8.0 North Rochester-Mississippi River 345 kV Section

This chapter analyzes potential resource impacts associated with 345 kV transmission line routes between the North Rochester Substation and the Mississippi River crossing at Alma. The Preferred and Alternative Routes are described in detail in Chapter 6.2.2. The Preferred Route originates from the preferred substation siting area on the south end of the North Rochester Substation siting area, and crosses the Zumbro River north of the White Bridge Road. The Alternative Route originates from the alternative substation siting area on the north end of the of the North Rochester Substation siting area, and crosses the Zumbro River along a property line 2.2 miles north of the Zumbro Dam. The two route segments share a common alignment approximately 9 miles long. This common alignment is located in the blufflands west of the Mississippi River, along the existing Dairyland Q-3 line. Chapters 8.2 through 8.5 identify existing environmental resources along this section of the Preferred and Alternative Routes, potential impacts to those resources that may occur due to construction and operation of the proposed transmission line, and mitigation measures that may be used to minimize potential impacts. Chapter 8.6 provides a summary comparison of potential impacts associated with the North Rochester–Mississippi River 345 kV section of the Preferred and Alternative Routes.

Within the Preferred and Alternative Routes identified above, there were two route options that the Applicant identified to provide flexibility at the Zumbro River Crossing and through the McCarthy Lake WMA. Chapter 8.7 identifies potential impacts associated with the Zumbro Dam Route Option, which may be used with the Preferred Route to cross the Zumbro River instead of the White Bridge Road crossing. Chapter 8.8 identifies potential impacts associated with the McCarthy Lake route option. This route option may be utilized with the Preferred or Alternative Routes near the Mississippi River to avoid the McCarthy Lake WMA, managed by the MDNR.

8.1 Description of Regional Environmental Setting

The North Rochester–Mississippi River 345 kV section extends from the North Rochester Substation siting area to the Mississippi River Crossing at Alma. The Preferred Route is located in Goodhue, Olmsted, and Wabasha counties. The Alternative Route is located in Goodhue and Wabasha counties. Figure 8.1-1 shows land management jurisdictions and communities near the North Rochester–Mississippi River 345 kV section. Most communities in this area are small agriculture-based towns, including Pine Island, Zumbrota, Mazeppa, Oronoco, South Troy, Zumbro Falls, Hammond, Plainview, and Kellogg.

The Zumbro River, blufflands east of the Mississippi River, and the Mississippi River are prominent natural features in this section of the Project. Land cover along the portion of the Preferred Route that lies west of the Dairyland Q-3 line is mostly cropland and grassland, with scattered rural residences and forested drainages. East and west of the Zumbro River, terrain is gently rolling hills dominated by agricultural land uses, with scattered rural residences and forested drainages. Terrain is hillier and more forested along the Zumbro River. Denser residential development occurs along the Zumbro River, which is valued for recreation, scenery, and conservation.

The Preferred and Alternative Routes share an alignment for approximately 9 miles along the Dairyland Q-3 line. To avoid creating new linear corridor through the bluffland west of the Mississippi River, the Applicant chose to identify a single alignment along the Dairyland Q-3 line for both the Preferred and Alternative Routes. In addition, the terrain along the Dairyland Q-3 line becomes steeper and is dominated by forested bluffs. Scattered rural residences, agricultural fields, and recreation lands also occur along the bluffs. Between US-61 and the Alma Crossing site, the route passes through floodplains and wetlands associated with the Mississippi River, including the McCarthy Lake WMA, and the Upper Mississippi National Fish and Wildlife Refuge managed by the USFWS. Impacts associated with the Preferred and Alternative Routes through the McCarthy Lake WMA and the Upper Mississippi National Fish and Wildlife Refuge would be incremental because the new facilities can be collocated with the existing Q-3 transmission line. Agricultural operations and residences do occur in the floodplains and wetlands, but conservation and recreation make up the majority of land use.

