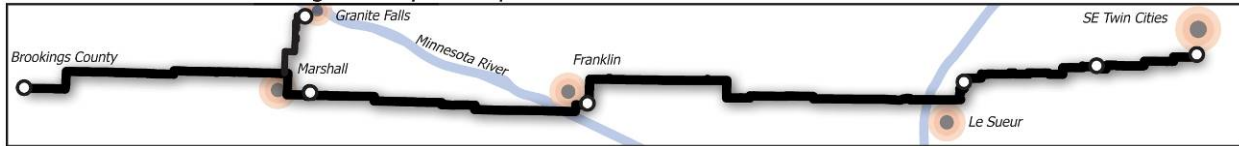


## Preferred Route: Brookings County - Hampton



## 6.0 ENVIRONMENTAL INFORMATION: PREFERRED ROUTE

A description of the environmental resources and impacts associated with the Preferred Route is provided below. Much of the analysis focuses on the resources between each of the substations along the route. The data in the environmental analyses only reflect the area from the South Dakota border east to the proposed Hampton Substation. To assist in clarifying the resources along this route, Chapters 6 through 9 are broken down into the following:

- “Brookings County to Lyon County” – the route section between the South Dakota border and the Lyon County Substation northeast of Marshall, Minnesota.
- “Lyon County to Minnesota Valley” – the route section between the Lyon County Substation and the existing Minnesota Valley Substation near Granite Falls, Minnesota.
- “Lyon County to Cedar Mountain” – the route section between the Lyon County Substation and one of two Cedar Mountain Substation alternatives, either northwest or east of the existing substation southeast of Franklin, Minnesota.
- “Cedar Mountain to Helena” – the route section between a new Cedar Mountain Substation and a new substation located along the existing 345 kV transmission line in Helena or Derrynane townships in Scott and Le Sueur counties, respectively.
- “Helena to Lake Marion” – the route section between a new substation located along the existing 345 kV transmission line in Helena or Derrynane townships in Scott and Le Sueur counties, respectively, and the existing Lake Marion Substation located northeast of Elko New Market, Minnesota.
- “Lake Marion to Hampton” – the route section between the existing Lake Marion Substation and a new Hampton Substation to be located near Hampton, Minnesota.

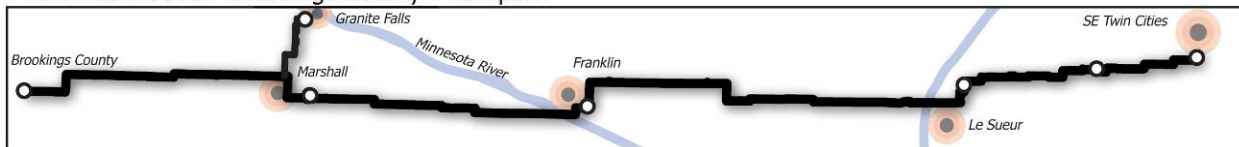
The Applicants use specific terms through the environmental information Chapters to identify analysis areas. The term “centerline” is used to identify the intended route centerline. The term “route” is used to identify the location of the transmission line between two points, with widths of between 1,000 feet (500 feet on each side of centerline) and 1.25 miles. The route and centerline are identified on the maps in Appendix B. The term “Project area” is used to identify the area including and surrounding the route.

The Applicants reviewed environmental information in their analysis of the Project area and compared the existing environmental conditions with the Project impacts associated with each route section. The environmental resource impacts are tabulated in Appendix E.

### 6.1 DESCRIPTION OF ENVIRONMENTAL SETTING

The Project extends from the South Dakota border to the proposed Hampton Substation southeast of the Twin Cities in Minnesota. The route crosses the Minnesota River in three locations: near the cities of Granite Falls, Franklin, and Le Sueur. The route lies in two distinct province areas, according to the Minnesota Department of Natural Resources (“DNR”) Environmental Classification Systems (“ECS”), including the Prairie Parkland and Eastern Broadleaf Forest. The subsections within the ECS Province areas are discussed below.

## Preferred Route: Brookings County - Hampton



The Prairie Parkland Province includes the Coteau Moraines and Minnesota River Prairie subsections; the Eastern Broadleaf Forest Province includes the Big Woods and Oak Savanna subsections. The Coteau Moraines Subsection was formed by glacial erosion and deposition and is characterized by gently rolling hills, streams, rivers, and shallow prairie lakes and wetlands. The Minnesota River Prairie is a landscape dominated by large till plains on either side of the Minnesota River and is characterized by gently rolling terrain, except where it is split by the broad Minnesota River Valley. The Big Woods Subsection is characterized by gentle to moderate rolling hills and large forested areas. The Oak Savanna Subsection is distinguished by rolling plains over till and bedrock with oak openings rather than forested areas due to frequent fires on the adjacent southern prairies.

Presettlement vegetation along the Preferred Route consisted primarily of tallgrass prairie with small islands of wet prairie. Wet prairies and wooded areas were restricted to instream margins and ravines adjacent to rivers. The primary present-day use of the land along the route is agricultural; few remnants of native vegetation are present (DNR 2008a). The majority of the Preferred Route crosses cropland primarily used to grow corn and soybeans. Many of the wetlands have been drained, while most of the smaller watercourses have been channelized to increase the acreage of land available for agricultural production. A small percentage of the area remains wetlands or upland forests.

### 6.1.1 BROOKINGS COUNTY TO LYON COUNTY

The Preferred Route extends from the South Dakota border to an existing substation northeast of the City of Marshall. This Project section is located in Lincoln and Lyon counties, Minnesota. According to the DNR ECS, the route lies within the Coteau Moraines and the Minnesota River Prairie subsections of the Prairie Parkland Province. The elevation along the Preferred Route section ranges from 1,080 feet above mean sea level (“AMSL”) in the east to 1,820 feet in the west. It is a steady decline in elevation from west to east.

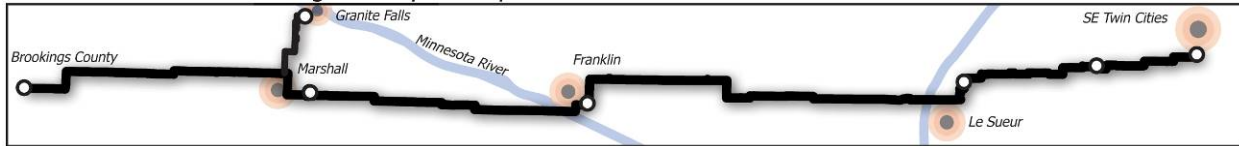
With the exception of Marshall, the majority of communities located within the Project area are small agriculture-based towns. The towns near the Project area are Hendricks and Minneota. Marshall is a level two regional trade center, which is defined as a secondary wholesale retail center, according to the 1999 Regional Trade Center of the Upper Midwest (Casey 1999).

### 6.1.2 LYON COUNTY TO MINNESOTA VALLEY

The Preferred Route extends from the Lyon County Substation to the existing Minnesota Valley Substation in Granite Falls. This section is located in Lyon and Yellow Medicine counties and includes one Upper Minnesota River crossing at Granite Falls, and a proposed Hazel Creek Substation area southwest of Granite Falls. According to the ECS, the route lies within the Minnesota River Prairie Subsection of the Prairie Parkland Province. The Minnesota River Prairie landscape is dominated by large till plains on either side of the Minnesota River and is characterized by gently rolling terrain except where it is split by the broad Minnesota River Valley. Elevations along the Preferred Route range from 880 feet to 1,111 feet AMSL. The highest elevation occurs in the south and the lowest in the north.

Pre-settlement vegetation consisted primarily of tallgrass prairie with small islands of wet prairie. Forested areas were located in the Minnesota River floodplains. The primary present-day use of the land along this section is agricultural; few remnants of native vegetation are present (DNR 2008a).

## Preferred Route: Brookings County - Hampton



Many of the wetlands have been drained and most of the smaller watercourses have been channelized to increase the acreage of land available for agricultural production. The Minnesota River Prairie Subsection has been called the heart of the Minnesota Cornbelt (Wright 1972).

The Preferred Route crosses corn and soybean cropland. Communities near the Project are generally small farm-based towns including Cottonwood, Wood Lake, and Hanley Falls. A few WMAs are present near the route, along with several wetlands. Relatively few forested areas are present, especially in the western and central sections of the Project route. Most wooded areas are adjacent to farmsteads or are located in the Minnesota River Valley.

### 6.1.3 LYON COUNTY TO CEDAR MOUNTAIN

The Preferred Route extends from the existing Lyon County Substation to the proposed Cedar Mountain Substation South area. This section is located in Lyon, Redwood, Renville, and Brown counties and it crosses the upper Minnesota River along a county road. According to the ECS, the route lies within the Minnesota River Prairie Subsection of the Prairie Parkland Province. The elevation changes from 800 feet to 1,130 feet AMSL, with the highest elevation in the west and the lowest at the Granite Falls crossing at the Minnesota River. The elevation typically increases out from the river crossings.

The majority of the communities near the Project area are small agriculture-based towns. The towns near the Preferred Route include Seaforth and Franklin.

### 6.1.4 CEDAR MOUNTAIN TO HELENA

The Preferred Route extends from the proposed Cedar Mountain Substation South area to the proposed Helena Substation South area. According to the ECS, Brown, Renville and western Sibley counties are within the Minnesota River Prairie Subsection of the Prairie Parkland Province, while Le Sueur and eastern Sibley counties are within the Big Woods Subsection of the Eastern Broadleaf Forest Province. This section also crosses the Lower Minnesota River at the Le Sueur Treatment Pond crossing, utilizing the existing wastewater treatment ponds as the crossing location. Elevations along the Preferred Route range from 717 feet to 1,073 feet AMSL, with the highest elevations occurring in the west and the lowest in the Minnesota River Valley.

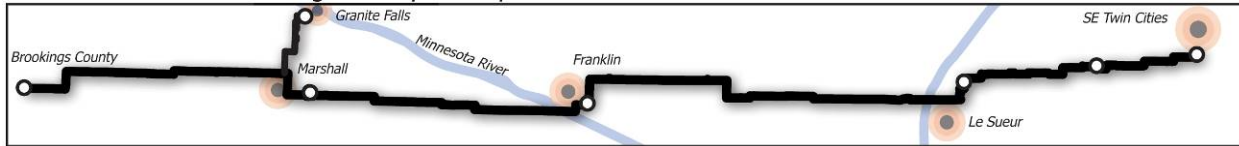
The majority of the communities near the Project area are small agriculture-based towns. Cities include Franklin, Fairfax, Gibbon, Winthrop, and Le Sueur.

### 6.1.5 HELENA TO LAKE MARION

The Preferred Route extends from the proposed Helena Substation South area to the existing Lake Marion Substation. According to the ECS, Scott County is located within the Big Woods Subsection. Elevations along the Preferred Route range from 931 feet to 1,102 feet AMSL. The elevation decreases toward the center of the Subsection, while the highest elevations occur in the east and the lowest in the center.

Cities near the Preferred Route include New Prague and Elko New Market. Urban development has started to encroach on these agricultural communities.

## Preferred Route: Brookings County - Hampton



### 6.1.6 LAKE MARION TO HAMPTON

The Preferred Route extends from the existing Lake Marion Substation to a proposed new substation north of Hampton. According to the ECS, eastern Scott and Dakota counties are located in the Oak Savanna Subsection of the Eastern Broadleaf Forest Province. Elevations along the Preferred Route range from 867 feet to 1,072 feet AMSL, with the highest elevations in the west and the lowest in the east.

The majority of the communities near the Project area are small agriculture-based communities, including Eureka Township, Hampton, Hampton Township and Castle Rock Township. Urban development is beginning to encroach on the northern border of the area's communities. The City of Farmington is also located in the Project area and has seen a large population increase within the past 20 years.

## 6.2 HUMAN SETTLEMENT

### 6.2.1 PUBLIC HEALTH AND SAFETY

This section discusses the potential public health and safety impacts of construction and operation of the Preferred Route. The Applicants will implement appropriate safeguards during construction and operation to avoid any impacts to human health.

#### 6.2.1.1 Public Safety

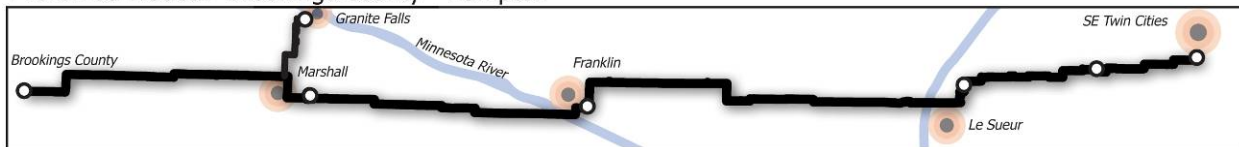
Proper safeguards will be implemented for construction and operation of the facility. The Project will be designed according to local, State, and NESC standards regarding ground clearance, crossing utilities clearance, building clearance, strength of materials and ROW widths. Construction crews and/or contract crews will comply with local, State, and NESC standards regarding facility installation and standard construction practices. Established Applicants' and industry safety procedures will be followed during and after installation of the transmission line, including clear signage during all construction activities.

The proposed transmission lines will be equipped with protective devices (breakers and relays located where transmission lines connect to substations) to safeguard the public in the event of an accident, or if the structure or conductor falls to the ground. The protective equipment will de-energize the transmission line should such an event occur. In addition, the substation facilities will be properly fenced and accessible only by authorized personnel.

#### 6.2.1.2 Airports, Landing Strips, and Airplane Safety

HVTLs can present an important safety concern to airports and aircraft. The placement of transmission line structures or the stringing of transmission lines between structures could severely impact the safe operation of an airport or hinder the maneuverability of aircraft. If close enough, the presence of a steel transmission line structure or wiring could interfere with the operation of air navigation or weather systems. Transmission line wiring can also present a significant risk to pilots. It is important to note that the physical dimensions of airport runways determine the class size of aircraft capable of landing at an airport. Furthermore, the aircraft design and propulsion system are determinants in an aircraft's ability to land at a given facility. For example, jet aircraft are heavier, typically require a greater runway length for take-off and landing, and require more glide slope

## Preferred Route: Brookings County - Hampton



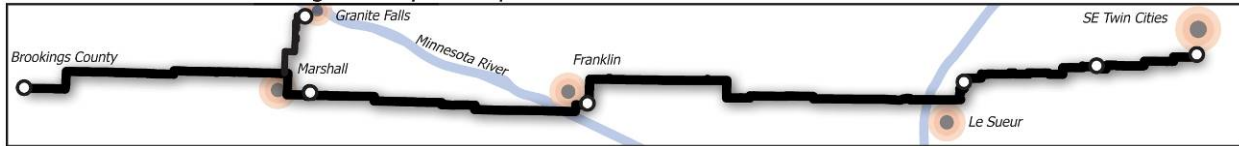
clearance distance compared to propeller-driven aircraft. Both of these factors are important in relation to tall structures such as transmission lines because they determine the take-off and landing glide slopes necessary for safe flight operation, which in turn determine the setback distance of tall structures such as transmission line structures.

The FAA and the MnDOT have established development guidelines on the proximity of tall structures, including HVTLs, to public use airports and heliports. Federal Aviation Regulation (“FAR”) Part 77 establishes standards and notice requirements for reporting airspace obstructions for objects currently impacting or that could impact navigable airspace around aviation facilities. FAR Part 77 defines a series of imaginary surface zones surrounding airports that specify height restrictions for structures based on slope ratios. These imaginary surfaces include the primary surface, horizontal surface, conical surface, approach surface, precision instrument approach surface, and the transitional surface. According to FAR Part 77, “an object will be considered an obstruction to a public airport (excluding seaplane bases and heliports) if it is of greater height” than any of the aforementioned imaginary surfaces. Each of these imaginary surfaces have corresponding slopes, based in part on the airports’ use designation, flight volumes, and plane size capabilities. All surfaces are measured at the mean sea-level elevation of the airport. If applicable, the Applicants would file the required notice with FAA pursuant to the requirements set forth by FAR Part 77, Subsection 13.

In addition to FAA regulations, the State of Minnesota establishes air navigation obstruction criteria under Minnesota State Statute and Minnesota Rules Chapter 8800. These regulations are intended to control the type of development around airports to prevent incompatible land uses. The State regulations are similar to the FAA regulations as published in FAR Part 77. Runway Safety Zones A through C, which follow the runway approach zones and restrict specific types of development, are included as this part of these regulations. The most restrictive safety zones are A and B; Safety Zone A does not allow any buildings or temporary structures, places of public assembly or transmission lines; Safety Zone B does not allow places of public or semipublic assembly (*i.e.*, churches, hospitals, or schools). Permitted land uses in both zones include agricultural uses, cemeteries, and parking lots. A complete description and copy of the Minnesota Rules Chapter 8800 Department of Transportation Aeronautics Section 2400 Airport Zoning Standards can be found at <http://www.dot.state.mn.us/aero/avoffice/planning/zoning.html>.

Furthermore, certain objects such as steel pole transmission line structures have the potential to conflict with the operation of airport navigational aids and weather observation station facilities. Specifically, these facilities include Very High Frequency Omnidirectional Radio Range (“VOR”) air navigation systems and Automated Weather Observation Stations (“AWOS”). FAA Order 6820.10 “VOR, VOR/DME, and VORTAC Siting Criteria,” specifies the distance setback requirements for trees, buildings, and metallic structures. Within this order, Chapter 3, Section 15 identifies obstruction criteria for a VOR facility. Subsections D and E detail setback distances for transmission lines and pole structures. These regulations specify that overhead transmission line structures with conductors should be located beyond 1,200 feet of the VOR antenna to avoid communication interference. Additionally, metallic structures are required to subtend vertical angles of 1.2 degrees or less, measured from the ground elevation of the VOR facility. Therefore, the transmission line structures proposed for the Project of 130 feet must be 6,206 feet away from a VOR air navigational station to avoid interference with the operation of the facility. Structures of 140 feet in height must be 6,683 feet away and structures of 175 feet in height must be 8,354 feet away from a VOR.

## Preferred Route: Brookings County - Hampton



### 6.2.1.3 Impacts and Mitigation

The Applicants will ensure that all safety requirements are met during the construction and operation of the proposed transmission line and any accompanying facilities. Additionally, when crossing roads or railroads during stringing operations, guard structures will be utilized to eliminate traffic delays and provide safeguards for the public. With the proper safeguards and protective measures implemented as described above, no additional mitigation should be needed.

### 6.2.2 COMMERCIAL, INDUSTRIAL, RESIDENTIAL LAND USE

This section discusses the existing and future land use, major development activities, and zoning controls within the Preferred Route. Land cover data and zoning information were obtained for the counties and municipalities through which the route would travel. Land uses were identified through a comprehensive analysis of the Minnesota Gap Analysis Program (“GAP”) data provided by the DNR, current comprehensive land use plans (as available), and zoning ordinances for each of the counties and municipalities (as available) to provide the most accurate portrait of existing conditions and planned future conditions in the Preferred Route. Additionally, public comments from open houses and routing work group meetings and comments received during the planning process, along with agency correspondence from State and local governments, were reviewed as part of the routing process. The Preferred Route travels across entire lengths or portions of 10 counties; Lincoln, Lyon, Yellow Medicine, Redwood, Brown, Renville, Sibley, Le Sueur, Scott, and Dakota. Larger communities in the vicinity of the Preferred Route include the cities of Marshall, Franklin, Le Sueur, New Prague, Lakeville, and Farmington. The types of land cover analyzed included agricultural lands (cropland and pastureland), open water, forested areas, grasslands, shrublands, urban areas, and transportation facilities. For each route and its ROW, impacts to the aforementioned categories were determined by comparing the various levels of GAP data. Land use maps for the counties crossed by the Preferred Route are provided in Appendix F.

The predominant land use that the Preferred Route crosses is rural agricultural. Rural Residences and farmsteads are located along all of the roads that the Preferred Route would follow, with residential development more widely dispersed in western Minnesota and transitioning to more clustered rural residential development south of the Twin Cities metropolitan region in Scott and Dakota counties. Commercial and industrial land uses are typically concentrated around the urban centers of each county the transmission line would cross, while some industrial development has occurred outside of urban centers to support the growing renewable energy industry and for agricultural activities. Other land cover types the route crosses include natural land features—forested areas, wetlands, streams and standing water features.

The area acreage and percent of land cover for the various land use types the Preferred Route would traverse are shown in Table 6-1.

Preferred Route: Brookings County - Hampton

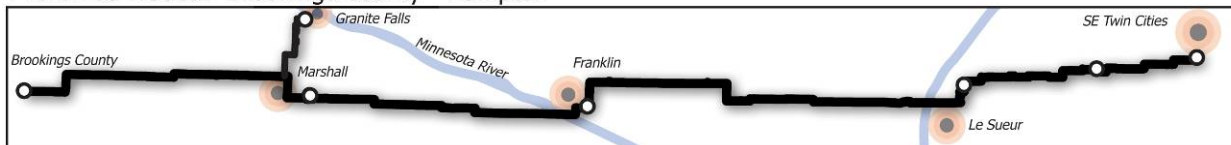


Table 6-1. Preferred Route Land Use Summary

Land Cover Type	Total	
	Area (Acres) <sup>1</sup>	Percent of Route
<b>Cropland</b>	<b>29,562</b>	<b>86.4</b>
<b>Grassland</b>	<b>2,612</b>	<b>7.6</b>
<b>Shrubland</b>	<b>470</b>	<b>1.4</b>
- Lowland Shrub	15	0
- Upland Shrub	456	1.3
<b>Forest</b>	<b>881</b>	<b>2.6</b>
- Bur/White Oak	353	1
- Cottonwood	212	0.6
- Maple/Basswood	189	0.6
- All Others	127	0.4
<b>Aquatic</b>	<b>456</b>	<b>1.3</b>
- Open Water	200	0.5
- Marshland	256	0.8
<b>Urban</b>	<b>229</b>	<b>0.7</b>
- High Intensity Urban	53	0.2
- Low Intensity Urban	174	0.5
- Transportation	2	0
<b>Total</b>	<b>34,210</b>	<b>100.0</b>

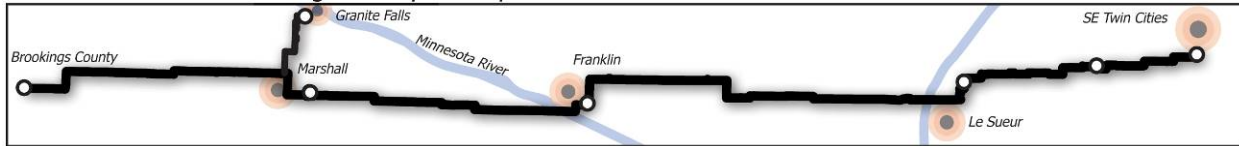
Source: Minnesota Department of Natural Resources, 2005

<sup>1</sup>All acreages rounded to the nearest whole number

### 6.2.2.1 Existing Land Use Conditions

The majority of the land within the Preferred Route is cultivated agricultural land used for planted row crops and pasturelands. In western Minnesota, the land crossed may be characterized as flat, open terrain with some areas of rolling terrain and lightly forested areas near small streams or water features. In eastern Minnesota, the land area crossed is a mixture of flat terrain with rolling hillside terrain. In both cases, the farmland crossed by the Preferred Route is mostly used for planted row crops including corn, soybeans, or other crops. The route would also cross some lands used for open pasture and grazing areas. The Preferred Route largely follows roads and farm field lines to minimize impacts to farm fields. Rural residential development is widely dispersed across the county landscapes and has occurred along each of the roads the Preferred Route would follow. Housing densities along many of the roads followed average one home per mile or less in western Minnesota. Higher densities and clusters of rural residential developments are more common in eastern Minnesota, on the southern edge of the Twin Cities metropolitan area. Commercial and industrial land uses are mainly located in the urban centers of the counties; the proposed transmission line is not anticipated to affect the use or operation of any commercial establishment. Some industrial land uses for agribusiness commercial activities are located in ex-urban locations of each county and in proximity to the roads the Preferred Route would follow. However, the proposed transmission line would not impact the operation of these facilities. Expansive areas of open space and ecological

## Preferred Route: Brookings County - Hampton



preserves for plant and animal wildlife habitat and production have been established on lands the route would cross or travel past including WMAs, Reinvest in Minnesota (“RIM”), and Conservation Reserve Program (“CRP”) lands, along with USFWS habitat easement areas. These lands have helped create a concentration of wildlife habitats throughout Minnesota extending from tributary rivers.

County-specific descriptions of land uses the Preferred Route would cross are provided below.

### **Lincoln County**

Extensive areas of open farmland dominate the existing land use in Lincoln County, with very few rural residences or farmsteads along the roads the Preferred Route would follow. The homes per mile density along the Preferred Route in Lincoln County is 0.5 (which is approximately 1 home per two miles). Based on available data, no commercial or industrial land uses are located along the roads paralleled. The land crossed by the route is zoned agricultural under the Rural Preservation Management District.

### **Lyon County**

Similar to Lincoln County, the dominant land use in Lyon County is open agricultural land with most residential development clustered around existing urban centers. In Lyon County, the homes per mile density is 0.9 along the roads the route would parallel. Commercial enterprises are also clustered around the urban centers of the county, particularly the City of Marshall, where access to transportation services and a concentrated consumer base are located. Some agribusiness industrial activities occur near the Preferred Route, but the transmission lines are not anticipated to disrupt these businesses. The land crossed in Lyon County is zoned as agricultural land under the Agricultural District classification of the Lyon County Zoning Ordinance.

### **Yellow Medicine County**

Yellow Medicine County is a lightly populated, rural county, with few rural residences located along the roads the Preferred Route would parallel. The homes per mile density along the Preferred Route is 1.4, with commercial and industrial land uses concentrating around urban centers. The majority of land within Yellow Medicine County is zoned for agricultural use under the Rural Preservation zoning district. The county zoning code establishes eight classifications within the Rural Preservation District, ranging from prime farmland to marginal and non-tillable farmland primarily used as pasture lands.

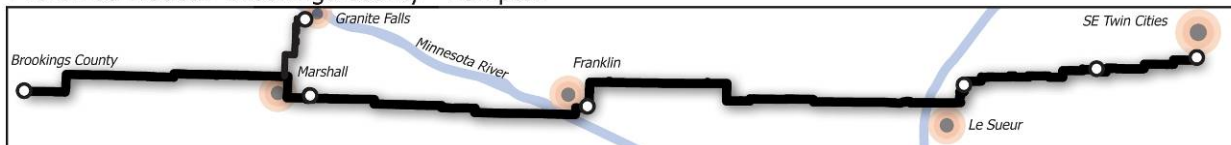
### **Redwood County**

In Redwood County, rural residences and farmsteads are scattered across the county landscape, and the primary land use continues to be open farm and pasture lands. The homes per mile density along the roads followed is approximately 0.42. Commercial and industrial land uses are principally located in urban centers or near major transportation facilities. Redwood County has zoned much of the county’s unincorporated land under the agricultural or rural residential districts.

### **Brown County**

The Preferred Route crosses only a small portion of land in Brown County. Rural residential development has occurred, with a homes per mile density of 1.1 along the roads the route would

## Preferred Route: Brookings County - Hampton



parallel. The land area crossed by the transmission line is zoned under the Agricultural/Shoreland zoning district.

### **Renville County**

The primary land use in southern Renville County is agriculture. Rural home densities along roads followed by the Preferred Route in Renville County are also comparable to neighboring counties, 0.8 homes per mile. Commercial and industrial land uses focused are around the cities and towns. The majority of the transmission line would cross land zoned as Agricultural (A). Renville County has established the Shoreland Special Protection zoning district, a zoning district used around all of the open water features in the county including the Minnesota River.

### **Sibley County**

The land area crossed by the Preferred Route in Sibley County is predominantly agricultural land (zoned General Agricultural Zoning District (A)) with limited rural residential, commercial, or industrial land uses. Most of the County's commercial land uses are focused around the urban centers, which are located at the intersections of major surface transportation facilities, including roadways and a freight railway corridor. Industrial land uses are also focused in the urban areas. Residential land uses comprise the largest category of land use development along the roads the Preferred Route would follow, with a homes per mile density of 1.3. On the eastern end of the county near the Minnesota River the transmission line would cross land zoned under the Conservation and Agricultural District.

### **Le Sueur County**

Much of the land in northern Le Sueur County is zoned agricultural under the Agricultural/Residential District. On the east bank of the Minnesota River beyond the wastewater treatment ponds, the Preferred Route would cross lands used for light industrial and manufacturing purposes, land uses considered compatible with HVTLs. The Mars Petcare U.S. company operates a pet food manufacturing facility immediately north of the TH 169 bridge over the river, and Cambria USA operates a manufacturing facility of quartz countertops on TH 169. A small cluster of residences is located in proximity to these industrial facilities on the northern side of Le Sueur. Once the Preferred Route leaves the city area, land uses are primarily agricultural. The homes per mile density is 4.1 along the roads paralleled in Le Sueur County.

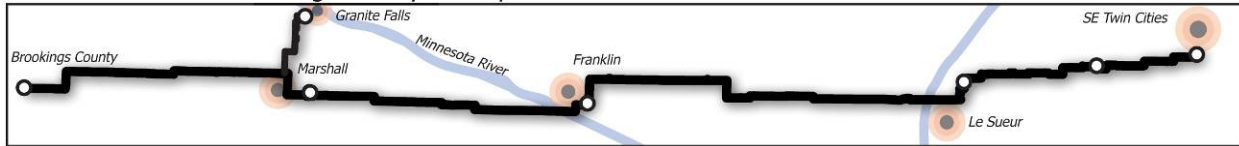
### **Scott County**

The homes per mile density is 6.1 along the roads followed by the Preferred Route in Scott County. While commercial and industrial land uses continue to be concentrated around the urban centers of the county, some commercial and industrial development has occurred outside of urban locations along primary transportation corridors with good connections to I-35. The county and municipalities have often planned for highway commercial districts, with land uses typically comprised of auto-oriented businesses, repair services, and trucking/shipping businesses.

