

3.1.1 Predominant transmission line configurations proposed for the project (H-frame, single-pole delta, double-circuit, etc.).

The proposed transmission line would be a single pole delta configuration.

3.1.2 Each unique structure type or circuit configuration (new and existing line) with the exception of dead-end structures adjacent to substations in areas with high residence densities or other sensitive populations.

Unique structure types and circuit configurations are described in Appendix C.

3.1.3 Each existing line that would be affected by the proposed transmission line and a post-construction scenario that incorporates the new and the existing lines.

Not applicable.

3.1.4 Each set of circuit configurations for routes that would have multiple adjacent underground circuits.

Not applicable.

3.2 Include the following information in PSC Table 6 for each estimated magnetic field scenario.

Estimated magnetic field scenarios include estimates at 80 and 100 percent of peak load at 1 year and 10 years post-construction and current levels for those scenarios as required in items 3.2.1 and 3.2.2.

3.2.1 Estimate the proposed lines at 80 percent and at 100 percent of peak load for one year post-construction and ten years post-construction. For existing lines, use present day loadings to estimate the magnetic fields levels.

Peak load for one-year post construction is 9.8 MVA and 10.9 MVA for 10 years post construction.

3.2.2 Provide expected current levels for 80 and 100 percent of peak load at one and ten years post-construction.

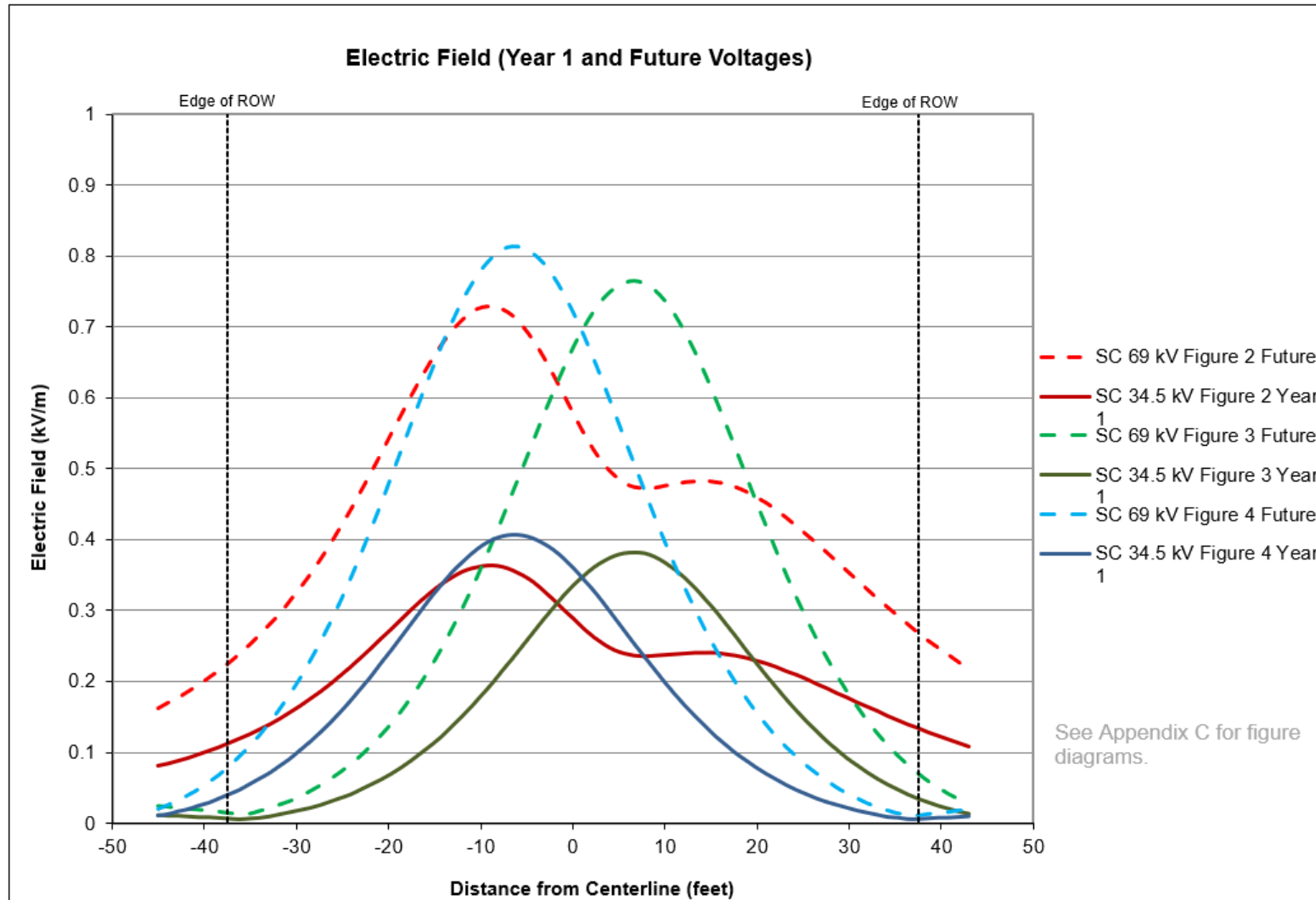
The expected current level for 80 percent of peak load is 0.131 kilo-amperes (kA) at one-year post-construction and 0.146 kA ten years post-construction. The expected current level for 100 percent of peak load is 0.164 kA at one-year post-construction and 0.182 kA 10 years post construction. Calculations were performed using a nominal voltage of 34.5 kV.

3.3 Provide all assumptions used to model magnetic field levels including:

Electric Fields

There is no federal standard for transmission line electric fields. Xcel Energy, however, has self-imposed a maximum electric field limit of 8 kV/m measured at one meter above the ground. The standard was designed to prevent serious hazards from shocks when touching large objects parked under alternating current (AC) transmission lines of 500 kV or greater. Figure 3.3-1 provides the EFs at nominal conductor voltage for the proposed 34.5 kV and future 69 kV transmission line for each structure configuration. The maximum electrical field (EF), measured at one meter (3.28 feet) above ground, associated with the project is calculated to be 0.814 kV/m. As shown in Figure 3.3-1, the strength of EFs diminishes rapidly as the distance from the conductor increases.

Figure 3.3-1 - Calculated Electric Fields (Year 1 and Future Voltages)



Magnetic Fields

There are presently no federal or Wisconsin regulations pertaining to magnetic field (MF) exposure. The Applicant provides information to the public, interested customers and employees so they can make informed decisions about MFs. Such information includes the availability for measurements to be conducted for customers and employees upon request.

The magnetic field profiles around the proposed transmission line for each structure and conductor configuration proposed for the project are shown in Figures 3.3-2, 3.3-3 and 3.3-4. Magnetic fields were calculated for normal system conditions (systems intact with projected load flows) for the 1st year of service and the 10th year of service. The magnetic field profile 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). The maximum MF, calculated at one meter (3.28 feet) above ground, is calculated to be 21.6 mG for year 1 and 24.0 mG for year 10 within ROW. The maximum MF, again calculated at one meter (3.28 feet) above ground, is calculated to be 9 for year 1 and 10 mG for year 10 at the edge of ROW. Maximum values at the edge of the transmission line ROW and sample points beyond are shown here in Table 3.3-1.

Table 3.3-1 Maximum milliGauss (mG) Values at Specified Distances from Proposed Transmission Lines ¹					
	Max. Level within ROW	Max. Level at Edge of ROW	25' from lines	150' from lines	300' from lines
Year 1					
Appendix G, Figure 2	21.6	6.8	11.3	0.6	0.2
Appendix G, Figure 3	17.8	7.5	11.8	0.6	0.2
Appendix G, Figure 4	19.4	8.3	12.9	0.7	0.2
Year 10					
Appendix G, Figure 2	24.0	7.6	12.6	0.7	0.2
Appendix G, Figure 3	19.8	8.3	15.0	0.7	0.2
Appendix G, Figure 4	21.6	9.2	14.3	0.8	0.2
¹ Values shown are for the predominant structure type and alignment. Values for all structure types and alignments are provided in Appendix G.					

The magnetic field produced by the transmission line is dependent on the current flowing on its conductors. Actual current flow on the transmission line will vary throughout the day, so magnetic fields will be less than these projected upper levels during most hours of the year with short intermittent instances of levels reaching these calculated forecasts.

Figure 3.3-2 - Calculated Magnetic Fields (Year 1 and Year 10)

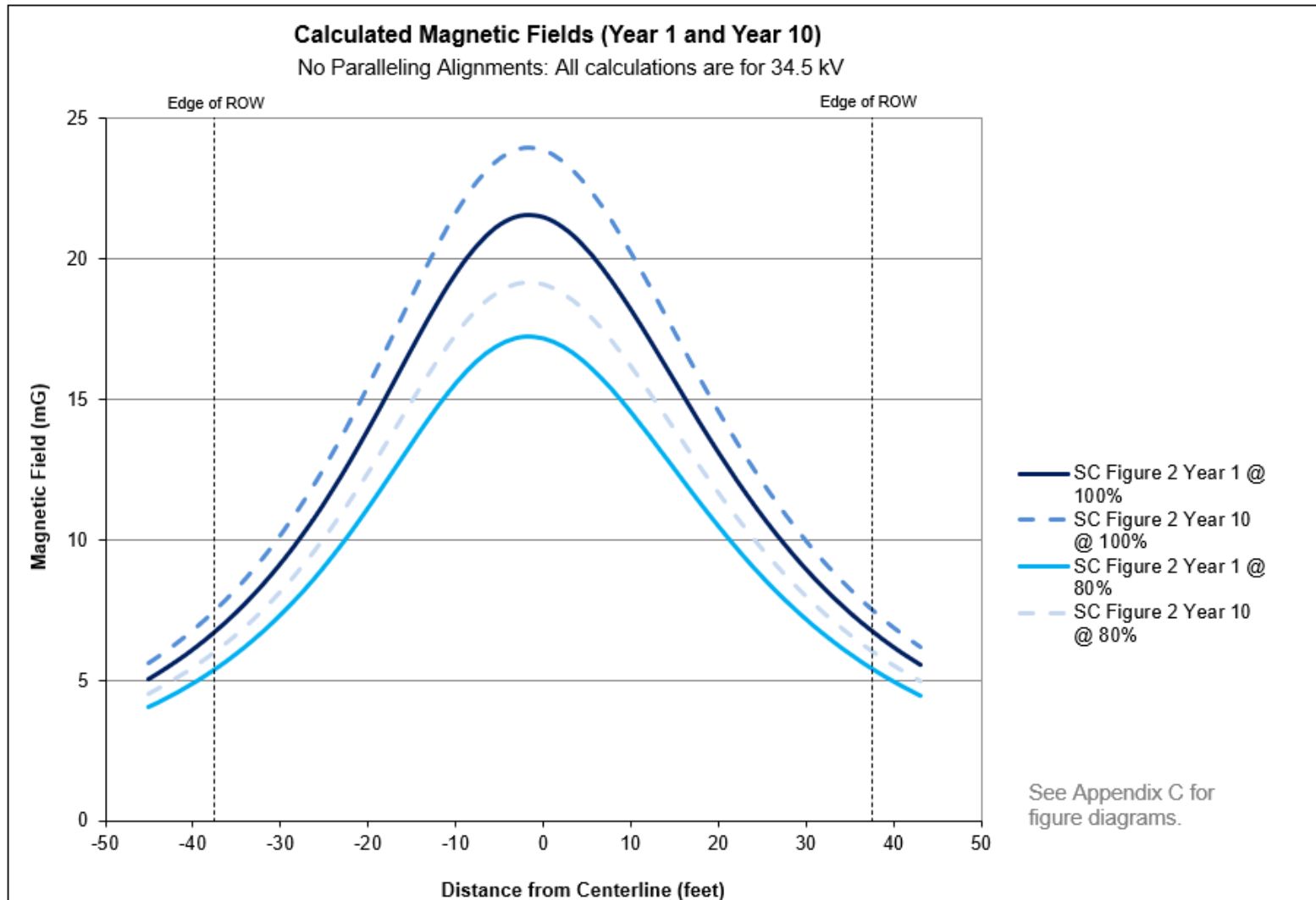


Figure 3.3-3 - Calculated Magnetic Fields (Year 1 and Year 10)

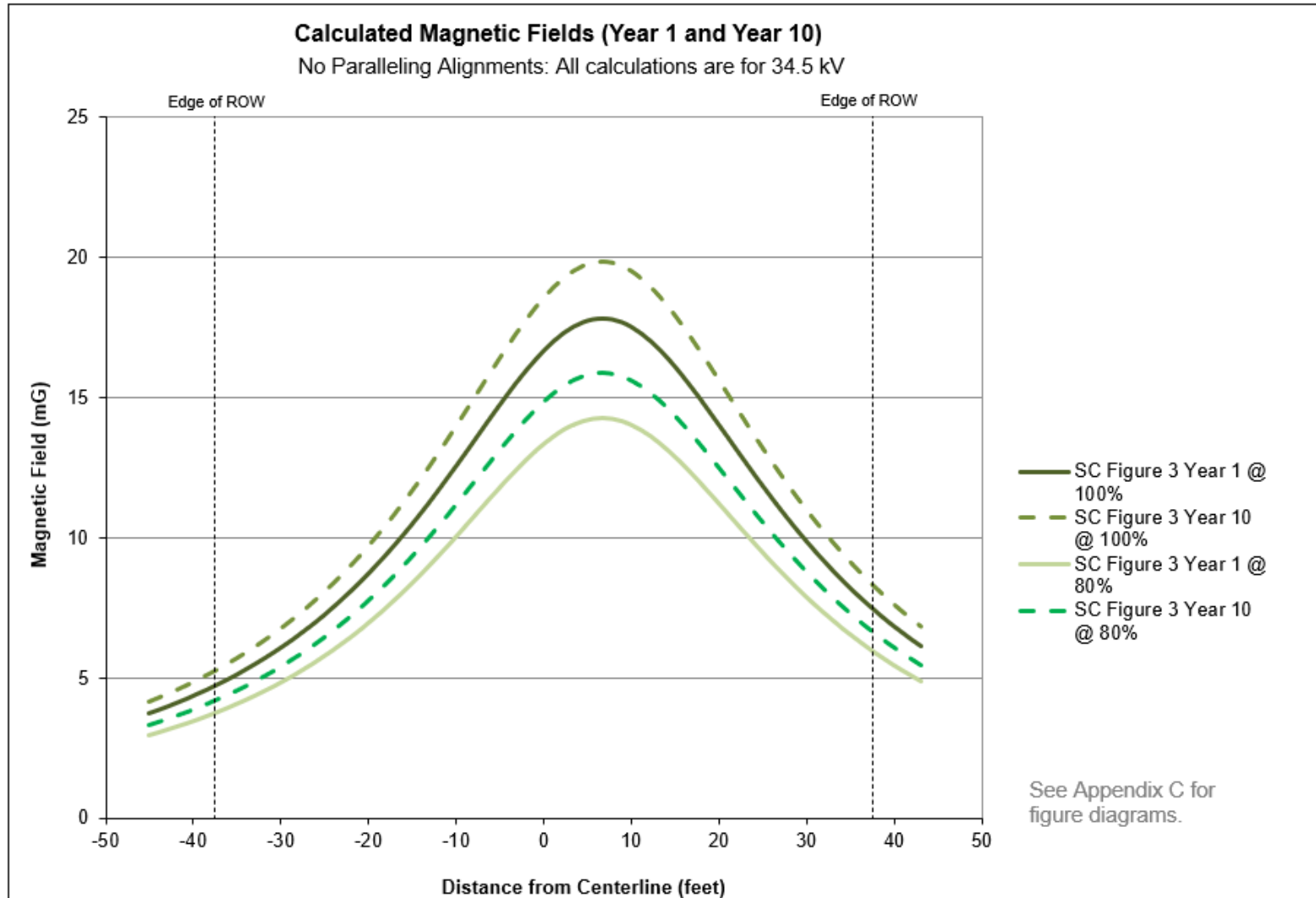
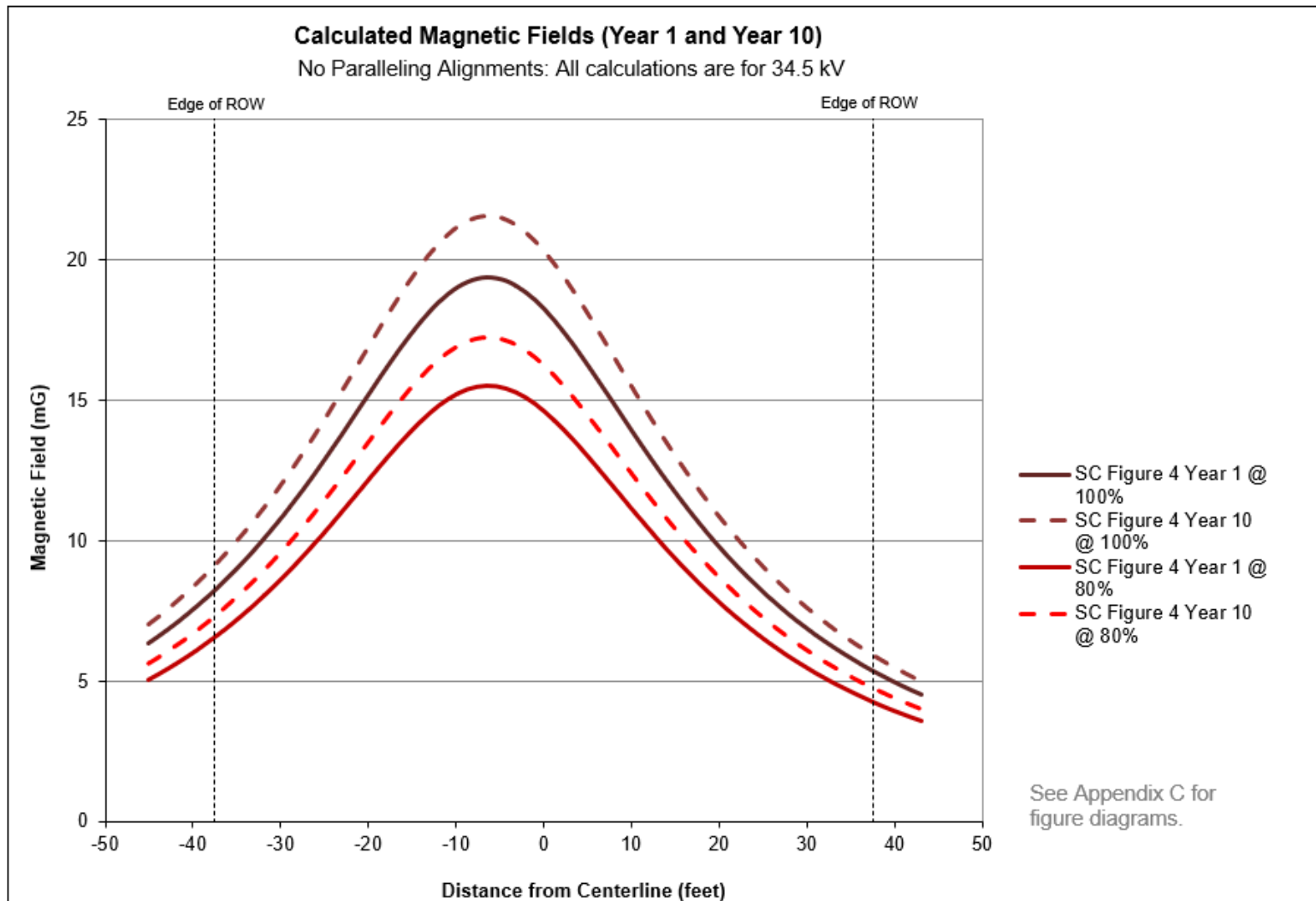


Figure 3.3-4 - Calculated Magnetic Fields (Year 1 and Year 10)



3.3.1 Phase ID and angles.

No paralleling circuits are expected to be present alongside this transmission line. Thus, phase angles do not have an impact on magnetic field results. The phase angles were assumed to be 120 out of phase (0, 120, 240).

3.3.2 Pole design diagram that includes the dimensions of pole arms, dimensions of conductor locations, horizontal distance from the pole to the conductors, and the distance of conductors from the ground at the pole.

The pole design diagram including dimensions of pole arms, conductor locations, horizontal distance from the pole to the conductors, and the distance of conductors from the ground at the pole can be found in Appendix C.

3.3.3 Height of lowest conductor(s) at mid-span.

The vertical clearance to ground is 24.3 feet for 5,300' Xcel Standard and is utilized as the lowest conductor height at mid-span.

3.3.4 Depth from ground surface to circuits, for underground construction.

Not applicable for this Project, as there is no underground construction.

3.4 For existing substations, submit magnetic field readings at the secured fence line and in the area from the fence outward to the property boundary or 150 feet, whichever is the shortest distance as follows:

3.4.1 At each corner of the fence line and outward toward the property perimeter at 25-foot intervals.

Not applicable.

3.4.2 At the midpoint along each linear fenced section and outward toward the property perimeter at 25-foot intervals.

Not applicable.

3.4.3 At the fence line where existing overhead or underground electric lines cross the fence.

Not applicable.

3.5 For new substations that would tap existing transmission lines, estimate the power flow changes and magnetic fields of the existing transmission lines.

Not applicable.

3.6 For substations associated with new generation, state how the new generation source would change the magnetic fields on the existing transmission lines connected to the substation with the generating plant operating at full capacity.

Not applicable.

4.0 PROJECT COSTS

Cost tables should be based on the projected in-service year. Tables must be submitted in a Microsoft Excel format, in addition to Adobe Acrobat (*.pdf) format.

Estimated Project costs are shown in Table 4.1-1 below and reflect total project cost for each of portions of the Project to be completed. Project costs included in the below table include: installation and removal costs of transmission and distribution lines, installation and removal of two distribution substations; precertification costs, contingency reserve, and Allowance for Funds Used During Construction (AFUDC). Project costs identified are in 2023 dollars and includes an average of 6.2 percent escalation for anticipated costs when installation is complete in 2026 and removals complete in 2027.

Estimated costs for construction of new transmission lines and the removal of existing facilities are based on Xcel Energy historical data for similar 69 kV transmission and distribution projects for lines and substations. The development of project cost estimates also included on-the-ground site visits of the proposed route with representatives from civil, line and substation construction, vegetation management, siting and land rights, engineering and project management, as well as desktop reviews.

For the estimate, Xcel Energy identified key known factors that could result in additional costs. Xcel Energy also sought to identify potential unknown risks given the scope of the Project, its duration and specific construction circumstances. Construction will span over several months including winter months in northern Wisconsin. The Project will involve constructing a new transmission line in existing three phase distribution right-of-way, while keeping the distribution energized. Estimated project costs include contingency reserve for cost as impacts due to weather; unknown subsurface soil/rock conditions; possible alignment alterations; market factors that affect material price and delivery; and restoration of disturbed areas due to construction of new transmission lines and removal of existing substations.

To assess project costs and constructability the project team performed multiple field reviews of the route and substation locations. The costs provided in the table below reflect the best estimates that can be derived at this stage of the Project.

Upon route determination from the PSC, Xcel Energy will conduct additional field reviews and update project costs based on the permitted route.

4.1 Transmission Route and Substation Cost Estimate Tables

Provide table(s) detailing the projected total costs for each proposed route or substation broken into the major categories listed below. Indicate if project costs include Allowance for Funds Used During Construction. Each major category of costs should be broken down into logical components and/or contracts. If portions of the route(s) are to be constructed underground, those costs should be separated from

overhead construction costs. Substation costs should also be separated out (see Substation Application Filing Requirements).

- **Material Costs (Transmission Line and Substations)**
- **Labor Costs (Transmission Line and Substations)**
- **Other Costs (Transmission Line and Substations)**
- **Pre-certification Costs (Transmission Line and Substations)**
- **High-Voltage Transmission Impact Fees (Transmission Line)**
- **Operation and Maintenance Costs (Transmission Line)**

Table 4.1-1 Transmission Route and Substation Cost Estimates		
TRANSMISSION LINES		Cost Estimate
34.5 kV Transmission Line Installation	Materials	\$4,782,000
	Labor	\$6,750,000
	Other	\$5,158,000
	Subtotal	\$16,690,000
Distribution Installation	Materials	\$1,100,000
	Labor	\$1,450,000
	Other	\$1,200,000
	Subtotal	3,750,000
Transmission Lines Total:		\$20,440,000
SUBSTATIONS		
Chain O Lakes Substation	Materials	\$1,666,885
	Labor	\$1,801,075
	Other	\$1,109,974
	Subtotal	\$4,577,935
Boot Lake Substation	Materials	\$1,666,885
	Labor	\$1,801,075
	Other	\$1,109,974
	Subtotal	\$4,577,935
Rest Lake and Presque Isle Substation Removals	Materials	\$50,000
	Labor	\$250,000
	Other	\$100,000
	Subtotal	\$400,000

Table 4.1-1 Transmission Route and Substation Cost Estimates		
Distribution Line Removals	Materials	\$15,000
	Labor	\$150,000
	Other (Includes scrap recovery)	\$85,000
	Subtotal	\$250,000
Substations Total:		\$9,805,870
Pre-certification Costs		\$240,152 (included in above)
Contingency / Risk Reserve		Included in above (approx. 8%)
Operations & Maintenance (O&M)		No O&M for this project
Allowance for Funds Used During Construction		\$2,337,009
Other Costs Total:		\$2,337,009
TOTAL PROJECT COSTS		\$32,582,879

4.2 For 345 kV projects: Provide a summary table of total costs (transmission and substation) for each proposed route, broken down by the following voltage classes.

