

Addendum to the Environmental Assessment Prepared for the Big Stone South to Alexandria to Big Oaks 345 kV Transmission Project

PUC Docket Nos. ET10/TL-23-159 & E015/CN-22-538

OAH Docket No. 25-2500-39723

June 10, 2024

Submitted by the Minnesota Department of Commerce, Energy Environmental Review and Analysis

On May 29, 2024, the Minnesota Department of Commerce, Energy Environmental Review and Analysis (EERA) unit completed and made available the Environmental Assessment (EA) prepared for the Big Stone South to Alexandria to Big Oaks 345 kV Transmission Project.

The EA analyzes the human and environmental impacts of the project to facilitate two decisions by the Minnesota Public Utilities Commission – a certificate of need (CN) for the entire project (Big Stone South to Alexandria to Big Oaks) and a route permit for the Eastern Segment (Alexandria to Big Oaks).

Following issuance of the EA, EERA staff identified amendments necessary to ensure that readers of the EA clearly understand that the EA addresses the entirety of the project for CN purposes. These amendments are shown in Attachment A. The amendments do not affect the analysis in EA. They are intended to clarify that the project, for CN purposes, is the entire project from Big Stone South to Alexandria to Big Oaks.

Additionally, EERA has identified amendments necessary to ensure that readers of the EA can accurately compare the potential impacts of the project to other system alternatives. The EA, as issued, focuses most of its analysis on the Eastern Segment of the project. To provide a complete picture of the potential impacts of the project as a whole, additional informational is needed for the Western Segment (Big Stone South to Alexandria). Amendments to provide this information are shown in Attachment B. The amendments do not affect the analysis in the EA. They do provide additional, general information about the potential impacts of the project in the Western Segment.

With this letter and filing, EERA staff incorporates Attachments A and B into the EA as amendments to the document.

Attachment A

Addendum to the Environmental Assessment Prepared for the Big Stone South to Alexandria to Big Oaks 345 kV Transmission Project
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Environmental Assessment for the Big Stone – Alexandria – Big Oaks 345 kV Transmission Project		
Page Number/ Chapter	Original EA Text	Amended Text
Cover Page	<p>Environmental Assessment: Alexandria to Big Oaks 345 kV Transmission Project The Human and Environmental Impacts of Stringing Over 100 Miles of New 345 kV Transmission Line on Existing Structures to the Proposed Big Oaks Substation.</p>	<p>Environmental Assessment: Big Stone South to Alexandria to Big Oaks 345 kV Transmission Project The Human and Environmental Impacts of a new 345 kV Transmission Line from Big Stone South Substation to Big Oaks Substation.</p>
Project Contacts Page	<p>The applicants propose to string approximately 105-108 miles of 345 kV transmission line on existing double-circuit capable structures from the existing Alexandria Substation in Alexandria, Douglas County to the proposed Big Oaks Substation on the north side of the Mississippi River in Becker, Sherburne County, Minnesota. New transmission lines will be required to cross the Mississippi River to connect the new transmission line to the Big Oaks Substation. The applicants must obtain a certificate of need and a route permit from the Minnesota Public Utilities Commission before it can construct the proposed project.</p>	<p>The applicants have applied for a Certificate of Need from the Minnesota Public Utilities Commission (Commission) for the portion of the Big Stone South – Alexandria – Big Oaks 345 kilovolt (kV) Transmission Project located within Minnesota (the Project). The Project consists of new 345 kV transmission facilities between Big Stone City, South Dakota, and Sherburne County, Minnesota which will be comprised of two segments: (1) the western segment will run from the existing Big Stone South Substation near Big Stone City, South Dakota to the existing Alexandria Substation near Alexandria, Minnesota (West Segment); and (2) the eastern segment will continue from the existing Alexandria Substation to the Riverview Substation to a new Big Oaks Substation in Sherburne County, Minnesota (East Segment). The applicants have also applied for a Route Permit for the East Segment. A Route Permit for the West Segment is expected to be filed in late 2024. The applicants must obtain both a certificate of need and a route permit for each segment of the Project.</p>

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Page Number/ Chapter	Original EA Text	Amended Text
p. 6/Chapter 1	The applicant filed a combined CN and route permit application (hereinafter “route permit application” or “application”) on September 29, 2023. The Commission determined that the application was substantially complete on October 4, 2023.	The applicants filed a Certificate of Need for the Project on September 29, 2023, and filed a route permit application for the East Segment on the same day. The Commission determined that both applications were substantially complete on December 5, 2023, and ordered joint hearings and combined environmental review of the certificate of need and route permit. For the Certificate of Need, the Commission ordered that the Department of Commerce, Energy Environmental Review (EERA) unit prepare an environmental assessment in lieu of an environmental report.
p. 6/Chapter 1	The project is currently scheduled to be placed in service by the fourth quarter of 2027.	The East Segment of the Project is scheduled to be placed in service by the fourth quarter of 2027. The West Segment of the Project is scheduled to be placed in service in either 2030 or 2031.
p. 6/Chapter 1	The applicant applied to the Commission for a CN and route permit for the project in June 2023.	The applicants applied to the Commission for a Certificate of Need for the Project in September 2023 and, on the same day, also applied to the Commission for a route permit for the East Segment of the Project.
pp. 6 and 10/Chapter 1	If the project is needed, what conditions should be placed on the route permit?	If the project is needed, what route should be selected and what conditions should be placed on the route permit?
p. 14/ Chapter 1	The Commission is expected to make a CN and route permit decision in the summer of 2023.	The Commission is expected to make a CN and route permit (East Segment) decision in the fall of 2024.

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p. 25/ Chapter 3	<p>The applicants propose to string approximately 105-108 miles of 345 kV transmission line on existing double-circuit capable structures from the existing Alexandria Substation in Alexandria, Douglas County to the proposed Big Oaks Substation on the north side of the Mississippi River in Becker, Sherburne County, Minnesota. New transmission lines will be required to cross the Mississippi River to connect the new transmission line to the Big Oaks Substation. This chapter describes the project and the three route alternatives to the project proposed by the DNR (DNR Alternatives 1-3). This includes how they would be constructed, operated, and maintained. Unless otherwise noted, the source of information for this chapter is the combined certificate of need and route permit application.</p>	<p>For the West Segment, the Applicants propose a new single-circuit 345 kV transmission line that will be placed on double-circuit capable structures from the existing Big Stone South Substation near Big Stone City, South Dakota to the existing Alexandria Substation near Alexandria, Minnesota. For the East Segment, the applicants propose to string approximately 105-108 miles of 345 kV transmission line on existing double-circuit capable structures from the existing Alexandria Substation in Alexandria, Douglas County to the proposed Big Oaks Substation on the north side of the Mississippi River in Becker, Sherburne County, Minnesota. New transmission lines will be required to cross the Mississippi River to connect the new transmission line to the Big Oaks Substation. This chapter describes the project and the three route alternatives to the East Segment of the project proposed by the DNR (DNR Alternatives 1-3). This includes how the Project will be constructed, operated, and maintained. Unless otherwise noted, the source of information for this chapter is the certificate of need and route permit applications.</p>