According to the MDNR ECS, the Preferred and Alternative Routes lie within the Rochester Plateau and the Blufflands subsections of the Paleozoic Plateau Section within the EBF Province (described in Chapter 7.1) (Figure 8.1-2).

8.2 Human Settlement

8.2.1 Land Cover and Land Use

Chapter 7.2.1 provides background information on land cover/land use, and methodology used to identify potential impacts.

8.2.1.1 Existing Environment

Land cover types identified within the Preferred and Alternative Routes include cropland, grassland, shrubland, forest, aquatic, and urban development. Table 8.2-1 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 in Figure 8.2-1.

The Preferred and Alternative Routes are located in Goodhue, Olmsted (preferred only), and Wabasha counties. The Preferred and Alternative Routes cross lands that are 61 percent and 59 percent cropland, respectively. Cropland crossed by the routes is mostly used for row crops such as corn, soybeans, and fruit and berries. The route also crosses land used for open pasture/hay production, and livestock. The Alternative Route crosses more forested land than the Preferred Route. Both Preferred and Alternative Routes cross similar amounts of aquatic and urban land cover classifications.

Table 8.2-1:
Preferred and Alternative Routes: Land Cover Summary

Land Cover Type	Preferred Route Percent of Route[1]	Alternative Route Percent of Route[1]
Cropland	61	59
Grassland	25	21
Shrubland (total)	2	2
Lowland Shrub	1	1
Upland Shrub	<1	<1
Forest (total)	11	17
Bur/White Oak	<1	2
Cottonwood	-	-
Maple/Basswood	<1	1
All Others	10	14
Aquatic (total)	2	2
Open water	1	1
Marshland	1	1
Urban (total)	1	1
High Intensity Urban	<1	-
Low Intensity Urban	<1	-
Transportation (paved surface)	<1	1
Total acreage	100 (+/- 1%)	100 (+/- 1%)

Source: MN GAP (2002).

[1] All percentages rounded to the nearest whole number.

The Preferred and Alternative Routes generally follow property lines as opposed to roads or existing transmission lines. The Preferred Route follows more existing linear corridor (transmission lines and roads) than the Alternative Route. Near the Zumbro River and as the Preferred and Alternative Routes approach the Mississippi River, terrain gradually transitions from gently rolling hills to steeper hills and bluffs with more forested areas. Residential density along the Preferred Route is approximately 0.3 home per linear mile and residential density along the Alternative Route is approximately 0.1 home per linear mile.

Some public lands are located along the Preferred and Alternative Routes including the Snake Creek Management Unit of the RJD Memorial Hardwood Forest, the McCarthy Lake WMA, and the Upper

Mississippi River National Wildlife and Fish Refuge. These public lands are mostly used for conservation, recreation, and for conducting environmental studies.

There are no commercial or industrial land uses in adjacent to the Preferred Route. The Hammons/ Milestone mine is located along the Alternative Route approximately 1 mile southwest of Hammond, east of the Zumbro River. The mine is the only identified commercial/industrial land use area within 500 feet of the Alternative Route. County-specific descriptions of zoning and current land uses along the Preferred and Alternative Routes are provided below. Land use plans and zoning district maps for select counties, municipalities, and townships in the Project area are provided in Appendix N.

Goodhue County

Information regarding Goodhue County's comprehensive plan is detailed in Chapter 7.2.1.

Land use located within the Preferred and Alternative Routes in Goodhue County is a mixture of cultivated land, grassland, rural farmsteads, and residences. Commercial and industrial developments are not located along the Preferred or Alternative Routes in Goodhue County.

The Preferred and Alternative Routes through Goodhue County are located in Agricultural Protection (A1) and Urban Fringe (A3) zoning districts in Goodhue County. The descriptions associated with these zoning districts are included in Chapter 7.2.1.