- 345 kV
- Less than 345 kV
- Distribution

Not applicable.

5.0 ROUTING AND SITING INFORMATION

5.1 Describe the factors considered in the applicant's evaluation of potential routes and locations for the transmission line and its associated facilities.

Xcel Energy identified general potential route corridors between established end points meeting the routing priorities defined in Wis. Stat. § 1.12(6). To develop the proposed route, Xcel Energy utilized a stepwise process which included consultation with the PSC, the WDNR, Vilas County, and other local authorities such as the Town of Presque Isle. The Company also relied heavily on the public participation process as described in Section 7.0, and the transmission line siting priorities established by the state of Wisconsin (see Section 5.1.3).

5.1.1 Identify route(s) that were considered and explain why those corridors were or were not chosen. Provide a map of these routes, if available.

During initial route development Xcel Energy looked at other route options for the new transmission line. Because of the general remote nature, steep terrain, and the number of lakes, streams, and rivers throughout much of the Project area there are few existing linear corridors to follow between the new Chain O Lakes and Boot Lake substations. Some routes were considered early in the process but were eliminated prior to conducting detailed analysis because desktop analysis identified less impactful route alternatives. Xcel Energy used desktop mapping with available geographic data of environmental and infrastructure features as well as aerial photos to develop and evaluate initial routes. Field reviews were also conducted to better understand on the ground conditions for some of these routes. Appendix H provides a table that describes each route option evaluated and the reason why it was not selected to include in this Application.

After evaluation of the options described above and shown in Appendix A, Figure 3 Xcel Energy selected the proposed route.

5.1.2 Describe the use of any weighting criteria used to evaluate potential routes.

No quantitative weighting criteria were used to evaluate potential routes. The route selection process is a multi-step analysis that emphasizes identifying route alternatives with minimal impacts to the human and natural environment. Preliminary routes are initially developed in a GIS map where we begin to evaluate alternatives for potential impacts to human settlement and the environmental setting, including, but not limited to:

- Natural resource/environmental impacts (waterways, wetlands, forest clearing, soils and steep slopes, archaeological sites, protected species).
- Route corridor sharing opportunities (existing corridors, highways and roads, recreational trails, section lines or field lines).

- Affected landowners (proximity to residences, permanent and temporary easements needed, tree clearing near homes, impacts to agricultural lands).
- Aesthetics (type, height, number and size of poles, visual appearance, tree clearing).
- Public/protected lands (type of ownership and protection, designated uses, ability to get approval to cross).
- Constructability issues (outage risk, worker safety, construction vehicle access routes, engineering constraints).
- Estimated cost.

Route alternatives are typically eliminated from more detailed evaluation if the overall impacts clearly are substantially greater than other alternatives (see Section 5.1.1 above). Of those remaining, each alternative route will typically have different types and quantities of expected impacts which can make direct comparisons difficult. For example, one route may require many acres of tree clearing while an alternative may have much less clearing, but would be located near more homes. The Project team works together to identify potential routes based on which routes, on balance, solves the electrical need, are the least impactful, and most cost effective.

The Applicant conducted field reviews of the route options including environmental, construction, engineering, and routing staff, to better understand site conditions. In addition to understanding the scope of natural resource impacts, these field reviews helped confirm landowner impacts and opportunities to share corridor with existing roads and distribution lines, as well as how to best avoid impacts to homes and the environment.

5.1.3 Describe how the transmission line siting priorities in Wis. Stat. § 1.12(6) were considered.

As required by Wis. Stat. § 1.12(6), Xcel Energy sought to develop a route that “to the greatest extent feasible that is consistent with economic and engineering considerations, reliability of the electric system, and protection of the environment”, using the following corridors, “in order of priority”

- existing utility corridors;
- highway corridors;
- recreational trails to the extent the facilities may be constructed below ground and do not significantly impact environmentally sensitive areas; and
- new corridors.

The proposed route substantially follows existing utility corridors (distribution) and roads/highways.

Corridor Type	Proposed Route
Highway	28.8%
Highway & Existing Utility	42.3%
Existing Utility	2.4%
Greenfield	26.6%
Total	100%

5.2 Changes to Existing Easements

If the proposed project contains segments that would share part or all of an existing transmission ROW, submit the following for each of those segment(s):

5.2.1 Describe changes to the location or width of existing electric easements.

Where the proposed route overlaps the existing 30-foot-wide 3-phase distribution line corridor the ROW will be widened to 75 feet. Refer to Table 1.6-1 in Section 1.6.7 for a complete list of where the new and existing ROWs overlap.

5.2.2 Provide the results of an analysis of existing transmission easements that would be shared by application routes and potential problems that may be encountered.

The existing 3-phase distribution line ROW loosely parallels County Highway W in non-contiguous segments along the proposed route. During construction there may be short term traffic interruptions along County Highway W, the Heart of Vilas County Bike Trail, and the Presque Isle-Winchester Bike Route.

5.2.3 State if the existing easements are to be renegotiated and/or rewritten. If so, indicate the reason (for example language modernization, change in easement size, change in transmission, etc.).

Xcel Energy will work with landowners crossed by the Project to obtain new easements where appropriate and will modify existing easements where the existing 3-phase distribution easements are in place.

5.3 Route Segments

A description of the proposed route with respect to the information required for Sections 5.3.1 to 5.3.6 is provided below.

5.3.1 Type and dimensions of structure and foundation (such as underground/overhead, single-pole/H-frame, direct embed/concrete caisson, type of material, typical span length, etc.)

The Applicant performed initial engineering with preliminary pole spotting to develop structure types, configurations, and quantities required for each section of line in the proposed route. Typical structure drawings can be found in Appendix C. All dead-end structures are proposed to be weathering steel finish, but tangent structures will be round wood poles. Light angle structures may be laminated wood poles when loading and soil properties allow, rather than steel poles on foundations.

A majority of the structures on the Project (approximately 85 percent) will be direct-embed monopole structures. Steel culverts with a 36-inch diameter will be installed below grade, as necessary, to prevent the excavated hole from caving during construction. Embedment depths for the direct embed poles are anticipated to be 10 percent of overall pole length plus 2 feet for standard wood pole construction. Embedment depths would range 8 feet to 12 feet. Laminated Wood Poles with higher loading may require embedment depths ranging from 10 feet to 15 feet.

A minority of the structures on the Project (approximately 15 percent) will be self-supporting steel monopole structures on concrete foundations. All heavy angle and dead-end structures would be self-supporting steel. The reinforced concrete pier caissons are expected to be approximately 7 feet diameter by 36 feet below ground. The piers would have a 1 foot reveal above ground line. No transmission structure designs will use down-guy supports to minimize impacts on property owners.

Monopole tangent and light angle structures will predominantly be in a delta configuration. When the ROW corridor width is limited, the tangent and light angle structures may be in a vertical configuration (all one side). Medium angle, large angle, and dead-end structures will be in a vertical configuration.

Monopole structure heights above ground are expected to range 60 to 75 feet. Span lengths would approximately 300 feet with distribution underbuild or approximately 400 feet without distribution underbuild. Only a limited number of the structures on the Project (approximately 12 percent) will be without distribution underbuild.

Monopole structures will use standard horizontal line post insulators rated for 115 kV as is Applicant's standard 69 kV assembly. The structure geometry will be such that 69 kV will be the maximum operating voltage.

Switch structures are not proposed on the transmission line as it is designed. Both substation terminations are in and out and switching can be controlled within the substations.

A preliminary geotechnical evaluation (field review) has not been conducted. Based on the Applicant's legacy knowledge of soil types along existing 3-phase distribution line, we are

anticipating hard shallow rock in some areas. This will impact foundation design whereas some reinforced concrete pier caisson designs could be shortened to rock sockets that toe into competent rock. The plan for direct-embed poles is to get them down to full embedment depth.

5.3.2 Transmission configuration (single-circuit, double-circuit, etc.)

See above section 5.3.1.

5.3.3 Conductor information (for example size, voltage, etc.)

The Project's transmission line will be designed for and energized at two different voltages. The existing surrounding system operates at 34.5 kV, and upon initial energization, the transmission line will operate at 34.5 kV. The structure geometry, insulation, and clearance design criteria will allow the transmission line to be energized at 69 kV if/when the surrounding system including substation equipment is upgraded.

Due to the presence of distribution underbuild on fifteen (15) of the seventeen (17) miles of transmission line, span lengths are expected to be limited in length. Therefore, the possibility of wire galloping events during winter weather will be significantly reduced and round wire conductor may be used.

The Applicant proposes a single (non-bundled) 477 thousand circular mils (kcmil) aluminum conductor steel reinforced (ACSR) 26/7 "Hawk" conductor for all transmission line phase wires. The Project will require modification of existing radial single circuit transmission lines W3626 and W3634 to disconnect from existing Rest Lake Substation and Presque Isle Substation respectively, and reterminate to the new stations built at Chain O Lakes Substation and Boot Lake Substation respectively.

The Applicant proposes the Xcel Energy-owned distribution underbuild on transmission structures would use a single 336 ACSR 18/1 "Merlin" conductor for each phase. The distribution neutral wire would be either a single 336 ACSR 18/1 "Merlin" wire (for longer spans) or a 2/0 ACSR 6/1 "Quail" wire (for shorter spans).

The Applicant proposes a single shield wire atop each monopole structure. One monopole structure alignment would carry a 48-count fiber optical ground wire (OPGW).

Aside from segments of Xcel Energy-owned distribution underbuild, the Project does not propose any foreign-utility owned underbuild attachments such as communications (cable television or phone).

5.3.4 Existing transmission affected by proposed project

The Project does not affect any transmission lines owned by other utilities. All existing transmission lines listed below are owned, operated, and maintained by Xcel Energy.

- W3626 Mine Road to Presque Isle
- W3634 Weber Lake to Rest Lake

5.3.5 Existing distribution affected by the proposed project

Xcel Energy's 3-phase distribution line will require rebuilding along the proposed route. The Applicant's preference is to build all transmission circuits overhead with distribution underbuild on the new transmission structures.

5.3.6 Shared ROW configuration

The Applicant will construct the Project within a new 75-foot-wide ROW. Where the existing 3-phase distribution overlaps the new ROW and it will be underbuilt, that existing easement will occur completely within the new ROW with no offset. Figure 5.3-1 shows the typical structure types proposed for the Project.

Figure 5.3-1 Typical Single Circuit Structure Design Type



- Post Insulator 69 kV Tangent Structure with Distribution underbuild (left)
- 69 kV Steel Dead-end structure (middle)
- 69 kV Laminated Wood Angle Structure with Distribution underbuild (right)

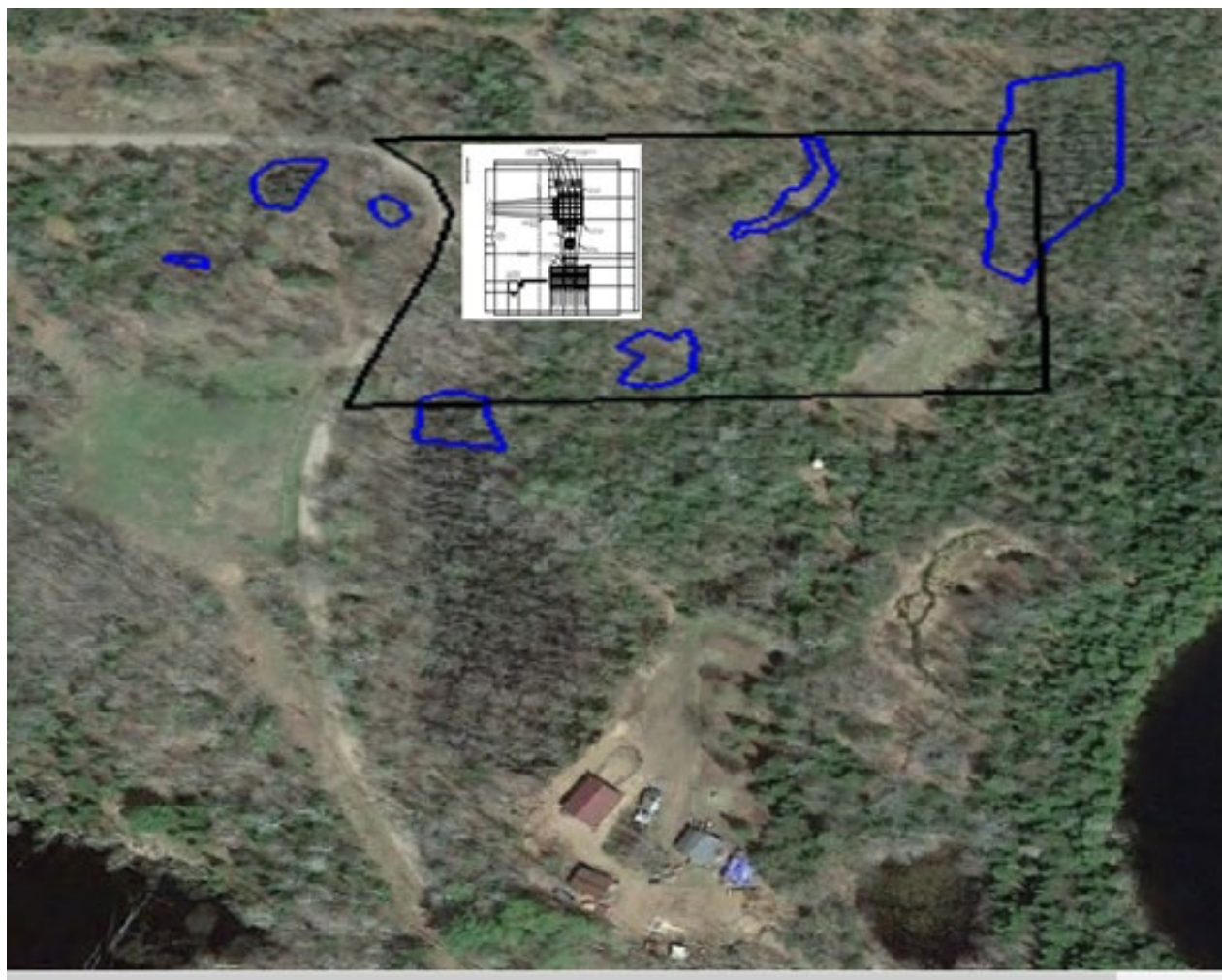
5.3.7 Substation: Provide descriptions, diagrams, and graphics for the proposed project that include the following details:

5.3.7.1 The location, size, and dimensions of the proposed substation, access roads, detention ponds, and associated facilities

Figure 5.3-2 Chain O Lakes Substation– 0.44 acre, 160 feet x 120 feet



Figure 5.3-3 Boot Lake Substation – 0.44 acre, 160 feet x 120 feet



5.3.7.2 Provide a list of major new equipment.

Chain O Lakes Substation

- 69 kV Breaker (1)
- 14MVA 34.5 kV/12.5 kV Transformer (1)
- 12 foot x 12 foot Electronic Equipment Enclosure (1)
- 12.5 kV Distribution feeders (3)

Boot Lake Substation

- 69 kV Breaker (1)
- 14MVA 34.5 kV/12.5 kV Transformer (1)
- 12 foot x 12 foot Electronic Equipment Enclosure (1)

- 12.5 kV Distribution feeders (3)

5.3.7.3 The topography, land cover, zoning, and land use of the proposed site(s).

Refer to Section 1.6 for a description of the proposed substation sites.

5.3.7.4 Layout of the proposed substation equipment.

Refer to Appendix C.

Figure 5.3-4 Chain O Lakes Substation

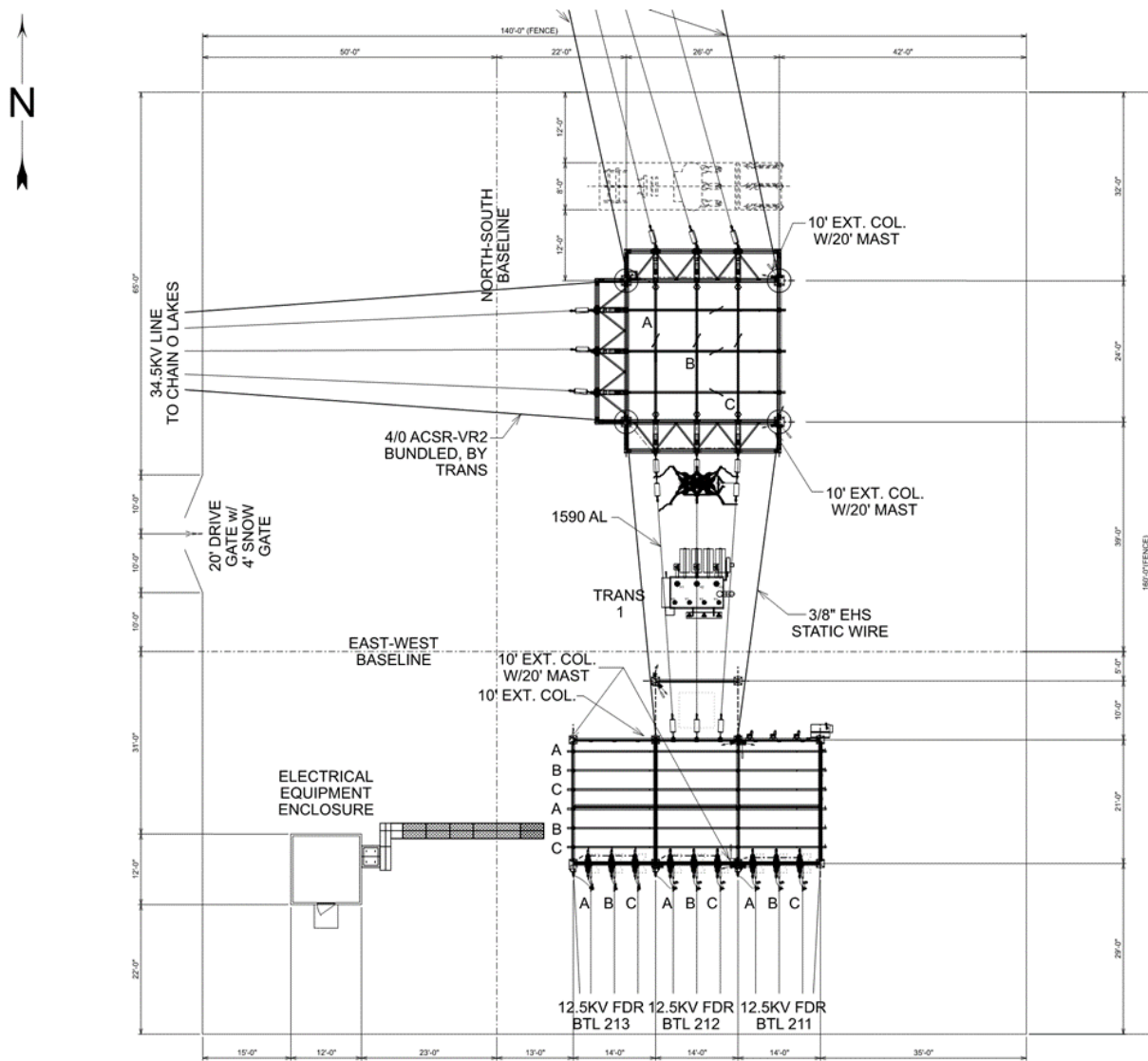
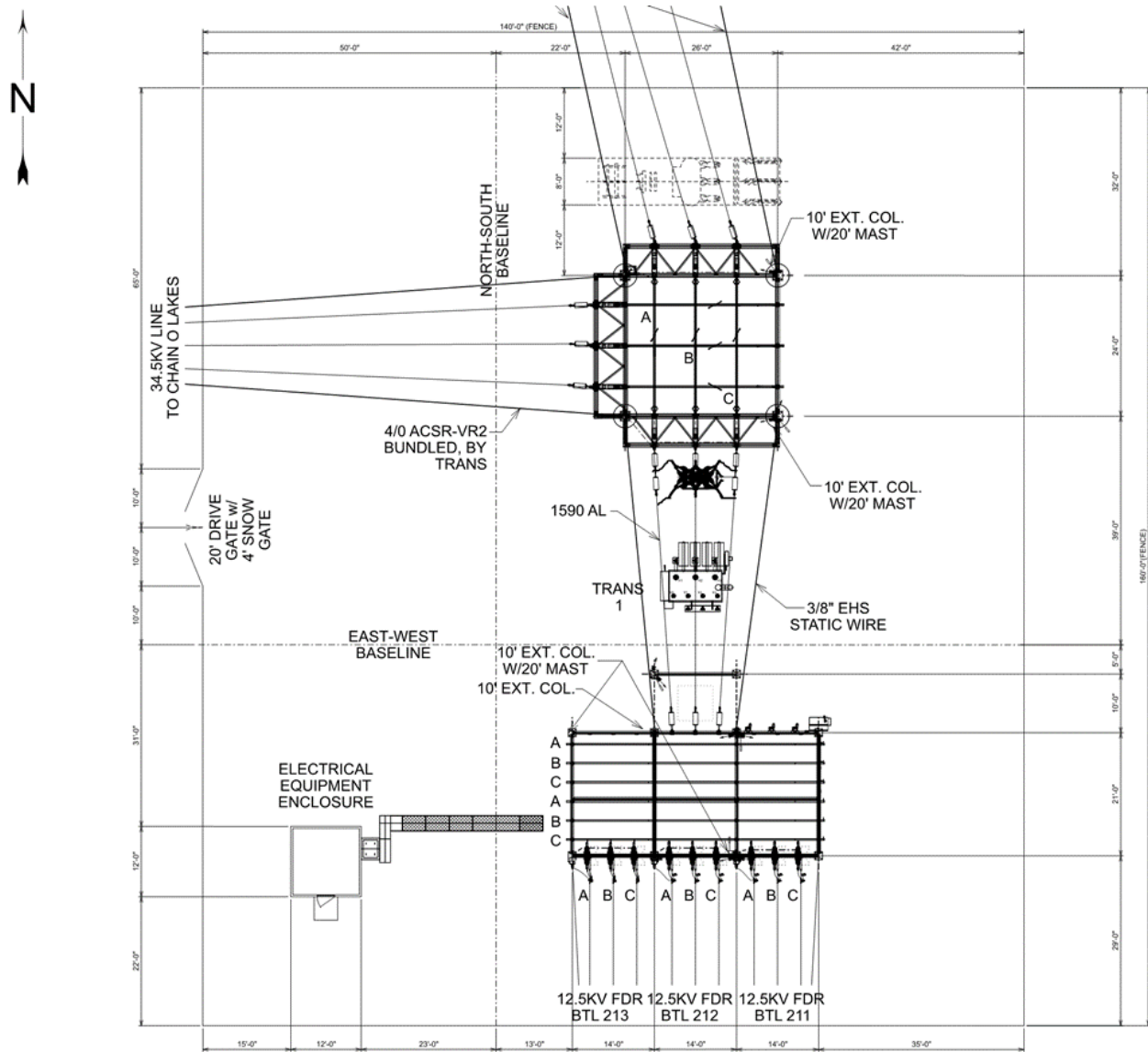


Figure 5.3-5 Boot Lake Substation



5.3.7.5 Dimensions of the property boundaries and substation fenced area.

Chain O Lakes Substation: 160 feet x 120 feet

Boot Lake Substation: 160 feet x 120 feet

5.3.7.6 Vertical profile and topography of the proposed substation and property.

Figure 5.3-6 Chain O Lakes Substation



Figure 5.3-7 Boot Lake Substation



5.3.8 Substation: For any electric structures or lines (transmission and distribution) that would be constructed outside of the fence line of the proposed substation, including the following:

5.3.8.1 Electric line configuration (such as single-circuit or double-circuit with existing line, overhead or underground, conductor replacement or new construction, etc.).

Transmission line will be single-circuit, overhead, and new construction.

5.3.8.2 A description and location of the proposed ROWs (for example new ROW, partially overlapping existing transmission ROW, completely within existing ROW, etc.).

Refer to Section 1.6.7.

5.3.9 Substation: Describe the construction impacts of the proposed project and any proposed associated facilities:

Refer to Section 5.5 for this information.