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p. 25/Chapter 3	<p>The project runs from Alexandria to Becker where a second circuit will be strung on existing transmission lines structures (Appendix B, Map 3). New foundations and poles will be required along parts of this alignment as described later in this section. Townships, Ranges, and Sections within this entire route can be found in Table 2.1-1 of the Route Permit Application. The project will also deviate from the existing infrastructure in three other places to accommodate 0.2 miles of new HVTL to tap into the Alexandria Substation, reconfiguration with 0.5 miles of new HVTL to bypass the Riverview Substation, and reconfiguration with 0.2 miles of new HVTL to bypass the Quarry Substation (Appendix B, Maps 5A-5C).</p> <p>The majority of the project that will be newly built is north of Interstate 94 and south of U.S. Highway 10, bisected by the Mississippi River near both Becker and Monticello (Appendix B, Map 2A).</p>	<p>The West Segment of the Project runs from Big Stone City, South Dakota to Alexandria, Minnesota. The East Segment of the Project runs from Alexandria to Becker where a second circuit will be strung on existing transmission lines structures (Appendix B, Map 3). New foundations and poles will be required along parts of this alignment as described later in this section. Townships, Ranges, and Sections within this entire proposed route for the East Segment can be found in Table 2.1-1 of the Route Permit Application. The East Segment of the project will also deviate from the existing infrastructure in three other places to accommodate 0.2 miles of new HVTL to tap into the Alexandria Substation, reconfiguration with 0.5 miles of new HVTL to bypass the Riverview Substation, and reconfiguration with 0.2 miles of new HVTL to bypass the Quarry Substation (Appendix B, Maps 5A-5C).</p> <p>The majority of the East Segment of the project that will be newly built is north of Interstate 94 and south of U.S. Highway 10, bisected by the Mississippi River near both Becker and Monticello (Appendix B, Map 2A).</p>

Environmental Assessment for the Big Stone – Alexandria – Big Oaks 345 kV Transmission Project		
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p. 26/Chapter 3	<p>There are certain locations where new structures will be required, approximately 67 to 78 in total depending on the River Crossing selected for the project. These would be needed in select areas along the existing infrastructure to accommodate angles (i.e., where the alignment turns), highway crossings, or where the anticipated alignment deviates from the existing infrastructure (e.g., substation bypasses, new substation taps and the Mississippi River crossing).</p>	<p>The West Segment of the 345 kV transmission line will be constructed on steel, single pole (monopole) double-circuit capable structures. Certain locations along the West Segment may include multiple poles or other specialty structures, such as angles, along highways, or environmentally sensitive areas. These specialty and multiple pole structures (including H-frame or three-pole structures) may be used at any point along the route to accommodate large angles where the transmission line route changes direction or any other potential constraints that may be encountered along the route.</p> <p>The majority of the East Segment of the Project involves adding a second 345 kV circuit to existing double-circuit capable transmission structures within the existing 150-foot right-of-way. There are certain locations where new structures will be required, approximately 67 to 78 in total depending on the River Crossing selected for the project. These would be needed in select areas along the existing infrastructure to accommodate angles (i.e., where the alignment turns), highway crossings, or where the anticipated alignment deviates from the existing infrastructure (e.g., substation bypasses, new substation taps and the Mississippi River crossing).</p>

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p. 26/Chapter 3	Xcel Energy will be responsible for the construction of the proposed 345 kV transmission circuit and for the maintenance of the 345 kV transmission circuit from the Quarry Substation to the Big Oaks Substation. The equipment and improvements required inside the Quarry Substation and the new Big Oaks Substation will be owned solely by Xcel Energy.	<p>The East Segment will be jointly owned by Xcel Energy, Great River Energy, Minnesota Power, Otter Tail, and Western Minnesota. As the Project Manager for the East Segment, Xcel Energy will be responsible for the construction of this portion of the proposed 345 kV transmission circuit. On the East Segment, Great River Energy is expected to be responsible for the maintenance of the 345 kV transmission circuit from the Alexandria Substation to the Quarry Substation, located west of St. Cloud, and Xcel Energy is expected to be responsible for the maintenance of the 345 kV transmission circuit from the Quarry Substation to the Big Oaks Substation.</p> <p>The West Segment will be jointly owned by Otter Tail and Western Minnesota. As the Project Manager for the West Segment, Otter Tail will be responsible for the construction and maintenance of this portion of the proposed 345 kV transmission circuit. The equipment and improvements required inside the Big Stone South Substation in South Dakota will be owned solely by Otter Tail. The equipment and improvements required inside the Alexandria Substation will be owned solely by Western Minnesota. The equipment and improvements required inside the Riverview Substation will be owned solely by Great River Energy. The equipment and improvements required inside the Quarry Substation will be owned solely by Xcel Energy. The new Big Oaks Substation will be owned solely by Xcel Energy. Each party will be responsible for the construction and maintenance of its own substation.</p>
p. 37/Chapter 3	The applicants anticipate beginning construction in the fourth quarter of 2024 or first quarter of 2025 with completion in the fourth quarter of 2027. The project is scheduled to be in service	The applicants anticipate beginning construction in the East Segment in the fourth quarter of 2024 or first quarter of 2025 and this segment is expected to be in service by the fourth quarter of 2027. Otter Tail and MRES anticipate beginning construction in the West Segment in the

