

7.0 Hampton–North Rochester 345 kV Section

This chapter analyzes potential resource impacts associated with the Preferred and Alternative Routes between the Hampton Substation and the proposed North Rochester Substation (Hampton–North Rochester 345 kV section). The Preferred and Alternative Routes are described in detail in Chapter 6.2.1.

By resource category, this chapter identifies existing environmental resources in the Preferred and Alternative Routes, potential impacts to those resources that may occur due to the construction and operation of the transmission line, and mitigation measures that may be used to minimize potential impacts. A summary of potential impacts is located in Chapter 7.6. Measurement of potential impacts differs between resources. The occurrence of potential impacts is generally described in this chapter in four ways: along the route centerline, within the 150-foot ROW, within the 1,000-foot-wide route, or within 1 mile of the centerline. The methodology used to measure potential impacts is described for each resource in the sections below.

7.1 Description of Regional Environmental Setting

The proposed Hampton–North Rochester 345 kV section extends from the Hampton Substation in Dakota County to the North Rochester Substation in Goodhue County. The majority of the communities located in this section are small towns whose economies are based on agriculture. The dominant land cover crossed by the Preferred and Alternative Routes is cropland and grassland. Figure 7.1-1 shows major communities and jurisdiction in the Hampton–North Rochester 345 kV section.

The Preferred Route is in Dakota and Goodhue counties, and crosses the Cannon River adjacent to US-52 near Cannon Falls. The Alternative Route is in Dakota, Goodhue, and Rice counties, and crosses the Cannon River approximately 1.6 miles southwest of Randolph.

The Preferred and Alternative Routes lie within the Eastern Broadleaf Forest (EBF) province according to the MDNR Ecological Classification System (MDNR 2000a). The EBF province covers much of the southeastern corner of Minnesota and east into southwestern Wisconsin (Figure 7.1-2). The EBF is a transition area between semiarid portions of the state that were historically prairie, and semi-humid mixed conifer-deciduous forests to the northeast (MDNR 2009b). Precipitation in the southeastern portion of the province is approximately 35 inches annually. The Preferred and Alternative Routes lie within the Oak Savanna, Rochester Plateau, and Blufflands subsections of the EBF.

The Oak Savanna subsection is distinguished by rolling plains over till and bedrock with oak openings rather than forested areas due to frequent grass fires on the adjacent southern prairies. Pre-settlement vegetation within the Oak Savanna consisted of bur oak savanna as the primary vegetation with areas of tallgrass prairie and maple-basswood forest. Presently, the majority of the Oak Savanna is farmed with increasing urban development in the subsection's northern area (MDNR 2009).

The Rochester Plateau subsection consists of level to gently rolling older till plains. Topography is controlled by underlying glacial till along the western edges and sinkholes, representative of karst

topography, and common in the southwestern portion. The pre-settlement vegetation in the Rochester Plateau subsection consisted of tallgrass prairie and bur oak savanna (MDNR 2009c). Vegetation and land use consist of agricultural cropland.

The Blufflands subsection consists of a loess-capped plateau deeply dissected by river valleys. Topography is controlled by underlying glacial till along the western edge of the Blufflands subsection where loess is several feet thick and sinkholes are common in the southwestern portion (MDNR 2009d). Pre-settlement vegetation within the Blufflands consisted of tallgrass prairie and bur oak savanna with red oak-white oak-shagbark hickory-basswood forests present on moist slopes, and red oak-basswood black walnut forests in protected valleys (MDNR 2009d). Approximately 30 percent of the Blufflands subsection is used as cropland, 20 percent is in pasture, and 50 percent is in woodland (MDNR 2009d).

7.2 Human Settlement

7.2.1 Land Cover and Land Use

Land use compatibility was a factor considered in the development of the routes. Land cover data and zoning maps were obtained for the counties, municipalities, and townships traversed by the transmission line routes. Land cover was identified through a comprehensive analysis of the Minnesota Gap Analysis Program (MNGAP) data and as an indicator of land use. Where available, comprehensive land use plans and zoning ordinances for counties, municipalities, and townships were studied to evaluate existing conditions and consider potential impacts related to comprehensive planning and future development in the Project area.

The types of land cover identified within the Project area included cropland, grassland, shrubland, forest, aquatic, marshland, and urban designations. Potential impacts that may occur to land cover from the Project were quantified for the Preferred and Alternative Routes in this chapter.

7.2.1.1 Existing Environment

Table 7.2-1 shows the acreage and percent of land cover for the various land cover types where the Preferred and Alternative Routes are proposed. Land cover along the Preferred and Alternative Routes is shown on Figure 7.2-1.

The Preferred Route is in Dakota and Goodhue counties, and the Alternative Route is in Dakota, Goodhue, and Rice counties. The Preferred Route primarily follows existing roads, specifically US-52 making use of an existing linear corridor. In contrast, the Alternative Route primarily follows property lines and the Goodhue/Rice County line minimizing impacts to agriculture. The majority of the land cover type for both the Preferred and Alternative Routes is cropland, covering 61 percent and 86 percent, respectively. Farmland crossed by the routes is mostly used for row crops such as corn or soybeans. The routes also cross land used for open pasture/hay production, and livestock. The Preferred Route crosses more grassland and urban land cover than the Alternative Route, and both routes cross similar amounts of aquatic and forest land cover.

Table 7.2-1:
Preferred and Alternative Routes: Land Cover Summary. Percentages are rounded to the nearest whole number.

| Land Cover Type | Preferred Route | Alternative Route |
|--------------------------------|------------------|-------------------|
| | Percent of Route | Percent of Route |
| Cropland | 57 | 86 |
| Grassland | 24 | 12 |
| Shrubland (total) | 1 | <1 |
| Lowland Shrub | <1 | <1 |
| Upland Shrub | <1 | 0 |
| Forest (total) | 4 | 1 |
| Bur/White Oak | 1 | <1 |
| Cottonwood | 0 | 0 |
| Maple/Basswood | 1 | <1 |
| All Others | 42 | 1 |
| Aquatic (total) | 1 | <1 |
| Open water | <1 | <1 |
| Marshland | 1 | <1 |
| Urban (total) | 13 | <1 |
| High Intensity Urban | 3 | 0 |
| Low Intensity Urban | 2 | 0 |
| Transportation (paved surface) | 8 | <1 |
| Total | 100 (+/-1%) | 100 (+/-1%) |

Source: Minnesota Gap Data (2002).

Rural residential development along the Preferred Route is not as dispersed as along the Alternative Route. Residential density along the Preferred Route is 0.8 home per mile, vs. 0.25 home per mile along the Alternative Route. Commercial and industrial land use along both routes is typically concentrated around the more developed areas of the counties, although some isolated industrial development occurs outside of developed areas, particularly along the Preferred Route where it is aligned with US-52. The Preferred Route is not anticipated to affect the use or operation of any industrial or commercial establishment. There were no commercial or industrial land use designations or zoning identified where the Alternative Route is located (Goodhue 2008; Rice 2007). There are no public lands located along the Preferred or Alternative Routes. Land use plans and zoning district maps for select counties, municipalities, and townships in the Project area are provided in Appendix N.

County- and township-specific descriptions of zoning and current land use for both the Preferred and Alternative Routes are provided below.

Preferred Route

Dakota County

The Dakota County Comprehensive Plan identifies goals of protecting the cultural, economic, built environments, and natural environments of Dakota County's communities and the metropolitan region (Dakota 1999).

Land use in southern Dakota County is a mixture of open agricultural lands and single-family rural residential properties. Commercial and industrial developments are concentrated within Cannon Falls and Zumbrota. There are no identified commercial or industrial land uses adjacent to the Preferred Route in Dakota County.

Zoning authority and land use governance in Dakota County is controlled exclusively by the cities and townships of the county. The Preferred Route through Dakota County is in Vermillion, Randolph, and Hampton townships, and the Alternative Route is in Hampton, Randolph, Vermillion, and Sciota townships. Land use and zoning information by township for Dakota County is provided below.

Vermillion and Randolph Townships

The predominant land use within Vermillion and Randolph townships is agricultural with some intermittent rural residential development. Zoning districts in Vermillion Township are defined as agricultural, commercial, and rural residential. At the time of this Application, no specific zoning information for Randolph Township was available.

Hampton Township

The predominant land use within Hampton Township is agricultural with some clustered rural residential development. All of Hampton Township is zoned agricultural with one residence per 40 acres permitted (Hampton 2009).

Sciota Township

The predominant land use within Sciota Township is agricultural land with some intermittent rural residential development. Three zoning districts have been established in Sciota Township;

- *Cluster Housing district*, established to “allow single-family detached dwellings to be clustered together in a manner that would preserve land for continued agricultural use”;

- *Rural Residential district*, established to “allow single-family detached dwellings of medium density development and on-lot utilities in areas where agricultural/residential mix land use patterns exist”; and
- *Agricultural district*, established to for the “purpose of protecting viable agricultural lands from non-farm influence; retaining valuable areas for conservation purposes; preventing scattered non-farm growth (Sciota 2001).

Goodhue County

Goodhue County identifies the following goals in its comprehensive plan: preservation of the county’s natural beauty, preservation of agricultural lands, and the importance of keeping development around the cities (Goodhue 2004).

Land use along the Preferred and Alternative Routes in Goodhue County is mostly a mixture of agricultural land, rural farmsteads and residences, and rural residential development. The Preferred Route through Goodhue County parallels US-52 for the majority of the route. Commercial and industrial developments are concentrated within and around the cities of Cannon Falls and Zumbrota.

The Preferred and Alternative Routes through Goodhue County are in the following county-designated zoning districts;

- *Agricultural Protection District (A1)*, established “to maintain, conserve and enhance agricultural lands which are historically valuable for crop production, pasture land, and natural habitat for plant and animal life. This district is intended to encourage long-term agricultural use and preserve prime agricultural farmland by restricting the location and density of non-farm dwellings and other non-farm uses”;
- *Agricultural District (A2)*, established “to maintain and conserve agricultural investments and prime agricultural farmland, but provide for a slightly higher density of dwellings than the A-1 district. ... (It) is intended to apply to those areas where large farms and feedlots are more scattered and greater numbers of non-farm uses or small parcels are present.” The A-2 district has varying topography and less prime farmland than the A-1 District; and
- *Urban Fringe District (A3)*, established “to provide for urban expansion in close proximity to existing incorporated urban centers within Goodhue County” (Goodhue 2008).

Each city governs its own zoning within municipal boundaries, and the county is responsible for the zoning and land use on property that is not incorporated. The Preferred Route is in the townships of Cannon Falls, Stanton, Leon, Minneola, Pine Island, Roscoe, and Wanamingo. The Preferred Route also is within the western boundary of Cannon Falls. The Alternative Route is in Stanton, Warsaw, Holden, Wanamingo, Minneola, Roscoe, and Pine Island townships. Below is a brief discussion regarding zoning designations in these townships.

Cannon Falls Township

The Preferred Route passes through the western edge of the Cannon Falls Township. The land area crossed by the Preferred Route consists of Agricultural district, Urban Fringe district, and Highway Business (B2) district. The Highway Business district is intended for major retail, service, and repair establishments serving a large trade area based on the county zoning ordinance. The Highway Business district is predominantly located along US-52. There are several housing developments located along US-52 and in the vicinity of Cannon Falls.

City of Cannon Falls

The predominant land use for the Preferred Route, within the municipal boundaries of Cannon Falls, is low-density residential and highway commercial. Other smaller public park and open space, public, and urban reserve zoning districts also exist within the Preferred Route.

Stanton Township

The Preferred Route through Stanton Township is in the Urban Fringe District, and the Alternative Route through Stanton Township is in the Agricultural Protection and Agricultural Districts (Goodhue 2009).

Leon Township

The Preferred Route is in the center of Leon Township. The land area crossed by the Preferred Route consists of the Agricultural Protection District and Agricultural District, described above.

Minneola, Wanamingo, Pine Island and Roscoe Townships

The Preferred and Alternative Routes through Minneola, Wanamingo, Pine Island and Roscoe townships are located in the Agricultural Protection District.

Holden Township

The Alternative Route through Holden Township is located in the Agricultural Protection District.

Rice County

Rice County identifies an extensive list of goals in its comprehensive plan to ensure that the quality of life for current and future residents of the county is preserved and protected. Goals were developed based on the following fundamentals and factors: citizen participation, cooperation, economic development, conservation, livable community design, housing and population projections, transportation, land-use planning, public investments, public education, sustainable development, and the ability to implement the goals (Rice 2002).

The Alternative Route crosses approximately 0.5 mile of unincorporated land in Rice County. The Preferred Route is not located in Rice County. Planning and zoning for individual townships in Rice County is under the jurisdiction of the Rice County Planning and Zoning Office.

The Alternative Route is located in Northfield Township in Rice County, which is zoned agricultural with very few rural residences and farmsteads scattered to the west of the transmission line route. The Alternative Route does not cross through any municipalities in Rice County, but the closest areas of commercial and industrial developments are concentrated within and around the cities of Northfield, approximately 5.9 miles west of the Alternative Route, and Nerstrand, approximately 1.7 miles west of the Alternative Route.

7.2.1.2 Impacts and Mitigation

Land use in and adjacent to the Preferred and Alternative Routes is not expected to be impacted as a result of construction and operation of the Project. Agriculture is the principal land use within the Preferred and Alternative Routes, and the majority of land within or adjacent to the ROW could still be used for agricultural following construction. Impacts to agricultural land are expected to be minor and mitigation strategies are discussed in detail in Chapter 7.3.1.

Current land use plans, zoning ordinances, and public policies of the counties and cities indicate that agriculture is the predominant land use along the Preferred and Alternative Routes. Permanent impacts to land cover or land use are primarily the result of structure placement. To the greatest extent possible, placing structures in farm fields would be avoided, to minimize interruption of agricultural operations. Pole placement in heavily forested areas also would be avoided where possible, to minimize clearing of vegetation. Where the routes do not follow existing roadways, field lines and/or parcel and property lines are used to minimize impacts to agricultural land and minimize the need to create new access roads for maintenance. Each land cover type crossed by the transmission line along either Preferred or Alternative Route would be temporarily impacted by construction and, potentially, for maintenance.

The Applicant will continue to maintain open communication with all counties, cities, townships, and landowners throughout the course of the permitting process to ensure that community values set forth in land use and zoning plans are considered. Direct impacts to the Project area's community values would be minimized to the greatest extent feasible.

7.2.2 Displacements

NESC and the Applicant's standards require certain clearances between the transmission line structures and buildings for safe operation of the transmission line. The Applicant would acquire a ROW for the proposed transmission line sufficient to maintain these clearances. Displacements could occur when an existing structure is located within the 150-foot ROW for a new transmission line. The ROW requirement for a 345 kV transmission line is 150 feet, or 75 feet on either side of the route centerline. A displacement is defined by the Applicant as any occupied structure located within 75 feet of the route centerline proposed in this Application.

No occupied structures are located within the identified 150-foot ROW of the proposed routes.

Residences and businesses located within the routes were identified through analysis of aerial photography, field observation, and comments received from the public. Residences or businesses, referred to as occupied structures, and other unoccupied structures (e.g., barns, sheds, outbuildings, etc.) located within 75 feet of the route centerlines were first identified using high-resolution aerial photography and GIS data. Residences and businesses were then verified in the field. During public meetings, the locations of these structures were further verified and recorded.

There may also be instances where landowners elect to require the Applicant to purchase their property rather than an easement for the facilities. This option is authorized under Minn. Stat. § 216E.12, subd. 4 (sometimes referred to as “Buy the Farm”) for parcels along the 345 kV transmission line route. 345 kV. This statute gives the owners of certain types of property the option of having the Applicant purchase the property that the transmission line would cross for the fair market value of the land. Generally, the statute applies to residential, recreational, and agricultural property. Eligibility of a parcel under the statute depends on its classification under Minn. Stat. § 273.13. Only those parcels falling within the enumerated classifications are covered; unlisted classifications are excluded. The statute applies 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 whether any landowners would exercise this option.

7.2.2.1 Existing Environment

Table 7.2-2 lists the estimated number of residences or businesses located within 300 feet of the Preferred and Alternative Route alignments. There are no other structures, such as barns, sheds or outbuildings located within the Preferred or Alternative Route 150-foot ROW. There are 11 more residences located within 300 feet of the Preferred Route alignment compared with the Alternative Route alignment. Where routes follow roads, the alignment generally follows close to the road ROW. Route alignments that follow property boundaries tend to have jogs and angles to avoid nearby houses. In an effort to meet Minnesota’s non-proliferation requirements, many routes follow roads. Residences are primarily located along roads; therefore, more residents are likely to be impacted with these routes.

Table 7.2-2:
Residences in Proximity to Preferred and Alternative Route Alignment

| Proximity (Feet) | Number of Residences in Proximity | |
|---------------------------------|-----------------------------------|-------------------|
| | Preferred Route | Alternative Route |
| 0–75 (within ROW ¹) | 0 | 0 |
| 75–150 | 8 | 2 |
| 150–300 | 21 | 10 |
| Density (homes/linear mile) | 0.8 | 0.25 |

Table 7.2-2:
Residences in Proximity to Preferred and Alternative Route Alignment

| Proximity (Feet) | Number of Residences in Proximity | |
|------------------|-----------------------------------|-------------------|
| | Preferred Route | Alternative Route |

¹ The ROW required is 150 feet, or 75 feet on either side of the centerline.

7.2.2.2 Impacts and Mitigation

No displacements are anticipated along the Preferred or Alternative Routes.

Because no displacements have been identified to date during the transmission line routing, no mitigation measures are currently proposed. If potential displacements were to occur due to realignment of the Preferred or Alternative Route, Project land representatives would continue to work with individual landowners to avoid potential displacements wherever possible.

7.2.3 Noise

Transmission lines produce noise under certain conditions. The level of noise depends on conductor geometry, voltage level, and weather conditions. Generally, noise levels caused by transmission lines are minimal and do not exceed the Minnesota Pollution Control Agency (MPCA) noise limits outside of the ROW.

In foggy, damp, or rainy weather, transmission lines can create a crackling sound because a small amount of electricity ionizes 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. During light rain, dense fog, snow, or other times when there is moisture in the air, transmission lines may produce audible noise approximately equal to household background levels.

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. A noise level change of 3 dBA is barely perceptible to average human hearing. A change of 5 dBA in noise level, however, is clearly noticeable. A change of 10 dBA in noise levels is perceived as a doubling or halving of noise loudness, while a change of 20 dBA is considered a dramatic change in loudness.

An increase in noise levels occurs on a logarithmic scale. As depicted in Figure 7.2-2, if a 50 dBA noise source is doubled, there is an increase of 3 dBA in noise, which is barely discernible to the human ear.

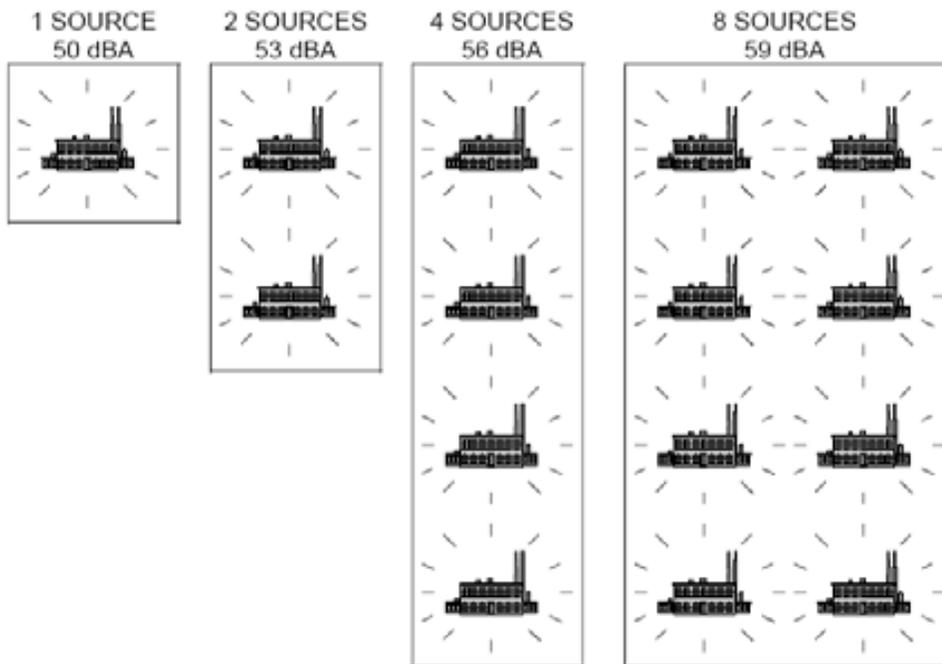


Figure 7.2-2: Addition and Subtraction of Decibel Levels (MPCA 2008)

For cumulative increases resulting from sources of different magnitudes, the rule of thumb is that if there is a difference greater than 10 dBA between noise sources, there would be no additive effect. Only the louder source would be heard and the quieter source would 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 would not increase the existing background noise levels in the Project area. Table 7.2-3 lists the noise levels associated with common everyday sources.

7.2.3.1 Existing Environment

Existing sources of noise along the routes include traffic along US-52, MN-60, and other local roads, farm equipment, wind, and insects. Average street traffic produces noise levels as high as 70 dBA; a tractor or power lawn mower produces noise levels that are approximately 65 to 95 dBA; and refrigerators, washing machines, and air conditioners produce noise levels that are approximately 50 to 75 dBA (Center for Hearing and Communication 2009). The transmission line could produce noise levels that are approximately 50.1 to 46.6 dBA for a double-circuit 345 kV with both circuits in service and one circuit operating at 161 kV, and noise levels that are approximately 45.8 to 54.1 dBA when only one 345 kV

circuit is in service. When compared to everyday noise sources, it is unlikely that the transmission line would create noise that can be heard above and beyond those sources that already exist.

Table 7.2-3:
Noise Levels Associated With Everyday Sources

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

Source: MPCA (1999).

7.2.3.2 Impacts and Mitigation

The primary noise-sensitive receptors in the Project area are rural residences. The 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 using a Noise Area Classification (NAC) as described in Minn. R. 7030.0050. Each NAC is then assigned both daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) limits for land use activities within the NAC as described in Minn. R. 7030.0040. Table 7.2-4 shows the MPCA daytime and nighttime limits in A-weighted dBA for each NAC. The limits are expressed as a range of permissible dBA within a one-hour; L₅₀ is the level that may be exceeded 50 percent (30 minutes) of the time within an hour, while L₁₀ is the level 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 7.2-4:
MPCA Noise Limits by Noise Area Classification (dBA)

| Noise Area Classification | Daytime | | Nighttime | |
|---------------------------|-----------------|-----------------|-----------------|-----------------|
| | L ₅₀ | L ₁₀ | L ₅₀ | L ₁₀ |
| 1 Residential | 60 | 65 | 50 | 55 |
| 2 Commercial | 65 | 70 | 65 | 70 |
| 3 Industrial | 75 | 80 | 75 | 80 |

Source: MPCA 2008.

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

Table 7.2-5 presents the L₅ and L₅₀ noise levels predicted for proposed transmission line structures and voltages for the Project. The L₅ noise level presented in Table 7.2-5 represents the noise level calculated to occur 5 percent (3 minutes) of the time within an hour and do not exceed the MPCA L₁₀ limits outside of the ROW for the NACs, which would allow the specified levels to occur for up to 6 minutes. No mitigation would be required for the audible noise generated by the proposed transmission lines.

Table 7.2-5:
Calculated Audible Noise for Proposed Single Circuit/Double Circuit/Underbuild Transmission Line Designs

| Structure Type | Noise L ₅ (Edge of ROW) (dBA) ¹ | Noise L ₅₀ (Edge of ROW) (dBA) ¹ |
|--|---|--|
| Single Pole, Davit Arm, 345/345 kV Double-Circuit with one Circuit In Service | 54.1 | 45.8 |
| Single Pole, Davit Arm, 345/345 kV Double-Circuit with one Circuit operating at 161 kV | 50.1 | 46.6 |
| Single Pole, Davit Arm, 161 kV Single-Circuit | 14.2 | 10.7 |
| Single Pole, Davit Arm, 345/345 kV Double-Circuit with 69 kV Underbuild | 53.7 | 45.6 |

¹ Measurement is 3.28 feet aboveground.

7.2.4 Aesthetics

The discussion of visual quality and aesthetics is based on a qualitative review of the natural and manmade features of the existing environment within and adjacent to the Project area. Visual resources within the Project area were identified through coordination with federal, state, and local agency officials,

by comments received from the public at open houses or route working groups, and through review of high-resolution aerial photographs as well as field observation.

Determining the relative scenic value or visual importance of an area is a complex concept involving both the philosophical and/or psychological response regarding what may be visually perceived by an individual. Generally, landscapes that exhibit a high degree of variety and harmony among the basic elements of form, line, color, and texture have the greatest potential for high scenic quality, and may be considered important to viewers living in or traveling through the region. These landscapes also have the greatest capability to absorb new elements into the landscape when compared to landscapes with less variety. Viewer sensitivity is based on an individual's concern for scenic quality and visibility of a particular viewshed. Sensitivity relates to the magnitude of the public's concern for changes in scenic quality, while visibility is a function of the type, distance, perspective, and duration of the affected view.

7.2.4.1 Existing Environment

The existing landscape character of the Project area in the Hampton–North Rochester 345 kV section is composed of three types: (1) towns and suburban developed areas, (2) farmsteads and agricultural lands, and (3) forests and riparian areas. All three types are crossed or located adjacent to the Preferred and Alternative Routes as described in Chapter 7.2.1. Aesthetically, the major difference between the Preferred and Alternative Routes is the extent to which they follow existing transmission lines. The Preferred Route parallels an existing 69 kV transmission line located on the west side of US-52 for approximately 15.6 miles between Cannon Falls and Zumbrota. In contrast, the Alternative Route does not follow any existing transmission lines.

7.2.4.2 Impacts and Mitigation

Where visible, a transmission line in both the Preferred and Alternative Routes would change the existing viewshed in the three types of landscapes (towns, farmsteads and agricultural lands, and forests and riparian areas). Visual impacts would result from new transmission line structures and conductors, and the new or expanded ROW through forested areas. The height of the structures would range from 130 to 175 feet, and create additional lines and forms within the viewshed. The extent to which these additional lines and forms affect scenic quality depends upon whether the new transmission line follows an existing linear corridor, such as transmission lines, roadways, and railroads; the degree to which it is shielded from view by terrain and vegetation; and the types of other visual elements (such as mining operations, communications towers, industrial areas, farmsteads and forests) that already exist in the landscape.

Overall, the Preferred Route is likely to have reduced impact on aesthetics because it follows an existing high-voltage transmission line for approximately 18 miles and is a shorter route compared to the Alternative Route. The Applicant proposes to reduce aesthetic impacts along the Preferred Route by consolidating the existing 69 kV transmission line and the proposed 345 kV transmission line for 15.5 miles between Cannon Falls and north of Zumbrota.