5.4 PSC Impact Tables

Route impact tables, which quantify the general impacts of constructing the transmission line, have been prepared. These tables are included in Appendix B and summarize impacts associated with the proposed transmission line corridor. Off-ROW access roads will be required in certain locations to construct the route. Land cover impacts associated with off-ROW access roads are provided in Section 5.7. Information regarding the type and date of source data is included with each table. Copies of each table have also been provided to Commission staff in Microsoft Excel spreadsheet format.

Below is a list of the impact tables included:

- Table 1 – General Route Impacts;
- Table 2 – Land Cover;
- Table 3 – Federal, State, Local, and Tribal Lands excluding ROWs;
- Table 4 – Sensitive Receptors;
- Table 5 – Residential Buildings;
- Table 6 – Magnetic Field Data (refer also to Appendix G); and
- Table 7 – Route Impact Summaries.

An outline of the methods used to prepare the impact tables and a summary of the results for each route is presented below.

The information contained in these tables was developed using a combination of sources including available reference data, aerial photography, and field survey and observations along accessible segments. These sources were utilized to measure and calculate impacts using GIS software.

The reference data utilized include county tax parcel data obtained from the Wisconsin Statewide Parcel Data (V8) in October 2022; databases from the State of Wisconsin regarding the locations of schools, daycares, and hospitals; state managed lands information from the WDNR; USFWS

cadastral data; and USGS GAP land cover data. Sources of aerial photography ranged from 2020-2022.

General Route Impacts

More detailed line items for general route impacts are listed in Appendix B, Table 1.

Methods

The type and extent of existing ROW was determined from Xcel Energy's existing easements, aerial photography, and field observations. Xcel Energy will generally use a 75-foot ROW for the proposed transmission line, a portion of which would be constructed within the existing 30-foot ROW of the distribution line where these ROWs overlap. As discussed in Section 1.6.7, Xcel Energy has made general assumptions on existing ROW widths to determine corridor sharing.

Summary of General Route Impacts

The proposed route is 15.1 miles long and would require relocation of approximately 12.2 miles of the existing 3-phase distribution line to the new 34.5 kV transmission poles as an underbuild design. As indicated above, the route generally shares 20 feet of road ROW when the route is parallel with County Highway W.

Table 5.4-1 below provides a summary of the general route impacts for the construction of the proposed route. The nine removal segments, which only include removal of existing structures are separated in Table 5.4-1 as they do not involve any new installation.

Segment	Total ROW (New + Shared)		Shared ROW				New ROW		Total % of Shared ROW
	Total Length (ft)	Total ROW Area (acres)	Shared ROW Length (ft)	Existing ROW Width (ft)	Shared ROW Width	Shared ROW Area (acres)	New ROW Width (ft)	New ROW Area (acre)	
1	5,409	9.3	5,409	30/105	30/55	4.7	45/20	4.6	51%
2	198	0.4	55	105	55	0.2	20	0.3	50%
3	2,784	4.7	2,784	120	50	3.2	25	1.6	68%
4	1,293	2.2	1,293	100	25	0.6	50	1.6	27%
5	517	0.9	517	130	60	0.7	15	0.2	78%
6A	2,153	3.7	2,153	100	25	1.4	50	2.3	38%
7B	2,340	4.0	2,340	90	50	2.9	25	1.1	73%
8	1,316	2.3	1,316	150/30/100	50/30/60	1.7	25/45/15	0.6	74%
8-1	1,233	2.1	1,233	100/130	40/55	1.4	35/20	0.7	67%
9A	1,818	3.1	1,818	100	38	2.0	37	1.2	65%
10	1,297	2.2	1,297	130	55	1.6	20	0.6	73%
11	952	1.6	952	140	40	0.9	35	0.7	56%
12	2,185	3.8	2,185	130	65	3.6	10	0.2	95%
12-2	1,661	2.9	1,661	115	60	2.4	15	0.4	83%
13	7,642	13.2	7,642	130	55	9.6	20	3.5	73%
13-1	1,255	2.2	1,255	200	50	1.2	25	0.9	55%
16	11,058	19.0	11,058	200	75	19.0	--	--	100%
17	3,667	6.3	3,667	230/200	62/45	5.1	13/30	1.2	81%
18	2,559	4.4	2,559	220	55	3.3	20	1.1	75%
19	7,278	12.5	7,278	200	70	12.4	5	0.1	99%
20	1,961	3.4	1,961	200	75	3.4	--	--	100%

Segment	Total ROW (New + Shared)		Shared ROW				New ROW		Total % of Shared ROW
	Total Length (ft)	Total ROW Area (acres)	Shared ROW Length (ft)	Existing ROW Width (ft)	Shared ROW Width	Shared ROW Area (acres)	New ROW Width (ft)	New ROW Area (acre)	
21	3,361	6.3	3,631	200	75	6.3	--	--	100%
22	8,026	13.8	8,026	230	50	9.5	25	4.3	69%
23	7,405	12.8	1,829	230/30/0	75/30/0	3.5	0/45/75	9.3	27%
Removal 1	1,367	1.6	1,367	30	30	0.9	--	--	100%
Removal 2	2,244	0.4	2,244	30	30	1.5	--	--	100%
Removal 3	931	0.2	931	30	30	0.7	--	--	100%
Removal 4	1,864	0.4	1,864	30	30	1.3	--	--	100%
Removal 5	987	1.1	987	30	30	0.7	--	--	100%
Removal 6	8,255	9.5	8,255	30	30	5.7	--	--	100%
Removal 7	4,271	4.9	N/A ¹	30	30	2.9	--	--	100%
Removal 8	1,688	2.0	1,688	30	30	1.3	--	--	100%
Removal 9	1,692	1.9	1,692	30	30	1.2	--	--	100%

General Substation Impacts

Methods

The proposed Chain O Lakes Substation will be constructed on a parcel to be purchased by Xcel Energy adjacent to an existing Xcel Energy service center. The parcel is relatively flat, so significant changes in grade are not likely. However, it is likely that existing site soils will need to be removed and replaced with imported granular fill within the substation footprint. The extent of grading at this substation is not anticipated to result in any requirements for permanent stormwater management.

The proposed Boot Lake Substation will be constructed on a parcel to be purchased by Xcel Energy. The parcel is moderately sloped, though large enough to allow for grading a relatively level substation pad. The parcel will be large enough to support associated permanent stormwater management measures should the extent of grading result in the requirement to do so.

Summary of General Substation Impacts

The Chain O Lakes substation will be constructed near a large wetland area, though the station will be sited to avoid any wetland fill. It is anticipated that the proposed substation will share an entrance with the adjacent Xcel Energy service center; therefore, no additional roadway impacts or curb cuts will be required.

The Boot Lake substation will be sited to avoid wetland disturbances. The parcel is accessed by a private road, and some roadway improvements are likely to be required.

Land Cover

Land Cover generally refers to the current type of features, either natural or human-made, on the land. Land Use refers to how humans use the land. Land cover/use types by route segment are included in Appendix B, Table 2.

Methods

Land cover types were derived from the USGS GAP Land Cover database (USGS, 2019). The GAP Ecosystem Land Use attribute was reviewed and assigned to a category consistent with the PSC Table 2. Table 5.4-2 below displays the GAP Ecosystem Land Use categories and how they were translated to the PSC categories. After the reclassification, the land cover data was spot checked for accuracy.

A corridor corresponding to the required ROW width was established along the route centerline. Existing ROW corridors were then overlaid on the route corridor to distinguish land cover in existing ROW versus new ROW. The polygons of each land cover type were then clipped with the

route and existing ROW corridors. The acreages of each resulting polygon were quantified with GIS software. The resulting acreages were summed by land type within existing and new ROW for each segment.

USGS GAP Ecosystem Land Use Type	PSC Land Cover Type	PSC Land Use Category
Cultivated Cropland	Crop Land	Agricultural
Pasture/Hay ¹	Grassland	Undeveloped Lands
Laurentian-Acadian Floodplain Systems	Non-Forested Wetland ²	
Open Water (fresh)		
Laurentian-Acadian Swamp Systems	Forested Wetland ²	
Boreal-Laurentian Conifer Acidic Swamp and Treed Poor Fen		
Boreal Aspen-Birch Forest		
Laurentian-Acadian Northern Hardwoods Forest		
Laurentian-Acadian Northern Pine-(Oak) Forest	Upland Forest	
Laurentian-Acadian Pine-Hemlock-Hardwood Forest		
Boreal White Spruce-Fir-Hardwood Forest		
Managed Tree Plantation		
Developed, Open Space	Developed	Developed/Urban
Developed, Low Intensity		
Developed, Medium Intensity		
Developed, High Intensity		
¹	Pasture/hay lands have not been field-verified to assess previous disturbance. For the purposes of the analysis in this application, Xcel Energy is categorizing pasture/hay as grassland.	
²	Forested and non-forested wetlands described here are based on the GAP land use types. A more detailed discussion of wetlands based on Wisconsin Wetlands Inventory data is presented in Section 8.0.	

Summary of Land Cover

Appendix B, Table 2 provides an estimate of the land cover that will be impacted by the proposed route within the proposed ROW. A map of land cover in the Project area is also included in Appendix A, Figure 6. The land cover present within the proposed route includes non-forested wetland, forested wetland, upland forest, and developed lands as described in more detail below. Table 5.4-3 below provides a summary of the land cover along the proposed route.

Table 5.4-3 Summary of Land Cover/Use Impacts in the Proposed Route			
PSC Land Use Type	PSC Land Cover Type	ROW Area	Proposed Route (acres)
Agricultural ¹	Crop Land	Shared	--
		New	--
Undeveloped Lands	Grassland	Shared	25.2
		New	--
	Non-forested Wetland	Shared	7.4
		New	1.0
	Forested Wetland	Shared	--
		New	4.1
	Upland Forest	Shared	--
		New	18.5
Developed/Urban	Developed	Shared	68.1
		New	12.9
Total Shared			100.6
Total New			36.5
¹ This category also includes Specialty; however, since there are no specialty crops crossed by the Project, the category is not included in this summary.			

Agricultural Land Use

Agricultural land cover includes active fields, pastures, recently fallow fields (old field) and specialty crops (i.e., tree farms). Fields or other areas with no evidence of recent tillage or agricultural production were not included as agricultural land. A detailed discussion of agricultural lands is included in Section 7.4.

Crop Land

The proposed route, removal segments, off-ROW access, and new or removal substation sites do not cross cropland, but 4.9 acres of the Presque Isle Transfer Station Laydown Yard is categorized as cropland in the USGS GAP data. However, review of recent aerial imagery indicates that the laydown yard area has been developed (a mix of graveled areas and maintained lawn) and is not currently used for crop cultivation.

Specialty

There is no specialty agricultural land present within the new ROW, removal segments, new substation sites, removal substation sites, off-ROW access, or laydown yards.

Undeveloped Lands

The types of undeveloped lands include grassland, non-forested wetland, forested wetland, and upland forest.

Grassland

Because areas identified as hay/pasture in the USGS GAP data were not field verified as previously disturbed, these lands are conservatively classified as grassland. Approximately 25.2 acres of grassland is present within the proposed route, all of it within shared ROW, and approximately 1.3 acres of grassland is also present within the removal segments. No grassland is present within the new or removal substation sites, or off-ROW access, but 13.2 acres of grassland is present within the laydown yards.

Non-Forested Wetland

This section refers to non-forested wetland types encountered along the route (i.e., Laurentian-Acadian Floodplain Systems and open water (fresh); Table 5.4-2). As mentioned in Table 5.4-2, these wetland types are based on GAP land cover data. A detailed discussion of wetlands based on wetland specific desktop resources (e.g., Wisconsin Wetland Inventory [WWI]) within the Project is provided in Section 8.0.

About 8.5 acres of non-forested wetland is present within the proposed route, of which 7.4 acres is within existing ROW. Non-forested wetland is also present within the removal segments (0.8 acre), off-ROW access (0.5 acre), and laydown yards (3.8 acres). Non-forested wetland is not present within the new or removal substation sites.

Forested Wetland

The forested wetland category does not include wetlands located in existing transmission line ROW which are no longer forested due to previous clearing. These wetlands are included within the non-forested wetland category. Based on the GAP land cover classifications, forested wetlands include Laurentian-Acadian Swamp Systems and Boreal-Laurentian Conifer Acidic Swamp and Treed Poor Fen.

Per USGS GAP land cover data, approximately 4.1 acres of forested wetland is present within the proposed route ROW. Forested wetland is also present within the new Chain O Lakes Substation (less than 0.1 acre) and off-ROW access (1.3 acres). Forested wetland is not present within the removal segments, the new Boot Lake Substation, the removal substation sites, or the laydown yards.

A detailed discussion of wetlands based on wetland specific desktop resources (e.g., WWI), as well as wetland delineation results, within the Project is provided in Section 8.0.

Upland Forest

A detailed discussion of forested lands along the proposed route, including the criteria to identify forested areas, is included in Section 6.1. The upland forest category does not include cleared areas in existing transmission line ROW through previously wooded areas. These areas are included within the grassland category. Based on the GAP land cover data, the following ecosystem land use types comprise upland forest: boreal aspen-birch forest, Laurentian-Acadian northern hardwoods forest, Laurentian-Acadian Northern pine-oak forest, Laurentian-Arcadian pine-hemlock-hardwood forest, boreal white spruce-fir hardwood forest, and managed tree plantation (Table 5.4-2).

About 18.5 acres of upland forest is present within the proposed route ROW. Upland forest is also present within the new Chain O Lakes Substation (0.2 acre), the new Boot Lake Substation (0.2 acre) and off-ROW access (6.8 acres). Upland forest is not present within the removal segments, the removal substation sites, or the laydown yards.

Developed / Urban Land

Developed lands are based on the USGS GAP land use developed type classifications (Table 5.4-2). These are primarily related to roads along the proposed route.

Approximately 80.9 acres of developed land is present within the proposed route ROW, of which 68.1 acres is within existing ROW. Developed land is also present within the removal segments (5.2 acres), the new Chain O Lakes Substation (0.1 acre), the new Boot Lake Substation (0.4 acre), the Presque Isle Removal Substation (less than 0.1 acre), off-ROW access (14.0 acres), and laydown yards (9.9 acres).

Federal, State, Local, and Tribal Lands

Federal, state, and local lands are listed in Appendix B, Table 3 and shown on Figure 4 in Appendix A. No tribal land would be crossed by the Project.

Methods

Review for federal, state, local, and tribal lands used a number of sources including public lands data from Vilas County, the U.S. Bureau of Indian Affairs, WDNR-owned and managed areas, and the USGS Protected Area Database. Xcel Energy then assigned generic ownership and management fields to the database (i.e., federal, state, or local). Ownership with WDNR data were then cross-referenced, and data discrepancies were identified, reviewed, and corrected to reflect data that matched the appropriate jurisdiction.

The acreages of these managed lands intersecting the Project ROW was determined by intersecting the parcel data with the route. However, as requested by the Commission, a representative length is also provided for each entry in Appendix B, Table 3. The length refers to

the maximum length of a parcel within the proposed ROW. In some cases, the parcel data created instances where the route width included only a portion of a parcel. The route width in Appendix B, Table 3 represents the entire route width needed for that segment. The ROW acreages are based on GIS calculations and account for these instances where the parcel edges do not align with the route width. Where the crossing length is zero, the public lands parcel is within the Project ROW, but not overlapping the proposed centerline.

Summary of Federal, State, and Local Lands

An estimate of the potential impacts on public lands is compiled by crossing length and management type for the proposed route and is included in Appendix B, Table 3.

The proposed route would cross approximately 831.7 acres of public land owned by the State of Wisconsin, WDNR, and the Town of Winchester, of which 151 acres would be new ROW. The removal segments cross approximately 80.4 acres of public land owned by the State of Wisconsin, Vilas County, and the Town of Presque Isle; this land would be allowed to revegetate and revert to non-utility uses after removal of the distribution line segments. Laydown yards for the Project would affect 58.3 acres of public land owned by the Town of Presque Isle.

Schools, Hospitals and Daycare Centers

Distances to schools, daycare centers, and hospitals are addressed in Appendix B, Table 4. There are no schools, daycare centers, or hospitals within 300 feet of the proposed route.

Methods

The number of schools, daycare centers and hospitals and the distance of these buildings from the route centerline were determined using GIS measurements to geocoded addresses provided by the following state agencies:

- Locations of licensed family and group child care centers were provided by the Wisconsin Department of Children and Families (Wisconsin Department of Children and Families, 2023);
- Public and private school locations were provided by the Wisconsin Department of Public Instruction (Wisconsin Department of Public Instruction, 2023); and
- Hospital locations were provided by the Wisconsin Department of Health Services (Wisconsin Department of Health Services, 2023).

Summary

There are no schools, daycare centers, or hospitals within 300 feet of the proposed route or the new substations. The nearest daycare center is approximately 1.0 mile east of the proposed route in Manitowish Waters. The nearest school is approximately 4.0 miles east of the proposed route

in the Manitowish Waters. The nearest hospital is approximately 19.0 miles southeast of the proposed route in Minocqua.

Residential Buildings

Residential buildings include homes and apartments. Residential buildings within 300 feet of the proposed route centerline are quantified in Appendix B, Table 5 and are shown in Appendix A, Figure 4.

Methods

The types of residential buildings (homes and apartments) and the distance of these buildings from the route centerline were determined using GIS measurements on aerial photography. Residential buildings were tallied according to five distance categories from the route centerline: 0–25 feet, 26–50 feet, 51–100 feet, 101–150 feet, and 151–300 feet.

Summary of Residential Buildings

Table 5.4-4 below provides a summary of the residential buildings near the construction of the proposed route. The nine removal segments which only include removal of existing structures are separated as they do not involve any new installation.

Project Component	0-25 feet	26-50 feet	51-100 feet	101-150 feet	151-300 feet
Proposed Route	2	2	13	8	41
Existing Distribution Line Removal Segments 1 to 8	4	1	6	6	23
W3634 34.5 kV Transmission Line (Removal Segment 9)	--	--	--	--	2
¹ There are only residential homes in proximity to the Route; there are no apartment buildings within 300 feet of either route centerline.					

Route Impact Summaries

A summary of the impacts associated with the proposed route that are described throughout Section 5.4 of this application is provided in Appendix B, Table 7.

5.5 Construction Impacts

The proposed transmission line and substations will be designed to meet or surpass relevant local and state codes including the National Electric Safety Code (NESC), North American Electric Reliability Corporation, and Xcel Energy standards. Appropriate standards will be met for

construction and installation, and applicable safety procedures will be followed during and after installation.

5.5.1 Discuss the proposed construction sequence for both overhead and underground lines in the project.

Transmission Lines:

In order to keep the existing distribution energized while constructing a new 34.5 kV transmission line within the same corridor, the following strategies would be employed. The goal with each strategy is to minimize outages while also creating enough space between the new construction and the existing distribution to ensure a safe working environment.

Strategy #1. In areas where the alignment of the new transmission line is centered on the existing distribution line, the energized wire can be spread out onto temporary crossarms to allow room for pole setting between the energized conductors. This is the preferred method when transferring the existing distribution conductors to the new poles since it requires minimal effort to complete the transfer.

Strategy #2. In areas where the alignment is offset, existing structures can be leaned by excavating a small amount of material at the pole base and leaning the poles with a digger derrick. This provides a safe working distance to construct the new transmission line. When the distribution is leaned, transferring the conductors onto the new poles requires conductor splices.

The Project involves the following general activities for constructing overhead transmission lines:

- Soil borings – Collection of geotechnical data will be necessary for final design of the transmission line. Soil borings are typically completed using rubber tired or tracked drill rigs, depending on site and access conditions. A pick-up truck or all-terrain vehicle (ATV) is also typically used to transport the crew and drilling supplies to the work area.
- Surveying and staking of ROW – These activities have minimal impact, typically completed by a two-person crew travelling by foot, ATV, or pick-up truck.
- Tree Clearing– Vegetation crews will clear new or expanded ROW, and where necessary, access routes. Vegetation will be cut at or slightly above the ground surface using mechanized mowers, harvesters or by hand. Root stocks will generally be left in place, except in areas where stump removal is necessary to facilitate the movement of construction vehicles, or as required by the landowner. Stump removal will not occur within wetlands.
- Access Road Construction – Where adjacent to County Highway W, short off-ROW access paths to structure locations will need to be constructed prior to transmission line construction. This includes activities such as tree clearing, grading, and gravel installation.

This work is typically completed using equipment such as a bulldozer, track-hoe, skid-loader, and dump trucks.

- Install Construction Matting – Matting will be installed along access roads and the ROW to provide access through wetlands or other unstable soil areas prior to transmission line construction. Construction matting may consist of timber, composite, or hybrid timber mats and will be installed with rubber-tired mat trucks, forwarders, forklifts or skid loaders. Mat roads will generally be 14 feet wide with some larger matted work platforms, if needed, depending on the type of structure and location.
- Installation of erosion control Best Management Practices (BMPs) – BMPs will be location specific and installed prior to all anticipated ground disturbance. Where unexpected ground disturbance occurs, BMPs will be installed immediately after the disturbance occurs. Typical erosion control equipment includes ATVs and or trucks for crew transportation, skid loaders, tractors, backhoes, hydro-seeders and other light duty equipment.
- Temporary staging of poles and other materials along ROW – Trucks, loaders, and cranes will be needed to unload foundation materials, poles and other materials near each work location.
- Poles will be delivered either onsite to their respective location or to a permitted laydown yard site, framed on the ground and set in one piece. Foundation installation and/or excavation for direct embedded structures – including a combination of direct-embedded poles without culverts, direct-embedded poles with culverts, and rebar-reinforced drilled pier foundations. In general, the excavated holes will be approximately 3 feet to 7 feet in diameter, depending on foundation type and soil conditions.
- If there are areas where groundwater seeps into the excavation, or where water is needed to hold the hole during drilling, it may be necessary to dewater the excavation. Depending on site conditions, the water may be de-silted and discharged to an upland area where it is allowed to re-infiltrate, or removed from site via a tank truck. Dewatering will proceed in accordance with applicable regulations and permit requirements.
- Structure setting for direct-embedded poles without culverts (no concrete foundation and no culvert), a hole is excavated to the appropriate depth. The base of the structure is placed into the excavated hole, and the area around the pole is backfilled with clean granular fill. For direct-embedded poles in culverts a hole is excavated, a culvert is placed vertically into the hole (typically 36-inch diameter) and the pole is then inserted in the middle of the culvert to the appropriate depth, then backfilled.
- For structures requiring a reinforced concrete foundation, the required hole is excavated and a rebar cage and anchor bolts are placed into the excavation. The excavation is then filled with concrete to a point where the rebar cage and anchor bolts are covered leaving a typical 1- to 2-foot reveal of the foundation above grade with exposed threaded anchor

bolts. The complete caisson is allowed to cure. Drilled-pier foundations will typically be about 7 feet in diameter.

- Typical equipment for this phase of construction includes: dump trucks, drill rigs, cranes, vacuum trucks, concrete trucks, concrete pump trucks and tanker trucks.
- Structure setting – (for drilled pier foundations) after the direct embed base is set or the caisson is cured, the steel pole structure is mounted to the base. Typical equipment for this phase of construction are cranes and bucket trucks.
- Wire stringing and clipping – once all the structures within a wire-pull segment are set, dollies are attached to the cross-arms and ropes are pulled through each of the dollies. Crews will need to access all the structures in that wire-pull segment to get the rope from structure to structure. These ropes are then used to pull the conductor wires in. Crews will access each of the structures, install the insulators and clip the conductor wire into each, and remove the dollies. This requires access to each structure with either a bucket truck or helicopter. Wire set up areas containing reel trailers, wire pullers, and related equipment are located at each end of the wire pull.
- Cleanup and Restoration of ROW – Upon completion of construction, cleanup and site restoration occurs. This includes removing construction mats, temporary clear span bridges (TCSBs), and other material or debris from the ROW, any necessary seedbed preparation, and seeding. Typical equipment for these activities includes mat trucks, bobcats, pickup trucks, and other light duty vehicles.
- Existing Distribution Line Removals – For the existing distribution and 34.5 kV transmission lines that are no longer needed, the plan is to utilize removal practices commonly employed throughout the Northern Wisconsin region. The wires will be dropped to the ground in sections and spooled up with equipment from one end. Poles in upland areas would be excavated and removed in one piece followed by backfilling, tamping the holes and reseeding. Poles located in wetlands or softer soils would be accessed using low ground pressure equipment like an Argo or on mats to prevent ground disturbance. The structure would then be cut with a chainsaw just below the ground line to avoid further unnecessary disturbance to wetland areas.