The Preferred and Alternative Routes through Goodhue County are located in Pine Island Township and do not cross any municipal boundaries. The Preferred Route through Pine Island Township is located in the Agricultural Protection and Urban Fringe Districts. The Agricultural Protection District is the only zoning district that the Alternative Route crosses.

Olmsted County

Only the Preferred Route is located in Olmsted County, in Oronoco and Farmington townships. The Olmsted County Comprehensive Plan identifies the values of local community members. Some of the key community values identified in the Olmsted County Comprehensive Plan include the following; wise use of energy resources, urban systems, and land area; maximize efficiency of resource use and minimize waste; preserve and restore natural and cultural resources (including agricultural resources); ensure sustainable growth; and encourage cooperation between the county and local jurisdictions (Olmsted County 1995).

The Olmsted County Land Use Plan identifies four land-use types; Suburban Development Areas, 25 Year Urban Service Areas, 50 Year Urban Reserve Areas, and Resource Protection Areas. The Preferred Route does not cross through any municipal boundaries in Olmsted County, nor does it cross through any Suburban Development Areas, 25 Year Urban Service Areas, or 50 Year Urban Reserve Areas.

The Preferred Route is located in the following county-designated zoning districts:

- *Agricultural Protection District (A1),* established to "maintain, conserve, and enhance agricultural land and natural habitat for plant and animal life" (Olmsted 2007);
- *Agricultural Protection District (A2)*, established under the same premise as the A1 district, but allows for a higher density of non-farm dwellings and other non-farm uses; and
- *Rural Residential District (R1),* established to "provide suitable areas for low density residential development" and has restrictions regarding the number of dwellings per acre that are allowed (Olmsted 2007).

The zoning authority in Olmsted County is governed by either Olmsted County Planning or individual townships. The Preferred Route is located in Farmington and Oronoco townships. Zoning ordinance regulations in Oronoco Township are governed by Olmsted County and zoning ordinance regulations in Farmington Township governed by the township. Below is a brief discussion regarding zoning designations in Oronoco and Farmington townships.

Oronoco Township

The Preferred Route through Oronoco crosses through the north of Oronoco Township. The route crosses through both the Agricultural Protection District (A2) and through the Rural Residential District, described above.

Farmington Township

The route through Farmington Township is located in the Agricultural Protection District. The Agricultural Protection district was established to "identify and classify the land within the boundaries of Farmington Township as protected agricultural land and to preserve and protect agricultural land from unnecessary encroachment by non-agricultural uses" (Farmington 2002).

Wabasha County

Wabasha County solicited the input of citizens while drafting a comprehensive plan in 1998. Community members identified property rights, residential encroachment, and environmental concerns as issues of concern for the county (Wabasha 1998).

The types of land use crossed by the Preferred Route include Upland Agriculture Area, and Upper Valley Area. The types of land use crossed by the Alternative Route include Upland Agriculture Area, Upper Valley Area, and Common Interested Area. The Upland Agriculture Area covers the largest area of Wabasha County and is used for crops, pasture land, fruit trees, forestry, and raising livestock (Wabasha 1998). The Upper Valley Area consists of forest land, and the slopes and valley floor of the Zumbro River area (Wabasha 1998). While some farming occurs in the Upper Valley Area, most farming takes place in the Upland Agriculture Area. Common Interest Areas were established to encourage

cooperative planning between the county, townships, and cities throughout Wabasha County. Several zoning districts are allowed in the Common Interest Area (Wabasha 2009).

The Preferred Route through Wabasha County is located in the following county-designated zoning districts:

- *Agricultural Protection District (A1),* established to "maintain, conserve, and enhance agricultural lands that have been historically valuable for crop production, pastureland, and natural habitat for plant and animal life and to encourage long-term agricultural uses"; and
- *Agricultural/Low Density District* (A3), established to "provide for agricultural use and low density residential in areas where there is less prime agricultural land and where farms and feedlot operations are more scattered than A-1 District, while maintaining the rural character of the County."