The following identifies potential visual impacts in the landscape types that would occur at specific locations, including identified areas of high viewer sensitivity, within 1 mile of the Preferred and Alternative Routes. Potential mitigation measures for reducing visual impacts also are provided.

Preferred Route

Constructing the transmission line in the Preferred Route would likely be visible from multiple vantage points near Hampton and Cannon Falls depending upon degree of screening from vegetation, terrain, and surrounding buildings. It would likely be visible to a higher number of viewers than the Alternative Route because of its location along US-52 and the proximity of the Preferred Route to Cannon Falls.

Due to vegetative screening, the Preferred Route is not expected to impact the Cannon Falls Commercial Historic District viewshed. The viewshed from the Cannon Golf Club course towards US-52 would be impacted because the Preferred Route is located along the same (west) side of US-52 with limited vegetative screening between the golf course and the highway.

Rows of crops, fence lines, and local roads create linear patterns across the rolling terrain similar to linear patterns formed by transmission lines. Most of the Preferred Route in agricultural land follows US-52 or an existing 69 kV transmission line, and other vertically oriented linear features such as communication towers and distribution lines that exist in this landscape. Where the Preferred Route is not located parallel to existing linear corridors, aesthetic impacts would be more pronounced.

Aesthetic impacts could occur where the Preferred Route crosses forested and riparian areas. These areas would be impacted where tree removal within the 150-foot ROW creates new or expanded openings, increasing the visibility of the transmission line. The 345 kV transmission line generally would be visible 50 to 95 feet above tree canopies, which is estimated to be an average of 80 feet high.

The Preferred Route ROW may require the removal of trees at the Cannon River where it is designated as a Recreational River. Visual impact to recreationists on the Recreational River segment would depend upon final structure proximity to the river banks and the degree of vegetative screening from the viewer's standpoint. Based on a field review conducted in April 2009, it is not anticipated that the designated Scenic River segment of the Cannon River would be negatively impacted with the Preferred Route.

Alternative Route

The transmission line would likely be visible from multiple vantage points in or near the communities of Randolph, Stanton, Dennison, Wanamingo, and Zumbrota, depending upon degree of screening from vegetation, terrain, and the surrounding buildings. A transmission line along the Alternative Route would likely be visible to a lower population of viewers than the Preferred Route, due to its location in a primarily rural area with small communities. Because the Alternative Route does not follow existing transmission lines, impacts to aesthetic values along the Alternative Route would be more pronounced than impacts associated with the Preferred Route along US-52.

Agricultural lands within the Alternative Route have similar visual characteristics, including linear patterns on the landscape and vertically oriented visual elements, compared to the agricultural lands within the Preferred Route. Aesthetic values crossing forested and riparian areas and windbreaks would be impacted by the Alternative Route similar to the Preferred Route. The Alternative Route crosses less forested areas than the Preferred Route, and therefore likely will require less tree clearing. Tree clearing would be required where the Alternative Route crosses the Cannon River southwest of Randolph, where the river is designated as a Recreational River. Visual impacts to recreationists on the Recreational River segment would depend upon final structure proximity to the river banks, but would likely be limited due to vegetative screening on both sides of the river and the variation in the direction of the river channel.

The Alternative Route borders Lake Byllesby Regional Park's western parcel boundary, and would likely be visible from some locations inside the park where not obscured by trees and/or terrain. Trees would not be removed in the Woodbury or Warsaw WMAs, but the transmission line may be visible to recreationists visiting the WMAs. Scenic impacts are more likely at the Woodbury WMA, where there is limited vegetative screening between the WMA boundary and the Alternative Route. In comparison, forested areas between the Warsaw WMA and the Alternative Route may reduce visual impacts from that area.

The Nansen Agricultural Historic District and Veblen Farmstead were identified by the public as historic resources with aesthetic values in proximity to the Alternative Route. The western boundary of the Nansen Agricultural Historic District is approximately 2.5 miles east of the Alternative Route. Because of distance, terrain, and vegetation, the transmission line would likely not be visible from inside the Nansen Agricultural Historic District. At less than 1 mile west of the Alternative Route, the transmission line would likely be visible from the Veblen Farmstead due to little vegetative screening. The views east and northeast of the Veblen Farmstead, however, are already impacted by two communication towers less than 1 mile away.

Mitigation Measures

Where the Preferred Route parallels existing transmission lines, impacts to aesthetic resources would be reduced because visual impacts already exist in the landscape, and new impacts to previously undisturbed areas are avoided. . The Applicant will continue to work with landowners and public agencies to identify concerns related to the transmission line and aesthetics. General mitigation strategies in addition to those mentioned above may be utilized to enhance positive effects as well as minimize or eliminate negative effects. Additional potential mitigation measures would be site-specific depending on the landscape type and existing visual character and may include the following:

- Where feasible, the location of structures, ROWs, and other disturbed areas would be evaluated considering input from landowners or land management agencies to minimize aesthetic impacts.

- Structure types (designs) would be uniform to the extent practical. The height or type of structure may be altered, as feasible, to minimize impacts within areas of high scenic importance.
- The design and color of the single-pole, self-weathering steel structures for use in the Preferred and Alternative Routes would reduce color and texture contrasts except during periods of snow, compared to galvanized steel structures.
- Structures would be placed at the maximum feasible distance from scenic highways, waterways, and trail crossings, and from areas of high viewer sensitivity, within the limits of structure design.
- Where feasible, the Applicant would double-circuit existing transmission lines using a single set of new structures.
- Care would be used to preserve the natural landscape; construction and operation would be conducted to prevent any unnecessary destruction, scarring or defacing of the natural surroundings.
- To the greatest extent practical, waterways would be crossed in the same location as existing disturbances, utility line, or transportation routes.
- The proposed transmission line would parallel existing ROWs to the extent practicable to minimize visual impacts to farmlands or open spaces.

7.2.5 Social and Economic Resources

Socioeconomic resources were assessed to identify potential effects to socioeconomic resources within the study area from construction and operation of the Project. The socioeconomic study area is defined as Dakota and Goodhue counties for the Preferred Route; and Dakota, Goodhue and Rice counties for the Alternative Route. The socioeconomic study area for each section of the Project is geographically defined as the counties in which the Project would occur and the nearby communities that are considered a close commute for the temporary workforce. Mitigation measures also are recommended to address any impacts anticipated within the socioeconomic study area.

Socioeconomic factors analyzed in this Application include population, race and ethnicity, income, and leading industries. To consider population characteristics, a Region of Comparison (ROC) was established to understand the dynamics of the population living in proximity to the routes. The ROCs established for this Project include those counties crossed by the Preferred and Alternative Routes. U.S. Census Bureau data, as noted in this assessment, was used for this evaluation and summarized at different geographic levels: state, county, census tracts, and block groups.

In a predominantly rural area, it has been observed that the size of a census block group increases as the population decreases. Therefore, in some cases, persons living outside of the proposed transmission line route may also be included in the Project analysis, where the results do not actually portray the existing conditions for residents living in proximity to a transmission line 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.

7.2.5.1 Existing Environment

The majority of the Preferred and Alternative Routes follow a north-south path through Dakota and Goodhue counties. A small segment of the Alternative Route is located along the extreme eastern border of Rice County. The primary land use in Dakota, Goodhue, and Rice counties is agricultural and agricultural-serving communities. According to MNGAP, most of the land cover in the socioeconomic study area is cropland, with pockets of grassland, forest and aquatic land cover types (Figure 7.2.4). Urban land cover is limited to the area in the immediate vicinity of population centers (MNGAP 2000).

Communities in the socioeconomic study area (generally listed north to south) include Hampton, Randolph, Cannon Falls, Stanton, Northfield, Dennison, Nerstrand, Kenyon, Wanamingo, Zumbrota, and Pine Island. Although it is outside of the socioeconomic study area, the City of Rochester is noted because it is the most urban community in proximity to the Preferred and Alternative Routes. The City of Rochester is approximately 8.5 miles south of the North Rochester Substation siting area.

The Center for Urban and Regional Affairs at the University of Minnesota published a study, *Trade Centers of the Upper Midwest 2003 Update*, which classifies cities in an urban hierarchy based on population and number of businesses. The study identified eight levels of hierarchy: Level 0 is considered “major metro area” and Level 7 is considered a “hamlet.” Table 7.2-6 presents the classifications for the communities in proximity to the Preferred and Alternative Routes. The remaining communities in proximity to the Preferred and Alternative Routes were not included in the trade center analysis (Casey 2003). US-52, located parallel to the Preferred Route, is the major transportation corridor between the Twin Cities and Rochester, Minnesota.

Population Characteristics

Population characteristics used to analyze the social setting of the study area include the total population, estimated future population, and per capita income. Population information is included in Table 7.2-7, and shown in Figure 7.2-3. According to the U.S. Census Bureau (2008), the population in the socioeconomic study area has experienced a population change ranging from -3 to 51 percent. The rate in both Dakota and Rice counties was above the state average of 10 percent, the growth rate in Goodhue County is slightly lower, at 4 percent.

Table 7.2-6:
Level of Hierarchy of Regional Trade Centers within the Socioeconomic Study Area for the Hampton–North Rochester 345 kV Section

| Level | Description | Cities/County | Total Establishments |
|-------|-----------------------------------|----------------------|----------------------|
| 0 | Major Metro Area | — | — |
| 1 | Primary Wholesale/Retail Center | Rochester/Olmsted | 3,757 |
| 2 | Secondary Wholesale/Retail Center | Northfield/Rice | 890 |
| 3 | Complete Shopping Center | — | — |
| 4 | Partial Shopping Center | Cannon Falls/Goodhue | 381 |

Table 7.2-6:

Level of Hierarchy of Regional Trade Centers within the Socioeconomic Study Area for the Hampton–North Rochester 345 kV Section

| Level | Description | Cities/County | Total Establishments |
|-------|----------------------------|---------------------|----------------------|
| | | Zumbrota/Goodhue | 226 |
| 5 | Full Convenience Center | Pine Island/Goodhue | 171 |
| | | Kenyon/Goodhue | 120 |
| | | | |
| 6 | Minimum Convenience Center | — | — |
| 7 | Hamlet | — | — |

Source: Casey (2003).

Table 7.2-7:

Population in the Socioeconomic Study Area for the Hampton–North Rochester 345 kV Section

| City/County | 2000 Population | 2008 Population | Percent Change 2000–2008 |
|---|-----------------|-----------------|--------------------------|
| Dakota County | 355,904 | 392,755 | 10% |
| Hampton | 434 | 657 | 51% |
| Randolph | 318 | 351 | 10% |
| Goodhue County | 44,127 | 45,897 | 4% |
| Cannon Falls | 3,795 | 4,034 | 6% |
| Dennison | 168 | 164 | -2% |
| Kenyon | 1,661 | 1,680 | <1% |
| Pine Island | 2,337 | 3,326 | 42% |
| Stanton | 1,080 | 1,089 | <1% |
| Wanamingo | 1,007 | 1,004 | 4% |
| Zumbrota | 2,789 | 3,074 | 10% |
| Rice County (Alternative Route only) | 56,665 | 62,390 | 10% |
| Northfield | 17,147 | 19,633 | 14% |
| Nerstrand | 233 | 226 | -3% |
| State of Minnesota | 4,919,479 | 5,220,393 | 6% |

Source: U.S. Census Bureau (2008; 2000a, b, c).

The socioeconomic study 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 shares 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 compose 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 U.S. Census Bureau.

As shown in Table 7.2-8, the majority of persons in the study area self-identified as white or Caucasian.

Table 7.2-8:
Race or Ethnic Heritage

| Geographic Area | | White or Caucasian | Black or African American | Hispanic or Latino | Asian | Two or More Races | All Other Races | Total |
|----------------------|--------------------------------------|--------------------|---------------------------|--------------------|---------|-------------------|-----------------|-----------|
| Preferred Route | Number of Persons | 1,435 | 0 | 13 | 1 | 11 | 8 | 1,455 |
| | Percent | 99 | 0 | 1 | <1 | 1 | 1 | |
| Alternative Route | Number of Persons | 1,268 | 0 | 10 | 8 | 12 | 3 | 1,291 |
| | Percent | 98 | 0 | 1 | <1 | 1 | <1 | |
| Region of Comparison | Dakota County | 325,166 | 8,091 | 10,459 | 10,285 | 6,244 | 4,606 | 355,904 |
| | Percent | 91 | 2 | 3 | 3 | 2 | 1 | |
| | Goodhue County | 43,672 | 449 | 768 | 360 | 187 | 871 | 45,539 |
| | Percent | 96 | <1 | 1.6 | <1 | <1 | 2 | |
| | Rice County (Alternative Route only) | 53,032 | 741 | 3,117 | 826 | 738 | 1,060 | 56,397 |
| | Percent | 93.6 | 1.3 | 5.5 | 1.5 | 1.3 | 1.9 | |
| State of Minnesota | Number of Persons | 4,400,282 | 171,731 | 143,382 | 141,968 | 82,742 | 65,810 | 4,919,479 |
| | Percent | 89 | 4 | 3 | 3 | 2 | 1 | |

Source: U.S. Census Bureau (2000a, b, c).

Economic Characteristics

The per capita income in 2000 was approximately \$27,008 in Dakota County, \$21,934 in Goodhue County, and \$19,695 in Rice County (U.S. Census 2000). A variety of industries make up the workforce in Dakota, Goodhue, and Rice counties as shown in Table 7.2-9. Leading industries in all three counties include educational, health, and social services, manufacturing, and retail trade.

Table 7.2-9:
Leading Industries in Socioeconomic Study Area for the Hampton–North Rochester 345 kV Section

| County | Industry | Percent of Workforce |
|---------|--|----------------------|
| Dakota | Educational, Health, and Social Services | 16.9 |
| | Manufacturing | 13.9 |
| | Retail Trade | 11.7 |
| | Professional, Scientific, Management, Administrative, and Waste Management | 10.7 |
| | Finance, Insurance, Real estate, Rental and Leasing | 10.1 |
| | Transportation, Warehousing, and Utilities | 8.8 |
| | Arts, Entertainment, Recreation, Accommodation, and Food Services | 6.7 |
| | Construction | 5.3 |
| | Wholesale Trade | 4.2 |
| | Other Services, except Public Administration | 4.4 |
| | Public Administration | 3.5 |
| | Information | 3.1 |
| | Agriculture, forestry fishing and hunting, and mining | 0.6 |
| Goodhue | Educational, Health, and Social Services | 21.0 |
| | Manufacturing | 19.7 |
| | Retail Trade | 10.9 |
| | Arts, Entertainment, Recreation, Accommodation, and Food Services | 9.7 |
| | Construction | 6.5 |
| | Transportation, Warehousing, and Utilities | 6.3 |
| | Agriculture, Forestry Fishing and Hunting, and Mining | 5.5 |
| | Professional, Scientific, Management, Administrative, and Waste Management | 5.3 |
| | Finance, Insurance, Real estate, Rental and Leasing | 4.5 |
| | Other Services except Public Administration | 4.3 |
| | Wholesale Trade | 3.4 |
| | Public Administration | 2.7 |
| | Information | 1.5 |

Table 7.2-9:
Leading Industries in Socioeconomic Study Area for the Hampton–North Rochester 345 kV Section

| County | Industry | Percent of Workforce |
|-------------------------------|--|----------------------|
| Rice (Alternative Route only) | Educational Health, and Social Services | 27.8 |
| | Manufacturing | 18.8 |
| | Retail Trade | 9.7 |
| | Arts, Entertainment, Recreation, Accommodation, and Food Services | 7.4 |
| | Construction | 6.9 |
| | Professional, Scientific, Management, Administrative, and Waste Management | 5.2 |
| | Transportation, Warehousing, and Utilities | 4.3 |
| | Agriculture, Forestry Fishing and Hunting, and Mining | 3.1 |
| | Other Services except Public Administration | 4.0 |
| | Finance, Insurance, Real estate, Rental and Leasing | 4.0 |
| | Public Administration | 3.8 |
| | Wholesale Trade | 3.0 |
| | Information | 2.0 |

Source: U.S. Census Bureau (2000a, b, c).

7.2.5.2 Impacts and Mitigation

Any adverse impacts to socioeconomic conditions or factors for the proposed transmission line construction would be short-term; therefore, no mitigation is proposed. Neither the Preferred or Alternative Route is expected to have negative short- or long-term economic impacts, nor are they expected to negatively impact population. It is estimated that approximately 50 temporary workers would be required for the transmission line construction, and that construction would take approximately 36 to 40 months to complete. Potential impacts to services such as police, fire, hospital/emergency service, and social services within the study area are discussed in Chapter 7.2.7.

The Project is expected to provide some short-term economic benefits from the purchase of materials and goods and expenditures made by the projected workforce. It is likely expenditures made by temporary construction laborers hired for the Project would be associated with lodging, meals, and other consumer goods and services. It is not anticipated that the Project would create new permanent jobs, but would create temporary construction jobs that would provide a one-time influx of income to the area. Increased payroll earnings and construction expenditures resulting from the construction of the Project are not expected to be significant in comparison to the regional economy.

In general, the proposed transmission line would provide an economic development benefit to the surrounding communities on a long term basis. Long-term beneficial impacts from the proposed transmission line include increased local tax base resulting from the incremental increases in revenues from utility property taxes. Indirectly, the increased capacity and reliability of the electric system may allow existing customers to expand their businesses as well as attract new commercial and industrial users that may contribute to a population growth of communities and counties along the Preferred or Alternative Routes. Short-term positive economic gains in staging areas along the Preferred and Alternative Routes may result from activities associated with construction and could include an increase in revenue to local businesses.

7.2.6 Recreation and Tourism

There are a variety of outdoor recreational opportunities in the Project area, including snowmobiling, biking, hiking, canoeing, boating, fishing, camping, swimming, hunting, and nature observation. GIS data identifying recreational resources were gathered from local, state, and federal agencies. Private recreational resources, such as golf courses, were identified through aerial maps or field verification. The MDNR Recreational Compass was used to locate federal and state recreation areas, lakes, water access points, and trails. Hunting information was obtained through the MDNR website.

The majority of tourism opportunities within the Project area are associated with recreational resources. These areas include WMAs; the Cannon River, Zumbro River, and Mississippi River valleys; state forests; and areas or sites of historical importance. The Applicant identified tourism activities within the Project area. Tourism opportunities along specific routes are also identified. The Applicant consulted county, city and township websites, and tourism and recreational plans to identify tourism resources in the Project area.

7.2.6.1 Existing Environment

Public lands near the Preferred and Alternative Routes offer residents and visitors opportunities for recreational activities that include hunting, fishing, boating, and snowmobiling. Resorts, parks, and campgrounds near lakes support tourism that focuses on the enjoyment of the natural environment. Recreational opportunities in the vicinity of the Preferred Route are found at WMAs, the Cannon River (a designated Recreational River), snowmobile trails, and parks. Tourism opportunities along the Preferred and Alternative Routes are associated with recreational resources described below. Figure 7.2-4 shows recreation resources near the Preferred and Alternative Routes.

Wildlife Management Areas (WMAs)

WMAs play a large role in the Minnesota outdoor recreation system. The Woodbury WMA is located approximately 1 mile west of the Preferred Route, and is located approximately 0.5 mile east of the Alternative Route. The Woodbury WMA is primarily a grassland management area, although some woody cover has been planted and a food plot is maintained. Management of the Woodbury WMA is primarily focused on grassland and prairie wildlife species. Recreation opportunities in the Woodbury WMA include

hunting and wildlife viewing. Hunting options include deer, small game, forest game birds, pheasant, and turkeys, while wildlife viewing options include wetland wildlife, prairie wildlife, and forest wildlife (MDNR 2009c).

The Alternative Route is located approximately 0.75 mile west of the Warsaw WMA. The Warsaw WMA is a grassland/intermittent wetland management area currently under development. Management of the Warsaw WMA is primarily for grassland and wetland wildlife species. Recreation opportunities in the Warsaw WMA include hunting and wildlife viewing. Hunting options include small game and pheasant and wildlife viewing options include wetland wildlife and forest wildlife (MDNR 2009g).

Neither the Preferred nor the Alternative Route crosses WMAs.

Cannon River

The Preferred Route crosses the Cannon River adjacent to US-52 near Cannon Falls, and the Alternative Route crosses the Cannon River southwest of the Randolph. The Cannon River is designated as a Recreational River by the MDNR in the area where the Preferred and Alternative Routes cross.

Recreational rivers have bordering lands that have been developed for a full range of agricultural or other land uses but also are readily accessible by pre-existing roads and railroads for recreational activities such as canoeing, boating, fishing, and swimming (MDNR 2009h).

East of the bridge on Minnesota Highway 20 (MN-20) in Cannon Falls, the Cannon River is a designated Scenic River by the MDNR. The Scenic River designation begins approximately 0.7 mile northeast of the Preferred Route centerline.

Snowmobile Trails

Minnesota has an extensive 20,000-mile snowmobile trail system. The majority of trails are maintained by local clubs and by MDNR (MDNR 2008). The Preferred and Alternative Routes cross multiple snowmobile trails, but because snowmobile trails are often relocated each winter, it is not possible to determine the exact number of crossings or the exact distance each route parallels snowmobile trails.

Parks

The Preferred and Alternative Routes do not cross nor are they adjacent to any state parks. Various county and city parks and recreational facilities are located within 1 mile of the routes. Lake Byllesby Regional Park, managed by Dakota County, and Lake Byllesby County Park, managed by Goodhue County, are located approximately 1 mile west of the Preferred Route. The Alternative Route runs along the westernmost boundary of Lake Byllesby Regional Park for 0.14 mile. The park is managed by Dakota County. The 2005 Byllesby Master Plan calls for development of a secondary trail in this area, which would connect to the main trail system in West Byllesby Park, but the plan cites steep slopes and wetlands as limiting factors for trail development (Dakota County 2005). Construction on this trail system

has not commenced. There is a park trail system that is open during the summer and winter and offers camping adjacent to the Lake Byllesby Swimming Beach.

Private Recreation Facilities

The Cannon Golf Club is an 18-hole course that is located along the west side of US-52 just north of the Cannon River. It is located on the same side of US-52 as the Preferred Route centerline.

There are no private recreation facilities identified along the Alternative Route.

7.2.6.2 Impacts and Mitigation

Direct impacts to recreational resources and tourism would be minimized to the greatest extent feasible. The transmission line would include spans up to 1,000 feet in length across recreational resources to minimize impacts.

Snowmobile trails may be temporarily impacted during construction along the Preferred or Alternative Routes if temporary closures are required where the transmission line would cross or parallel the trail. The Applicant will work with local clubs and the MDNR to ensure that proper safety measures are taken during construction and to avoid pole placement in trails.

The transmission line might be visible from recreation areas located directly adjacent to the Preferred Route and would have the potential to be visible from all recreation resources within approximately 1 mile of the route depending on the surrounding topography. The Woodbury and Warsaw WMAs are not likely to be impacted because the boundaries are more than 500 feet away from the Preferred and Alternative Route centerlines. The transmission line would be visible from the snowmobile trails it would cross or parallel, from the Cannon Golf Club, and from the Recreational section of the Cannon River. The area of the Cannon River designated as Scenic is not anticipated to be impacted, as it is approximately 0.7 mile from the centerline of the Preferred Route and would be screened by terrain, vegetation, and the buildings in Cannon Falls. The Alternative Route would be visible to visitors of the West Byllesby County Park, as the Alternative Route is adjacent to the park boundary for approximately 0.14 mile. The Applicant would work with federal, state, and local agencies to reduce visual impacts in this area. No impacts to recreation activities along either of the routes are anticipated.

7.2.7 Public Services, Health and Safety

Public services and facilities are generally defined as services provided by government entities, including hospitals, fire and police departments, schools, public parks, water supply or wastewater disposal systems, and gas and electricity services. Outside the urban areas, landowners and rural residences are typically serviced by privately owned septic systems and wells, or by rural water districts and electric cooperatives. Direct or indirect impacts to public utilities may result from the construction and operation of the Project. Utilities infrastructure is identified on Figure 7.2-5.

Public services were considered during the development of routes so that the construction and operation of the transmission line would avoid service disruptions.

7.2.7.1 Existing Environment

There are no public services, municipal buildings or wastewater treatment facilities located along the Preferred or Alternative Routes.

Rural residents and businesses in Dakota, Goodhue and Rice counties typically get their water from private wells, and Subsurface Sewage Treatment Systems (SSTs), commonly known as septic systems, provide sanitary waste water treatment. Electricity is typically provided by Dakota Electric Association, Xcel Energy, and Goodhue County Cooperative Electric. Natural Gas is provided by Xcel Energy, CenterPoint Energy, and Minnesota Energy. Cannon Falls, an incorporated area, provides residents with water, sewer, and electricity service. Residents and businesses of Cannon Falls are supplied by a public water system.

Electricity distribution lines, cable television, and telephone lines providing service to adjacent homes and businesses are located along many of the roads that the Preferred Route follows. The Preferred Route parallels an existing 69 kV transmission line owned by Xcel Energy for approximately 16 miles. The Alternative Route parallels two existing 69 kV transmission lines owned by Xcel Energy for approximately 0.8 mile and 0.5 mile. The Alternative Route also crosses three 69 kV transmission lines. These lines do not present a barrier to construction and operation of the transmission line, but it may be necessary for the Applicant to work with other public service utilities to relocate facilities if they conflict with the location of the transmission line.

The Preferred Route crosses two gas pipelines. One is crossed near the intersection between the Preferred Route and Fischer Avenue, and the other is near the intersection between the Preferred Route and 280th Street East. The Alternative Route crosses two gas pipelines. One is crossed near the intersection between the Alternative Route and MN-56 and the other is approximately 0.2 mile south of the intersection between the Alternative Route and 260th Street East. No pipelines are paralleled by either route.

7.2.7.2 Impacts and Mitigation

The Preferred and Alternative Routes are not anticipated to directly or indirectly impact the operation of existing public services, municipal buildings, or wastewater treatment plants, because these facilities are not located within the routes. Minimal disruptions to electric services may take place during construction if the transmission line passes or crosses existing utilities. During construction, efforts to minimize any disruption to public services or utilities would be made. Where any impacts to existing utilities may occur, the Applicant would work with both landowners and local agencies to determine the most appropriate placement for structures.

The construction and operation of the transmission line located along the Preferred or Alternative Routes is not anticipated to impact public health and safety because proper safeguards would be implemented for construction and operation of the line. The Project would be designed according to local, state, NESC, and CapX2020 standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, wind and ice loadings, and ROW widths. Construction crews and/or contract crews would comply with local, state, NESC, and CapX2020 standards regarding installation of facilities and standard construction practices. Established Applicant and industry safety procedures would be followed during and after installation of the transmission line. This would include clear signage during all construction activities.