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	by the fourth quarter of 2027. Table 5 shows the applicants’ estimate of development and construction milestones.	<p>third quarter of 2027 or third quarter of 2028 and this segment is expected to be in service in the fourth quarter of 2030 or the fourth quarter of 2031. Table 5a shows the applicants’ estimate of development and construction milestones for the East Segment and Table 5b shows the applicants’ estimate of development and construction milestones for the West Segment.</p> <p>Table 5a: Anticipated East Segment Project Schedule</p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Estimated Dates</th> </tr> </thead> <tbody> <tr> <td>Minnesota Certificate of Need and Route Permit for Eastern Segment Issued</td> <td>Second/Third Quarter 2024</td> </tr> <tr> <td>Land Acquisition Begins</td> <td>Third Quarter 2024</td> </tr> <tr> <td>Survey and Transmission Line Design Begins</td> <td>Second Quarter 2024</td> </tr> <tr> <td>Other Federal, State, and Local Permits Issued</td> <td>First Quarter 2025</td> </tr> <tr> <td>Start Right-of-Way Clearing</td> <td>Second Quarter 2025</td> </tr> <tr> <td>Start Project Construction</td> <td>Second Quarter 2025</td> </tr> <tr> <td>Project In-Service</td> <td>Fourth Quarter 2027</td> </tr> </tbody> </table> <p>Table 5b: Anticipated West Segment Project Schedule</p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Estimated Dates</th> </tr> </thead> <tbody> <tr> <td>Minnesota Certificate of Need Issued</td> <td>Second/Third Quarter 2024</td> </tr> <tr> <td>Minnesota Route Permit for Western Segment Filed</td> <td>Fourth Quarter 2024</td> </tr> <tr> <td>Minnesota Route Permit for Western Segment Issued</td> <td>Fourth Quarter 2026</td> </tr> <tr> <td>Land Acquisition Begins</td> <td>First Quarter 2026/First Quarter 2027</td> </tr> <tr> <td>Survey and Transmission Line Design Begins</td> <td>First Quarter 2027/First Quarter 2028</td> </tr> <tr> <td>Other Federal, State, and Local Permits Issued</td> <td>Second Quarter 2027/Second Quarter 2028</td> </tr> <tr> <td>Start Right-of-Way Clearing</td> <td>Third Quarter 2027/Third Quarter 2028</td> </tr> <tr> <td>Start Project Construction</td> <td>Third Quarter 2027/Third Quarter 2028</td> </tr> <tr> <td>Project In-Service</td> <td>Fourth Quarter 2030/Fourth Quarter 2031</td> </tr> </tbody> </table>	Activity	Estimated Dates	Minnesota Certificate of Need and Route Permit for Eastern Segment Issued	Second/Third Quarter 2024	Land Acquisition Begins	Third Quarter 2024	Survey and Transmission Line Design Begins	Second Quarter 2024	Other Federal, State, and Local Permits Issued	First Quarter 2025	Start Right-of-Way Clearing	Second Quarter 2025	Start Project Construction	Second Quarter 2025	Project In-Service	Fourth Quarter 2027	Activity	Estimated Dates	Minnesota Certificate of Need Issued	Second/Third Quarter 2024	Minnesota Route Permit for Western Segment Filed	Fourth Quarter 2024	Minnesota Route Permit for Western Segment Issued	Fourth Quarter 2026	Land Acquisition Begins	First Quarter 2026/First Quarter 2027	Survey and Transmission Line Design Begins	First Quarter 2027/First Quarter 2028	Other Federal, State, and Local Permits Issued	Second Quarter 2027/Second Quarter 2028	Start Right-of-Way Clearing	Third Quarter 2027/Third Quarter 2028	Start Project Construction	Third Quarter 2027/Third Quarter 2028	Project In-Service	Fourth Quarter 2030/Fourth Quarter 2031
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p. 38/Chapter 3	Costs are dependent upon routing option. Table 6 below provides itemized cost estimates. These estimates are engineering estimates because regulatory approvals are secured prior to contracting with a vendor and finalizing material orders. In aggregate, the Alexandria to Big Oaks 345 kV Transmission Project is anticipated to cost approximately \$209.5 to \$238.2 million.	<p>Costs are dependent upon routing option. Table 6 below provides itemized cost estimates. These estimates are engineering estimates because regulatory approvals are secured prior to contracting with a vendor and finalizing material orders. In aggregate, the Big Stone South to Alexandria to Big Oaks 345 kV Transmission Project is anticipated to cost approximately \$606.5 to \$699.4 million (2022\$).</p> <p>Table 6: Estimated Project Costs</p> <table border="1"> <thead> <tr> <th>Project Components</th> <th>Low Capital Expenditures (2022\$) (\$Millions)</th> <th>High Capital Expenditures (2022\$) (\$Millions)</th> </tr> </thead> <tbody> <tr> <td>Big Stone South – Alexandria 345 kV Transmission Line</td> <td>\$385.0</td> <td>\$441.2</td> </tr> <tr> <td>Big Oaks – Alexandria 345 kV Transmission Line</td> <td>\$123.1</td> <td>\$130.9</td> </tr> <tr> <td>Big Stone South Substation Modifications</td> <td>\$12.0</td> <td>\$20.0</td> </tr> <tr> <td>Alexandria Substation Modifications</td> <td>\$20.0</td> <td>\$28.0</td> </tr> <tr> <td>Riverview Substation Modifications</td> <td>\$3.0</td> <td>\$3.0</td> </tr> <tr> <td>Quarry Substation Modifications</td> <td>\$3.0</td> <td>\$4.0</td> </tr> <tr> <td>New Big Oaks Substation</td> <td>\$60.4</td> <td>\$72.3</td> </tr> <tr> <td>Total Project Costs*</td> <td>\$606.5</td> <td>\$699.4</td> </tr> </tbody> </table> <p><i>*There may be differences between the sum of the individual component amounts and Total Project Costs due to rounding</i></p>	Project Components	Low Capital Expenditures (2022\$) (\$Millions)	High Capital Expenditures (2022\$) (\$Millions)	Big Stone South – Alexandria 345 kV Transmission Line	\$385.0	\$441.2	Big Oaks – Alexandria 345 kV Transmission Line	\$123.1	\$130.9	Big Stone South Substation Modifications	\$12.0	\$20.0	Alexandria Substation Modifications	\$20.0	\$28.0	Riverview Substation Modifications	\$3.0	\$3.0	Quarry Substation Modifications	\$3.0	\$4.0	New Big Oaks Substation	\$60.4	\$72.3	Total Project Costs*	\$606.5	\$699.4
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pp. 42-43/Chapter 4	The project is between the City of Alexandria in Douglas County and the City of Becker in Sherburne County, Minnesota along I-94 (Appendix B, Map 3).	The Project is between Big Stone City, South Dakota to the City of Becker in Sherburne County, Minnesota (Appendix B, Map 1).																											

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The text of this attachment is a new section entitled “Potential Impacts of the Proposed Project.” It is inserted in Chapter 7 of the EA, page 176, *after* the following text:

These alternatives are commonly referred to as system alternatives. This chapter discusses whether these system alternatives are feasible (whether they can be engineered, designed, and constructed) and available (whether the alternative is readily obtainable and at the appropriate scale) and, if so, whether they can meet the need for the project. Additionally, this chapter discusses the potential human and environmental impacts of the alternatives, particularly in comparison to the project.

And *before* the following text:

Need for the Project

The applicants indicate that the project is needed to provide benefits to the Midwest subregion of the MISO footprint by facilitating more reliable, safe, and affordable energy delivery. The current 345 kV transmission system is at capacity which leads to several reliability concerns that could affect customers’ service. The project intends to provide additional transmission capacity, mitigate current capacity issues, and improve electric system reliability throughout the region as more renewable energy resources are added to the electric system in and around the region.

Potential Impacts of the Proposed Project

The discussion here of system alternatives compares the potential human and environmental impacts of the alternatives to the proposed project. The potential impacts of the Eastern Segment of Project are discussed in Chapters 4 and 5. The potential impacts of the Western Segment, shown in Map 1 in Appendix B, are discussed here. By necessity, as there is not a proposed route for the Western Segment, the discussion of potential impacts is general in nature. Before construction can commence on the Western Segment, a route permit will need to be issued by the Commission. As part of the route permit proceeding, an environmental impact statement will be prepared for the Western Segment that will evaluate the potential impacts of the route alternatives being considered for the Western Segment in further and greater detail.

Environmental Setting

The Western Segment begins at the South Dakota/Minnesota border and, depending on the approved route, could travel through a portion of Big Stone County, Lac Qui Parle County, Swift County, Stevens County, Pope County, Grant County, and Douglas County before terminating at the existing Alexandria Substation near Alexandria, Minnesota.

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The landscape of the Western Segment consists of generally level to slightly undulating landforms that were once tallgrass prairie. Agricultural fields now dominate this portion of the Project Study Area. Major rivers in the Western Segment include the Chippewa River, Pomme de Terre River, and the Minnesota River. Larger cities in the Western Segment include Glenwood, Ortonville, Benson, Starbuck and Alexandria.

Human Settlement

High voltage transmission lines have the potential to impact human settlements. Impacts might be short-term, such as noise during construction, or long-term, such as changes to the aesthetics in the project area.

Human settlements within the Western Segment includes municipalities, farmsteads, rural residences, utility infrastructure, roadways, and commercial and industrial areas. Publicly available information was reviewed to characterize commercial, industrial, and residential land use patterns throughout the Western Segment. Municipalities in the Western Segment of the Project Study Area are concentrated along roadways such as Minnesota State Highway 7, 9, 29, 55, and 15 and U.S. Highway 12. Larger cities and towns in the Western Segment include Glenwood, Ortonville, Benson, Starbuck and Alexandria.

Residential areas in the Western Segment are located within large and small cities and towns, as well as scattered rural residences and farmsteads located in more rural areas. Outside of the larger municipalities, communities are generally small and rural in nature with farmsteads and residences located along roadways, away from population centers. Commercial and industrial areas in the Western Segment are generally located within or adjacent to these larger municipalities.

There are no reservations or other tribal lands located within the Western Segment.

The primary method of mitigation for minimizing effects on human settlements and related infrastructure is to route transmission lines away from municipalities and residential areas. Routing a transmission line adjacent to existing utility corridors and roadways can also help to minimize the effects of transmission lines.

The Project will be designed in compliance with State, NESC, and the applicable applicants' standards for clearance to ground, crossing other utilities, clearance from buildings, strength of materials, vegetation, and other obstructions. Furthermore, the applicants will comply with their construction standards, which include requirements of NESC and Occupational Safety and Health Administration (OSHA). Adherence to NESC and OSHA standards will limit the effects of the Project on areas of human settlement and related infrastructure.