The Alternative Route is located in these three zoning districts and one additional district:

- *Agricultural/Urban Fringe (A2)*, established to "provide for agricultural uses in close proximity to incorporated urban centers within Wabasha County by conserving agricultural land, forest lands and natural resources, and stabilizing expenditures for public services, until such time as urban services become more available" (Wabasha 2006).

The Preferred Route is located in Elgin, Plainview, Highland, Watopa, and Greenfield townships, and the Alternative Route is located in Mazeppa, Zumbro, Oakwood, Highland, Watopa, and Greenfield townships. Zoning authority in Wabasha County is mostly controlled by the County Planning and Zoning Office; however, some of the townships in Wabasha County have more stringent zoning ordinance requirements than those required by the County. Mazeppa and Zumbro townships are the only townships located along the Alternative Route that have elected to use their own zoning ordinances over those implemented by Wabasha County.

The Preferred and Alternative Routes share an alignment through Watopa and Greenfield townships. There are no municipalities located along the Alternative Route. Descriptions of zoning in the townships through which the Preferred and Alternative Routes cross are described below.

Mazeppa Township

The Alternative Route through Mazeppa Township is located in the Agricultural Protection District (A1) and the Agriculture/Low Density District (A3). While Mazeppa Township has its own zoning ordinance, the ordinance does not specifically reference either of these zoning districts; therefore, the Wabasha County zoning ordinance was referenced for Mazeppa Township. Zoning district descriptions in Wabasha County are described above.

Zumbro Township

Zumbro Township has only two zoning district designations; Low Density Residential (R1) and Agricultural District (A1).The Alternative Route through Wabasha County is located in both of these districts. The

Agricultural District was established to "provide a district that will (1) retain major natural ground cover for conservation purposes; (2) encourage the agricultural use of productive farm land; (3) regulate non-farm growth; (4) secure economy in governmental expenditures" (Zumbro 2008). The Low Density Residential District was established to "provide a limited amount of low-density, residential development in those areas that have suitable soils for long-term private sewage systems, the development of which would not require a substantial increase in equipment and manpower to provide fire and police protection" (Zumbro 2008).

Elgin Township

The Preferred Route through Elgin Township would be located in the Agricultural (A1) zoning district. This zoning district was established to "provide a district that will (1) retain major areas of natural ground cover for conservation purposes; (2) allow productive farm land to remain in agricultural use; and (3) prevent scattered, non-farm growth and secure economy in governmental expenditures" (Elgin 1994).

Highland, Plainview, Watopa, and Oakwood Townships

The Preferred Route through Highland, Plainview, and Watopa townships is located in Agricultural Protection District. The Alternative Route through Oakwood, Highland, and Watopa townships is located in the Agricultural Protection District, described above.

Greenfield Township

The Preferred and Alternative Routes share an alignment through Greenfield Township and are located in the Agricultural Protection District (A1) zoned land and Agricultural/Urban Fringe District (A2) zoned land, described above. Most of the land crossed is public land belonging to the RJD Memorial Hardwood Forest, the McCarthy Lake WMA, and the Upper Mississippi River National Wildlife and Fish Refuge.

8.2.1.2 Impacts and Mitigation

Land use adjacent to the Preferred and Alternative Routes is not expected to be impacted as a result of construction and operation of the routes. Agriculture is the principal land use within both of the routes, and the majority of land within or adjacent to the transmission line route could still be used for agricultural operations following construction. Impacts to agricultural land are expected to be minor and mitigation strategies are discussed in detail in Chapter 7.2.1.

Current land use plans, zoning ordinances, and public policies of the counties and cities along the routes indicate that agriculture would continue to be the predominant land use where the transmission line routes are proposed. Permanent impacts to land cover are primarily the result of structure placement and are described in detail in Chapter 7.2.1. Commercial or industrial land uses would not be impacted, as transmission lines and other utilities are generally accepted uses in areas where commercial and industrial operations take place. It is expected that any impacts to public lands would be minimal and temporary.