The proposed transmission lines would be equipped with protective devices to safeguard the public in the event of an accident, or if the structure or conductor falls to the ground. The protective devices are breakers and relays located where the transmission lines connect to the substation. The protective equipment would de-energize the transmission line should such an event occur. In addition, the substation facilities would be properly fenced and accessible only to authorized personnel. The construction and operation of the Preferred and Alternative Routes is not anticipated to impact public health and safety.

The Preferred and Alternative Routes do not parallel any pipelines, therefore no mitigation is proposed.

7.2.8 Transportation

The analysis addresses the direct and indirect impacts to transportation corridors, such as roadways, railroads, and trails as a result of the construction and operation of the Preferred or Alternative Routes. Public airports and aviation facilities also are identified.

Transportation corridors in the Project area were identified during development of the routes as opportunities for collocating the transmission line. The Applicant considered potential direct and indirect impacts to transportation corridors as a result of Project construction and operation. Transportation corridors were identified along the route using GIS data. Annual average daily traffic (AADT) volumes for all roads with data available were obtained from Mn/DOT and were reported in the impact assessments as available. Future transportation facilities and plans were identified through consultation with Mn/DOT and county public works or planning departments.

The FAA and the Mn/DOT have each established development guidelines on the proximity of tall structures, including transmission lines, to public use airports and heliports, described under Impacts and Mitigation, below. The FAA also has developed guidelines for the proximity of structures to Very-High-Frequency Omni-Directional Range (VOR) navigation systems, also described below.

7.2.8.1 Existing Environment

Roads, railroads, and public airports and aviation facilities, if located near the Preferred or Alternative Routes, are identified on Figure 7.2-6.

Roadways

US-52 is the major transportation corridor located along the Preferred Route. The Applicant consulted the *Highway 52 Interregional Corridor Management Plan* during route identification. US-52 is a four lane divided highway. A high-level review of ROW maps indicate that much of the rural portions of US-52 south of Hampton are constructed on approximately 280 feet of ROW. The ROW is wider at discrete locations such as existing interchanges and bridges, where hills have been cut, etc. North of Hampton there are sections constructed on a 225-foot ROW. Table 7.2-10 shows the types of road paralleled by the Preferred and Alternative Routes. Table 7.2-11 shows short-term and mid-term planned construction projects located along US-52 between Hampton and Pine Island (Mn/DOT 2002). The Corridor Management Plan in its entirety can be found in Appendix D. The Preferred Route is not anticipated to impede construction of any of these projects. Additional transportation corridors located along the Preferred Route include county highways, and local access roads.

Various county roads and township roads also are present in the Project area. County roads can vary and can have ROW widths of 66 feet, 100 feet and occasionally wider. Township roads typically have a 66-foot ROW width. Township roads often do not have a well-defined ROW and can vary from section lines.

Between the Hampton Substation siting area and Zumbrota, the Preferred Route parallels US-52 for approximately 27 miles. US-52 is a divided, four-lane highway; it carries a high volume of vehicles daily, serving as a critical link between the Twin Cities metropolitan area and Rochester. Generally, AADT volumes along US-52 are moderate to high.

Between the Hampton Substation siting area and Zumbrota, the Alternative Route parallels these roads for less than 1 mile each: 290th Street SW, Casper Avenue, Goodhue Avenue, 5th Avenue Way, 50th Avenue, and MN-60.

Railroads

The Preferred Route crosses one railroad line operated by Union Pacific Railroad north of Cannon Falls. The Preferred Route parallels the Union Pacific Railroad for approximately 0.19 mile.

The Alternative Route crosses one railroad operated by Progressive Rail and does not parallel any railroads.

Airports, Landing Strips, and Airplane Safety

The FAA and Mn/DOT have each established development guidelines on the proximity of tall structures, including transmission lines, to public-use airports and heliports. The FAR Part 77 establishes standards and notice requirements for reporting airspace obstructions for objects currently impacting, or potentially impacting, navigable airspace around aviation facilities. The FAR Part 77 outlines a series of imaginary surface zones surrounding airports that specify height restrictions for structures based on slope ratios.

Table 7.2-10:
Preferred and Alternative Routes: Roads Paralleled (miles)

| Road Type | Preferred Route | Alternative Route |
|--|-----------------|-------------------|
| Length paralleling Interstate Highways | 0.0 | 0.0 |
| Length Paralleling U.S. Highways | 28.2 | 0.4 |
| Length Paralleling State Highways | 0.0 | 0.9 |
| Length Paralleling County Roads | 6.2 | 3.8 |
| Length Paralleling Local Roads | 0.3 | 0.8 |

Table 7.2-11:
Short-Term and Mid-Term Planned Construction—US-52

| Mn/DOT Location Description | Short-Term Plan | Mid-Term Plan (By 2025) |
|-----------------------------|--|---|
| Hampton | <ul style="list-style-type: none"> Construct CR-47 overpass (highest priority safety improvement intersection on Highway 52 corridor) | No Recommendations |
| Hampton to Cannon Falls | No Recommendations | No Recommendations |
| Cannon Falls | <ul style="list-style-type: none"> Conduct study to determine future east-west regional arterial needs between I-35, MN- 52, and Red Wing Coordinate with Cannon Falls on the development of their Comprehensive Plan to assist in determining the location of the southern interchange Construct interchange in southern Cannon Falls to replace two existing traffic signals (preliminary design is available) Progressive Rail line recently reactivated – possible US-52 overpass needed | CR-86 Interchange (no design available, no funding source identified) |
| Hader Area | <ul style="list-style-type: none"> Continue to monitor safety at CR-1 and CR-9 intersections. Consider modifications if safety concerns continue to grow such as median restrictions Construct MN-57 interchange (no design available, no funding source identified) | Consider interchange at either CR-1 or CR-9 |
| Zumbrota | <ul style="list-style-type: none"> Implement any short-term recommendations developed as part of the Zumbrota Subarea Land Use and Transportation Study | No Recommendations |

Table 7.2-11:
Short-Term and Mid-Term Planned Construction—US-52

| Mn/DOT Location Description | Short-Term Plan | Mid-Term Plan (By 2025) |
|-----------------------------|--|---|
| Zumbrota to Pine Island | <ul style="list-style-type: none"> Continue to monitor safety issues at 480th Street intersection and consider appropriate improvement measures such as turn lane improvements, approach improvements, median restrictions | No Recommendations |
| Pine Island | <ul style="list-style-type: none"> Enhance connections to Douglas State Trail with CR-11 Improvements. Middle Pine Island Interchange would not likely change CR- 31 Interchange is proposed to be let for bids soon (a preliminary layout is available) | Construct new CR-11 interchange at north side of Pine Island. (no design available, no funding source identified) |

Source: Site corridor plan and meeting with Mn/DOT Nov. 3, 2009.

These imaginary surfaces include the primary surface, horizontal surface, conical surface, approach surface, precision instrument approach surface, and the transitional surface. According to the FAR Part 77, “an object would 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 has corresponding slopes, based in part on the airport’s use designation, flight volumes, and plane size capabilities. All surfaces are measured at the mean sea-level elevation of the airport. If applicable, the required notice with the FAA according to the FAR Part 77, Subsection 13 would be filed by the Applicant for the Project.

In addition to the FAA regulations, the state of Minnesota has established air navigation obstruction criteria under the Minnesota statutes and Minn. R. ch. 8800. These regulations are intended to control the type of development around airports to prevent incompatible land uses. State regulations are similar to the FAA regulations as published in the 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. Minn. R. 8800.2400. 8800.1100-1200 specify height and guide slope restrictions for different types of airport facilities.

There are three airports that are subject to FAA and Mn/DOT regulations in the Project area in Minnesota: Stanton Airfield, Dodge Center, and Rochester International. FAA regulations state that notice of planned construction is required for a structure that falls into one of the following categories (FAA form 460-1):

- More than 200 feet in height;
- Height greater than 100:1 slope within 20,000 feet of a runway more than 3,200 feet in length;
- Height greater than 50:1 slope within 10,000 feet of a runway shorter than 3,200 feet in length; or
- Height greater than 25:1 slope within 5,000 feet of a heliport.

Public airports near the Preferred and Alternative Routes are shown in Figure 7.2-6. The Stanton Airfield is a privately owned and public-use airport located near Stanton, Minnesota. The centerline of the Preferred Route is approximately 5 miles east of the Stanton Airfield, and the centerline of the Alternative Route is approximately 1.2 miles west of the Stanton Airfield. Federal Aviation Regulations (FAR) Part 77, Imaginary Surfaces, and Minn. R. 8800.2400, Airport Zoning Standards, were analyzed for the runways at the Stanton Airfield. Both Preferred and Alternative Routes are located outside the safety zones established by the FAA and the Minnesota Rule (Appendix O).

7.2.8.2 Impacts and Mitigation

Roadways

During construction, it is anticipated that several types of light-, medium-, and heavy-duty construction vehicles would travel to and from construction sites, spooling locations, and staging areas, as would 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 adjacent to sections of roads or railways are not expected permanently to impact the operation of either transportation facilities 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 Applicant will work with state and local officials to minimize any impacts to traffic during construction and operation of the transmission line. The Applicant will obtain all appropriate Mn/DOT and county permits as applicable for transmission line crossings over regulated roadways.

Construction activities may require access from the roadway ROWs to the transmission line ROW at existing or additional turnout or approach locations. Construction of additional or temporary turnouts or approaches may require the installation of culverts and fill material. Installation of additional or temporary access points would be subject to review and approval by 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 the stringing of new overhead conductors over highways would require the 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.

Once the installation of new conductors has been completed, the temporary guard structures would be 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 the Minnesota State Patrol to ensure implementation of appropriate measures to safeguard the public and construction crews.

Railroad

When a high-voltage transmission line is located adjacent to a railroad, the tracks and signals may be subjected to electrical interference from electric and magnetic induction, conductive interference, and capacitive effects.

Because only a short distance of the transmission line would parallel railroads, very few impacts are anticipated. The Applicant will ensure that computer modeling of AC interference effects is completed and that any required mitigation is designed and installed prior to energizing the transmission line.

Airports, Landing Strips, and Airplane Safety

Certain objects such as steel pole transmission line structures can present a challenge to the operation of airport navigational aids and weather observation station facilities. Specifically, these facilities include VOR air navigation systems and Automated Weather Observation Stations (AWOS). The FAA Order 6820.10, VOR, VOR/DME (Distance Measuring Equipment), and VHF Omni-Directional Range/Tactical Aircraft Control (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 describe the 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. Based on these requirements, a 175-foot structure, the proposed pole height for the Project, would have no impact on a VOR facility or antenna if it were located at least 8,350 feet away from a VOR facility or antenna. There are no VOR facilities or antennas within 2 miles of the Preferred or Alternative Routes in any of the Project sections. Therefore, no impacts to VOR facilities or antennas are expected. A search distance of 2 miles was used based on the fact that.

No impacts to airports, landing strips, or airplane safety are anticipated from the Preferred or Alternative Routes. Because of the distance between the Stanton Airfield, Kenyon Heliport, and the routes, no impacts are anticipated. The Applicant would ensure that all safety requirements are met during the construction and operation of the transmission line and associated facilities. The Applicant intends to file all necessary notice requirements with the FAA and work with both the FAA and Mn/DOT to ensure compatibility between the transmission lines and air navigation stations and equipment.

7.2.9 Electrical Interference

The potential exists for interference between the proposed transmission line and communications devices, such as radios, televisions, cellular phones, and geographical positioning system (GPS) units.

Corona from transmission line conductors can generate electromagnetic “noise” at the same frequencies transmitted by radio and television signals. (Corona consists of the breakdown or ionization of air within a few centimeters of conductors and hardware.) This noise can cause interference with signal reception 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 to either side.

FM radio receivers usually do not pick up interference from transmission lines for two reasons:

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

A two-way mobile radio located immediately adjacent to and behind a large metallic structure (such as a steel tower) may experience interference because of signal-blocking effects. Movement of either mobile unit so that the metallic structure is not immediately between the two units should restore communications. Such a move 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 line 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 facilities in those areas where good reception is currently obtained, the Applicant would 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 necessary.

Data obtained from the FCC was used to determine locations of existing communications facilities and structures, including multiple television, radio, cellular towers, etc., within the Project area.

7.2.9.1 Existing Environment

There are seven communications facilities located along the Preferred Route and there is one located along the Alternative Route (Figure 7.2-7).

7.2.9.2 Impacts and Mitigation

The transmission line hardware would be designed and maintained to minimize gap and corona discharges. There is a potential for interference impacts to occur to omni-directional communication towers. The height of the transmission line may interfere with beam paths. If interference occurs, the Applicant would 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 is anticipated to be complete by the time the Project is constructed. Digital reception in most cases is 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 radio frequency noise, it would impact digital television reception if the noise levels or reflections are great enough. In the rare occasion where the construction of the Project may cause interference within a television station's primary coverage area, the Applicant would work with the affected viewers to correct the problem, which can usually be corrected with the addition of an outside antenna.

No impacts to GPS equipment are anticipated from the construction or operation of the transmission lines. *Use of GPS Receivers under Power-Line Conductors, Institute of Electrical and Electronics Engineers (IEEE) Transactions on Power Delivery, Vol 17, No. 4, October 2002*, states that power transmission lines are unlikely to cause signal degradation to GPS signals.

If a problem does occur with GPS equipment or signals, the Applicant would work with companies or customers to correct this problem.

7.3 Land-Based Economies

7.3.1 Agriculture

In many cases, transmission line structures and agricultural operations are compatible uses that result in minimal impacts if the transmission line structures are located along farm field lines, property lines, or parcel lines, and by avoiding pivot irrigation systems. Aerial maps and GIS data were reviewed to identify agricultural land in the Project area, in order to avoid segmentation of agricultural operations wherever possible. The Applicant also reviewed land use plans, zoning codes, MNGAP data, and MDA data to identify agricultural resources.

Agricultural resources evaluated in this Application include areas with land cover identified as cropland, center irrigation pivots, all categories of prime farmland, farmland preservation easements, and organic farms.

County-level agricultural data were obtained from the 2007 Census of Agriculture (USDA 2007c). Land cover identified by the MNGAP as cropland is considered agricultural land or land used for agriculture. Some of the agricultural land in the Project area is designated as “prime farmland,” indicating land that is most desirable for agricultural production. Prime farmland is important because the land itself contains the necessary features (e.g., soil type) for successful 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)).

Center irrigation pivots were identified by aerial photography and field observation, as well as through public comments. Center irrigation pivots are a form of overhead sprinkler irrigation commonly used in the Project area. 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 Applicant avoided interrupting center pivot irrigation systems where possible.

To estimate the total number of acres of agricultural land located along the Preferred Route, the Applicant gathered data for the following agricultural resources: prime farmland, prime farmland when drained, and farmland of statewide importance, Conservation Reserve Program (CRP) land, and calculated the amount of farmland that could be impacted using center pivot irrigation systems.

Farmland preservation easements include the FNAP in Dakota County. In 2002, Dakota County implemented FNAP, a voluntary program undertaken by Dakota County and various state and federal governmental agencies. FNAP began in response to citizen concern regarding the loss of farmland and natural areas. The primary goal of FNAP is to protect the quality of farmland, natural areas, water, and wildlife habitat (Dakota County 2003). Landowners provide a permanent easement to Dakota County alone, or jointly with the federal government in exchange for payments. As of August 2009, Dakota County had acquired 25 permanent agricultural conservation easements totaling 3,069 acres. FNAP conservation easements prohibit the construction or placement of utility structures on encumbered land parcels.

The Applicant consulted with the MDA to identify organic farms in the Project area. All information acquired by the state of Minnesota was voluntarily submitted by the landowner. The MDA provided mailing addresses of certified organic farms as reported by the state for each county in the Project area. According to the MDA, precise locations of organic fields are unknown. If an organic farm has less than \$5,000 of organic 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. Organic farms that are identified on the detailed maps are based on the mailing addresses of the state-reported certified organic farmers and do not depict the exact location of an organic farm field. The Applicant also received comments from the public verifying organic farm locations and identifying other locations of organic farms that were not reported by the state. There were no organic farms identified within the Preferred or Alternative Route for any of the Project sections.

7.3.1.1 Existing Environment

Between the Hampton Substation siting area and Cannon Falls, the Preferred Route crosses Dakota County, and the Alternative Route crosses Dakota County between the Hampton Substation siting area and Randolph. According to the 2007 Census for Agriculture (USDA 2007c), the average number of farms in Dakota County has increased by 7 percent and the average farm size has increased by 4 percent between 2002 and 2007. Total sales increased for Dakota County by 65 percent between 2002 and 2007, with crop sales at \$117,315,000 (64 percent) and livestock sales at \$67,393,000 (36 percent). Crops in Dakota County are primarily peas, corn and soybeans, and livestock consists primarily of turkeys, cattle and calves (USDA 2007b). The Minnesota 2007 Agricultural Statistics published by the USDA ranks Minnesota counties in terms of agricultural production. Dakota County ranked number three for production of green peas.

Between Cannon Falls and the North Rochester Substation siting area, the Preferred Route crosses Goodhue County, and the Alternative Route crosses Goodhue County between Randolph and the North Rochester Substation siting area. Between 2002 and 2007, the number of farms in Goodhue County has decreased by 2 percent while the average farm size has increased by 3 percent. Total agricultural sales in Goodhue County have increased by 68 percent, with crop sales at \$124,283,000 (47 percent) and livestock sales at \$139,687,000 (53 percent). Crops in Goodhue County are primarily corn and soybeans, and livestock are primarily turkeys, hogs and pigs. In 2007, Goodhue County ranked number five in Minnesota for production of oats. In 2008, Goodhue County ranked number five in Minnesota for production of milk cows, and ranked five for production of milk in 2007 (USDA 2007c, 2008).

The Alternative Route is located in Rice County for approximately 0.5 mile between the Cannon River and Stanton. The number of farms in Rice County has increased by 15 percent, while the number of land in farms has increased by 2 percent between 2002 and 2007. Total agricultural sales in Rice County have increased by 38 percent with crop sales at \$66,376,000 (48 percent) and livestock sales at \$70,821,000 (52 percent). Primary agricultural crops in Rice County are primarily corn and soybeans; the primary livestock raised are turkeys, hogs, and pigs (USDA 2007d). Rice County did not rank in the top producers of crops or livestock in the state of Minnesota.

Figure 7.2-1 shows land cover type along the Preferred and Alternative Routes, including cropland. Approximately 57 percent of the Preferred Route and about 57 percent of the 150-foot ROW are cropland. Approximately 86 percent of the Alternative Route is cropland, and over 85 percent of the 150-foot ROW is cropland.

Figure 7.3-1 shows soils considered prime farmland, prime farmland when drained, and farmland of statewide importance. Other agricultural resources are identified on Figure 7.3-2. Approximately 78 percent of the Preferred Route 150-foot ROW, and approximately 91 percent of the Alternative Route 150-foot ROW are considered prime farmland, prime when drained, or farmland of statewide importance.

The Preferred Route crosses the edge of three center irrigation pivots. There are four locations where the Alternative Route crosses center pivot irrigation and may affect operation. These include two overlapping center pivots approximately 1 mile southeast of the Hampton Substation siting area, one center pivot

approximately 2.5 miles south of Hampton and adjacent to the west side of MN-56, and one center pivot along the Goodhue/Rice county line approximately 0.7 mile south of the Cannon River. Center pivots are shown on Figure 7.3-2.

The Preferred Route crosses two parcels of land with FNAP easements along US-52. The parcels are adjacent to each other on the east side of US-52 in Hampton Township, Sections 26 and 35 (Figure 7.3-2). The Applicant has requested an expanded route width around the FNAP easements along US-52 to allow for flexibility in identifying a feasible transmission line alignment.

7.3.1.2 Impacts and Mitigation

The Project would result in permanent and temporary impacts to agricultural operations (Appendix P). The Applicant has made an effort to suggest routes that avoid or minimize potential impacts to agricultural operations by locating the centerline along field lines and limiting impacts to planted windbreaks.

Permanent impacts would occur as a result of structure placement along the Preferred or Alternative Route centerline. Permanent impacts would be limited to the immediate vicinity around the transmission structure, because farming and other agricultural operations are permitted beneath the transmission line. Clearing of windbreaks in the ROW would be limited to the amount necessary to permit the safe and reliable operation of the transmission line. The Applicant estimates that the permanent impacts in agricultural fields would be approximately 1,000 square feet per structure, estimated as the total area of the structure footprint plus a small area around the structure that would be removed from production. Total number of structures to be placed in agricultural lands was estimated by multiplying the total number of structures required for the route (total length of route divided by the typical span of 1,000 feet) by the percent of the 150-foot ROW categorized as cropland by MNGAP (2002). Along the Preferred Route in this area, the Applicant estimates approximately 109,000 square feet or 2.5 acres of cropland would be permanently impacted. Along the Alternative Route, the Applicant estimates approximately 222,932 square feet or approximately 5.1 acres of cropland would be permanently impacted.

During construction, temporary impacts such as soil compaction and crop damage would occur in a small area around each structure. Temporary impacts to agricultural lands also are possible if staging areas and spooling locations are located on agricultural lands. The Applicant estimates that the temporary impacts in agricultural fields would be 1 acre per span for construction. The Applicant estimates that a 5-acre staging area would be required every 25 miles, and that a 1,600-square-foot spooling location would be required every 2 miles. Total temporary impacts were calculated as the sum of impact areas from construction, spooling locations, and staging locations.⁸ Along the Preferred Route, the Applicant estimates 200 acres of agricultural land would be temporarily impacted by transmission line construction. Along the Alternative Route, the Applicant estimates that approximately 270 acres of agricultural land would be temporarily impacted by transmission line construction.

⁸ Because not all spooling and staging locations will be located in agricultural areas, the estimated acreage of temporary impacts may be overestimated.

When the length of the route crossing a center irrigation pivot is greater than the typical span length for the proposed transmission line (700 to 1,000 feet), a structure may need to be placed within the pivot, interrupting its operation. Although three center irrigation pivots are crossed by the Preferred Route, impacts to the operation of those pivots is not expected because the centerline is located adjacent to the edge of the pivot. The Alternative Route crosses five center pivot irrigation systems that may be impacted.

The Applicant has developed an AIMP in collaboration with the MDA to identify measures the Applicant would take to avoid, mitigate, or provide compensation for negative agricultural impacts that may result from transmission line construction (Appendix G). The AIMP addresses mitigation, where possible, restoration of damaged drainage tiles, removal of construction debris, and restoration of soil to pre-construction conditions. The Applicant will work with landowners to reduce impacts to irrigation systems and restore temporary roads to pre-construction conditions. The Applicant will provide as much advance notice as is reasonable before accessing private property for construction of the Project.

The Applicant will work with landowners to minimize impacts to all farming operations. By aligning the transmission line along existing ROW such as roads and property lines, impacts would be minimized. Landowners commented at the public meetings that there was a preference for structures to be located as close to property lines and roads as possible. To minimize the loss of farmland and ensure reasonable access to the land near the structure, the Applicant intends to place the structures approximately 5 feet from and overhanging the road ROW. The Applicant also will attempt to avoid placing spooling locations and staging areas on agricultural land. Some landowners use GPS navigation systems on farm equipment. Once a route is permitted, the transmission line structure locations will be identified and GPS coordinates may be provided to the landowners, if requested.

Landowners would be compensated for use of their land through an easement payment. The Applicant would compensate landowners for any temporary impacts, including crop damage and soil compaction that may occur during construction. Soil compaction would be addressed by compensating the farmer to repair the ground or by using contractors to chisel-plow the site. Normally, a declining scale of payments is set up over a period of a few years. Areas disturbed during construction would be repaired and restored to pre-construction contours as required so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion.

Drain tiles may be present along the transmission line routes. As described in the AIMP, the Applicant would consult with the landowners to identify the locations of drainage tiles along the route and would minimize interference with tiling, where possible. In the event that the Applicant intercepts a tile line, the Applicant would relocate the structure, if possible, and repair the tile line if it has been damaged.

Crop dusting within agricultural fields could be impacted if flying near the transmission line Preferred or Alternative Routes. The Applicant would work with landowners to identify potential mitigation measures that could avoid or reduce Project-induced changes to farming practices. Impacts to the FNAP parcels will

be dependent on the final alignment and pole placement. The Applicant will continue to consult with Dakota County and Mn/DOT to minimize impacts.

No organic farms were identified along the Preferred or Alternative Route; therefore, no impacts are anticipated.

7.3.2 Forestry

The MDNR Division of Forestry manages timber harvesting in Minnesota. The forestry industry is located primarily in the northeastern section of the state, but some lands managed for forestry do exist in southeastern Minnesota, primarily in lands managed by the MDNR.

The Annual Timber Harvest Plans (AHPs) for townships in the Project area were referenced to identify potential impacts to economically important forestry resources. The AHPs are work plans for forest stands on MDNR-managed lands where timber sales are being considered for the upcoming state fiscal year. The AHPs are developed based on long-term forest management goals identified in existing forest resource management plans (MDNR 2009i,j).

For the purpose of this Application, a potential impact to forestry resources would occur only if the routes cross lands with AHPs. Impacts may include tree clearing within the 150-foot ROW or in construction staging areas. Impacts to wooded areas other than economically important forestry areas are discussed in Chapter 7.5.3.

7.3.2.1 Existing Environment

The Preferred and Alternative Routes are located primarily in grassland and cropland. Forested areas are scattered along the routes, primarily along the Cannon River and other waterways. The Preferred Route crosses approximately 223 acres of forested land and the Alternative Route crosses approximately 76 acres of forested land. Neither of the routes crosses any of the MDNR-managed RJD State Forest. Figure 7.2-1 shows land cover identified along the Preferred Route.

According to the MDNR Forestry Division Fiscal Year 2010 Harvest Plans (MDNR 2009j), no townships crossed by the Preferred or Alternative Routes have AHPs. Therefore, no economically important forestry resources were identified within the either route.

7.3.2.2 Impacts and Mitigation

No impacts to economically important forestry resources are anticipated and therefore no mitigation measures are proposed. Mitigation measures associated with tree clearing within the ROW in wooded areas other than economically important forestry areas are discussed in Chapter 7.5.3.

7.3.3 Mining

The general geology of the Project area is described to provide a background for area mining resources. The Project area is located in the Hollandale Embayment. Cambrian-age rock bedrock (predominately dolomite limestone) underlies the Mississippi River drainage and tributaries along the southeastern edge of the Project area. Bedrock along the southwest edge of the Project area consists of Devonian-age rock formations.