Aesthetics

Overhead electric transmission and distribution lines and other linear infrastructure (e.g., roads, pipelines) are present throughout the Western Segment study area. Potential routes for the Western Segment that are yet to be determined may follow existing infrastructure such as existing transmission lines or roads, where possible. In addition, portions of the Western Segment may be located outside of existing transmission line or road rights-of-way. Specific aesthetic impacts for the new transmission line route for the Western Segment will be evaluated during the route permit process.

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Cultural Values

Cultural values can be described as shared community beliefs or attitudes that define what is collectively important to the group. These values provide a framework for both individual and communal thought and action. The highly visible, industrial look and feel of utility projects can erode the rural feeling that is part of a resident's sense of place. Infrastructure projects believed inconsistent with cultural values can deteriorate community character. Those found consistent with these values can strengthen it. Projects can invoke varying reactions and can, at times, weaken community unity.

Cultural values are also informed by the work and recreational pursuits of residents and by geographical features. The Western Segment study area is generally rural in nature but crosses through several urban areas including Glenwood, Ortonville, Benson, Starbuck, and Alexandria. Rural portions of the route have an agriculture-based economy. Corn and soybean crop production, livestock operations, and associated industries drive the local agricultural economy. Farming and protecting agriculture, the land, and the ability to continue to farm and support livelihoods through agriculture are strong values in the surrounding area.

Manufacturing, industrial, and service industries (restaurants, hotels, repair shops, convenience, and retail stores) are concentrated in the urban areas in the Western Segment study area. Alexandria is the largest city in the Western Segment study area and is a regional center for manufacturing, retail and service businesses, along with education, arts, medicine and wellness.¹

Numerous natural resources that are important to the identity of some of the residents along the route, including lakes, rivers, state trails, and Wildlife Management Areas (WMAs) attract local and regional recreational users. Residents and visitors use these areas for various recreational activities such as fishing, hunting, hiking, wildlife viewing, and snowmobiling.

Environmental Justice

The Minnesota Pollution Control Agency (MPCA) website "Understanding Environmental Justice" provides tools to help identify environmental justice communities throughout the state and provide guidance for integrating environmental justice principles such as fair treatment and meaningful involvement of environmental justice communities.

The Western Segment is located within portions of 23 census tracts. The MPCA mapping tool did not identify any environmental justice communities within these 23 census tracts. In the tool, 11 are identified as low-income communities. There are no federally recognized tribes located within the Western Segment. As routes are developed for the Western Segment, these routes will be reviewed to determine if any of these environmental justice communities would be disproportionately affected by the Project.

Land Use and Zoning

According to the 2019 National Landcover Database – Land Use-Land Cover dataset, cultivated cropland is the dominant land cover making up 66 percent of the Western Segment study area and, therefore, agriculture is the primary land use. Emergent herbaceous wetlands and pasture/hay are the second and

¹ City of Alexandria website. Retrieved from: <https://alexandriamn.city/live-visit-alexandria-mn/>.

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third most dominant land cover type accounting for 10 percent and 8 percent, respectively of the Western Segment study area. Table 38 summarizes land cover in the Western Segment study area.

Table 38: Land Cover in Western Segment Study Area

Land Cover Types	Western Segment	
	Acres	Percentage
Barren Land	1,620	<1
Cultivated Crops	754,112	66
Deciduous Forest	30,521	3
Developed, High Intensity	1,900	<1
Developed, Low Intensity	14,606	1
Developed, Medium Intensity	7,647	<1
Developed, Open Space	31,109	3
Emergent Herbaceous Wetlands	111,835	10
Evergreen Forest	589	<1
Pasture/Hay	96,592	8
Herbaceous	8,752	<1
Mixed Forest	3,587	<1
Open Water	79,620	7
Shrub/Scrub	307	<1
Woody Wetlands	8,062	<1
Total	1,150,859	100

The Project is not anticipated to significantly alter the existing land use within the Western Segment. Impacts to the existing land use due to new structure construction in the Western Segment would be minimized during the routing process and permitting processes.

Noise

Construction activities will generate noise that is short-term and intermittent. Construction activities will be limited to daytime hours. As such, the Project will have temporary and localized noise impacts during construction, but overall will not have significant noise effects on the surrounding area. Residents living in close proximity to the construction of the Project would be temporarily affected by noise generated from construction activities. Construction activities are estimated to last between two and four years for the Western Segment, however noise would dissipate at a single location as construction crews progress along the Project’s route.

Generally, activity-related noise levels during the operation and maintenance of transmission lines are minimal. Transmission conductors can produce noise under certain conditions. The level of noise

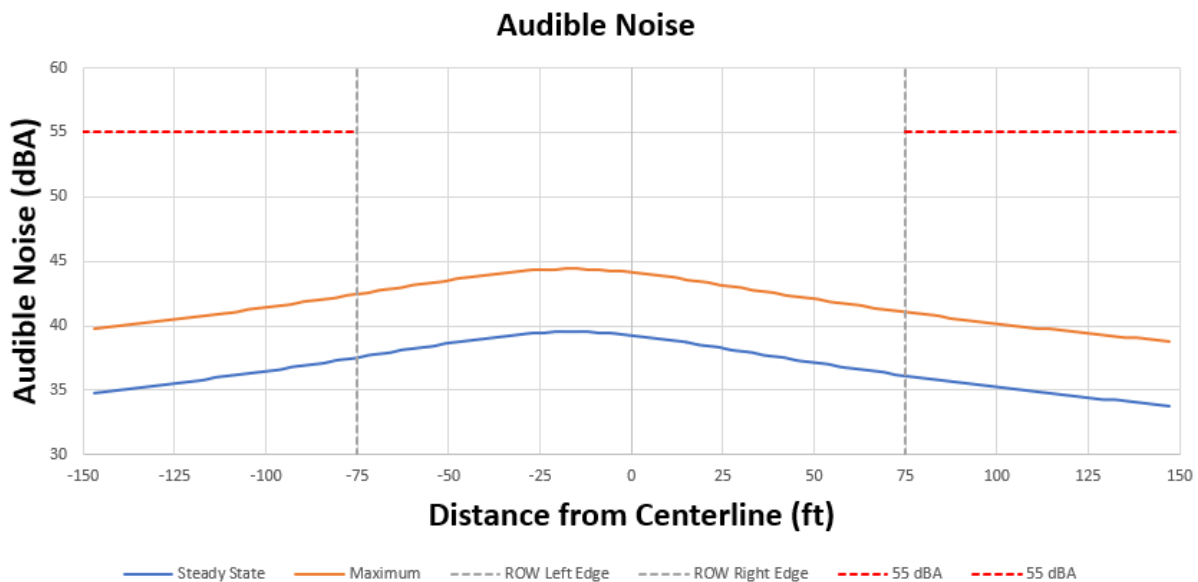
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depends on conductor conditions, voltage level, and weather conditions. In foggy, damp, or rainy weather, power lines can create a crackling sound due to the small amount of electricity ionizing the moist air near the conductors. During heavy rain, the background noise level of the rain is usually greater than the noise from the transmission line. As a result, people do not normally hear noise from a transmission line during heavy rain. During light rain, dense fog, snow, and other times when there is moisture in the air, transmission lines will produce audible noise equal to approximately household background levels. During dry weather, audible noise from transmission lines is barely perceptible by humans.

The applicants have calculated that the noise generated by the operation of the new single-circuit transmission line in the Western Segment is not anticipated to exceed 45 dba. This analysis is shown in Figure 9 below.