### **Dakota County**

Land uses in southern Dakota County are a mixture of open agricultural lands and single family rural residential properties. The homes per mile density is approximately 3.6 along the roads followed or in proximity to the Preferred Route. Commercial and industrial developments are concentrated

## Preferred Route: Brookings County - Hampton



within and around the cities of Lakeville and Farmington on the northern sides of Eureka and Castle Rock townships. There are no identified commercial or industrial land uses in proximity to the Preferred Route.

Zoning authority and land use governance in Dakota County is controlled exclusively by the cities and townships of the county. Therefore, a discussion of the land uses and zoning code information as it is available for the townships the Preferred Route would cross in Dakota County is provided below.

### **Eureka Township**

The land area crossed in Eureka Township is mostly agricultural land with some areas of scattered rural residential development in proximity to the Preferred Route. According to the Eureka Township Zoning Code, all of the land area in Eureka Township is zoned as agriculture.

### **Castle Rock Township**

In Castle Rock Township, the majority of land crossed by the Preferred Route would be agricultural lands. Rural residences are clustered along the roads the transmission line would follow through the township. The land area crossed by the transmission line is zoned agriculture and rural residential under the Agricultural District (“AG”) and Rural Residential (“RR”) zoning districts.

### **Hampton Township**

The predominant land use within Hampton Township is agricultural lands with some clustered rural residential development. At the time of this Application, no specific land use planning information for the township was available.

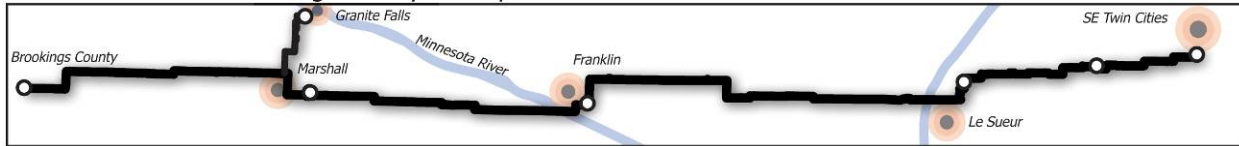
#### **6.2.2.2 Impacts and Mitigation**

Land uses within proximity of the Preferred Route are not expected to change as a result of construction and operation of the proposed transmission line. Agriculture is the principal land use within the Preferred Route, and the majority of land under or adjacent to the transmission line could still be used for agricultural practices following construction. Current county and city land use plans, zoning ordinances and public policies indicate that agriculture will continue to be the predominant land use in the future.

Permanent land impacts are primarily the result of structure placement. To the greatest extent possible, the Preferred Route will avoid the placement of poles in open farm fields or heavily forested areas. Where the proposed route sections do not travel along existing roadways, farm field lines and section lines were used to minimize impacts to agricultural lands and the need to create new access paths for maintenance purposes. It was assumed that each land cover type crossed by the line would be temporarily impacted as a result of construction and for occasional maintenance purposes.

Impacts to agricultural lands are expected to be relatively minor. Agricultural activities will be allowed beneath the transmission line with the exception of in the immediate vicinity of the poles. During Project construction, there will be a small loss of land around each pole and temporary impacts to agricultural land. As specified in Section 3.3, the Applicants will purchase ROW easements for private property crossed by the transmission lines pursuant to State and federal land acquisition requirements, which will be recorded as part of the property record. Temporary impacts

## Preferred Route: Brookings County - Hampton



to farmland during construction include soil compaction and likely some crop damage within the ROW. Significant efforts have been made to avoid crossing or impacting center-pivot irrigation systems. These systems are predominantly located in the eastern portion of the Preferred Route, with several facilities located in proximity to the proposed Hampton Substation area. See Section 6.3.1.7 for a discussion of all impacts and mitigation practices for agricultural lands. The Applicants will work with landowners to minimize impacts to farming operations along the entire route. Landowners will be compensated where the transmission line crosses property. Landowners will also be compensated in the event of any crop damage or soil compaction during construction.

### 6.2.3 DISPLACEMENT

Displacement results from ROW acquisitions that require the use of a property occupied by a residence or business. A displacement was defined by the Applicants as any home or business whose structure fell within the ROW of the proposed transmission line. In this case a structure that is within 75 feet of the proposed route centerline would constitute a displacement. The Project will be designed to avoid displacement of existing homes or businesses.

Residences near the Preferred Route were identified through field observation, analysis of high resolution aerial photography, and comments received at public work group meetings and open houses. To identify potential displacements, parcels located within 75 feet of the Preferred Route centerline were identified using GIS software. When potential for displacement was identified, the Preferred Route centerline was adjusted to avoid a displacement of that structure.

However, because the Project involves construction of 345 kV transmission line facilities there may be instances where property is purchased per Minnesota Statutes Section 216E.12, subdivision 4 (sometimes referred to as “Buy the Farm”). This gives the owner of certain types of property the option of having the Applicants purchase the property that the transmission line crosses for the fair market value of the land. Generally, the statute applies to residential, recreational and agricultural property. A parcel’s eligibility under the statute depends on its classification under Minnesota Statutes Section 273.13. Only those parcels falling within the enumerated classifications are covered; unlisted classifications are excluded. The statute extends to the following types of property: “agricultural or nonagricultural homestead, non-homestead agricultural land, rental residential property, and both commercial and noncommercial seasonal residential recreational property.” Minn. Stat. § 216E.12, Subd. 4. It is unclear at this time what landowners may exercise this option.

Table 6-2 provides an estimate of the number of residences located between the substation locations and the ROW requirements for the Preferred Route.

Preferred Route: Brookings County - Hampton

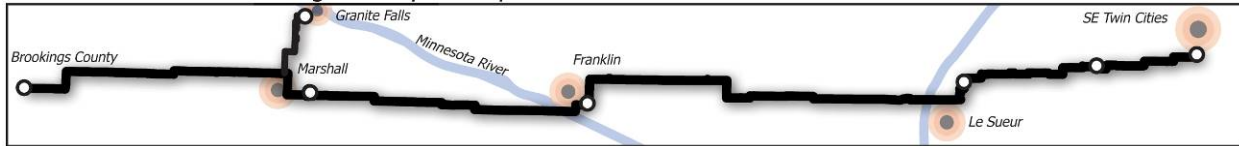


Table 6-2. Residences within 500 Feet of the Preferred Route Centerline

Proximity (Feet)	South Dakota Border to Lyon County Substation	Lyon County Substation to Minnesota Valley Substation	Lyon County Substation to Cedar Mountain Substation	Cedar Mountain Substation to Helena Substation	Helena Substation to Lake Marion Substation	Lake Marion Substation to Hampton Substation
ROW Required	150	150	150	150	150	150
Residences 0-75	0	0	0	0	0	0
Residences 75-150	3	7	5	6	8	5
Residences 150-300	13	14	13	19	52	30
Residences 300-500	15	13	7	24	45	31
<b>Total Residences</b>	<b>31</b>	<b>34</b>	<b>25</b>	<b>49</b>	<b>105</b>	<b>66</b>
<b>Density (homes/mile)</b>	<b>0.6</b>	<b>1.2</b>	<b>0.5</b>	<b>0.8</b>	<b>4.0</b>	<b>3.6</b>

6.2.3.1 Impacts and Mitigation

No displacement of residences or businesses is anticipated due to construction of the Project along the Preferred Route.

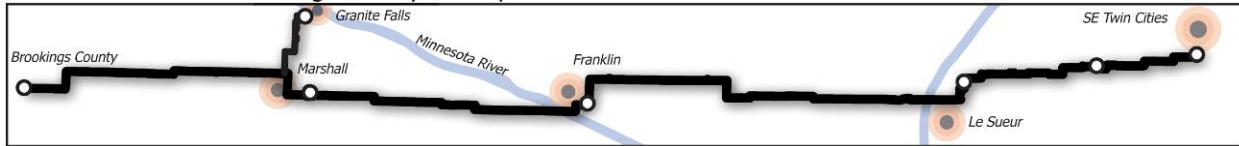
6.2.4 NOISE

Noise is defined as unwanted sound. It may include a variety of sounds of different intensities across the entire frequency spectrum.

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

Cumulative noise increases occur on a logarithmic scale. If a noise source is doubled, there is a 3 dBA increase in noise, which is barely discernible to the human ear. For cumulative increases resulting from sources of different magnitudes, the rule of thumb is that if there is a difference of greater than 10 dBA between noise sources, there will be no additive effect (*i.e.*, only the louder source will be heard and the quieter source will not contribute to noise levels). Therefore, predicted noise levels associated with the transmission line are typically much lower than the ambient noise in the Project area and will not increase the existing background noise levels in the Project area. Table 6-3 shows noise levels associated with common, everyday sources and places the magnitude of noise levels discussed here in context.

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**Table 6-3. Noise Levels Associated With Everyday Sources**

Sound Pressure Level (dBA)	Noise Source
140	Jet Engine (at 25 meters)
130	Jet Aircraft (at 100 meters)
120	Rock and Roll Concert
110	Pneumatic Chipper
100	Jointer/Planer
90	Chainsaw
80	Heavy Truck Traffic
70	Business Office
60	Conversational Speech
50	Library
40	Bedroom
30	Secluded Woods
20	Whisper

Source: A Guide to Noise Control in Minnesota, MPCA (revised, 1999), <http://www.pca.state.mn.us/programs/pubs/noise.pdf>

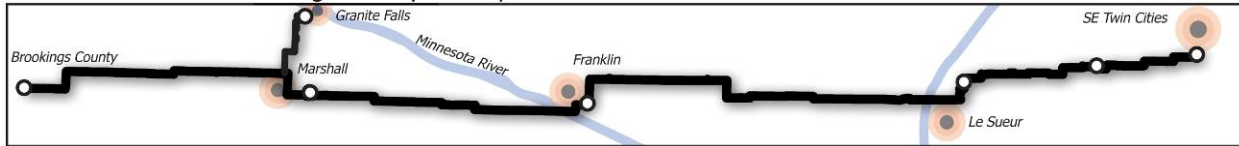
The Minnesota Pollution Control Agency (“MPCA”) has established standards for the regulation of noise levels. The land use activities associated with residential, commercial and industrial land have been grouped together into Noise Area Classifications (“NAC”). See Minn. R. 7030.0050. Each NAC is then assigned both daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) limits for land use activities within the NAC. See Minn. R. 7030.0040. Table 6-4 shows the MPCA daytime and nighttime limits in dBA for each NAC. The limits are expressed as a range of permissible dBA within a one hour period; L<sub>50</sub> is the dBA that may be exceeded 50 percent (30 minutes) of the time within an hour, while L<sub>10</sub> is the dBA that may be exceeded 10 percent (6 minutes) of the time within an hour. Residences, which are typically considered sensitive to noise, are classified as NAC 1.

**Table 6-4. MPCA Noise Limits by Noise Area Classification (dBA)**

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

Transmission lines produce noise under certain conditions. The level of noise depends on conductor conditions, voltage level, and weather conditions. Generally, activity-related noise levels during the operation and maintenance of transmission lines are minimal and do not exceed the MPCA Noise Limits outside of the ROW.

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In foggy, damp, or rainy weather, transmission 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 approximately equal to household background levels.

The proposed transmission lines were modeled using the Bonneville Power Administration CFI8X model to evaluate audible noise from HVTLS. Where possible, the model was executed as a worst-case scenario benchmark, to ensure that noise was not under-predicted.

Table 6-5 presents the L<sub>5</sub> and L<sub>50</sub> noise levels predicted for proposed transmission line structures and voltages for the Project.

**Table 6-5. Calculated Audible Noise for Proposed Single/Double Circuit Transmission Line Designs (Five feet Above Ground)**

Structure Type	Noise L <sub>5</sub> (Edge of ROW) (dBA)	Noise L <sub>50</sub> (Edge of ROW) (dBA)
Single Pole, Davit Arm, 345 kV/345 kV Double Circuit with both Circuits In Service	51.6	41.8
Single Pole, Davit Arm, 345 kV/345 kV Double Circuit with one Circuit In Service	54.1	45.8
Single Pole, Davit Arm, 115 kV Single Circuit	24.3	19.3
Single Pole, Davit Arm, 345 kv/345 kV Double Circuit with one Circuit operating at 230 kV	36.0	26.0

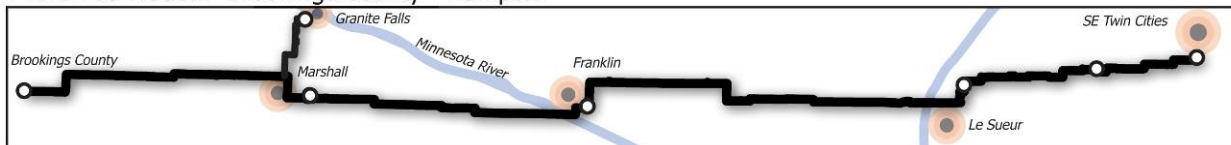
### 6.2.4.1 Impacts and Mitigation

Transmission line audible noise levels are not predicted to exceed the MPCA Noise Limits outside the ROW for all Noise Area Classifications. No mitigation is required for the audible noise generated by the transmission lines.

### 6.2.5 AESTHETICS

This section details the visual characteristics and aesthetic resources of the Preferred Route Project area along with the potential visual impacts and mitigation measures at various locations along the Preferred Route. The discussion of visual quality and aesthetics is based on a qualitative review of

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the existing landscape environment surrounding the Project area. Visual and aesthetic resources within the Project area were identified through discussions with State and local agency officials, review of city and county comprehensive land use plans and other local and regional plans, comments received from participating citizens at public work groups or open houses, and through a review of high-resolution aerial photography and field observation. Generally, visual and aesthetic resources within the area include historic residential or commercial structures, parklands, open space areas, water features, scenic overlooks, and densely forested areas.

Determining the relative scenic value or visual importance of an area is a complex process involving both the philosophical and/or psychological response to what may be perceived as beautiful by the individual. Generally, landscapes that incorporate a balanced mixture of diversity and harmony have the greatest potential for high scenic value and may be considered important to persons living in or traveling through a region. Viewer response is based on the sensitivity and exposure of the viewer to a particular viewshed. Sensitivity relates to the magnitude of the viewer's concern for the viewshed, while exposure is a function of the type, distance, perspective and duration of the view.

### 6.2.5.1 General Landscape Context

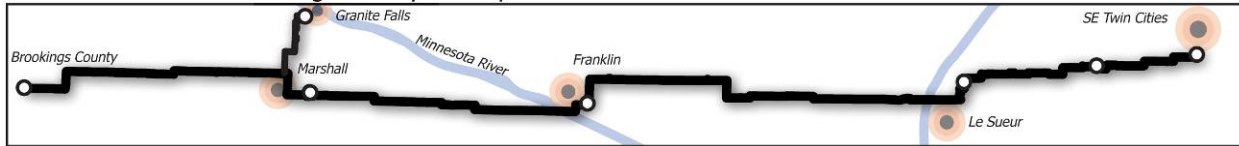
The landscape topography crossed by the Preferred Route between the South Dakota border and the proposed Hampton Substation is a mixture of agriculture, farmsteads, fallow fields, large open vistas, and gently rolling hillside topography. As described in Section 6.1, the Project is primarily located in sparsely populated rural areas of southwestern Minnesota, where the landscape is mostly flat to rolling agricultural lands and can be classified as rural open space. The settlements in much of the Project area are rural residences and farm buildings (inhabited and uninhabited) scattered along rural county roads. These structures are focal points in the open space character of the landscape crossed by the Preferred Route. A number of farmsteads date back to the late 19th and early 20th centuries, along with more modern farm buildings and residences that represent the different eras of Minnesota farm architecture. Scattered areas of forest and tree cover occur throughout the Project area, primarily in the eastern third. In western Minnesota, forest patches are located in areas typically considered unsuitable for farming, or were planted as protection from the wind and sun around rural residences or farmsteads.

Residences are located adjacent to roads where the Preferred Route is proposed and many residents have surrounded their homes with a mix of deciduous and coniferous trees that serve as natural windbreaks, shade, and enhanced privacy for homes. As the proposed transmission line extends from west to east, the number of rural residences gradually increases, thereby increasing the potential for visual impacts to homes near the transmission line. Additionally, the transmission lines would be visible to travelers along the roads the Preferred Route follows.

There are areas of high scenic integrity and significance at points along the Preferred Route, as identified by the public and agency officials during public open houses, work group meetings, and agency coordination meetings. Specifically, these areas include river and open water features, historic structures, public recreation areas, and scenic byways.

Land parcels along the Preferred Route considered to contain outstanding natural features and warrant protection or management have been placed into State and federal conservation easement programs such as WMAs or wildlife habitat areas under the jurisdiction of the USFWS. The

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Preferred Route would follow existing highways, county and township roads, and some farm field lines in an effort to utilize existing corridors.

In Lincoln County, the Preferred Route would cross the Yellow Medicine River along County Road 134. The land area surrounding the river is rolling agricultural lands with minimal tree cover near the river. The transmission line would traverse an existing bridge crossing. In Lyon County the transmission line would cross the Redwood River. Several existing transmission lines and transportation corridors run through this region and the Preferred Route would utilize these corridors to minimize further impacts to the landscape. The transmission line would parallel an existing 69 kV transmission line for a short portion south of the Twin Cities and Western railway line. The transmission line would also cross the Scenic Byway, but would not follow the road for any length. The Applicants intend to work with area landowners and State agencies to minimize the impact of the transmission line on natural landscape features, and to minimize the visual aesthetic impact of the poles and wiring.

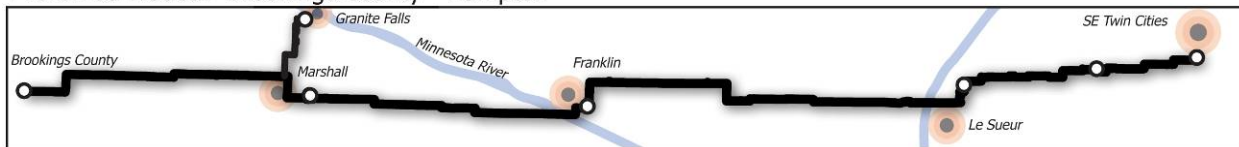
The terrain between the Lyon County Substation and the Minnesota Valley Substation is a combination of rolling and flat farmland. As the route nears the City of Granite Falls, it crosses TH 23, where the terrain changes to a mixture of forested lands with several marshlands and small standing water bodies and wetland areas. Several acres of land in this region have been placed in preservation and conservation easements with both the State of Minnesota and the USFWS. Cutting through this region of forested wetlands is TH 67, along which a small number of farm structures and some rural residences are located. Additionally, the Granite Falls Golf Club is located on a parcel of land in this region. The golf club is located approximately 600 feet from the existing transmission line structures. The area around the Minnesota River is considered to be a high scenic value area and while the 345 kV line will replace an existing 115 kV transmission line, it would be a visual impact to the region. On the north side of the river where the substation is currently located, Granite Falls operates a series of wastewater treatment ponds. U.S. Highway 212 travels east-west just north of the substation, contributing to increased development on the west side of the river.

Small lakes occur throughout the landscape along with creeks or stream tributaries, which flow into larger rivers including the Minnesota, Yellow Medicine, and Redwood rivers. These rivers serve as both natural wildlife corridors and scenic viewpoints and have been identified as important tourism resources for area communities. Conservation preservation easements have been established along each of these rivers to maintain the river area's natural setting and ecosystem characteristics. As part of the routing process, existing river crossing locations were selected at the most appropriate points to cross all rivers within the Project area to avoid disruption and adverse effects to the landscape.

The two most sensitive visual resources identified by State agencies and the public along the route are the Minnesota River and Scenic Byways. The Minnesota River serves a variety of users and is an important landscape feature in western Minnesota. Recreational users travel the river, often along Minnesota Scenic Byway roads, and the river also serves as a primary wildlife corridor.

There are three crossings of the Minnesota River. The first would use an existing crossing point (County Road 8) between Brown and Renville counties, eventually connecting with the proposed Cedar Mountain Substation near Franklin. The Franklin crossing would likely result in the removal of some native tree cover as part of the transmission line ROW.

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The second crossing would follow the path of an existing transmission line to connect with the Minnesota Valley Substation located adjacent to the Minnesota River near Granite Falls. At this location the river is designated recreational by the State of Minnesota. In addition to the Preferred Route, two other transmission lines traverse this region to connect with the substation. In contrast with the majority of the route, the landscape around the Minnesota River is characterized by densely wooded areas, creating a diverse ecological setting, with high recreational and scenic value.

The third crossing of the Minnesota River would occur on the northern side of Le Sueur between Sibley and Le Sueur counties. While much of the landscape in Sibley County is flat, open farmland, the land topography changes significantly where glacial ice carved out the Minnesota River Valley and its tributaries. The riparian corridor along the river stretches into the countryside along the Rush River, a tributary to the Minnesota River. Near the river, slope and elevation changes present a challenge for the location of the transmission line, which would also pass through dense forest canopy on both sides of the river.

The preferred route crosses TH 93, which parallels the river and is designated as a Scenic Byway. This area is characterized by wooded areas, a diverse ecological setting, high visual and recreational value and the presence of the Minnesota River. The Preferred Route would cross both the highway and river and create a new visual impact. On the other side of river, the land area in northern Le Sueur County is a mixture of rolling agricultural lands and some forest area, which contribute to the scenic nature of the landscape. The river valley and bluff lines along the river dominate the viewshed, creating an area of high scenic value for recreational users and residents.

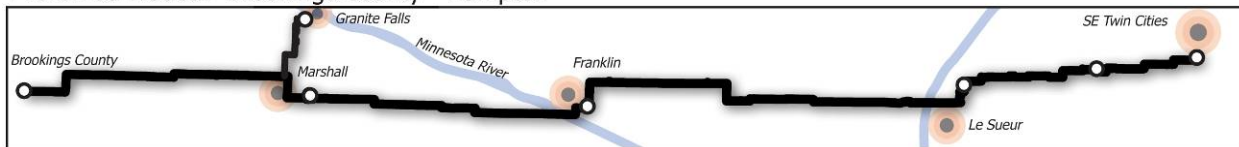
An additional National Scenic Byway is U.S. Highway 75, the “King of Trails” highway, which is an historic federal highway. U.S. Highway 75 runs north-south, formerly connecting Winnipeg, Manitoba with the Gulf of Mexico. The highway has a rich history dating back to pre-settlement periods and at points is surrounded by rolling agricultural and prairie lands. The Preferred Route would cross U.S Highway 75 in northern Lincoln County, but would not parallel the road for any length.

In addition to the naturally occurring landscape features and scenic byways, historic structures are located at various points along the route. Data from the State Historic Preservation Office (“SHPO”) and the National Register of Historic Places (“NRHP”) were obtained to identify historic structures along the route. These structures serve many functions, such as cultural resources and tourist destinations. Along the Preferred Route, many of the structures identified as historic are bridges spanning tributaries or rivers the route would cross. At specific locations, the Preferred Route would utilize these crossings, but these bridge structures would not be removed. Other structures along the route identified as historic include barns and silos. The Barnum Windmill, located southwest of Redwood Falls, is an energy facility located within 500 feet of the Preferred Route. The majority of historic structures in western Minnesota are located in proximity to cities or towns, or scattered across the landscape and outside of the transmission line ROW.

### 6.2.5.2 Impacts and Mitigation

The new transmission line will create a new visual element within the vicinity of the Preferred Route. The visual impact of the transmission line could affect landowners who live along or near the roads the Preferred Route intends to follow, or community residents who travel along these roads regularly. The natural landscape is often characterized as rolling or flat terrain used for agricultural

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purposes. Depending on a viewer's physical location, the terrain conditions, and natural landscape features such as tree cover, the transmission structures could be visible for distances between 1.5 and 2 miles. A viewer's degree of discernable detail decreases as physical distance from an object increases. Beyond two miles in physical distance, the outline of pole structures may be seen. The transmission line wiring is unlikely to be seen clearly beyond distances of one-half to three-quarters of one mile.

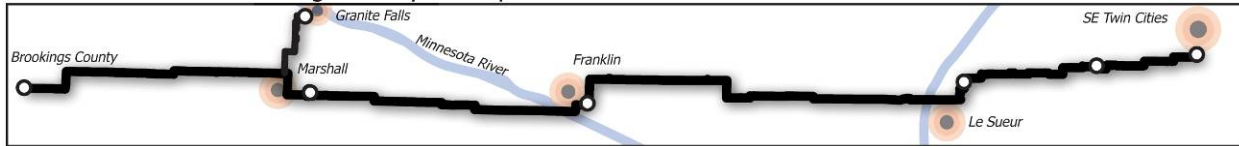
During public open houses, residents of western Minnesota identified the importance of trees for privacy, shade, and wind screen protection around rural residences and farmsteads. In eastern Minnesota, where tree cover is more abundant, open house participants identified the importance of trees for helping maintain the rural character of the region, providing a source of economic activity for some residents, and playing a role in recreational activities. Additionally, trees often help to protect wildlife corridors, particularly near water and wetland features. Throughout the routing process, the Applicants have sought routes that would minimize the removal of trees. Much of the land area crossed by the transmission line is open agricultural land. Most of the tree cover in proximity to the Project is located around water features or on lands deemed unsuitable for farming. The Preferred Route has been located to avoid the removal of trees to the greatest extent possible. For the safe operation and maintenance of the transmission line, trees within the transmission line ROW would need to be removed. In an effort to avoid agricultural impacts or impacts to wildlife corridors through the removal of tree canopy, the transmission line may share portions of the public right-of-way along some of the roads paralleled. Where tree cover would need to be removed pursuant to ROW requirements, the Applicants intend to work with the landowners to minimize the removal of trees to the greatest extent possible.

In an effort to minimize the visual effects of the transmission line in visually sensitive areas, the route would be collocated with existing transmission lines or located in areas where compatible land uses have been identified by the public and public agencies. The Preferred Route generally follows existing transportation corridors or quarter-section field lines. The proposed structures would be between 130 and 175 feet tall, typically located just outside the public road ROW. Many of these roads currently do not share a right-of-way with a transmission line, with the exception of power distribution lines serving rural residences and farmsteads. However, the Preferred Route would share right-of-way for short distances in several locations, typically collocating with other routes at entrance and exit points to substations. These areas include the entrance point to the Lyon County Substation, the Minnesota River crossing at Granite Falls, and near the Lake Marion Substation.

As discussed, several land areas the transmission line crosses may be considered visually sensitive, specifically the crossing points of the Minnesota River. To minimize visual impacts, crossing points with the shortest distance across the river and scenic byways were identified as the optimal points to cross the river.

At the first crossing south of Granite Falls, the route would be collocated with two other transmission lines crossing the river to connect with the Minnesota Valley Substation. The route would replace one of these existing transmission lines, using the same ROW, in effort to minimize the visual intrusion in this region. Several areas of land surrounding these transmission lines are either owned by or are under the jurisdiction of the DNR or the USFWS. A few rural residences are located near these lines along with the Granite Falls Golf Club on TH 67. The existing tree cover surrounding these homes and the golf course would likely limit the visual impact of the transmission

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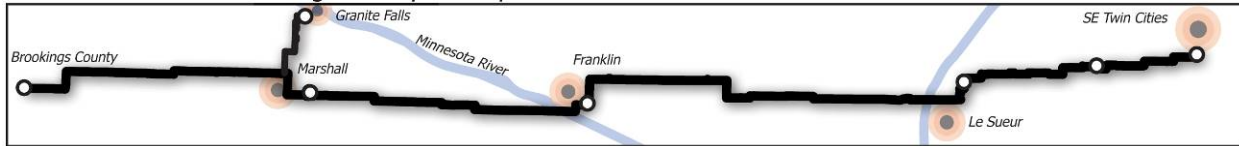
lines to area residents or visitors. As part of the routing process, care has been taken to avoid the placement of structures in ecologically sensitive areas, typically identified by the public as areas of scenic significance, and additional care will be taken to avoid visual impacts to the greatest extent practicable. The river crossing at Granite Falls is designated as recreational while the crossing southeast of Franklin and the crossing north of Le Sueur are not designated as scenic areas. The existing transmission line ROW would be increased slightly in accordance with the ROW requirements for a 345 kV transmission line; however, trees within the ROW of the existing transmission line have already been removed, and the new ROW requirements are not anticipated to change the existing visual characteristics in this area significantly beyond their current condition. The Applicants intend to work with landowners to minimize the physical and visual intrusion of the transmission line through this region.

At the second crossing point of the Minnesota River southeast of Franklin, the transmission line would follow an existing bridge crossing between Brown and Renville counties. Dense forest areas border the river. Few residences or farmsteads are located along the roadway at this crossing. While the transmission line ROW would require the removal of tree cover within the ROW, all efforts to minimize the impacts to trees will be implemented. The line will share ROW over the road, in an effort to minimize the number of trees cleared. Additionally, agricultural lands are next to the riverbank and the roadway, where tree cover has been removed. The Applicants intend to work with landowners in this area to minimize the impact of the transmission line to the surrounding landscape and limit the removal of trees.

The third and final crossing of the Minnesota River occurs north of the City of Le Sueur. The river crossing would parallel the existing TH 169 bridge crossing, and be collocated with land uses generally considered to have low scenic significance and compatible with transmission lines. Land uses in this area are primarily industrial, with the City of Le Sueur operating a set of wastewater treatment ponds on the western side of the river, and the Mars Petfood U.S. company operating a pet food manufacturing plant on the eastern side. The slopes alongside the river are typically steep. A small cemetery is located on the hillside on the eastern side of the river, along with a small number of homes surrounded by dense tree cover. There is a large radio and microwave communication tower at the top of the hill on the eastern side. The super-structure of the facility rises approximately 192 feet above ground, well above all other land uses in this area. The transmission line crossing would constitute a new river crossing; however, the dense tree cover would likely limit the visibility of the transmission line to area residents and businesses. Because of the existing tree cover and the landscape topography, it is unlikely that the transmission lines could be seen from the downtown Le Sueur area. The Applicants intend to work with area landowners to ensure that the visual intrusion of the transmission line is limited. In the case of both the Franklin and Le Sueur crossing points, the transmission line would cross scenic byways; however, these crossings would be perpendicular and would not parallel these roadways.