The primary mining resources in the Project area are dolomitic limestone deposits with numerous quarries scattered throughout the Project area (Minnesota Geological Survey (MGS) 1966). Post-Paleozoic iron deposits occur in Wabasha County, and clay and shale deposits used in structural products occur in Goodhue County. Igneous and metamorphic rock quarries are located in southwestern Winona County. Quaternary glacial deposits overlie older bedrock in the Project area. Alluvium, colluvium, and terrace deposits occur along the Mississippi River and along tributary drainages, some of which have been deposited 60 miles from the existing river alignment. Weathered bedrock is present along the uplands of these deposits. Glacial till, noted as “old till” (dating back 600,000 to 700,000 years), dominates areas of the Project farther from the Mississippi River (MGS 1997). The eastern terminus of the Bemis moraine is located along the western edge of the Project area in the vicinity of the Hampton to North Rochester section. The thickness of glacial material can be in excess of 300 feet in the extreme western portion of the Project area, although the thickness is generally less than 100 feet throughout most of the Hampton to North Rochester section. Mining operations of stratified sand and gravel occur within the thick glacial outwash material located throughout Minnesota (Hart and Ziegler 2008). Known mines were avoided during route development to minimize impacts.

7.3.3.1 Existing Environment

Mines and future reserve areas 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 structure locations. The Applicant used data collected from the Mn/DOT Aggregate Sources Interactive Map. Two aggregate mines are located within the Preferred Route, and one aggregate mine is located within the Alternative Route. Figure 7.3-3 shows mining resources located near the Preferred and Alternative Routes.

Minn. Stat. § 84.94 requires each Minnesota county to identify and protect aggregate resources, in addition to locating areas to mine and developing long-term comprehensive plans that incorporate aggregate resources (MDNR 2007). Goodhue and Rice counties were identified by the MDNR as being a region of many crushed stone operations, and southwestern Dakota County was identified as being a source of horticultural peat (MDNR 1998).

7.3.3.2 Impacts and Mitigation

The transmission line would not impact the mining operations located within the Preferred and Alternative Routes. There would be no direct impacts to existing mining operations. If mining operations cannot be

avoided, the Applicant would work with existing mine operators to identify the extent of current and planned mining operations and develop appropriate mitigation measures.

7.4 Archaeological and Historic Resources

Archaeological and historic resources are those places that represent the visible or otherwise tangible record of human occupation or changes. These resources vary in size, shape, and condition. Some are clearly evident on the landscape, while others are buried or only recognized by knowledgeable people. For the purpose of this Application, an archaeological resource is typically considered to be at or below ground surface, while historic resources include standing structures such as bridges or buildings. Those places that may have traditional cultural property (TCP) or cultural landscape significance have not been identified thus far.

Information about known archeological and historic resources is generally limited to those resources identified through surveys in specific locations. These surveys are often tied to urban and rural development and infrastructure projects. These records of previous surveys are maintained by the State Historic Preservation Office (SHPO) and were reviewed during a Class I Literature Search (Class I) to determine whether identified resources could be avoided to the greatest extent possible. This consideration of opportunities and constraints was done in consideration with other natural resources and existing conditions.

Cultural resources are typically categorized by type and level of eligibility for listing on the National Register of Historic Places (NRHP).

Federal agencies apply a standard of significance for compliance with federal regulations, typically Section 106 of the National Historic Preservation Act of 1966 (as amended), and is useful when determining sites to avoid. Where sites have not been evaluated for significance or determination of eligibility for listing on the NRHP and may be physically impacted by the Project, the Applicant will coordinate with the SHPO to develop a work plan to address the impact.

For areas under their jurisdiction and within their Area of Potential Effects (APE), RUS has already initiated Section 106 consultation and other compliance activities in anticipation of the Section 404 and Section 10 permit application. Additional 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 defined APE would be treated through a federal consultation process.

7.4.1 Archaeological

The Applicant performed a Class I to examine available survey data to identify documented archaeological and historical resources within 1 mile of the centerline of the Preferred and Alternative Routes. The Class I was based on information from the Minnesota SHPO site database. From this list of known sites, 70 archaeological sites were identified in the APE. Physical avoidance of these sites was a part of the opportunities and constraints consideration in locating route alternatives for the Project.

Subsequent chapters of this document outline a suggested process where the Applicant may conduct additional resource identification efforts and, should a resource be identified, work with the SHPO to resolve questions regarding eligibility. A revised Class I of the Project area is being planned for late 2009 or early 2010. Archaeological sites documented within 1 mile of the Preferred and Alternative Route centerlines are listed in Appendix Q.

7.4.1.1 Project Area

Preferred Route

Four archaeological sites were documented within 1 mile of the Preferred Route centerline. Two sites were identified as historic depressions and two sites were identified as lithic scatter. The NRHP status of these archaeological sites is listed as Not Determined (MVAC 2008).

Alternative Route

Five archaeological sites were documented within 1 mile of the Alternative Route centerline. All sites were documented as historic depressions. The NRHP status of these archaeological sites is listed as Not Determined (MVAC 2008).

7.4.1.2 Impacts and Mitigation

A survey methodology would be developed in consultation with RUS, USACE, and the SHPO to document cultural resources within the Project area. The survey would identify the extent of resources within the routes and, if applicable, provide recommendations regarding NRHP eligibility. During the Project engineering phase, the Applicant would seek to avoid the resources or minimize impacts by using best management practices developed in coordination with RUS, USACE, Office of Environmental Services, and SHPO. RUS may also invite other parties (particularly Native American Tribes and other state and federal permitting or land management agencies) to assist in development of the avoidance, minimization, or treatment measures. The Applicant would integrate a training, monitoring, and discovery plan into construction bid documents should previously unknown cultural resources or human remains be inadvertently encountered during construction of the transmission line. The plan would 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 in 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 are activated in accordance with federal laws, policies, guidelines, and state statutes (Minn. Stat. § 307.08).

7.4.2 Architectural

The Class I described in Chapter 7.4.1 identified known historical resources within the Project area, including sites listed on the NRHP and architectural properties. Physical avoidance of these resources also was a consideration during the route development process.

7.4.2.1 Existing Environment

There are eight NRHP-listed sites within 1 mile of the Preferred Route. All sites are located in Cannon Falls. These NRHP sites include: Captain Charles Gellett House, Darwin E. Yale House, Third Street Bridge, Cannon Falls School, Yale Hardware Store, Ellsworth Hotel, Livery Stable, and Church of the Redeemer. The Veblen Farmstead is the only NRHP-listed site within 1 mile of the Alternative Route. NRHP-listed sites are identified on Figure 7.4-1.

There also are 60 architecture sites within 1 mile of the Preferred Route and 81 architecture sites within 1 mile of the Alternative Route that have not yet been evaluated for eligibility on the NRHP. Architecture sites within 1 mile of the Preferred and Alternative Route are listed in Appendix Q.

7.4.2.2 Impacts and Mitigation

Chapter 7.4.1 describes the mitigation approach associated with the discovery of historic resources.

7.4.3 Historic Landscapes

Identification of historic landscapes typically arises through a state's preservation planning program, thematic studies, or compliance-related surveys. The Class I described in Chapter 7.4.1 identified known cultural resources within the Project area. No designated historic landscapes were referenced in the Class I.

7.4.3.1 Existing Environment

There are no designated historic landscapes within 1 mile of the Preferred or Alternative Route (MVAC 2008).

7.4.3.2 Impacts and Mitigation

If a historic landscape were to be identified prior to construction, consultation with appropriate parties would be initiated and consideration would be given to the Project-related impacts.

7.5 Natural Environment

7.5.1 Air Quality

Potential air quality impacts are related to the breakdown or ionization of air in a few centimeters or less immediately surrounding conductors that produce ozone and oxides of nitrogen in the air. Currently, both the state and federal governments have similarly restrictive regulations regarding permissible concentrations of ozone and oxides of nitrogen. The national standard is 0.075 parts per million (ppm) on an 8-hour averaging period (40 CFR Part 50). The state standard is 0.08 ppm based upon the fourth-highest 8-hour daily maximum average in 1 year (Minn. R. 7009.0080). The national standard for nitrogen dioxide (NO₂), one of several oxides of nitrogen, is 0.053 ppm on an annual basis and the Minnesota State Air Quality Standard for NO₂ is 0.05 ppm.

7.5.1.1 Existing Environment

The air quality in Minnesota is generally good and has been improving for most pollutants since 2002. Additionally, the state has been in compliance with all national ambient air quality standards since the 2002. Even though the non-attainment areas in Minnesota have been reclassified to attainment and are now known as maintenance areas, the sources in those areas must continue to comply with the limits established when the area was in non-attainment.

Of the counties crossed by the transmission line, only Dakota and Olmsted counties are designated as maintenance areas. Dakota County is designated as a maintenance area for carbon monoxide, lead, and sulfur dioxide. Olmsted County is designated as a maintenance area for fine particulate matter (PM-10) and sulfur dioxide.

7.5.1.2 Impacts and Mitigation

Construction of the transmission line would result in minor short-term air quality impacts from the operation of heavy-duty construction equipment and fugitive dust due to travel on unpaved roads and excavation for transmission structure foundations. Exhaust emissions from construction equipment would include oxides of nitrogen, volatile organic compounds, carbon monoxide, and PM-10. Due to the short-term nature of the construction activities, local impacts on air quality are expected to be minor. Construction of the Project is not expected to have any long-term or regionally significant impacts on air quality.

Operation of the transmission line is expected to have negligible impacts on air quality. 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.

Transmission line maintenance and inspection activities would include periodic aerial and ground inspections. During ground inspections, maintenance vehicles would drive along the transmission line ROW making periodic stops to inspect the structures, insulators, and conductors. Air quality impacts during maintenance and inspection activities would be negligible.

7.5.2 Water Resources

Several rivers, streams, and ditches are crossed by the Preferred and Alternative Routes in each Project section. Water resources are identified on Figure 7.5-1. Some rivers and streams are designated Public Waters and listed in the Public Water Inventory (PWI) by the State of Minnesota and are under the regulatory jurisdiction of the MDNR. The statutory definition of the PWI can be found in Minn. Stat. § 103G.005, Subd. 15 and 15a. A permit from the MDNR is required to cross these features. Some lakes and wetlands also are listed in the PWI. No lakes would be crossed by the Project, although some of the PWI wetlands may lie within a route. The Applicant would obtain utility crossing permits from the MDNR for any of the PWI water or wetland crossed.

Minn. R. 6105.0180 regulates special use areas including the Minnesota Wild, Scenic, and Recreational Rivers system. According to Minn. R. 6105.0060:

- Wild rivers are those that “exist in a free-flowing state with excellent water quality and with adjacent lands that are essentially primitive”;
- Scenic rivers are those that “exist in a free-flowing state with adjacent lands that are largely undeveloped”; and
- Recreation rivers are those that “may have undergone some impoundment or diversion in the past and that may have adjacent lands which are considerably developed, but that are still capable of being managed” under the system.

Transmission line crossings of these designated resources require a permit and must follow existing corridors across water features wherever feasible.

Section 10 of the Rivers and Harbors Appropriation Act of 1899 is administered by the USACE. Under Section 10, a permit is required in order to construct any structure that crosses in, over, or below any “navigable water of the U.S.” Navigable waters of the U.S. is defined by the USACE as “those waters subject to the ebb and flow of the tide shoreward to the mean high water mark and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.” Within the Project area, the Mississippi and Black Rivers (Wisconsin) are considered “navigable waters” that would be crossed by the Project. A Section 10 permit would need to be obtained from USACE for these river crossings.

Section 303(d) of the federal Clean Water Act (CWA) 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, which are described as “impaired.” Reasons for impairment in the Project area include turbidity, polychlorinated biphenyls, mercury, fecal coliform, perfluorooctane sulfonate, and acetochlor. This Project would have the potential to increase turbidity through increased sedimentation from construction activities. Turbidity is the only pollutant on the MPCA impairment list that could be generated by this Project.

According to the federal CWA, a proposed project that requires a federal permit for any activity that may result in a discharge to navigable waters of the U.S. must first obtain a state Section 401 water quality certification to ensure the project would comply with state water quality standards. Federal permits include the USACE Section 10 and 404 permits. Section 401 of the federal CWA grants state agencies the authority to require certification of compliance with state and federal water quality regulations. In Minnesota, the MPCA implements Section 401 compliance.

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, the function and maintenance of transmission structures could be affected within the floodplain during a flood event. The FEMA 100-year floodplains are found at several of the river crossings in the Project area.

Wetlands perform many important hydrologic functions, such as flood abatement, maintaining stream flows, slowing and storing floodwaters, stabilizing stream banks, nutrient removal and uptake, groundwater drainage and recharge, sediment control, and water quality. Wetlands also serve as important resources for wildlife habitat and food web support. A number of wetland classification systems have been developed, but the Cowardin et al. (1979) classification methods described by the USFWS are the most widely recognized system and have been used for wetland classification within the regional area. Of the five wetland systems described by Cowardin et al., palustrine, riverine, and lacustrine systems occur within the Project area. Palustrine refers to smaller (less than 20 acres), shallow (less than 6.5 feet) wetlands. Riverine wetlands are those associated with streams and rivers. Lacustrine wetlands are larger wetlands typically associated with open water areas.

Pursuant to Section 404 of the CWA, the USACE defines wetlands in 33 CFR 328.3b as those areas that are “inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Jurisdictional wetlands must possess three essential *characteristics*: “(1) a dominance by hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology” (USACE 1987, 2008). For an area to be classified as a jurisdictional wetland under the federal guidelines, all of the above criteria must be met, and the wetland must have a hydrologic connection to a water of the U.S.

In Minnesota, both jurisdictional and non-jurisdictional wetlands are protected under Minn. R. ch. 8420, the Wetland Conservation Act (WCA). Although the Board of Water and Soil Resources (BWSR) administers the WCA on a statewide basis, LGUs implement the WCA locally. Wetlands may also be regulated by the MDNR if they are listed as PWI wetlands. The WCA regulates wetland draining and filling activities on all wetlands not covered by the MDNR Public Waters Work Permit Program. The MDNR requires a permit to cross or change or diminish the course, current, or cross section of public

waters by any means, including filling, excavating, or placing of materials in or on the beds of public waters. Local governments may also have their own wetland ordinances. The USFWS produced maps of wetlands based on aerial photographs and the Natural Resource Conservation Service (NRCS) soils surveys starting in the 1970s. These wetlands comprise the National Wetland Inventory (NWI). Wetlands identified on the NWI may be inconsistent with current wetland conditions; however, the NWIs are the most accurate and readily available database of wetland resources within the Project area. Wetland impacts for the Project area have been initially assessed using the NWI maps.

7.5.2.1 Existing Environment

Streams

All streams that would be crossed by the 150-foot ROW of the Preferred Route are listed in Table 7.5-1. The Preferred Route crosses 15 streams, nine of which are the PWI streams under the regulatory jurisdiction of MDNR (MDNR 2009). Dry Run Creek, the North Fork of the Zumbro River, Belle Creek, an unnamed tributary to Belle Creek, an unnamed tributary to the Little Cannon River, Butler Creek, Little Cannon River, Cannon River, and Pine Creek are designated as PWI streams (MDNR 2009).

Table 7.5-1:
Streams Crossed by the 150-foot ROW of the Preferred Route

| Waterbody Name | Number of Crossings | PWI Stream (Yes/No) |
|---|---------------------|---------------------|
| Unnamed Perennial/Intermittent Stream, Tributary to Zumbro River, North Branch of Middle Fork | 2 | No |
| Unnamed Perennial/Intermittent Stream, Tributary to Dry Run Creek | 3 | No |
| Dry Run Creek | 1 | Yes |
| Unnamed Perennial/Intermittent Stream, Tributary to Zumbro River, North Fork | 8 | No |
| Zumbro River, North Fork | 1 | Yes |
| Belle Creek | 1 | Yes |
| Unnamed Perennial/Intermittent Stream, Tributary to Belle Creek | 1 | Yes |
| Unnamed Perennial/Intermittent Stream, Tributary to Belle Creek | 3 | No |
| Unnamed Perennial/Intermittent Stream, Tributary to Little Cannon River | 3 | No |
| Unnamed Perennial/Intermittent Stream, Tributary to Little Cannon River | 4 | Yes |
| Butler Creek | 1 | Yes |
| Little Cannon River | 1 | Yes |
| Cannon River | 2 | Yes |
| Pine Creek | 3 | Yes |
| Unnamed Perennial/Intermittent Stream, Tributary to South Branch Vermillion River | 1 | No |

Three surface waters crossed by the Preferred Route are designated as impaired waters by the MPCA (MPCA 2009). The Little Cannon River is designated as impaired due to *E. coli*, Butler Creek is designated as impaired due to *E. coli* and turbidity and the North Fork of the Zumbro River is designated as impaired due to turbidity. The Applicant anticipates that all streams and surface water within the Preferred Route would be spanned and that no structures would be located within these water features.

All streams crossed by the 150-foot ROW of the Alternative Route are listed in Table 7.5-2. The Alternative Route crosses 19 streams, nine of which are PWI streams under the regulatory jurisdiction of MDNR (MDNR 2009). Chub Creek, the Cannon River, Spring Creek, Prairie Creek, an unnamed tributary to Prairie Creek, an unnamed tributary to the Little Cannon River, the North Fork of the Zumbro River, Spring Creek, and Shingle Creek are classified as PWI streams (MDNR 2009).

Table 7.5-2:
Streams Crossed by 150-foot ROW of the Alternative Route

| Water Body Name | Number of Crossings | PWI Stream (Yes/No) |
|--|---------------------|---------------------|
| Unnamed Perennial/Intermittent Stream, Tributary to Vermillion River | 1 | No |
| Unnamed Perennial/Intermittent Stream, Tributary to Pine Creek | 2 | No |
| Unnamed Perennial/Intermittent Stream, Tributary to Cannon River | 1 | No |
| Chub Creek | 1 | Yes |
| Cannon River | 1 | Yes |
| Spring Creek | 1 | Yes |
| Prairie Creek | 1 | Yes |
| Unnamed Perennial/Intermittent Stream, Tributary to Prairie Creek | 2 | No |
| Unnamed Perennial/Intermittent Stream, Tributary to Prairie Creek | 1 | Yes |
| Little Cannon River | 5 | No |
| Unnamed Perennial/Intermittent Stream, Tributary to Little Cannon River | 1 | No |
| Unnamed Perennial/Intermittent Stream, Tributary to Little Cannon River | 1 | Yes |
| Unnamed Perennial/Intermittent Stream, Tributary to Zumbro River, North Fork | 19 | No |
| Zumbro River, North Fork | 1 | Yes |
| Spring Creek | 1 | Yes |
| Unnamed Perennial/Intermittent Stream, Tributary to Spring Creek | 3 | No |
| Shingle Creek | 1 | Yes |
| Unnamed Perennial/Intermittent Stream, Tributary to Shingle Creek | 1 | No |
| Unnamed Perennial/Intermittent Stream, Tributary to Zumbro River, North Fork | 2 | No |

Three water bodies that the Alternative Route crosses are considered impaired waters by the MPCA (MPCA 2009). Chubb Creek and Prairie Creek are impaired due to fecal coliform, and the Cannon River is impaired due to fecal coliform and mercury. The Applicant anticipates that all streams and other surface water features within the Alternative Route would be spanned and that no structures would be located within these waters.

Wetlands

A summary of wetlands that would be crossed by the 150-foot ROW of the Preferred Route is shown in Table 7.5-3. The 150-foot ROW of the Preferred Route crosses seven different types of NWI wetlands in 16 different locations, including one location mapped as a MDNR PWI wetland. The total area of NWI wetlands within the 150-foot ROW of the Preferred Route is approximately 8.9 acres, or 1.3 percent of the total ROW acreage.

Table 7.5-3:
NWI Wetlands Crossed by 150-foot ROW of Preferred Route

| Wetland Type | Total NWI Wetlands | | | Number of MDNR PWI Wetlands Crossed |
|--------------|--------------------|--------------|----------|-------------------------------------|
| | Count | Acres in ROW | % of ROW | |
| NWI Total | 16 | 8.9 | 1.3 | 1 |
| PEMC | 7 | 3.6 | 0.5 | 0 |
| PEMCd | 2 | 1.2 | 0.2 | 0 |
| PSS1C | 3 | 1.4 | 0.2 | 0 |
| PEMCx | 1 | 1.0 | 0.2 | 0 |
| R3UBH | 1 | 0.8 | 0.1 | 0 |
| L1UBHh | 1 | 0.4 | 0.06 | 1 |
| PSS1B | 1 | 0.5 | 0.08 | 0 |

NWI Wetlands based on NWI data; % of ROW calculated as acreage within the ROW; Source: USFWS NWI, MDNR PWI.

PEMC—Palustrine, Emergent, Seasonally Flooded wetlands.

PEMCd—Palustrine, Emergent, Seasonally Flooded, Partially Drained/Ditched wetlands.

PSS1C—Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded wetlands.

PEMCx—Palustrine, Emergent, Seasonally Flooded, Excavated wetlands.

R3UBH—Riverine, Upper Perennial, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded wetlands.

L1UBHh—Lacustrine, Limnetic, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded wetlands.

PEMCh—Palustrine, Emergent, Seasonally Flooded, Diked/Impounded wetlands.

PSS1B—Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Saturated wetlands.

A summary of wetlands crossed by the Alternative Route 150-foot ROW is shown in Table 7.5-4. The 150-foot Alternative Route ROW crosses 13 different types of NWI wetlands in 29 different locations

totaling 16 acres, or 1.82 percent of the total ROW acreage. No areas are mapped as MDNR PWI wetlands.

FEMA 100-Year Floodplains

A summary of the FEMA 100-year floodplains crossed by the 150-foot ROW of the Preferred and Alternative Routes is shown in Table 7.5-5.

The Preferred Route crosses the FEMA 100-year floodplains at four locations. The total area of floodplains within the 150-foot ROW would be 30.3 acres. Three of the crossed floodplains are longer than the typical span distance of 1,000 feet. The floodplain associated with the Little Cannon River would require one structure, the floodplain associated with Pine Creek would require four structures, and the floodplain associated with the North Fork of the Zumbro River would require one structure to be placed in the floodplains.

Table 7.5-4:
NWI Wetlands Crossed by 150-foot ROW of Alternative Route

| Wetland Type | Total NWI Wetlands | | | Number of MDNR PWI Wetlands Crossed |
|-------------------|--------------------|--------------|----------|-------------------------------------|
| | Count | Acres in ROW | % of ROW | |
| NWI Total | 29 | 16.00 | 1.82 | 0 |
| PEM/FO1Cd | 1 | 1.06 | 0.12 | 0 |
| PEMA | 1 | 0.42 | 0.05 | 0 |
| PEMA _d | 2 | 0.13 | 0.01 | 0 |
| PEMB | 1 | 0.68 | 0.08 | 0 |
| PEMC | 9 | 3.20 | 3.20 | 0 |
| PEMC _d | 3 | 3.90 | 3.90 | 0 |
| PFO1/EMA | 1 | 0.72 | 0.08 | 0 |
| PFO1/EMB | 1 | 2.14 | 0.24 | 0 |
| PFO1A | 4 | 1.39 | 0.16 | 0 |
| PFO1C | 1 | 0.48 | 0.05 | 0 |
| PSS1C | 3 | 0.96 | 0.11 | 0 |
| PUBG _h | 1 | 0.09 | 0.01 | 0 |
| R2UBH | 1 | 0.83 | 0.09 | 0 |

NWI Wetlands based on NWI data; percentage of route calculated as acreage within the ROW; Source: USFWS NWI, MDNR PWI.
 PEM/FO1Cd—Palustrine, Emergent, Forested, Broad-Leaved Deciduous, Seasonally Flooded, Partially Drained/Ditched wetlands.
 PEMA—Palustrine, Emergent, Temporarily Flooded wetlands.
 PEMA_d—Palustrine, Emergent, Temporarily Flooded, Partially Drained/Ditched wetlands.
 PEMB—Palustrine, Emergent, Saturated wetlands.
 PEMC—Palustrine, Emergent, Seasonally Flooded wetlands.

Table 7.5-4:
NWI Wetlands Crossed by 150-foot ROW of Alternative Route

| Wetland Type | Total NWI Wetlands | | | Number of MDNR PWI Wetlands Crossed |
|--------------|--------------------|--------------|----------|-------------------------------------|
| | Count | Acres in ROW | % of ROW | |

PEMCD—Palustrine, Emergent, Seasonally Flooded, Partially Drained/Ditched wetlands.

PFO1/EMA—Palustrine, Forested, Broad-Leaved Deciduous, Emergent, Temporarily Flooded wetlands.

PFO1/EMB—Palustrine, Forested, Broad-Leaved Deciduous, Emergent, Saturated wetlands.

PFO1A—Palustrine, Forested, Broad-Leaved Deciduous, Temporarily Flooded wetlands.

PFO1C—Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded wetlands.

PSS1C—Palustrine, Scrub-Shrub, Seasonally Flooded, wetlands.

PUBGh—Palustrine, Unconsolidated Bottom, Intermittently Exposed, Diked/Impounded wetlands.

R2UBH—Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded wetlands.

Table 7.5-5:
FEMA 100-Year Floodplains Crossed by the 150-foot ROW of the Preferred and Alternative Routes

| Route | Preferred Route | Alternative Route |
|--|--|---|
| Length (mi) | 36.1 | 47.1 |
| Acres in ROW ^{1, 2} | 656.5 | 856.3 |
| Number of Floodplains Crossed | 4 | 6 |
| Floodplains within ROW (acres) | 30.3 | 20.9 |
| Percent of ROW that crosses Floodplains | 4.6 | 2.5% |
| Number of Floodplain Crossings over 1,000 feet | 4 | 2 |
| Lengths (feet) of Floodplains over 1,000 feet crossed by ROW | 2,231—Little Cannon River 2,431—Cannon River 4,548—Pine Creek 1,748—Zumbro River (North Fork) | 1,841—Pine Creek 1,276—South Tributary of Vermillion Creek |

¹ The Applicant is requesting a 150-foot-wide ROW, 75 feet on either side of structure. Additional ROW may be required in special situations.

² ROW acreage was calculated based on a width of 150 feet multiplied by the length of the route centerline.

³ Temporary construction impacts were determined using 1 acre per span. A span is defined as the distance from a structure to a structure.

The Alternative Route crosses the FEMA 100-year floodplains at six locations, and the total area of floodplains within the 150-foot ROW is 20.9 acres. Two of the six floodplain areas crossed are longer than the typical span distance of 1,000 feet. The floodplains associated with Pine Creek and Vermillion Creek would each require one structure to be placed in the floodplain. These structures, as well as those mentioned above, will displace less than 100 cubic feet of flood storage volume each.

BWSR Easements

No BWSR easements are crossed by the 150-foot Preferred Route ROW.

One BWSR perpetual easement is crossed by the 150-foot ROW of the Alternative Route. The easement, located approximately 2.75 miles southeast of Wanamingo, is approximately 0.75 mile southwest of the intersection of 460th Street and 135th Avenue in Goodhue County. It is a marginal cropland perpetual easement approximately 400 feet long where it would be spanned by the Alternative Route.

7.5.2.2 Impacts and Mitigation

The following describes impacts and mitigation strategies related to streams, wetlands, the FEMA floodplains, and the BWSR easements in the Project area.

Streams

The Applicant anticipates that all streams and other surface water features within the Preferred Route would be spanned and that no structures would be located within these waters. Therefore, no permanent impacts are anticipated.