The Applicant would 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. Chapter 7.2.1 describes additional information regarding impacts to community values and mitigation measures to be implemented.

8.2.2 Displacements

A displacement is defined by the Applicant as any occupied structure (residence or business) located within the 150-foot ROW of the proposed routes. Chapter 7.2.2 describes the background information and methodology for identifying potential displacements and impacts to residences.

8.2.2.1 Existing Environment

Table 8.2-2 lists the estimated number of residences that located within 300 feet of the Preferred and Alternative Route alignments, including residences located within the 150-foot ROW. No other structures, such as barns, sheds, or outbuildings, are located within the 150-foot ROW.

Table 8.2-2:
Residences in Proximity to Preferred and Alternative Route Alignments

Proximity (feet)	Number of Residences in Proximity	
	Preferred Route	Alternative Route
0–75 (within ROW[1])	0	0
75–150	2	0
150–300	6	5
Density (residences/linear mile)	0.2	0.1

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

There are no residences, businesses, or other structures within 75 feet of the Preferred or Alternative Route alignments. Residential density is greater along the Preferred Route alignment. There are 3 more residences located within 300 feet of the Preferred Route alignment compared with the Alternative Route centerline.

8.2.2.2 Impacts and Mitigation

Since no displacements were identified during the transmission line routing to date, no mitigation measures are proposed.

8.2.3 Noise

Transmission lines produce noise under certain conditions. The level of noise depends on conductor geometry, voltage level, and weather conditions. Generally, activity-related noise levels during the operation and maintenance of transmission lines are minimal and do not exceed the MPCA noise limits outside of the 150-foot ROW. More information on how noise impacts were analyzed is included in Chapter 7.2.3.

8.2.3.1 Existing Environment

Existing background noise along the Preferred and Alternative Routes is generated from everyday sources such as traffic along local roads, farm equipment, wind, and in-home appliances. Noise levels associated with these everyday noise sources are listed in Chapter 7.2.3. The transmission line would produce noise levels that range from approximately 41.8 to 51.6 dBA for a double circuit 345 kV transmission line with both circuits in service, and noise levels that range from approximately 45.8 to 54.1 dBA when only one 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.

8.2.3.2 Impacts and Mitigation

Transmission line audible noise levels are not predicted to exceed the MPCA noise limits outside the ROW for all NACs. No mitigation is proposed for the audible noise generated by the transmission lines.

Information showing the MPCA daytime and nighttime limits in A-weighted decibels for each NAC is provided in Chapter 7.2.3.

8.2.4 Aesthetics

The discussion of visual quality and aesthetics is based on a qualitative review of the natural and man-made features of the existing environment within and views toward the Project area. Chapter 7.2.4 provides general information about the methods used to assess potential impacts to aesthetic resources in the Project area.

8.2.4.1 Existing Environment

The existing landscape character of the Project area in the North Rochester–Mississippi River 345 kV section is comprised by three types, all of which are crossed by the Preferred and Alternative Routes as described in Chapter 8.2.1: (1) Agricultural lands east and west of the Zumbro River, (2) forested bluffs, and (3) the Mississippi River valley.

The Preferred and Alternative Routes have different visual impacts where they follow different alignments west of the Dairyland Rochester to Alma 161kV line (Dairyland Q-3 line). The Preferred and Alternative Route have the same visual impacts where they follow the same alignment along the Dairyland Q-3 line.

Aesthetically, the major difference between the Preferred and Alternative Routes west of the Dairyland Q-3 line is the extent and location where each route follows existing transmission lines. The Preferred Route parallels existing transmission lines for 32 percent of its length, including a 69 kV transmission line for approximately 3.5 miles near Plainview, and the Dairyland Q-3 line for approximately 11 miles. In comparison, the Alternative Route parallels existing transmission lines for 22 percent of its length, along the Dairyland Q-3 line for 9.3 miles. The Alternative Route also crosses several forested drainages where there is no existing linear corridor west of the Dairyland Q-3 line.