Substations:

- Soil Borings – Collection of geotechnical data will be necessary for final design of substation foundations. Soil borings are typically completed using rubber tired or tracked drill rigs, depending on site and access conditions. A pick-up truck or ATV is also typically used to transport the crew and drilling supplies to the work area.
- Surveying and staking site – These activities are minimal impact, typically completed by a two-person crew travelling by foot, ATV, or pick-up truck.
- Tree Clearing– Vegetation crews will clear the sites to provide adequate clearance for substation grading as well as transmission lines which will tie into the subs. In the

substation area, the necessary trees will be cut and all stumps and roots will be removed during site grading.

- Installation of erosion control BMPs – BMPs will be installed prior to beginning grading and will continue to be modified and repaired as needed throughout the construction process. Typical erosion control equipment includes ATVs and or trucks for crew transportation, skid loaders, tractors, backhoes, hydro-seeders, and other light duty equipment.
- Grading of site to build the substation pad – Sites will be graded to create level areas and construct the substation pad (more detail about pad construction is included in Section 5.5.2.1). Typical equipment includes bulldozers, excavators, dump trucks, and bobcats.
- Installation of concrete footings – Once the gravel pad is complete, concrete footings and pads are poured and assembled to support electrical equipment. Equipment includes concrete trucks and pump trucks.
- Installation of electrical equipment – Substation layout drawings are included in Appendix C, which show the proposed equipment and layout for each of the substations.

5.5.2 Describe the construction impacts associated with each phase of construction, including:

5.5.2.1 The size of excavations for foundations or other underground structures

Transmission Lines

Transmission poles will be installed within one of three foundation types: drilled concrete pier, direct-embedded within culverts and direct-embedded without culverts. Most of the tangent structures for the proposed route are expected to use the direct-embed type installation, either with or without culverts. Some structures with heavier loading such as at angles, corners or long spans will be installed with drilled pier/poured concrete foundations.

Volumes of excavations for the different installation/foundation type are approximately as follows (see Tables 5.5-1 and 5.5-2):

Foundation/ Installation Type	Approx. Diameter (ft)	Approx. Depth (ft)	Approx. Volume of excavation (yd³)
Concrete Pier	7	36	51.3
Direct-embed	3	12	5.6

Foundation/ Installation Type	
Concrete Pier	43
Direct-embed: Culverts	114
Direct-embed: no culvert	127
Total	284

Substations: The area and depth of excavations.

Substation sites include the substation pads as well as stormwater ponding areas and transmission poles outside the substation fence. Detailed grading plans will be developed for each substation site prior to construction. Grading requirements will vary based on topography of each site and the types of soils present. In general construction of the substation starts with grading the site to create a level footprint. Construction of the pad involves installing 3 feet of sand with one foot of gravel on top. Grading and shaping of the stormwater pond is typically done using soils from on-site. If necessary, any unsuitable or excess spoils will be removed from the site and disposed of according to stormwater plan requirements.

The proposed Chain O Lakes Substation pad and fenced area is approximately 0.44 acres (19,200 sq. ft.). The total area expected to be impacted temporarily during grading and construction is approximately 0.96 acres. No transmission line poles or structures are expected to be installed inside the Substation pad. The site for the Chain O Lakes Substation is an existing gravel lot and adjacent forested area which is relatively flat; therefore, the site will not require a significant amount of initial grading prior to construction of the pad. Initial tree and stump clearing will be necessary before site grading begins.

The proposed Boot Lake Substation pad is approximately 0.51 acres (22,200 sq ft.) in size with a preliminary stormwater pond design of about 0.20 acres. The total area of temporary impact during grading and construction is expected to be approximately 1.35 acres. No transmission line poles or structures are expected to be installed inside the substation pad. In addition, approximately 0.25 miles of existing gravel roadway will be widened from approximately 9' to 16'. The Boot Lake Substation site is currently wooded and initial tree and stump clearing will be necessary prior to the start of site grading. The existing site is not as level as the Chain O Lakes site and generally slopes away from the northeast corner of the property. Site grading will include moving soils to create a level area for the substation pad and for creation of a stormwater pond.

5.5.2.2 The type of construction machinery that would be used

Section 5.5.1 describes the typical construction equipment anticipated to be used on the Project.

5.5.2.3 The construction disturbance zone, if different from the ROW.

Aside from the 75-foot-wide ROW, transmission line and substation construction will be confined to the off-ROW access paths off of County Highway W, substation sites, and the laydown and staging areas. These areas are depicted on Figure 4 in Appendix A, and in Figures 1 and 2 in Appendix C. Most disturbances will occur in the area immediately surrounding transmission line structures. In areas where access cannot be gained from existing roads, some disturbance from vehicular traffic is expected to occur. Disturbance at these areas may include clearing of vegetative cover, soil compaction, vehicular tracking, and some topsoil disturbance.

5.5.2.4 How spoil materials would be managed on and off-site

Excavated soil may be thinly spread on surrounding upland areas and stabilized depending on site conditions, landowner preferences, and environmental requirements. Temporary stockpiles of excavated soils and woody debris will be required throughout the course of construction. Those materials will either be hauled to an approved disposal site or remain onsite in an upland location upon landowner consent. While specific locations have not been determined, it is anticipated that minor soil piles may be required adjacent to excavations for the new transmission line structures and within the laydown yards. Stockpiles will be placed in upland locations. Stockpiled materials will be prevented from entering any wetlands or waterways by the use of proper erosion control methods such as silt fence, silt socks, or wattles.

If contaminated materials are encountered during construction, spoils will be isolated and steps will be taken to determine disposal requirements in accordance with applicable regulations.

5.5.2.5 If any underground line installation will occur, identify the installation method(s), such as directional bore, open-cut trench, plow, etc.

No underground line installation is proposed for the Project.

5.5.3 For unique construction methods (e.g., directional boring, jack and bore, helicopter, vibratory caissons, etc.), provide the following:

No unique construction methods are proposed at this time. Should any areas be identified that would require such methods Xcel Energy will notify appropriate agencies and acquire the necessary approvals.

5.5.3.1 The location and reason for the construction method

Not applicable.

5.5.3.2 A description of the construction method

Not applicable.

5.5.3.3 The temporary construction needs and limitations such as boring pits, staging areas, frac-outs, timing, weather, etc.

Not applicable.

5.5.4 Substation: For transmission or distribution electric lines proposed to be constructed outside of the substation fenced area, provide the following:

Construction methods for the electric lines.

Refer to Sections 5.5.1 and 5.5.2.

A description of any unique construction methods (e.g., directional boring, jack and bore, helicopter, vibratory caissons, etc.

Refer to Section 5.5.3.

Details on additional laydown areas or access roads

Refer to Sections 5.6 and 5.7.

5.6 Identify and describe the number, location, footprint, and existing land use of staging areas and any additional temporary workspace.

Temporary staging areas (laydown yards/laydown areas) outside of the Project ROW will be utilized to store job trailers, construction vehicles and equipment, transmission line structures, conductor, cables and equipment, and other related material/equipment.

Potential laydown yards have been identified based on the construction requirements of the Project, proximity to work areas, and environmental and landowner impacts. Laydown yards are selected based on the ability to minimize the amount of disturbance and preparation required to provide suitable surfaces for temporary storage and staging of construction equipment and material. For example, sites that are paved and/or have been previously graded and cleared of vegetation, such as parking lots, old gravel pits, and fields are ideal locations for laydown yards.

Xcel Energy has identified four potential laydown yards along the Project. These sites are preliminary although the Applicant has already discussed use of these areas with the landowners as of the filing of this Application.

An environmental review of the potential laydown yards was conducted using existing GIS data and aerial photography. The following resources were utilized in the evaluation: WDNR Natural Heritage Inventory (NHI), WDNR 24k Hydro Layer, WDNR WWI, WDNR Wetland Indicators and Soils, WHS database, and county soil maps. The potential laydown yards are listed in Table 5.6-1 below, and are shown on site maps included in Appendix A, Figure 4.

Site #	Parcel Owner	Township, Range, Section	County	Size of Parcel (acres)
1	Ben Peck	T43N R5E Sec. 2	Vilas	11.6
2	Town of Presque Isle Transfer Station	T44N R6E Sec. 33	Vilas	8.9
3	Town of Presque Isle Vacant Lots	T44N R6E Sec. 34	Vilas	0.5
4	Liability Company ILG Peterson	T42N R5E Sec. 8	Vilas	10.8

If any additional laydown yards or other staging areas are identified, they will be reviewed and evaluated for potential impacts or concerns with respect to wetlands, waterways, natural features, grading and clearing requirements, threatened and endangered resources, and cultural or archaeological concerns. Xcel Energy will also notify the Commission and WDNR of these new locations and will submit the necessary information to the Commission prior to establishing any such areas in accordance with Wis. Admin. Code § PSC 111.71.

5.7 Off-ROW Access Roads

Wherever possible, Xcel Energy intends to access the Project by traveling down the Project ROW or directly from public roads that intersect the Project ROW. Access from outside the Project ROW will be required in some cases where physical limitations exist within the Project ROW, where other constraints prevent direct access from public roads, or to avoid impacts to environmentally sensitive areas within the Project ROW.

The proposed route has reasonable access from local, County and State Highways and therefore, off-ROW access will be minimal. However, there may be some areas that will require off-ROW access. Refer to Appendix A, Figure 4 for location of off-ROW access roads identified during field reviews. The preliminary access plan may be amended based on additional field review, negotiations with local landowners and/or contractor requirements.

Prior to construction, many of the off-ROW access paths will need modifications and improvements to allow for safe equipment movement to and from the Project ROW. These modifications may include vegetation removal, grading, and/or gravel placement; however, permanent wetland fill associated with off-ROW access paths is not proposed. Access within wetlands may include the use of ice roads, conducting work during dry or frozen conditions, low ground pressure equipment, or construction mats. Gravel placement, including temporary, is not proposed for access across wetlands. These methods are further described in Section 8.0.

Following construction, the access roads will be returned to prior conditions. Access roads may be left in place following construction, except across wetlands and waterways, depending on landowner preference.

5.7.1 Identify those areas along the proposed routes and segments where off-ROW access roads may be required.

The Applicant will use access paths for the Project that occur outside of the ROW. Whenever possible these off-ROW access paths follow existing access routes, forest roads, or trails. Generally, these are short off-ROW access paths proposed for the Project occur along County Highway W where the ROW is collocated with the road. These are shown on Figure 4 in Appendix A.

5.7.2 For each route, provide the total length of off-ROW access roads.

The total length of off-ROW access roads is provided in Appendix B, Table 2.

5.7.3 Discuss the reasons for the necessity for off-ROW access roads such as topography, rivers/wetlands, etc. If protection of a natural resource is a reason, discuss how the resource would be protected during construction and operation of the proposed project.

The need for potential off-ROW access paths has been identified based on field reviews of the proposed route as well as aerial photography and topography data. Off-ROW access roads are necessary in locations where the route does not parallel existing roads, and where the terrain prevents travel along the ROW. The purpose of developing these off-ROW access paths is to allow for safe material and equipment movement to and from the Project ROW.

Information regarding off-ROW access roads across wetlands and waterways is included in Section 8.0.

The access paths may be amended based on additional field review and negotiations with local landowners.

5.7.4 Provide quantitative land cover information for off-ROW access roads similar to the information provided in PSC Impact Tables.

Quantification of preliminary off-ROW access paths is provided in Appendix B, Table 2. This table provides quantitative land cover information for areas such as agriculture, grassland, forested areas, and forested and non-forested wetlands. The land cover information was quantified using GIS, as described in Section 5.4.

The impacts included in Appendix B, Table 2 were calculated utilizing an access path with an approximate width of 14 feet, based on typical construction practices. In forested lands, existing cleared roads or trails were utilized where possible, however, in most cases these areas were relatively narrow, and the entire width was identified as forested land cover within the GIS data. As such, the forested land impacts, as outlined in Appendix B, Table 2, may overstate the actual

tree clearing necessary for utilizing these paths. As discussed, these paths may be amended based on further analysis in the field and negotiations with landowners.

5.7.5 If the off-ROW access roads would be modified post-construction, provide details.

Once construction has been completed, off-ROW access paths created or modified for the Project would typically be restored to pre-construction conditions. Appropriate restoration materials and methods would be employed, as described in Section 6.6. Depending on landowner negotiations and requirements, the improved access paths may be left in place, except in wetlands, unless permitted to do so. Some of the off-ROW access paths may be required for long-term maintenance and safe operation of the transmission line. No permanent access routes will be needed for the Project.

6.0 NATURAL RESOURCE IMPACTS

6.1 Forested Lands

Forested lands are defined as any wooded landscapes (greater than 20% canopy cover) excluding narrow windbreaks located between agricultural areas, but including wooded areas adjacent to waterways.

6.1.1 For each route segment and substation property describe the forested lands that would be impacted by the proposed project. Include the following information in the description.

- Type of forest (Transmission Line and Substation)
- Dominant species (Transmission Line and Substation)
- Average age, size of trees (Transmission Line and Substation)
- Ownership (private, county, etc.) (Transmission Line and Substation);
- Use (recreation, timber, riparian habitat, etc.) (Transmission Line and Substation)

Xcel Energy reviewed the USGS GAP national land cover data to identify forested lands along each proposed route (USGS, 2011). Appendix B, Table 2 presents the total acres of forested lands along each of the proposed route segments. The GAP National Land Cover Data does not provide specific details about tree species, size, or use of forested areas; therefore, this information is not available for all forested areas crossed by the proposed route. GAP National Land Cover Data does not accurately depict existing cleared utility or road rights-of-way as they are often shown as forested if adjacent woodlands exist. Therefore, Xcel Energy adjusted the dataset to ensure forested lands were accurately represented by categorizing the existing cleared ROW as grassland or non-forested wetland (if applicable). Based on this adjusted upland forest dataset, and as shown in Table 6.1-1 below, the Project would impact 25.7 acres of upland forest.

Project Component	Upland Forest Type ¹						Total Acreage
	Boreal Aspen-Birch	Boreal White Spruce-Fir-Hardwood	Laurentian-Acadian Northern Hardwoods	Laurentian -Acadian Northern Pine-(Oak)	Laurentian -Acadian Pine-Hemlock-Hardwood	Managed Tree Plantation	
ROW	0.1	3.8	11.4	2.6	0.3	0.4	18.5
Access Roads	0.1	1.4	4.3	0.9	<0.1	0.1	6.8
Substations	-	0.2	0.2	-	-	-	0.4
Total Acreage	0.2	5.4	15.8	3.5	0.3	0.5	25.7

Project Component	Upland Forest Type ¹						Total Acreage
	Boreal Aspen-Birch	Boreal White Spruce-Fir-Hardwood	Laurentian-Acadian Northern Hardwoods	Laurentian -Acadian Northern Pine-(Oak)	Laurentian -Acadian Pine-Hemlock-Hardwood	Managed Tree Plantation	
¹ USGS GAP Ecosystem Land Use Type (USGS, 2019).							

6.1.2 Managed Forest Law (MFL) and Forest Crop Law (FCL)

6.1.2.1 Identify properties within proposed ROWs that are enrolled in the MFL or FCL programs.

Identify any substation site land that is enrolled in either Managed Forest Law or Forest Crop Law.

Tables 6.1-1 list the properties identified along the route that are enrolled in the Managed Forest Law (MFL) program, based on the Vilas County online mapping application (Vilas County, 2023a). In some cases, only a portion of a parcel may be enrolled in the MFL program.

No properties enrolled in the Forest Crop Law (FCL) program are crossed by the proposed route. The MFL program was enacted in 1985 and replaced the Forest Crop Law program. The new substation sites do not cross properties enrolled in the MFL or FCL programs.

Tax ID	Forested ROW within MFL Properties (acres) ¹
22-1133	2.34
22-139	0.35
22-142	0.28
22-197	0.02
28-18	0.04
28-19	0 ²
28-22	0 ²
28-23	0.02
28-461	0.10
28-642-020	0.66
28-642-050	1.11
28-720-40	0.08
28-720-51	0.52

Tax ID	Forested ROW within MFL Properties (acres) ¹
28-90	0.03
Total	5.55
¹	Areas where a non-forested existing ROW overlaps with the proposed 75-foot ROW are not included in removal acreage.
²	Property is not crossed by ROW but is located directly adjacent (i.e., within 8 feet of the ROW).

6.1.2.2 Discuss how the proposed project would affect the properties enrolled in the MFL or FCL programs.

The extent to which program participation may be affected cannot be determined based on the information available to Xcel Energy. The extent to which a property is enrolled in the MFL program will be identified during the easement negotiation process. If any landowner would be unable to continue participation, Xcel Energy will compensate the landowner for the costs of withdrawal and any adverse tax consequences.

6.1.3 Provide specific details for mitigating or minimizing construction impacts in and around forested lands.

This Project will require the clearing of tall vegetation within the ROW and clearing of brush and trees along temporary construction access. Tall-growing vegetation that may interfere with safe construction and safe and reliable operation of the transmission line will be removed and controlled. Specifically, woody vegetation will be removed as needed within the ROW for construction of the Project and managed through the operational life of the facility. Clearing of vegetation within the ROW will occur prior to construction activities as allowed by landowner agreements and permit conditions.

The cut and scatter method may be used during construction in areas where limited clearing will occur. The purpose of this method is to limit the need for unnecessarily hauling and potentially disturbing the existing ground or vegetation. Likely situations where this method will be used are in shrub and brush areas with a limited number of trees. Limited numbers of trees in shrub wetlands may be disposed of in this manner as long as trees that are cut and scattered originate within the wetland.

Woody vegetation may be chipped and scattered over the ROW in non-agricultural upland areas. Invasive shrubs such as common and glossy buckthorn with berries will not be chipped and scattered to minimize the spread of these species. Chipping will not occur in wetlands or floodplains, with the exception of chipped material that is evenly scattered through the use of rubber-tracked blade mowers or ASV Posi-Track mower type equipment used to clear small diameter trees and shrubs. Chipped material left in wetland will not exceed a depth of 2 inches to ensure wetland vegetation can be re-established and wetland hydrology is not altered. Chipped material derived from onsite locations may be spread as mulch up to six inches deep in upland

areas to provide ground protection along access paths. Upon abandonment of access routes, mulch will be spread evenly to a depth no greater than 2 inches.

As discussed in Section 6.6 (Invasive Species) tree clearing timing restrictions and slash management procedures can be implemented to prevent the spread of oak wilt, emerald ash borer, and spongy moth (formerly known as gypsy moth) in forested areas. All vegetation clearing will be completed in accordance with the Commission restrictions on oak tree cutting and pruning as specified in Wis. Admin. Code § PSC 113.0511.

6.2 Grasslands

Grasslands are defined as lands covered by non-cultivated herbaceous (non-woody) vegetation.

6.2.1 For each route segment and substation property describe the grasslands that would be impacted by the proposed project. Include the following information in the description.

- **Type of grassland (prairie, pasture, old field, etc.)**
- **Dominant species**
- **Ownership (private versus public), and**
- **Use (agricultural, non-productive agricultural, recreation, natural area, etc.)**

Grasslands were classified based on USGS GAP ecosystem land use type pasture/hay. As previously mentioned in Section 5.4, because areas identified as pasture/hay were not field verified as previously disturbed, these lands are conservatively classified as grassland. Further, as discussed above, the shared portion of Xcel's existing distribution line easement that is classified as Upland Forest in the USGS GAP data was categorized as grassland to present a more accurate picture of potential Project impacts. Based on this adjusted grassland dataset the proposed route would cross approximately 16.3 acres.

6.2.2 Provide specific details for mitigating or minimizing construction impacts in and around grasslands.

Transmission Line

Grasslands crossed by the proposed Route are entirely within existing or shared ROW. Additionally, because most grassland is made of up pasture/hay land there is inherently some level of disturbance from either livestock or machinery. Regardless, Xcel Energy will limit construction impacts to the off-ROW access roads and the transmission line ROW.

Substations

No grassland is present within the new or removal substation sites.

6.3 Wetlands (See Section 8.0)

6.3.1 For each route segment, provide the total number of proposed wetland crossings

A total of 48 wetlands are located within the Project. Note this count does not include the wetlands at both new substation sites that were located in the larger survey area but outside of the Project area. Of these, 47 wetlands are proposed to be impacted by construction activities. Details on the wetland impacts from each construction activity are provided in Section 8.2.5.

6.3.2 For each route segment, provide the number of structures that would be constructed within wetlands.

A total of 69 pole structures are proposed within wetland (wholly or partially). Additional details are provided in Section 8.2.5.2.

6.3.3 Provide the methods to be used for avoiding, minimizing or, if necessary, mitigating construction impacts in and near wetlands.

See Section 8.2.12.

6.3.4 For “significant” or “high-quality” wetlands in the project area, identify:

6.3.4.1 The location where the proposed project would cross or potentially impact these wetlands.

See Section 8.2.4.

6.3.4.2 The wetland type (forested, shrub, emergent, or open water).

See Section 8.2.4.

6.3.4.3 The specific methods that would be used to mitigate the potential impacts.

See Section 8.2.12.

6.4 Waterbodies / Waterways (See Section 8.0)

6.4.1 For each route segment, provide the total number of proposed waterbody or waterway crossings.

A total of 6 waterways or waterbodies are located within the Project. Of these, 5 waterways or waterbodies are proposed to be crossed by the Project. Additional details are provided in Sections 8.1.1 and 8.1.4.

6.4.2 For each route segment, provide the number of structures that would be constructed below the ordinary high-water mark (OHWM) of a waterbody or waterway.

No structures would be constructed below the ordinary high-water mark (OHWM).

6.4.3 For each proposed waterbody and waterway crossing, identify the need and method for constructing the crossing.

See Section 8.1.4.1.

6.4.4 Provide the methods to be used for avoiding, minimizing, and finally mitigating construction impacts in and near waterbodies and waterways.

See Section 8.1.5.

6.4.5 Identify the waterways in the project area that are classified as follows and the site-specific methods that would be used to mitigate potential impacts to these waterways:

6.4.5.1 Outstanding or Exceptional Resource Waters

No waterways or waterbodies along the Project are designated as Outstanding or Exceptional Resource Waters.

6.4.5.2 Trout Streams

No waterways or waterbodies along the Project are designated as Trout Streams.

6.4.5.3 Wild or Scenic Rivers

No waterways or waterbodies along the Project are designated as Wild or Scenic Rivers.

6.5 Rare Species and Natural Communities (See Section 9.0)

6.5.1 Document communication with DNR and USFWS, as applicable.

The Project was reviewed for potential impacts to state listed rare species and natural communities using the WDNR's NHI data. Certified Endangered Resources (ER) Reviews were submitted to and approved by the WDNR. A total of two ER Reviews were completed for the Project, specifically:

- ER Review log # 21-447: submitted to the WDNR in 2021 and was approved by the WDNR on July 2, 2021.
- ER Review log # 23-200: This ER Review replaces ER Review log # 21-447 and was submitted to the WDNR on February 10, 2023 and approved by the WDNR on 3/21/2023.

The ER Reviews summarize all state-listed rare species, natural communities, and other natural features with element occurrence records within one mile of the Project route for terrestrial and wetland occurrences and within 2 miles for aquatic occurrences.

Rare species and natural communities that are not legally protected or are exempt from protection by the Project include special concern animal species; threatened and endangered, and special concern plant species; and natural communities.

A review of federally listed species with potential to occur in the Project area was conducted using the USFWS Information for Planning and Consultation online review tool. The results of the review identified the following federally listed species as known or expected to occur in the Project area: Canada lynx (*Lynx canadensis*), gray wolf (*Canis lupis*), northern long-eared bat (*Myotis septentrionalis*), and Whooping crane (*Grus americana*) which is a non-essential, experimental population. The results also included the tricolored bat (*Perimyotis subflavus*) which is proposed for listing, and monarch butterfly (*Danaus plexippus*) which is a candidate species. No designated critical habitat is present within the Project Area. Xcel Energy initiated consultation with the USFWS regarding impacts to federally listed species on May 2, 2023. In addition, Xcel Energy will adhere to the National Bald Eagle Management Guidelines to avoid disturbance to breeding eagles in the Project area.

6.5.2 Document compliance with DNR and USFWS direction, as applicable.

As stated above, ER Reviews have been approved by the WDNR. Due to confidentiality requirements for Wisconsin NHI data, redacted copies of the ER Reviews are included in Appendix I. Appropriate follow-up actions will be coordinated with WDNR and USFWS. Xcel Energy will continue regular communication with the agencies throughout the application process to follow state and federal endangered resources laws during Project evaluation, planning, and implementation.

6.5.3 For each route, discuss concerns and potential impacts to rare species as identified in the Endangered Resources Review and field studies.

Several of the rare species and natural communities have multiple element occurrence records along the route segments. In addition to providing an inventory of rare species and communities, the ER Reviews also outlines the required follow-up actions necessary to be implemented during Project construction to protect threatened and endangered animal species, as well as the recommended follow-up actions to help conserve rare species, communities, or other natural features that are not legally protected or are exempt from protection by the Project (i.e., special concern animal species; threatened, endangered, and special concern plant species and natural communities).