Temporary impacts to streams could potentially include sediments reaching surface waters during construction due to ground disturbance by excavation, grading, and construction traffic. Dewatering of holes drilled for transmission structures also could occur. These activities could temporarily degrade water quality to waters in the area due to increased turbidity, including in waters that are already considered impaired due to turbidity. Streams that are crossed by the Preferred Route that are considered impaired due to turbidity are Butler Creek and the North Fork of the Zumbro River. None of the streams that are crossed by the Alternative Route are considered impaired due to turbidity.

Impacts to streams would be avoided and minimized by implementing appropriate sediment control practices and best management practices. These practices would be detailed in the National Pollutant Discharge Elimination System (NPDES) permit and the Storm Water Pollution Prevention Plan (SWPPP) that would be completed prior to the start of construction. Post-construction, there would be no significant impact on surface water quality because wetland impacts would be minimized and mitigated, disturbed soil would be restored to previous conditions, and the amount of land area converted to an impervious surface would be small.

The Applicant would 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 would be completed according to the NPDES permit requirements. Practices may include the following activities:

- Containing 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;

- Locating structures and disturbed areas at least 300 feet from rivers and lakes with the exception of the major river crossings; and
- Prohibiting wastewater from concrete batching or other construction operations from entering streams or other surface waters without using turbidity control methods (i.e., wastewater would be free of settleable material).

Wetlands

Permanent impacts to wetlands would occur if structures are placed in a wetland, or if wetlands undergo permanent vegetative changes within the 150-foot ROW. Permanent fill also would potentially impact wetland hydrology. The Applicant would obtain necessary permits from the USACE, the WCA, and the MDNR for any wetland impacts.

Permanent impacts would be minimal as a result of structure placement for either the Preferred or Alternative Route. Maximizing span length is a strategy that would minimize the number of structures that would be required in the wetland. Another strategy to minimize wetland impacts would be to place new structures at the exact locations of old structures to avoid creating impacts at new sites.

Permanent impacts to wetlands also would occur if wetlands undergo permanent vegetative changes. Tall growing trees would be removed throughout the entire 150-foot ROW during construction of the transmission line, including trees in wetlands. After construction, vegetation maintenance procedures would be implemented under transmission lines to prohibit the establishment of new trees. Mitigation may need to be developed to account for the clearing of trees in forested wetlands. The Applicant anticipates that no permanent impacts to forested wetlands would occur for the Preferred Route, as there are not any present within the 150-foot ROW. Within the 150-foot ROW of the Alternative Route, the Applicant anticipates tree clearing in approximately 5.8 acres forested wetlands (classified as PEM/FO1Cd, PFO1/EMA, PFO1/EMB, PFO1A, PFO1C, wetlands in Table 7.5-4).

Temporary impacts to wetlands may occur if the wetlands need to be crossed during construction of the transmission line. Staging or stringing setup areas would be placed outside of water resources wherever possible. The Applicant would avoid major disturbance of individual wetlands and drainage systems during construction by spanning wetlands and drainage systems, where possible. Wetland vegetation would be restored following construction.

Temporary impacts were calculated based on the total acreage of all wetland types within the 150-foot ROW along the entire length of the centerline. Actual impact acreages may change for numerous reasons including additional construction access roads or a smaller construction footprint in the ROW. The Applicant anticipates 12.6 acres of temporary impacts to wetlands, or approximately 1.9 percent of the ROW, as a result of the implementation of the Preferred Route. The Applicant anticipates 19.3 acres of temporary impacts to wetlands or approximately 2.2 percent of the ROW, as a result of the implementation of the Alternative Route.

The Applicant would draw on several options during construction to minimize impacts:

- When possible, construction would be scheduled during the winter months when the ground is frozen.
- Crews would attempt to access a wetland with the least amount of physical impact to the wetland (e.g., shortest route).
- The structures would be assembled on upland areas before they are brought to the site for installation whenever feasible.
- When construction during winter is not possible, construction mats would be used where wetlands would be impacted. Additionally, the Applicant has access to an all-terrain construction vehicle, which is designed to minimize soil compaction and damage in damp areas. Wetlands impacted would be restored as required by the USACE, the MDNR, and the BWSR.

FEMA 100-Year Floodplains

Structures in the FEMA floodplains would displace water storage volume within the floodplain. For the Preferred Route, nine structures would be placed within the FEMA floodplains. One structure would be placed in the floodplains associated with the Little Cannon River, three structures in the floodplains associated with the Cannon River, four structures in the floodplains associated with Pine Creek, and one structure in the floodplains associated with the North Fork of the Zumbro River. For the Alternative Route, two structures would be placed within the FEMA floodplains. One structure would be placed in the floodplains associated with Pine Creek and one structure would be placed in the floodplains associated with the South Tributary of Vermillion Creek. Each structure would displace less than 100 cubic feet of flood storage volume. Based on the low volume of potential floodwater displacement, the structures are not anticipated to have an effect on flooding. As with structure placement in wetlands, the Applicant would coordinate with the USACE and the MDNR to identify a final appropriate structure placement in floodplains.

Minnesota Board of Water and Soil Resources Easements

No impacts to the BWSR easements are anticipated for the Preferred Route as no BWSR easements are crossed. No impacts to the BWSR easements along the Alternative Route are anticipated because the easements are shorter than the typical span distance of 1,000 feet.

7.5.3 Flora

Data on vegetation that currently and historically exists in the Project area were gathered from the MDNR's Minnesota County Biological Survey (MCBS). The MCBS is a MDNR program that identifies and documents significant natural areas, including the ecological characteristics of sites and the presence of rare species. MCBS biologists documented remnant native ecosystems and determined the historic vegetation based upon sampling relevant plots in the Project area between 1987 and 2008 (MDNR 2009).

Noxious weeds are regulated under Minn. Stat. § 18.75 to 18.88. Noxious weeds can compete with native or other preferred plant species for resources and habitat and can change or degrade sensitive or

important habitat features. The introduction or spread of noxious weeds can be accelerated or exacerbated by transporting and using construction or field equipment that is contaminated with seeds or other propagating materials from noxious weeds. Disturbed soil surfaces provide opportunities for noxious weeds to establish and compete with native and desired non-native plant species. This discussion identifies noxious weeds recognized by the state of Minnesota and by counties within the Hampton–North Rochester 345 kV section of the Project.

7.5.3.1 Existing Environment

According to the MDNR Ecological Classification System (ECS), ecological land classifications are used to identify, describe, and map progressively smaller areas of land with increasingly uniform ecological features. The majority of the Preferred Route lies within the Rochester Plateau Subsection of the Paleozoic Plateau Section. A small portion (approximately 5 miles) of the Preferred Route, from approximately the crossing of the Canon River south to Skunk Hollow Road, lies within and/or adjacent to the Blufflands Subsection of the Paleozoic Plateau Section. In addition, a small portion of the route (approximately 4 miles), from 280th Street south to Cannon Falls, is located within the Oak Savanna Subsection of the Minnesota and Northeast Iowa Morainal Section (MIM Section).

Historically, the Paleozoic Plateau Section was influenced by slope, aspect, flooding, and fire frequency, which influenced the distribution and condition of the dominant vegetation communities associated with the related subsection. The Rochester Plateau Subsection was historically characterized by two dominant vegetation communities: tallgrass prairie and bur oak savanna. The Blufflands Subsection was historically characterized by several dominant forested communities including: red oak, white oak, shagbark hickory, basswood, and black walnut; and tallgrass prairie and bur oak savanna communities associated with the upper slopes and ridgelines. The Oak Savanna Subsection historically contained tallgrass prairie and bur oak savanna communities. Areas protected from fire such as steeper slopes or dissected areas were typically dominated by oak forests with the exception of southwest facing bluffs and slopes which were typically dry prairie. Red oak-white oak-shagbark hickory-basswood forests were present on more moist slopes, and red oak-basswood-black walnut forests were present in protected valleys (MDNR 2005).

Wetland habitats in the Project area are commonly associated with surface waters and include floodplain forests, wet forests, lakeshores, wet meadows, and marshes. Floodplain forests are riparian hardwood forests located along the Mississippi River Valley and its tributaries and may include green ash, American elm, cottonwood, and hackberry. Wet forests are in areas of groundwater seepage, often on level stream terraces and at the base of slopes. The canopy is often dominated by black ash, basswood, and American elm with an herbaceous layer containing marsh marigold (*Caltha palustris*), fowl manna grass (*Glyceria striata*), and sedges. Lakeshore systems may contain sandbar willow (*Salix exigua*) with an understory of rushes (*Juncus* spp.) and sedges. Wet meadows are graminoid, forb, or shrub-dominated communities located near a marsh or open water. Species may include arrow-leaved tearthumb (*Polygonum sagittatum*), fen wiregrass sedge (*Carex lasiocarpa*), prairie sedge (*Carex prairea*), and tussock sedge (*Carex stricta*). Marshes are emergent herbaceous communities and can be heavily dominated by cattails (*Typha* spp.), bulrushes (*Scirpus* spp.), and sedges.

Since European settlement, the majority of the historical vegetation in the Project area has been converted or fragmented from the conversion of lands to support agriculture and development. The existing land cover types associated with the Preferred Route include: cropland (57 percent); grassland (24 percent); urban (13 percent); forestland (4 percent); shrubland (1 percent); and aquatic (1 percent). The land cover types associated with the Alternative Route include cropland (86 percent); grassland (12 percent); and forestland (1 percent); with less than 1 percent shrubland, aquatic and urban. Sixty-one percent of the Preferred Route has been converted to cropland. The second most prominent land cover is grassland which occurs along 20 percent of the Preferred Route. Forested areas occur less frequently and occur on 6 percent of the Preferred Route. Types and acreages of wetlands that occur in the Preferred Route are identified in Chapter 7.5.2. Figure 7.1-2 and Figure 7.2-2 show ECS Classifications and Land Cover, respectively, located along the Preferred Route. Figure 7.2-1 shows current land cover in the Hampton–North Rochester 345 kV section. Qualified biologists will conduct route-specific surveys and will note and describe any occurrences of native vegetation communities in the Project area.

Eleven species of noxious weeds are recognized by Minn. R. 1505.0730. The 11 species are listed in Table 7.5-6. These species must be controlled or eradicated as required in Minn. Stat. § 18.78. There also are two restricted noxious weed species listed by the state of Minnesota whose only feasible means of control is the prohibition on the importation, sale and transport of them or their propagating parts in the state except as provided by Minn. Stat. § 18.82. These two species are common buckthorn (*Rhamnus cathartica*) and glossy buckthorn (*Rhamnus frangula*). There are an additional 52 species of noxious weeds listed by the state on a secondary noxious weed list. This secondary list of noxious weeds may be added to a county prohibited or restricted list by following the process in Minn. R. 1505.0750.

Table 7.5-6:
Minnesota Prohibited Noxious Weeds

| Common Name | Scientific Name |
|----------------------|--|
| Garlic mustard | <i>Alliaria petiolata</i> |
| Hemp | <i>Cannabis sativa</i> |
| Plumeless thistle | <i>Carduus acanthoides</i> |
| Musk thistle | <i>Carduus nutans</i> |
| Canada thistle | <i>Cirsium arvense</i> |
| Bull thistle | <i>Cirsium vulgare</i> |
| Field Bindweed | <i>Convolvulus arvensis</i> |
| Leafy spurge | <i>Euphorbia esula</i> |
| Purple loosestrife | <i>Lythrum salicaria, virgatum, or any combination</i> |
| Perennial sowthistle | <i>Sonchus arvensis</i> |
| Poison ivy | <i>Toxicodendron radicans</i> |

Source: Minnesota Department of Agriculture 2009.

Dakota County regulates three noxious weeds from the state's secondary weed list (Table 7.5-7). Rice County regulates five noxious weeds from the state secondary noxious weed list (Table 7.5-8). Goodhue County does not list any of the secondary noxious weeds.

Table 7.5-7:
Dakota County Prohibited Noxious Weeds

| Common Name | Scientific Name |
|----------------|-------------------------|
| Cocklebur | Xanthium pennsylvanicum |
| Wild sunflower | Helianthus annuus |
| Velvetleaf | Abutilon theophrasti |

Source: Minnesota Department of Agriculture 2009.

Table 7.5-8:
Rice County Prohibited Noxious Weeds

| Common Name | Scientific Name |
|-----------------|-------------------------|
| Cocklebur | Xanthium pennsylvanicum |
| Jimsonweed | Datura stramonium |
| Yellow nutsedge | Cyperus esculentus |
| Wild sunflower | Helianthus annuus |
| Velvetleaf | Abutilon theophrasti |

Source: Rice County 2009.

7.5.3.2 Impacts and Mitigation

Impacts to existing vegetation communities caused by implementation and operation of the proposed Project include both direct and indirect temporary and permanent impacts. Site preparation and installation of support poles may impact 20,000 square feet (less than 0.5 acre) of habitat at each structure location. Except for the final footprint of the installed structure, the majority of the disturbed area at each structure would be reclaimed and allowed to revegetate naturally to pre-construction conditions. Temporary impacts to existing vegetation communities include localized physical disturbance caused by the use of construction equipment during site preparation including grading, excavation, and soil stockpiling. The establishment and use of staging areas and stringing areas also would temporarily impact flora by concentrating surface disturbance and equipment use. Grading could occur at the staging

areas if these areas are not located in previously disturbed sites. Clearing for access roads would be limited as much as practicable, to a maximum of 20 feet wide between pole locations. In forested areas, only trees or stands that interfere with safety and equipment operation would be removed. Permanent vegetative changes would take place at each pole footprint (55 square feet) and within the 150-foot ROW that occurs in the forested communities. The 150-foot transmission line ROW would be maintained to restrict the establishment and growth of trees and shrubs that have the potential to interfere with the operation and maintenance of the transmission line. Collocating with existing corridors through wooded areas would reduce the impact to trees on the river valley bluffs. After the ROW is established, it is typical to control and manage vegetation using mechanical and herbicide treatments following a prescribed management plan. Vegetation that does not interfere with the safe operation of the transmission line would be allowed to establish within the 150-foot ROW.

The Applicant would continue to work with the MDNR and the USFWS to minimize and avoid impacts to sensitive flora along the route. The Applicant would attempt to avoid, minimize, and/or mitigate impacts to any areas known to support native vegetation or special status species, as practicable. When native vegetation communities cannot feasibly be spanned, the Applicant would minimize the number of structures within these communities. When necessary, areas disturbed due to construction activities would be restored to pre-construction contours and would be reseeded with a seed mix agreed to by the landowner.

As an additional mitigation/conservation measures, the Applicant would comply with Minnesota noxious weed laws as described in the Minn. R. ch. 1505 and would observe county weed lists, where appropriate. The Applicant would provide for weed control associated with substation and switch locations in a manner that would reduce the spread of weeds onto adjacent agricultural land during operation of the transmission line.

7.5.4 Fauna

Wildlife populations that occur within the Project area include game and non-game species. Game populations are managed and regulated by the MDNR for hunting and fishing, and are an important part of Minnesota's recreation and rural economy. Non-game species contribute to Minnesota's biological diversity and are afforded protection or support at the federal level under acts such as the Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703–712) and the Fish and Wildlife Conservation Act of 1980 (16 USC 2901–2911). The MBTA governs the taking, killing, possession, transportation and importation of migratory birds, their eggs, parts and nests. The Fish and Wildlife Conservation Act supports Birds of Conservation Concern (BCC), which are species identified by USFWS as likely to become listed under the Endangered Species Act without additional conservation action. An evaluation was conducted to determine which wildlife species likely occur within the Project area in order to understand the potential effects of the Project on those species.

The evaluation relied on several sources of existing information about wildlife species within the region. Species records and range maps available through the MDNR, USFWS, and/or the literature were used to develop a comprehensive list of common wildlife species likely to occur within the Project area.

In addition, the Project area was reviewed for conservation and management areas that provide high quality wildlife habitat. Lands managed and maintained for wildlife habitat, as well as habitat occurring naturally on the landscape, are designated under several different state and federal organizations and programs. The USFWS has many lands that protect wildlife and enhance wildlife habitat. National Wildlife Refuges (NWR) are owned and managed by the USFWS to conserve important wildlife habitat. Waterfowl Production Areas (WPA) and easements are owned or managed by the USFWS to promote waterfowl populations and to conserve valuable wetlands. USFWS identifies and recognizes Grassland Bird Conservation Areas (GBCA), which are large areas of relatively intact grassland habitat important for maintaining and supporting grassland bird populations that have suffered decline from habitat loss. Similarly, the MDNR has several lands and programs that support wildlife including Wildlife Management Areas (WMA), Aquatic Management Areas (AMA), designated trout streams, Scientific and Natural Areas (SNA), and MCBS Areas of Biodiversity Significance. WMAs are state owned lands established and managed by MDNR to protect lands and waters with high potential for wildlife production, hunting, fishing, trapping and other recreational activities. AMAs protect and manage aquatic and wetland habitats that are critical for fish, other aquatic life, water quality, intrinsic biological value, public fishing, and other compatible recreational uses. Designated trout streams are streams identified by Minnesota statute that have special restrictions of recreation fishing activities designed to protect and enhance Minnesota's trout resources. SNAs are lands managed by MDNR for the protection of rare and exceptional natural resources. These areas are managed for public education and scientific research and intensive recreational activities are discouraged (i.e., there are no amenities, trails, etc.). MCBS Areas of Biological Significance are ranked as outstanding, high, moderate, or below based on the presence of rare species populations, the size and condition of native plant communities within the site, and the landscape context of the site. The biodiversity ranks help to guide conservation and management. In addition to federal and state lands, BirdLife International and the National Audubon Society recognize Important Bird Areas (IBAs) which provide critical habitat for migrating and breeding birds. Lastly, wetlands provide important wildlife habitat and a discussion of wetland resources in the Project area is provided in Chapter 7.5.2.

Similarly, several federal and state agricultural land conservation easement programs provide important foraging, nesting, brood rearing, and stop-over habitats for a wide variety of terrestrial wildlife species. The Conservation Reserve Program (CRP) is a federal program that converts highly erodible or marginal farmland to native grassland habitats. Easements last 10 to 15 years and are intended to reduce erosion and improve water quality. The Conservation Reserve Enhancement Program (CREP) is another federal program that places land into easements (often permanent), typically in coordination with the Re-invest in Minnesota Program (RIM). RIM is a state-initiated program that has similar habitat goals as CRP and CREP. RIM easements are long-term or permanent, and target watershed quality improvement and wildlife habitat restoration. Lastly, the Wetland Reserve Program (WRP) is another federal land easement program administered by the NRCS to restore and protect wetlands on private lands, which in turn provides habitat for wildlife.

Conservation, management, and easement lands within 1 mile of the Project's Preferred and Alternative Route centerlines were evaluated to determine potential impacts on fish and wildlife species. The Avian Power Line Interaction Committee suggests that the effects of transmission lines on avian species are negligible beyond 1 mile (APLIC 1994). As such, a distance of 1 mile was used to evaluate potential

impacts for all fish and wildlife species, as well as habitat. The following sections summarize these findings as they relate to the Preferred and Alternative Routes.

7.5.4.1 Existing Environment

Wildlife throughout the Project area consists of birds, mammals, fish, reptiles, amphibians, mussels, and insects, both resident and migratory, which use the existing habitat for foraging, shelter, breeding, and/or stopover sites during migration. Species include those found in agricultural landscapes, prairie remnants, pasture, grasslands, forests, wetlands, and riparian areas. A complete list of common mammals, birds, reptiles, amphibians, and fish known to occur in this region of Minnesota is included in Appendix R. Figure 7.5-2 shows conservation easements and designated wildlife areas near the Preferred and Alternative Routes.

Preferred Route

A number of wildlife conservation and management areas, as well as several easement lands, occur along the Preferred Route of this section. The Woodbury WMA is 76 acres in size and is located within 1 mile of the Preferred Route. As much as 60 acres of the property is restored to native prairie which provides nesting habitat for grassland birds. One AMA, the Gemini AMA, is an 83 acre easement located along the Cannon River, in the northwest corner of Cannon Falls. Approximately 10 acres of the AMA is located within the route. Pine Creek is a MDNR-designated trout stream that is crossed by the Preferred Route southeast of Hampton. The eastern edge of the Lake Byllesby IBA occurs within 1 mile of the where the Preferred Route crosses the Cannon River. This shallow lake, owned by MDNR, serves as important habitat for a variety of migratory birds including ducks, herons, geese, gulls, terns, and shorebirds. In particular, the annual abundance and diversity of migrating shorebirds at the site is unmatched in the state (National Audubon Society 2009). Sandhill cranes (*Grus canadensis*), a species known to collide with transmission lines, have been observed near Lake Byllesby during breeding season, though no confirmed nesting records exist (NHIS 2009). Other recognized bird habitat within 1 mile of the Preferred Route includes two GBCAs. The first is located west of the Preferred Route west of Hampton, but is not crossed by the route. The other is located west of Zumbrota and its eastern edge is crossed for approximately 1 mile by the Preferred Route. Both GBCAs are classified as Type 3 areas, meaning they have a core area of at least 55 acres of grassland habitat at least 1/4 mile wide that, when combined with other grassland habitat within a 1.0-mile buffer, equal 20 percent total grassland. The core area is the Woodbury WMA as described above. Type 3 GBCAs have smaller core grassland habitat and less total percent grassland habitat than either Types 1 or 2. Easement lands that may provide wildlife habitat along the Preferred Route include 263 CRP lands located within 1 mile of the Preferred Route. Of these, 51 are located within the Preferred Route. Two CREP easements were identified within 1 mile of the Preferred Route. No other wildlife conservation and management areas or easement lands were identified within 1 mile of the Preferred Route for this section.

Alternative Route

Conservation and management areas within 1 mile of the Alternative Route include one IBA, two WMAs, one SNA, and three GBCAs. The Lake Byllesby IBA, described above for the Preferred Route, is located within 1 mile of the Alternative Route along this section, but is not crossed by it. Another area considered to provide potential wildlife habitat along the Alternative Route is the Cannon River crossing. The Alternative Route crosses the Cannon River approximately 2 miles west of the western edge of the Lake Byllesby IBA (described above). The Woodbury WMA, described above for the Preferred Route, also occurs within 1 mile and is east of the Alternative Route. In addition, the Warsaw WMA is within 1 mile of the Alternative Route along this section and is northeast of Dennison. The Warsaw WMA is comprised primarily of grassland with some scattered wetland patches, and management is intended to promote wildlife diversity in grassland and wetland communities. The North Fork Zumbro Woods SNA, described in further detail in Chapter 7.5.5 below, is approximately 0.5 mile north of the Alternative Route immediately west of where the route crossed State Route 60. Lastly, three GBCAs occur within 1 mile of the Alternative Route. All are classified as Type 3, as described above for the Preferred Route. One of the GBCAs is crossed by the Alternative Route for approximately 4 miles southeast of Wanamingo.

In addition to designated conservation and management areas, several land easements occur within 1 mile of the Alternative Route. Thirty-one CRP lands occur within the Alternative Route, whereas a total of 183 CRP lands are located within 1 mile of the Alternative Route. Similarly, one CREP land easement occurs within 1 mile of the Alternative Route.

7.5.4.2 Impacts and Mitigation

Construction of new transmission lines can affect fauna through temporary impacts, permanent impacts, and avian-specific impacts. Each of these potential impacts, as well as potential mitigation strategies and measures that can be used to minimize these impacts, are summarized below. Specific areas where impacts to fauna may occur along the Preferred and Alternative Routes of this section also are summarized.

Temporary impacts include displacement and habitat alteration caused by temporary disturbances and noise associated with construction activities. Such impacts are most likely to affect fauna at the proposed structure locations where activity would be most intense. Approximately 20,000 square feet (<0.5 acre) of temporary impact is anticipated at each new structure or 1.0 acre of temporary impact per span. Similarly, staging and stringing areas also have the potential to temporarily impact fauna within the Project construction area. Grading previously undisturbed sites for staging areas and clearing for access roads has the potential to temporarily impact wildlife by altering habitat. Clearing for access roads would be limited as much as practicable and should only require a maximum width of 20 feet. Such activities have the potential to impact small birds (e.g., eggs or nestlings) and small mammals that may be unable to avoid equipment. Many wildlife species would likely avoid the immediate area during construction. The distance that animals would be displaced is dependent on the species and the tolerance level of each individual. Based on the availability and suitability of other unaffected and similar habitat within and near the Project area, the potential temporary impacts to wildlife are not expected to cause a change in listing status or a detectable change in local populations.

Permanent impacts to fauna that may result from the construction of a new transmission line include habitat loss and fragmentation. Habitat loss and fragmentation primarily occurs when the new transmission line bisects large forest tracts that provide habitat for woodland species. Some species depend on large areas of undisturbed habitat and their survivability decreases as fragmentation increases. Fragmentation affects some wildlife species by creating barriers to daily movement. In addition, predation rates may increase among animals that are forced out of cover as they search for food and as the distance predators need to travel to penetrate large habitat areas decreases. Since the Preferred and Alternative Routes tend to follow existing corridors, such as roads, existing transmission lines, and field lines, the potential for substantial habitat loss and fragmentation is greatly reduced. Furthermore, clearing in forested areas will be limited to only those trees necessary to permit the passage of equipment and to maintain the appropriate cleared ROW width.

In addition to temporary and permanent construction impacts to fauna, transmission lines also have the potential to impact birds through electrocution and collision after construction is complete. Electrocution risk is addressed in project wide structure design elements that provide adequate clearance for perching birds. Avian protection standards that minimize the risk of bird electrocution are well documented in the following resources: the Avian Power Line Interaction Committee's (APLIC's) *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006), APLIC's *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994* (APLIC 1994), and APLIC's and USFWS' *Avian Protection Plan (APP) Guidelines* (APLIC and USFWS 2005). The structure designs used for this Project are consistent with the recommendations of these resources in that they provide adequate clearance from energized conductors to grounded surfaces and to other conductors. As such, avian electrocution risk is considered minimal and is not addressed in further detail. Conversely, avian collisions with new transmission lines are possible, and risk is assessed through an analysis of line span locations relative to surrounding habitats and bird movement. Risk is characterized on a site-specific basis by evaluating surrounding habitat, reviewing bird concentration and movement patterns, and examining structure configurations. Habitats are characterized by identifying historical and active nest sites, bird concentration areas, foraging areas, roost sites, and rookeries. Potential collision risk within the Project area is highest at spans or structures located in rural areas with native vegetation where the line crosses habitats typically used by area birds (e.g., rivers and wetlands) and human influence in the immediate vicinity is limited.