Figure 9: Audible Noise Calculated for Single-Circuit 345 kV for Western Segment



Proper design and construction of the transmission line in accordance with industry standards will ensure that noise impacts are minimized. The applicants will comply with noise standards established under Minnesota Rule, part 7030.010 to 7030.0080. No additional mitigation is proposed.

Property Values

See Chapter 4 for a discussion of property values as it relates to the entire Big Stone – Alexandria – Big Oaks 345 kV Transmission Project.

Recreation

Power lines have the potential to impact recreational activities. Impacts might be negative if the line interferes with the resources that provide these activities, for example, changing the aesthetic of a recreational destination in a way that reduces visitor use. Recreational opportunities in the Western Segment include outdoor recreational trails, use of public lands and parks, snowmobiling, hunting and fishing, boating, camping, and participation in local area events. There are several types of formally

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managed and regulated lands across the Project Study Area, including federal easements and managed lands, National Wildlife Refuges (NWRs), Waterfowl Production Areas (WPAs), Wildlife Management Areas (WMAs), Scientific and Natural Areas (SNAs), state trails, state parks, and municipal and county parks and trails.

The Big Stone NWR is the only NWR located in the Western Segment. The refuge includes 11,586 acres in Big Stone and Lac Qui Parle Counties, near Ortonville, Minnesota. The NWR provides a variety of recreational activities such as hiking, fishing, wildlife viewing, and boating.

Impacts to recreation can be mitigated by selecting routes and alignments that avoid resources utilized for recreational purposes. Impacts can also be mitigated by reducing impacts to natural landscapes during construction. Maintaining more natural barriers around the project after construction would also mitigate noise.

Transportation and Public Services

The Western Segment is primarily located in a rural setting in western and central Minnesota. In rural areas, residents often rely on privately owned domestic water wells and on-site septic systems for their water supply and wastewater treatment. Larger population centers provide municipal water and sewer treatment via buried public infrastructure.

Existing road infrastructure within the Western Segment is a mix of federal, state, and county highways and roads, and township roads. Major transportation networks located in the Western Segment include Minnesota State Highway 7, 9, 29, 55, 104, 114 and U.S. Highway 12.

Numerous electric transmission lines exist throughout the Western Segment. Electrical substations that support the network of transmission lines are scattered throughout the Western Segment; these facilities are generally sited on the outer edges of municipalities or away from population centers in rural areas.

Oil and gas transmission and distribution pipelines are present throughout the Western Segment. Oil and gas transmission pipelines are generally sited away from population centers, while the distribution lines typically supply population centers. The location of pipelines will be identified with more specificity as routes are developed for the Western Segment. If the Western Segment is routed near or crosses public infrastructure, roads, railroads, pipelines, etc., appropriate engineering standards will be incorporated into Project design, and any required crossing permissions or agreements will be obtained from the applicable owners/operators.

There are 11 airports located within the Western Segment including four private airports and seven public airports. In general, the public airports are located in small to medium-sized municipalities in the Project Study Area such as Alexandria (Chandler Field and Douglas County Hospital), Appleton, Benson, Glenwood, and Ortonville. Private airports are a mixture of hospital/medical center airstrips or landing pads, and privately-owned landing strips. Airport impacts for the Western Segment of the Project can be addressed through the route selection process (generally through avoidance) and structure design (where an airport cannot be avoided). A flight hazard determination from the Federal Aviation Administration (FAA) may be required depending on the location of the approved route. The FAA requires notification of any transmission line constructed near an airport if the structure height exceeds

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a slope of 100:1 within 20,000 feet (3.8 miles) or a slope of 50:1 within 10,000 feet (1.9 miles) of the airport. In general, a transmission line will need to be approximately one mile from municipal airports to avoid conflicts with local requirements (14 Code of Federal Regulations (CFR) Part 77). The Project will comply with other rules that establish safety zones for airports, where appropriate.

Hospitals, fire stations and police departments are located throughout the Western Segment. Generally, these public services are located within municipalities. Some rural hospitals, fire stations, and police departments located outside of municipal boundaries provide services to rural residences.

In general, impacts on public services and transportation can be avoided or minimized through routing, design, permitting, and construction including paralleling existing utility corridors and other linear infrastructure. During Project construction roadway closures or diversions may be necessary to accommodate construction equipment, construction activities and restoration work. Mitigation measures could include avoiding construction during hours of peak use, detours, signage, and ensuring access to public service infrastructure is not restricted.

Socioeconomics

Counties in the Western Segment of the Project Study Area are generally rural in nature. The unemployment rate within the Project Study Area ranges from a low of 1.0 percent in Pope County to a high of 3.7 percent in Stearns and Swift County. The median household income within the 7 counties that the Project Study Area crosses, are below the state average of \$82,338 and range from a low of \$58,362 to a high of \$72,472. Table 39 below summarizes the population data and income data for the Western Segment study area.

Table 39: Population and Economic Profile of Western Segment Study Area

Location	Total Population	Percent Minority Population	Unemployment Rate	Median Household Income	Percent below poverty level
Minnesota	5,717,184	16.5%	3.2%	\$82,338	9.6%
Big Stone	5,161	2.5%	2.0%	\$63,024	10.5%
Douglas	39,081	2.3%	3.1%	\$72,472	8.5%
Grant	6,091	2.6%	3.7%	\$67,600	10.1%
Lac Qui Parle	6,736	2.8%	2.1%	\$66,967	8.7%
Pope	11,312	2.7%	1.0%	\$71,212	9.6%
Stevens	9,682	9.1%	1.4%	\$69,737	11.7%
Swift	9,806	3.8%	3.7%	\$58,362	10.7%

Socioeconomic impacts are anticipated to be positive. The applicants could procure labor from local employment resources. Construction materials such as fill, gravel, rock, concrete, rebar, fuel, and miscellaneous electrical equipment could be purchased from local vendors where practicable. No additional mitigation is proposed.

Human Health and Safety

Construction and operation of a high voltage transmission line has the potential to impact human health and safety. For a discussion of potential impacts to public health and safety, implantable medical devices, and stray voltage, including mitigation measures, see Chapter 4.

Electric and Magnetic Fields

For a general discussion of electric and magnetic fields, including mitigation measures, see Chapter 4.

Electric Fields

The Western Segment of the Project involves constructing a new single-circuit 345 kV transmission circuit that will be placed on new double-circuit capable structures from the Big Stone South Substation in South Dakota to the Alexandria Substation in Minnesota.

Table 40 provides the electric fields at maximum conductor voltage for the proposed 345 kV transmission lines. Maximum conductor voltage is defined as the nominal voltage plus five to ten percent depending on the facility owner. The maximum electric field generated by the Western Segment, measured at one meter (3.28 feet) above ground is calculated to be 5.7 kV/m.

Table 40: Calculated Electric Fields

Structure Type	Circuits Present	Maximum Voltage	Electric Filed (kV/m) Maximum Overall	Distance from Transmission Line (feet)
345 kV Single-Circuit on Double-Circuit Capable Monopole	Big Stone South – Alexandria	379.5 kV	5.7	25

Magnetic Fields

The intensity of the magnetic field associated with a transmission line is proportional to the amount of current flowing through the line’s conductors, and rapidly decreases with the distance from the conductors. The actual magnetic fields when the project is placed in service will vary as the current flow on the line changes throughout the day.

The applicants calculated magnetic fields for two estimated typical system conditions as outlined in the bullets below and demonstrated in Table 41. The magnetic field values for the two scenarios were calculated at a point where the conductor is closest to the ground.

- **1:** System Peak Energy Demand (estimated loading of 857 MVA for Western Segment) represents the current flow on the line during the peak hour of system-wide energy demand.
- **2:** System Average Energy Demand (estimated loading of 421 MVA for Western Segment) represents the current flow on the line during a non-peak time of the year.