Although the transmission line will be a contrast to surrounding land uses, the Applicants will continue to work with landowners and public agencies to identify concerns related to the transmission line and aesthetics. In general, mitigation includes enhancing positive effects as well as minimizing or eliminating negative effects. Potential mitigative measures include the following:

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- Where feasible, the location of pole structures, ROWs, and other disturbed areas will be determined by considering input from landowners or land management agencies to minimize visual impacts.
- Structure types (designs) would be uniform to the extent practical. The Project proposes to use single pole steel structures, double circuited, ranging in height between 130 and 175 feet. The height of the structure may be reduced, as feasible, to minimize impacts within areas of high scenic importance.
- Structures would be placed at the maximum feasible distance from scenic highway, waterway, and trail crossings, within the limits of structure design.
- Care shall be used to preserve the natural landscape; construction and operation shall be conducted to prevent any unnecessary destruction, scarring or defacing of the natural surroundings in the vicinity of the work.
- To the greatest extent possible, waterways would be crossed in the same location as existing disturbances, utility lines or transportation routes. This is especially important for the crossing points of the Minnesota, Yellow Medicine, and Redwood rivers.
- New transmission lines would parallel existing ROWs to the extent practicable to minimize visual impacts to farmlands or open spaces.

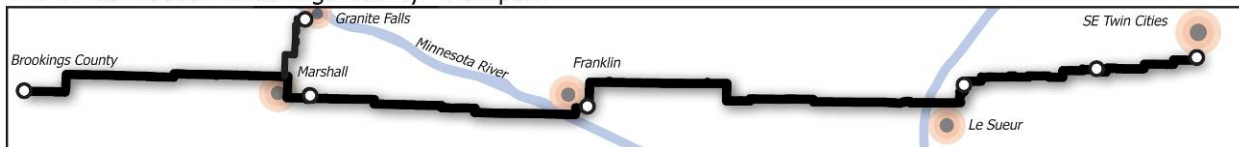
### 6.2.6 SOCIOECONOMICS

This section describes the primary social and economic characteristics of the Project area and along the route sections under consideration. Socioeconomic factors analyzed include population, income, households, employment, household income, and poverty. U.S. Census data used for this evaluation are summarized at different geographic levels: national, State, county, census tracts, block group and block. To most accurately portray the existing population conditions in proximity to the Proposed Route, Census block level data were used. Due to the predominantly rural nature of the Project area, with the notable exceptions of Scott and Dakota counties, the Census block groups increase as the population decreases. In some cases, persons living outside of the route would also be included in the analysis. Therefore, the results may not actually display the existing conditions as they pertain to the residents living in close proximity to the Preferred Route. As a result, it is difficult to ascertain specific social or economic characteristics of the population living along the route. However, based on the data available, general social and economic characteristics may be inferred from Census block data.

To consider population characteristics, a Region of Comparison (“ROC”) is established to understand the dynamics of the population living in proximity to the proposed transmission line route. The ROCs established for this Project are the selected counties the transmission line would cross. Additionally, towns and cities the route would travel around or through were also included in part of this analysis.

Shifts in population have occurred throughout the Project area, with populations continuing to grow around the Twin Cities metropolitan region and to spread outward in eastern Minnesota, while many communities in western Minnesota have continued to lose population. The trend in decreasing rural

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populations is not exclusive to southwestern Minnesota. The changing social dynamics in most rural areas, including the age of the population and the ability to find work in more urban areas, has contributed to the erosion of rural populations. The migration of young people away from rural areas has resulted in an increase in the average age of local residents. Furthermore, as area residents have aged, the desire to move to regional centers where better health care options are available has resulted in reduced rural populations and larger farming operations, or the loss of agricultural production. In turn, the migration of the population away from rural areas has had economic implications for out-state communities. Employment in social services, particularly health care and elder care occupations has significantly increased over the past decade. Per capita and median household incomes are typically lower in rural southwestern Minnesota counties compared with metropolitan counties such as Scott and Dakota.

### 6.2.6.1 Social Characteristics

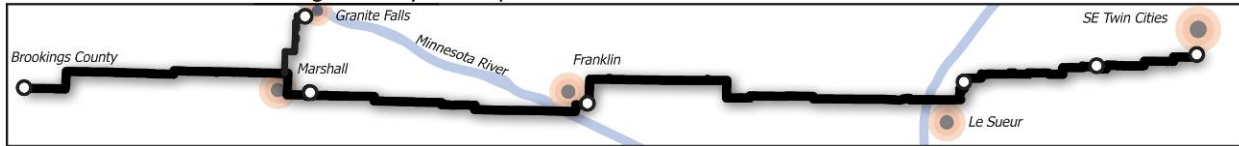
Population characteristics considered relevant to the social setting of the Project area include the total population, estimated population, per capita income, and poverty status. Based on the 2000 U.S. Census, the Preferred Route Project area population was estimated to be 51,870, comprising 9 percent of the total population for all of the counties the Preferred Route would cross. Western Minnesota communities have gradually experienced reductions in total population, with the exception of Lyon County and Marshall. Additionally, per capita incomes also rise significantly as the transmission line moves from west to east, a function of several factors including (but not limited to) higher costs of living, higher paying jobs, and property costs. Finally, poverty levels are generally higher in western Minnesota compared to eastern Minnesota. Table F-1 in Appendix F displays selected social characteristics of the population in the block groups the Preferred Route crosses.

### 6.2.6.2 Economic Characteristics

There are both similarities and differences between the economic characteristics of western Minnesota counties and the Twin Cities metropolitan region. As identified in Section 6.2.2, the prevailing land use within the Project area is agricultural, primarily planted crops. Many of the counties the Preferred Route would cross identify agricultural practices as a foundation of both the social and economic fabric of the county. Significant efforts by county and local officials to preserve and protect agricultural lands have been made. Aggregate mining for sand or gravel are also important economic activities in rural areas and in several instances, this type of extractive land use contributes directly to county and local road projects or other developments.

In recent years, western Minnesota has seen a significant boom in energy production, particularly wind energy technology and ethanol production. Planned expansion and major investments in energy production throughout the western region, coupled with favorable State policies promoting renewable energies, suggest that future investments will be made in this region to supplement the renewable energy industry. As the Preferred Route moves from west to east, the employment base of counties closest to the Twin Cities metropolitan region diversifies. Undoubtedly, the larger population base of the Twin Cities region leads to both greater demand and needs for a range of services and products. Economic commonalities between the employment bases of the two regions are apparent. Social service occupations in education and health care are leading industries in all counties and employment in manufacturing operations is also very strong. As discussed in the

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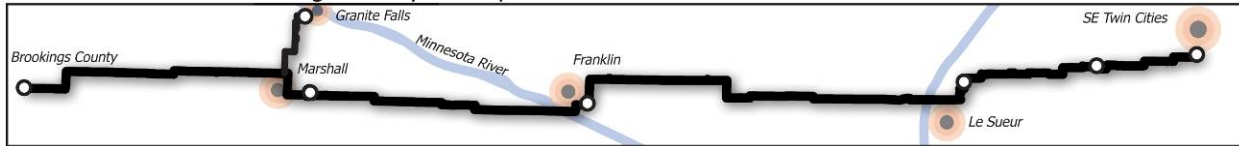


previous section, the changing dynamics of the population have put pressures on rural areas, particularly the need for health care, leading to a surge in health care and elder care occupations. Table 6-6 provides an overview of the leading county industries for the counties the Preferred Route would pass through.

**Table 6-6. Leading County Industries, Preferred Route**

County	Industry	Percent of Workforce
Lincoln County	Educational, Health & Social Services	25.6
	Agriculture	16.7
	Manufacturing	12.5
	Retail Trade	10.9
Lyon County	Manufacturing	22.4
	Educational, Health & Social Services	20.8
	Retail Trade	13.3
	Agriculture	6.3
Yellow Medicine County	Educational, Health & Social Services	23.3
	Manufacturing	18.1
	Retail Trade	9.2
	Construction	6.0
	Arts, Entertainment, Accommodation	6.3
Redwood County	Educational, Health & Social Services	17.6
	Manufacturing	17.3
	Retail Trade	12.1
	Agriculture	11.1
Brown County	Manufacturing	23.4
	Educational, Health & Social Services	20.1
	Retail Trade	11.3
	Agriculture	7.5
Renville County	Educational, Health & Social Services	19.8
	Manufacturing	19.7
	Agriculture	13.1
	Retail Trade	10.4
Sibley County	Manufacturing	27.3
	Educational, Health & Social Services	16.6
	Retail Trade	9.5
	Agriculture	9.5
Le Sueur County	Manufacturing	25.4
	Educational, Health & Social Services	21.0
	Retail Trade	9.3
	Construction	8.2
Scott County	Manufacturing	18.3
	Educational, Health & Social Services	14.8
	Retail Trade	11.8

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County	Industry	Percent of Workforce
Brookings County	Professional, Scientific, Management	10.2
	Finance, Insurance, Real Estate	8.4
	Construction	7.9
Dakota County	Educational, Health & Social Services	16.9
	Manufacturing	13.9
	Retail Trade	11.7
	Professional, Scientific, Management	10.7
	Finance, Insurance, Real Estate	10.1
	Transportation, Warehousing	8.8

Sources: U.S. Census Bureau, Census 2000 Summary File 3 (SF3), 2001

6.2.6.3 Population by Race and Ethnicity

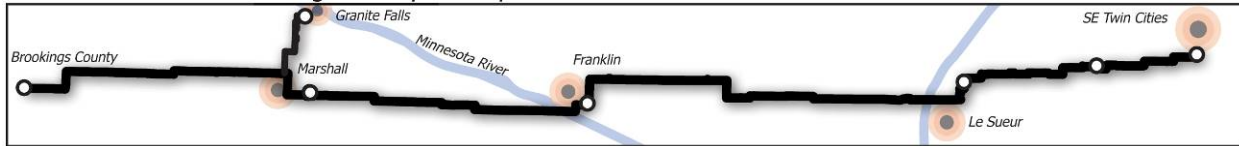
The Project area is composed of a variety of racial and ethnic groups. Race may be defined as a self-identification data item based on an individual’s perception of his or her racial identity. Respondents to the 2000 Census selected the race(s) with which they most closely identified themselves. Ethnicity is defined as a classification of a population that share common characteristics such as religion, cultural traditions, language, tribal heritage, or national origin. It should be noted however, that by definition, the ethnic category “Hispanic or Latino” includes persons of any race. For purposes of this document, Hispanic or Latino persons comprise their own ethnic category (White, Black, Asian, etc.). However, to avoid double counting of persons, the Hispanic or Latino population category was withheld from the final totals in all cases. This is a standard procedure by the Census Bureau. As shown in Table 6-7, the racial and ethnic composition of the Preferred Route area is principally persons who self-identified themselves as White/Caucasian. Persons of Hispanic or Latino ancestry along with Native American populations represented the next largest ethnicity groups, followed by persons of Asian heritage. The population characteristics of the Preferred Route are very similar (although with slightly lower populations of minority populations) to those of the ROC and the State of Minnesota.

Table 6-7. Race or Ethnic Heritage for the Preferred Route

		White or Caucasian	Black or African American	Hispanic or Latino	Asian	All Other Races	Total
Preferred Route	Number of Persons	49,866	276	985	246	1,453	51,841
	Percent	96.1	0.5	1.9	0.5	2.8	
Region of Comparison	Number of Persons	600,629	10,130	20,582	13,872	22,032	646,663
	Percent	92.9	1.6	3.2	2.1	3.4	
State of Minnesota	Number of Persons	4,400,282	171,731	143,382	141,968	205,498	4,919,479
	Percent	89.4	3.5	2.9	2.9	4.2	

Source: U.S. Census Bureau, Census 2000 Summary File 3 (SF3), 2001

## Preferred Route: Brookings County - Hampton



### 6.2.6.4 Impacts and Mitigation

Any adverse impacts to socioeconomic conditions or factors for project or transmission line construction would be short-term; therefore, no mitigation is necessary or proposed. In general, increasing the transmission output capability and reliability would benefit the surrounding communities on a long term basis. The Project is not expected to have any negative economic impacts. Indirectly, the increased capability and reliability of the electric system to supply energy to commercial and industrial users may contribute to the economic growth of communities and counties along the route and to future generation and renewable energy development. The construction, operation, and maintenance of the transmission line is not anticipated to negatively impact the socioeconomic resources along the route.

Short-term positive economic gains would result from activities associated with construction. Local businesses would likely see an increase in revenues from construction of the Project, and the number of workers hired from within and outside the Project area may result in positive economic gains in the form of increased wages and spending, lodging, meals, and other consumer goods and services. It is estimated that 200 to 250 workers will be employed during construction of the three CapX2020 projects statewide. It is not anticipated that the Project would create new permanent jobs, but it will create temporary construction jobs that will provide a one-time influx of income to the area.

Construction activities will provide a seasonal influx of additional dollars into the communities during the construction phase. Long-term beneficial impacts from the proposed transmission lines and substation additions include increased local tax base resulting from the incremental increases in revenues from utility property taxes.

### 6.2.7 CULTURAL VALUES

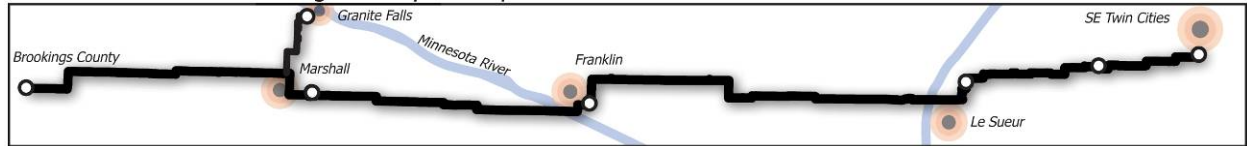
Cultural values include those perceived community beliefs or attitudes in a given area that provide a framework for that community's unity. The communities in the vicinity of the Project have cultural values steeped in rural agriculture and family-owned businesses. The communities falling within the Project area are primarily widely spaced small towns with populations below 6,000. The towns are surrounded by fertile cropland that produces corn and soybeans and provides grazing fields for cattle.

Public lands near the proposed transmission line offer residents and visitors opportunities for recreational activities that include hunting, fishing, boating and snowmobiling. Resorts, parks and campgrounds near lakes encourage a growing tourism industry that focuses on the enjoyment of the natural environment. The Minnesota River, the Minnesota Valley State Recreation Area and the Upper Sioux Agency State Park offer other natural environmental opportunities.

It appears that community and county historical societies have recently embraced heritage tourism as an industry. Historic railroad corridors, NRHP-recognized structures, districts and museums provide excellent opportunities for recreation related to interests in heritage.

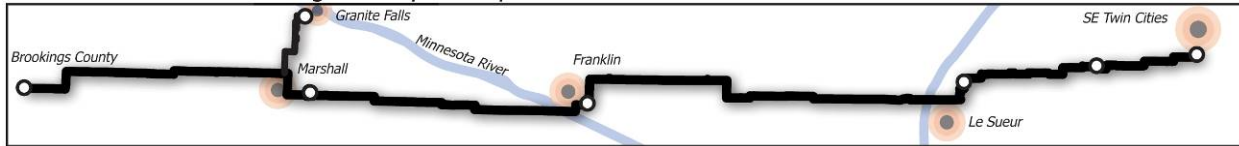
The construction of the proposed transmission facilities will serve the region with a stable power supply for years to come without compromising the area's cultural values. As western Minnesota

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continues to grow and the diverse economic base continues to expand, the available power supplied could contribute to the economic environment in which to live and work.

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### 6.2.8 RECREATION

This section describes the primary recreation resources of the Project area and along the route sections under consideration. Recreational resources are identified so the Applicants can understand the potential effects the Project may have on the resources. The Applicants focused on recreational resources within the Project route; however, some resources are identified in the Project area that may have viewshed impacts from the Project. Outdoor recreational opportunities along the Preferred Route include snowmobiling, biking, hiking, canoeing, boating, fishing, camping, swimming, hunting and nature observation. Recreational GIS resource data were gathered from local, State, and federal agencies. The DNR's Recreational Compass was also used to locate federal and State recreation areas, lakes, water access points, and trails. Hunting information was obtained through the DNR web site. Route maps in Appendix B identify the locations of recreation resources within the vicinity of the Preferred Route. Table I-7 in Appendix I provides a list of all recreational resources within the Project area.

#### 6.2.8.1 Minnesota River

The Minnesota River is designated as a Wild and Scenic River between the Lac Qui Parle Dam and Franklin, Minnesota. Recreational opportunities within this stretch of the river include canoeing, hiking trails, camping, boating access and wildlife observation.

The Minnesota River Valley National Scenic Byway runs from Browns Valley to Belle Plaine and is primarily used as a visual source of recreation to view the scenery of the River Valley (Explore Minnesota 2008). The Minnesota River Valley National Scenic Byway takes travelers along 287 miles of the Minnesota River Valley through hardwood forests, prairie grasses, 3.8 billion year old granite outcrops, agriculture, State and local parks and historic sites (NSBP 2007).

The Minnesota Valley trail system is an ideal place for camping, hiking, biking, canoeing, horseback riding, cross-country skiing, mountain biking and snowmobiling (DNR 2008e).

The Preferred Route crosses the Minnesota River three times, near Franklin at the Brown County crossing, at the Granite Falls crossing, and near Le Sueur at the Le Sueur Treatment Pond crossing. At the river crossing locations, the Applicants have requested a Project route greater than 1,000 feet and less than the 1.25 miles allowed per Minnesota Rules 7849.5010, Subpart 16, to provide more flexibility during design. This greater width also allows the Applicants to address any routing issues that may occur along the Preferred Route.

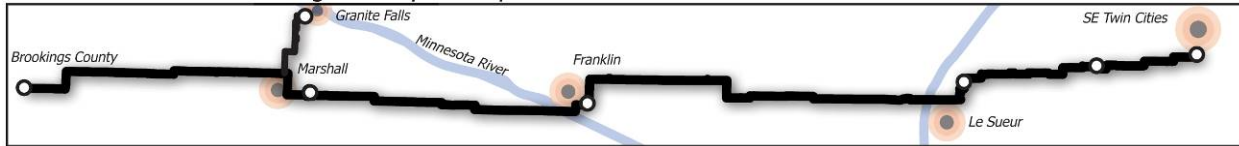
#### 6.2.8.2 Wildlife Management Areas

WMAs play a large role in Minnesota's outdoor recreation system. There are several WMAs located within the Project route, which are listed in Table I-7 in Appendix I. All WMAs located within the Preferred Route provide hunting opportunities, which may include deer, small game, pheasants, waterfowl and doves and may provide wetland, prairie and forest wildlife viewing opportunities.

#### 6.2.8.3 Scientific Natural Areas

Blue Devil Valley SNA is located southwest of the City of Granite Falls along 540th Street and provides hiking opportunities within unique bedrock outcrop areas and provides habitat to skink lizards that hikers can see basking on the exposed bedrock. This SNA is outside of the Project area, but within a mile of the Preferred Route.

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### 6.2.8.4 Highway 75 – King of Trails

Highway 75, also called the King of Trails, is a historic highway that runs from the Canadian border to the Dallas/Fort Worth area, but formerly ran to the Gulf of Mexico. The King of Trails provides an opportunity to view the Minnesota landscape and visit local communities along the highway. The Preferred Route intersects Highway 75 in Lincoln County.

### 6.2.8.5 Snowmobile Trails

Minnesota has an extensive 20,000 mile snowmobile trail system across the entire State. The majority of trails are maintained by local clubs (DNR 2008). The Preferred Route crosses and runs parallel to several different snowmobile trails, which are listed in Table I-7, Appendix I.

### 6.2.8.6 Parks

Cedar Lake is one of the largest lakes in Scott County and provides several recreational opportunities, including fishing, boating, swimming, and camping. According to the Scott County 2030 Comprehensive Plan, the county has plans to expand the Cedar Lake Regional Park to include another 172 acres on the southwest side of the lake, north of Highway 2 (Scott County 2030 Comprehensive Plan).

### 6.2.8.7 Impacts and Mitigation

Direct impacts to recreational resources will be minimized to the greatest extent feasible. The proposed transmission line will span 1,000 feet across recreational resources to minimize impacts. The transmission line will likely be visible from all recreational resources located within the Preferred Route and will have the potential to be visible from all recreation resources within approximately one mile of the route depending on the surrounding topography. The transmission line will likely be visible from the Minnesota River Recreation Areas and Scenic Byway and Highway 75 (King of Trails). The Applicants will work with the State and local agencies to reduce visual impacts in this area. As discussed in Section 6.2.5, the transmission line will be designed to minimize impacts to aesthetics.

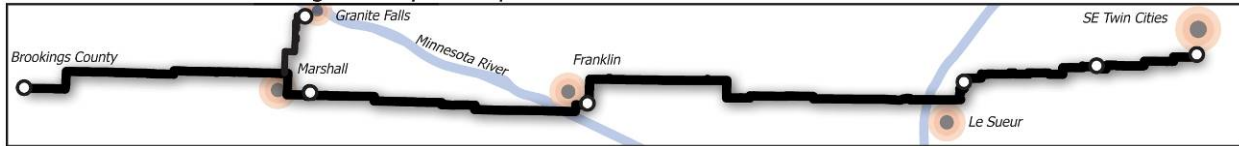
The transmission line will likely be visible from Blue Devil Valley SNA, the Granite Falls Crossing, and other recreational resources within one mile of the Preferred Route near Granite Falls, but will not be a new visual feature because the route is a rebuild of an existing transmission line in this section of the Preferred Route. The Preferred Route will not interfere with the use of those recreational resources.

The proposed transmission line will likely be visible from Cedar Mountain SNA and the Brown County crossing, but it will not interfere with the use of those recreational resources.

The Cedar Lake Regional Park is located north of County Road 2 in Scott County. Along the Preferred Route, the proposed centerline is located on the south side of County Road 2. Although there may be visual impacts, no direct impacts are anticipated in Cedar Lake Regional Park.

There are 135 acres of WMA property within the Preferred Route. The Applicants used the width of each WMA to approximate the number of poles that would potentially be placed within the WMA property. The Applicants determined temporary impacts by calculating one acre per pole. The permanent impacts are 55 ft<sup>2</sup> per pole. The Applicants will work to avoid any direct impacts to

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WMAs within the route. Table 6-8 provides impact calculations of WMA acreage within the Preferred Route.

**Table 6-8. WMA Impacts along Preferred Route**

WMA	Section	Acreage Impacts <sup>1</sup>	No. of Poles	Temporary Impacts (Acres)	Permanent Impacts (Feet)
Michel Marsh WMA	Helena to Lake Marion	0.2	0	0	0
Daub's Lake WMA	Lyon to Cedar Mountain	54	2	2	110
Luescher-Barnum WMA	Lyon to Cedar Mountain	20	0	0	0
Lines WMA	Lyon to Cedar Mountain	61	3	3	165
<b>Total Impacts</b>		<b>135.2</b>	<b>5</b>	<b>5</b>	<b>275</b>

<sup>1</sup> Acreage Impacts were calculated by the total WMA acreage within the Project area. Each pole has a temporary impact of one acre and a permanent impact of 55 ft<sup>2</sup>.

The Preferred Route runs adjacent to the Luescher-Barnum WMA. The Applicants may have the option to place the transmission line on the north side of the road to limit direct impacts to the WMA. The Preferred Route bisects Daub's Lake WMA, making impacts unavoidable. An easement for Daub's Lake WMA is anticipated with the Preferred Route. The Preferred Route runs adjacent to the Michel Marsh WMA, with only a small portion of the route within the WMA. The Michel Marsh is located at a turning point for the route and the Applicants are exploring options to span the WMA to avoid or minimize impacts. The route also runs parallel to County Highway 24 where Lines WMA is located on both the south and north side of the route. The Applicants will work to avoid and minimize impacts to Lines WMA, where possible.

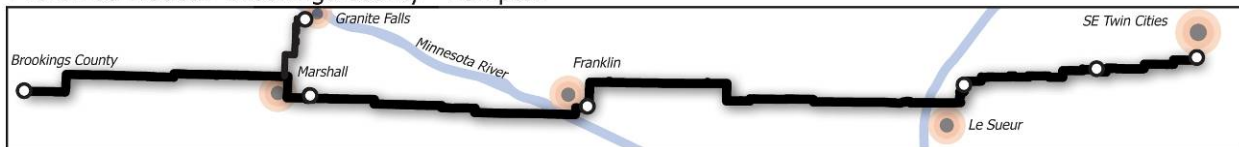
The Applicants do not anticipate any impacts to snowmobile trails along the Preferred Route. The Applicants will work to place structures so that no direct impacts to this resource would result, as practical.

**6.2.9 PUBLIC SERVICES**

This section discusses the impact of the Preferred Route on local public services and facilities. Public services and facilities may be generally defined as services provided by government entities, including hospitals, fire and police departments, schools, public parks, and water supply or wastewater disposal systems. Outside of urban areas, landowners and rural residences are typically serviced by privately owned septic systems and wells or by rural water districts and electric cooperatives. However, some communities near the Preferred Route have municipal sewer systems. Construction of the Project is not anticipated to affect any public utilities. The Applicants will work with landowners and the rural utility providers to avoid direct or indirect impacts to public utilities.

In western Minnesota, many rural residences and farmsteads are served by Lincoln Pipestone Rural Water, as well as other agencies providing service to rural residents and communities, such as the U.S. Department of Agriculture's Rural Development office. In metropolitan areas, such as Marshall, municipal utility associations or cooperatives provide utility electrical and water service to city residents. The Applicants would coordinate the location of the Preferred Route with Lincoln Pipestone Rural Water, Marshall Municipal Utilities, Redwood Falls Public Utilities, Southern Minnesota Municipal Power Agency, and any other public service providers. Most rural residences

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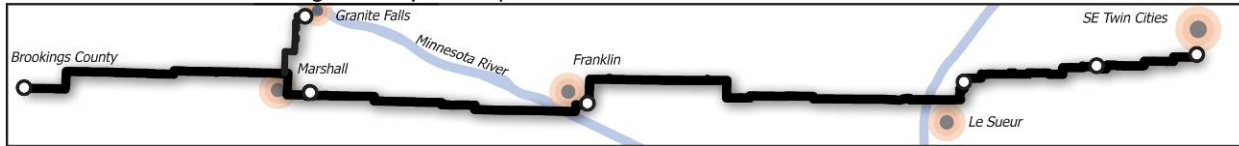
and farmsteads are served by on-site septic systems. The availability of data and information regarding the location of rural water services is limited and sometimes incomplete.

The Twin Cities metropolitan region is served by the Metropolitan Urban Service Area (“MUSA”), a growth management tool adopted by the Metropolitan Council (METC”) to stage development and regional infrastructure improvements. As part of the MUSA, an underground network of wastewater sewer lines extend throughout the seven county metropolitan region. As metro communities grow, requests are made to the METC to expand MUSA service based on forecasted community growth, including the extension of sewer lines. In the townships the Preferred Route would travel across in southern Scott and Dakota counties, sewer interceptor lines are currently under construction to service select communities but specific sewer service to the townships is not being planned at this time. The Applicants will coordinate construction, operation, and maintenance of the transmission line with METC officials to avoid interference with these sewer facilities.

There are no municipal buildings or hospitals within 1,000 feet of the Preferred Route. There is a home-based daycare facility on Sibley County Highway 22 approximately 800 feet from the Preferred Route. There are also home-based daycare facilities located in southern Scott County along County Highway 2 and north of 250th Street. In Dakota County, a home-based daycare facility is located along TH 3/Chippendale Avenue West, south of the City of Farmington. Electric distribution lines, cable television and telephone lines are located along each of the roads the Preferred Route would follow, providing service to the adjacent homes and businesses. These lines do not present a barrier to construction and operation of the transmission line. It may be necessary for the Applicants to work with other public service utilities to relocate their facilities if they conflict with the location of the transmission line.

On the northern side of Le Sueur, the transmission line would travel across the Minnesota River and be collocated with an existing wastewater treatment facility at the Le Sueur Treatment Pond crossing. This facility has three wastewater treatment ponds abutting the Minnesota River. The construction and operation of these ponds has impacted the current and future uses of land in this region of the city, and Le Sueur has planned and zoned land along the U.S. Highway 169 corridor adjacent to this facility for industrial and light manufacturing purposes, land uses considered consistent with HVTLS. The wastewater treatment facility is scheduled to be decommissioned and relocated to the south. Additionally, a public park is located adjacent to U.S. Highway 169. Further discussion of environmental impacts surrounding this area is provided in Appendix G. In addition to the facilities in Le Sueur, there are several parks and recreation areas located near the proposed Helena South and Lake Marion substations. East of the city limits of New Prague in southern Scott County, the Preferred Route travels south of Cedar Lake to avoid impacts to the public park along the southern side of the lake. Refer to Section 6.2.8 for a discussion of recreational resources.

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### 6.2.9.1 Impacts and Mitigation

The proposed transmission line is not anticipated to directly or indirectly impact the operation of existing public services. During construction, efforts to minimize any disruption to public services or public utilities will be made, and the transmission line is not anticipated to impact or interrupt public services or facilities during operation. Where any impacts to utilities have the potential to occur, the Applicants would work with both landowners and local agencies to determine the most appropriate placement for pole structures. At times, the route would cross over existing transmission lines, follow existing transmission line corridors, and likely pass over or cross small power distribution lines. Disruptions to public services during construction may occur; however, these would be temporary with service restored promptly. No direct long-term impacts to public buildings or infrastructure are expected, and as such, no mitigation would be required for the Project. The Applicants will work with local public service providers to plan any necessary disruptions.