Several mitigation strategies and measures would be used to minimize temporary, permanent, and avian impacts on this Project. To mitigate potential impacts to wildlife the transmission line would span designated habitat, conservation areas, or other sensitive habitats wherever practical. In areas where complete spanning is not possible, the Applicant would minimize the number of structures placed in high quality wildlife habitat and would work with the MDNR and USFWS to come up with appropriate mitigation. Additionally, the Applicant would use construction mats to avoid soil compaction where appropriate (e.g., in wetland habitats). Areas temporarily disturbed by construction activities may be restored to pre-construction contours and allowed to re-vegetate naturally, subject to landowner approval. The Applicant would address avian issues at river crossings and other areas of concern by working with MDNR and USFWS to identify areas that may require marking transmission line shield wires and/or the use of alternative structures to reduce the likelihood of collisions. If necessary, field surveys to obtain

more route specific wildlife data would be completed once a route has been permitted in order to help minimize and mitigate potential impacts.

Specific areas along the Preferred and Alternative Routes of the Hampton-North Rochester 345 kV Section where potential wildlife impacts may occur appear to be limited. Although the Woodbury WMA occurs within 1 mile of both routes and the Warsaw WMA occurs within 1 mile of the Alternative Route, neither WMA is intersected by the proposed routes so impacts to fauna are not anticipated in these areas. The Gemini AMA is located within the route, but would not be intersected by the Project ROW and therefore no impacts are anticipated. Similarly, the Lake Byllesby IBA occurs within 1 mile of both routes; however, neither route intersects the IBA nor are impacts to birds within the IBA anticipated. Both routes cross the Canon River, where avian collision risk may be higher relative to other areas along these routes. Three Type 3 GBCAs occur along the Preferred and Alternative Routes of this section. One is crossed by the Preferred Route, one is crossed by the Alternative Route, and the other is not crossed by either. Impacts to grassland habitat within GBCAs are likely to be temporary and long term impacts are anticipated to be minimal. The crossing of the state designated trout stream, Pine Creek, occurs along the Preferred Route. It is possible that some trees may need to be cleared along the banks of Pine Creek in the immediate vicinity of the route crossing, which may reduce shading in this area. In general, transmission line routing avoids direct impacts to lakes and rivers to limit impacts to fisheries and other aquatic resources. The potential impacts that may result from tree clearing are not expected to impact trout or other aquatic species populations.

7.5.5 Rare and Unique Resources

This chapter discusses rare and unique resources known to occur within or near the Preferred and Alternative Routes of the Hampton to North Rochester section. Rare species include federally and state listed species. Federally listed threatened, endangered, and candidate species of plants and animals are protected under the Endangered Species Act (1973). State listed threatened, endangered, and species of special concern are protected under Minn. Stat. § 84.895. Bald and golden eagles also are considered a unique resource within the Project area. Bald eagles are known to nest and winter near surface water in the Project area, and occasional reports of Golden Eagles in spring, fall and winter exist for most Minnesota counties (MDNR 2009). The 1940 Bald and Golden Eagle Protection Act (16 USC 668-668C) specifically prohibits the taking or possession of and commerce in Bald Eagle (*Haliaeetus leucocephalus*) and Golden Eagle (*Aquila chrysaetos*), either alive or dead, or any part, nest, or egg of these eagles. MDNR and USFWS have been involved in the pre-application coordination effort regarding rare and unique resources.

The Minnesota NHIS provides information on Minnesota's rare plants, animals, native plant communities, and other rare features. The NHIS database is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. The NHIS contains historical data on rare species occurrences from museum collections and published records, as well as more current data obtained from MDNR's MCBS work. All animal species that are listed as federally endangered or threatened (except the gray wolf) are tracked, as well as all birds, small mammals, reptiles, amphibians, mussels, and butterflies

that are listed as state endangered, threatened or special concern. Several rare species which currently have no legal status but need further monitoring to determine their status also are tracked in the NHIS database (MDNR 2009o).

Federal and state listed species are often found within high quality rare and unique habitats and features. Many of the threatened and endangered species identified in the Project area are associated with remnants of native prairie grassland, which were once abundant in this area of Minnesota. The MDNR MCBS data documents high quality native habitats in the state of Minnesota and classifies areas as having moderate, high, or outstanding biodiversity significance. Areas with moderate biodiversity significance are those containing significant occurrences of rare species in moderately disturbed native plant communities and/or landscapes that have a strong potential for recovery. Areas with high biodiversity significance contain sites with very good quality occurrences of the rarest species and high quality examples of rare native plant communities and/or important functional landscapes. An area with outstanding biodiversity significance is defined by MCBS as a “site containing the best occurrences of the rarest species, the most outstanding examples of the rarest native plant communities, and/or the largest, most intact functional landscapes” (MCBS 2008). In addition, MDNR has documented railroad prairies throughout the prairie regions of Minnesota. Railroad ROWs have often avoided cultivation and other disturbance, resulting in native prairie remnants. Finally, WMAs, SNAs, WPAs, NWRs, and easement lands often have native or restored habitats that can harbor threatened and endangered species (see Chapter 7.5.4 for a discussion of these lands).

Rare and unique resources known to occur within 1 mile of the Preferred and Alternative Route centerlines were evaluated and summarized. First, element occurrence records for rare species were summarized based on a review of the NHIS database. Next, the MCBS data were screened to determine the number of biodiversity significance areas that occur along or are intersected by each route. Finally, MDNR data on the location of railroad prairies and SNAs was reviewed to determine presence of these unique resource areas within the Project area. The following section summarizes the results of the rare and unique resources review for the Preferred and Alternative Routes in the Hampton to North Rochester section. Surveys for federal and state listed species that occur and that have suitable habitat within the Preferred and Alternative Routes would be conducted following the permitting of a route. The MDNR does not require surveys for state species of concern and species from the NHIS database that have a status of *not listed*.

7.5.5.1 Existing Environment

Preferred Route

A review of the MDNR NHIS database for occurrence records of rare and unique species, and rare native communities within 1 mile of the Preferred Route centerline revealed one federally listed plant species, eighteen state listed species, and five types of rare native plant communities. Tables 7.5-9 and 7.5-10 provide a summary of the rare species and rare native plant communities.

Based on a review of the MDNR MCBS data, 21 MCBS sites occur within 1 mile of the Preferred Route centerline (Figure 7.5-2). Only one of these MCBS sites is crossed by the Preferred Route. This area, known as Butler Creek Woods, is located just north of the intersection of US-52 and County 1 Boulevard. It is classified as having high biodiversity significance and it is crossed by the Preferred Route for approximately 0.5 miles along Highway 52 through an area of residential development scattered along the highway. Butler Creek Woods is classified as Sugar Maple-Basswood-Red Oak-(Blue Beech) Forest. Multiple records for a state special concern plant species exist in the vicinity of this site, including one record within Butler Creek Woods where it is crossed by the Preferred Route.

Table 7.5-9:
Preferred Route: Rare and Unique Species

| Common Name | Scientific Name | Status |
|------------------------|--|------------|
| Wildlife Species | | |
| Mollusks | | |
| Creek heelsplitter | <i>Lasmigona compressa</i> | SC |
| Mucket | <i>Actinonaias ligamentina</i> | ST |
| Fluted-shell | <i>Lasmigona costata</i> | SC |
| Birds | | |
| Bald Eagle | <i>Haliaeetus leucocephalus</i> | SC |
| Loggerhead Shrike | <i>Lanius ludovicianus</i> | ST |
| Reptiles | | |
| Eastern fox snake | <i>Elaphe vulpina</i> | Not Listed |
| Timber rattlesnake | <i>Crotalus horridus</i> | ST |
| Eastern racer | <i>Coluber constrictor</i> | SC |
| Fish | | |
| American brook lamprey | <i>Lampetra appendix</i> | Not Listed |
| Paddlefish | <i>Polyodon spathula</i> | ST |
| Plant Species | | |
| Herbaceous Plants | | |
| American ginseng | <i>Panax quinquefolius</i> | SC |
| Dwarf trout lily | <i>Erythronium propullans</i> | FE, SE |
| Kitten-tails | <i>Besseyia bullii</i> | ST |
| Long-bearded hawkweed | <i>Hieracium longipilum</i> | Not Listed |
| Moschatel | <i>Adoxa moschatellina</i> | SC |
| Plains wild indigo | <i>Baptisia bracteata</i> var. <i>leucophaea</i> | SC |

Table 7.5-9:
Preferred Route: Rare and Unique Species

| Common Name | Scientific Name | Status |
|-----------------------|---|--------|
| Rattlesnake-master | <i>Eryngium yuccifolium</i> | SC |
| Snow trillium | <i>Trillium nivale</i> | SC |
| Tuberclad rein-orchid | <i>Platanthera flava</i> var. <i>herbiola</i> | SE |
| Valerian | <i>Valeriana edulis</i> ssp. <i>ciliata</i> | ST |
| White wild indigo | <i>Baptisia alba</i> | SC |

FE Federal Endangered SE State Endangered SC Species of Concern
ST State Threatened

Table 7.5-10:
Preferred Route: Rare Native Communities

| Community Type | Notes |
|--|---|
| Dry Sand—Gravel Prairie (Southern) Type | Scattered junipers on gradual north-facing slope of sandy knoll in eroded old gray till. Disturbed prairie to east and south with false indigo (<i>Baptisia bracteata</i>). |
| Mesic Prairie (Southern) Type | Site fragmented by power lines, fields, houses. Located in Mississippi Valley outwash region. |
| Red Oak—Sugar Maple-Basswood-(Bitternut Hickory) Forest Type | Rock outcrops dominated by bulbet bladderfern (<i>Cystopteris bulbifera</i>). One recent red oak stump within 134 rings observed within large forested tract of Little Cannon River Valley. Located in Harmony-Plainview uplands. |
| Southern Seepage Meadow/Carr | Several county records collected here; unusually diverse for county. |
| Dry Bedrock Bluff Prairie (Southern) Type | Surrounded by overgrown Bur Oak Savanna. Dry Prairie on very steep SE facing slope above Little Cannon River. |

Alternative Route

Occurrence records exist in the MDNR NHIS database for two federally listed plant species, 16 state listed species, and 513 rare native plant communities within 1 mile of the Alternative Route centerline. Tables 7.5-11 and 7.5-12 summarize the results of the MDNR NHIS database review for element occurrence records of rare and unique species.

A review of the NHIS records for Cannon River crossing of the Alternative Route revealed several rare bird species records nearby. Confirmed nesting records of a state special concern bird species exist for the Alternative Route crossing of Chub Creek immediately north of the Cannon River crossing. This nest is known to have been active from 1999-2003, but inactive in 2005. No additional records exist for this

nest in any other years (NHIS 2009). Additionally, multiple nesting records a state threatened bird species exist on both the north and south sides of the Alternative Route Cannon River crossing. Records indicate at least intermittent breeding from 1980-2007. All known nest records are from disturbed agricultural lands (NHIS 2009).

Table 7.5-11:
Alternative Route: Rare and Unique Species

| Common Name | Scientific Name | Status |
|-----------------------|--|------------|
| Wildlife Species | | |
| Mollusks | | |
| Creek heelsplitter | <i>Lasmigona compressa</i> | SC |
| Ellipse | <i>Venustaconcha ellipsiformis</i> | ST |
| Spike | <i>Elliptio dilatata</i> | SC |
| Birds | | |
| Bald Eagle | <i>Haliaeetus leucocephalus</i> | SC |
| Loggerhead Shrike | <i>Lanius ludovicianus</i> | ST |
| Upland Sandpiper | <i>Bartramia longicauda</i> | Not Listed |
| Reptiles | | |
| Eastern fox snake | <i>Elaphe vulpina</i> | Not Listed |
| Mammals | | |
| Prairie vole | <i>Microtus ochrogaster</i> | SC |
| Plains Pocket Mouse | <i>Perognathus flavescens</i> | SC |
| Western harvest mouse | <i>Reithrodontomys megalotis</i> | Not Listed |
| Plant Species | | |
| Herbaceous Plants | | |
| American ginseng | <i>Panax quinquefolius</i> | SC |
| Dwarf trout lily | <i>Erythronium propullans</i> | FE, SE |
| Glade mallow | <i>Napaea dioica</i> | ST |
| Kitten-tails | <i>Besseyia bullii</i> | ST |
| Long-bearded hawkweed | <i>Hieracium longipilum</i> | Not Listed |
| Plains wild indigo | <i>Baptisia bracteata</i> var. <i>leucophaea</i> | SC |
| Prairie bush clover | <i>Lespedeza leptostachya</i> | FT, ST |
| Rattlesnake-master | <i>Eryngium yuccifolium</i> | SC |
| Snow trillium | <i>Trillium nivale</i> | SC |
| White wild indigo | <i>Baptisia alba</i> | SC |

FE Federal Endangered FC Federal Candidate ST State Threatened
 FT Federal Threatened SE State Endangered SC State Concern

Table 7.5-12:

Alternative Route: Rare Native Communities

| Community Type | Notes |
|--|--|
| Dry Bedrock Bluff Prairie (Southern) | Multiple occurrences located in Dakota, Rice, and Goodhue counties. |
| Native Plant Community, Undetermined Class | Multiple undetermined native plant communities containing lowland hardwoods, oak forest, and floodplain forest identified. |
| Mesic Prairie (Southern) | Nearly a 1-mile-long series of degraded mesic prairie remnants along southeast side of Hwy 47 and across low cultivated field to east. Has good diversity. |

The MDNR MCBS data revealed that 18 MCBS sites with moderate, high, or outstanding biodiversity significance occur within 1 mile of the Alternative Route centerline. Three of these sites are intersected by the Alternative Route centerline and are described in more detail here. The first area, located 0.3 mile north of where the Alternative Route and 320th Street intersect, is classified as having high biodiversity significance and is crossed by the Alternative Route centerline for 0.28 mile. This area is comprised of a Dry Bedrock Bluff Prairie and NHIS data indicate that several rare or unique resources are associated with this site. Rare species records include occurrences of a state threatened bird species, a state special concern small mammal species, and two state threatened plant species of which one also is listed as federally threatened. An unlisted but rare small mammal species also occurs in this area. The second area, located 0.2 mile south of where the Alternative Route and 350th Street East intersect, is classified as having outstanding biodiversity significance and is crossed for 0.05 mile. This area is comprised of Dry Bedrock Bluff Prairie and has several rare species associated with the site. These species include a state threatened bird species, an unlisted but rare snake species, a special concern small mammal species, an unlisted but rare small mammal species, a state special concern plant species, and a plant that is both federally and state threatened. Lastly, the third area is comprised of Mesic Prairie and is classified as being an area of moderate biodiversity significance. It is located where the Alternative Route and Northfield Boulevard intersect, and the Alternative Route centerline crosses it for 0.08 mile. NHIS data indicate a known occurrence of a state special concern plant species in this area. In addition to the MCBS sites, two MDNR Railroad ROW Prairie segments and one SNA occur within 1 mile of the Alternative Route. Both Railroad ROW Prairie segments occur east of where the route crosses the Cannon River, and neither is intersected by the Alternative Route. The North Fork Zumbro Woods SNA is located approximately 0.5 mile north of the alternative route immediately west of where it crosses State Route 60. Three natural communities comprise this SNA including maple-basswood forest, floodplain forest, and lowland hardwood forest. Lack of disturbance in these forest communities provides unique habitat for several rare species including a federally and state endangered plant species, as well as a state threatened plant species. In addition, a great blue heron rookery is present within this SNA.

7.5.5.2 Impacts and Mitigation

To reduce and minimize impacts to rare and unique natural resources the Applicant would, to the maximum extent practicable, span all native prairie remnants, documented native plant communities, rock outcrops, wetlands, streams, and rivers. If construction activities are proposed to disturb known endangered or threatened species habitat, surveys would be conducted to determine species presence, as well as to plan avoidance and mitigation strategies. Adjustments to structure configuration and careful pole siting would be used to minimize impacts in sensitive areas. The Applicant would 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. Upon receipt of a permitted route the Applicant will coordinate with the appropriate agencies (e.g., USFWS, USACE, and MDNR) to determine species-specific survey and wetland delineation needs, as well as additional avoidance and mitigation measures. Surveys for state listed endangered and threatened species would be conducted in suitable habitat within the permitted route corridor as directed by the agencies.

7.6 Impact Summary

Table 7.6-1 presents a summary comparison of environmental resource impacts for the Preferred and Alternative Routes based on analysis required by Minnesota Routing Guidance. Using this comparison, the Applicant concluded that the Preferred Route best conserves natural resources, minimizes potential environmental and human settlement impacts as well as other land use conflicts.

Table 7.6-1:
Summary Comparison of Impacts for Preferred and Alternative Routes

| Resource Category | Preferred Route | Alternative Route |
|--|--|-------------------|
| Residences | | |
| Number of Residences 0-75 feet from route centerline | 0 | 0 |
| Number of Residences 75-150 feet from route centerline | 8 | 2 |
| Number of Residences 150-300 feet from route centerline | 21 | 10 |
| Density (residences/linear mile within 300 feet of route centerline) | 0.8 | 0.25 |
| Recreation and Tourism | | |
| No impacts to recreation and tourism are anticipated | | |
| Effects on Land-Based Economics | | |
| Agriculture | | |
| Permanent Impact | 2.6 acres | 5.1 acres |
| Temporary Impact | 200 acres | 270 acres |
| Forestry | No impacts to economically important forestry areas are anticipated. | |
| Mining | No impacts to aggregate mines are anticipated. | |
| Archaeological and Historic Resources Sites Within 1 mile of Route Centerline | | |

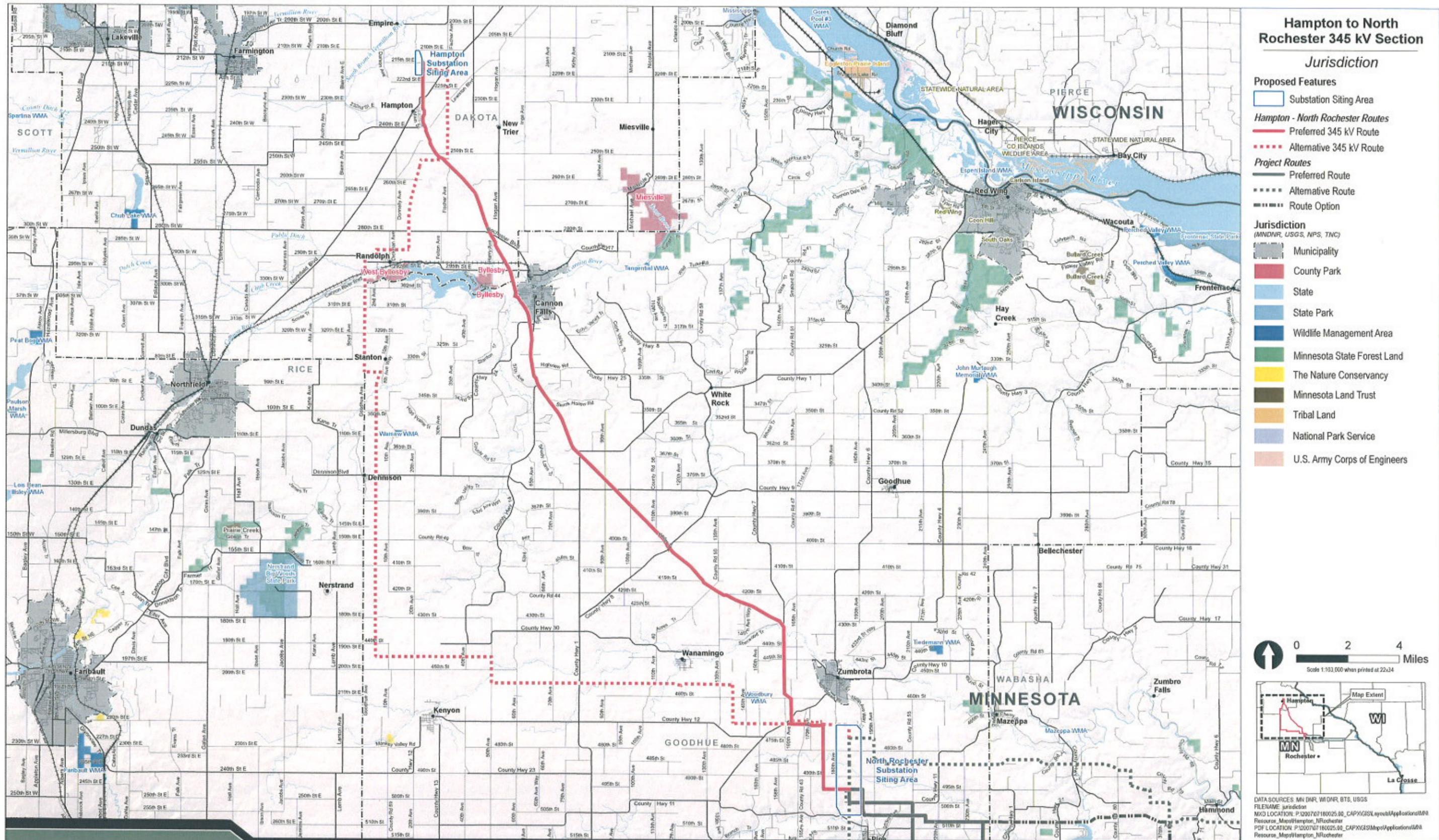
Table 7.6-1:
Summary Comparison of Impacts for Preferred and Alternative Routes

| Resource Category | Preferred Route | Alternative Route |
|--|-----------------|-------------------|
| Archaeological | 4 | 5 |
| Architectural | | |
| National Register of Historic Places (NRHP) | 8 | 1 |
| Architectural | 60 | 81 |
| Natural Environment | | |
| Water Resources | | |
| Permanent Wetlands Impacts | 0 | 0 |
| Temporary Wetlands Impacts | 0 | 0 |
| Potential Tree Clearing in Wetlands | 0 | 5.8 acres |
| Stream Crossings | 35 | 44 |
| Permanent Impacts to Floodplains | <1 acre | <1 acre |
| Flora | | |
| Percent Cropland | 57 | 86 |
| Percent Grassland | 24 | 12 |
| Percent Shrubland | <1 | <1 |
| Percent Forested Land | 4 | 1 |
| Percent Aquatic | 2 | <1 |
| Fauna | | |
| Conservation Reserve Program Lands Crossed | 51 | 31 |
| Conservation Reserve Enhancement Program Lands Crossed | 0 | 0 |
| Length of Important Bird Areas Crossed | 0 mile | 0 mile |
| Length of Grassland Bird Conservation Areas Crossed | 1.1 miles | 3.9 miles |
| Number of Federal Rare and Unique Species Known to Occur Within 1 mile of Route Centerline | | |
| Threatened | 0 | 1 |
| Endangered | 1 | 1 |
| Candidate | 0 | 0 |
| Number of State Rare and Unique Species Known to Occur Within 1 mile of Route Centerline | | |
| Threatened | 6 | 5 |
| Endangered | 2 | 1 |
| Species of Concern | 10 | 10 |
| DNR Rare Native Communities | 154 | 515 |
| Length of Outstanding Biodiversity Sites Crossed | 0 | 0.3 mile |
| Length of High Biodiversity Sites Crossed | 0.5 mile | 0.1 mile |
| Length of Moderate Biodiversity Sites Crossed | 0 | 0.1 mile |

Table 7.6-1:
Summary Comparison of Impacts for Preferred and Alternative Routes

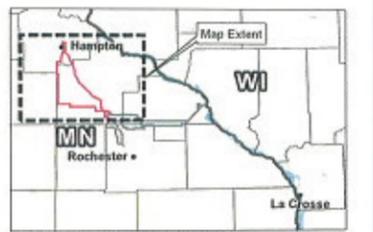
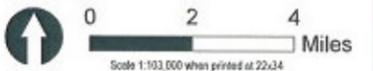
| Resource Category | Preferred Route | Alternative Route |
|---|-----------------|-------------------|
| Use or Paralleling of existing ROW (transportation, pipeline, and electrical transmission systems) and property lines | | |
| Total length of route (miles) | 36.1 | 47.1 |
| Length following Transmission Line (miles) | 15.1 | 0.7 |
| Percentage of route following Transmission Line | 42% | 1% |
| Length following road but not Transmission Line (miles) | 14.6 | 3.5 |
| Percentage of route following road but not Transmission Line | 40% | 7% |
| Length following property line but not transmission line or roads (miles) | 5 | 32.3 |
| Percentage of route following property line but not transmission line or roads | 14% | 69% |
| Total length following transmission line, roads, or property lines (miles) | 34.7 | 36.5 |
| Percentage of route following transmission line, roads or property lines | 96% | 78% |
| Length not following transmission line, roads or property lines (miles) | 1.4 | 10.7 |
| Percentage of route not following transmission line, roads or property lines | 4% | 22% |
| Estimated Costs (millions) | | |
| Cost | \$88 | \$101 |

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Hampton to North Rochester 345 kV Section

- Jurisdiction**
- Proposed Features**
- Substation Siting Area
 - Hampton - North Rochester Routes
 - Preferred 345 kV Route
 - Alternative 345 kV Route
- Project Routes**
- Preferred Route
 - Alternative Route
 - Route Option
- Jurisdiction (MNDNR, USGS, NPS, TNC)**
- Municipality
 - County Park
 - State
 - State Park
 - Wildlife Management Area
 - Minnesota State Forest Land
 - The Nature Conservancy
 - Minnesota Land Trust
 - Tribal Land
 - National Park Service
 - U.S. Army Corps of Engineers