Avoidance measures are required for two birds (Red-shouldered Hawk and Spruce Grouse) and one state-listed reptile (Wood Turtle) in areas of suitable habitat.

Rare plants have also been recorded in the Project vicinity and may be impacted by the Project. Although not required because utility projects are exempt from take of rare plants, the WDNR recommends avoidance or minimization of take of rare plants.

In addition, various special concern species and natural communities have also been recorded in the vicinity of the Project. As noted above in Section 6.5.1, special concern species and natural communities are not legally protected; however, the WDNR recommends avoidance or minimization measures for these species and communities.

6.5.3.1 For any DNR-identified follow-up actions that must be taken to comply with endangered species law, discuss how each action or rare species identified would affect the proposed project and the specific segment.

The ER Reviews (Appendix I) summarize the element occurrence records which exist for animal species requiring follow up actions. The required actions will be implemented (by species) where threatened and endangered animals are verified to occur based on species surveys or where species are assumed to occur based on the presence of suitable habitat along the proposed route. The required follow-up actions, as well as the effects these actions have on the proposed Project, vary by animal group and are summarized in the ER Reviews (Appendix I). In general, the required actions include avoiding work within suitable habitat during the sensitive timing windows for various bird and reptile species, or conducting surveys to determine presence/absence if timing windows are not feasible.

If during the course of the Project there is uncertainty regarding actions to avoid impacts or take for some species or in some situations, Xcel Energy will coordinate with the WDNR's Natural Heritage Conservation Program (NHCP) on appropriate conservation measures. If the Project cannot completely avoid all areas of suitable habitat or take, Xcel Energy will work with the WDNR's NHCP Incidental Take Coordinator to apply for an Incidental Take Permit/Authorization for the affected species.

6.5.3.2 For any DNR-identified recommended actions to help conserve Wisconsin's rare species and high-quality natural communities, discuss which actions would be incorporated into the proposed project.

Rare species and natural communities that are not legally protected or are exempt from protection by the Project include special concern animal species; threatened and endangered, and special concern plant species; and natural communities. The ER Reviews (Appendix I) summarize the specific segments along which element occurrence records exist for each species, community, or feature. In consultation with the WDNR NHCP, Xcel Energy may implement recommended avoidance and impact minimization measures by species, community, or feature where they are verified to occur.

Avoidance and minimization measures recommended as follow-up actions to help conserve rare species and natural communities are similar to those outlined in Section 6.5.3.1. Recommended

measures to protect special concern animal species when and where practicable include: voluntary species surveys, adherence to avoidance periods, use of erosion/runoff prevention practices, and use of native seed mix during restoration. Similarly, measures recommended for conserving rare plants include voluntary species surveys and implementation of minimization or avoidance areas where present. Recommendations that may be implemented for natural communities include avoiding direct impacts and/or minimizing impacts, where possible; and implementing erosion control practices and invasive species BMPs. In addition, Xcel Energy will conduct a review of suitable habitat areas prior to construction to ensure no new bald eagle nests are present within 660 feet of the Project area (i.e., the disturbance buffer provided in the USFWS' National Bald Eagle Management Guidelines).

6.6 Invasive Species (Uplands and Wetlands)

6.6.1 Describe areas where invasive species or disease-causing organisms have been observed or are a concern for the construction of the project (e.g., invasive plants, oak wilt, emerald ash borer, etc.). State if invasive species surveys have occurred or will be conducted. If invasive species surveys have been conducted, provide documentation showing where surveys occurred and locations of invasive species found, indicating which species.

The Project survey corridor will be evaluated for invasive plant species during field investigations, to be completed after the route is approved but prior to construction.

The entire state of Wisconsin is under quarantine to help prevent the spread of emerald ash borer, and the eastern two thirds of the state are under quarantine to prevent the spread of spongy moths (formerly known as gypsy moth). Practices that minimize the spread include avoiding movement of wood products (logs, posts, pulpwood, bark and bark products, slash and chipped wood from tree clearing) and hardwood firewood from quarantine areas to non-quarantine areas, as per Wis. Admin. Code Agriculture, Trade, and Consumer Protection (ATCP) §21.17. Where wood products cannot be left on-site, alternative plans will be developed to meet the requirements.

Vilas County is a county in which oak wilt is confirmed and known to be established. As such, all vegetation clearing will be completed in accordance with the Commission restrictions on oak tree cutting and pruning as specified in Wis. Admin. Code § PSC 113.0511. Specifically, in rural areas, from April 15 through July 1 of each year, pruning paint must be applied to all final cuts on oak trees immediately after cutting. Herbicide treatment of stumps to prevent sprouting may substitute for the painting of stumps. If a tree is dead at the time of cutting, no treatment is necessary.

6.6.2 Describe mitigation methods that would be used to prevent the introduction and the spread of invasive plants or disease-causing organisms and comply with Wis. Admin. Code ch. NR 40, such as cleaning of machinery, etc.

Xcel Energy will comply with Wis. Admin. Code ch. NR 40 by implementing BMPs when encountering species listed as “Restricted” or “Prohibited”. Standard BMPs have been developed to avoid and minimize the spread of NR 40 listed species. These BMPs will vary throughout the ROW based on the degree of invasiveness, severity of the current infestation, and susceptibility of non-infested areas to invasion.

Typical BMPs include:

- avoidance through construction timing and alternate access;
- proper management of construction vehicles and materials (i.e., storage, cleaning);
- minimizing ground disturbance;
- placing a barrier between construction vehicles and plants (i.e., construction matting);
- proper storage and disposal of plant materials;
- promoting native regeneration; and
- leaving cut vegetation on site where it is cut (i.e., mowing shrubs).

Additional evaluation will be conducted on the ordered route to further identify invasive species, their locations, and locations where site specific BMPs are appropriate. Appropriate BMPs will be incorporated into compliance plans and implemented during construction.

6.7 Historical Resources

Cultural resources were identified within a one-mile buffer around the proposed corridor referred to as the study area. GIS data was obtained from the WHS and additional information pertaining to cultural resources was accessed online through the Wisconsin Historical Preservation Database. Historical documents and aerial photos were reviewed to evaluate the potential for previously unidentified archeological resources within the proposed corridors.

6.7.1 Wisconsin Historical Society Sites Within Study Area

Merjent, Inc. (Merjent) on behalf of Xcel Energy, completed a Phase Ia Literature Review of cultural resources within the areas of the proposed route, removal segments, laydown yards and new substation locations. The objective of this review was to identify historic properties that may be potentially affected by the proposed Project and to provide recommendations for mitigation or avoidance of these resources. The Phase Ia Literature Review defined the area of potential effect (APE) as a 122-meter (400-foot) wide corridor. A one-mile buffer around the APE serves as the study area. A summary of historic properties is described below, and a full account provided

in the Phase Ia report, including maps, is provided to the PSC Historic Preservation Officer under separate cover.

There are seven previously reported archaeological sites (Table 6.7-1), three cemetery/burials (Table 6.7-2), and nine architectural/historic resources (Table 6.7-3) within one mile of the Project ROW. While none of the archaeological sites and three of the architectural/historic resources have been assessed for listing on the National Register of Historic Places (NRHP), four architectural/historic resources have been determined not eligible for the NRHP. Two architectural/historic resources have been demolished. The three cemetery/burial sites are protected under Wisconsin Statute §157.70(4).

Site ID	Affiliation	Description	NRHP Status	Project Component
VI-0042	Unknown Prehistoric	Lithic Scatter	Not Assessed	Within one-mile Study Area
VI-0232	Unknown Prehistoric	Lithic Scatter	Not Assessed	Within one-mile Study Area
VI-0208	Unknown Prehistoric	Campsite/Village	Not Assessed	Within one-mile Study Area
VI-0233	Unknown Prehistoric	Lithic Scatter	Not Assessed	Within one-mile Study Area
VI-0067	Unknown Prehistoric	Campsite/Village	Not Assessed	Within one-mile Study Area
VI-0455	Unknown	Foundation/ Depression	Not Assessed	Within one-mile Study Area
VI-0209	Woodland	Campsite/Village	Not Assessed	Within one-mile Study Area

Burial Site ID	Affiliation	Description	NRHP Status	Project Component
BVI-0055	Historic Indian	Cemetery/ burial	This human burial site is protected under Wis. Stats 157.70.	Within one-mile Study Area

Burial Site ID	Affiliation	Description	NRHP Status	Project Component
BVI-0014	Historic Euro-American	Cemetery/ burial	This human burial site is protected under Wis. Stats 157.70.	Within 400-feet of Project ROW and adjacent to Town of Presque Isle Transfer Station Laydown Yard
BVI-0050	Historic Euro-American	Cemetery/ burial	This human burial site is protected under Wis. Stats 157.70.	Within one-mile Study Area and Within 400-feet of Proposed Route Removal

AHI #	Civil Town	Structure	Year Built	NRHP Status	Route Component
24502	Manitowish Waters	Dietz’s Philip’s 66 Station	1940	Not Assessed	Within one-mile Study Area
24515	Manitowish Waters	D and D’s Oasis	1930	Not Assessed/ Demolished	Within 400-feet of Project ROW
44265	Presque Isle	Presque Isle RRS – storage #142	1935	Not Assessed	Within one-mile Study Area
44267	Presque Isle	Presque Isle State Graded School	1939	Not Eligible/ Demolished	Within 400-feet of Town of Presque Isle Vacant Lots Laydown Yard
242959	Winchester	Buck’s Divide Resort Main Lodge	1896	Not Eligible	Within one-mile Study Area
242960	Winchester	Buck’s Divide Resort Cabin	N/A	Not Eligible	Within one-mile Study Area
242961	Winchester	Buck’s Divide Resort Cabin	N/A	Not Eligible	Within one-mile Study Area
242962	Winchester	Buck’s Divide Resort Cabin	N/A	Not Eligible	Within one-mile Study Area
243817	Manitowish Waters	North Lakeland Discovery Center Museum	N/A	Not Assessed	Within one-mile Study Area

6.7.2 Significance of Historic Resources

Of the seven archaeological sites within the one-mile study area, none have been assessed for the NRHP. The status of each site is unknown and additional investigations would be needed if the project were to impact the sites. However, none of the archaeological sites are within the 122-meter (400-foot) transmission line corridor or near the laydown yards and proposed substation placements and will be avoided.

Of the three burial sites recorded within the study area, none are listed on the NRHP and only two are located within 122-meters (400-feet) of the proposed route or laydown yard. Both cemeteries will be avoided by the project.

- BVI-0014 (Presque Isle Cemetery) is a marked historic Euro-American cemetery located adjacent to LY-2, Town of Presque Isle Transfer Station. This cemetery is bordered by a mature tree line in all directions and has clearly marked graves.
- BVI-0050 (Shanty Boy Hill Cemetery) is an inactive historic Euro-American cemetery located within 122-meters (400-feet) of a route removal. This cemetery contains six markers and eighteen unmarked graves and was used as a burial place by loggers and lumbermen.

Of the nine recorded architectural resources, two resources have been demolished and will not be affected by the Project. Four resources have been determined not eligible for listing on the NRHP due to their lack of individual distinction and lack of integrity. The other three resources have not been assessed for NRHP eligibility. None of the architectural resources are located within the 122-meter (400-foot) transmission line corridor or near laydown yards, pole structures, or access routes. Additional survey and field verification would be recommended to identify additional unrecorded historic architectural resources that would have the potential to be affected by Project activities.

6.7.3 Potential Project Effects on Historic Resources

The recorded archaeological sites will not be affected by the Project as planned. They are located outside of the Project ROW and outside of the 122-meter (400-foot) buffer around the ROW. There are no recorded archaeological sites near the proposed laydown yards, access routes, or structure locations. Similarly, the three burial sites will not be affected by the Project as currently planned.

The recorded aboveground architectural resources will not be affected by the Project as currently planned. The resources are located outside of the Project ROW and outside of the 122-meter (400-foot) buffer around the ROW. Given the mature tree cover of the area, it is unlikely the proposed transmission line or project activities would be seen from the historic resources as they are also some distance away from the planned project activities.

Since there will be no effect to any recorded historic resources within the study area, no modifications to the project as planned are deemed necessary.

6.8 Conservation Easements

6.8.1 By route segment, for each route identify properties with conservation easement agreements. Identify conservation easements that may be impacted by any proposed substation construction activities.

Geographic information regarding properties with conservation easements or encumbrances was acquired from the sources listed in Table 6.5-1. No conservation easements were identified within Project areas as a result of this review.

Property Type	Database Source
Publicly available information for federal, state, and local conservation easements	National Conservation Easement Database
Wetland Reserve Program and Grassland Reserve Program Easements	Natural Resources Conservation Service (NRCS)
Emergency Watershed Protection Program - Floodplain Easement	NRCS
Riparian Easements	USFWS
State Fishery Areas, State Parks, Forests and Trails	WDNR - Managed Lands
Land & Water Conservation Fund Properties	WDNR, Bureau of Community Financial Assistance
The Nature Conservancy Easements	USGS GAP - Stewardship

6.8.2 For each conservation easement that would be crossed by a route, identify and discuss:

6.8.2.1 The holder and type of easement.

Not applicable.

6.8.2.2 The conditions of the easement.

Not applicable.

6.8.2.3 The approvals necessary to construct on the property.

Not applicable.

6.8.2.4 The potential impacts to the landowner, including costs, penalties etc.

Not applicable.

6.8.2.5 Whether the proposed project is consistent with the stated goals of the easement.

Conservation land interests, among many other factors, were utilized in the routing and siting process to inform the selection of proposed route while avoiding, to the extent practicable, properties with recorded conservation land interests. There are many types of conservation easements and encumbrances that exist today. Some of the conservation easements are placed upon properties by state and federal agencies (e.g., scenic easements), while other conservation land interests are initiated by the landowner (e.g., Conservation Reserve Program or Farmland Preservation Plan [FPP]). These land rights are generally not known until the Project's easement acquisition process is initiated with the landowner of record. Once Xcel Energy is made aware of the existence of other land rights on the property, it will work with the landowner to accommodate the existing agreement or make them whole if there are additional monetary burdens they must incur. A discussion of parks and recreation areas, and any land use restrictions associated with these features, is provided in Section 7.7. A discussion of MFL and FCL properties is provided in Section 6.1.2; FPP is discussed in Section 7.4.3.

Based on publicly available information and preliminary communications with landowners Xcel Energy is not aware of any properties with existing conservation easements or other types of agreements that restrict land use that would be crossed by the proposed route, removal segments, or new substation sites.

6.9 Restoration of Disturbed Areas

Provide a detailed re-vegetation and site restoration plan which discusses the following items:

6.9.1 Type of re-vegetation proposed for impacted areas (e.g. traditional restoration seed mixes, specialty native seed mixes for restoration of high quality habitats).

The need for and approach to site restoration and re-vegetation will be based on the degree of disturbance caused by construction activities and the ecological setting of each site, and will need to reflect and satisfy the requirements of the property owner. If construction can be accomplished without creating appreciable soil disturbance, restoration may not require active re-vegetation efforts if the Project areas would restore naturally. Restoration activities will be implemented following the completion of construction activities. These activities will begin as soon as practical and as allowed by seasonal conditions.

Xcel Energy will develop a site-specific restoration plan for disturbed sites along the transmission line ROW based on the level of ground disturbance. The plan will also be included in the Construction Site Stormwater permit application submitted to the WDNR. In some cases, re-

growth of vegetation in disturbed areas may be allowed to occur without supplemental seeding, allowing the existing seedbank to regenerate naturally. In cases where there is no sign of re-growth of pre-existing vegetation species in the first month of the subsequent growing season, an assessment will be made and if necessary, an appropriate seed mix will be brought in and properly applied. The restoration and re-vegetation methods for wetland areas are described in Section 8.2.14.

After the two existing substations have been removed, Xcel Energy will restore the landscape using a native pollinator seed mix or cool season grass. Additional details will be included in the site-specific restoration plan for the Project.

6.9.2 Vegetative monitoring criteria (number of post-construction years or percent cover achieved) and methods.

During active construction and ROW restoration, Xcel Energy's environmental inspectors, contractors, or an independent environmental monitor will inspect re-vegetation and restoration activities in accordance with Wis. Admin. Code ch. Natural Resources (NR) 216 and the Wisconsin Pollution Discharge Elimination System general permit conditions.

Written documentation of the inspection will be maintained by Xcel Energy describing the re-vegetation progress and corrective measures taken, if applicable. Areas where ground disturbance occurs will be monitored until 70 percent re-vegetation has occurred.

6.9.3 Invasive Species Monitoring and Management

The invasive species located along the Project corridor and the BMPs to avoid the spread of invasive species are discussed in Section 6.6. A post-construction assessment of these areas will be conducted in the growing season following construction. If this monitoring shows that the species composition within the ROW varies from surrounding conditions, Xcel Energy will discuss the need for additional restoration efforts with applicable agencies.

7.0 COMMUNITY IMPACTS

7.1 Communication with Potentially Affected Public

7.1.1 List all attempts made to communicate with and provide information to the public.

Xcel Energy began its communication efforts in 2021 and its representatives have actively sought input on the Project route and related issues from state, county, and local governments, elected officials, landowners, and business leaders. Copies of letters, emails, and comments forms that are referenced below are included in Appendix J. Following is a timeline and list of communication and outreach efforts:

- November 28, 2022. Xcel Energy sent a ‘Save the Date’ mailer out to 627 landowners and local officials in the Project area in regard to upcoming virtual and in-person public open houses for the Project scheduled for December 14, 2022 and December 15, 2022, respectively. Project route maps, photo simulations, comment form and a fact sheet were posted on the project website.
- December 14, 2022. Xcel Energy hosted a virtual Microsoft Teams open house that included a Project overview Power Point presentation with a question-and-answer portion at the end. The December 15, 2022 in-person public open house was rescheduled due to winter storms.
- January 10, 2023. A follow-up ‘Save the Date’ mailer was sent to landowners and local officials in the Project area to notify the public of the rescheduled in-person public open houses for the Project scheduled for January 26, 2023.
- January 26, 2023. Xcel Energy hosted an in-person public open house at the Winchester Town Hall on County Highway W in Winchester, Wisconsin. Approximately 28 landowners were in attendance.

7.1.2 Provide a description of public information meetings and who was invited.

Xcel Energy held a virtual open house on December 15, 2022 and an in-person open house on January 26, 2023 and notified all landowners within 0.5 mile of each route option. The Project mailing list is provided as Appendix K.

7.1.3 Submit copies of public outreach mailings and handouts.

Refer to Section 7.1.1 above.

7.1.4 Provide electronic copies of written public comments (e.g., letters, emails, forms, etc.) submitted prior to filing the application with the PSC.

Refer to Section 7.1.1 above.

7.2 Community Issues

Discuss any concerns that groups or potentially impacted communities have raised.

Xcel Energy's landowner and key stakeholder outreach opportunities in advance of the application submittal was helpful in resolving many questions and concerns and also provided the opportunity to modify route options from citizen feedback in advance of the application submittal.

7.3 Land Use Plans

Provide relevant portions of land-use plans that describe future land uses potentially impacted by the project. (Land use plans include recreational plans, agricultural plans, etc.)

There are several county and town plans that address land use planning within the Project area. The following plans are discussed in the sections below:

- Vilas County Comprehensive Plan
- Vilas County Land and Water Resource Management Plan
- Vilas County FPP
- Vilas County Outdoor Recreation Plans (ORPs)
- Town of Manitowish Waters Comprehensive Plan
- Town of Winchester Comprehensive Plan
- Town of Presque Isle Comprehensive Plan

7.3.1 Vilas County Comprehensive Plan

The Vilas County Comprehensive Plan (2010) is a compilation of historical data and community created goals, objectives, policies, and programs that will guide future planning and community decisions for a 20-year period. The plan serves as a guide to physical, social, and economic development within the county and is not intended to establish land use regulations.

Approximately 84.3 percent of Vilas County is comprised of land and the remaining 15.6 percent consists of surface water (including islands). Of all land in the county, approximately 76.9 percent is forest land (woodland), which is held in both public and private ownership. With forested land as the dominant land use type in Vilas County, commercial forestry operations are an important part of the economy.

Publicly owned and managed lands in the county include federally owned lands (8.3 percent of land in county), including portions of the Nicolet National Forest and the Chequamegon National Forest. The State of Wisconsin owns 23 percent of the land in the county, the majority of which is part of the Northern Highland American Legion State Forest. Every municipality in the county has some state forest land within its boundaries, except for the City of Eagle River. Vilas County

owns 6.1 percent of the county's total area, most of which is part of the Vilas County Forest. A portion of the Lac du Flambeau Indian Reservation is in Vilas County, as well, and covers approximately 4.5 percent of the county's total acreage. Town-owned lands comprise less than 1 percent of the county's total acreage. Town-owned land is primarily used for town facilities such as administration buildings, community centers, garages, maintenance buildings, and fire stations. However, some towns including Land O' Lakes, Presque Isle, and Washington own forest land for the purpose of commercial timber production (Vilas County, 2010).

The Vilas County Comprehensive Plan estimates that approximately 1,144 acres of residential, commercial, and industrial land will be needed every 5 years to support population growth between 2010 and 2030. The stated goals of the Vilas County Comprehensive Plan are to support growth through coordinated land use decisions that respect private property rights and protect and conserve natural resources, forestry resources, community character, the rural nature of the area, and the need for utilities and services.

Based on review of the Existing Generalized Land Use Map (Map 6 of the Comprehensive Plan), the Project would be located in an area of Woodland land use with smaller patches of Residential and Commercial uses. The Generalized Future Land Use Map (Map 7 of the Comprehensive Plan) indicates a desire to increase Commercial, Rural Residential, and Outdoor Recreation land uses in areas crossed by the Project.

The Vilas County Comprehensive Plan also discusses the need for reliable and efficient utility services to support future growth within the county, and encourages cooperative planning and decision making in utility development, including, "appropriate utility development in environmentally sensitive areas (Vilas County, 2010)."

Vilas County maintains three other documents related to land use management, the Vilas County Land Conservation and Water Resource Management Plan, the County FPP, and the ORP. These documents set further policy direction for the county (Vilas County, 2010).

7.3.2 Vilas County Land and Water Resource Management Plan

The Land and Water Resource Management Plan (2015) goal is to coordinate efforts between the County's Land and Water Conservation Department and other agencies and interested parties to develop measures intended to meet the state performance standards and prohibitions (NR 151 and ATCP 50) for reducing runoff and protecting water quality (Vilas County, 2015). No specific restrictions to utility corridor development are noted in the Vilas County Land and Water Resource Management Plan. Instead, the plan provides information about best management practices for protecting water resources such as reducing soil erosion, runoff, and the spread of invasive species during public or private development projects.

7.3.3 Vilas County Farmland Preservation Plan

The Vilas County FPP is part of the Vilas County Comprehensive Plan and is intended to satisfy the statutory requirements of Wis. Statutes, Chapter 91, Subchapter II (Farmland Preservation Planning) and Wis. Statutes §66.1001(2)(e) (Agricultural, natural and cultural resources element of the Comprehensive Plan) (North Central Wisconsin Regional Planning Commission [NCWRPC], 2015). The FPP establishes baseline data on farming resources and the agricultural production in the county and establishes the goals and protocols for preserving agricultural production capacity, farmland, soil and water resources, and the rural character of the county as the population grows land uses evolve over time (NCWRPC, 2015). The goals and protocols in the FPP are developed through stakeholder outreach and coordination with state and county agencies and the public.

Land in Vilas County is primarily forested and according to the FPP, only less than one percent of the county is currently used for traditional row crop production. Soils in Vilas County are typically sandy and when combined with the limited growing season make typical row crop production challenging and, therefore less prevalent. Due to the amount of surface water in the county (15.6 percent of the county is surface water), cranberry production is a viable agricultural pursuit. Other types of agricultural land uses in the county include woodland agriculture (e.g., lumber, Christmas trees, maple syrup), pasture and rangeland, and livestock operations.

Regardless of the limited amount of tillable land for traditional row crop production, agriculture is an important contributor to the economy in Vilas County. Maps provided in the FPP organize parcels in the county into the following categories:

- **Farmland Preservation Areas:** These include parcels that are depicted as farmlands on the Soils maps, farmlands and woodlands on the Land Use map, or are depicted as cranberry waterbodies. Landowners of these parcels may apply for the farmland preservation program administered by the state. Farmland Preservation Areas are excluded from non-agricultural development plans for the next 15 years.
- **Planned Out:** These are parcels that would not qualify for farmland preservation tax credits, but are identified as non-farmland preservation areas.
- **Existing Agricultural Areas:** These parcels were actively farmed in 2009 when the Existing Land Use map was created for the Vilas County Comprehensive Plan.