### 6.2.10 TRANSPORTATION

This section provides an analysis of the existing transportation infrastructure along the Preferred Route. The analysis addresses the direct and indirect impacts to transportation facilities as a result of construction and operation of the Project. Road infrastructure, railroads, airports, pipelines and trail systems were identified along the route using GIS data. Annual average daily traffic (“AADT”) volumes for all roads with data available were obtained and evaluated using GIS data provided as part of the 2006 MnDOT Trunk Highway Volume maps. Future transportation facilities and plans were identified through consultation with MnDOT and county public works or planning departments. While the Preferred Route would cross a series of waterways including the Minnesota and Redwood rivers, these waterways are not navigable beyond recreational use and therefore not considered in the context of transportation infrastructure.

#### 6.2.10.1 Roadways

Between the South Dakota border and the proposed Hampton Substation, the Preferred Route parallels the ROW with a variety of different roadways in each of the counties the transmission line would cross. These roadways include Interstate Highways, U.S. Highways, Trunk Highways, County Highways and County Roads, along with local roads and farm field lines. Many of the roads paralleled are paved two-lane roads; however, some are gravel and roads. The availability of traffic data for rural regions in southwestern Minnesota is limited. Many of the roads the Preferred Route parallels in this region of the State have very few rural residences or farmsteads, with roads typically carrying a mixture of local commuter traffic and farm equipment. Generally, AADT volumes along the roads the Preferred Route would share ROW with are low to moderate. As the transmission line moves from west to east, vehicle volumes increase steadily, a function of greater population and employment densities surrounding the Twin Cities metropolitan area. All of the roads paralleled in the metropolitan region of the Project area are paved roads. Table 6-9 provides the available traffic data for the roads the Preferred Route would follow.

Preferred Route: Brookings County - Hampton

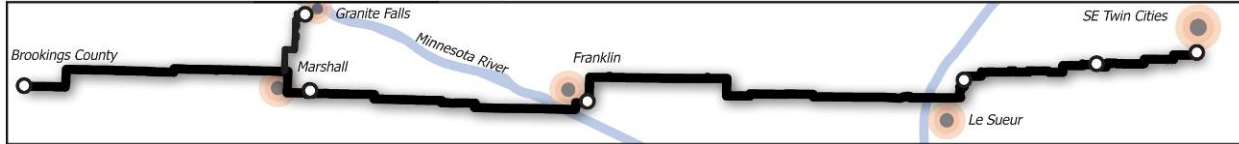


Table 6-9. Average Annual Daily Traffic for Selected Roads Parallel to the Preferred Route

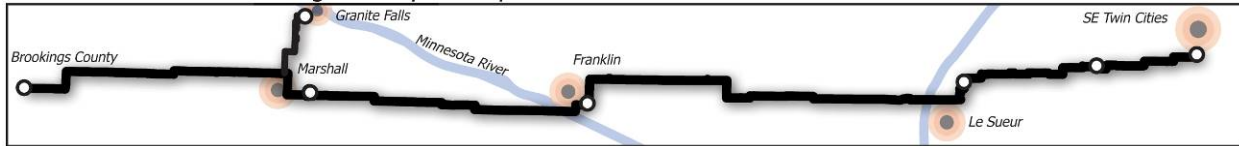
Roadway Segment <sup>1</sup>	Existing AADT <sup>2</sup>	Parallel Length (Miles)
<b>Lincoln County</b>		
County Road 134	31	3
<b>Lyon County</b>		
County Road 78	101	3
County Highway 22	424	0.6
County Highway 9	525	8
County Highway 24	76	3.5
340 <sup>th</sup> Avenue	N/A	3
<b>Yellow Medicine County</b>		
County Road B3	45	6
<b>Redwood County</b>		
County Road 59	26	1
County Highway 12	220	10
<b>Brown County</b>		
County Highway 8	81	0.8
<b>Renville County</b>		
County Highway 3	72	4
County Road 74	108	9.8
<b>Sibley County</b>		
TH 19	2,700	3
County Road 57	39	0.5
County Highway 8	1,104	1
County Highway 18	263	2
<b>Le Sueur County</b>		
U.S. Highway 169	15,600	2.7
County Highway 32	286	0.5
County Road 22	34	0.5
<b>Scott County</b>		
Aberdeen Avenue	66	1
County Highway 2	740 - 3,380	12
<b>Dakota County</b>		
Dodd Boulevard	2,480	0.8
TH 50	4,500	2

Source: Minnesota Department of Transportation, 2006

<sup>1</sup> This table lists only those roadway segments for which traffic data are available from MnDOT. The Preferred Route parallels other roadway segments without names or traffic data in each of the counties the route would traverse.

<sup>2</sup> Average Annual Daily Traffic count volumes are sometimes spread across segments of roads, including some roads that the Preferred Route does not parallel. Therefore, data on exact roadway volumes for the segments of road the Preferred Route would parallel are generally unavailable, and the above table provides an example of typical roadway volumes.

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### 6.2.10.2 Railways

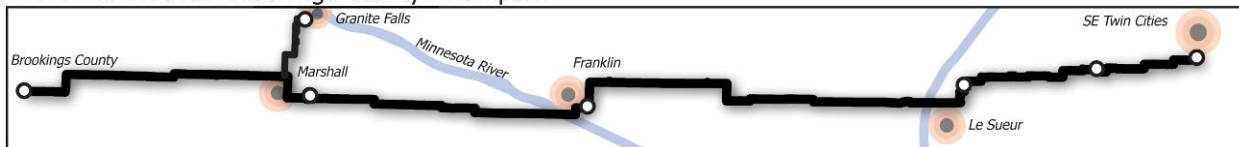
The Preferred Route crosses several railroad lines between the South Dakota border and the proposed Hampton Substation. Between the South Dakota border and the Lyon County Substation, the Preferred Route would cross a railway operated by the BNSF Railroad that runs parallel to TH 23 between the cities of Granite Falls and Marshall. The Burlington Northern Santa Fe Railroad operates two railways that connect in Hanley Falls, Minnesota. The proposed transmission line would cross both of these railways east of Hanley Falls, with a second crossing south of Granite Falls. The Preferred Route would not parallel, nor use any existing railroad ROW between the Lyon County Substation and the Minnesota Valley Substation. East of the Lyon County Substation, the Minnesota Prairie Line operates a railway that traverses the northern portion of Redwood County and extends into Sibley County. The proposed transmission line would cross this railway east of Franklin, where the railway begins to parallel TH 19. East of the Lyon County Substation, the Minnesota Prairie Line operates a rail line that travels across the southern portions of Renville and Sibley counties following TH 19. The Preferred Route would cross this railway west of Winthrop. A second railway is located in Le Sueur, adjacent to U.S. Highway 169 and the Minnesota River. This rail line is owned and operated by the Union Pacific Railroad and the Preferred Route would cross this railway shortly after the crossing point of the Minnesota River. In addition to the Union Pacific rail line in Le Sueur, Union Pacific Railroad operates a railway running parallel to TH 21 and TH 13 through New Prague, Minnesota. The Preferred Route would cross this rail line approximately 1.5 miles north of New Prague. Finally, in Dakota County the Preferred Route would cross two railways owned by Canadian Pacific Railroad in Eureka and Castle Rock townships.

### 6.2.10.3 Airports and Aviation Facilities

The majority of the airports within the Project area are classified as non-primary commercial service, reliever, and general aviation airports. The designation of an airport facility type is important when determining the airspace regulations governing development restrictions. Minnesota Rules 8800.1100 – 8800.1200 specify height and guide slope restrictions for different types of airport facilities. Development guidelines around airports without precision instrument guidance systems for landing approach are generally less restrictive compared to airports with precision instrument guided landing capabilities. More specifically, airports without precision instrument guidance systems generally have smaller guide slope restrictions compared to larger airports with a high frequency of flight service. Southwestern Minnesota Regional Airport in Marshall and Airlake Airport in Lakeville represent the two largest airport facilities within the Project area. Reliever airports (of which Airlake Airport is one within the Metropolitan Airports Commission system) are airports that help to relieve congestion at major commercial service airports and provide improved aviation access to communities. Airlake Airport serves as a reliever airport to the Minneapolis-St. Paul International Airport, the region's major commercial airport. General aviation airports are public or privately owned airfields commonly used by small aircraft.

There are airports and aviation facilities in all of the counties the Preferred Route would travel across between the South Dakota border and the proposed Hampton Substation area. There are five airports or landing strips located in proximity to the Preferred Route. Four of these air facilities are privately owned landing strips used primarily for general aviation, crop dusting, and recreational flying according to data obtained from the public and through field observational analysis. The fifth airport, Airlake Airport in Lakeville, is a public use facility.

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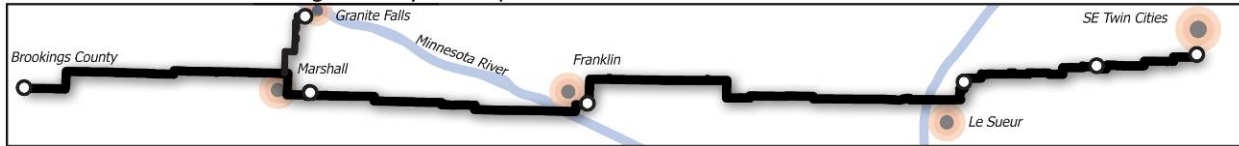
The Granite Falls Municipal Airport (Lenzen-Roe Memorial Field) is a public use air facility located four miles south of Granite Falls in Yellow Medicine County, whose primary use is for general aviation. The facility has one north-south paved runway (Runway 15/33) measuring 4,350 x 75 feet. At its closest point, the Preferred Route is located 1.2 miles north of the primary surface on the northern-most edge of the runway. The approach slopes for either end of Runway 15/33 are 34:1. At the airport's elevation of 1,047 MSL, and under the current approach slopes, the maximum pole structure height would be 149 feet, allowing development within the horizontal zone to a maximum 1,197 MSL. Future development plans for the airport support the extension of the runway to 5,000 feet on the southern end of the runway, thereby increasing the approach slope for both ends of the runway to 50:1. Additionally, airport improvements call for the construction of a cross-wind runway for smaller planes with approach slopes on either end of 20:1.

Two privately owned airstrips are located one-half mile from the Preferred Route off County Highway 8 in Sibley County. Directionally, one airstrip runs north-south while the second runs east-west. No approach slope information is available for either airstrip. In Dakota County, two landing strips are located in northern Eureka Township; both are one-half mile from the Preferred Route alignment along 240th Street in Eureka Township. The landing strip located closest to Airlake Airport runs northwest-southeast with the second airstrip running north-south. Based on the configuration of these airstrips in relation to the Preferred Route, the route may alter the take-off and landing approach movements but not impede the full operation of these facilities. No approach slope information is available for these facilities.

Two existing regional aviation facilities are located in Eureka Township on Dakota County's southwestern border with Scott and Rice counties. Airlake Airport is a reliever airport within the Metropolitan Airports Commission system, and there is a VOR station located near the airport in Farmington, Minnesota. The Preferred Route would travel approximately two miles south of Airlake Airport, paralleling 240th Street through northern Eureka Township. Aircraft landing at this facility include single- and double-engine propeller and small jet-engine aircraft. The airport has one runway (Runway 12/30), located northwest to southeast. The airport is located at an elevation of 960 feet AMSL, thus limiting the elevation of the top of structures to no more than 1,210 feet MSL. Approaches and take-offs occur on either end of the runway; however, each end of the runway has a different approach slope and glide path. According to the FAA, the northwest approach of Runway 12/30 has an approach slope of 34:1 for 10,000 feet from the end of the runway primary surface, transitioning to 20:1 for an additional 4,000 feet following the 10,000 foot radius. The southeastern approach, marked by chevrons at the end of the runway, has an approach slope of 50:1 for 10,000 feet from the end of the primary surface, and 40:1 for 40,000 feet beyond the initial 10,000 foot radius. In both instances, the transitional zone on either side of the runway centerline has a slope of 7:1.

Future planning for Airlake Airport includes the extension of Runway 12/30 from 4,098 feet to 5,000 feet, extending the runway's southern end. This extension would allow for expanded capacity and air service to this region, training grounds for pilots, and is necessary for new types of jet or other aircraft wishing to use the facility. The extension of the runway will also dictate changes to the Instrument Landing System landing approach guidance system. Additionally, aviation officials have indicated that the existing VOR facility in Farmington is expected to be operational for the

## Preferred Route: Brookings County - Hampton



foreseeable future; however, it is likely that the FAA will remove this facility at an unspecified time as the agency moves toward global positioning system (“GPS”)-related communications.

As discussed in Section 6.2.1, an object is considered an obstruction if it is greater than any airport imaginary surface. These surfaces include the horizontal, conical, approach, precision instrument approach, and transitional surfaces. For airports with one runway greater than 3,200 feet in actual length, the FAA FAR Part 77 obstruction guidelines specify that notice must be submitted to FAA for developments greater than 150 feet, the maximum height of the horizontal plane above the established airport elevation. The Applicants will coordinate structure height and pole placement with the assistance of FAA and MnDOT. FAA regulations governing obstructions to the airspace zones surrounding public-use airports do not apply to privately owned or operated airfields.

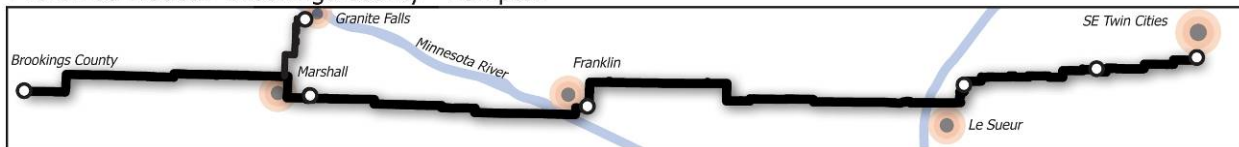
In addition to airports along the Preferred Route would pass by, there are air navigation aides located at several points between the South Dakota border and the proposed Hampton Substation area. VOR stations are a form of radio navigation system for aircraft. Utilizing the powers of magnetism and radio waves, a VOR station broadcasts a composite radio signal and Morse code identifier to airborne aircraft that allows aircraft to identify their location. VOR signals are transmitted on a line-of-sight basis. Buildings or natural terrain features (trees or mountains) can impede the performance of a VOR station by blocking or restricting the signals distance at a given altitude. While currently active, the FAA is in the process of updating its radar tracking systems using the En Route Automation Modernization and GPS satellite navigation systems, effectively replacing VOR technology. These locations include the airfield grounds of Southwestern Minnesota Regional Airport in Marshall, south of the City of Redwood Falls in Redwood County, and east of Airlake Airport in Farmington, Minnesota. These facilities are owned and operated by the FAA. The FAA generally establishes a 1,000-foot protection zone around the station restricting development. However, according to FAA guidelines, metallic structures are permitted 750 feet and beyond from a VOR station. The FAA and MnDOT also establish additional setback requirements for different types of structures that could impact the operation of the facility. Metallic structure height distance requirements pursuant to FAA and MnDOT regulations specify that structures at 130 feet must be 6,206 feet from the edge of the VOR protection zone, structures at 150 feet must be 7,161 feet from a VOR station, and structures at 175 feet must be 8,354 feet from a VOR station. In addition to the VOR facility in Farmington, the FAA also operates the regional air traffic control center in Farmington. The Applicants will file all necessary notice requirements with FAA and work with both FAA and MnDOT to ensure compatibility between the transmission lines and air navigation stations and equipment.

### 6.2.10.4 Pipelines

Underground pipelines exist in the Project area. The Preferred Route would cross pipelines in several locations and share a short portion of a pipeline ROW in Dakota County.

In Lincoln County, the Preferred Route would cross two pipelines. The first pipeline crossed is a natural gas pipeline near 320th Street immediately north of Hendricks, owned and operated by the Northern Natural Gas Company. Approximately 13.5 miles east of this pipeline, the Preferred Route would cross a second pipeline on County Road 134 owned by the Williams Companies Incorporated.

## Preferred Route: Brookings County - Hampton



In Lyon County, the Preferred Route would cross three underground pipelines north and east of Marshall. Similar to Lincoln County, these pipelines are owned and operated by Northern Natural Gas Company and Williams Companies Incorporated. Between Granite Falls and Marshall, a series of underground pipelines extend across farm fields connecting with other pipeline infrastructure in the region. The Preferred Route would cross but not parallel pipelines owned by Williams and Northern Natural Gas at various points between the Lyon County Substation and the Minnesota Valley Substation. These crossings would occur south of Cottonwood, Hanley Falls, and Granite Falls.

In Sibley County, the transmission line would cross a pipeline owned by Dome Pipeline Company west and south of Winthrop. The first crossing would occur along TH 19, the second along a farm field line.

The route would cross two pipelines in Scott County, both owned by Northern Natural Gas Company. The first pipeline crossed would be along Aberdeen Avenue west of New Prague, with the second pipeline crossed near the Lake Marion Substation at the intersection of 245th Street and County Highway 91.

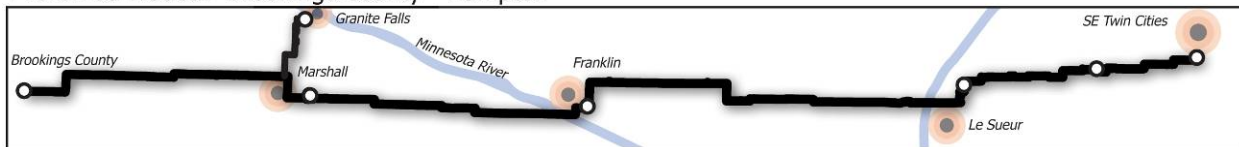
Finally, in Dakota County, a series of underground pipelines stretch across both Eureka and Castle Rock townships, including the MinnCan Pipeline. Along 240th Street in northern Eureka Township, the Preferred Route would cross seven identified underground pipelines south of Airlake Airport. In Castle Rock Township, an existing pipeline would be crossed along TH 50. The Preferred Route would parallel the MinnCan pipeline for short distances through both townships.

### 6.2.10.5 Impacts and Mitigation

State and county highways, along with local access roads and farm field lines, are the most abundant form of transportation infrastructure located along the Preferred Route and in proximity to the Project area. During construction, it is anticipated that several types of light, medium, and heavy-duty construction vehicles would travel to and from the site, as well as private vehicles used by construction personnel. That volume would occur during the peak construction time when the majority of the foundation and pole assembly would take place. This equipment would be removed at the completion of each construction phase. Transmission line structures located along sections of roads or railways are not expected to permanently impact the operation of either transportation facility or ROW. Short-term construction impacts to these facilities may include temporary re-routing of traffic through marked delineators and orange roadway cones or drums. The transmission line would be designed in accordance with NESC standards to minimize impacts to transportation facilities. The Applicants would work with State and local officials to minimize any impacts to traffic during construction and operation of the proposed transmission line. The Applicants would obtain all appropriate MnDOT and county permits as applicable for transmission line crossings over regulated roadways.

Construction activities may require access from the roadway ROW to the transmission line ROW at existing or additional turnout or approach locations. Construction of temporary additional turnouts or approaches may require installation of culverts and fill materials. Installation of additional or temporary access points would be subject to review and approval from local or State roadway officials. Construction crews would implement traffic control measures in accordance with the State Manual on Uniform Traffic Control Devices. Removal of existing conductors and stringing of new

## Preferred Route: Brookings County - Hampton



overhead conductors over highways requires installation of temporary wood pole “guard structures” and other measures to safeguard the public and construction crews. Temporary guard structures are designed to provide vertical clearance of the conductors above the road surface to avoid impacting normal vehicular traffic on the roadway.

After installation of the new conductors is complete, the temporary guard structures are removed. At some locations, additional measures such as boom trucks equipped with “bat wings” may be employed to ensure that adequate vertical clearance is maintained at the highway crossing during stringing operations. Restriction of traffic may occasionally be required for short periods of time during pole deliveries or during critical wire stringing activities. Construction crews would work closely with Minnesota State Patrol to ensure implementation of appropriate measures to safeguard the public and construction crews.

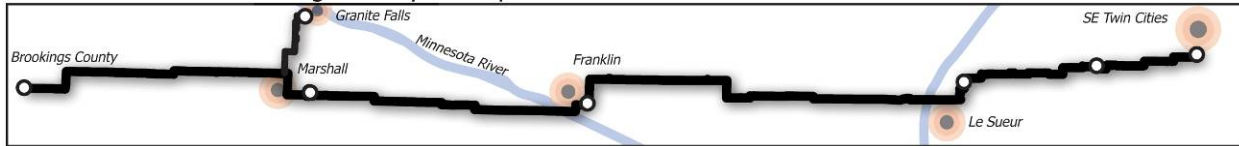
### **Railway Compatibility and Mitigation with High Voltage Transmission Lines**

When an HVTL is located adjacent to a railway, the railway’s tracks and signals may be subject to electrical interference from capacitive, electric and magnetic, and conductive effects. Capacitive coupling results from the electric field from the transmission lines’ conductors coupling with above ground conductive objects that are insulated from the earth, such as railway tracks that are typically installed on high impedance ballast (the rock bed used to support the tracks). Electric and magnetic induction results from the magnetic field produced by the AC flowing in the conductors of the transmission line coupling with the above ground and below ground metallic objects, such as railway tracks and buried communications cables, if present. Conductive interference results from fault currents entering the ground and raising the soil potential in the vicinity of the railway. If a transmission line is located in proximity and parallel to a railway for long distances, all these interference mechanisms can cause high currents and voltages to develop on the railway’s tracks and communication cables. If the AC interference is above certain thresholds, it can result in personal safety hazards, damage to signal and communication equipment, and false signaling of equipment.

These AC interference effects can be predicted with computer modeling. With proper planning and mitigation management, railways and high voltage AC transmission lines can be safely collocated. The American Railway Engineering and Maintenance-of-Way Association has specifications for steady state rail-to-ground and equipment-to-ground voltage levels to insure safety of railway operating personnel and the public. During fault conditions the safety criteria established by the American National Standards Institute/Institute of Electrical and Electronics Engineers Standard 80 (Guide for Safety in AC Substation Grounding) is used. In addition, railway signal and equipment manufacturers provide AC interference voltage tolerances for proper signal operation so that nearby transmission facilities can be designed to insure that AC interference levels do not exceed the acceptable safety criteria or equipment voltage tolerance.

Depending on AC interference levels, several mitigation methods may be used. These include reducing the distance between insulated joints in track sections, grounding the railroad’s tracks, and burying gradient control wires or matting. It is unlikely that installing any of the aforementioned mitigation methods would require additional ROW. Reducing the distance between insulated joints involves placement of additional joints in existing tracks to shorten track sections. This reduces coupled track area and AC interference voltage levels. Grounding the tracks and communication cables is one of the most effective methods. Typically, this is done at communication and signal

## Preferred Route: Brookings County - Hampton



cable access points (such as at splice locations and manholes) and the other points where the track would have high induced voltage if not grounded. Grounding reduces voltage levels along track sections and provides a path for AC interference currents to flow to ground. Burying gradient control wires or matting is an effective method to mitigate both inductive and conductive interference, by raising the earth potential in the vicinity of the railroad such that the difference in potential between the railroad and local ground is reduced. As a result, rail-to-ground and rail touch voltages are reduced. Gradient control wires or matting consist of one or more bare conductors buried parallel to and near the railroad.

The Applicants would insure that computer modeling of AC interference effects is completed and that any required mitigation is designed and installed prior to energizing the transmission line. Based on past projects, the cost to complete computer modeling, mitigation design, and installation is low compared to the cost of the overall proposed Project.

### **Pipeline Compatibility and Mitigation with High Voltage Transmission Lines**

When an HVTL is located adjacent to a pipeline ROW, the pipeline may be subjected to electrical interference from electric and magnetic induction, conductive interference and capacitive effects. Electric and magnetic induction is the primary effect of the high voltage AC transmission line on a buried pipeline during normal (steady state) operation. This form of interference is due to the magnetic field produced by the AC current flowing in the conductors of the transmission line coupling with the metallic pipeline, inducing a voltage and associated current on the pipeline.

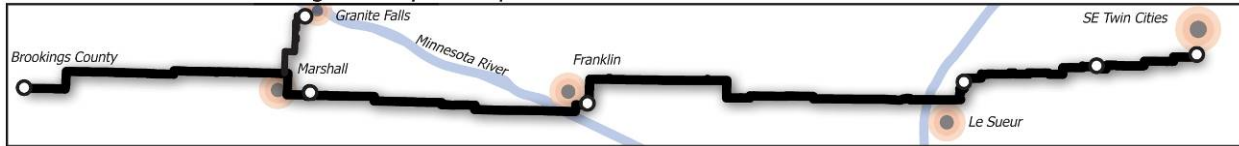
Conductive interference is a concern when a transmission line fault occurs in proximity to the pipeline, as it can cause AC currents to enter the pipeline at coating holidays (flaws in the coating) and produce a voltage gradient across the pipeline coating. Electric and magnetic effects are also a concern during a fault because the phase current in at least one phase (conductor) of the high voltage AC transmission line is elevated.

Capacity effects are typically only a concern during pipeline construction when long sections of the pipeline are above ground. To prevent contact shock hazards, proper horizontal and vertical separation between the transmission line's conductors and equipment used during pipeline construction and maintenance (such as cranes and shovels) must be maintained.

If these electrical interference effects are great enough during normal operation, then a potential shock hazard exists for anyone that touches an aboveground part of the pipeline, such as a valve or cathodic protection test station. In addition, during normal operation, if the induced AC current density at a flaw in the pipeline coating is great enough, AC pipeline corrosion may occur. Lastly, damage to the pipeline coating can occur if the voltage between the pipeline and surrounding soil becomes excessive during a fault condition.

With proper planning and mitigation, pipelines and high voltage AC transmission lines can be safely collocated. The AC interference effects can be predicted with computer modeling. The National Association of Corrosion Engineers has standards that ensure that pipeline integrity would not be degraded nor personnel safety compromised because of AC interference from a transmission line constructed and operated adjacent to a pipeline. Mitigation techniques for AC interference on pipelines include reducing the impedance of the transmission structure grounds, grounding the pipeline in conjunction with de-couplers, burying gradient control wires along the pipeline or

## Preferred Route: Brookings County - Hampton



burying ground mats under aboveground facilities (such as valves) and using dead fronts at test stations.

None of these mitigation methods would be expected to require additional ROW. Reducing transmission impedance consists of adding stacked or parallel ground rods to the structure grounding system. This is done adjacent to the transmission structure, thus no additional transmission line ROW is required. Grounding a pipeline typically occurs within the existing pipeline through a de-coupler device to prevent DC cathodic protection current from flowing to the ground. Gradient control wires are typically copper conductors buried parallel to and adjacent to the pipeline (within 5 to 10 feet).

Ground mats consist of an eight-foot-square section of conductors buried underneath where pipeline personnel stand when operating a valve. Dead fronts consist of replacing the existing test sections with test sections that are non-conductive and require no additional land. Lastly, additional “coupon stations” are sometimes installed to monitor the pipeline to insure that mitigative measures are effective at preventing AC pipeline corrosion. These facilities are installed adjacent to the pipeline and use coupons that are exposed to the same environment as the pipeline and are monitored to determine if AC corrosion is occurring. This typically would not require additional ROW.

The Applicants would insure that computer modeling of AC interference effects is completed and that any required mitigation is designed and installed prior to energizing the transmission line. Based on past projects, the cost to complete computer modeling, mitigation design, and installation is low compared to the overall cost of the Project. The Applicants have been meeting and working with all known pipeline owners to ensure there will be adequate separation between the proposed transmission line and pipelines to ensure safety requirements are met.

### 6.2.11 RADIO, TELEVISION, CELLULAR PHONE, AND GPS

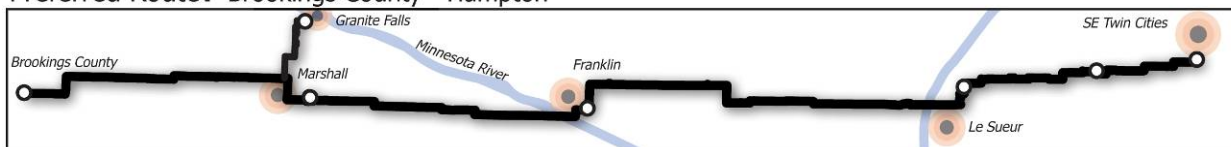
Corona from transmission line conductors can generate electromagnetic “noise” at the same frequencies that radio and television signals are transmitted (corona consists of the breakdown or ionization of air within a few centimeters of conductors and hardware). This noise can cause interference with the reception of these signals depending on the frequency and strength of the radio and television signal. Tightening loose hardware on the transmission line usually resolves the problem.

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

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

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

Preferred Route: Brookings County - Hampton



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

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

Table 6-10 identifies the number of communication towers located within the Preferred Route by section. The tower locations are identified in the detailed maps in Appendix B.

**Table 6-10. Communication Towers Within the Preferred Route**

Section	No. of Towers
Brookings County to Lyon County	6
Lyon County to Minnesota Valley	0
Lyon County to Cedar Mountain	1
Cedar Mountain to Helena	25
Helena to Lake Marion	1
Lake Marion to Hampton	2
<b>Total</b>	<b>35</b>

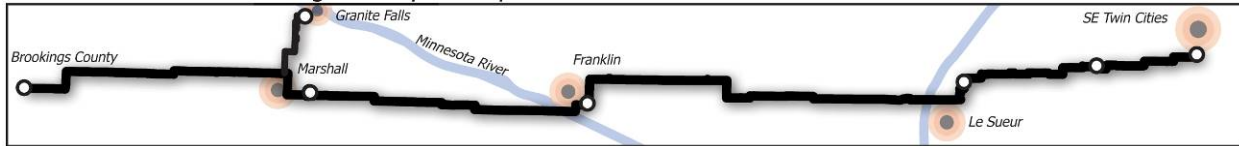
**6.2.11.1 Impacts and Mitigation**

The transmission line hardware will be designed and maintained to minimize gap and corona discharges. There is a potential for interference impacts to occur to omnidirectional communication towers. The height of the transmission line may interfere with beam paths. If interference occurs, the Applicants will work with the microwave tower owner to mitigate the impacts.

If interference from transmission line corona does occur for an AM radio station that is within the station’s primary coverage area and that had good reception before the Project was built, satisfactory reception can be obtained by appropriate modification of the receiving antenna system.