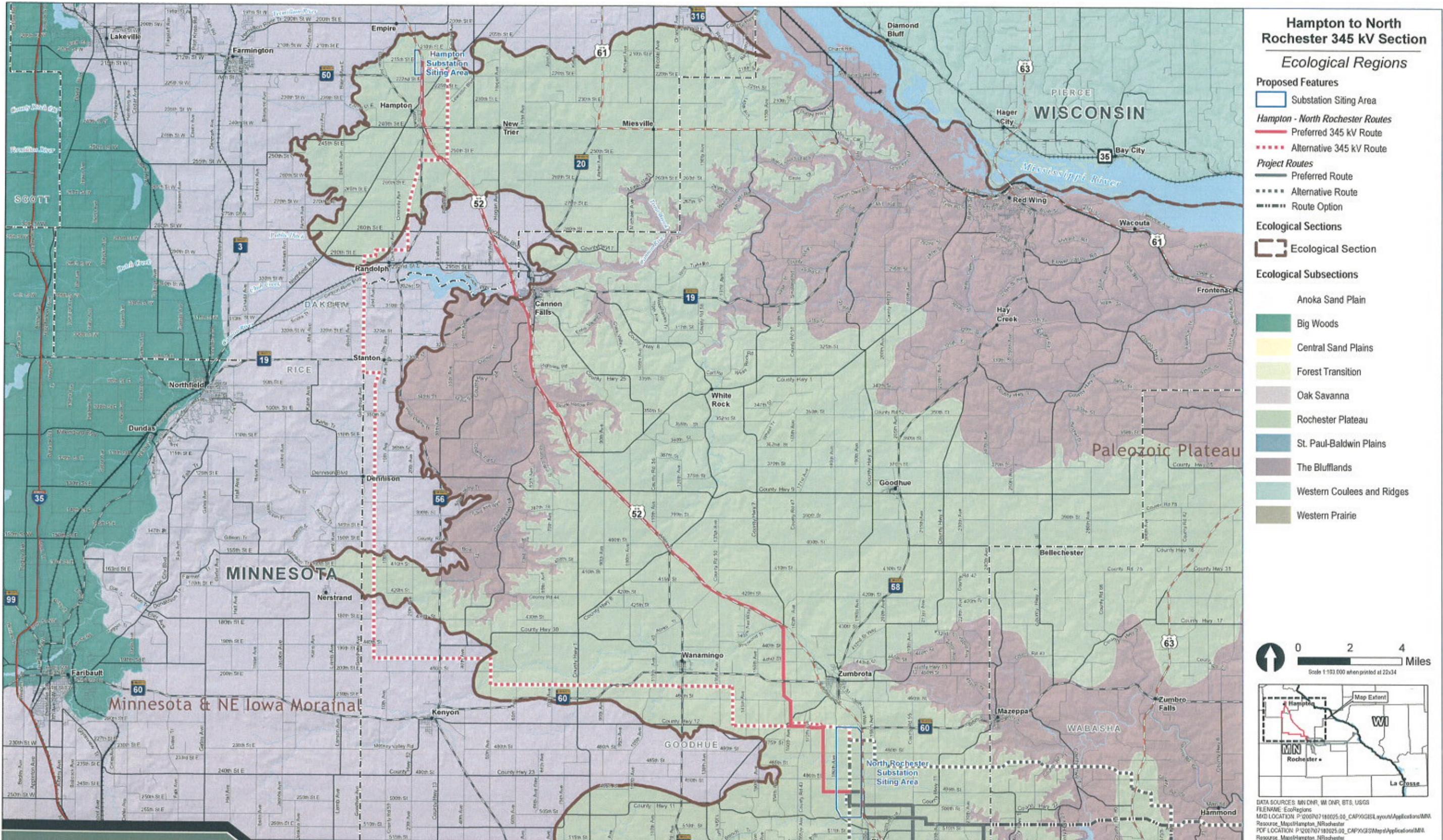
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**Jurisdiction Resource Map
 MN Route Permit Application**

7.1-1: Hampton to North Rochester Section Overview

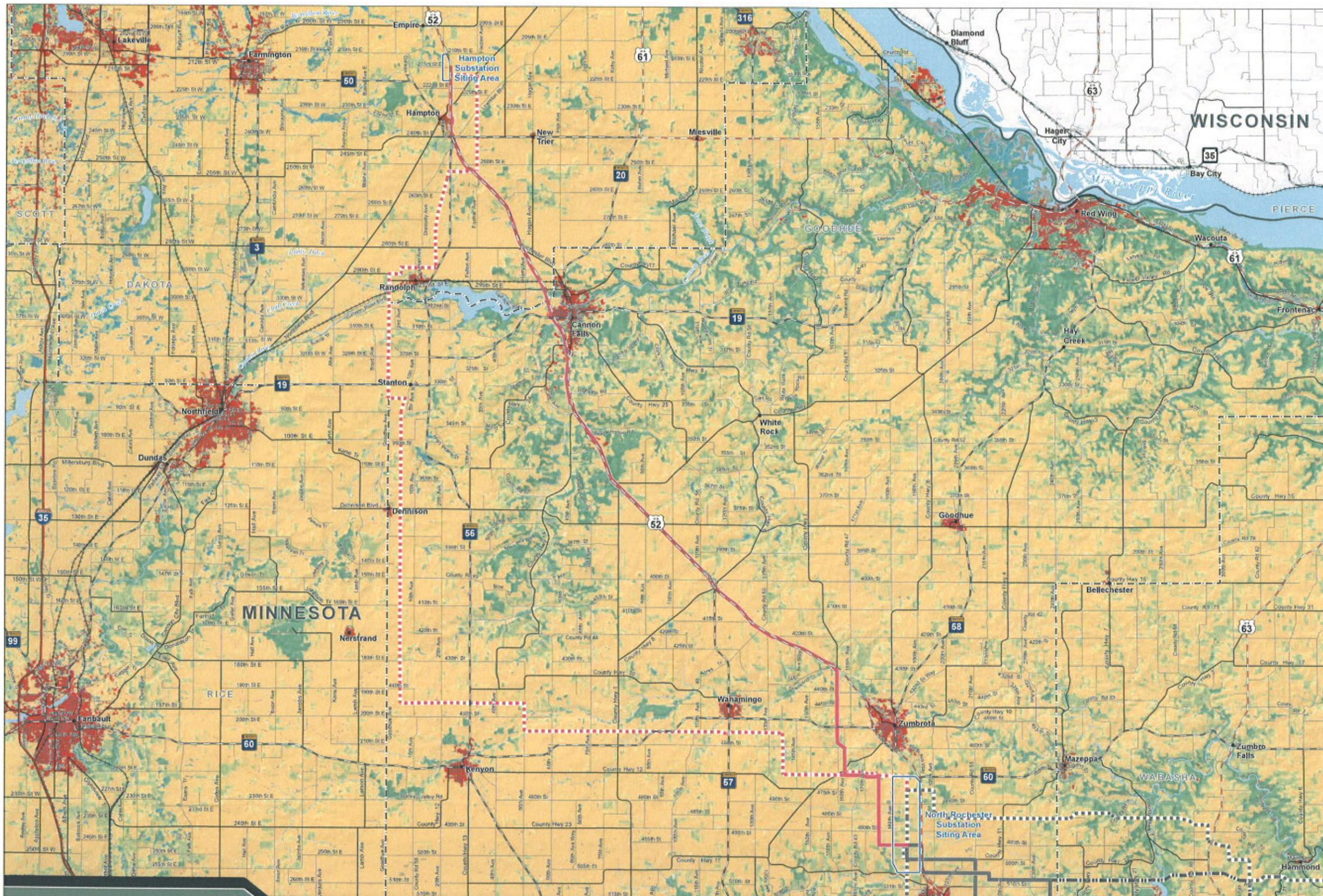


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Ecological Regions Resource Map
 MN Route Permit Application

7.1-2: MN DNR Environmental Classification System Provinces and Subsections



Hampton to North Rochester 345 kV Section

Land Cover

Proposed Features

- Substation Siting Area

Hampton - North Rochester Routes

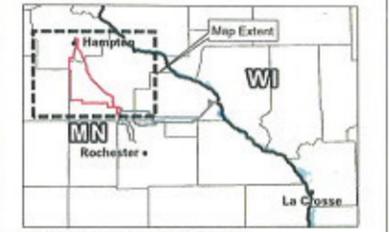
- Preferred 345 kV Route
- Alternative 345 kV Route

Project Routes

- Preferred Route
- Alternative Route
- Route Option

Land Cover (MN GAP)

- Aquatic
- Urban
- Forest
- Grassland
- Cropland
- Shrubland



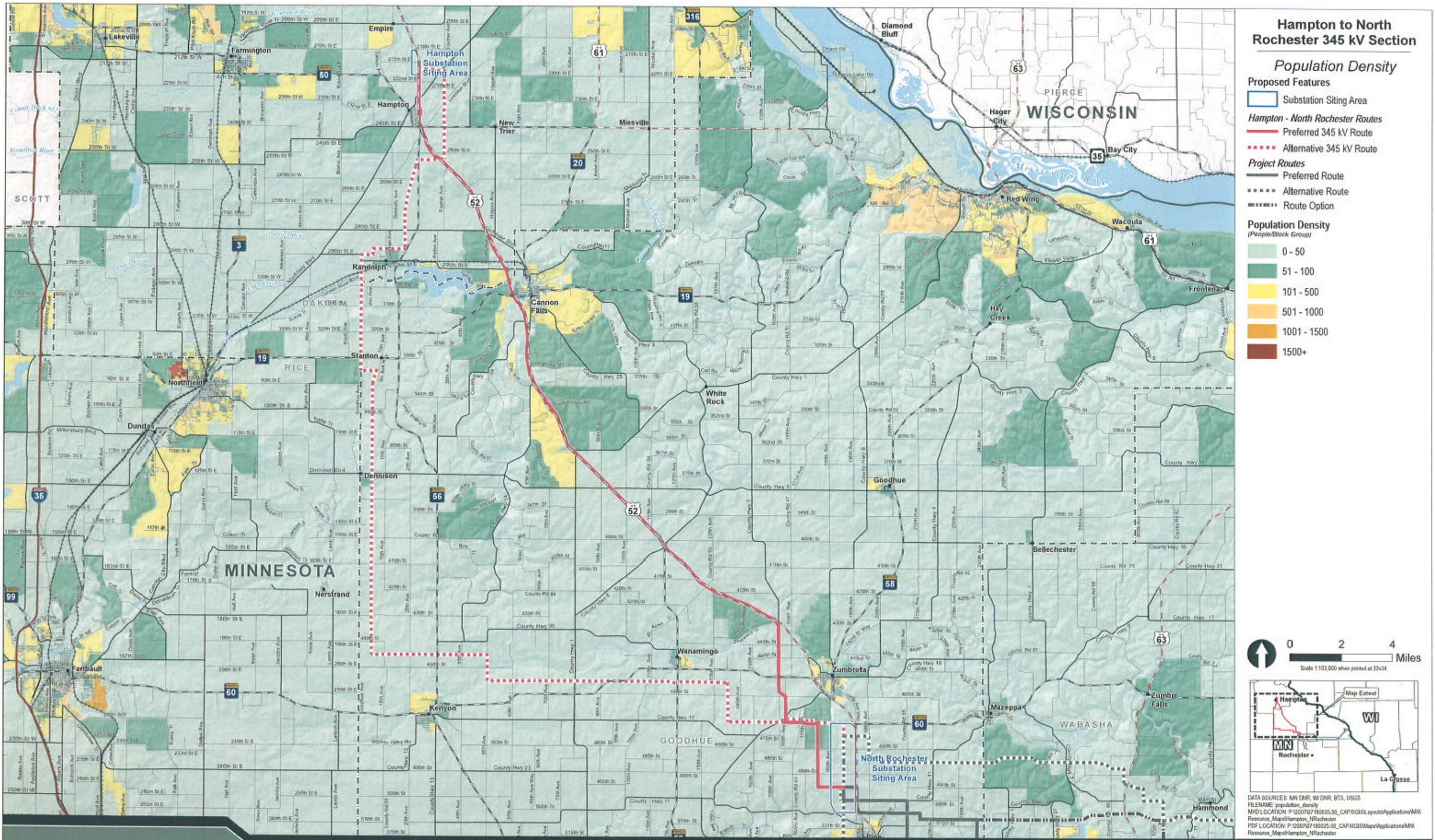
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Land Cover Resource Map
 MN Route Permit Application

7.2-1: Land Cover



Hampton to North Rochester 345 kV Section

Population Density

Proposed Features

- Substation Siting Area

Hampton - North Rochester Routes

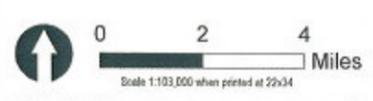
- Preferred 345 kV Route
- Alternative 345 kV Route

Project Routes

- Preferred Route
- Alternative Route
- Route Option

Population Density (People/Block Group)

- 0 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- 1001 - 1500
- 1500+



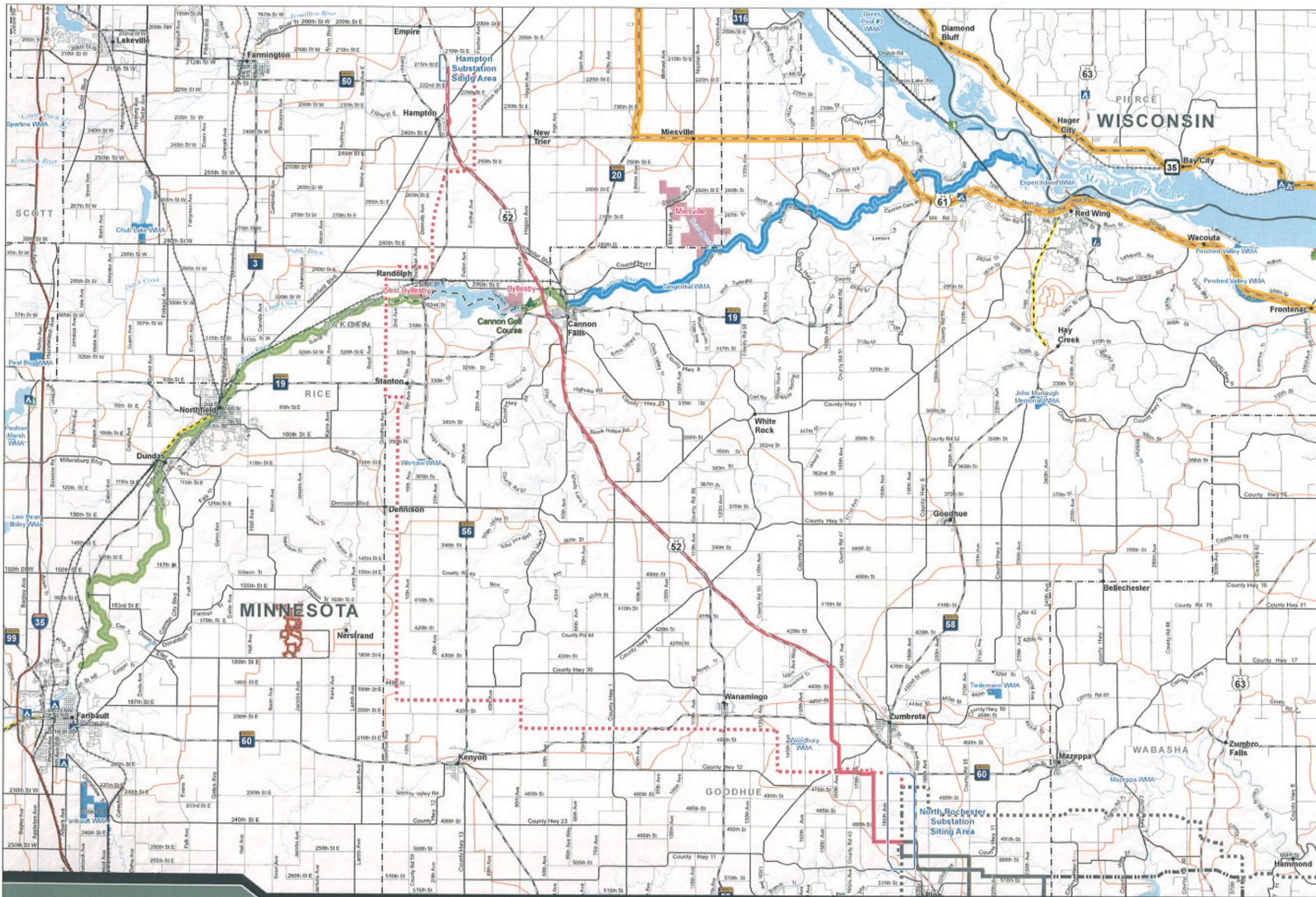
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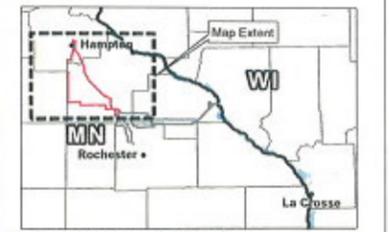
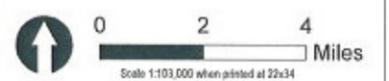
Population Density Resource Map
 MN Route Permit Application

7.2-3: Population Density



Hampton to North Rochester 345 kV Section

- Recreation**
- Proposed Features**
- Substation Siting Area
- Hampton - North Rochester Routes**
- Preferred 345 kV Route
 - Alternative 345 kV Route
- Project Routes**
- Preferred Route
 - Alternative Route
 - Route Option
- Recreation Areas**
(Census 2000 and MNDNR)
- Park
 - Campground
 - Campsite
 - Horse Campground
 - Golf Course
 - County/ County Park
 - Wildlife Management Area
- Trails**
(MN DNR and WI DNR)
- State Trail
 - MN State Park Trail
 - Snowmobile Trail
- Scenic Byways**
(Census/Digitized EDAA)
- Scenic Byway
- Wild, Scenic, and Recreational Rivers**
(HDR 2007)
- Scenic River Segment
 - Recreational River Segment



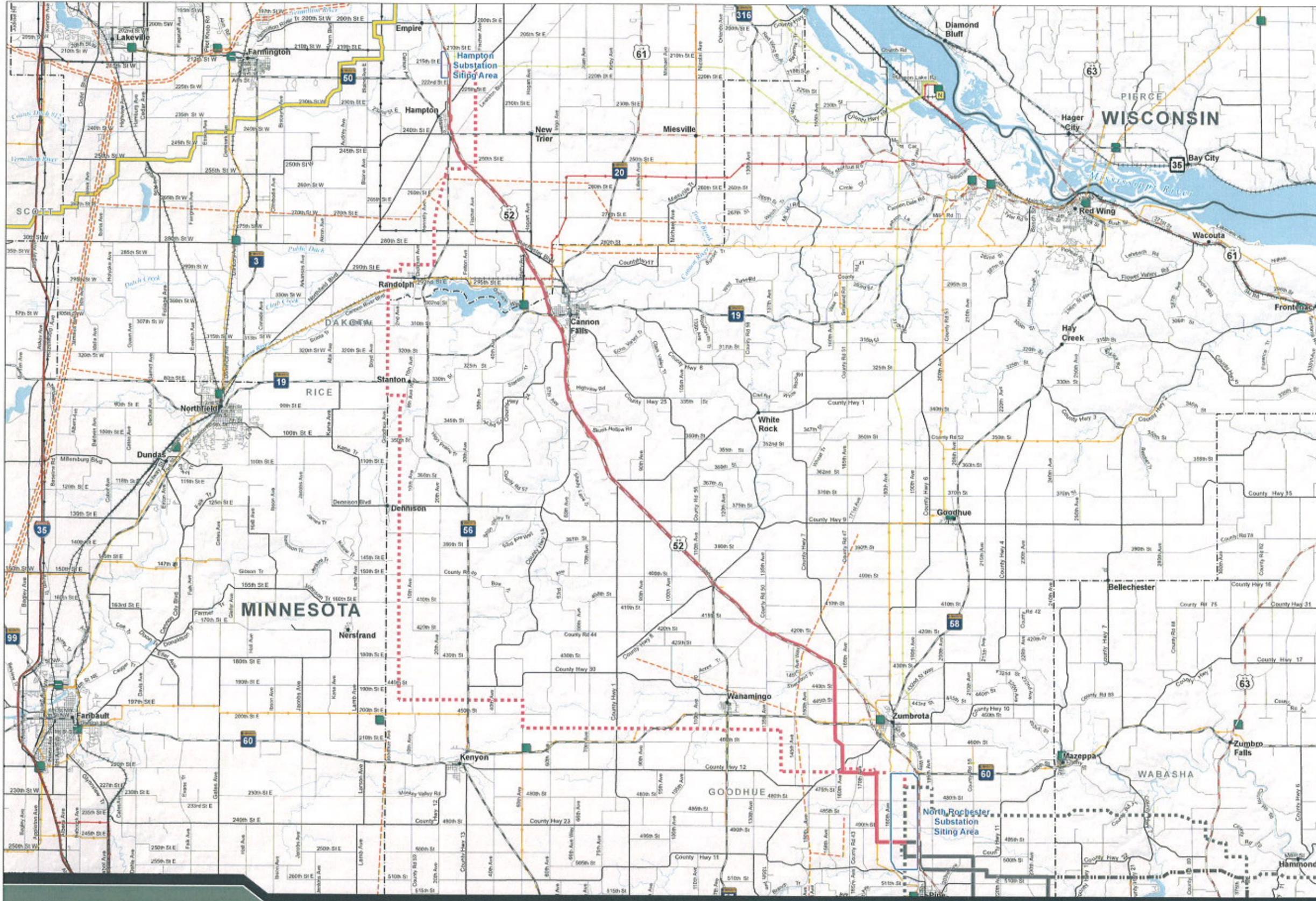
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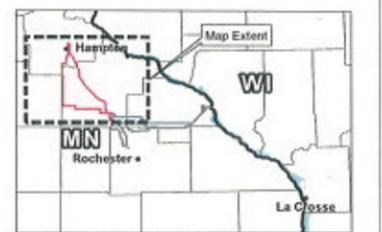
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Recreation Resource Map
 MN Route Project Application

Hampton to North Rochester 345 kV Section



- Utilities**
- Proposed Features**
- Substation Siting Area
 - Hampton - North Rochester Routes
 - Preferred 345 kV Route
 - Alternative 345 kV Route
- Project Routes**
- Preferred Route
 - Alternative Route
 - Route Option
- Existing Transmission (HDR, GRE)**
- Substation
 - Generation Facility
 - 69 kV Transmission Line
 - 115 kV Transmission Line
 - 138 kV Transmission Line
 - 161 kV Transmission Line
 - 230 kV Transmission Line
 - 345 kV Transmission Line
- Pipelines (MN PUC and Flats)**
- Proposed MinnCan Oil Pipeline
 - Existing Pipeline

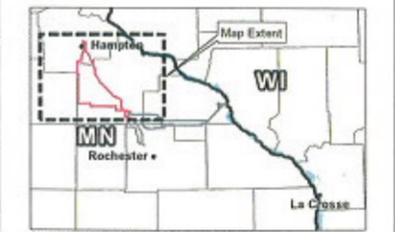
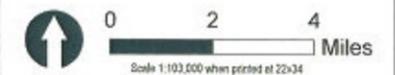
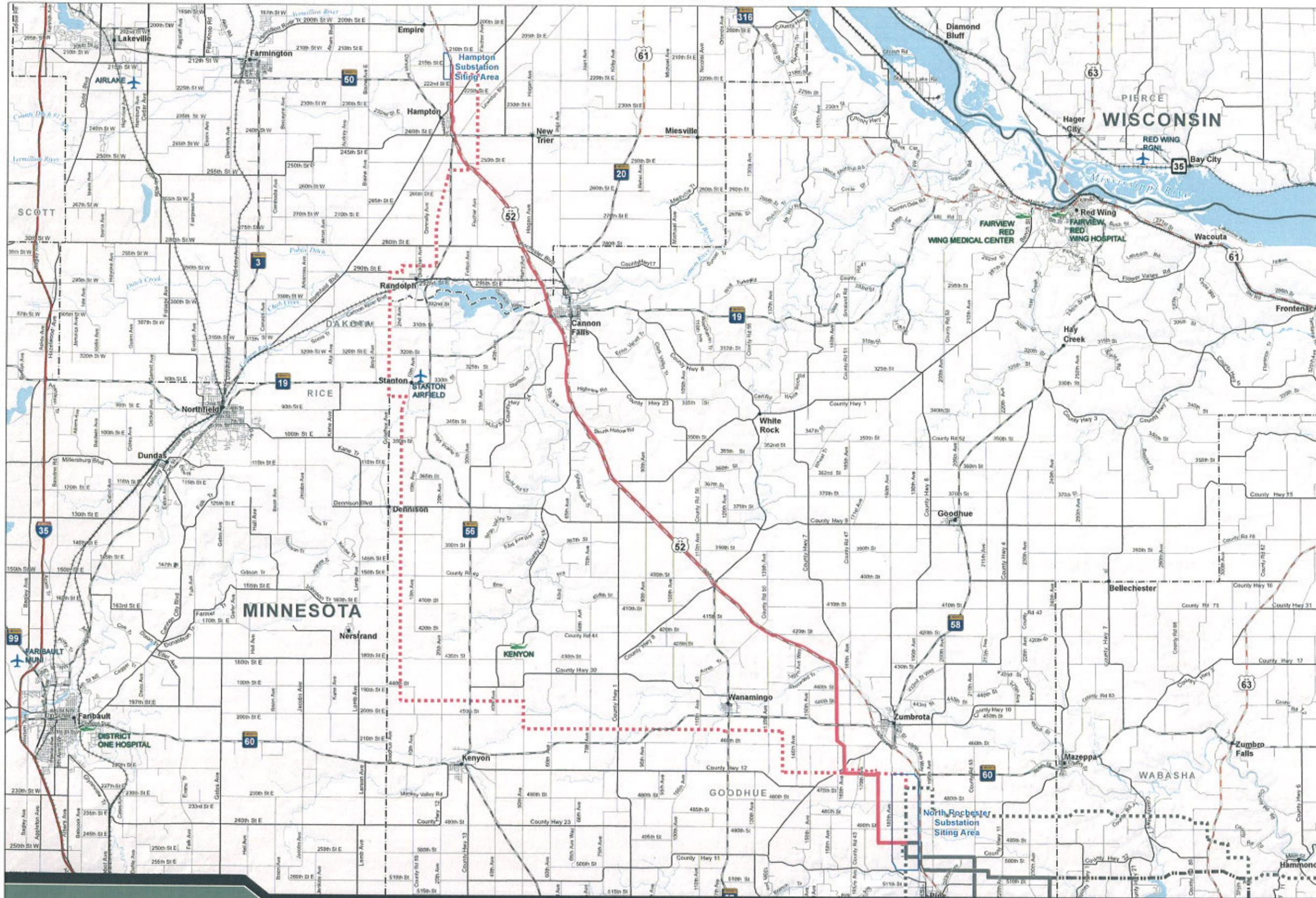


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Hampton to North Rochester 345 kV Section

Transportation

- Proposed Features**
- Substation Siting Area
- Hampton - North Rochester Routes**
- Preferred 345 kV Route
 - Alternative 345 kV Route
- Project Routes**
- Preferred Route
 - Alternative Route
 - Route Option
- Transportation**
(Bureau of Transportation Statistics, Census)
- Interstate Highway
 - US Highway
 - State Highway
 - Major Road
 - Local Road
 - Railroad
 - Public Airport
 - Heliport