8.2.4.2 Impacts and Mitigation

General visual impacts and mitigation strategies applicable for the Project are identified in Chapter 7.2.4. Overall, the Preferred Route would likely have less impact on aesthetics because it follows existing transmission lines for a greater percentage of its length when compared to the Alternative Route. The Preferred Route crosses the Zumbro River at a location where there is existing transportation corridor, on the north side of White Bridge Road. The Alternative Route crosses the Zumbro River at a location with no existing linear feature. Furthermore, the Preferred Route would require less tree clearing west of the Dairyland Q-3 line.

The following identifies potential visual impacts in the landscape types that occur at specific locations within 1 mile of the Preferred and Alternative Routes west of the Dairyland Q-3 line, and the Preferred and Alternative Routes where they share the same alignment along the Dairyland Q-3 line.

Preferred Route

Along the Preferred Route, row crops, fence lines, and local roads create linear patterns across agricultural lands similar to linear patterns formed by transmission lines. Other vertically oriented features along the Preferred Route through agricultural lands west of the Q-3 transmission line include transmission lines, distribution lines, and communication towers.

Aesthetic values crossing forested areas, including bluffs near the Zumbro River, would be impacted by the Preferred Route where tree removal within the 150-foot ROW would create new or expanded openings and increase the visibility of the transmission line. While the Preferred Route would be partially buffered by existing tree cover and terrain, the transmission line structures would extend above the tree canopy for over 50 feet and could be visible for over a mile away depending on the vantage point, the viewer's degree of discernable detail at such distance, terrain, and vegetative screening. Due to the width of the Zumbro River, the transmission line would be highly visible to boaters and anglers near the Zumbro River at the crossing site. Impact to views from residences located on the east bank of the Zumbro River on the south side of White Bridge Road would depend upon the degree of screening provided by vegetation and terrain.

Aesthetic resources along the existing Dairyland Q-3 line, the proposed alignment for both the Preferred and Alternative Routes, would be impacted by expanding the current ROW, from approximately 80 feet to approximately 150 feet in most locations. The ROW expansion would likely increase the visibility of the Q-3 transmission line. The 345 kV transmission lines would be visible 50 to 95 feet above tree canopies,

which is estimated to be an average of 80 feet high. The Preferred and Alternative Routes cross the Snake Creek Management Unit of the RJD State Forest, an area owned and managed by the MDNR for recreation and described in Chapter 8.2.6. The Preferred and Alternative Routes cross motorized and non-motorized trails associated with the Snake Creek Unit on the south side of Wabasha CR-14, and also cross a non-motorized trail system on the north side of Wabasha CR-14.

Aesthetic resources of the Mississippi River Valley would be impacted by both the Preferred and Alternative Routes along the existing Dairyland Q-3 line. Visibility is greatest in this landscape type, especially when viewed from or toward higher elevations. For example, tree clearing for the existing ROW at the top of the bluff south of Kellogg is skylined and can be seen for several miles and in Wisconsin.

Viewer sensitivity also is very high as a result of sightseeing and recreational activities, as described in Chapter 8.2.6. The Preferred and Alternative Routes cross the Great River Road Scenic Byway (US-61), and would be visible to travelers along that roadway. As seen by travelers looking west of the Great River Road, a new transmission line would be screened by terrain, vegetation, and camouflaged similar to the existing Dairyland Q-3 line. Looking east, however, a new transmission line would likely create a moderate to strong contrast in the valley bottoms from the Great River Road similar to the existing, visible Dairyland Q-3 line.

Recreationists visiting the McCarthy Lake WMA and the Upper Mississippi National Fish and Wildlife Refuge, and boaters and anglers on the Mississippi River also would see the new transmission line. Form and line contrasts would be reduced, as the Dairyland Q-3 line already exists in the landscape; however the scale and design of the Preferred and Alternative Routes and the potential for ROW clearing would still draw attention.