The transition to digital TV broadcasts will be complete by the time the Project is constructed. Digital reception is in most cases more tolerant of noise and somewhat less resistant to multipath reflections (*i.e.*, reflections from structures) than analog broadcasts. Although digital reception is more tolerant of RF noise, if the noise levels or reflections are great enough, they will impact digital television reception. In the rare occasion where the construction of the Project may cause interference within a television station’s primary coverage area, the Applicants would work with the affected viewers to correct the problem, which can usually be corrected with the addition of an outside antenna.

## Preferred Route: Brookings County - Hampton



## 6.3 LAND-BASED ECONOMIES

### 6.3.1 AGRICULTURE

Agriculture is the primary land-based economic resource in the Project area. The highest yield resources include corn, soybeans, oats, and cattle. Much of the agricultural land is designated as “prime farmland,” indicating land that is most desirable for agricultural production. Federal regulations define prime farmland as “land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses.” (7 CFR, 657.5 (a) (1)). There are several livestock farms located along the Preferred Route, including turkey, cattle, hogs, and sheep farms.

According to the Minnesota 2007 Agricultural Statistics published by the U.S. Department of Agriculture (“USDA”), the State of Minnesota ranks sixth among the states in total crop cash receipts in 2005 and the total number of farms in Minnesota in 2006 was estimated at 79,300, which is 300 fewer farms than the previous year. Renville, Redwood, and Brown counties ranked in the top 10 of Minnesota’s leading agricultural counties in 2006. In 2007, Renville County ranked number one for production of corn for grain, green peas and sweet corn and Redwood County ranked number one in soybean production. For livestock and dairy inventories, Lincoln County led the State in breeding sheep and lambs and Lyon County ranked third raising cattle and calves on feed (USDA 2008).

The Applicants consulted with the Minnesota Department of Agriculture (“MnDOA”) to identify organic farms in Project area. All information acquired by the State was voluntarily submitted by the landowner. The MnDOA provided mailing addresses of certified organic farms as reported by the State for each county in the Project area. According to the MnDOA, precise locations of organic fields are unknown. If an organic farm has less than \$5,000 in organic product revenue, certification is not required. Organic farms may also be transitional farms because the certification process takes three years and the farm, while using organic methods, may not have completed the process. The organic farms identified on the detailed maps (Appendix B) are the mailing addresses of the State-reported certified organic farmers and do not depict the exact location of an organic farm field. The Applicants also received comments from the public verifying organic farm locations and identified other locations of organic farms that are not reported by the State.

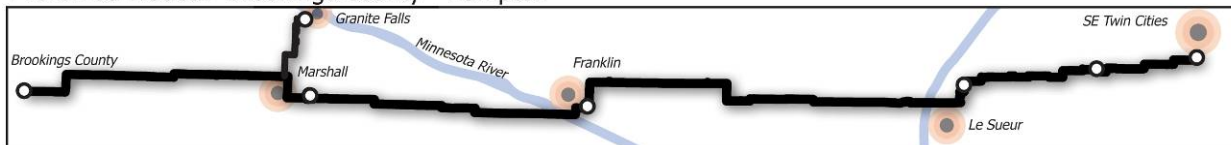
#### 6.3.1.1 Brookings County to Lyon County

In this Preferred Route section, the overall production trend of the agriculture industry has increased.

Along the Preferred Route from the South Dakota border to the Lyon County Substation, 88.4 percent of the land is used for agriculture (United States Geological Survey (“USGS”) 2004) and 89.7 percent of the soils are listed by the Natural Resources Conservation Service (“NRCS”) as prime farmland, prime when drained, or farmland of statewide importance (NRCS 2005).

According to the 2002 Census of Agriculture (the latest year for which information is available), the average number of farms in Lincoln County increased by 1 percent and the average farm size decreased by 2 percent between 1997 and 2002. Total sales increased for Lincoln County by 6 percent between 1997 and 2002 with crop sales at \$37,114,000 (51 percent) and livestock sales at

## Preferred Route: Brookings County - Hampton



\$36,225,000 (49 percent). Crops in Lincoln County are primarily corn and soybeans and livestock are primarily hogs and cattle (USDA 2002).

The number of farms in Lyon County has stayed consistent and the average farm size has increased by 1 percent between 1997 and 2002. The total sales increased by approximately 1 percent. Crop sales in 2002 for Lyon County were \$75,284,000 (48 percent) and livestock sales were \$81,800,000 (52 percent). Crops in Lincoln County are primarily corn and soybeans. Crops in Lyon County are primarily corn and soybeans and livestock are primarily turkeys and hogs (USDA 2002).

### 6.3.1.2 Lyon County to Minnesota Valley

In this Preferred Route section the overall production trend of the agriculture industry has increased. Yellow Medicine County did see a slight decrease in the average size of farms while the number of farms increased.

Along the Lyon County to Minnesota Valley Preferred Route section, 87.9 percent of the land is used for agriculture (USGS 2004), and 90.8 percent of the soils are listed by the NRCS as prime farmland, prime when drained, or farmland of statewide importance (NRCS 2005).

According to the 2002 Census of Agriculture, the average number of farms in Yellow Medicine County increased by 9 percent and the average farm size decreased by 3 percent between 1997 and 2002. Crop sales in 2002 for Yellow Medicine County were \$86,631,000 (62 percent) and livestock sales were \$52,218,000 (38 percent). Crops in Yellow Medicine County are primarily corn and soybeans and livestock are primarily hogs and turkeys (USDA 2002).

There is one known organic farmer within one mile of the Lyon County to Minnesota Valley Preferred Route section. This is a certified organic farm as reported by the MnDOA. The State does not depict the exact location of an organic farm field.

### 6.3.1.3 Lyon County to Cedar Mountain

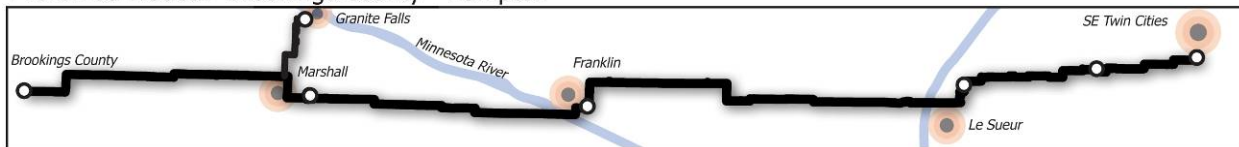
In this Preferred Route section, the overall production trend of the agriculture industry has increased, including in Lyon, Redwood, and Renville counties. Yellow Medicine County saw a decrease in the average size of farms with an increase in the overall number of farms, and Brown County had a slight decrease in the number of farms with a slight increase in the average size of farms.

Along this Preferred Route section, 90 percent of the land is used for agriculture (USGS 2004) and 91.7 percent of the soils are listed by the NRCS as prime farmland, prime when drained, or farmland of statewide importance (NRCS 2005).

Refer to Section 6.3.1.1 for agricultural information in Lyon County and Section 6.3.1.2 for agricultural information in Yellow Medicine County.

According to the 2002 Census of Agriculture, the average number of farms in Yellow Medicine County increased by 9 percent and the average farm size decreased by 3 percent between 1997 and 2002. Crop sales in 2002 for Yellow Medicine County were \$86,631,000 (62 percent) and livestock sales were \$52,218,000 (38 percent). Crops in Yellow Medicine County are primarily corn and soybeans and livestock are primarily hogs and turkeys (USDA 2002).

## Preferred Route: Brookings County - Hampton



The average number of farms in Redwood County increased by 3 percent and the average farm size increased by 5 percent between 1997 and 2002. Crop sales in 2002 for Redwood County were \$122,004,000 (55 percent) and livestock sales were \$98,486,000 (45 percent). Crops in Redwood County are primarily corn and soybeans and livestock are primarily turkeys and hogs (USDA 2002).

The average number of farms in Renville County increased by 3 percent and the average farm size increased by 6 percent between 1997 and 2002. Crop sales in 2002 for Renville County were \$203,689,000 (64 percent) and livestock sales were \$113,324,000 (36 percent). Crops in Renville County are primarily corn and soybean and livestock are primarily turkeys and hogs (USDA 2002).

The average number of farms in Brown County decreased by 2 percent and the average farm size increased by 1 percent between 1997 and 2002. Crop sales in 2002 for Brown County were \$72,839,000 (44 percent) and livestock sales were \$92,569,000 (56 percent). Crops in Brown County are primarily corn and soybeans and livestock are primarily hogs and turkeys (USDA 2002).

### 6.3.1.4 Cedar Mountain to Helena

In this Preferred Route section, there is no clear trend of the agricultural industry of the counties crossed by the route. Renville and Le Sueur counties have seen an increase in both the average size of farms and the numbers of farms, where Brown and Sibley counties have also seen an increase in the average size of farms with a decrease in the number of farms. Scott County has seen an increase in the number of farms and a decrease in the average size of farms.

Along this Preferred Route section, 87 percent of the land is used for agriculture (USGS 2004) and 88.7 percent of the soils are listed by the NRCS as prime farmland, prime when drained, or farmland of statewide importance (NRCS 2005).

Refer to Section 6.3.1.2 for agricultural information in Renville and Brown counties.

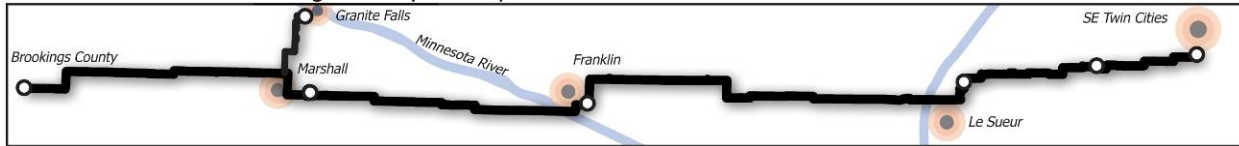
According to the 2002 Census of Agriculture, the average number of farms in Sibley County decreased by 2 percent and the average farm size increased by 9 percent between 1997 and 2002. Crop sales in 2002 for Sibley County were \$83,298,000 (49 percent) and livestock sales were \$85,303,000 (51 percent). Crops in Sibley County are primarily corn and soybeans and livestock are primarily hogs, turkeys and cattle (USDA 2002).

The average number of farms in Le Sueur County increased by 4 percent and the average farm size increased by 5 percent between 1997 and 2002. Crop sales in 2002 for Le Sueur County were \$45,425,000 (51 percent) and livestock sales were \$42,781,000 (49 percent). Crops in Le Sueur County are primarily corn and soybeans and livestock are primarily turkeys and hogs.

The average number of farms in Scott County increased by 11 percent and the average farm size decreased by 3 percent between 1997 and 2002. Crop sales in 2002 for Scott County were \$27,898,000 (52 percent) and livestock sales were \$25,612,000 (48 percent). Crops in Scott County are primarily corn and soybeans and livestock are primarily cattle and hogs.

The Applicants consulted with the Scott County Environmental Health Manager to discuss documented anthrax outbreaks in cattle in Scott County. The map in Appendix G identifies previously documented anthrax outbreaks near the Project route. Anthrax is a spore forming bacillus bacteria that lives in the soil until exposed to light. Anthrax outbreaks can occur when soil moving activity is conducted. There must be the right dusty and dry weather conditions for anthrax to

## Preferred Route: Brookings County - Hampton



deposit on vegetation. Livestock tend to graze closer to the soil during these weather conditions and may become exposed and infected with anthrax. Humans may become exposed to anthrax as a skin infection or uncommonly by inhalation.

There are two known organic farmers within one mile of the Cedar Mountain to Helena Preferred Route section. One of the farms was identified during the public involvement process and the other farm is a certified organic farm as reported by the MnDOA. The State does not depict the exact location of an organic farm field.

### 6.3.1.5 Helena to Lake Marion

In this Preferred Route section, the overall trend of the agricultural industry has been an increase in the number of farms. Scott and Rice counties have seen a decrease in the average size of farms where Le Sueur County has seen a slight increase in farm size.

Along this Preferred Route section, 78.7 percent of the land is used for agriculture (USGS 2004) and 80.8 percent, of the soils are listed by the NRCS as prime farmland, prime when drained, or farmland of statewide importance (NRCS 2005).

Refer to Section 6.3.1.4 for agricultural information in Le Sueur and Scott counties.

According to the 2002 Census of Agriculture, the average number of farms in Rice County increased by less than 1 percent and the average farm size decreased by 4 percent between 1997 and 2002.

Crop sales in 2002 for Rice County were \$45,347,000 (46 percent) and livestock sales were \$53,979,000 (54 percent). Crops in Rice County are primarily corn and soybeans and livestock are primarily turkeys and hogs (USDA 2002).

There are two known anthrax outbreak sites in cattle on the south side of TH 2 within the Helena to Lake Marion section of the Preferred Route.

There are four known organic farmers within one mile of the Helena to Lake Marion Preferred Route section. One of the farms was identified during the public involvement process and the other three farms are certified organic farms as reported by the MnDOA. The State does not depict the exact location of an organic farm field.

### 6.3.1.6 Lake Marion to Hampton

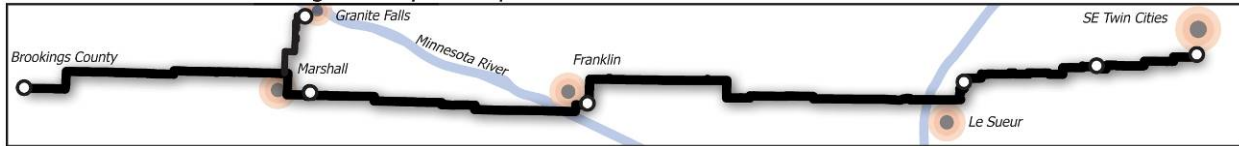
In this Preferred Route section, the overall trend of the agricultural industry has been an increase in the number of farms and the average size of farms is either the same or has decreased.

Along this Preferred Route section, 77.4 percent of the land is used for agriculture (USGS 2004) and 83.2 percent of the soils are listed by the NRCS as prime farmland, prime when drained, or farmland of statewide importance (NRCS 2005).

Refer to Section 6.4.1.4 for agricultural information in Scott County, and Section 6.4.1.5 for Rice County.

According to the 2002 Census of Agriculture, the average number of farms in Dakota County increased by 3 percent and the average farm size stayed consistent between 1997 and 2002. Crop sales in 2002 for Dakota County were \$74,480,000 (67 percent) and livestock sales were \$37,521,000 (33 percent). Crops in Dakota County are primarily corn and soybeans and livestock are primarily turkeys, cattle and hogs (USDA 2002).

Preferred Route: Brookings County - Hampton



Center pivots are a form of overhead sprinkler irrigation used in Minnesota. Center pivot irrigation systems are located in this section of the Preferred Route. Center pivot irrigation systems are placed in the center of a field line and rotate on the center axis, creating a circular field line. The Applicants have identified the locations of center pivot field lines. Along the Preferred Route, 14 center pivots are present.

There are four known organic farmers within a mile of the Lake Marion to Hampton Preferred Route section. These organic farms were identified during the public involvement process, but specific organic field locations are unknown.

**6.3.1.7 Impacts and Mitigation**

The Project will result in permanent and temporary impacts to farmland. Permanent impacts will occur as a result of structure placement along the route centerline. The Applicants estimated that the permanent impacts in agricultural fields will be 1,000 feet<sup>2</sup> per pole. During construction, temporary impacts, such as soil compaction and crop damage within the ROW, are likely to occur. The Applicants estimated that the temporary impacts in agricultural fields will be one acre per pole for construction.

Refer to Section 6.3.1 for general agriculture information.

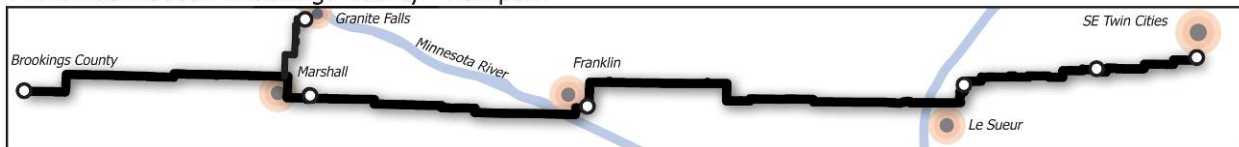
Along the Preferred Route, the Applicants estimate permanent impacts to agricultural lands at 1,097,000 feet<sup>2</sup> or approximately 25 acres. The Applicants estimate that 1,097 acres of agricultural land will be impacted temporarily by the Preferred Route due to transmission line construction. Clearing of the ROW in these areas will be limited to the amount necessary to permit the safe and reliable operation of the transmission line. Table 6-11 provides the temporary and permanent impacts for each Preferred Route section within the ROW.

**Table 6-11. Agricultural Impacts by Section in Acres Within the ROW**

Section	Temporary Impacts (acres)	Permanent Pole Impacts (acres)
Brookings County to Lyon County	219	5
Lyon County to Minnesota Valley	139	3
Lyon County to Cedar Mountain	261	6
Cedar Mountain to Helena	305	7
Helena to Lake Marion	101	2
Lake Marion to Hampton	72	2
<b>Total Agricultural Impacts</b>	<b>1,097</b>	<b>25</b>

The Applicants will work with landowners to minimize impacts to all farming operations, including organic farms, along the route. By aligning the transmission line along existing ROW such as roads and quarter-section and field lines, impacts can be minimized. Landowners commented at the public meetings that they would prefer structures as close to the field lines and roadways as possible. The Applicants will compensate landowners for any crop damage and soil compaction that may occur during construction. Areas disturbed during construction will be repaired and restored to pre-construction contours as required so that all surfaces drain naturally, blend with the natural terrain,

## Preferred Route: Brookings County - Hampton



and are left in a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion.

Some landowners use GPS navigation systems on farm equipment. Once the Project is complete, the transmission line poles will have GPS coordinates that the Applicants may provide to the landowners, if requested.

The Applicants are developing an Agricultural Impacts Mitigation Plan (“AIMP”) in collaboration with the MnDOA to identify measures the Applicants will implement to avoid, mitigate, or provide compensation for, negative agricultural impacts that may result from the transmission line construction. The AIMP addresses mitigation actions, where possible, restoration of damaged tiles, removal of construction debris, and restoration of soil to existing pre-construction conditions. The Applicants will work with landowners to reduce impacts to irrigation systems and restore temporary roads to pre-construction conditions. The Applicants will provide as much advance notice as is reasonable before accessing private property for construction of the Project.

The AIMP also addresses the mitigation plan for organic farms. All mitigation requirements addressed in the AIMP apply to organic farms. The Applicants will avoid the application of prohibited substances, including herbicides, pesticides, fertilizers or seeds unless requested and approved by the landowner. The Applicants will follow the requirements outlined in the AIMP to control erosion, weeds, water from other fields, and manage soils to continue the organic status of the field. An organic farm will not be used for the natural resource mitigation unless approved by the landowner.

No impacts to center pivot irrigation systems are anticipated along the Preferred Route.

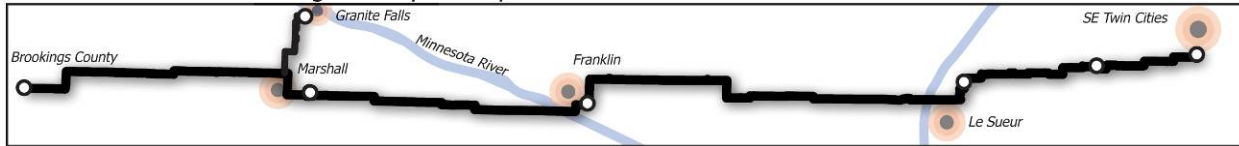
To minimize the risk of exposure to soil-borne *Bacillus anthracis* (Anthrax) spores during transmission line construction, a safety plan that specifically addresses the soil with potential Anthrax spores will be created and followed by all parties involved in the construction activities. The safety plan will describe appropriate measures for the evaluation, recognition, and control of soil potentially containing Anthrax spores in the Preferred Route.

Tile lines may be present along the transmission line route. The Applicants will work with the landowners to identify locations of drainage tiles along the route and will minimize interference with tiling, where possible. In the event that the Applicants locate a tile line that the landowner did not discuss, the Applicants will relocate the pole and repair the tile line, if damaged, according to the AIMP.

Crop dusting may occur within agricultural fields along the route. If this farming practice is utilized, and has the potential to become impacted by the Project, the Applicants will work with the landowner to identify mitigative measures to avoid or reduce changes to farming practices caused by the Project.

The Applicants received comments regarding noise impacts to livestock along the alignment. In particular, several individuals were concerned about noise level increases near livestock farms during Project construction and the potential for flight inspections of the route during maintenance. The Applicants will avoid direct impacts to livestock farms and will work with individual landowners to minimize noise impacts near livestock farm facilities during construction. The Applicants do not anticipate a change in domestic livestock production due to the Project.

## Preferred Route: Brookings County - Hampton



### 6.3.2 FORESTRY

The Preferred Route is located primarily in grassland and cultivated land with some forested areas adjacent to farmsteads, waterways, and within DNR-managed lands. The forestry industry is located primarily in the northeastern section of the State. According to the DNR Forestry Division Fiscal Year 2009 Harvest Plans (DNR 2008b), no townships within the Preferred Route have timber harvest plans. There are no economically important forestry resources within the Preferred Route.

#### 6.3.2.1 Impacts and Mitigation

No impacts to economically important forestry resources will occur. Construction staging areas will be located and arranged in a manner to preserve trees and vegetation to the maximum extent possible.

### 6.3.3 TOURISM

The Applicants identified tourism activities that are located within the Preferred Route along with resources within the vicinity that may be indirectly impacted by the Project because of viewshed or alteration of the landscape. The majority of tourism opportunities along the Preferred Route are associated with recreational resources including the WMAs, USFWS WPAs, and the Minnesota River Valley. Refer to Section 6.2.8 for recreation resource information along the Preferred Route. Bird watching has recently become popular along the Minnesota River Valley with the rebound of eagle populations and the opening of “Henderson Feathers” a birding information center in Henderson, Minnesota. The center provides birding information including maps of trails and viewing site locations, viewing times and displays (Mankato Free Press, 2007). The Midwest Center for Wind Energy is located near Hendricks on the Buffalo Ridge that attracts guests to the area to view the turbines, provide awareness to energy consumers and educate the public on the renewable resource. The Preferred Route crosses the U.S. Highway 75 – King of Trails, which is a historic highway that formerly ran from Canada to the Gulf of Mexico. Tourists drive this highway to experience the tall grass prairies, small farm communities, festivals, historical sites, and cultivated land.

#### 6.3.3.1 Impacts and Mitigation

Refer to Section 6.2.8.7 for impacts and mitigation information for recreational resources. Refer to Section 6.5.4.7 for information regarding potential impacts to migratory birds. No impacts to area tourism are anticipated due to the presence of the transmission line, and no mitigation is necessary.

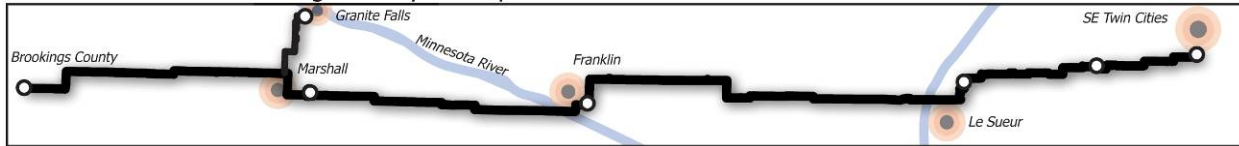
### 6.3.4 MINING

The primary mining resources in the area are sand and gravel with some granite and clay resources along the Minnesota River and horticultural peat along the eastern end of the Preferred Route.

Mining resources have been identified along the Preferred Route to understand the potential impact to current and future mining operations and to understand the area geology when siting pole locations. The Applicants used data collected from MnDOT, DNR and Minnesota Geological Survey maps.

A flat-iron shaped plateau called Coteau des Prairies dominates the regional topography of eastern South Dakota and southwestern Minnesota. Two prominent belts of high, hilly terrain on the

## Preferred Route: Brookings County - Hampton



eastern flank of the plateau are moraines of the Des Moines Lobe. Thickness of glacial material along these moraines can be in excess of 400 feet and are located along the western end of the Project area in Lincoln and Yellow Medicine counties. Thickness of glacial material varies from 0 feet to 600 feet (Quaternary Stratigraphy, 1999) within the Project area. Glacial materials range from predominately Des Moines tills that are characterized as loam to clay loam to large pockets of sand and gravel. Mining operations of stratified sand and gravel occur within the thick glacial material in nearly every county in Minnesota (Surficial Geology, 1999). Bedrock outcroppings occur in areas along the Minnesota River Valley including the Granite Falls, Redwood, and Brown County crossings. The Applicants have identified areas where shallow bedrock and bedrock outcropping occur because construction in these areas can be more complex than in areas with thick layers of glacial material.

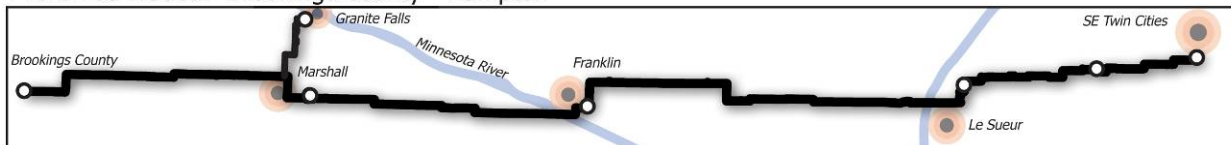
Underlying bedrock is characterized as Ordovician and Cambrian age dolomite, sandstone, and shales in the eastern half of the Project area into Sibley County. The western half of the Project area consists of mainly younger Cretaceous shale, sandstone, and clay. Areas along the Minnesota River, particularly near the cities of Morton and Redwood Falls stretching into much of Renville and Redwood counties, contain Lower Precambrian metasedimentary, gneiss, schist and granitic bedrock. Karst features, substantial groundwater resources that may create large below surface limestone caves, may be encountered in the western half of the Project area (Morey, 1976).

Sand and gravel mining is allowed within the Wild and Scenic portion of the Minnesota River. The Wild and Scenic Rivers Legislation Land Management; Zoning Regulations (6105.1260) allow local governments to provide a conditional use permit for the extraction of sand and gravel. All other mining operations are not allowed along a designated Wild and Scenic River. (12 SR 365)

In 1984, Minnesota Statutes Section 84.94 was passed, which required each county in Minnesota to identify and protect aggregate resources. Since then, counties in Minnesota have begun to identify areas of potential mining and develop long-term comprehensive plans that incorporate aggregate resources (DNR 2008c). Renville County, Le Sueur County, and the seven county metropolitan area, along with other counties outside the Project area, have developed mapping of potential aggregate mining resources and placed them on the DNR website. These maps are located in Appendix G. In Renville County there are areas of crushed stone deposits for future mining along the Lyon to Cedar Mountain Preferred Route section. Le Sueur County shows limited potential for aggregate mining in the Project area. Scott and Dakota counties (Seven County Metropolitan Area Maps in Appendix G) identify moderate to good aggregate resources near the Le Sueur Treatment Pond crossing in the Cedar Mountain to Helena Preferred Route section.

Kaolin clay is extracted along the Lyon to Cedar Mountain Preferred Route section. There is an existing kaolin clay extraction operation south of Franklin near the Minnesota River outside this section. There are proposed plans to expand this mine to the north near or within the Preferred Route. Mining resources within the Preferred Route are provided in Table 6-12.

Preferred Route: Brookings County - Hampton



**Table 6-12. Mining Resources Within the Preferred Route Sections**

Section	Number of Mines	Status
Brookings County to Lyon County	0	
Lyon County to Minnesota Valley	2	2 – Inactive Sites
Lyon County to Cedar Mountain	0	
Cedar Mountain to Helena	0	
Helena to Lake Marion	1	1 – Inactive Site
Lake Marion to Hampton	0	

\*Data produced by the MnDOT Aggregate Source Information.

There are no active mineral-based mining operations within the Preferred Route.

There are areas along the Preferred Route that are not currently mined for natural resources that may be used in the future. Eureka Township has mapped plans in their 2030 comprehensive plan (Eureka 2030 Plan) for future natural resource extraction in Southeast Quarter of Section 12, including a new mining operation along 235th Street. The Minnesota and Redwood river valleys provide significant areas of potential natural resource extraction including aggregate and granite resources. There are locations of shallow bedrock along the following Minnesota River crossings: Brown County, Granite Falls, and Redwood. Pole placement may become more difficult.

#### 6.3.4.1 Impacts and Mitigation

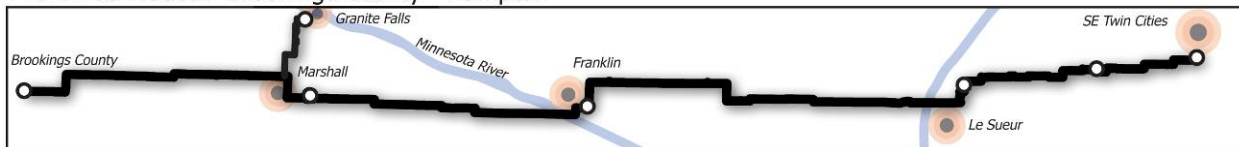
The transmission line will be routed to avoid direct impacts to existing and future (if known) mining operations whenever feasible. The Applicants will work to avoid all mining operations, but especially granite mining locations because of the unique geology of the outcrop areas along the Minnesota River. If mining operations cannot be avoided, the Applicants will work with existing mine operators to identify the extent of current and planned mining operations and develop appropriate mitigative measures.

### 6.4 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Archaeological and historic resources are those places that represent the visible or otherwise tangible record of human occupation. These resources vary in size, shape, condition, and importance, among other considerations; some are clearly evident on the landscape, while others are buried or only visible to knowledgeable people. For the purpose of this Application archaeological resources are typically underground or at the surface, while historic resources include standing structures such as bridges and buildings. Identified locations that have special meaning for specific communities along the Project are also included in this section.