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Table 41: Calculated Magnetic Fields

Structure Type	Circuits Present	System Condition	Current (Amps)	Magnetic Field (mG) Maximum Overall	Distance from Transmission Line (feet)
345 kV Single-Circuit on Double-Circuit Capable Monopole	Big Stone South – Alexandria	1 (Peak)	1,434	182	25
		2 (Average)	705	89	25

Land-Based Economies

Transmission lines can impact land-based economies by precluding or limiting land use for other purposes.

Agriculture

The agricultural production industry is a significant part of local economies throughout Minnesota. Information from the USDA’s 2017 Census of Agriculture for each of the counties in the Western Segment is provided in Table 42. The percent of land used for farmland varies by county within the Western Segment. Stevens County has the greatest percentage of county land used for farmland (92 percent). Corn is the predominant crop produced in each county, typically followed by soybeans. Cattle and hogs are the dominant livestock produced in the Western Segment study area.

Table 42: Agriculture Statistics by County

Location	Total Farmland (Acres)	Top Crops Produced	Livestock by County Inventory	Market Value of Agricultural products sold (dollars)
Big Stone County	268,769 (85% of county)	Corn, soybeans, wheat	Hogs, cattle, sheep	\$138,754,000
Douglas County	263,265 (65% of county)	Corn, soybeans, wheat	Cattle, chicken, hogs	\$100,345,000
Grant County	324,188 (93% of county)	Corn, soybeans, wheat	Cattle, hogs, chicken	\$190,286,000
Lac Qui Parle County	419,884 (86% of county)	Corn, soybeans, hay	Hogs, cattle, chicken	\$249,877,000
Pope County	333,009 (78% of county)	Corn, soybeans, oats	Hogs, cattle, sheep	\$199,295,000

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Location	Total Farmland (Acres)	Top Crops Produced	Livestock by County Inventory	Market Value of Agricultural products sold (dollars)
Stevens County	330,334 (92% of county)	Corn, soybeans, wheat	Hogs, cattle, chicken	\$327,441,000
Swift County	344,976 (72% of county)	Corn, soybeans, wheat	Cattle, hogs, chicken	\$284,161,000

The applicants indicate that they would implement mitigation measures to reduce compaction, soil erosion, and sedimentation and would compensate producers for crops damaged during construction and future year crop loss due to soil compaction. Areas damaged during construction would be restored and put back into production after completion of construction activities. Construction, restoration, and maintenance activities would follow an approved AIMP. A draft AIMP is expected to be submitted with the route permit application for the Western Segment and will be reviewed by relevant state agencies.

Mining

Mining does not comprise a major industry in the Western Segment. According to the MDNR map of minerals mined in Minnesota, mining operations are located within Big Stone County. Big Stone County has granite and crushed stone mines located along the Minnesota River corridor. The Project is anticipated to avoid these mining resources, and no impacts to mining are anticipated.

Archeological and Historic Resources

Previously identified archaeological sites are present in the Western Segment, primarily along the margins of rivers and other surface waters. The Western Segment also contains historic architectural resources, the majority of which are located within municipalities. Rural farmsteads and homesteads have also been documented throughout the Western Segment.

There are 366 archaeological sites located in the Western Segment. There are 794 documented historic architectural resources located in the Western Segment. A summary of listed and eligible resources, broken down by cultural resource type is shown in Table 43.

Table 43: NRHP-Listed and Eligible Cultural Resources in Western Segment Study Area

	Historic Architectural Resources		Archaeological Sites	
	NRHP-Listed	Considered Eligible	NRHP-Listed	Considered Eligible
Big Stone County	25	3	--	--
Douglas County	65	1	1	8
Grant County	--	--	--	--
Lac Qui Parle County	1	--	--	--
Pope County	40	2	--	--
Stevens County	--	--	--	--

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	Historic Architectural Resources		Archaeological Sites	
	NRHP-Listed	Considered Eligible	NRHP-Listed	Considered Eligible
Swift County	9	4	--	--
Multiple Counties	--	2	--	--

Prudent routing can avoid impacts to archaeological and historic resources. This is the preferred mitigation.

Natural Resources

Electric infrastructure such as transmission lines impact the natural environment. Impacts are dependent upon many factors, such as how the project is designed, constructed, and maintained. Other factors such as the environmental setting influence potential impacts.

Vegetation

The Western Segment is almost entirely located in the Minnesota River Prairie ECS subsection, with the northeastern corner located in the Hardwood Hills subsection. Pre-settlement vegetation in the Minnesota River Prairie subsection consisted primarily of tallgrass prairie and wet prairie islands. Floodplain forests were present within the riparian areas along watercourses and waterbodies. In the Hardwood Hills subsection, irregular topography and presence of numerous lakes and wetlands provided a partial barrier to fire, resulting in more woodland or forest compared to the Minnesota River Prairie subsection. At pre-settlement, mixed hardwood forests were found in the eastern portion of the subsection, while tallgrass prairie was found on flatter terrain in the west.

Currently, the Western Segment is dominated by agricultural land, with corn and soybeans representing the most common crops. Natural vegetation is present in wetlands and the forested areas near waterbodies and watercourses. In addition, areas of native vegetation are found scattered throughout the Western Segment study area. These include native prairie remnants, native plant communities, SNAs, and Sites of Biodiversity Significance.

Potential impacts to vegetation in the Western Segment study area would occur where clearing of trees and other vegetation is necessary for Project construction and maintenance. Construction and maintenance activities also have the potential to result in the introduction or spread of noxious weeds. Clearing could be required in the Western Segment to construct the new transmission line alignment and associated right-of-way.

As routing for the Western Segment is developed and refined, the applicants state that they would strive to avoid large, forested areas and other sensitive native vegetation resources to the extent practicable and would work with agencies to develop the appropriate best management practices (BMPs) and mitigation measures to minimize potential impacts to vegetation resources from the proposed Project facilities.

Wildlife

Several lands that are preserved or managed for wildlife and associated habitat are scattered throughout the Western Segment study area, including: Audubon Society Important Bird Areas and Grassland Bird

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Conservation Areas; Minnesota Migratory Waterfowl Feeding and Resting Areas, WMAs, and game refuges; and USFWS NWRs and WPAs.

The Western Segment's agricultural landscape, combined with the preserved or managed wildlife lands, provide habitat for a diversity of resident and migratory wildlife species. These species include large and small mammals, songbirds, waterfowl, raptors, fish, reptiles, mussels, and insects. These species use the Western Segment study area for forage, shelter, breeding, or as stopover during migration.

Temporary impacts to wildlife may occur during construction from increased noise and human activity, which could cause some species to temporarily abandon their habitat. Permanent habitat loss, conversion, or fragmentation may occur in areas that are permanently cleared for construction and maintenance of the Project. This habitat alteration could occur where new right-of-way is obtained for the Western Segment. Once the Project is operational, there is potential for avian and transmission line interactions in the form of collisions.

As routing for the Western Segment is refined, the applicants state that they would strive to avoid preserved or managed wildlife lands to the extent practicable and would work with applicable resource agencies to develop the appropriate BMPs and mitigation measures to minimize the potential for Project activities impacting these sensitive wildlife resources. The applicants state that they would also incorporate BMPs, as well as implement design and engineering measures where necessary that are consistent with the Avian Power Line Interaction Committee's (APLIC) guidelines to minimize the potential for avian collisions.

Air Quality

Air quality is a measure of how pollution-free the ambient air is and how healthy it is for humans, other animals, and plants. Emissions of air pollutants will occur during construction and operation of new infrastructure for the project. Overall air quality in Minnesota has improved over the last 20 years, but current levels of air pollution are alleged to still contribute to health impacts. Air quality in the Western Segment study area is relatively better than more populated areas of the state such as the Twin Cities metro region.