Based on review of the maps in Attachment A of the FPP, the Project predominantly crosses Planned Out areas along County Highway W, but also crosses a several Farmland Preservation Areas, as well, totaling about 11.2 acres. Two Existing Agricultural Areas are located along County Highway W, but the proposed route would be on the opposite side of the highway from these parcels, thereby avoiding impacts on ongoing agricultural production.

Parcels identified as Farmland Preservation Areas are eligible for various types of farmland preservation programs and encumbrances; landowner participation in these programs is voluntary, though municipalities may choose to place zoning restrictions on Farmland Preservation Areas. These land rights are generally not known until the Project's easement acquisition process is initiated with the landowner of record. Once Xcel Energy is made aware of the existence of other land rights on the property, it will work with the landowner to accommodate the existing agreement or make them whole if there are additional monetary burdens they must incur. Based on publicly available information and preliminary communications with landowners Xcel Energy is not aware of any properties with existing farmland agreements that restrict land use that would be crossed by the proposed route, removal segments, or new substation sites.

7.3.4 Vilas County Outdoor Recreation Plan

The Vilas County ORP was developed to protect, preserve, and develop outdoor recreation opportunities throughout the county pursuant to Wis. Statutes §23.30 (NCWRPC, 2019). Having an ORP allows the county to apply for federal and state grants and other funding to support development of public outdoor recreation opportunities. The ORP was developed in coordination with state and local agencies and public input, and considers existing outdoor recreation areas while planning for future outdoor recreation needs of a growing population and changing land use and infrastructure needs over time. The ORP provides recommendations for improving the recreation system over the next five years (NCWRPC, 2019). Additional plans and studies influencing Vilas County recreation are included in the list below:

- Vilas County Countywide Bike/Ped Route & Trail Plan, 2011
- Vilas County Shared Use Route & Trail Study, 2018
- Vilas County Forest Comprehensive Land Use Plan, 2006-2020
- North Central Wisconsin Regional Bicycle and Pedestrian Plan, 2018
- State Trails Network Plan

Seasonal tourism related to outdoor recreation plays an important role in the economy of Vilas County. Various federal, state, county, and local forests and parks in Vilas County provide an abundance of opportunities for recreation. The following recreation areas that would be crossed by the Project are discussed in the ORP:

- Northern Highland American Legion State Forest
- Heart of Vilas County Hike and Bike Trail
- Presque Isle to Winchester Bike Route
- Tamarack Lake Access

Additional discussion of Parks and Recreation Areas that may be affected by the Project is included in Section 7.7.

No specific restrictions to utility corridor development are noted in the ORP.

7.3.5 Manitowish Waters, Winchester, and Presque Isle Comprehensive Plans

Vilas County communities crossed by the Project also have comprehensive plans. Towns in the Project area with plans are Manitowish Waters, Winchester, and Presque Isle (Town of Manitowish Waters, 2017; NCWRPC, 2021a and 2021b). The plans developed by the towns generally align with the Vilas County Comprehensive Plan and provide planning and strategies for local land use planning decisions that support population growth and infrastructure development in a manner that protects and conserves natural resources, forestry, agriculture, and the rural nature of the county. No specific restrictions to utility corridor development are noted in the town comprehensive plans.

7.4 Agriculture

For each route, by route segment, and substation site provide the following:

7.4.1 Type of farming: pasture, row crops, or other type (e.g., orchards, tree plantations, cranberry bogs, etc.).

Xcel Energy reviewed USGS GAP National Land Cover Data to identify agricultural lands within the Project area (USGS, 2019). No agricultural land was identified along the proposed route, removal segments, new or removal substation sites, or off-ROW access routes. The only agricultural land identified within the Project area is within the Town of Presque Isle Transfer Station Laydown Yard. Review of recent aerial imagery indicates that the entire Town of Presque Isle Transfer Station Laydown Yard has been developed and no portion of the site is currently used for agricultural production. PSC Table 2, provided in Appendix B, presents the total acres of agricultural lands within the laydown yard.

According to the U.S. Department of Agriculture (USDA) 2017 Census of Agriculture, 5,652 acres (less than 0.1 percent) of the approximately 651,500 acres of land in Vilas County is used for farming operations (USDA, 2017). Crops, including nursery and greenhouse crops, comprise a significantly larger portion of the market value of products sold compared to livestock, poultry, and their products in Vilas County (\$6.7 million vs. \$188 thousand, respectively). Forage, vegetables harvested for sale, and oats for grain are the only crops grown in Vilas County. Cattle are the predominant livestock raised in Vilas County by number of farms, and farms raising hogs and pigs, sheep and lambs, and poultry are also present in the county. Overall, the number of farms raising or selling livestock in Vilas County is low.

7.4.2 Any agricultural practices that may be affected by the project (construction or operation), such as irrigation systems, aerial seeding or spraying, windbreaks, organic farms, and drainage tiles.

Transmission Line

Specific agricultural practices such as irrigation systems or drainage tiles are generally not identified until Xcel Energy initiates the easement acquisition process with the landowner of record. To date, public outreach and meetings have not identified irrigation systems or other specific agricultural practices that could be affected by the Project. Once Xcel Energy is made aware of the existence of specific agricultural practices, they will work with the landowner to avoid or minimize impacts to these practices or make them whole if there are additional monetary burdens they might incur as a result of the Project.

Substations

Neither of the new substation sites or the substations to be removed would affect agricultural land, specialty crop land, or irrigation and drainage systems related to agricultural production.

Include the amount of land that would no longer be farmed.

Not applicable.

7.4.3 Identify the number and size of parcels enrolled in farmland preservation programs that may be affected by the proposed project.

Transmission Line

The Project area was reviewed within the DATCP's Agricultural Enterprise Area (AEA) interactive web mapper. AEA's, part of the FPP, are areas designated by DATCP as productive agricultural land. Landowners and/or local governments can apply to DATCP to receive this designation. Landowners within designated AEA's are eligible to enter into FPP agreements.

The Project does not cross any designated AEA's or FPP parcels.

Substations

Neither of the new substation sites or the substations to be removed would affect parcels enrolled in the farmland preservation program.

7.4.4 Specific details for mitigating or minimizing construction impacts in and around agricultural lands.

No agricultural land is present along the proposed route, removal segments, new or removal substation sites, or off-ROW access routes. A minimal amount of agricultural land was identified in the USGS GAP National Land Cover Data within the Town of Presque Isle Transfer Station Laydown Yard; however, review of recent aerial imagery indicates that the entire laydown has been developed and is not actively cultivated. As such, no mitigation or minimization measures specific to agricultural land are proposed.

7.4.5 Agricultural Impact Statement (AIS) – Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP). If the project is a transmission line of 100kV or more, is longer than one mile, and would affect any properties used for agricultural purposes, submit one of the following, either:

Per Wis. Stat. § 32.035(2) and 196.491(1)(f), the Project is exempt from an AIS as the transmission line and associated facilities will be designed for operation at less than 100 kV.

7.4.5.1 A completed Agricultural Impact Notice (see DATCP web site and search “Agricultural Impact Notice” for appropriate form).

Not applicable.

7.4.5.2 A release letter from DATCP stating that an AIS will not be written for this proposed project.

Not applicable.

7.4.6 Neutral to Earth Voltage (NEV) and Induced Voltage

Provide for each route and/or route segment:

7.4.6.1 The number of confined animal dairy operations within one-half mile of the proposed centerline.

No confined animal dairy operations are located within one half mile of the proposed route centerline.

7.4.6.2 The number of agricultural buildings located within 300 feet of the proposed centerline.

No agricultural buildings are located within 300 feet of the proposed route centerline.

7.4.6.3 Discuss NEV and induced voltage issues as they relate to the project and routes.

NEV, induced voltage, or “stray voltage” is a condition that can potentially occur on a property or on the electric service entrances to structures from distribution lines connected to these structures - not transmission lines as proposed here. The term generally describes a voltage 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 parallel or cross distribution lines, appropriate mitigation measures can be taken to address any induced voltages. For additional information regarding stray voltage, please see the PSC page on Stray Voltage Guide that is available online at <https://psc.wi.gov/Pages/Programs/StrayVoltageHomePage.aspx>, or contact your electrical utility provider.

The power lines will be designed to meet or exceed minimum clearance requirements with respect to electric fencing as specified by the NESC. Nonetheless, insulated electric fences used in livestock operations can be instantly charged with an 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 safely used 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, under high voltage transmission lines will be immediately charged with an electric charge. Without a continuous grounding path, this charge can provide a nuisance shock. Such nuisance shocks are a rare event because generally vehicles are effectively grounded through tires. Modern tires provide an electrical path to ground because carbon black, a good conductor of electricity, is added when they are produced. Metal parts of farming equipment are frequently in contact with the ground when plowing or engaging in various other activities. Therefore, the induced charge on vehicles will normally be continually flowing to ground unless they have unusually old tires or are 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 itself because a structure under a transmission line may interfere with safe operation of the transmission facilities. For example, a fire in a building on the right-of-way could damage a transmission line. As a result, NESC guidelines establish horizontal and vertical clearances for transmission facilities. Metal buildings may have unique issues. For example, conductive buildings near power lines of 200 kV or greater must be properly grounded. Any person with questions about a new or existing metal structure can contact Xcel Energy for further information about proper grounding requirements.

Xcel Energy will design and construct the proposed facilities to minimize the potential for induction issues. See Section 5.3 of this Application for locations where electric distribution lines will be relocated to eliminate physical conflicts with the Project or to increase separation with the proposed transmission line. Additionally, Xcel Energy will work with the owners of the potentially impacted facilities to address their concerns. This includes coordinating with the local distribution companies to perform pre- and post-construction testing of potentially impacted facilities, if necessary, to ensure that no adverse impacts result.

7.5 Residential and Urban Areas:

7.5.1 Discuss anticipated impacts to residential/urban neighborhoods and communities such as ROW clearance and temporary construction impacts, including noise, dust, duration of construction, time-of-day of construction, road congestion, impacts to driveways, etc.

The proposed Project is located in a rural, sparsely populated area of Vilas County. The proposed route shares ROW with County Highway W and the existing 34.5 kV distribution line corridors for most of its length. The end of the proposed route, the new Boot Lake Substation, Removal Segment 9, and removal of the existing Presque Isle Substation would be within the municipal boundaries of Presque Isle.

The Project will be built using conventional construction equipment (e.g., bulldozers, heavy trucks, drill rigs, cranes, and hydraulic and pneumatic tools). The equipment noise levels of the laydown yards will be consistent with local truck traffic and equipment. The construction noise levels along the transmission line route, including the substation sites, will be equivalent to highway traffic and truck equipment throughout the remaining Project route. Noise will be intermittent and not out of the ordinary for general truck traffic. Most truck and equipment noise will be from 7:00 am to 6:00 pm, generally Monday through Friday. When undertaking construction activities around residences, Xcel Energy and its contractor will be cognizant of the residents.

Dust may be generated by ground disturbing activities and the use of access roads; and mud may be tracked onto public roadways at construction vehicle access points. Dust impacts will be minimized in residential areas and whenever practical.

Work will generally be completed during daylight hours under a typical 8- to 12-hour workday, unless night work is specifically required.

Construction vehicles will use public roads to access the ROW. There may be occasions when construction vehicles are parked on roads during construction. Xcel Energy will minimize the number of vehicles and the amount of time they are parked on the roads. All current traffic control measures will be adhered to while equipment is on a public roadway. In areas of active construction along roadways or at road crossings, lane closures may be necessary during active construction to ensure public safety. Xcel Energy will not impact any driveways without specific landowner permission to travel or park equipment and will ensure residence driveways are not blocked during construction.

7.5.2 Discuss how anticipated impacts would be mitigated.

Xcel Energy will mitigate transmission line and substation construction impacts, where possible. Noise generated during construction will be temporary and sporadic throughout a typical workday including night work if specifically required. Dust will be controlled by periodic wetting of access roads and work areas or by application of polymer to exposed soil. Tracking pads will be constructed at frequently used access points to minimize mud being tracked onto public roads. Road sweepers may also be used to remove mud tracked onto the road. Traffic control plans will be developed if needed and implemented during construction to minimize impacts on traffic and to comply with permit requirements.

Use of residential concrete or blacktop driveways will be avoided whenever possible. If access is unavoidable, the driveways may be protected using composite mats or other low-profile protection systems. Commercial or industrial driveways may be used without surface protection but will be evaluated prior to their use. Any damage caused by construction access will be repaired as needed.

7.6 Aesthetic Impacts

7.6.1 Photo Simulations

Xcel Energy created photo simulations to support and enhance stakeholders' understanding of Project impacts from a visual perspective. These photo simulations are available to the public on this website: <https://www.transmission.xcelenergy.com/Projects/Wisconsin/boot-lake-to-chain-of-lakes> and are also included as Appendix L.

7.6.2 Scenic Roads

The Project does not cross, nor is in the vicinity of any Wisconsin Scenic Byways or Rustic Roads (WisDOT, n.d.).^{1 2}

7.6.3 Substation Aesthetic Impacts

The Proposed Chain O Lake Substation is shown as Viewpoint 1 in the Photo Simulations in Appendix L. The site of the Chain O Lakes substation has an adjacent existing Xcel Energy building and associated storage and equipment yard. There is also existing utility infrastructure within the County Highway W ROW adjacent to the proposed substation location. The proposed Chain O Lakes substation will be similar in appearance to existing utility building and infrastructure and will have minimal aesthetic impact on the surrounding area.

The proposed Boot Lake Substation is shown as Viewpoint 4 in the Photo Simulation in Appendix L. The Boot Lake Substation location is located adjacent to Thoma Drive, in Presque Isle in a heavily wooded, rural area. Although tree clearing will be necessary to construct and operate the new substation, once constructed existing trees surrounding the site will provide visual screening on the north, east, and south sides and the new substation will not be visible to occupied structures in the Town of Presque Isle. For these reasons, the new Boot Lake substation will have minimal aesthetic impacts on the surrounding area.

7.6.4 Substation Aesthetic Impact Mitigation

Since the construction of the proposed Chain O Lake and Boot Lake Substations will have minimal aesthetic impacts on the surrounding area, no additional landscaping is planned beyond standard Xcel Energy engineering design and minimizing construction impacts to land cover whenever practical. Xcel Energy plans to broadcast wildflowers and native grasses (pollinator mix) between the new Chain O Lakes Substation and County Highway W and between the new Boot Lake Substation and Thoma Drive to help screen the substations and blend them with the surrounding environment.

7.7 Parks and Recreation Areas

7.7.1 Identify any parks and recreation areas or trails that may be impacted by the proposed project and the owner/manager of each recreation resource

Transmission Line

A list of parks and recreation areas that may be affected by the Project is presented in Table 7.7-1. A brief description of each park and recreation area follows the list.

¹ <https://wisconsin.gov/Pages/travel/road/scenic-ways/byways.aspx>

² <https://wisconsin.gov/Pages/travel/road/rustic-roads/rr100.aspx>

Table 7.7-1 Parks and Recreation Areas		
Name	Owner/Manager	Project Component
Northern Highland American Legion State Forest and North Lakeland Discovery Center	WDNR	<ul style="list-style-type: none"> Proposed Route Segments 1, 8, 11, 12, 12-2, and 23 Removal Segments 2 and 6 Off-ROW Access for Segments 1, 8, 11, 12, and 23 Rest Lake Substation Removal
Heart of Vilas County Bike Trail	Vilas County	<ul style="list-style-type: none"> Proposed Route Segments 7B, 8, 8-1, 9A, and 10 Removal Segment 1 Off-ROW Access for Segments 8, 8-1, and 9
Presque Isle-Winchester Bike Route	Vilas County	<ul style="list-style-type: none"> Proposed Route Segments 17, 18, 22, and 23 Removal Segments 4 and 5 Off-ROW Access for Segments 17, 18, and 22
Tamarack Lake Boat Access	Town of Winchester	<ul style="list-style-type: none"> Proposed Route Segment 13 Off-ROW Access for Segment 13
South Turtle Lake Boat Access	Town of Winchester	<ul style="list-style-type: none"> Removal Segment 3
Sportsman’s Motel and Resort	Private	<ul style="list-style-type: none"> Removal Segment 3
WinMan Trails	Private	<ul style="list-style-type: none"> Proposed Route Segment 10 Off-ROW Access for Segment 10
ATV/Utility Task Vehicle (UTV) trails	Vilas County/ Private	<ul style="list-style-type: none"> Proposed Route and Off-ROW Access Removal Segments 1-6
Snowmobile Trails	Vilas County/ Private	<ul style="list-style-type: none"> Proposed Route and Off-ROW Access Removal Segments 1-6

Northern Highland American Legion State Forest – The Northern Highland American Legion State Forest covers more than 236,000 acres across Vilas, Oneida, and Iron Counties in Wisconsin (WDNR, n.d.). More than 900 lakes and about 300 miles of rivers and streams are present within the state forest. Opportunities for public recreation include camping, biking, hiking, horseback riding, hunting, picnicking, boating, kayaking, canoeing, cross-country skiing, snowshoeing, and snowmobiling. All-terrain Vehicle use is not permitted within the state forest.

The North Lakeland Discovery Center is a nature-based education and community center located within the state forest (North Lakeland Discovery Center, 2019). Access to the center is from County Highway W and Discovery Lane. In addition to educational programs for all ages, the North Lakeland Discovery Center offers public access to several hiking, biking, snowshoeing, and cross-country skiing trails.

The proposed route would cross state forest land along Segments 1, 8, 11, 12, 12-2, and 23 as would off-ROW access for Segments 1, 8, 11, 12, and 23. Driveway access to the North Lakeland Discovery Center would be crossed by the proposed route along Segment 1 and Discovery Lane is currently planned for use as Off-ROW Access during construction. Removal Segments 2 and 6 also would cross state forest land. The existing Rest Lake Substation, planned for removal, is located on state forest land about 0.1 mile west/northwest of the intersection of County Highway W and Tower Road. Installation of the new substations and removal of the existing Presque Isle Substation would not affect state forest land.

Heart of Vilas County Bike Trail – The Heart of Vilas County Bike Trail is a National Recreation Trail that provides over 52 miles of paved trail that travels through the Northern Highland American Legion State Forest between St. Germain, Sayner, Boulder Junction, Manitowish Waters, and Mercer (Heart of Vilas County Bike Trail System, 2023). More than 20 parking areas along the trail provide public access and numerous campgrounds, motels, and resorts are located along or within a short distance from the trail.

Within the Project area, one bike trail segment travels along County Highway W beginning on the east side of the road at the intersection of County Highway W and Tower Road and eventually crossing over to the west side of the road at the northern intersection of County Highway W and Brunell Road. This segment of the trail ends at the intersection of County Highway W and County Highway J. The existing Rest Lake Substation is about 400 feet west of the beginning of this segment of the bike trail. The proposed route parallels the bike trail along County Highway W and crosses it five times between Structures 1 and 81. Removal Segment 1 also parallels and crosses the bike trail in two locations along this route. The new Chain O Lakes Substation is about 100 feet northwest of the bike trail, but on the opposite side of County Highway W.

Presque Isle-Winchester Bike Route – The Presque Isle-Winchester Bike Route begins at the Presque Isle Community Center and offers 4.25 and 10.5 miles of paved bike trails (Vilas County, 2023b). The beginning of the bike route offers access to the 1.5-mile Pipke Park Trail System in Presque Isle. The bike trail diverges from the Pipke Park Trail System and travels along Riverside Road, then travels along County Highway W before the 4.25-mile route turns south at S. Bay View Road and ends at Wilderness Park and Presque Lake. The 10.5-mile route continues past S. Bay View Road, following smaller roadways like Old W Road, Harris Lake Road, Mud Lake Road, and W. Birch Lake Road, crossing the highway in a few locations before terminating at the Birch Lake Boat Landing in Winchester.

The proposed route crosses the Presque Isle-Winchester Bike Route in four locations (Segments 17, 18, 22, and 23). Removal Segments 4 and 5 also cross the bike trail. Off-ROW Access crosses the bike trail along Segments 17, 18, and 22. The new substations and the substation removals would not affect this bike route.

Boat Access Points – Tamarack Lake Boat Access is owned and managed by the Town of Winchester and provides access to Tamarack Lake via a private drive from County Highway W.

The boat access is about 50 feet north of Segment 16 of the proposed route and the proposed route crosses the driveway to the boat access.

The South Turtle Lake Boat Access is owned and managed by the Town of Winchester and provides access to South Turtle Lake from County Highway W via Chicago Avenue. The boat access is located about 0.2 mile west of Removal Segment 3 and the removal segment crosses the road to the boat access (Chicago Avenue).

Sportsman's Motel and Resort (on South Turtle Lake) – Sportsman's Motel and Resort is located on the west side of County Highway W on South Turtle Lake in Winchester, Wisconsin (Sportsman's Motel and Resort, n.d.). The resort is open year-round and offers five motel suites with kitchenettes and direct access to South Turtle Lake.

Removal Segment 3 crosses the driveway to the resort. The proposed route (Segment 13) and off-ROW access to Segment 13 are located on the opposite side of County Highway W from the resort.

WinMan Trails – WinMan Trails is a privately owned trail system in Vilas County that offers year-round access to over 40 miles of groomed trails. Access to the trail system is located near the intersection of County Highway W and County Highway J. The trail system is open to the public and includes amenities such as a chalet, park, and the WinMan Bar and Apparel Shop. The owners of the trail system recently applied for public, non-profit status which will allow them to access grants and other funding options.

The proposed route crosses the driveway entrance to WinMan Trails along Segment 10 and the driveway is planned for use as off-ROW Access during construction.

ATV/UTV trails – There are numerous ATV/Utility Task Vehicle (UTV) trails in Vilas County, most of which are on local roads. The proposed route and off-ROW access have several crossings of ATV/UTV trails and, in some cases, is parallel to the roads that make up the trails. ATV/UTV trails near the Project loosely follow County Highway W, with some areas paralleling the highway while some trails diverge from the highway to travel off-road (e.g., along County Highway P).

Snowmobile trails – snowmobiles trails traverse much of Vilas County and connect cities. Snowmobile trails near the Project follow Highway W and other public roadways. The proposed route, off-ROW access, and the removal segments would cross snowmobile trails in Vilas County.

7.7.2 Provide any communications with these owners/managers

Refer to Appendix D.

7.7.3 Discuss how short- and long-term impacts to these resources might be mitigated.

Potential long-term impacts on the affected properties have been minimized primarily by utilizing the existing distribution line corridor to the extent practicable and/or routing the transmission line with existing linear facilities such as roads. Construction of the proposed route could result in some medium-term impacts, particularly in locations where trees need to be trimmed or removed. However, once the transmission line is constructed vegetation will be allowed to grow back over time.

Short-term impacts would include an increase in ambient noise. Short-term construction impacts for affected areas on the selected route would be mitigated, in coordination with the corresponding land managers and owners, through strategic scheduling and the application of construction BMPs.

7.8 Airports

7.8.1 Identify the location of all private and public airports/airstrips in the project area.

The Manitowish Waters Airport is located approximately 2.0 miles south of the proposed Chain O Lakes Substation, 1.2 miles south of the southern terminus of the transmission line, and 0.4 mile south of the southern laydown yard for the Project near the intersection of Hwy 51 and County Hwy W, south of the Town of Manitowish Waters.

7.8.2 Describe the airports/airstrips, their runways, (length/orientation), and type of use.

The Manitowish Waters Airport is publicly owned airport that is accessible only by private or charter plane (Town of Manitowish Waters, 2023). The airport is open year-round and has two runways: Runway 14/32 is 3,498 feet by 60 feet with an asphalt surface and is oriented northwest/southeast; runway 4/22 is 3,094 feet by 120 feet with a turf surface and is oriented northeast/southwest. The Manitowish Waters Airport averages 119 aircraft operations per week and is predominantly used for transient general aviation, local general aviation, and air taxi use (AirNav, 2023).

7.8.3 Describe any potential for impact to aircraft safety and intrusion into navigable airspace (runway approaches).

On February 20, 2023, Xcel Energy submitted approximate structure locations and heights for the five closest structures to the Manitowish Waters Airport to the Federal Aviation Administration (FAA) Notice Criteria Tool as a preliminary screening. The Notice Criteria Tool indicated the proposed structures are in proximity to a navigation facility (Manitowish Waters Airport) and may impact the assurance of navigation signal reception. Xcel Energy notes it is typical for the FAA to review any proposed structure within approximately 4 miles of a public airport, regardless of structure height. Xcel Energy does not anticipate any impact on airports as the proposed structures will be of similar height and location as the existing structures in this area. An

evaluation of the structures will be conducted in coordination with the FAA once a route and the pole designs are final.

7.8.4 Identify potential construction limitations and permit issues.

Xcel Energy does not anticipate any impacts on airports (refer to Section 7.8.3).

7.8.5 Provide documentation of consultation with the WisDOT Bureau of Aeronautics and the Federal Aviation Administration.