Alternative Route

The Alternative Route crosses the Zumbro River approximately 2.2 miles north of the Zumbro Dam, and is not planned to be collocated with existing transmission infrastructure. The new transmission line would be visible to travelers and water-based recreationists along that stretch of the Zumbro River, albeit for a more limited distance as visibility is screened by bluffs and tree canopies.

Between US-63 and the Dairyland Q-3 line, the Alternative Route is located approximately 1.7 miles north of the Preferred Route in hillier and more varied terrain. The Alternative Route crosses more forested area associated with drainages and bluffs in this area where there are currently no established transmission corridors. Tree removal within the 150-foot ROW in these areas would create new openings, and the 345 kV transmission lines would be visible 50 to 95 feet above tree canopies, which are estimated to be on average 80 feet high. The degree to which the ROW clearing would be visible depends on terrain and vegetative screening. Tree clearing would create new linear corridors in these areas resulting in aesthetic impacts. Potential impacts to aesthetic resources along the Dairyland Q-3 alignment would be the same as those discussed for the Preferred Route above.

8.2.5 Social and Economic Resources

The socioeconomic study area for the North Rochester–Mississippi River 345 kV section is defined as Goodhue, Wabasha, and Olmsted counties. Socioeconomic factors analyzed in this Application include population, race and ethnicity, income, and leading industries. Chapter 7.2.5 provides additional background information and methodology for the socioeconomic analysis in this Application. The socioeconomic study area presented here includes the communities located near the Preferred and Alternative Routes in Minnesota.

8.2.5.1 Existing Environment

The majority of the Preferred and Alternative Routes follow an east-west and northeasterly path through Goodhue and Wabasha counties. The majority of the land use in Goodhue, Wabasha, and Olmsted counties is agricultural and agricultural serving communities. According to the MN GAP, most of the land cover in the socioeconomic study area is cropland, with pockets of grassland, forest, and aquatic land cover types (Figure 8.2-2). Urban land cover is limited to the area in the immediate vicinity of population centers (MN GAP 2002).

Communities near the Preferred Route include (generally listed west to east) Zumbrota, Pine Island, South Troy, Hammond, Potsdam, Millville, Elgin, Plainview, Kellogg, and Weaver (Figure 8.2-2 and Table 8.2.4). Residences along the Preferred and Alternative Routes occur in a rural setting and are distributed across farmsteads and agricultural operations. Rochester is the most urban community in the socioeconomic study area, and is located approximately 8.5 miles south of the North Rochester Substation siting area. Table 8.2-3 lists communities in the socioeconomic study area that were identified in the *Trade Centers of the Upper Midwest 2003 Update* as regional trade centers (Casey 2003).

Table 8.2-3:
Level of Hierarchy of Regional Trade Centers within the Socioeconomic Study Area for the North Rochester-Mississippi River 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	—	
3	Complete Shopping Center	—	—
4	Partial Shopping Center	Zumbrota(Goodhue)/Plainview(Wabasha)	226/178
5	Full Convenience Center	Pine Island(Goodhue)	171
6	Minimum Convenience Center		
7	Hamlet	—	—

Source: Casey (2003).

Population Characteristics

Population characteristics used to analyze the social setting of the socioeconomic study area include the total population, estimated future population, and per capita income. Population information is included in Table 8.2-4, and shown on Figure 8.2-2. According to the U.S. Census Bureau 2008, the population in the socioeconomic study area has experienced a population change ranging from negative 9 percent to more than 40 percent. The rates of growth between 2000 and 2008 was less in Wabasha County (1 percent) and Goodhue County (4 percent) than in Olmsted County (14 percent) and the state growth rate of 6 percent most likely due to the existing environment and lack of any large trade centers in these two counties. It is projected that population growth in the study area will follow historic trends during the projected construction schedule due to its rural environment, stability of leading industries, and size of trade centers.