The nearest air quality monitors to the Western Segment study area are located in St. Cloud and Marshall, Minnesota. Air quality in St. Cloud and Marshall has been considered good for the majority of the past five years of reported data (2018 – 2022). Only six days across all five years have been in an unhealthy category for St. Cloud and seven for Marshall. There was only one day across both monitors and five years where it was very unhealthy (St. Cloud, 2021), likely due to wildfire smoke.

Construction of the Western Segment will result in intermittent and temporary impacts to air quality. Emissions sources generally include dust generated from soil disturbing activities, such as earthmoving and wind erosion associated with right-of-way clearing and construction, and combustion emissions from construction machinery engines. These emissions would be dependent upon weather conditions, the amount of equipment at any specific location, and the period of operation required for construction at that location. Air pollutants from the construction equipment will be limited to the immediate vicinity of the construction area and will be temporary. Therefore, it is not anticipated that construction activities will independently cause or significantly contribute to an emission level that alters the air pollution score or attainment status for any of the National Ambient Air Quality Standards (NAAQS).

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During operation of the line, air emissions would be minimal. A small amount of ozone is created due to corona from the operation of transmission lines. Therefore, the applicants have engineered the transmission lines to limit corona. The emission of ozone from the operation of a transmission line of the voltages proposed for the Western Segment is not anticipated to have a significant impact on air quality.

Greenhouse Gases and Climate Change

See Chapter 4 for a discussion of greenhouse gases and climate change as it relates to the entire Big Stone – Alexandria – Big Oaks 345 kV Transmission Project.

Climate Resilience

See Chapter 4 for a discussion of climate resilience for the entire Big Stone – Alexandria – Big Oaks 345 kV Transmission Project.

Groundwater

Groundwater in Minnesota is divided into six aquifer provinces based on glacial geology and bedrock. The Western Segment is located within the Arrowhead/Shallow bedrock, Central and Western groundwater provinces. The majority of the Western Segment is located within the Central Groundwater Province.

The Central groundwater province is characterized by buried sand aquifers and relatively extensive surficial sand plains, part of a thick layer of sediment deposited by glaciers overlaying the bedrock. This province has thick glacial sediment, and sand and gravel aquifers are common. The Western Segment is not anticipated to adversely impact groundwater resources within any of the provinces.

Soils and Topography

The Minnesota Department of Natural Resources (MDNR) and the U.S. Forest Service (USFS) developed an Ecological Classification System (ECS) for ecological mapping and landscape classification in Minnesota that is used to identify, describe, and map progressively smaller areas of land with increasingly uniform ecological features. Within the ECS, the State of Minnesota is split into ecological provinces, sections, and subsections. Under this classification system, the Western Segment of the Project Study Area is in the North Central Glaciated Plains Section of the Prairie Parkland Province.

The Minnesota and NE Iowa Morainal Section is further broken down into ecological subsections. The Western Segment of the Project Study Area is within the Minnesota River Prairie subsection of the North Central Glaciated Plains Section.

The Minnesota River Prairie subsection is characterized by large till plains that are bisected by the broad valley of the Minnesota River. The Minnesota River was formed by Glacial River Warren which drained Glacial Lake Agassiz. Topography is steepest along the Minnesota River and the Big Stone Moraine, which has steep kames and broad slopes, while topography outside of the river valley consists of level to gently rolling ground moraine. Glacial drift generally ranges between 100 and 400 feet throughout this subsection. Soils are predominantly well-to-moderately well-drained loams formed in gray calcareous till of the Des Moines lobe with some localized inclusions of clayey, sandy, and gravelly soils. Streams and small rivers drain into the Minnesota River or the Upper Iowa River, though drainage networks are poorly developed due to landscape characteristics. There are 150 lakes greater than 160 acres in size throughout

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this subsection, though many are shallow. Wetlands were common within this subsection prior to Euro-American settlement, and most have been drained to establish usable cropland.

Topography in the Minnesota River Prairie subsection is generally more level to slightly rolling. Elevations here range from 790 to 1,710 feet above sea level. The Minnesota River is the main drainage channel for this subsection and occurs as an abrupt gorge within the Minnesota River Prairie subsection.

Floodplains

The major floodplains in the Western Segment occur adjacent to large waterbodies and watercourses. Most of the Western Segment is mapped as areas with minimal flood hazard (Zone X). The Federal Emergency Management Agency (FEMA) has mapped regulated floodways located along the Chippewa River, Pomme de Terre River, Yellow Bank River, and Minnesota River. Outside the 100-year floodplain, some areas along these rivers are mapped as 500-year floodplains that reach beyond the adjacent riverine areas into agricultural areas and the edges of communities. Additional floodplains are found adjacent to larger perennial streams and areas with shallow banks and low terraces.

It is anticipated that the Project would have no effect on the flood elevations within the Western Segment because the Project construction is not expected to result in flood elevations to rise.

Surface Water

There are eight major watershed basins (HUC-04) and 81 major surface water watersheds (HUC-08) covering Minnesota. The Western Segment is predominantly located within the Minnesota River Watershed (HUC-4).

Wetlands

According to the MDNR Public Water Inventory (PWI) dataset, there are 517 PWI basins and 512 PWI wetlands located within the Project Study Area. There are ten waterbodies in the Western Segment study area that are greater than 1,000 acres in size including Big Stone Lake, Lake Minnewaska, Lake Reno, Lake Mary, Lake Emily, Artichoke Lake, Marsh Lake, Oscar Lake, and two unnamed wetlands.

The Project Study Area is located within the Midwest and Northcentral Northeast wetland delineation region. The Midwest region is characterized by its generally flat to rolling topography, fertile soils, and moderate to abundant rainfall. Wetlands in the region are generally characterized as prairie wetlands or riverine wetlands.

According to the United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) database, the Western Segment Study Area contains approximately 214,647 acres of wetlands (Table 44). The majority of the wetlands are classified as shallow open water wetlands, seasonally flooded wetlands, or shallow marshes.

Table 44: National Wetland Inventory Wetlands Within the Western Segment Study Area

Cowardin Class	Circular 39 Class	Wetland Type	Acres in Western Segment
PEMA, PUS, PFOA	1	Seasonally Flooded Wetlands	53,368
PEMB, PSSB	2	Wet Meadows (including Calcareous Fens)	5,787
PEMC and F, PSSH, PUBA and C	3	Shallow Marshes	56,000
L2ABF, L2EMF and G, L2US, PABF and G, PEMG and H, PUBB and F	4	Deep Marshes	5,369
L1; L2ABG and H; L2EMA, B, and H; L2RS; L2UB; PABH; PUBG and H	5	Shallow Open Water	80,691
PSSA, C, F, and G; PSS1, 5, and 6B	6	Shrub Swamp	6,351
PFO1, 5, and 6B; PFOC and F	7	Wooded Swamp	4,265
PF02, 4, and 7B; PSS2, 3, 4, and 7B	8	Bogs	83
L2UB, PAB, PUB, PEMK	80	Lake	346
R2AB; R2UB and S; R4SB	90	Rivers	2,387
Total			214,647

The Western Segment will require some amount of ground disturbance, which could result in impacts to surface waters. Effects to surface waters can be minimized by routing the Project to avoid surface waters.

Rare and Unique Resources

For a general discussion of rare and unique resources, see Chapter 4.

Endangered, Threatened, or Special Concern

The applicants assessed information about plants and wildlife through the USFWS Information for Planning and Consultation (IPaC) tool on April 20, 2023 and identified seven federally protected threatened, endangered or candidate species that could be present in the Western Segment study area. As shown in Table 45, these include the endangered Northern Long-eared Bat, the proposed endangered Tricolored Bat, and the candidate Monarch Butterfly. In addition, the IPaC query identified designated critical habitat for two species within the Western Segment study area. For a description of each of these species, please see Chapter 4.