The Applicants reviewed available records of identified resources to avoid them to the greatest extent possible, taking into consideration other natural resources and existing conditions. The Applicants recognize that the list of known resources is limited to those identified through surveys in specific locations, often tied to urban and rural development and infrastructure. Resources are typically categorized by type with an indication of relative importance, more exactly whether or not these resources are significant. The standard of significance is one applied by federal agencies for compliance with federal regulations, typically Section 106 of the National Historic Preservation Act

## Preferred Route: Brookings County - Hampton



(NHPA) of 1966 (as amended), and is useful when determining sites to avoid. Where sites have not been evaluated for significance (and therefore for determination of eligibility for listing on the NRHP) and may be physically impacted by the Project, the Applicants will coordinate with SHPO to develop a work plan to address the impact.

The following section presents the results of a search of available background information for the Preferred Route. Physical avoidance of these resources was a consideration in locating route alternatives for the Project. Mitigation discussions within each section outline a suggested process where the Applicants may conduct additional resource identification efforts and, should a resource be identified, work with State agencies and the SHPO to resolve questions of importance.

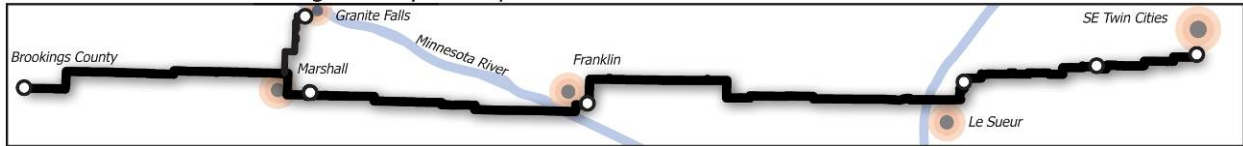
As mentioned above, the available background information illustrates the limited extent of previous archaeological site inventories. Archaeological inventories of the Preferred Route and Alternate Route have not been conducted, nor are they required, for this Route Application, so it is not possible to quantify the entirety of the potential archaeological impacts and use that information during the route selection process. Likewise, predicting the locations of pre-contact archaeological sites heretofore not identified is a difficult and subjective proposition. Archaeologists often develop such a predictive model based on a number of factors, including but not limited to areas immediately adjacent to permanent water sources. According to this commonly used modeling factor, these environments have a higher probability to contain pre-contact archaeological sites because of the possible variety and abundance of potable water and flora and fauna resources. This water-based factor has been referenced during coordination among state agencies and the SHPO for this and other transmission projects.

Therefore, the Applicants reviewed the location of the Preferred Route and Alternate Route relative to known aquatic environments. The GAP analysis shows that the Preferred Route will impact fewer acres (27 acres) of aquatic environments than the Alternate Route (44 acres). One would expect, supposing that pre-contact archaeological sites are more common near permanent water sources, that fewer such sites would be impacted by the construction and operation of the Preferred Route.

The Project has a federal nexus at certain river crossings where the U.S. Army Corps of Engineers (“USACE”) will review an application for Clean Water Act, Rivers and Harbors Act, Section 404, and Section 10 permits after the Route Permit is issued. For areas under their jurisdiction and within their Area of Potential Effect (“APE”), the USACE has already initiated Section 106 consultation and other compliance activities in anticipation of the Section 404 and Section 10 permit application. Cultural resources may be identified in the APE as a result of USACE compliance activities; any adverse effects to NRHP-eligible or listed properties in the USACE-defined APE would be treated through a federal consultation process.

The Applicants expect that any additional field surveys outside of the USACE-defined APE would be identified during the route scoping process; some locations might then be subject to archaeological inventory and associated activities once the Applicants secure access to the ROW. As above, physical avoidance of these resources would be preferred but, should a resource be identified and not avoided, the Applicants will work with State agencies and the SHPO to resolve questions of significance and mitigation if necessary.

## Preferred Route: Brookings County - Hampton



### 6.4.1 ARCHAEOLOGY

In July 2008, the Applicants reviewed SHPO records in St. Paul to identify known archaeological resources within one mile of the centerline of the Preferred and Alternate Routes. The literature review also included reports of previously surveyed areas relevant to the Project area. Results were requested for Lincoln, Lyon, Yellow Medicine, Redwood, Renville, Brown, Nicollet, Sibley, Le Sueur, Scott and Dakota counties. Section-specific discussions of archaeological sites within one mile of the centerline of the Preferred Route are provided below.

#### 6.4.1.1 Brookings County to Lyon County

Four archaeological resources were previously recorded within one mile of the Preferred Route centerline between the South Dakota border and the Lyon County Substation outside Marshall, Minnesota (Table H-1, Appendix H). Site 21LN0010 is eligible for listing on the NRHP. The three other sites have not been evaluated for listing on the NRHP.

No previously recorded archaeological resources within one mile of the Brookings County to Lyon County Preferred Route section centerline would be impacted by construction or operation of the Project.

#### 6.4.1.2 Lyon County to Minnesota Valley

Forty-one archaeological sites were previously identified within one mile of the Lyon County to Minnesota Valley Preferred Route section centerline (Table H-21, Appendix H). This is a culturally and historically rich area of Minnesota, particularly on the margins of the Minnesota River. The identified archaeological sites illustrate the broad cross section of pre-contact and historic period occupations and activities, as represented by the sites in Table H-26. Pre-contact earthworks are common along the margins of the Minnesota River Valley, as well habitations and more limited occupations. Historic-period town sites, transportation features, and even Dakota War-era sites are also present.

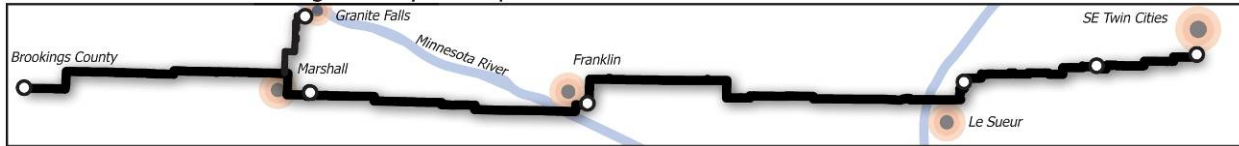
Two sites are considered eligible for listing on the NRHP. The remaining 39 sites have not been evaluated for listing on the NRHP.

Two sites are within the Preferred Route along the Lyon County to Minnesota Valley section. Sites 21YM0084 and 21YM0092 have not been evaluated for listing on the NRHP, but the Project planning and engineering effort will strive to avoid these two sites. Once the Project ROW is accessible, the Applicants will sponsor an archaeological investigation to locate these sites and provide a report to the OES and SHPO on the existing conditions, site management recommendations, and efforts, if known, to avoid, minimize, or treat impacts related to construction and maintenance of the Project. No other known sites within one mile of the Lyon County to Minnesota Valley Preferred Route section will be impacted by construction or maintenance of the Project.

#### 6.4.1.3 Lyon County to Cedar Mountain

Three archaeological resources were previously recorded within one mile of the Preferred Route centerline between the Lyon County Substation and the proposed Cedar Mountain Substation (Table H-2, Appendix H).

## Preferred Route: Brookings County - Hampton



Two archaeological sites, Site RN0002 and RWq, were inventoried as earthworks and a lithic scatter respectively. Site RNy represents the historic location of Mangeseth Landing, a mid-19th Century steamboat landing. None of these sites have been evaluated for listing on the NRHP.

No previously recorded archaeological resources within one mile of the Lyon County to Cedar Mountain Preferred Route section would be impacted by construction or operation of the Project.

### 6.4.1.4 Cedar Mountain to Helena

There are 14 archaeological resources within one mile of the Cedar Mountain to Helena Preferred Route section centerline (Table H-3, Appendix H).

The archaeological sites include pre-contact and historic-period ceramics, faunal remains, lithic debitage and suspected locations of historically documented town sites. Site 21LE0045 is considered to be eligible for listing on the NRHP; the remaining 13 sites have not been evaluated for listing on the NRHP.

No previously recorded archaeological resources within one mile of the Cedar Mountain to Helena Preferred Route section would be impacted by construction or operation of the Project.

### 6.4.1.5 Helena to Lake Marion

Two archaeological sites were previously identified within one mile of the Helena to Lake Marion Preferred Route section centerline (Table H-4, Appendix H).

The archaeological sites include the historically documented towns of Plum Creek and Raven Stream. These sites have not been evaluated for listing on the NRHP.

No previously recorded archaeological resources within one mile of the Helena to Lake Marion Preferred Route section centerline would be impacted by construction or operation of the Project.

### 6.4.1.6 Lake Marion to Hampton

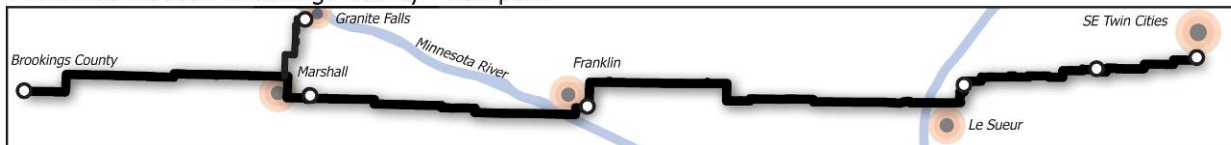
Three archaeological sites were previously identified within one mile of the Lake Marion to Hampton Preferred Route section (Table H-5, Appendix H). These archaeological sites represent locations of historically documented towns or structural features, and have not been evaluated for listing on the NRHP.

There is one site within the Preferred Route along the Lake Marion to Hampton section. Site 21DK0075 (Empey), a structural ruin, has not been evaluated for listing on the NRHP, but the Project planning and engineering effort will work to avoid the site. Once the Project ROW is accessible, the Applicants will sponsor an archaeological investigation to locate the site and provide a report to the OES and SHPO on the existing condition, site management recommendations, and efforts, if known, to avoid, minimize, or treat impacts related to construction and maintenance of the Project. No other known sites within one mile of the Lake Marion to Hampton Preferred Route section centerline will be impacted by construction or maintenance of the Project.

## 6.4.2 ARCHITECTURAL HISTORY

In July 2008, the Applicants reviewed SHPO records in St. Paul to identify known historical structures and cultural resources within one mile of the centerline of the Preferred Route and Alternate Route. The literature review also searched for reports of previously surveyed areas relevant

## Preferred Route: Brookings County - Hampton



to the Project area. Results were requested for Lincoln, Lyon, Yellow Medicine, Redwood, Renville, Brown, Nicollet, Sibley, Le Sueur, Scott, and Dakota counties. More information on the sites that lie within one mile of the Preferred Route is provided below.

### 6.4.2.1 Brookings County to Lyon County

Fourteen historic architecture properties were previously recorded within one mile of the Preferred Route centerline between the South Dakota border and the Lyon County Substation outside Marshall, Minnesota (Table H-6, Appendix H). None of the sites have been evaluated for listing on the NRHP.

### 6.4.2.2 Lyon County to Minnesota Valley

There are 112 historic architecture properties located within one mile of the Preferred Route centerline between the Lyon County Substation and the Minnesota Valley Substation (Table H-22, Appendix H). Five of these sites are either eligible or listed on the NRHP, including site YM-GRN-016, the Andrew J. Volstead House, YM-HFC-012, the Hanley Falls Railroad “Y”, CP-GRN-005, the Pillsbury and Susan House, CP-GRN-011, the J.A. Weaver House, and YM-GRN-046, the World War Memorial Park. The other 107 sites are not evaluated.

### 6.4.2.3 Lyon County to Cedar Mountain

Seven historic architecture properties were previously recorded within one mile of the Preferred Route centerline between the Lyon County Substation and the proposed Cedar Mountain Substation (Table H-7, Appendix H). None of the sites have been evaluated for listing on the NRHP.

### 6.4.2.4 Cedar Mountain to Helena

There are 42 historic architecture properties resources within one mile of the Cedar Mountain to Helena Preferred Route section centerline (Table H-8, Appendix H). Site LE-TYR-007, which is the German Evangelical Salem Church, is listed on the NRHP. The other 41 sites are not evaluated.

### 6.4.2.5 Helena to Lake Marion

Ten historic architecture properties were previously identified within one mile of the Helena to Lake Marion Preferred Route section centerline (Table H-9, Appendix H). Site SC-NMT-005, which is the Kajer Farmstead, is registered on the NRHP. The other nine sites are not evaluated.

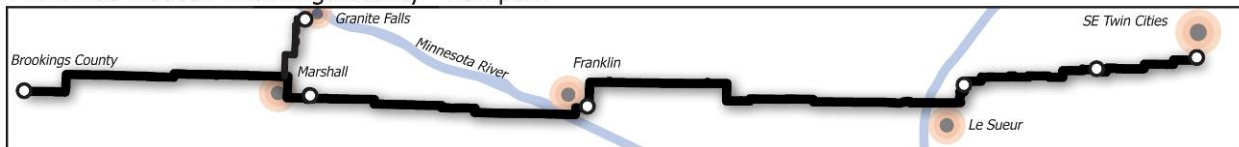
### 6.4.2.6 Lake Marion to Hampton

Nineteen historic architecture properties were previously identified within one mile of the Lake Marion to Hampton Preferred Route section centerline (Table H-10, Appendix H). Site DK-CRK-001, which is a Horticulture Building, is listed on the NRHP. None of the remaining 18 sites are listed on the NRHP.

## 6.4.3 HISTORIC LANDSCAPES

According to the National Park Service, a cultural landscape is defined as “a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.” A historic landscape is associated with an event or series of events of historical note and may also be the visual perception of a particular period of civilization, a way of life or patterns of living. A historic

## Preferred Route: Brookings County - Hampton



landscape can range from thousands of acres of rural tracts to a small homestead with a front yard of less than one acre. Like historic buildings and structures, these places reveal aspects of our country's origins and development through their forms, features, and the way they were used (National Park Service 2008). Identification of historic landscapes typically arises out of federal preservation requirements, including Sections 106 and 110 of the NHPA of 1966, as amended, or through the State's preservation planning program.

No historic landscapes have been identified within the Project area. If a historic landscape is identified prior to construction, consultation with appropriate parties would be initiated and consideration would be given to the Project-related impacts.

### 6.4.4 IMPACTS AND MITIGATION

Construction activities for the Preferred Route would occur in areas with previously identified archaeological and historic resources that have not been evaluated for listing on the NRHP. The Applicants will devise a survey methodology to document the existing conditions within the Project area at these locations, identify the extent of resources within these areas, and, if applicable, provide recommendations regarding NRHP eligibility. During the Project engineering phase, the Applicants will strive to avoid the resources or minimize impacts by utilizing best management practices developed in coordination with the OES and SHPO. If avoidance or impact minimization are not feasible actions given the Project engineering requirements, the Applicants will develop, in coordination with OES and SHPO, the means to compensate for the losses of those properties that are eligible for listing on the NRHP. The Applicants may also invite other parties (particularly Native American Tribes and other State and federal permitting or land management agencies) to assist in the development of the avoidance, minimization, or treatment measures.

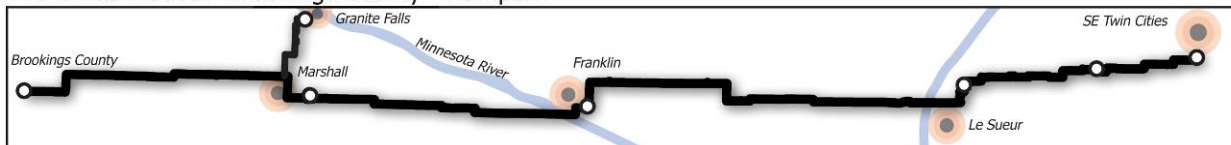
The Applicants will integrate a training, monitoring, and discovery plan into construction bid documents should previously unknown cultural resources or human remains be inadvertently encountered during construction along the route. The plan will outline the framework for handling such discoveries in an efficient and legally compliant manner. The plan may include the following topics: construction contractor training, construction monitoring by a professional archaeologist in specific locations along the Project area, procedures for identification and protection of resources in the field, contact information for parties to address a discovery, and procedures for avoidance and associated tasks in the event of work stoppage in a construction area. With regard to human remains, Project-specific procedures would be outlined to ensure that the appropriate authorities could be activated in accordance with State statutes (Minn. Stat. § 307).

## 6.5 NATURAL ENVIRONMENT

### 6.5.1 AIR QUALITY

Corona consists of the breakdown or ionization of air within a few centimeters of transmission line conductors and hardware. Usually some imperfection such as a sharp edge, a protrusion on hardware, a scratch on the conductor, or water is necessary to cause corona. Corona can produce ozone and oxides of nitrogen in the air surrounding the conductor. Ozone also forms in the lower atmosphere from lightning discharges and from reactions between solar ultraviolet radiation and air pollutants, such as hydrocarbons from auto emissions. The natural production rate of ozone is

## Preferred Route: Brookings County - Hampton



directly proportional to temperature and sunlight and inversely proportional to humidity. Thus, humidity or moisture, the same factor that increases corona discharges from transmission lines, inhibits the production of ozone. Ozone is a very reactive form of oxygen molecules and combines readily with other elements and compounds in the atmosphere. Because of its reactivity, ozone is relatively short-lived.

Currently, both the State and federal governments have regulations regarding permissible concentrations of ozone and oxides of nitrogen. The State and national ambient air quality standards for ozone are similarly restrictive. The national standard is 0.08 ppm on an eight-hour averaging period (40 CFR Part 50). The State standard is 0.08 ppm based upon the fourth-highest eight-hour daily maximum average in one year (Minn. R. 70009.0080). Both averages must be compared to the national and State standards because of the different averaging periods. Calculations done for a 345 kV project showed that the maximum one-hour concentration during foul weather (worst case) would be 0.0007 ppm. This is well below both federal and State standards. Lower voltage lines would have correspondingly lower concentrations.

Most calculations for the production and concentration of ozone assume high humidity or rain, with no reduction in the amount of ozone due to oxidation or air movement. These calculations would therefore overestimate the amount of ozone that is produced and concentrated at ground level. Studies designed to monitor the production of ozone under transmission lines have generally been unable to detect any increase due to the transmission line facility.

### 6.5.1.1 Impacts and Mitigation

No impacts to air quality due to the operation of the transmission line are anticipated.

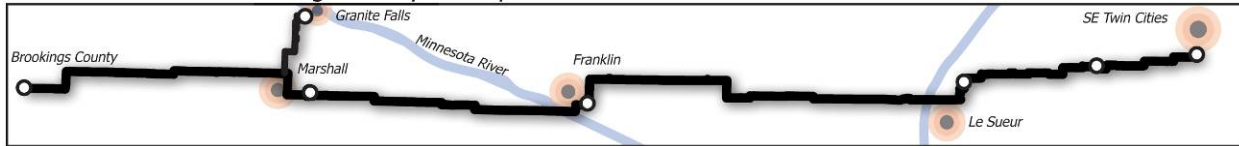
Temporary air quality impacts caused by construction-vehicle emissions and fugitive dust from ROW clearing and construction are expected to occur. Exhaust emissions from diesel equipment will vary during construction, but will be minimal and temporary. The magnitude of these emissions is influenced heavily by weather conditions and the specific construction activity taking place. Appropriate dust control measures will be implemented.

### 6.5.2 WATER QUALITY AND RESOURCES

The Project crosses two major hydrologic units (“HUs”) within the Upper Mississippi Drainage Region (Seaber et al. 1987). The western three-quarters of the Project area drains through the Minnesota HU to the Minnesota River. The eastern portion of the Project area drains through the Upper Mississippi - Black-Root HU to the Mississippi River. Lakes and large wetlands become more common in the eastern portion of the Project area, while lakes are less common and smaller prairie pothole wetlands are more typical in the west. Annual precipitation tends to increase west to east across the Project area from about 25 inches in Lincoln County to about 31 inches in Dakota County (State Climatology Office 2003).

Several rivers, streams, and ditches will be crossed by the Project. No structures will be located within these features. No direct impacts to rivers, streams, or ditches are anticipated. Some rivers and streams are designated Public Waters by the State of Minnesota and are under the regulatory jurisdiction of the DNR. These are listed in the Public Waters Inventory (“PWI”). The statutory definition of public waters can be found in Minnesota Statutes Section 103G.005, subdivisions 15

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and 15a. A license from the DNR is required to cross these features. Public Waters also include some lakes and wetlands. No lakes will be crossed by the Project; however, some Public Water wetlands may be within the route. The Applicants will obtain utility crossing licenses from the DNR for any PWI water crossed. Rivers, streams, and ditches crossed by the centerline are summarized in Table 6-13 and listed in full in Appendix I. Water bodies listed in the PWI are also denoted in these tables.

The Minnesota River is listed as a Scenic River by the State of Minnesota and managed by the DNR beginning at the Redwood County Highway 11 bridge upstream of the City of Franklin. Upstream from the Minnesota Falls Dam, the river is designated Recreational. Minnesota State Administrative Rules regulate special use areas including the Minnesota Wild, Scenic, and Recreational Rivers system (Chapter 6105.0180). Transmission line crossings of these designations are permitted. Transmission line crossings must follow existing corridors across wherever feasible. In addition, a Section 10 permit from the USACE will be required for the Minnesota River crossings.

**Table 6-13. Water Body Crossings at Preferred Route Centerline**

Section	Stream Count <sup>1</sup>	PWI Stream Count
Brookings County to Lyon County	45	13
Lyon County to Minnesota Valley	15	7
Lyon County to Cedar Mountain	15	8
Cedar Mountain to Helena	44	16
Helena to Lake Marion	19	12
Lake Marion to Hampton	20	4
<b>Preferred Route Total</b>	<b>158</b>	<b>60</b>

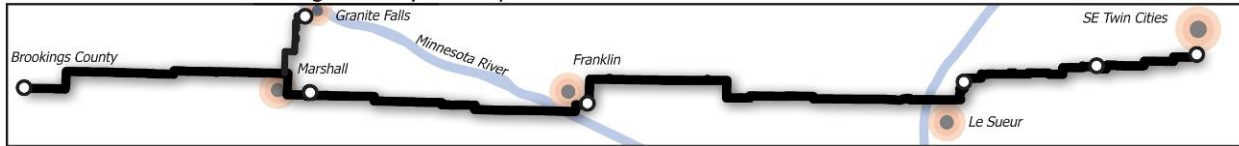
<sup>1</sup> Includes all streams, ditches, and other linear water systems crossed by the centerline.

Source: DNR 24K Streams DNR 2004 Public Waters Inventory

Section 303(d) of the Federal Clean Water Act requires states to publish, every two years, a list of streams and lakes that are not meeting their designated uses because of excess pollutants (impaired waters). The list, known as the 303(d) list, is based on violations of water quality standards. In Minnesota, the MPCA has jurisdiction over determining 303(d) waters. These waters are described as “impaired.” Reasons for impairment in the Project area include turbidity, polychlorinated biphenyls (“PCBs”), mercury, fecal coliform or *E. coli*, chloride, and low biological integrity for fish. This Project would have the potential to increase turbidity due to increased sedimentation from construction activities. While all MPCA impairments are listed, turbidity is the only pollutant that could be generated by this Project. Section 401 of the federal Clean Water Act grants State agencies the authority to require certification of compliance with State and federal water quality regulations. In Minnesota, the MPCA implements Section 401 and approves Project certification.

The Federal Emergency Management Agency (“FEMA”) designates areas that are likely to experience flooding in a 100-year rainfall event. While transmission structures can withstand some inundation, function and maintenance of the transmission structures could be affected within the floodplain during a flood event. FEMA 100-year floodplains are found at the Minnesota River

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crossings and other large river crossings. FEMA floodplains are described in the following text sections.

Wetlands are important resources for flood abatement, wildlife habitat, and water quality. Wetlands that are hydrologically connected to the nation’s navigable rivers are protected federally under Section 404 of the Clean Water Act. In Minnesota, wetlands are also protected under the Wetland Conservation Act (“WCA”) and by the DNR for those areas identified as PWI wetlands. A wetland permit is required from the USACE; the DNR requires a license to cross PWI wetlands. This project may not require a permit under WCA by definition (Minnesota Rule 8420.0110 Subpart 18) or by exemption (Minnesota Rule 8420.0122 Subpart 6). Coordination with the local government units (“LGUs”) and/or the Board of Water and Soil Resources (“BWSR”) is required for the WCA determination.

The USFWS produced maps of wetlands based on aerial photographs and NRCS soil surveys starting in the 1970s. These wetlands are known as the National Wetlands Inventory (“NWI”). Wetlands listed on the NWI may be inconsistent with current wetland conditions; however, NWIs are the most accurate and readily available database of wetland resources within the Project area. Wetland impacts that would occur due to construction of the Project were estimated using NWIs. A summary of NWI wetland impacts within the Preferred Route is shown in Table 6-14 and a complete list is included in Appendix I. Calculations are based on a 150 foot ROW centered on the intended centerline.

**Table 6-14. NWI Wetlands within Preferred Route ROW**

Section	Total Wetlands			Forested Wetland			>1,000 ft: Ct/Poles <sup>1</sup>	DNR PWI <sup>2</sup>
	Count	Acres	% of Route	Count	Acres	% of Route		
Brookings County to Lyon County	28	4.6	0.5	4	0.6	0.1	0/0	0
Lyon County to Minnesota Valley	16	5.9	1.1	0	0.0	0.0	0/0	0
Lyon County to Cedar Mountain	26	11.3	1.2	1	0.3	<0.1	0/0	0
Cedar Mountain to Helena	20	11.0	1.0	3	0.3	<0.1	0/0	1P
Helena to Lake Marion	57	37.9	7.8	4	0.4	0.1	3/4	0
Lake Marion to Hampton	43	33.7	10.0	11	4.2	0.3	3/4	2W
<b>Preferred Route Total</b>	<b>190</b>	<b>104.4</b>	<b>2.4</b>	<b>23</b>	<b>5.8</b>	<b>0.1</b>	<b>6/8</b>	<b>1P, 2W</b>

<sup>1</sup> Ct = count of wetlands greater than 1,000 feet long at proposed centerline; Poles refers to the approximate total number of poles to be placed within the wetlands greater than 1,000 feet

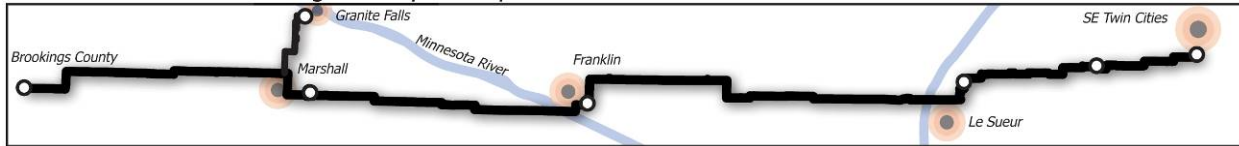
<sup>2</sup> P=Public Water - Lake, W=Public Water – Wetland

Source: USFWS NWI, DNR PWI

**6.5.2.1 Brookings County to Lyon County**

This Preferred Route section crosses the Lac Qui Parle, Hawk-Yellow Medicine, and Redwood major watersheds. The Preferred Route ROW also crosses the Lac Qui Parle River, North Branch, South Branch, and main channel of the Yellow Medicine River, Three Mile Creek, and the Redwood

## Preferred Route: Brookings County - Hampton



River. There are 45 streams and ditches within the ROW of this section. The MPCA list of impaired water bodies includes the South Branch Yellow Medicine River (turbidity, fecal coliform), an unnamed tributary to the South Branch Yellow Medicine River (fecal coliform), Three Mile Creek (fecal coliform, turbidity), and the Redwood River (chloride, biological integrity - fish, fecal coliform, mercury, turbidity). This ROW crosses four PWI streams and no PWI lakes. This route section crosses 1.6 miles of FEMA floodplains at rivers and major streams, requiring approximately six poles within the floodplains.

There are 28 NWI wetlands located within the ROW of this section. Wetlands total 4.6 acres, or 0.5 percent of the total ROW acreage, and 0.6 acres are forested. No wetlands are longer than typical span distance. No PWI wetlands are crossed.

### 6.5.2.2 Lyon County to Minnesota Valley

Water in this section of the Project area flows through the Redwood and Hawk-Yellow Medicine watersheds to the Minnesota River. Annual average precipitation is 25 inches (State Climatology Office 2003). The ROW crosses surface water resources including the Redwood River, Yellow Medicine River, Hazel Creek, and the Minnesota River. The ROW crosses 15 streams and ditches within the section. Water bodies of impaired quality include the Minnesota River (mercury), the Yellow Medicine River (turbidity), and the Redwood River (low biological integrity for fish, mercury). The Minnesota River is designated as Recreational by the State of Minnesota at the Granite Falls crossing. The ROW crosses six PWI streams and no PWI lakes. This route section crosses 1.7 miles of FEMA floodplains at rivers and major streams, requiring approximately nine poles within the floodplains.

There are 16 NWI wetlands located within the ROW. Wetlands total approximately 5.9 acres, or 1.1 percent, of the total ROW acreage. No forested wetlands occur. No wetlands are longer than typical span distance. The ROW does not cross PWI wetlands.

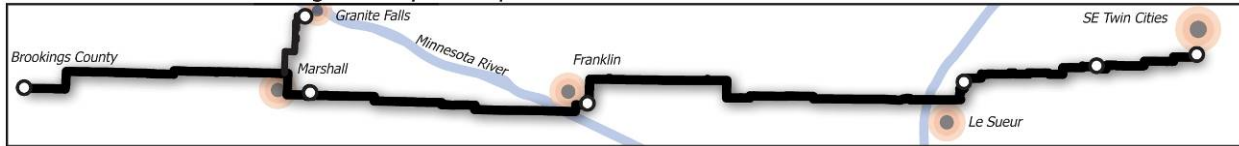
### 6.5.2.3 Lyon County to Cedar Mountain

This section crosses the Redwood, Cottonwood, and Middle Minnesota major watersheds. The ROW crosses surface water resources including Clear Creek and the Minnesota River. Fifteen streams and ditches occur within the ROW. The Project crosses the Minnesota River at the Brown County Highway 8 Bridge. At this location, the river is not designated as Scenic or Recreational, and is designated as impaired for mercury and PCBs by the MPCA. Clear Creek is also impaired for fecal coliform. The ROW of this section crosses five PWI streams and no PWI lakes. This route section crosses 1.3 miles of FEMA floodplains at rivers and major streams, requiring approximately seven poles within the floodplains.