Not applicable.

7.9 Communication Towers

A search of available Federal Communications Commission (FCC) databases was conducted for registered communication towers within one mile of the Project. There are 5 Land Mobile Private Transmission Towers and 6 FCC Registered Antenna Structures within one mile of the Project. Table 7.9-1 includes information on the communication towers identified in the search. The closest tower to the Project, Identification Number 1285045, is located within the proposed Town of Presque Isle Transfer Station Laydown Yard. Other towers are located at varying distances from the Project as shown on Figure 6, Appendix A and included in the GIS data files. The closest tower to a Project substation, Identification Number 1195196, is located 0.7-mile east of the proposed Boot Lake Substation (Figure 6, Appendix A).

ID Number	Distance from Project (Miles)	Distance to Substation (Miles)	Type of Tower	Latitude	Longitude
1285045	0.00	0.83	FCC Registered Antenna Structure	46.2449	-89.7607
1201413	0.02	2.44	FCC Registered Antenna Structure	46.2371	-89.7924
1288483	0.02	0.79	Land Mobile Private Transmission Tower	46.2483	-89.7274
1195196	0.10	0.68	Land Mobile Private Transmission Tower	46.2483	-89.7299
1245501	0.24	1.21	FCC Registered Antenna Structure	46.1691	-89.8657
2551915	0.24	0.75	Land Mobile Private Transmission Tower	46.1487	-89.8939
2608191	0.32	1.07	Land Mobile Private Transmission Tower	42.6389	-83.6163

Table 7.9-1 Communication Towers within One Mile of Project					
ID Number	Distance from Project (Miles)	Distance to Substation (Miles)	Type of Tower	Latitude	Longitude
2608191	0.47	4.67	Land Mobile Private Transmission Tower	42.6389	-83.6163
1064476	0.52	1.89	FCC Registered Antenna Structure	46.1269	-89.8794
1207301	0.71	2.03	FCC Registered Antenna Structure	46.1249	-89.8768
1280931	0.82	2.34	FCC Registered Antenna Structure	46.1204	-89.8803

7.9.1 Discuss any potential interference to the function of communication towers within the project area by the proposed project.

No impact on radio, television, cellular phones, or Global Positioning System units are expected from construction or operation of the proposed route. Depending on signal strength and direction, minor interference with AM radio may occur within the ROW along the proposed route. The route was developed to provide an adequate distance from any of these towers or facilities during the initial routing process to avoid potential safety or quality issues.

7.9.2 Provide GIS location information for communications facilities evaluated in Section 7.9.1. Include in the GIS information the communications technologies used for each facility.

GIS information for the communications facilities evaluated in Section 7.9.1 is provided in the GIS data package submitted with this application.

7.10 Community Income from High-Voltage Transmission Impact Fees

7.10.1 Provide an estimate of all fee payments that must be made to the Department of Administration as required under Wis. Stat. §196.491(3g).

Not applicable.

7.10.2 Identify which components of the total project cost were used as the base cost and how the fees were calculated.

Not applicable.

7.10.3 Provide estimates of one-time and annual payments that would be made to each affected city, village, town, or county.

Not applicable.

7.11 Shared Revenue

7.11.1 For modifications of existing substations, provide a brief overview of the current shared revenue payments and how it might change as a result of the proposed project.

Not applicable.

7.11.2 For new substations, provide a general idea of the potential shared revenue distributions.

Not applicable.

8.0 WATERWAY/WETLAND PERMITTING ACTIVITIES

This section covers information required by DNR for wetland and waterway permits. The following subsections apply to all proposed project sites or routes. These sections should be consistent with the wetlands and waterways included in DNR Tables 1 and 2 and associated wetland and waterway maps. See the Wetlands and Waterways section of the Introduction portion of this document on what to include in DNR Tables 1 and 2 regarding waterway resources. Questions about this section should be directed to DNR Office of Energy's Energy Project Liaison staff.

8.1 Waterway Activities

This section should be consistent with the waterways included in DNR Tables 1 and 2 and associated maps. This section should apply to the proposed and alternative sites/routes (if applicable) and their associated facilities (for example, off-ROW access roads, staging areas, permanent structures, new substations and/or expansion of existing substations (including associated driveways and permanent storm water management features to be constructed)).

8.1.1 Identify the number of waterways present, including DNR-mapped waterways and additional field identified waterways. Also identify the number of times the waterway meanders in and out of the project area and indicate the number of waterway crossings.

Within the Project, a total of 5 waterways (s01 to s05) and one waterbody (o01) are present, as shown in Appendix B, Table 9 (WDNR Table 2).

Waterway field surveys have not occurred within the transmission line ROW corridor (including for installation and removal sections on-ROW access roads), the off-ROW access roads, laydown yards, or temporary workspaces for removal of the existing substations. As such, waterways and waterbodies in these areas were identified via desktop mapping, specifically WDNR 24K waterway and waterbody data and aerial imagery. To represent features that meandered, a different unique ID was assigned to each intersection of the Project's access roads with the feature. Per desktop mapping resources, no waterways or waterbodies occurs within any off-ROW access roads, laydown yards, or temporary workspaces for removal of the existing substations. The 5 waterways and one waterbody are present within the on-ROW access roads within the ROW corridor (for installation and/or removal sections). Wetland and waterway field surveys will be conducted prior to construction. Pending field surveys will confirm the location of all waterways and waterbodies within the non-surveyed portions of the Project.

Wetland delineation field surveys occurred at both proposed substations in August 2021. The wetland delineation report is provided as Appendix M. At the Boot Lake Substation,³ an approximately 6.81-acre area was surveyed. No waterways or waterbodies were observed during

³ In the wetland delineation report, the Boot Lake Substation site is referred to as the Lynn and Lenny Thoma site.

the field survey, nor are any desktop mapped waterways or waterbodies present within the survey area. At the Chain O Lakes Substation,⁴ an approximately 7.55-acre area was surveyed. No waterways or waterbodies were observed during the field survey, nor are any desktop mapped waterways or waterbodies present within the survey area. As such, no waterways or waterbodies are present within either of the proposed substation sites.

8.1.2 Identify any waterways in the project route(s) that are classified as Outstanding or Exceptional Resource Waters, Trout Streams, Wild Rice Waters, and/or Wild or Scenic Rivers.

No waterways or waterbodies within the Project are designated as Outstanding or Exceptional Resource Waters, Trout Streams, Wild Rice Waters, and/or Wild or Scenic Rivers. The one waterbody present, o01, is designated as a Priority Navigable Water less than 50 acres.

8.1.3 State if you are requesting DNR staff perform a navigability determination on any of the DNR mapped waterways and/or field identified waterways that will be impacted and/or crossed by project activities.

A navigability determination is not being requested for any waterway or waterbody.

8.1.4 Provide the following information:

8.1.4.1 How many waterway crossings are proposed to be traversed with equipment and how that crossing will be accomplished (i.e. placement of temporary clear span bridges (TCSB), use of existing bridge or culvert, driving on the bed, etc.).

Four of the five waterways present (s01 to s04) are proposed to be traversed via the installation of temporary clear span bridges (TCSBs). Waterway s05 will not be traversed by construction equipment. Waterbody o01 is also proposed to be traversed via a temporary clear span bridge (TCSB). As such, a total of 5 TCSBs are proposed for the Project, as shown in Appendix B, Table 8 (DNR Table 1).

8.1.4.2 How many structures are proposed to be placed below the ordinary high water mark (OHWM) of a waterway. Indicate if structures are temporary or permanent.

No structures are proposed below the ordinary high water mark for the Project.

⁴ In the wetland delineation report, the Chain O Lakes Substation site is referred to as the Nancy Benson and NSP site.

8.1.4.3 Indicate if any other waterways would be impacted and/or crossed by other construction activities regulated under Chapter 30 Wis. Stats. (i.e. placement of a new storm water pond within 500 feet of a waterway, stream relocation, staging areas, placement of riprap, etc.).

No other construction activities or regulated activities, other than the TCSBs as described above, are proposed for the Project. A new stormwater pond will be constructed at the Boot Lake Substation and will not be located within 500 feet of a waterway.

8.1.4.4 For underground installation only: Indicate the amount of waterway crossings via underground installation and specify the installation method (i.e. X waterways will be bored, Y waterways will be trenched, etc.)

Not applicable.

8.1.5 Provide the methods to be used for avoiding, minimizing, and mitigating construction impacts in and near waterways. This discussion should include, but not be limited to, avoiding waterways, installation methods (i.e. directional bore versus open-cut trenching or plowing), equipment crossing methods (i.e. for temporary access, the use of TCSB versus temporary culvert; for permanent access, the use of permanent bridge versus permanent culvert), sediment and erosion controls, invasive species protocols for equipment, etc.

All waterways to be traversed by construction equipment will occur via TCSBs. The placement of temporary culverts or driving on the bed will not occur. All TCSBs will be clear-span, spanning from bank to bank, with no center-support pilings in the waterway channel. TCSBs will typically consist of a construction mat placed across the waterway, above the ordinary high-water mark. TCSB approaches, if needed, will consist of wood or metal material. No bed material will be removed to place or remove the TCSBs. All waterways or waterbodies proposed for a TCSB are less than 35 feet wide. Wide waterway crossings (over 20 feet in width) may require the use of an I-beam or similar bank-to-bank support.

TCSBs will be placed from the waterway banks and equipment will not need to work in the waterway channel to install or remove the TCSBs. TCSBs will either be carried in or assembled on site. No disturbance to the bed or banks would occur from installation or removal. TCSBs will be removed after final clean up and restoration activities have been conducted. Appropriate sediment and erosion control devices (i.e., geotextile fabric, silt sock, silt fence, etc.) will be installed along the sides and bottom of the TCSBs to prevent sediment from entering the waterway during use of the TCSBs. TCSBs will be inspected on a regular basis and anchored to prevent movement. Upon TCSB removal, waterway banks will be restored to pre-existing conditions.

Installation and/or removal of TCSBs may occur during the fish spawning timing restriction period (March 1 to June 15 of any year). A fish spawning timing waiver request is included as Appendix N.

Prior to the start of land disturbing activities, sediment and erosion control measures will be installed adjacent to all waterways within the Project to prevent sedimentation into waterways.

8.1.6 For waterways that will be open-cut trenched, provide the following:

8.1.6.1 State if any waterways are wider than 35 feet (measured from OHWM to OHWM).

Not applicable.

8.1.6.2 The machinery to be used, and where it will operate from (i.e. from the banks, in the waterway channel) and if a TCSB is needed to access both banks.

Not applicable.

8.1.6.3 The size of the trench (length, width, and depth) for each waterway crossing.

Not applicable.

8.1.6.4 Details on the proposed in-water work zone isolation/stream flow bypass system (i.e. dam and pump, dam and flume, etc.).

Not applicable.

8.1.6.5 Duration and timing of the in-stream work, including the installation and removal of the isolation/bypass system and the trenching activity.

Not applicable.

8.1.6.6 How impacts to the waterway will be minimized during in-water work (i.e. energy dissipation, sediment controls, gradually releasing dams, screened and floating pumps, etc.).

Not applicable.

8.1.6.7 How the waterway bed and banks will be restored to pre-existing conditions.

Not applicable.

8.1.7 For waterways that will be directionally bored, provide the following:

8.1.7.1 The location and size of any temporary staging and equipment storage.

Not applicable.

8.1.7.2 The location and size of bore pits and their distance from waterways.

Not applicable.

8.1.7.3 Provide a contingency plan for bore refusal and a plan for the containment and clean-up of any inadvertent releases of drilling fluid (e.g. a frac-out).

Not applicable.

8.1.8 For waterways that will have a TCSB installed across them, provide the following:

8.1.8.1 Description of the TCSB proposed, including dimensions, materials, and approaches. Verify the TCSB will completely span the waterway.

See section 8.1.5.

8.1.8.2 State if any waterways are wider than 35 feet (measured from OHWM to OHWM), and/or if any in-stream supports will be used.

See section 8.1.5.

8.1.8.3 State how the TCSB placement and removal will occur (i.e. carried in and placed with equipment, assembled on site, etc.) and if any disturbance would occur to the bed or banks for the installation and removal, including bank grading or cutting.

See section 8.1.5.

8.1.8.4 Duration of the placement of the TCSB.

TCSBs may be placed for the entire duration of construction. TCSBs will be removed no later than 7 days after the necessary waterway crossing activities, including restoration, have been completed, unless the removal conflicts with the fish spawning timing restriction (and an approved waiver was not issued).

8.1.8.5 Sediment controls that will be installed during the installation, use, and removal of the TCSB's.

See section 8.1.5.

8.1.8.6 How the TCSB's will be inspected during use and how they will be anchored to prevent them from being transported downstream.

See section 8.1.5.

8.1.8.7 State if the required 5-foot clearance will be maintained, or if the standards in NR 320.04(3), Wis. Adm. Code will be complied with.

If a 5-foot clearance cannot be maintained, the requirements listed under NR 320.04(3), Wis. Admin. Code will be followed.

8.1.8.8 How the waterway bed and banks will be restored when the TCSB is removed.

Upon removal of TCSBs, the banks will be restored with seed and mulch or erosion control blanket, as necessary.

8.1.9 Describe the proposed area of land disturbance and vegetation removal at waterway crossings. Include a description of the type of vegetation to be removed (e.g. shrub, forest), and if this vegetation removal will be temporary (allowed to regrow) or permanent (maintained as cleared).

Much of the ROW corridor overlaps an existing distribution line corridor which has been previously cleared. Where additional clearing is needed, the ROW will be kept in a permanently herbaceous state for the operation and safety of the transmission line.

Specifically at each waterway or waterbody within the Project:

- Waterway s01: This area is located within the existing 30-foot distribution corridor. Approximately 10 additional feet of clearing will be required, on the north side of the existing distribution corridor. Visual impacts from the waterway are not anticipated, as the majority of the area at the waterway crossing is already cleared from the existing distribution line and County Highway W.
- Waterway s02: This area is not located within the existing 30-foot distribution corridor. As such, the 75-foot ROW corridor will be cleared. Visual impacts from the waterway are not anticipated, as the area immediately south is already cleared from the existing distribution line and County Highway W.
- Waterway s03: This area is located within the existing 30-foot distribution corridor. Approximately 10 additional feet of clearing will be required on the north side of the existing distribution corridor and 15 additional feet of clearing will be required on the south side. Visual impacts from the waterway are not anticipated, as the majority of the area at the waterway crossing is already cleared from the existing distribution line.

- Waterway s04: This waterway is located within a removal section. As such, no clearing is proposed.
- Waterbody o01: This area is not located within the existing 30-foot distribution corridor. As such, the 75-foot ROW corridor will be cleared. Visual impacts from the waterbody are not anticipated, as the area immediately south is already cleared from the existing distribution line and County Highway W.
- Waterway s05: This area is not located within the existing 30-foot distribution corridor. As such, the 75-foot ROW corridor will be cleared. Segment 23 deviates from the existing distribution line corridor in order to connect to the new Boot Lake Substation, then turns east (across waterway s05) to connect to the existing transmission line along County Highway B. In order to meet both of these connection points, an aerial crossing of the waterway is required.

See section 6.1.3 for additional information regarding minimizing impact from clearing activities.

8.1.10 If any of the following activities are proposed, provide the information as detailed on the applicable permit checklist:

- **New culvert placement:**
<https://dnr.wi.gov/topic/waterways/documents/PermitDocs/GPs/GP-CulvertWPEDesign.pdf>,
<https://dnr.wi.gov/topic/Waterways/documents/PermitDocs/IPs/IP-culvert.pdf>
(General Permit) or (Individual Permit).
- **New permanent bridge placement:**
<https://dnr.wi.gov/topic/waterways/documents/PermitDocs/GPs/GP-ClearSpanBridge.pdf>,
<https://dnr.wi.gov/topic/Waterways/documents/PermitDocs/IPs/IP-bridgeTempCross.pdf> (General Permit, no in-stream supports) or (Individual Permit, in-stream supports).
- **New storm water pond placed within 500 feet of a waterway:**
<https://dnr.wi.gov/topic/waterways/documents/PermitDocs/GPs/GP-StormwaterPond.pdf>.

None of the above regulated activities are proposed.

8.2 Wetland Activities

This section should be consistent with the waterways included in DNR Tables 1 and 2 and associated maps. This section should apply to the proposed and alternative sites/routes (if applicable) and their associated facilities (for example, off-ROW access roads, staging areas, permanent structures, new substations and/or expansion of existing substations (including associated driveways and permanent storm water management features to be constructed).

8.2.1 Describe the method(s) used to identify wetland presence and boundaries within the project area (i.e. wetland field delineation, wetland field determination, conservative desktop review, etc.). If conservative desktop review was the only method used to identify the presence of wetlands, state if any areas will be field-verified (and when). If a combination of methods were used, describe which project areas utilized which method. The associated delineation report and/or desktop review documentation should be uploaded to the PSC's website as part of the application filing.

Wetland delineation field surveys occurred at both proposed substations in August 2021. The wetland delineation report is provided as Appendix M. At the Boot Lake Substation,⁵ an approximately 6.8-acre area was surveyed. No desktop mapped wetlands (WWI or WDNR Wetland Indicators and Soils) are present within the survey area. Seven wetlands (w01 to w07) were identified in the survey area. At the Chain O Lakes Substation,⁶ an approximately 7.6-acre area was surveyed. A portion of the survey area has desktop mapped wetlands (WWI and WDNR Wetland Indicators and Soils) present. Three wetlands (w08 to w10) were identified in the survey area.

Within all other portion of the Project (the transmission line ROW (including both for line install and removal sections on-ROW access roads), the off-ROW access roads, the laydown yards, and the temporary workspaces for removal of the existing substations), the conservative desktop method is being applied. This means all area mapped as WWI and WDNR Wetland Indicators and Soils is assumed to be wetland. Wetland field surveys are proposed to occur in these portions of the Project prior to construction to confirm the location and extent of wetlands.

8.2.2 Identify the number of wetlands present and by wetland type, using the Eggers and Reed classification. Provide as an overall project total, as well as broken down by the proposed site and the alternative site(s) (if applicable) and their associated facilities.

In the Boot Lake Substation survey area, 7 wetlands (w01 to w07), comprised of hardwood swamp and fresh (wet) meadow wetland types, were identified. None of these wetlands will be impacted by the construction of the Boot Lake Substation. The substations new permanent footprint (including new permanent access drive) will be entirely located within the upland portions of the survey area.

In the Chain O Lakes Substation survey area, 3 wetlands (w08 to w10), comprised of alder thicket and fresh (wet) meadow wetland types, were identified. None of these wetlands will be impacted by the construction of the Chain O Lakes Substation. The substations new permanent footprint (including new permanent access drive) will be entirely located within the upland portions of the survey area.

⁵ In the wetland delineation report, the Boot Lake Substation site is referred to as the Lynn and Lenny Thoma site.

⁶ In the wetland delineation report, the Chain O Lakes Substation site is referred to as the Nancy Benson and NSP site.

There are no wetlands present within any of the four proposed laydown yards per available desktop resources.

There are also no wetlands present within the temporary workspaces associated with the removal of the existing Rest Lake and Presque Isle Substation per available desktop resources.

Within the transmission line ROW (including both for line install and removal segments on-ROW access roads) and the off-ROW access roads, the conservative desktop method is being applied. Using this method, a total of 44 wetlands were identified. The wetland types were assigned by the following method:

- In areas of WWI mapping, the wetland type listed in the data was assigned.
- In areas of WDNR Wetland Indicators Soils mapping, the wetland type was assigned via aerial imagery. Two wetland types were assigned, as “forested desktop wetland” or “herbaceous desktop wetland.”

8.2.3 Wetland functional values:

8.2.3.1 Discuss the existing functional values of the wetland present. Functional values include but are not limited to floristic diversity, fish and wildlife habitat, flood storage, water quality, groundwater discharge and recharge, public use, etc.

Many of the wetlands are located adjacent to road ditches and waterways and as such provide flood storage values. Floristic diversity is likely lessened due to impacts from the adjacent roads and road ROW maintenance. However, the roadside wetlands could provide an opportunity for diverse plant species. The wetlands could provide habitat for a variety of animal species as well. Public use is likely limited due to the adjacency to road ROW, but could provide more opportunity for public use farther away from the Project.

8.2.3.2 Discuss how the project may impact existing functional values of wetlands.

Adverse impacts to functional values are not anticipated. The majority of wetlands present are within or adjacent to road ROW and/or in existing distribution line corridor. As such, these wetlands have been previously influenced by road and utility construction, as well as maintenance activities associated with these corridors (i.e., moving, clearing). All temporary wetland impacts will be temporary in nature and restored to pre-construction conditions. Clearing is minimized to the extent possible by overlapping the existing distribution line corridor whenever possible.

8.2.3.3 Provide Wisconsin Rapid Assessment Methodology (WRAM) forms, or other assessment methodology documentation, if completed.

Wisconsin Rapid Assessment Methodology (WRAM) forms are not available at this time. Additional information for the wetlands present within the survey areas for the proposed substations can be found in the wetland delineation report provided as Appendix M.

8.2.4 Identify any wetlands in the project area that are considered sensitive and/or high-quality wetlands, including, but not limited to:

8.2.4.1 Any wetlands in or adjacent to an area of special natural resource interest (ASNRI) (NR 103.04, Wis. Adm. Code).

There are no wetlands located in or adjacent to areas of special natural resources interest (ASNRIs).

8.2.4.2 Any of the following types: deep marsh, northern or southern sedge meadow not dominated by reed canary grass, wet or wet-mesic prairie not dominated by reed canary grass, fresh wet meadows not dominated by reed canary grass, coastal marsh, interdunal or ridge and swale complex, wild rice-dominated emergent aquatic, open bog, bog relict, muskeg, floodplain forest, and ephemeral ponds in wooded settings.

High quality wetlands were observed during the wetland delineations completed at the two proposed substations. These include hardwood swamp wetlands dominated by native species and fresh (wet) meadows dominated by native sedges, as shown in the Wetland Delineation Report (Appendix M).

Wetland quality information is unknown for the portions of the Project utilizing the conservative desktop method. Information on wetland quality will be obtained during pending field investigations.

8.2.4.3 Any wetlands with high functional values based on factors such as abundance of native species and/or rare species, wildlife habitat, hydrology functions, etc.

See Section 8.2.4.2.

8.2.5 Provide the following:

8.2.5.1 The number of wetlands that would have construction matting placed within them to facilitate vehicle access and operation and/or material storage. Provide the total amount of wetland matting, in square feet.

A total of 33 wetlands are proposed to be temporarily impacted by the use of construction matting. To avoid soil mixing and/or rutting in wetlands, construction equipment will work from mats.

Matting is proposed for all temporary access roads (both on and off-ROW) in wetland, for which a 14-foot-wide width was applied. Temporary wetland impact from the placement of matting for access roads (including removal segments) is anticipated to be 4.12 acres, as shown in Appendix B, Table 8.

Matting is also proposed in the temporary disturbance area for installation of new pole structures. Each pole requires an approximate 50-foot-long by 50-foot-wide (2,500 square feet) area of temporary disturbance to support installation. Temporary wetland impact from the placement of construction matting for pole structure installation is anticipated to be 2.21 acres, as shown in Appendix B, Table 8.

If site conditions allow, such as during dry, stable, and/or frozen ground conditions, tracked and/or low ground pressure equipment will be utilized instead of matting to minimize wetland impact from vehicle and equipment access. However, Xcel is requesting wetland permit coverage on a worst-case scenario basis (reflected in Appendix B, Table 8) in case site conditions require construction matting within all portions of the temporary access roads and pole installations located in wetland.

8.2.5.2 The number of structures that would be constructed within wetlands. Indicate if structures are temporary or permanent. Provide the total square footage of permanent and temporary wetland impact for the placement of structures.

A total of 69 pole structures are proposed within wetland (wholly or partially). Temporary wetland impact associated with pole installation is discussed above in section 8.2.5.1. Each new structure would result in up to 7 square feet permanent disturbance (for poles entirely located in wetland). Permanent wetland impact from the placement of pole structures is anticipated to be 252.72 square feet (0.01 acre), as shown in Appendix B, Table 8.

Along the removal segments, existing poles in wetland will be cut at ground level.

8.2.5.3 How many wetlands will have permanent fill placed within them. Provide the total amount of permanent wetland fill, in square feet.

Permanent wetland fill would only occur from the placement of new pole structures (see section 8.2.5.2). New pole structures would be placed in 19 wetlands. The construction of both proposed substations gravel pads and permanent drives will be entirely located in upland areas.

8.2.5.4 How many shrub and/or forested wetlands would be cleared for construction. Provide the total amount of shrub and/or forested wetland conversion, in square feet.

A total of 42 shrub and/or forested wetlands are proposed to be cleared for construction.