Table 45: Federally Protected Species and Designated Critical Habitat Within the Western Segment Study Area

Common Name	Scientific Name	Federal Status ^[1]
Northern long-eared bat	<i>Myotis septentrionalis</i>	END
Tricolored bat	<i>Perimyotis subflavus</i>	Proposed END
Monarch butterfly	<i>Danaus plexippus</i>	Candidate
Dakota Skipper	<i>Hesperia dacotae</i>	THR; Designated Critical Habitat ^[2]

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Common Name	Scientific Name	Federal Status ^[1]
Poweshiek skipperling	<i>Oarisma poweshiek</i>	Designated Critical Habitat ^[3]
Red knot	<i>Calidris canutus rufa</i>	THR
Western prairie fringed orchid	<i>Platanthera praeclara</i>	THR

[1] THR = threatened; END = endangered.

[2] IPaC identified both the Dakota skipper and designated critical habitat for the species as potentially occurring within the Western Segment.

[3] IPaC only identified designated critical habitat for the Poweshiek skipperling within the Western Segment and not the species itself.

On behalf of the applicants, Barr Engineering Company submitted a request to the DNR’s Minnesota Conservation Explorer website to conduct a formal Natural Heritage Review (License Agreement #2022-008) to identify known occurrences of state protected threatened and endangered species within the Western Segment study area. As shown in Table 46, the NHIS query identified a total of 30 threatened and endangered species that have been documented within the Western Segment study area. Habitat suitable for several state-protected species is potentially present in the vicinity of the Western Segment study area. As routing for the Western Segment is developed and refined, the applicants stated that they will conduct a Natural Heritage Review utilizing the Minnesota Conservation Explorer online tool and would consult with the MDNR to minimize the potential for adverse impacts to state-protected species and associated habitat from construction and operation of the Project.

**Table 46: State Protected Species
Within the Western Segment Study Area**

Common Name	Scientific Name	State Status ^[1]	Federal Status ^[1]
Birds			
Burrowing Owl	<i>Athene cunicularia</i>	END	---
Chestnut-collared Longspur	<i>Calcarius ornatus</i>	END	---
Henslow's Sparrow	<i>Ammodramus henslowii</i>	END	---
Horned Grebe	<i>Podiceps auritus</i>	END	---
Loggerhead Shrike	<i>Lanius ludovicianus</i>	END	---
Piping Plover	<i>Charadrius melodus</i>	END	END; THR
Wilson's Phalarope	<i>Phalaropus tricolor</i>	THR	---
Mollusks			
Elktoe	<i>Alasmidonta marginata</i>	THR	---
Fluted-shell	<i>Lasmigona costata</i>	THR	---
Mucket	<i>Actinonaias ligamentina</i>	THR	---
Yellow Sandshell	<i>Lampsilis teres</i>	END	---

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Common Name	Scientific Name	State Status ^[1]	Federal Status ^[1]
Fish			
Pugnose Shiner	<i>Notropis anogenus</i>	THR	---
Skipjack Herring	<i>Alosa chrysochloris</i>	END	---
Insects			
Dakota Skipper	<i>Hesperia dacotae</i>	END	THR
Ghost Tiger Beetle	<i>Cicindela lepida</i>	THR	---
Poweshiek Skipperling	<i>Oarisma poweshiek</i>	END	END
Plants			
Ball Cactus	<i>Escobaria vivipara</i>	END	---
Eared False Foxglove	<i>Agalinis auriculata</i>	END	---
Hair-like Beak Rush	<i>Rhynchospora capillacea</i>	THR	---
Hairy Waterclover	<i>Marsilea vestita</i>	END	---
Larger Water Starwort	<i>Callitriche heterophylla</i>	THR	---
Mud Plantain	<i>Heteranthera limosa</i>	THR	---
Prairie Quillwort	<i>Isoetes melanopoda</i>	END	---
Short-pointed Umbrella-sedge	<i>Cyperus acuminatus</i>	THR	---
Sterile Sedge	<i>Carex sterilis</i>	THR	---
Stream Parsnip	<i>Berula erecta</i>	THR	---
Waterhyssop	<i>Bacopa rotundifolia</i>	THR	---
Whorled Nutrush	<i>Scleria verticillata</i>	THR	---
Wolf's Spikerush	<i>Eleocharis wolfii</i>	END	---

[1] THR = threatened; END = endangered.

Impacts to rare and unique resources can be avoided by selecting routes, alignments, and structure placements away from these resources and their habitats to the extent practicable. If these resources cannot be avoided, impacts can be minimized by routing alignments or placing structures away from rare and unique resources; spanning these resources; or using seasonal construction practices within the selected route. Upon determining a final route, biological surveys may be required as a permit condition should resource agencies deem it necessary.

Conservation Easements

Conservation lands are areas designated by a legal instrument (i.e., contract, easement, regulation) that limits or conditions certain uses of the land to fulfill the respective conservation purpose. Conservation lands in the Project Study Area include:

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- Conservation Reserve Enhancement Program (CREP);
- Reinvest in Minnesota (RIM);
- Wetland Reserve Program (WRP);
- Permanent Wetlands Preserves Program (PWP); and
- Wetland Banking Easement.

There are approximately 18,582 acres of conservation easements located in the Western Segment study area. The CREP program is the largest conservation program in the Western Segment study area and is a land conservation program established to pay farmers a yearly rental fee for agreeing to take environmentally sensitive land out of agricultural production with the intent of improving environmental health and quality. There are 10,434 acres of CREP land located within the Western Segment study area.

Similarly, the RIM program was implemented by the Minnesota Board of Water and Soil Resources (BWSR) to conserve environmentally sensitive property in order to improve water quality by reducing soil erosion, phosphorus and nitrogen loading, and improving wildlife habitat and flood attenuation on private lands. There are approximately 4,467 acres of land in the RIM program located within the Western Segment study area.

The WRP properties are established by the United States Department of Agriculture (USDA) and Natural Resource Conservation Service (NRCS) to provide habitat for migratory waterfowl and other wetland dependent wildlife, including threatened and endangered species; improves water quality by filtering sediments and chemicals; reduces flooding; recharges groundwater; protects biological diversity; provides resilience to climate change; and provides opportunities for educational, scientific and limited recreational activities. There are approximately 3,136 acres of WRP land within the Western Segment study area.

The PWP is a state program that establishes permanent conservation easements to protect at-risk wetlands. There are approximately 257 acres of PWP land within the Western Segment study area.

Similarly, wetland banking easements are conservation easements that protect wetlands from future disturbances. There are approximately 288 acres of wetland banking easements within the Western Segment study area. Table 47 summarizes the conservation easements in the Western Segment study area.

Table 47: Conservation Easements in Western Segment Study Area

Conservation Easement	Western Segment (Acres)
Conservation Reserve Enhancement Program (CREP)	10,434
Reinvest in Minnesota (RIM)	4,467
Wetland Reserve Program (WRP)	3,136
Permanent Wetlands Preserves Program	257

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Conservation Easement	Western Segment (Acres)
Wetland Banking Easement	288
Total	18,582

Depending on the governing conservation program, specific restrictions may be applied that would limit or restrict development of a transmission line. As routing of the Western Segment proceeds, the applicants will work with federal, state, and county agencies and landowners to identify conservation easements that may be affected by the Project. If a conservation easement cannot be avoided through modifications in Project routing and siting, the applicants will work with the owner and managing agency to develop appropriate mitigation measures to minimize effects.