The ROW in this section includes 26 NWI wetlands. Wetland acres total 11.3 acres, or 1.2 percent of the total ROW acreage, and 0.3 acres are forested. No wetlands are longer than typical span distance. No PWI wetlands are crossed.

This section crosses the Minnesota River southeast of Franklin at the Brown County crossing where a single-lane 10 ton weight class bridge is scheduled for decommission. Wetlands are present within the ROW near the river.

## Preferred Route: Brookings County - Hampton



### 6.5.2.4 Cedar Mountain to Helena

This section crosses the Middle Minnesota and Lower Minnesota major watersheds. The ROW crosses surface water resources including the Minnesota River, Eight Mile Creek, Middle Branch and South Branch of the Rush River, and Forest Prairie Creek. Forty-four streams and ditches occur within the ROW. Impaired rivers include the Minnesota River (PCB, mercury), West Branch Raven Stream (fecal coliform), and South Branch Rush River (fecal coliform). This section contains nine PWI streams and one PWI lake. This route section crosses 1.1 miles of FEMA floodplains at rivers and major streams, requiring approximately five poles within the floodplains.

The ROW of this section crosses 20 wetlands totaling 11.0 acres, or 1.0 percent of the total ROW acreage, and 0.3 acres are forested. No wetlands are longer than typical span distance and no PWI wetlands are crossed.

This section crosses the Minnesota River at the Le Sueur Wastewater Treatment Ponds crossing. The City of Le Sueur plans to decommission the existing wastewater treatment ponds in the next three to five years, replaced by a new facility at a different location. The existing treatment ponds will be dredged and then abandoned, though the clay liners and levees will not be removed. The land may be converted to a restored wetland, developed in to a park or sold.

### 6.5.2.5 Helena to Lake Marion

This section crosses the Lower Minnesota, Cannon, and Rush-Vermillion major watersheds. The ROW crosses surface water resources including the West Branch and East Branch Raven Creek, Sand Creek, and the Vermillion River. This section will pass by the south end of Cedar Lake. Nineteen streams and ditches occur within the ROW. This section of the Preferred Route does not cross impaired streams or rivers. This section contains six PWI streams and no PWI lakes. This route section crosses 0.6 miles of FEMA floodplains at rivers and major streams, requiring no poles within the floodplains.

The ROW of this section crosses 57 wetlands totaling 37.9 acres, or 7.8 percent of the total ROW acreage, and 0.4 acres are forested. Three wetlands are longer than typical span distance requiring that four poles be placed in wetlands. No PWI wetlands are crossed.

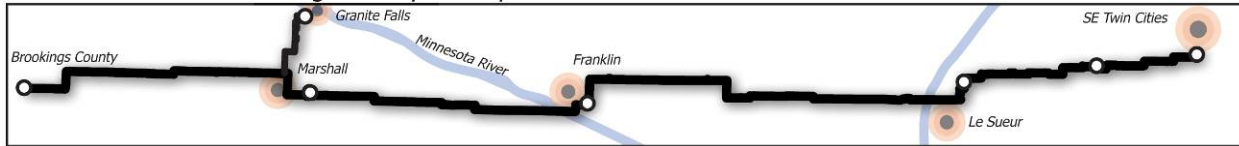
### 6.5.2.6 Lake Marion to Hampton

This section crosses the Rush-Vermillion major watershed. Surface water resources include the Vermillion River, the South Branch Vermillion River, and a tributary to the Vermillion River. The tributary to the Vermillion River is a designated trout stream, which indicates high water quality. The ROW crosses 20 streams and ditches within the section. The South Branch of the Vermillion River is impaired due to fecal coliform. There is a BWSR wetland bank easement within the Preferred Route in Eureka Township. The ROW of this section contains one PWI stream and no PWI lakes. This route section crosses 2.9 miles of FEMA floodplains at rivers and major streams, requiring approximately 12 poles within the floodplains.

The ROW of this section crosses 43 wetlands totaling 33.7 acres, or 10 percent of the total ROW acreage, and 4.2 acres are forested. Three wetlands are longer than typical span distance requiring that four poles be placed in wetlands. Two PWI wetlands will be crossed.

### 6.5.2.7 Impacts and Mitigation

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Because all rivers, streams, and ditches will be spanned by transmission structures, no structures will be located within these features and no direct impacts to rivers, streams, or ditches are anticipated. Indirect impacts could include sedimentation reaching surface waters during construction due to ground disturbance by excavation, grading, construction traffic, and dewatering of holes drilled for transmission structures. This could temporarily degrade water quality due to turbidity. These impacts will be avoided and minimized using appropriate sediment control practices and construction practices. These practices will be detailed in the National Pollutant Discharge Elimination System (“NPDES”) permit and Stormwater Pollution Prevention Plan (“SWPPP”) that will be completed prior to the start of construction. Once the Project is completed, there would be no significant impact on surface water quality because wetland impacts will be minimized and mitigated, disturbed soil will be restored to previous conditions or better, and the amount of land area converted to an impervious surface will be small. The Applicants will seek Section 401 certification from the MPCA.

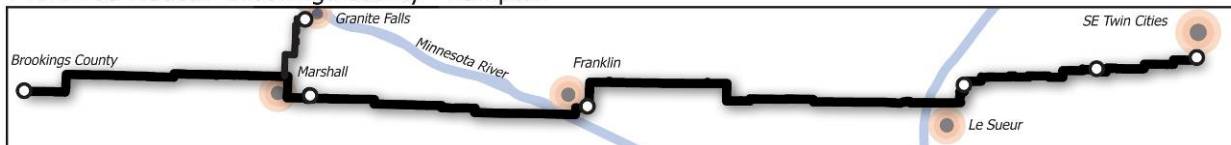
The Applicants will maintain sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent water resources and minimize soil erosion. Construction will be completed according to NPDES permit requirements. Practices may include:

- Containment of stockpiled material away from stream banks and lake shorelines.
- Stockpiling and respreading topsoil.
- Reseeding and revegetating disturbed areas as required by the NPDES permit.
- Implementing erosion and sediment controls as required by the NPDES permit.
- Structures and disturbed areas will be located 300 feet from rivers and lakes, where possible.
- Waste water from concrete batching or other construction operations will not enter streams or other surface waters without using turbidity control methods. Waste waters discharged will be free of settleable material.

Temporary impacts to wetlands may occur if they need to be crossed during construction of the transmission line. No staging or stringing setup areas will be placed within or adjacent to water resources, as possible. The typical span of the proposed structures is 1,000 feet. The Applicants will avoid major disturbance of individual wetlands and drainage systems during construction. This will be done by spanning wetlands and drainage systems, where possible. When it is not possible to span the wetland, the Applicants will draw on several options during construction to minimize impacts:

- When possible, construction will be scheduled during frozen ground conditions.
- Crews will attempt to access the wetland with the least amount of physical impact to the wetland (*i.e.*, shortest route).
- The structures will be assembled on upland areas before they are brought to the site for installation, when possible.
- When construction during winter is not possible, construction mats will be used where wetlands would be impacted. Additionally, the Applicants have access to an all-terrain construction vehicle that may be used, which is designed to minimize soil impact in damp areas. Wetlands impacted will be restored as required by the USACE and WCA.

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Permanent impacts to wetlands would take place where structures must be located within wetland boundaries. Typically, one structure will need to be placed in a wetland greater than 1,000 feet long but less than 1,500 feet. Two structures will be needed for wetlands between 1,500 and 2,500 feet, and so on. Wetland impacts due to permanent structure placement would result in approximately 55 square feet of permanent impacts per standard single-pole structure. Temporary impacts will total one acre per span of transmission line. Wetland vegetation would be restored following construction. Applicants will obtain necessary Section 404 permits from the USACE and will comply with the WCA.

Vegetation maintenance procedures under transmission lines prohibit trees from establishing. Existing trees must be removed throughout the entire ROW, including forested wetlands. The USACE may require wetland mitigation for conversion of forested wetlands to nonforested wetlands. The required mitigation would be determined based on consultation with the USACE, as their guidance documents have not been finalized.

The Applicants calculate that eight poles would need to be placed in wetlands, resulting in approximately 440 square feet of permanent wetland impacts. Temporary wetland impacts total 12.9 acres within the ROW of the Preferred Route. Approximately six acres of forested wetlands will undergo a permanent vegetation type change to emergent or shrub/scrub vegetation.

Structures in FEMA floodplains displace an amount of permeable surface within the floodplain. Across the Preferred Route, approximately 39 structures will be placed within FEMA floodplains, using 2,145 square feet, or 0.05 acres, for permanent structure foundations. Impacts of structures within FEMA floodplains are not anticipated to have an effect on flooding.

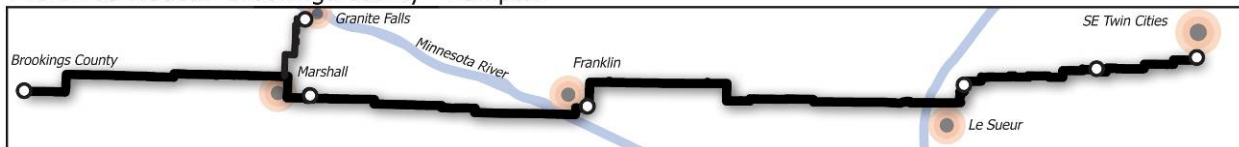
The Preferred Route will cross the Minnesota River at three locations: at the Granite Falls, Brown County, and Le Sueur Wastewater Treatment Pond crossings. The Minnesota River is distinct from other rivers in the Project area because it is regulated by the USACE and the DNR as described in Section 6.5.2. The Minnesota River Valley is much wider than the actual banks of the river (a mile or wider throughout the Project area). This poses engineering considerations, as large floodplains and steep bluffs are associated with the river. Resources related to the Minnesota River are described in the appropriate sections of this document. The Applicants are studying triple circuiting with existing transmission lines at river crossings to mitigate impacts. No structures will be placed within rivers.

### 6.5.3 FLORA

The Project area ranges across two ECS units: the Prairie Parkland ecoregion in the western half of the Project area and the Eastern Deciduous Forest in the eastern portion (ECOMAP 1993). The Prairie Parkland ecoregion was under tallgrass prairie preceding modern settlement. Natural vegetation in prairie remnants is dominated by big bluestem (*Andropogon gerardii*) and Indian grass (*Sorghastrum nutans*), with prairie dropseed (*Sporobolus heterolepis*) also a prominent component. In drier conditions, little bluestem (*Schizachyrium scoparium*), porcupine grass (*Stipa spartea*), and side-oats grama (*Bouteloua curtipendula*) are important. (DNR 2006) Forbs include purple coneflower (*Echinacea purpurea*), lead plant (*Amorpha canescens*), and pasque flower (*Anemone pulsatilla*) (Aaseng et al, 1993).

The eastern portion of the Project area enters the Eastern Broadleaf Forest ecoregion. A transition occurs in this ecoregion between eastern forest species and western prairie species, each at the limits of their range. The Big Woods Ecological Subsection in eastern Sibley, Scott, Le Sueur, and Rice

## Preferred Route: Brookings County - Hampton



counties was dominated by maple (*Acer sp.*), basswood (*Tilia americana*), and oak (*Quercus sp.*) deciduous forest (DNR 2005). Tallgrass prairie, bur-oak (*Quercus macrocarpa*) savanna, and oak (*Quercus sp.*) woodland were historically common in the easternmost part of the Project area (DNR 2005). Woodlands and forests dominated sites where fire was uncommon, including species such as sugar maple (*Acer saccharum*), basswood, American elm (*Ulmus americana*), and northern red oak (*Quercus rubra*). Silver maple (*Acer saccharinum*) forests still occupy the active floodplains, while silver maple, cottonwood (*Populus deltoides*), box-elder (*Acer negundo*), green ash (*Fraxinus pensylvanica*), and slippery elm (*Ulmus rubra*) grow near rivers where flooding is infrequent (DNR 2005). Wet depressions create conditions suitable for marshes, wet meadows, shrub/scrub wetlands, and wet prairies.

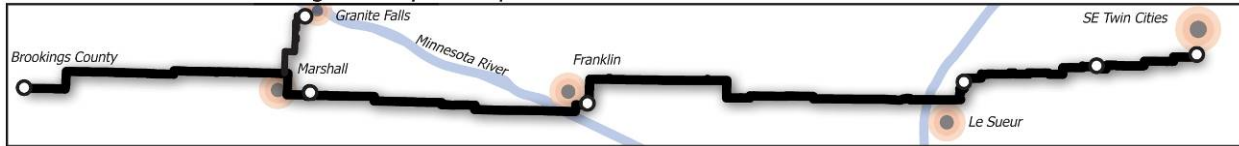
As a result of settlement and farming in the 1800s, most of the historic prairie has been converted to agriculture. The dominant plant species in the agriculture areas are corn (*Zea mays*) and soybeans (*Glycine max*); in the grazed areas, dominant vegetation includes introduced grasses, such as smooth brome (*Bromus inermis*) and sorghum (*Sorghum vulgare*). Similarly, woodland trees were removed and land was converted to agriculture.

Wetlands are ecologically important and are typically found as isolated pothole wetlands or in association with rivers. Wet prairie and meadow/carr communities are typically encountered in southern Minnesota. Dominant plant species include slough sedge (*Carex atherodes*), tussock sedge (*C. stricta*), or aquatic sedge (*C. aquatilis*). Prairie cordgrass (*Spartina pectinata*) bluejoint (*Calamagrostis canadensis*), and lake sedge (*C. lacustris*) are also common species. Other common plants include forbs such as spotted Joe pye weed (*Eupatorium maculatum*), great water dock (*Rumex orbiculatus*), and water smartweed (*Polygonum amphibium*), and shrubs such as red-osier dogwood (*Cornus sericea*) and willow (*Salix spp.*) (DNR 2008). Invasive species, particularly purple loosestrife (*Lythrum salicaria*) and reed canary grass (*Phalaris arundinacea*) often degrade native wetland communities.

Throughout the Project area, there are several areas where native vegetation occurs naturally or is managed. Designated habitat or conservation areas include managed lands such as DNR WMAs and USFWS WPAs and easements, and unmanaged areas include DNR-designated Minnesota County Biological Survey (“MCBS”) biodiversity significance and rare native habitats and communities. These resources provide habitat for native vegetation, wildlife and rare and unique resources. Native prairie commonly occurs along railroads. These areas have been inventoried by the DNR and are listed as state-designated railroad prairie. The DNR has identified areas with high-quality natural resources that would be suitable for metro parks. These areas are designated Metro Significant Natural Resource Areas (“MSNRA”). See Appendix B for maps showing locations of many of these features.

WMAs are typically managed for wildlife resources including game species. Refer to Table 6-13 for impacts to WMAs within the Preferred Route ROW. Two types of USFWS easement occur in the Project area. On habitat easements, the USFWS holds tillage, cropping, and disturbance rights to the upland and protects the wetlands. These lands are often used for waterfowl production. Wetland and prairie restoration typically takes place on these easements. Farmer’s Home Administration (“FmHA”) easements are managed by the USFWS for wildlife resources. Management practices vary among easements depending on location and management goal.

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MCBS data were reviewed to determine if there were areas with medium, high, or outstanding biodiversity significance in the Project area. Areas with medium biodiversity significance are those containing significant occurrences of rare species and/or moderately disturbed native plant communities and landscape that have a strong potential for recovery. Areas with high biodiversity significance contain sites with very good quality occurrences of the rarest plant communities and/or important functional landscapes. Areas with outstanding biodiversity significance contain the best occurrence of the rarest species; the most outstanding example of the rarest native plant communities and/or the largest, most intact functional landscapes present in Minnesota.

The Big Woods Heritage Forest is managed by the DNR through a program that relies largely on voluntary partnerships with private landowners. Landowners with more than 20 acres of deciduous woodland in counties in the Big Woods Ecological Subsection can enroll in this program to conserve old-growth deciduous forest. Transmission line easements across these lands would require agreement from the landowner.

Noxious weeds are regulated under Minnesota Statutes, Chapter 18. Noxious weeds can rapidly overtake native vegetation and severely degrade habitat quality. Cropland suffers losses in productivity following noxious weed infestations. Noxious weeds can be introduced to new areas through propagating material like roots or seeds transported by contaminated construction equipment. Disturbed soil surfaces allow noxious weeds to establish and out-compete existing vegetation.

Eleven species of primary noxious weeds are recognized by Minnesota Rules 1505.0730. The Minnesota Noxious Weed Law also defines and lists 49 secondary noxious weeds. A county may select a weed or weeds from this secondary list to be placed on its noxious weeds list. If a secondary noxious weed is placed on a county noxious weed list, that weed must be controlled in that county. State and county noxious weeds that are controlled in the Project counties are listed in Table 6-15.

Preferred Route: Brookings County - Hampton

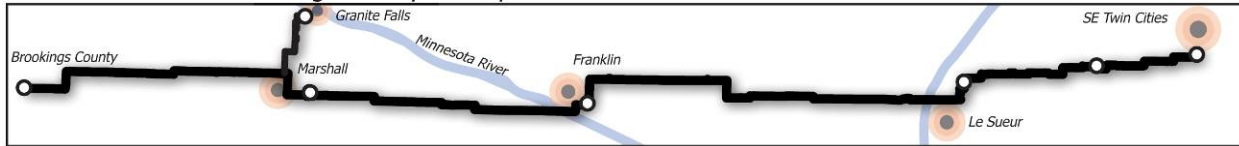
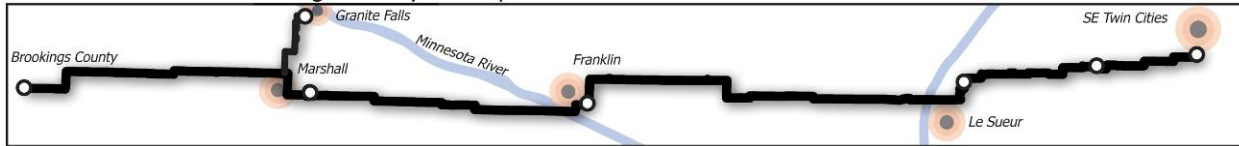


Table 6-15. Minnesota Prohibited Noxious Weeds

Common Name/County	Scientific Name
Mustard, garlic	<i>Alliaria petiolata</i> (Bieb.) (formerly <i>alliaria officinalis</i> )
Hemp	<i>Cannabis sativa</i>
Thistle, plumeless	<i>Carduus acanthoides</i> (L.)
Thistle, musk	<i>Carduus nutans</i> (L.)
Thistle, Canada	<i>Cirsium arvense</i> (L.) Scop.
Thistle, bull	<i>Cirsium vulgare</i> (Savi) Tenore
Field Bindweed	<i>Convolvulus arvensis</i>
Spurge, leafy	<i>Euphorbia esula</i> (L.)
Loosestrife, purple	<i>Lythrum salicaria</i> , <i>virgatum</i> , or any combination
Sow thistle, perennial	<i>Sonchus arvensis</i> (L.)
Poison Ivy	<i>Toxicodendron radicans</i> (Ktze.) (formerly <i>rhus radicans</i> )
Additional Noxious Weeds by County	
Lincoln County	None
Lyon County	None
Yellow Medicine County	None
Redwood County	Wild sunflower ( <i>Helianthus annuus</i> )
	Velvet leaf ( <i>Abutilon theophrasti</i> )
	Cocklebur ( <i>Xanthium pennsylvanicum</i> )
	Buffalo bur ( <i>Solanum rostratum</i> )
Brown County	None
Renville County	Wild sunflower
	Velvet leaf
	Cocklebur
Sibley County	Wild sunflower
	Velvet leaf
	Cocklebur
	Woolly cupgrass ( <i>Eriochloa villosa</i> )
Le Sueur County	Wild sunflower
	Velvet leaf
	Cocklebur
Scott County	Jimson weed ( <i>Datura stramonium</i> )
	Wild sunflower
	Velvet leaf
Rice County	Jimson weed
	Wild sunflower
	Velvet leaf
	Cocklebur
	Yellow nutsedge ( <i>Cyperus esculentus</i> )

Preferred Route: Brookings County - Hampton



Common Name/County	Scientific Name
Dakota County	Velvet Leaf
	Common Sunflower
	Cocklebur
	Spotted Knapweed ( <i>Centaurea stoebe</i> )

**6.5.3.1 Brookings County to Lyon County**

The section of the Preferred Route between the South Dakota border to the Lyon County Substation was historically tallgrass prairie and is predominantly in the Coteau Moraines Ecological Subsection. Steep relief occurs in some locations of this area and is better suited to pasture land than agriculture. GAP land use data show that 86.7 percent of this ROW is used for agriculture, and another 12.5 percent is grassland.

No designated habitat or conservation areas that may contain native vegetation are found within this route. Flora within this route are typical of agricultural areas.

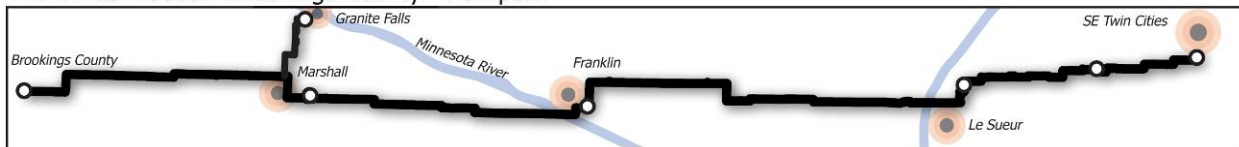
**6.5.3.2 Lyon County to Minnesota Valley**

This section of the Preferred Route is within the tallgrass prairie historic range and is within the Minnesota Prairie Ecological Subsection. Agriculture now dominates the landscape. GAP land cover data show that 88.8 percent of this ROW is used for agriculture, and 6.8 percent is grassland. This ROW crosses two portions of Lines WMA requiring three poles to be placed in the WMA. Four USFWS FmHA easements occur within the ROW on the west bluff top of the Minnesota River. One of these is greater than 1,000 feet and would require one pole located within. An additional FmHA easement is outside the ROW but within the route. Areas identified by the MCBS as moderate and high biodiversity, including a mesic prairie, are found at the Granite Falls crossing. One DNR protected prairie is located within the route but outside the ROW about three-quarters of a mile southwest of the Minnesota Valley Substation. Pole placement would avoid these lands as much as possible. The forested western bluff of the Minnesota River Valley would be crossed.

**6.5.3.3 Lyon County to Cedar Mountain**

This section of the Preferred Route crosses the Upper Minnesota River at the Brown County crossing and was historically tallgrass prairie with deciduous forest bluffs and floodplain forest at the Minnesota River. It is predominantly in the Minnesota River Prairie Ecological Subsection. GAP land use data show that 95.3 percent of the ROW is used for agriculture, and another 3 percent is grassland. The bluffs of the valley are forested with maple, red oak, and elm. The route across the west bluff of the Minnesota River will follow an existing distribution line corridor. The route on the eastern bluff follows a road. A sand-gravel prairie community is found east of the river near Renville County Highway 5. The floodplain of the valley is cultivated with row crops and has conservation easements. Forests that extend into the floodplain are typically dominated by silver maple, cottonwood, and willow. Areas identified by the MCBS as moderate biodiversity are found at the Brown County crossing. Outside of the river valley, agriculture continues to dominate the landscape. Rohlik’s Slough WMA is located within the route but outside of the ROW. Portions of both Daub’s Lake and Luescher-Barnum WMA are located within the ROW. Routing across Daub’s Lake WMA requires two poles within the WMA, and Luescher-Barnum WMA will be spanned.

## Preferred Route: Brookings County - Hampton



### 6.5.3.4 Cedar Mountain to Helena

This section of the Preferred Route was historically tallgrass prairie with deciduous forest bluffs and floodplain forest at the Minnesota River. It is predominantly in the Minnesota River Prairie Ecological Subsection. East of the Minnesota River, the Preferred Route enters the Big Woods Ecological Subsection where deciduous forest and oak savanna were historically prevalent. GAP land use data show that 92.5 percent of this ROW is used for agriculture, and another 5.7 percent is grassland. The Minnesota River is crossed again near the City of Le Sueur at the Le Sueur Treatment Pond crossing. Vegetative communities at this river crossing have been impacted by development of the Le Sueur area. This route crosses the wastewater treatment plant north of Le Sueur. The route crosses forested bluffs on both sides of the river, most significantly on the eastern side of the river following the U.S. Highway 169 corridor.

Areas identified by the MCBS as moderate biodiversity are found at the Le Sueur Treatment Pond crossing outside of the route. A portion of designated railroad prairie would be crossed west of Winthrop. An access road to the Michel Marsh WMA is within the route but would be spanned. No other designated habitat or conservation areas are found within this route section.

### 6.5.3.5 Helena to Lake Marion

This section is within the Big Woods Ecological Subsection where deciduous forest and oak savanna were historically prevalent. Much of the wooded areas have been removed since settlement. GAP land use data show that 71.5 percent of this ROW is used for agriculture, and another 24.5 percent is grassland.

Portions of two MSNRAs are found within this route section but not within the ROW. No designated habitat or conservation areas that may contain native vegetation are found within this section, and flora are typical of agricultural areas. While total land area that has been developed becomes more common nearer to the Metro area, habitat fragmentation is also a significant issue as more roads and smaller parcels divide habitat areas.

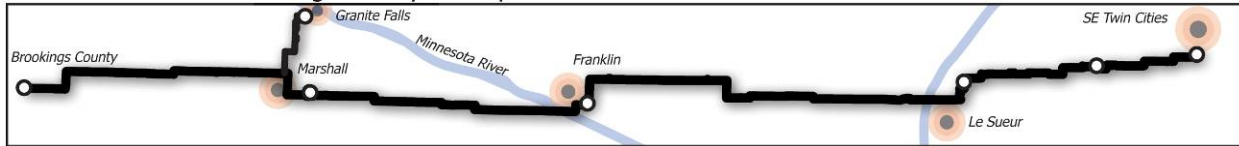
### 6.5.3.6 Lake Marion to Hampton

This area was originally characterized by deciduous forest and oak savanna. The section passes through the Big Woods, Oak Savanna, and Rochester Plateau ecological subsections. Woodlands become more common in this section of the Preferred Route. GAP land use data show that 75 percent of this ROW is used for agriculture, 16 percent is grassland, and four percent is woodland.

Large predominantly wooded areas in the section include the area west and north of Chub Lake, and a large parcel of woodland about two miles northwest of the town of Hampton. Forests are composed of sugar maple, basswood, American elm, and northern red oak. Agriculture dominates the majority of the remainder of the land area. Human population density is highest in this section of the Preferred Route, thus more vegetation has been replaced with development. Prairie and oak savanna remnants may occur in areas that have avoided development and agriculture, though without disturbance such as fire, these areas typically succeed to forest communities.

Two MSNRAs and one MCBS area of outstanding biodiversity are found within this route. No other designated habitat or conservation areas are found within this section.

## Preferred Route: Brookings County - Hampton



### 6.5.3.7 Impacts and Mitigation

Flora throughout most of the Project area are typical of that normally found in an agricultural setting. Approximately 93 percent of the route will occur along existing ROWs, including roads and agricultural field lines, most often adjacent to cultivated row crops. Impacts to native vegetation are not anticipated to substantially disrupt vegetative community quality or function. The Applicants will span areas containing native communities wherever possible. The Applicants will avoid and minimize direct impacts to habitat and conservation areas as possible.

Temporary impacts to flora would take place most intensively at the structure locations where borings will take place and spoils will be stored. Permanent impacts are estimated at 55 square feet per pole. Temporary impacts are estimated at one acre per span. Staging areas and stringing areas will also temporarily impact flora across the route. Grading could occur at the staging areas if they are not located in previously disturbed sites. In forested areas, clearing for access roads and staging areas will be limited to only those trees necessary to permit the passage of equipment. Temporary access roads will be removed and the area restored to its original condition.

Permanent vegetative changes will take place in woodland areas within the ROW. Trees and shrubs that may interfere with maintenance and the safe operation of the transmission line will not be allowed to establish within the ROW. Collocating with existing corridors through wooded areas will reduce the impact to trees on the river valley bluffs. Typically, vegetation is controlled mechanically or with herbicides on a regular maintenance schedule. Vegetation that does not interfere with the safe operation of the transmission line is allowed to establish within the ROW.

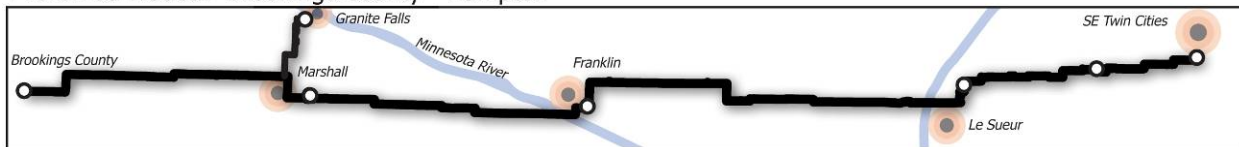
The Applicants will continue to work with the DNR and USFWS to minimize and avoid impacts to sensitive flora along the route. The Applicants will avoid and minimize impacts to any areas known to contain native vegetation, as possible. When native vegetation communities cannot feasibly be spanned, the Applicants will minimize the number of structures within these lands. Areas disturbed due to construction activities will be restored to pre-construction contours and will be reseeded with a seed mix recommended by the local DNR management and that is certified to be free of noxious weeds.

Construction equipment can spread noxious weed-propagating material to new locations. The Applicants will comply with Minnesota noxious weed laws as described in Minnesota Rules Chapter 1505 and will observe county weed lists where they occur. Around substations and switches, the Applicants will provide for weed control in a manner that does not allow for the spread of weeds onto adjacent agricultural land during operation of the transmission line.