The wetland conversion category does not include wetlands located in the existing distribution ROW, where it overlaps the Project, as they are no longer forested due to previous clearing. Similarly, the wetland conversion category does not include work within the removal segments, as it has also been previously cleared.

Wetland conversion is anticipated to be 15.52 acres, as shown in Appendix B, Table 8.

As noted in Section 8.2.2, where the conservative desktop method is being applied, wetland types were assigned via the wetland type listed in the WWI mapping data, or via aerial imagery (as forested or herbaceous) for areas mapped as WDNR Wetland Indicator Soils mapping. In some areas, the WWI mapping data lists multiple wetland types for an individual WWI polygon (i.e., “forested, emergent/wet meadow,” “shrub/scrub, emergent/wet meadow”). In these cases, the entire WWI polygon was assumed as all forested and/or all shrub type and the full area of the WWI polygon was utilized to calculate the wetland conversion impact in Appendix B, Table 8.

8.2.5.5 How many wetlands will be impacted and/or crossed by other construction activities regulated under 281.36 Wis. Stats. (i.e. road building activities such as grading and cutting, substation upgrades, new tie-ins, vehicle/equipment access across wetland resulting in soil mixing or soil rutting, etc.).

No other impact types are proposed to occur in wetlands than what is listed in sections 8.2.5.1 to 8.2.5.4.

8.2.5.6 For underground installation only: how many wetlands will be crossed by collection lines and specify the installation method (i.e. X wetlands will be bored, Y wetlands will be trenched, etc.).

Not applicable.

8.2.6 Describe the sequencing of matting placement in wetlands and the anticipated duration of matting placement in wetlands. For matting placed in any wetland for longer than 60 consecutive days during the growing season, prepare and submit a wetland matting restoration plan with the application filing.

Following clearing activities and the installation of sediment and erosion control measures, construction matting will be installed in all wetlands within designated access route (for both the installation and removal segments) and for pole installation activities, as needed per site conditions.

As noted in Section 8.2.5.1, if site conditions allow, such as during dry, stable, and/or frozen ground conditions, tracked and/or low ground pressure equipment will be utilized instead of matting to minimize wetland impact from vehicle and equipment access. However, Xcel Energy is requesting wetland permit coverage on a worst-case scenario basis (reflected in Appendix B,

Table 8) in case site conditions require construction matting within all portions of the temporary access roads and pole installations located in wetland.

It is not anticipated that the placement of construction matting in any wetland would exceed 60 consecutive days during the growing season.

8.2.7 For wetlands that will be open-cut trenched, provide the following:

8.2.7.1 Provide details on the total disturbance area in wetland, including how total wetland disturbance was calculated. Include the size of the trench (length, width, and depth), where stockpiled soils will be placed (i.e. in upland, in wetlands on construction mats, etc.), and where equipment will operate.

Not applicable.

8.2.7.2 Provide details on the proposed trench dewatering, including the method(s) that may be used (pumps, high capacity wells, etc.), how discharge will be treated, and where the dewatering structure will be located.

Not applicable.

8.2.7.3 Duration and timing of the work in wetlands.

Not applicable.

8.2.7.4 How the wetlands will be restored to pre-existing conditions.

Not applicable.

8.2.8 For wetlands that will be directionally bored, provide the following:

8.2.8.1 How bored wetlands and associated bore pits will be accessed.

Not applicable.

8.2.8.2 The location and size of any temporary staging and equipment storage.

Not applicable.

8.2.8.3 The location and size of bore pits and the distance from wetlands.

Not applicable.

8.2.8.4 Provide a contingency plan for bore refusal and a plan for the containment and clean-up of any inadvertent releases of drilling fluid (e.g. a frac-out).

Not applicable.

8.2.9 For wetlands that will be plowed, resulting in a discharge of fill (soil mixing and/or soil rutting), provide the following:

8.2.9.1 Provide details on the total disturbance area in wetland, including how total wetland disturbance was calculated.

Not applicable.

8.2.9.2 Duration and timing of the work in wetlands.

Not applicable.

8.2.9.3 How the wetlands will be restored to pre-existing conditions.

Note: Plowing through saturated or wet/soggy wetlands would likely result in soil mixing and rutting, and thus the plowing would then be 281.36 Wis. Stats. regulated activity.

Not applicable.

8.2.10 For wetlands that will be crossed/accessed by vehicle/equipment resulting in a discharge of fill (soil mixing and/or soil rutting), provide the following:

8.2.10.1 Details on the total disturbance area in wetland, including how total wetland disturbance was calculated.

Not applicable. Soil rutting and/or mixing will be avoided through the use of construction matting and/or working during frozen or stable conditions, as discussed in sections 8.2.5.1 and 8.2.6.

8.2.10.2 Duration and timing of the work in wetlands.

Not applicable. Soil rutting and/or mixing will be avoided through the use of construction matting and/or working during frozen or stable conditions, as discussed in sections 8.2.5.1 and 8.2.6.

8.2.10.3 How the wetlands will be restored to pre-existing conditions.

Note: Vehicle/equipment access through saturated or wet/soggy wetlands would likely result in soil mixing and rutting, and thus the plowing would then be 281.36 Wis. Stats. regulated activity.

Not applicable. Soil rutting and/or mixing will be avoided through the use of construction matting and/or working during frozen or stable conditions, as discussed in sections 8.2.5.1 and 8.2.6.

8.2.11 For wetland vegetation that will be cleared or cut for construction, provide the following:

8.2.11.1 Justification for why wetland trees and shrubs are proposed to be cleared, and what construction activity the clearing is associated with (e.g. transmission line installation, off-ROW access road, staging area, etc.).

Shrub and/or forested (woody) wetlands are proposed to be cleared to construct the transmission line. To minimize clearing impacts, the transmission line is located within or overlapping the existing 30-foot distribution line corridor whenever possible, which has been previously cleared.

Clearing of woody wetland will be limited to where the proposed 75-foot transmission line ROW corridor does not overlap the existing 30-foot distribution line corridor:

- Woody wetlands located within Project segments 1, 3, 7B, 9A, 16, 18, 20, and a portion of segment 22 will require up to 25 feet of clearing, as these segments overlap the existing 30-foot distribution corridor.
- Woody wetlands located within Project segments 4, 8-1, 11, 13, 17, 19, 21, a portion of segment 22, and 23 will require 75 feet of clearing, as these segments do not overlap the existing 30-foot distribution corridor.

Project segments 2, 5, 6A, 8, 10, 12, 12-2, and 13-1 do not have wetlands present and/or only have herbaceous type wetlands present. As such, woody wetland clearing will not occur.

Off-ROW access roads may require clearing, where necessary. Clearing of woody wetlands along off-ROW access roads is presented in Appendix B, Table 8 as the maximum amount necessary, if needed during construction.

Per delineation and available desktop data, there will be no impacts to wetlands for the proposed laydown yards, the construction of the two new substations, nor the removal of the two existing substations. As such, woody wetland clearing will not occur in any of these portions of the Project. Additionally, no woody wetland clearing impacts would occur in the removal segments, due to previous vegetation management for the existing distribution line.

8.2.11.2 The timing and duration of vegetation removal

Clearing is proposed to occur during the winter months when the ground would be frozen and/or stable. Clearing activities are anticipated to occur between October 15 and March 15.

8.2.11.3 Describe the type of equipment that will be used, and if the vegetation removal will result in soil disturbance, including rutting and soil mixing.

As stated in section 5.5.1, vegetation will be cut at or slightly above the ground surface using mechanized mowers, harvesters, or by hand. Root stocks will generally be left in place, except in areas where stump removal is necessary to facilitate the movement of construction vehicles, or as required by the landowner. Stump removal will not occur within wetlands.

Clearing is proposed to occur during the winter months when the ground would be frozen and/or stable. As such, clearing activities will not result in soil disturbances such as soil rutting and/or mixing.

8.2.11.4 The type of wetland and type of vegetation to be cleared.

A portion of the transmission line corridor overlaps the areas surveyed for the two new proposed substation sites. Per the wetland delineation report:

- Wetland w02 is a hardwood swamp type wetland. Dominant woody vegetation included black ash.
- Wetland W08 is an alder thicket type wetland. Dominant woody vegetation included American larch, speckled alder, and balsam fir.

The remainder of the Project is utilizing available wetland desktop resources. Woody wetland types per WWI data include scrub/shrub, emergent/wet meadow; forested, scrub/shrub; forested; forested, open water; forested, emergent/wet meadow; scrub/shrub; and scrub/shrub, emergent/wet meadow. WDNR Wetland Indicator Soils data was broken into two types via aerial imagery – herbaceous or forested. It is assumed the woody vegetation present may include ash, elm, maple, pine, and similar tree species.

8.2.11.5 State if tree and shrubs that are removed will be allowed to regrow or be replanted, or if cleared areas will be kept free of trees and shrubs long-term.

As stated in section 6.1.3, tall-growing vegetation may interfere with safe construction and safe and reliable operation of the transmission line. Specifically, woody vegetation will be removed as needed within the ROW for construction of the Project and managed through the operational life of the facility. Following construction, landowners may plant low growing species such as shrubs or grasses.

8.2.11.6 Indicate the plan for handling and disposing of the debris (brush piles, tree trunks, wood chips, etc.) resulting from vegetation clearing in wetlands. State if debris would

be removed from all wetlands to be cleared and disposed of in upland or other non-wetland locations.

Handling of clearing debris will be conducted in accordance with applicable permits and landowner preference. If the landowner's preference is to retain tree trunks, the trunks will be stacked in upland areas.

Where easily accessible (i.e., adjacent to public roads), clearing debris will be removed off-site. However, there may be situations where removal equipment may cause additional ground disturbance. As stated in section 6.1.3, the cut and scatter method may be used during construction in areas where limited clearing will occur. The purpose of this method is to limit the need for unnecessarily hauling and potentially disturbing the existing ground or vegetation. Likely situations where this method will be used are in shrub and brush areas with a limited number of trees. Limited numbers of trees in shrub wetlands may be disposed of in this manner as long as trees that are cut and scattered originate within the wetland.

8.2.11.6.1. If debris is not proposed to be removed from all wetlands during clearing, explain why disposal in non-wetland areas is not feasible.

Removal of clearing debris will be removed off-site or placed in upland areas whenever possible. However, there may be situations where removal equipment may cause additional ground disturbance, such as where not located near a public road. Unnecessary hauling can also spread invasive species to non-infested areas.

8.2.11.6.2. If debris is not proposed to be removed from all wetlands during clearing, state how debris left in wetland will not restrict re-vegetation growth, will not alter surface elevations, and will not obstruct water flow. If wood chips will be placed in wetlands, state the depth (in inches) proposed.

As stated in section 6.1.3, Chipping will not occur in wetlands or floodplains, with the exception of chipped material that is evenly scattered through the use of rubber-tracked blade mowers or ASV Posi-Track mower type equipment used to clear small diameter trees and shrubs. Chipped material left in wetland will not exceed a depth of 2 inches to ensure wetland vegetation can be re-established and wetland hydrology is not altered. Xcel will install signs in wetlands to alert construction crews that depth of chipping cannot exceed 2 inches.

8.2.11.6.3. If debris is not proposed to be removed from all wetlands during clearing, state how these wetlands will be monitored to ensure re-vegetation growth, surface elevations, and water flow are not impacted, and that the proposed depth of chip cover is adhered to. If re-vegetation growth becomes impeded, surface elevations become altered, and/or water flow

becomes obstructed from wood chip placement, state how these impacts will be addressed and corrected, if they should occur.

Xcel Energy will install signs in wetlands to alert construction crews that depth of chipping cannot exceed 2 inches. Additionally, Xcel Energy will employ an environmental monitor to work with the contractor to ensure any chips left in wetland will adhere to the 2-inch depth requirements and are spread evenly (not piled) to ensure chips are not impeding revegetation or altering hydrology.

If issues are observed from chips, Xcel Energy would discuss remediation options with the WDNR. Remediation options include removal of excess chips by hauling to an upland location or off-site or using a skidsteer to push them into an adjacent upland.

8.2.12 Provide the methods to be used for avoiding, minimizing, and mitigating construction impacts in and near wetlands.

This discussion should include, but is not limited to, how wetland impact was first avoided then minimized by shifting the project boundary, relocating structures and/or fill outside of wetland, minimizing construction ROW through wetland, by installation methods (i.e. directional bore versus open-cut trenching, soil segregation during trenching, etc.), equipment crossing methods (i.e. use of construction matting, frozen ground conditions, etc.), sediment and erosion controls, invasive species protocols for equipment, etc. Additional guidance to prepare this discussion can be found here: <https://widnr.widen.net/s/fxdd8pmgg/paasupp3utility>.

During route selection, environmental and other factors were evaluated along all potential routes as described in Section 5.1. Potential wetland impacts were taken into consideration along with other environmental and social impacts, input from the preceding open houses, engineering feasibility, and cost as described in Section 5.1.

The purpose of the Project is to improve electric reliability to communities in northern Wisconsin. A number of factors were considered during the routing process including, but not limited to the following:

- Cost - relative to wetland avoidance.
- Available technology - materials and construction methods that can be employed to minimize impacts on wetlands for example.
- Logistics - weighing wetland avoidance with factors such as proximity to homes and other buildings, regulation-based design, and benefits of collocation.

However, complete avoidance of wetlands is not feasible due to the frequency of occurrence and number of line miles for this Project. Therefore, Xcel Energy was unable to identify a practicable alternative that would entirely avoid wetland impacts.

Through careful attention to access routing, consideration of off-ROW access, types of equipment used, construction time of year, sedimentation control, and the implementation of other relevant site-specific measures, Xcel Energy will minimize impacts to wetlands, to the extent practicable in each case.

The proposed route segments have been selected to avoid and minimize wetland impacts to the extent practicable. However, given the structure spanning requirements, wetland impacts cannot be completely avoided. Furthermore, a shorter span length (300 feet) is required to accommodate the distribution underbuild proposed for the entire transmission line, compared to a typical 400-foot span without distribution underbuild. This distance is dependent upon several factors, including topography and ROW constraints which can restrict Xcel Energy's flexibility to completely avoid structure placement in wetlands.

The number of structures preliminarily determined to be placed in wetlands, as shown in Appendix B Table 8, represents a conservative estimate based on the conceptual pole locations. Upon route approval, Xcel Energy will attempt to further minimize wetland impacts in the final design. For example, where possible, efforts will be made to move structures near a wetland edge to outside of the wetland. However, based on the number and extent of wetlands along each route, complete avoidance of wetlands may not be practicable.

Much of the route will overlap and existing 30-foot distribution line corridor, reducing wetland conversion impacts associated with the Project. Fragmentation of undisturbed wetlands will be minimized due to the collocation of the transmission with the existing distribution corridor and public roads. Stump removal will not occur in wetland areas. Clearing activities will be scheduled during winter months, during frozen and/or stable conditions, to minimize ground disturbance.

Prior to the start of construction, the boundaries of wetlands and other sensitive environmental sites will be marked to alert construction crews. During construction, the implementation of BMPs and Xcel Energy's standard environmental protection practices will provide for further avoidance and minimization of wetland impacts. Sediment and erosion control measures and devices will be installed prior to ground disturbing activities and maintained until restoration is achieved. Measures will also be taken to minimize the spread of invasive species, as discussed in Section 6.6.

Access through wetlands will be minimized to the extent practicable, and the use of heavy equipment in wetlands will also be minimized to the extent practicable. When wetland access is required, disturbance to wetlands will be reduced by one or more of the following: completing wetland construction during dry or frozen conditions; the use of equipment with low ground pressure tires or tracks; placement of construction matting to help minimize soil and vegetation disturbances; distributing axle loads over a larger surface area thereby reducing the bearing pressure on wetland soils; or the use of ice roads. The width of access roads has also been reduced to 14-foot-wide to minimize disturbance.

Construction will result in 252.72 square feet (0.01 acres) of permanent loss of wetlands along the length of the Project from the installation of pole structures. Both proposed substations will be constructed entirely in uplands areas. Additionally, all proposed laydown yards are also located entirely in upland areas.

Compensatory wetland mitigation options that meet regulatory requirements will be developed in coordination with the appropriate agencies.

Upon completion of the transmission line, Xcel Energy will complete site restoration and revegetation, further discussed in Section 8.2.14.

8.2.13 Indicate if an environmental monitor will be employed during project construction and restoration activities. If so, describe the monitors roles and responsibilities, frequency of visits, etc.

During construction, Xcel Energy is proposing to employ an environmental inspector on the Project. It is anticipated the inspector will be present on-site 2-3 days per week, during all phases of the Project to help ensure compliance with the regulatory requirements of the Project.

Responsibilities of the environmental inspector include but are not limited to:

- Verifying that the limits of the ROW corridor are visibly marked before clearing, and maintained throughout construction;
- Verifying the location of signs and highly visible flagging marking the boundaries of sensitive resource areas, such as wetlands and waterways;
- Confirming the requirements of clearing activities, including depth of chips, in wetland are adhered to;
- Ensuring that sediment and erosion control devices are properly installed to prevent sediment flow into sensitive environmental resource areas such as wetlands and waterways, and determining the need for additional erosion control devices;
- Inspecting and ensuring the maintenance of temporary erosion control measures per applicable permit requirements.
- Ensuring the repair of all ineffective temporary erosion control measures within 24 hours of identification, or as soon as conditions allow;
- Overseeing the implementation of restoration activities to ensure restoration goals are achieved; and
- Keeping records of compliance with the environmental conditions federal, state, and local environmental permits during active construction and restoration.

8.2.14 Describe how all wetlands within the project area will be restored. This discussion should include details on the seeding plan, maintenance and monitoring, restoring elevations and soil profiles, restoring wetland hydrology, etc.

The need for and approach to site restoration and re-vegetation will be based on the degree of disturbance caused by construction activities and the ecological setting of each site, and will need to reflect and satisfy the requirements of the property owner. If construction can be accomplished without creating appreciable soil disturbance, restoration may not require active re-vegetation efforts if the Project areas would restore naturally. Restoration activities will be implemented following the completion of construction activities. These activities will begin as soon as practical and as allowed by seasonal conditions.

Wetlands will be restored to pre-construction conditions, including elevations, hydrology patterns, and vegetation. Upon removal of construction mats, each matted wetland location will be inspected by the environmental inspector to document site conditions and determine the appropriate restoration requirements.

If bare or exposed ground is **not** observed upon mat removal, wetlands will be allowed to re-vegetate naturally using the existing seedbank.

If bare, exposed ground is observed upon mat removal, wetlands will be seeded with a cover crop (e.g., annual oats, annual rye) to stabilize and help prevent invasive species infestation while allowing the natural seedbank to establish perineal vegetation and achieve revegetation standards. If mat removal occurs during the non-growing season, but prior to snow cover, a dormant seed will be used for quick growth in the following spring.

Changes to the existing hydrology and soil compaction are not anticipated from the placement of construction matting. This conclusion is based on past project experience where matting has been installed in wetland areas. Typically, the placement of matting is a best management practice (BMP) used to maintain hydrology and reduce soil disturbance (i.e., soil mixing, soil rutting, and soil compaction) in wetlands.

Wetland soil compaction will be evaluated upon the removal of mats. Wetland compaction will be evaluated within the areas matted by comparing to adjacent, non-matted area. If significant compaction has occurred, Xcel Energy will discuss alleviation options with the WDNR that will minimize impact to wetlands as much as practicable. The first option would be to allow for a natural freeze and thaw cycle to de-compact the soils, as re-grading or tilling would likely cause additional disturbance and discharge to wetlands.

Following the implementation of restoration activities, the environmental monitor will continue to monitor the restored areas weekly for compliance with Stormwater permit requirements and until wetland restoration performance standards are achieved. The following performance standards must be met to consider the site successfully restored where wetland areas are impacted by construction activities:

1. Vegetative cover of 70 percent uniform perennial vegetation.
2. Geomorphic wetland position shall be the same post-mat removal and may not be the result of soil compaction.
3. Surface water presence must be consistent with adjacent non-matted wetland areas post-mat removal.

8.3 Mapping Wetland and Waterway Locations, Impacts, and Crossings

Provide the following map sets, as described below, for each proposed and alternative sites/routes (if applicable) and their associated components. Each map set should include an overview or index page that includes page extents for the corresponding smaller-scale map pages within the remainder of the map set. The smaller-scale map pages should show the project and resources in greater detail, include pages numbers to reference to the overview page, and have consistent scales throughout the pages.

8.3.1 Aerial Map Imagery showing the following:

- Delineated wetlands, labeled with the feature unique ID,
- Wisconsin Wetland Inventory (“Mapped Wetlands” SWDV layer) and hydric soils (“Wetland Indicators & Soils” SWDV layer), if a delineation was not conducted,
- DNR-mapped waterways, labeled with the feature unique ID,
- Field identified waterways, labeled with the feature unique ID,
- Vehicle crossing method of waterways for both permanent and temporary access, labeled by the crossing method (i.e. TCSB, installation of culvert, installation of bridge, installation of ford, use of existing culvert, use of existing bridge, use of existing ford, driving on the bed),
- ROW,
- Locations of temporary and permanent structures,
- Transmission line route,
- Segment names and nodes,
- Access paths (both on and off-ROW). Off-ROW access roads should be labeled with an identifying name or number,
- Staging areas, laydowns, and any temporary workspaces, such as crane pads(labeled with identifying name or number),
- Footprint of new substations and/or footprint of existing substations to be expanded, and associated driveways and permanent storm water management features to be built (ponds, swales, etc.),
- Placement of construction matting in wetlands,
- Underground line installation only: symbolize the line route to indicate installation method (directional bore, open-cut trench, plow etc.). This includes the excavation areas in wetlands (i.e. bore pits, open-cut trench, etc.), and;

- **Locations of any other waterway or wetland impacting activity regulated under Wis. Stats. Chapter 30 and 281.36.**

See Appendix A, Figure 5 for a map showing Project construction activities, wetlands, waterways, and proposed impacts to these features.

8.3.2 A map showing which method(s) were used to identify wetland presence and boundaries within the project area (i.e. wetland field delineation, wetland field determination, conservative desktop review).

See Appendix A, Figure 5, which includes the surveyed areas at both proposed substation sites. As noted in section 8.2.1 and 8.2.2, the conservative desktop method was applied for all other portion of the Project including the transmission line ROW corridor for line install and removal, off-ROW access roads, proposed laydown yards, and temporary workspaces for removal of the existing substations).

9.0 ENDANGERED, THREATENED, SPECIAL CONCERN SPECIES AND NATURAL COMMUNITIES

9.1 Provide a copy of the completed ER screening and all supporting materials for all project areas, including all applicable components such as off-ROW access routes, staging areas, new substations, and expansion of existing substations.

ER Reviews have been reviewed and approved by the WDNR (log #s 21-447 and 23-200) with required and recommended actions for various species. Due to confidentiality requirements of NHI data, a public (redacted) version is provided in Appendix I, and the full review was provided to the PSC under a separate and confidential filing.

9.2 Submit results from habitat assessments and biological surveys for the proposed project, if completed or if required to be completed per the ER screening. If surveys or assessments are required to be completed prior to construction but have not yet been completed, state when these surveys will be completed. Results from additional surveys conducted during the review of the application, prior to the start of construction, and/or post-construction must be submitted as they are completed.

Xcel Energy conducted a field-based habitat assessment in August 2021 to identify potential suitable habitat for 8 rare species based on the results of a review of the Project area in the WDNR NHI portal. The habitat assessment report was provided to the WDNR on February 10, 2023.

9.3 Species as identified in the completed ER screening and/or field assessments.

9.3.1 For any required follow-up actions that must be taken to comply with endangered species law, discuss how each required action would affect the proposed project, and how the required action would be complied with.

See Section 6.5.3.1 for a discussion of the required actions that will be implemented for the Project.

9.3.2 For any recommended follow-up actions to help conserve Wisconsin's rare species and natural communities, discuss if and how any recommended actions would be incorporated into the proposed project.

See Section 6.5.3.2 for a discussion of the avoidance and minimization measures recommended as follow-up actions to help conserve rare species and natural communities.

9.3.3 If any recommended follow-up actions are not planned to be incorporated into project construction or operation, state the reasons why.

Not applicable.

9.4 Provide communications with DNR and U.S. Fish and Wildlife Service, as applicable.

Based on the results of the ER Review, Xcel Energy will implement various required and recommended avoidance measures in areas of suitable habitat for various species. Those measures include avoiding work within suitable habitat during the sensitive timing windows for various bird and reptile species, or conducting surveys to determine presence/absence if timing windows are not feasible. Xcel Energy will also implement various BMPs to avoid or minimize impacts to various natural communities, as applicable. In addition, Xcel Energy will conduct a review of suitable habitat areas prior to construction to ensure no new bald eagle nests are present within 660 feet of the Project area (i.e., the disturbance buffer provided in the USFWS' National Bald Eagle Management Guidelines).

10.0 REFERENCES

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