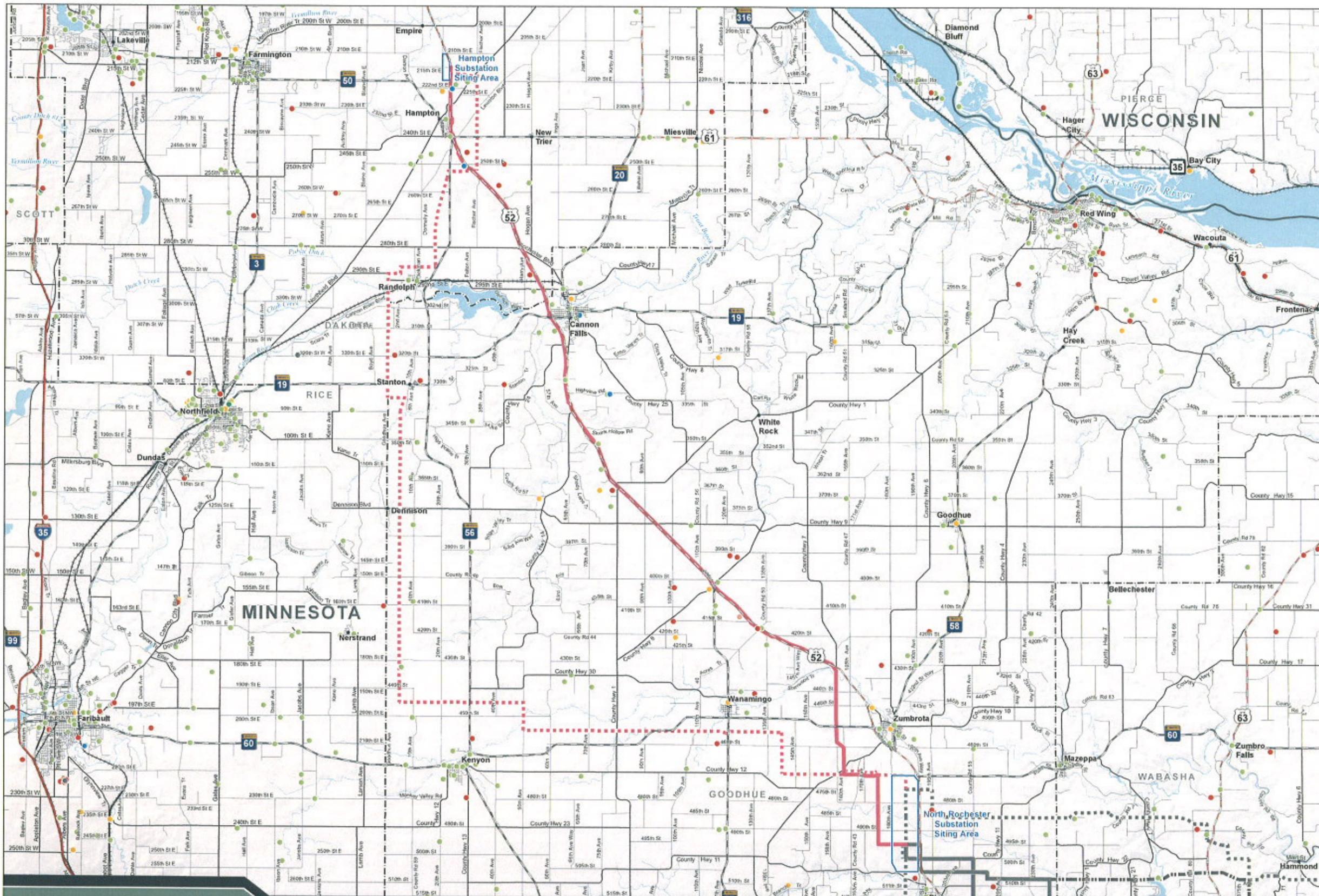


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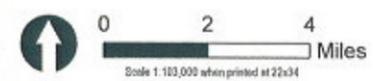
Transportation Resource Map
 MN Route Permit Application



Hampton to North Rochester 345 kV Section

Communication Facilities

- Proposed Features**
- Substation Siting Area
 - Hampton - North Rochester Routes
 - Alternative 345 kV Route
- Project Routes**
- Preferred Route
 - Alternative Route
 - Route Option
- Communications Facilities (FCC 2007)**
- AM
 - Antenna Structure Registration
 - BRS and EBS Transmitter
 - Cellular
 - FM
 - Land Mobile Broadcast
 - Microwave
 - Paging
 - TV



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Hampton to North Rochester 345 kV Section

- Prime Farmland**
Proposed Features
- Substation Siting Area
 - Hampton - North Rochester Routes**
 - Preferred 345 kV Route
 - Alternative 345 kV Route
 - Project Routes**
 - Preferred Route
 - Alternative Route
 - Route Option
 - Prime Farmland (ARCS SSURGO)**
 - Prime Farmland
 - Prime farmland if drained
 - Farmland of statewide importance

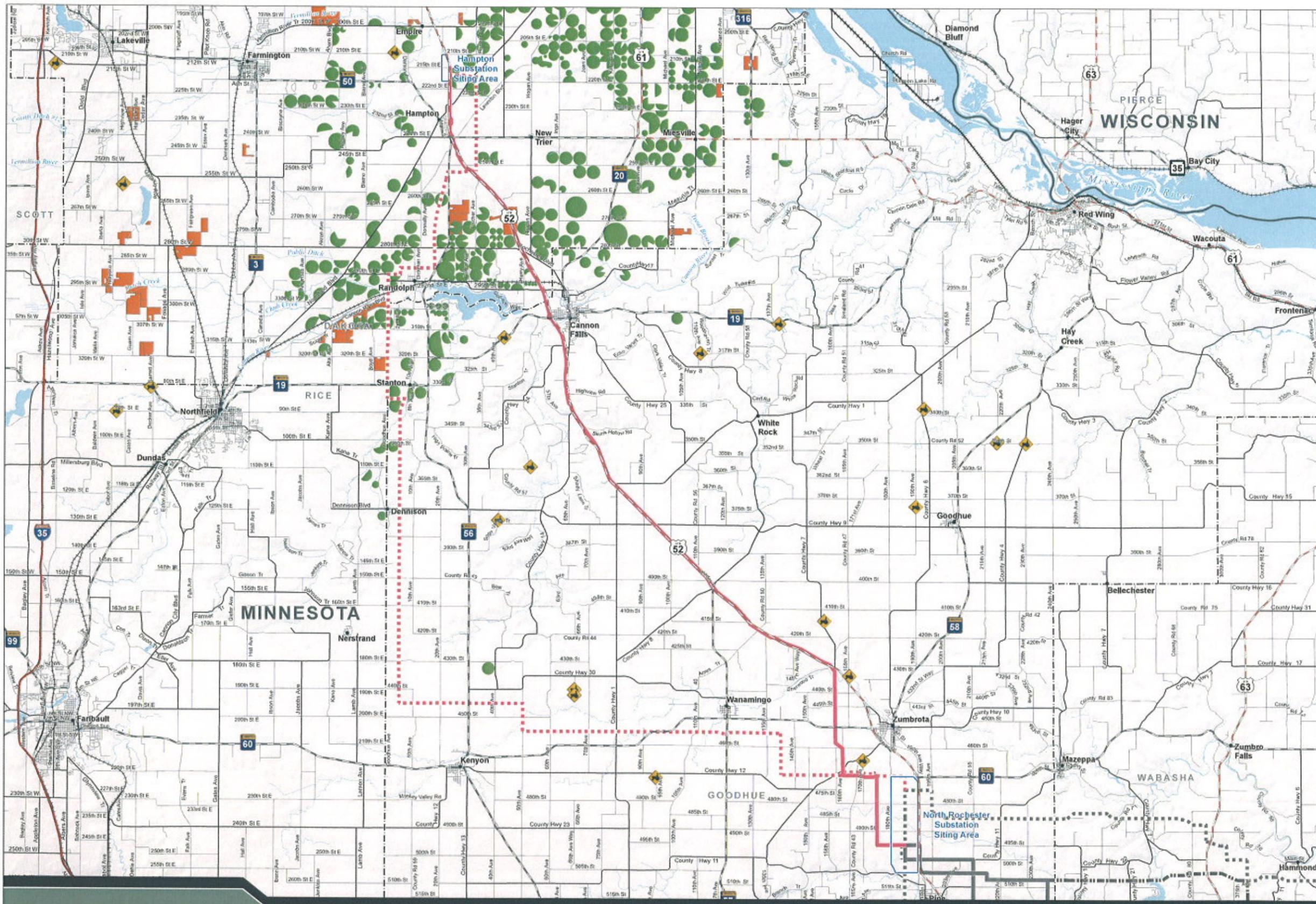


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Hampton to North Rochester 345 kV Section

Agriculture

- Proposed Features**
- Substation Siting Area
- Hampton - North Rochester Routes**
- Preferred 345 kV Route
 - Alternative 345 kV Route
- Project Routes**
- Preferred Route
 - Alternative Route
 - Route Option
- Agricultural Features**
- Pivot Irrigation
 - Organic Farm
 - Farmland Natural Areas Program



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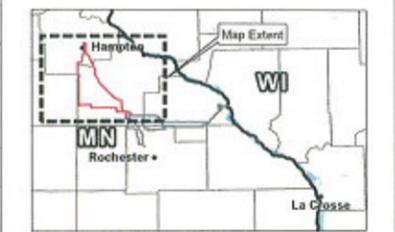
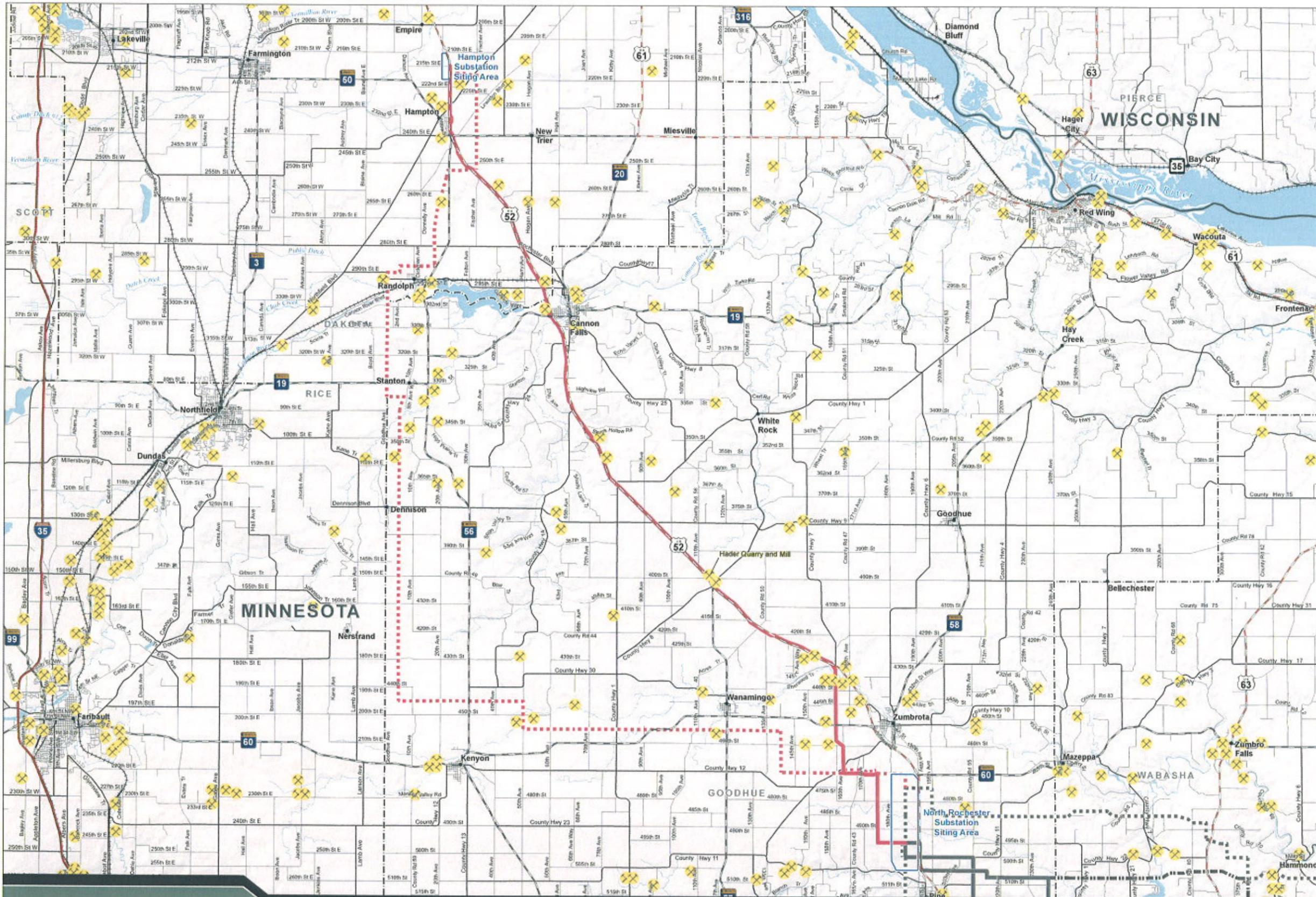
Agriculture Resource Map
 MN Route Permit Application

Hampton to North Rochester 345 kV Section

Mining

Proposed Features

-  Substation Siting Area
- Hampton - North Rochester Routes**
-  Preferred 345 kV Route
-  Alternative 345 kV Route
- Project Routes**
-  Preferred Route
-  Alternative Route
-  Route Option
- Gravel Pits**
-  Gravel Pit

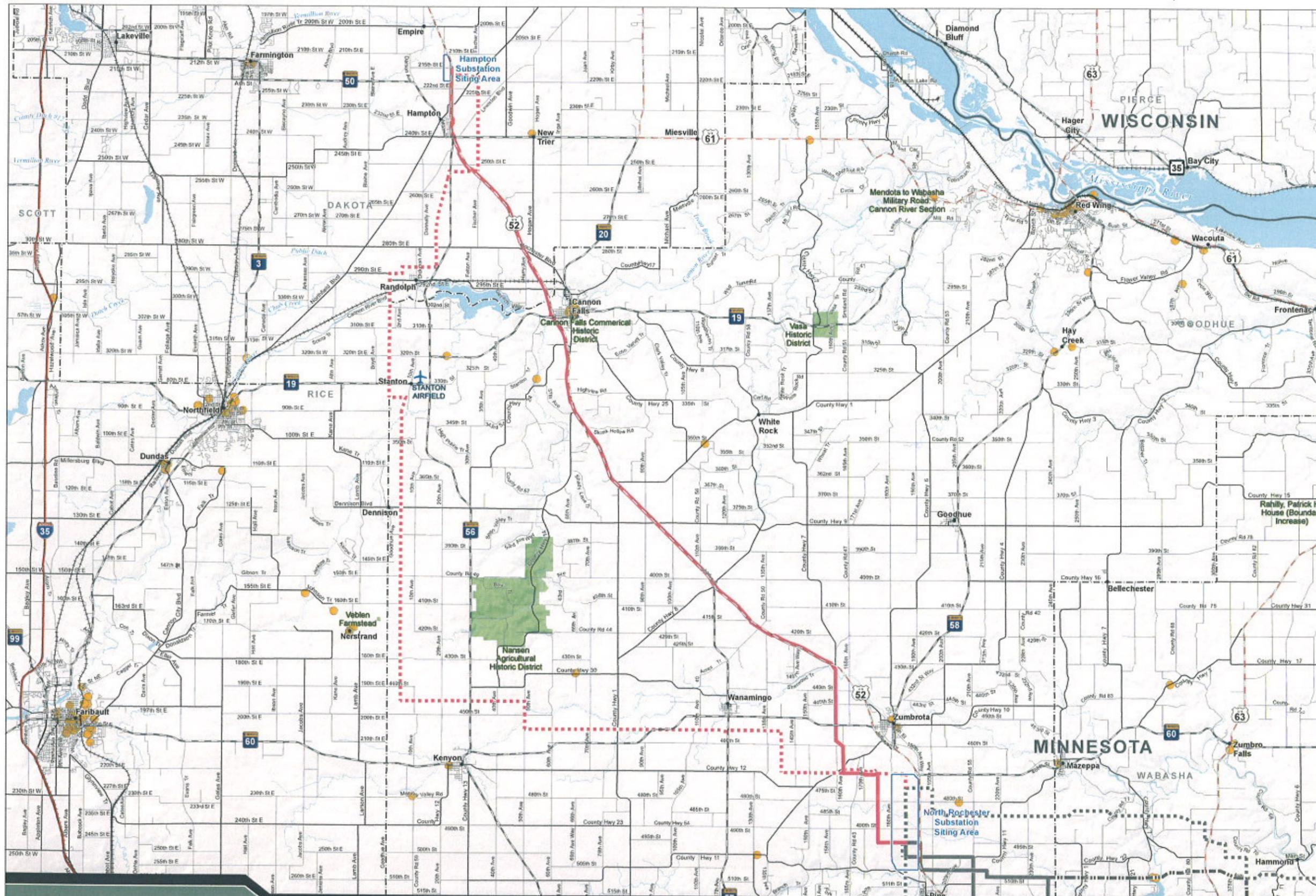


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Mining Resource Map
 MN Route Permit Application



Hampton to North Rochester 345 kV Section

Historic Places

Proposed Features

- Substation Siting Area
- Hampton - North Rochester Routes
- Alternative 345 kV Route

Project Routes

- Preferred Route
- Alternative Route
- Route Option

Historic Places
(National Register of Historic Places)

- Historic Place
- Historic Region



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Hampton to North Rochester 345 kV Section

Water Resources

Proposed Features

- Substation Siting Area

Hampton - North Rochester Routes

- Preferred 345 kV Route
- Alternative 345 kV Route

Project Routes

- Preferred Route
- Alternative Route
- Route Option

Surface Water
(MNDOT, WDNR and EPA)

- Perennial Stream/Drainage Ditch
- Intermittent Stream/Drainage Ditch
- Perennial Waterbody
- Impaired Water

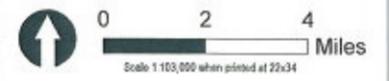
Wetlands
(National/Wisconsin Wetland Inventories)

- Wetland

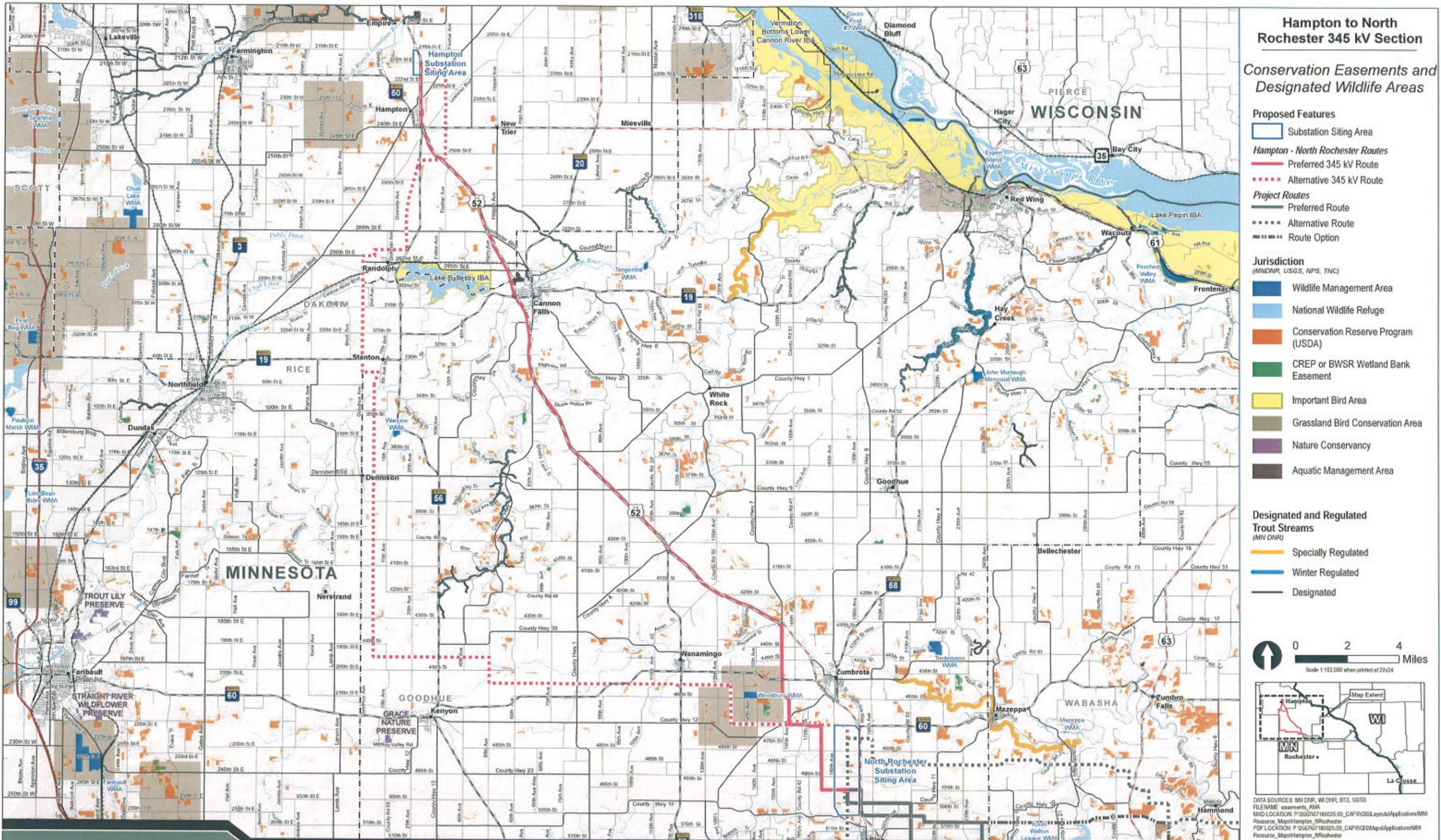
*Wetland data is incomplete for Rice and Dakota counties

Floodplains
(FEMA Q3)

- 100-Year Floodplain



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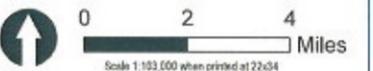


Hampton to North Rochester 345 kV Section

Conservation Easements and Designated Wildlife Areas

- Proposed Features**
- Substation Siting Area
 - Hampton - North Rochester Routes
 - Preferred 345 kV Route
 - Alternative 345 kV Route
 - Project Routes
 - Preferred Route
 - Alternative Route
 - Route Option
- Jurisdiction (MNDNR, USGS, NPS, TNC)**
- Wildlife Management Area
 - National Wildlife Refuge
 - Conservation Reserve Program (USDA)
 - CREP or BWSR Wetland Bank Easement
 - Important Bird Area
 - Grassland Bird Conservation Area
 - Nature Conservancy
 - Aquatic Management Area

- Designated and Regulated Trout Streams (MN DNR)**
- Specially Regulated
 - Winter Regulated
 - Designated



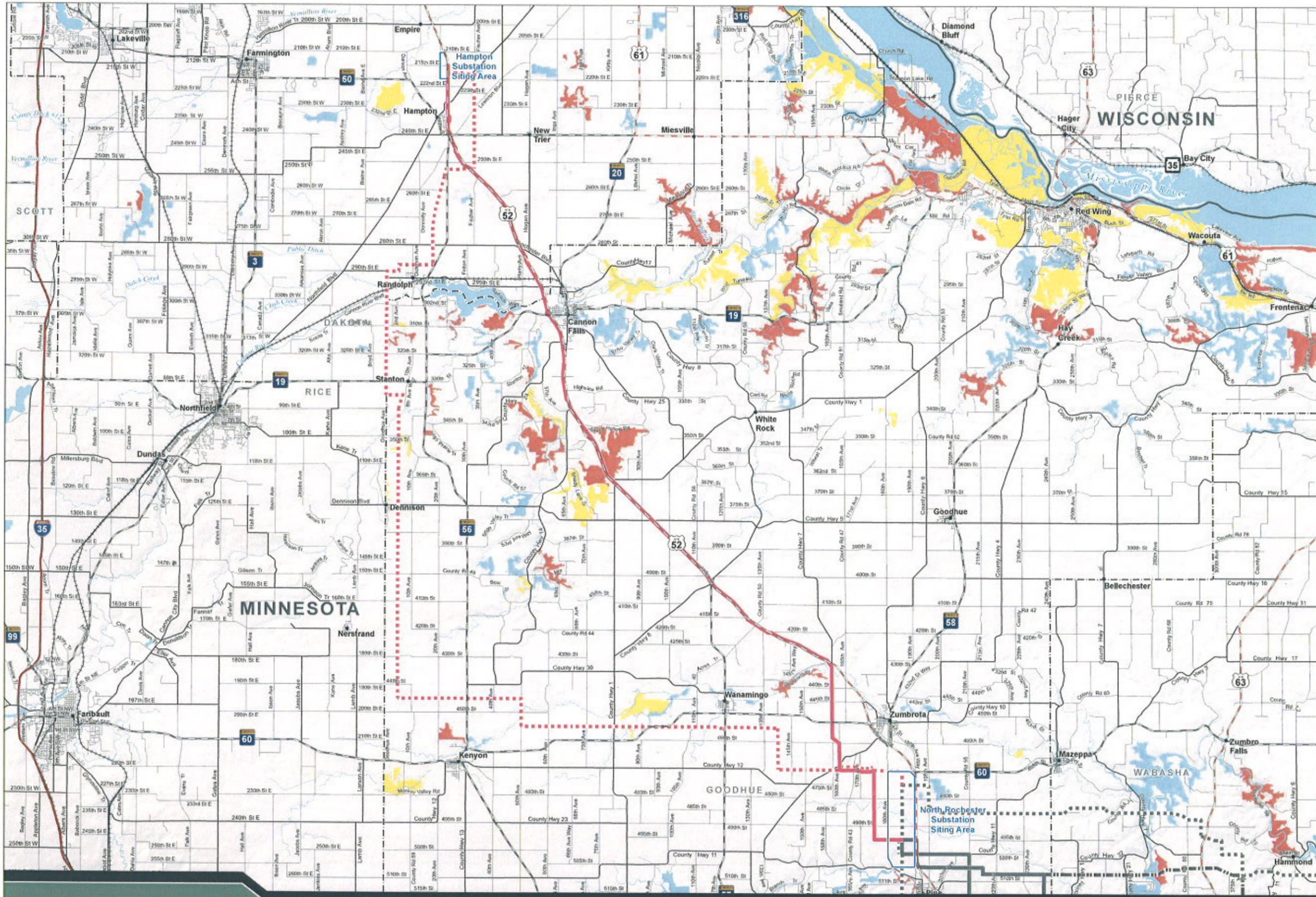
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Hampton • Rochester • La Crosse 345 kV Transmission Project

Conservation Easements and Designated Wildlife Areas Resource Map
 MN Route Permit Application

7.5-2: Conservation Easements and Designated Wildlife Areas



Hampton to North Rochester 345 kV Section

Biodiversity

Proposed Features

- Substation Siting Area
- Hampton - North Rochester Routes
- Preferred 345 kV Route
- Alternative 345 kV Route
- Project Routes**
- Preferred Route
- Alternative Route
- Route Option

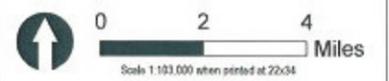
Biodiversity (MNDNR)

- Outstanding
- High
- Moderate

Outstanding = sites containing the best occurrences of the rarest species, the most outstanding examples of the rarest native plant communities, and/or the largest, most intact functional landscapes present in the state

High = sites containing very good quality occurrences of the rarest species, high quality examples of the rarest native plant communities, and/or important functional landscapes

Moderate = sites containing significant occurrences of rare species, and/or moderately disturbed native plant communities and landscapes that have a strong potential for recovery



DATA SOURCES: MN DNR, WI DNR, BTS, USGS
 FILENAME: biodiversity
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