Within the Preferred Route ROW, pole placement in Daub's Lake and Lines WMAs may be unavoidable. A total of five poles would be placed in these WMAs. This would result in approximately 275 square feet of land permanently removed from the existing habitat and 2.2 acres temporarily impacted. One pole will be located in a USFWS easement creating 55 square feet of permanent impacts. Other resources would be spanned or avoided as much as possible.

Expansion at the Lyon County, Lake Marion, and Minnesota Valley substations is not expected to have significant effects on flora resources.

## Preferred Route: Brookings County - Hampton



### 6.5.4 FAUNA

Wildlife throughout the Project area consists of birds, mammals, fish, reptiles, amphibians, mussels, and insects, both resident and migratory, which use the area habitat for forage, shelter, breeding, or as a stopover during migration. Species include those found in agricultural landscapes, prairie remnants, pasture, grasslands, wetland, and riverine habitats. Common mammals for these habitats include raccoon (*Procyon lotor*), mink (*Neovison vison*), skunk (*Mephitis* spp.), weasel (*Mustela nivalis*), white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), badger (*Mustelidae* family), porcupine (*Erethizon dorsatum*) and rabbit (*Sylvilagus* spp.). Common birds include songbirds, waterfowl, and game birds such as pheasant (*Phasianus colchinus*) and turkey (*Meleagus gallopavo*) (DNR AniMap 2008). A list of mammals, birds, reptiles, amphibians, and fish known to occur in habitats of this region of Minnesota is included in Appendix I-1.

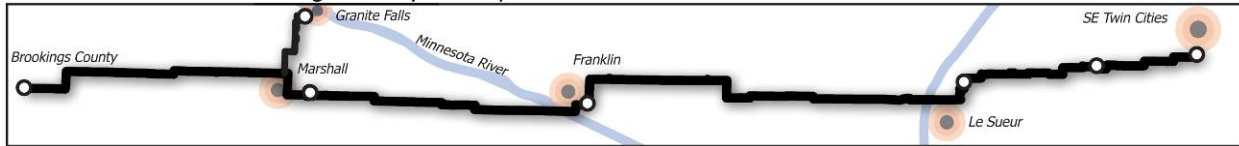
Throughout the Project area, there are several areas where high-quality wildlife habitat occurs naturally or is being managed. Designated habitat or conservation areas including managed areas such as DNR WMAs, USFWS WPAs and easements, and unmanaged areas including DNR-designated MCBS biodiversity significance and rare native habitats and communities were analyzed within one mile of the route centerline. A distance of one mile was used because studies have shown that transmission line impacts to avian species are negligible at distances greater than one mile from wildlife habitat (APLIC 1994).

While agricultural land uses are an important component of wildlife resources in the Project area, land managed to promote wildlife habitat can provide for higher species diversity and larger populations than surrounding intensively used landscapes. Federally owned or operated lands include National Wildlife Refuges (“NWRs”), WPAs, and USFWS easements. NWRs are owned and managed by the USFWS to conserve important natural resources. No sections in this Project include NWR lands. WPAs are owned and managed by the USFWS to promote waterfowl populations and to conserve ecologically and recreationally valuable wetlands and lakes. USFWS easements protect wetlands and native grassland habitats on private land, which are important for survival of native species.

WMAs are managed by the DNR to promote wildlife and game species. Wildlife that can be found in the WMAs include deer, upland game birds such as pheasants, small game animals such as squirrels (*Sciuridae* family) and rabbits (*Leporidae* family), and non-game animals such as songbirds, reptiles and amphibians, and mice and voles (*Muridae* family). Aquatic Management Areas and Fish Management Areas (“FMAs”) protect aquatic wildlife and fish species by conserving lakes and rivers and the surrounding land areas. The DNR Shallow Lakes Program manages many PWIs less than 15 feet deep for wildlife resources including waterfowl.

Long-term and permanent federal and State agricultural land conservation easement programs provide valuable grassland habitat for many bird and terrestrial species and act as riparian buffers to improve water quality for wildlife and humans. CRP is a federal program that converts marginal farmland to grassland in easements lasting 10 to 15 years. Conservation Reserve Enhancement Program (“CREP”) easements are often permanent and are in coordination with RIM. Upland or wetland habitat restoration projects often take place within CREP lands. CREP Wetland Reserves (“WR”) target wetland restoration areas. RIM is a State-initiated program that has similar habitat goals as CRP and CREP. RIM easements are long-term or permanent and target improving

## Preferred Route: Brookings County - Hampton



watershed quality and restoring wildlife habitat. The Wetland Reserve Program and the Permanent Wetland Preserve program protect wetland habitats. For this discussion, all permanent land conservation programs will be considered in one category. These areas are evaluated within the 1,000 foot route instead of within one mile of the intended centerline, because these areas are less intensively managed for wildlife resources.

Organizations have identified other areas or habitats that are important for wildlife species. While land within these areas is usually privately owned, land managers can use this information for land use planning and development decisions. The MCBS biodiversity areas, identified by the DNR, are good indicators of wildlife species habitat and quality. Important Bird Areas (“IBAs”) are developed by BirdLife International and the Audubon Society and designate high-quality bird habitat. Similarly, Grassland Bird Conservation Areas (“GBCAs”) have been developed by the USFWS to identify areas of unbroken grassland where migratory bird species make their summer homes. Grassland bird species have experienced significant population decreases due in large part to grassland habitat loss. Wetlands also provide important wildlife habitat. See Section 6.5.2 for a discussion of wetland resources.

Game species populations are managed by the DNR and are an important part of Minnesota recreation and rural economy. Pheasant populations have been increasing slightly over the past 10 years, while gray partridge (*Perdix perdix*) populations are below the 10-year average, as are the populations of mourning doves (*Zenaida macroura*), cottontail rabbits (*Sylvilagus floridanus*), and jackrabbits (*Lepus townsendii*) (Tranel and Haroldson, 2008). Turkey populations have been increasing in the past decade throughout the Project area (DNR 2006). Deer populations have been steady in the western portion of the Project area and slightly decreasing in the Minnesota River area (DNR 2008h). Fishing takes place on many lakes and rivers in the Project area. Trout streams, designated and managed by the DNR, have very high water quality and are stocked with trout.

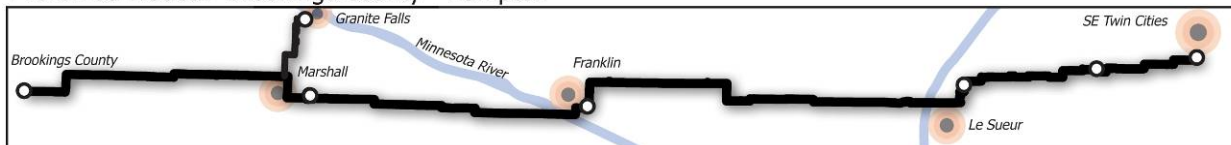
The Migratory Bird Treaty Act (“MBTA”) of 1918 (16 United States Code (“USC”) 703-712) governs the taking, killing, possession, transportation and importation of migratory birds, their eggs, parts and nests. The Fish and Wildlife Conservation Act of 1980 (16 USC 2901-2911) affords protection to Birds of Conservation Concern (“BCC”). Migratory birds and BCC are an important component of biodiversity in North America. Species included under these acts are diverse and widespread. Many species are known to occur in the Project area in a variety of habitats, particularly native prairie, grasslands, and wetlands. Additionally, the 1940 Bald and Golden Eagle Protection Act (16 USC 668-668C) specifically prohibits the taking or possession of and commerce in bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*), either alive or dead, or any part, nest, or egg of these eagles.

The Minnesota River Valley is recognized as a major flyway for migrating birds; more than 200 species of birds have been recorded in the valley (USFWS 2008). Birdlife International has designated much of the Minnesota River Valley as an IBA. The USFWS recognizes the value of the valley and is expanding the Minnesota Valley NWR to protect more of these resources. Bald eagles are frequent along the Minnesota River Valley.

### 6.5.4.1 Brookings County to Lyon County

This western portion of the Project area is an important region for grassland migratory birds. The combination of prairie pothole wetlands with grassland habitat is necessary for many species of birds

## Preferred Route: Brookings County - Hampton



protected under the MBTA. A high concentration of GBCAs are located in the western section of the Preferred Route. These areas indicate suitable habitat for these bird species. Seven land conservation easements are located within this route. Bossuyt, Pothole, Poposki, Vallers, and Hendricks WMAs are located within one mile of the Preferred Route centerline. Two USFWS easements are found within one mile of the Preferred Route centerline including a habitat easement and a tallgrass prairie easement. Portions of four Shallow Lakes are located within the one-mile area. See Section 6.5.3.1 for habitat and conservation lands within the ROW. Grassland migratory birds are likely to occur in high numbers in this portion of the Project area. No other habitat or conservation lands are found within one mile of the route centerline. Other wildlife within this section of the Preferred Route would be typical for agricultural habitats.

### 6.5.4.2 Lyon County to Minnesota Valley

Lines, Sham Lake, and Green Valley WMAs are located within one mile of the route centerline in this section. In the Minnesota River Valley, the route crosses 2.25 miles of Upper Minnesota River Valley IBA. There are seven USFWS easements, two moderate and one high MCBS area of biodiversity significance, two areas of protected prairie, and the Blue Devil SNA within one mile of the route centerline. A concentration of GBCAs occurs in the river valley. A portion of one Shallow Lake is located within one mile of the route centerline, and this route includes four land conservation easements. See Section 6.5.3.2 for habitat and conservation lands within the ROW. A colonial bird nesting site for great blue heron is documented near Green Valley WMA approximately 2.5 miles northwest of the Lyon County Substation. Due to the number of protected habitats in this area, wildlife and migratory birds are likely to occur in high numbers.

### 6.5.4.3 Lyon County to Cedar Mountain

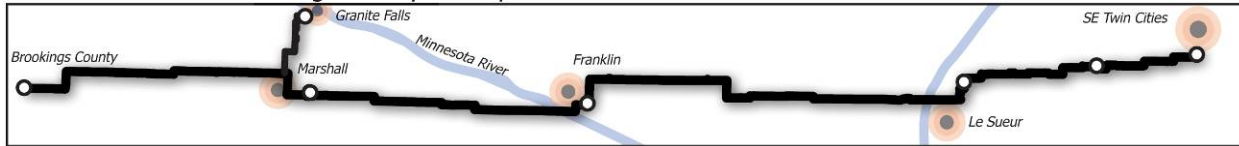
The Minnesota River and the river valley provide habitat for terrestrial, aquatic, and avian species. The large river habitat of the Minnesota River provides unique ecological conditions that support a diversity of wildlife such as gizzard shad (*Dorosoma cepedianum*), shortnosed gar (*Lepisosteus platostomus*), masked shrew (*Sorex cinereus*), spiny softshell (*Apalone spinifera*), and prothonotary warbler (*Protonotaria citrea*) (DNR AniMap 2008). The river bluffs and often undeveloped valley and riparian areas similarly provide important habitat for many species. Migrating birds are prominent among the wildlife in the river valley. The centerline at the Brown County crossing passes through 2.2 miles of the Upper Minnesota River Valley IBA. This route includes 33 land conservation easements. Because there are no existing transmission line structures across the river here, a new transmission line crossing could increase the likelihood of avian collisions.

Outside of the Minnesota River Valley, Rholik's Slough, Daub's Lake, and Luescher-Barnum WMAs are within one mile of the route centerline. Portions of seven Shallow Lakes are located within one mile of the route centerline. These provide habitat for many species of waterfowl, amphibians, and other wetland-dependent wildlife. See Section 6.5.3.3 for habitat and conservation lands within the ROW.

### 6.5.4.4 Cedar Mountain to Helena

Outside of the Minnesota River Valley, habitat and conservation lands are uncommon. This route includes 14 land conservation easements. Due to the developed nature of the Le Sueur Treatment Pond crossing north of Le Sueur, few areas of native habitat occur at this crossing. This portion of

## Preferred Route: Brookings County - Hampton



the river is not an IBA. Bald eagle nests and activity have been recorded in the area. Because there are no existing transmission line structures across the river here, a new transmission line crossing could increase the likelihood of avian collisions. Three MCBS areas of moderate significance are found in or near the river valley within the route. Within one mile of the route centerline, a colonial bird nesting site for great blue heron is documented near the Le Sueur wastewater treatment ponds.

Outside of the Minnesota River Valley, the Grundmeyer, Sigler, St. Thomas Lake, Sheas Lake, and Windot WMAs are located within one mile of the route centerline. The Redhead WPA and portions of five Shallow Lakes are also located within one mile of the route centerline. See Section 6.5.3.4 for habitat and conservation lands within the ROW.

### 6.5.4.5 Helena to Lake Marion

This section of the Project begins in the southwestern extent of the Twin Cities urban development. Habitat fragmentation is frequent. High concentrations of GBCAs occur across this section. No land conservation easements are found within this route section. Wildlife typical for rural and suburban land uses becomes common here, such as raccoons and Canada geese. Invasive plant species are also common as development causes soil disturbance, promoting establishment of such species as reed canary grass (*Phalaris arundinacea*) and buckthorn (*Rhamnus cathartica*). Portions of six Shallow Lakes are located within the one-mile area. Within one mile of the route centerline, a colonial bird nesting site for red-necked grebe is documented near Metogga Lake. Marsh, Michel Marsh, Bradshaw Lake, and Spartina WMAs are also within one mile of the route centerline. See Section 6.5.3.5 for habitat and conservation lands within the ROW.

### 6.5.4.6 Lake Marion to Hampton

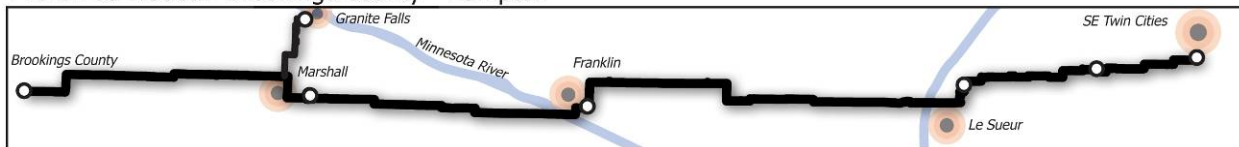
This section of the Preferred Route travels across the transition area between suburban development and rural land uses. One MCBS area of outstanding significance includes a large tract of sugar maple-red oak mesic forest within the route but outside the ROW. Species likely to occur in this habitat include white tail deer, skunks opossums, mice, shrews, turkeys, vireos, warblers, garter snakes, and gray tree frogs (DNR AniMap 2008). One Shallow Lake is located within one mile of the route centerline. An unnamed tributary to the Vermillion River is a designated trout stream that crosses the ROW. See Section 6.5.3.2 for habitat and conservation lands within the ROW. No WMAs or land conservation easements are located within one mile of the route centerline.

### 6.5.4.7 Impacts and Mitigation

There is potential for the displacement of wildlife and loss of habitat from construction of the Project. Wildlife could be impacted in the short-term within the immediate area of construction. The distance that animals will be displaced will depend on the species. Additionally, these animals will be typical of those found in agricultural and urban settings and should not incur population level effects due to construction.

Temporary impacts to fauna would take place most intensively at the structure locations (requiring one acre per span of transmission line) where borings will take place and spoils will be stored. Staging areas and stringing areas will also temporarily impact fauna within the Project construction area. Grading could occur at the staging areas if they are not located in previously disturbed sites. Clearing for access roads will be limited as much as possible and will be at maximum 20 feet wide. In forested areas, clearing will be limited to only those trees necessary to permit the passage of

## Preferred Route: Brookings County - Hampton



equipment. This clearing would temporarily fragment habitat. Temporary access roads will be removed and the area restored to original condition.

Permanent impacts to wildlife could take place at substation locations where two to five acres of land for each substation would be changed from existing land uses, most likely agricultural, to the developed substation area. Construction will displace wildlife. Additional impacts to wildlife are not expected.

Raptors, waterfowl, and other bird species may be affected by the construction and placement of the transmission lines. Avian collisions are a possibility after the completion of the transmission line. Waterfowl typically are more susceptible to transmission line collision, especially if the transmission line is placed between agricultural fields that serve as feeding areas, and wetlands or open water, which serve as resting areas. In these areas, it is likely that waterfowl and other birds will be traveling between different habitats, potentially increasing the likelihood of avian conflicts with the transmission line. The Cedar Mountain to Helena and Helena to Lake Marion sections are both within one mile of colonial bird nesting sites. Because of the high density of birds in such nesting sites, disturbance to the site has the potential to impact individuals of the bird species. Species' population reproductive success is not likely to be impacted. Construction impacts to these areas will be minimized as much as possible in coordination with the DNR.

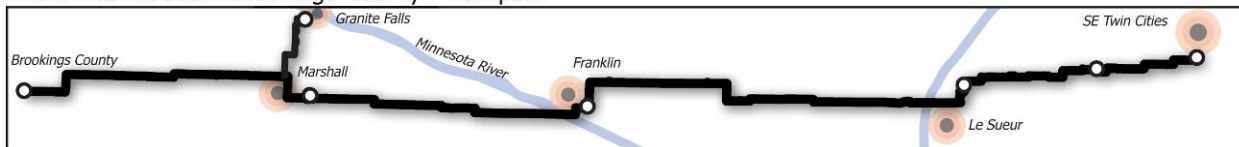
Migratory bird collisions are of particular concern in the Minnesota River Valley migratory corridor. High volumes and diversity of birds utilize this corridor. Both the USFWS and the DNR have expressed concerns over additional transmission crossings of the Minnesota River and impacts to migratory birds. Wildlife resources including bird impacts were analyzed at several river crossing options in the River Crossing Analysis (Appendix I). The selected crossings would have the fewest impacts of those analyzed for the Project. The Applicants will address avian issues at river crossings and other areas of concern by working with the DNR and USFWS to identify any areas that may require marking transmission line shield wires and/or to use alternate structures to reduce the likelihood of collisions.

Electrocution of large birds, such as raptors, is a concern typically related to distribution lines. Electrocution occurs when birds with large wingspans come in contact with either two conductors or a conductor and a grounding device. The Applicants' transmission line design standards provide adequate spacing to eliminate the risk of raptor electrocution. As such, electrocution is not a concern related to the Project.

Habitat fragmentation could be caused by the transmission line bisecting habitats. Because the proposed transmission line follows existing features such as roads, transmission lines, or field lines, very few new corridors will be created as a result of this Project. Areas of sensitive habitat will be spanned as much as possible. Impacts from habitat fragmentation can extend beyond the area disturbed by a new route. Fragmentation affects some wildlife species by creating barriers to daily migrations. Predation can increase among animals that are forced out of cover as they search for food, and decreases the distance that predators may have to travel to penetrate large habitat areas. Some species depend on large areas of undisturbed habitat and their survivability decreases as fragmentation increases.

To mitigate possible impacts to wildlife, the Applicants will span designated habitat or conservation areas wherever feasible. In areas where complete spanning is not possible, the Applicants will

## Preferred Route: Brookings County - Hampton



minimize the number of structures placed in high quality wildlife habitat and will work with the DNR and USFWS to determine appropriate mitigation. Additionally, where appropriate, the Applicants will use construction mats to avoid soil compaction. Areas disturbed due to construction activities will be restored to pre-construction contours and will be reseeded with a DNR-recommended seed mix that is free of noxious weeds.

Game species are not likely to be negatively affected by this Project. Because WMAs and native habitat and managed wildlife areas will be spanned wherever feasible, impacts to these species' habitat will be small. Similarly, because transmission line routing avoids direct impacts to lakes and rivers, impacts to fisheries will be small. Any impacts, temporary or permanent, are unlikely to affect population levels of these species.

### 6.6 RARE AND UNIQUE NATURAL RESOURCES

This section discusses the threatened and endangered species protected under Minnesota Statutes Section 84.895, and under Section 7 of the Endangered Species Act. Critical habitat and unique natural resources such as SNAs are also identified and discussed. The Minnesota DNR and USFWS have been involved in the pre-application coordination effort regarding these resources. Appendix I lists the State and federally listed species identified within one mile of the route centerline. These resources were identified using the DNR Natural Heritage Information System (“NHIS”).

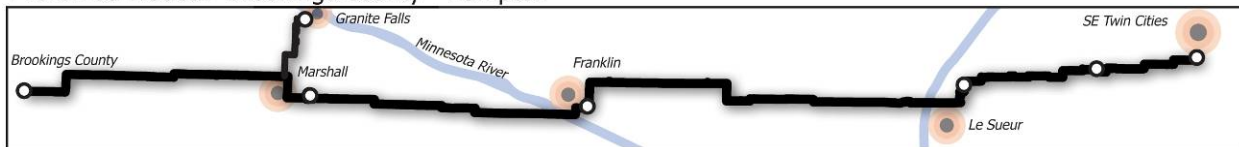
Threatened and endangered species are often found within high quality rare and unique habitats and features. Appendix I shows documented instances of these sensitive habitats and features. These resources were also identified using the DNR NHIS. Many of the threatened and endangered species identified in the Project area are associated with remnants of prairie land, which were once abundant in this area of Minnesota. River species of fish and mussels are encountered in major rivers, particularly the Minnesota River. Species associated with rock outcrops and with wetlands are also found in the Project area.

In addition to the rare and unique habitats listed in Appendix I, the DNR MCBS data document high quality native habitats. The MCBS data were reviewed to determine if there were areas with medium, high or outstanding biodiversity significance within the Project area. Areas with medium biodiversity significance are those containing significant occurrences of rare species and/or moderately disturbed native plant communities and landscape that have a strong potential for recovery. Areas with high biodiversity significance contain sites with very good quality occurrences of the rarest plant communities and/or important functional landscapes. Areas with outstanding biodiversity significance contain the best occurrence of the rarest species; the most outstanding example of the rarest native plant communities and/or the largest, most intact functional landscapes present in Minnesota.

The DNR has documented railroad prairies throughout the prairie regions of Minnesota. Railroad ROWs are often devoid of cultivation and other disturbance, resulting in native prairie remnants. WMAs, WPAs, NWRs, and USFWS easements often have native or restored habitats that could harbor threatened and endangered species. See Section 6.5.3 for a discussion of lands with native habitats that are managed for wildlife in the Preferred Route.

The following discussions focus on federal and State protected species and rare and unique communities within one mile of the Preferred Route centerline. While State non-status species are

## Preferred Route: Brookings County - Hampton



mentioned, they are outside the focus of this discussion. Species protected under State statute are those listed as special concern, threatened, and endangered.

### 6.6.1 BROOKINGS COUNTY TO LYON COUNTY

Loggerhead shrikes (State threatened) were identified in pastureland on private land within one mile of the Preferred Route centerline. Prairie voles (State species of concern) were identified in private pastureland, mesic prairie was identified in Vallery WMA, and wet-mesic prairie is located along the BNSF railroad. Non-status species within one mile of the route centerline include northern grasshopper mouse and Richardson's ground squirrel.

### 6.6.2 LYON COUNTY TO MINNESOTA VALLEY

There are two areas of mesic prairie along the BNSF railroad within one mile of the route southwest of Cottonwood. A mucket has been recorded in the Yellow Medicine River. Several rare and unique species and habitats are found in association with the Blue Devil SNA, MCBS areas of moderate and high significance, and USFWS easements in the Minnesota River Valley and bluffs. Rare and unique habitats include dry hill prairie, mesic prairie, bedrock outcrop, and geologic formations. Two areas of protected prairie are also located in within one mile of the route centerline.

Species within one mile of the route centerline include populations of five lined skink (State species of concern), clustered broom rape (State species of concern), a species of lichen (State endangered), and mucket. Non-status species include a great blue heron colonial nesting site west of Green Valley WMA, Western fox snake, little barley, and plains prickly pear.

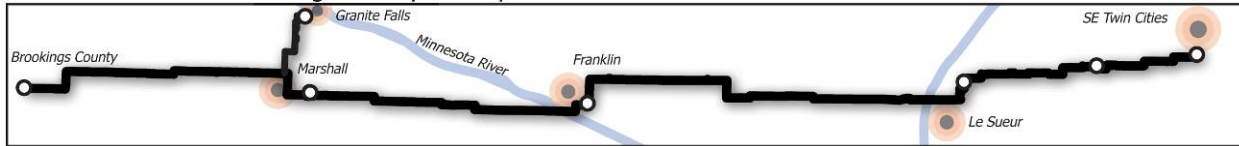
### 6.6.3 LYON COUNTY TO CEDAR MOUNTAIN

Within one mile of the route centerline, there is a dry sand-gravel prairie remnant within a MCBS area of moderate significance one half mile from the Minnesota River. Two species of mussel (mucket, State threatened; wartyback, State endangered) are documented in the Minnesota River. A regal fritillary butterfly (State species of concern) was documented in a railroad prairie and MCBS area of moderate significance east of Franklin. Four areas of mesic railroad prairie are located along the Minnesota Central Railroad corridor east of Franklin. Several MCBS areas of moderate significance are found near the Minnesota River, and low milk-vetch (State non-status) is known to occur within one mile of the route centerline.

### 6.6.4 CEDAR MOUNTAIN TO HELENA

There is an area of wet prairie located along the Minnesota Central Railroad corridor within one mile of the route centerline. Several native habitats are associated with the Rush River Valley and the Minnesota River Valley. Deciduous forest native habitats are documented along the Rush River Valley in MCBS areas of moderate and high significance. The Minnesota River Valley and eastern bluff also have MCBS areas of moderate significance and have been identified as native big woods habitats. American ginseng (State species of concern) has been identified in these habitats. Bald eagles (State species of concern) have been documented near the wastewater treatment ponds northwest of Le Sueur. Paddle fish (State threatened) and blue sucker (State species of concern) have been documented in the Minnesota River. Regal fritillary butterflies were found in association with prairie habitat. Non-status species within one mile of the route centerline include upland sand

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pipers, Kentucky coffee tree, Western fox snake, and a great blue heron nesting site involving several birds.

### 6.6.5 HELENA TO LAKE MARION

One old growth maple-basswood community is located north of Lonsdale within one mile of the Preferred Route centerline. Wet prairie and a native deciduous forest community are found in MCBS areas of moderate significance east of Lonsdale. An area of MCBS moderate significance harbors a deciduous forest native community within one mile to the south of the Lake Marion Substation. A red-necked grebe (no status) nesting site is documented within one mile of the route centerline west of Lonsdale. Blanding's turtle (State threatened) and an occurrence of cowbane (State non-status) are found within one mile of the Lake Marion Substation.

### 6.6.6 LAKE MARION TO HAMPTON

A Blanding's turtle and loggerhead shrike are found within one mile of this route section centerline. Two MCBS areas each contain wet shrub communities. A MCBS outstanding significance area is located about one mile northwest of Hampton. This old growth forest area contains American ginseng and big tick trefoil (State species of concern) and several big woods habitats such as maple-basswood and oak forest communities. A loggerhead shrike and a mesic prairie community are also found within one mile of the route centerline.

### 6.6.7 IMPACTS AND MITIGATION

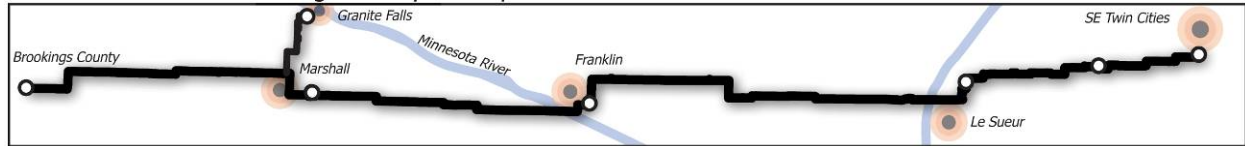
The search of the DNR's NHIS showed that no listed species are known to occur within the Project ROW. Within one mile of the route centerline, the NHIS identified a total of 49 individual records or species. There were no instances of federal-listed species and two instances of State endangered species (wartyback and a species of lichen). There are seven different State threatened species and 11 different species of special concern were documented within one mile of the Preferred Route centerline. Nine different State non-status species were also documented. There are a total of 33 DNR-listed natural communities within one mile of the route centerline. No critical habitat occurs within one mile of the Preferred Route centerline.

USFWS easements, MSCB areas of moderate, high, and outstanding biodiversity significance, and DNR-listed natural communities are areas known to be capable of supporting rare and unique species. The number of structures placed in these areas will be avoided or minimized by maximizing the span. Where structure placement cannot be avoided in these sensitive communities, special status species associated with these habitats could be affected.

The Applicants will span any habitats where native prairie remnants, other unique plant communities, and rock outcrops that have been recorded or are likely to occur, as possible. If construction within these resources cannot be avoided, surveys will be conducted and the appropriate agencies will be consulted to assure impacts to listed species are avoided or minimized.

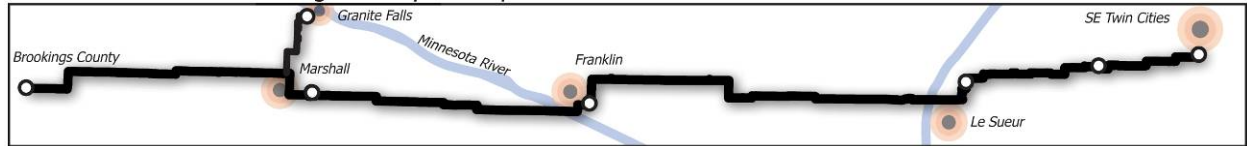
Several of the special status species are associated with wetlands, stream banks, and rivers and could be impacted by placement of structures within these habitats, or by increased erosion and sedimentation that could occur if Best Management Practices ("BMPs") are not employed. The Applicants will span rivers, streams, and wetlands throughout the Project area, whenever feasible,

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and will use appropriate BMPs. Wherever it is not feasible to span, a survey will be conducted to determine the presence of special status species or suitability of habitat for such species and coordination will occur with the appropriate agencies to avoid and minimize any impact. The Applicants will maintain sound water and soil conservation practices during construction of the Project to protect topsoil and adjacent water resources and minimize soil erosion and sedimentation.

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