Table 8.2-4:
Population in the Socioeconomic Study Area for the North Rochester-Mississippi River 345 kV Section

City/County	2000 Population	2008 Population	Percent Change 2000-2008
Goodhue County	44,127	45,897	4%
Pine Island	2,337	3,326	42%
Zumbrota	2,789	3,074	10%
Wabasha County	21,610	21,813	1%
Elgin	826	938	1%
Hammond	198	181	-9%
Kellogg	439	472	8%
Mazeppa	778	771	-1%
Millville	186	170	-9%
Plainview	3,190	3,225	1%
Potsdam	Data Not Available		
South Troy	Data Not Available		
Weaver	Data Not Available		
Zumbro Falls	177	172	-3%
Olmsted County	124,277	141,360	14%
Rochester	85,806	100,413	17%
State	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. As shown in Table 8.2-5, the majority of persons in the study area self-identified as White/Caucasian. Standard procedures used by the U.S. Census Bureau to determine race and ethnicity are discussed in Chapter 7.2.5.

Table 8.2-5:
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	1,071	4	3	8	6	6	1,095
	Percent	98	<1	<1	1	1	1	
Alternative Route	Number of Persons	1,249	3	5	1	7	4	1,264
	Percent	99	<1	<1	<1	1	<1	
Region of Comparison	Goodhue County	42,613	280	473	251	305	678	44,127
	Percent	97	1	1	1	1	1	
	Wabasha County	21,171	54	364	94	97	194	21,610
	Percent	98	<1	2	<1	<1	1	
	Olmsted County	112,255	3,330	2,959	5,305	1,881	1,506	124,277
	Percent	90	3	2	4	2	1	
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	3.5	2.9	2.9	1.6	1.3	

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

Economic Characteristics

The per capita income in 2000 was approximately $21,934 in Goodhue County, $25,659 in Wabasha County, and $24,939 in Olmsted County (U.S. Census 2000).

A variety of industries make up the workforce in Goodhue, Wabasha, and Olmsted counties. Leading industries in all three counties include educational, health and social services; manufacturing; and retail

trade. Social service occupations, education, and health care are leading industries in the ROC. Table 8.2-6 provides an overview of the leading county industries for Goodhue, Wabasha, and Olmsted counties.

Table 8.2-6:
Leading Industries in the Socioeconomic Study Area for the North Rochester-Mississippi River 345 kV Section

County	Industry[1]	Percent of Workforce
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
Wabasha	Educational, Health, and Social Services	24.8
	Manufacturing	17.4
	Retail Trade	12.1
	Agriculture, forestry fishing and hunting, and mining	9.6
	Construction	7.8
	Arts, Entertainment, Recreation, Accommodation, and Food Services	6.7
	Transportation and Warehousing, and utilities	4.3
	Other services except public administration	4.2
	Finance and insurance and real estate and rental and leasing	4.1
	Professional, scientific, management, administrative and waste management	3.6
	Wholesale Trade	2.2
	Public administration	2.1
	Information	0.9

Table 8.2-6:
Leading Industries in the Socioeconomic Study Area for the North Rochester-Mississippi River 345 kV Section

County	Industry[1]	Percent of Workforce
Olmsted	Educational, Health, and Social Services	39.9
	Manufacturing	11.0
	Retail Trade	9.9
	Arts, Entertainment, recreation, accommodation, and food services	7.9
	Professional, scientific, management, administrative and waste management	6.8
	Construction	6.0
	Finance and insurance and real estate and rental and leasing	3.8
	Other services except public administration	3.7
	Transportation and warehousing, and utilities	3.5
	Information	2.3
	Public administration	2.1
	Wholesale Trade	1.9
	Agriculture, forestry fishing and hunting, and mining	1.3

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

8.2.5.2 Impacts and Mitigation

Any adverse impacts to socioeconomic conditions within the study area would be short-term due to the duration of construction and size of projected workforce; therefore, no mitigation is proposed. The types of impacts that may be anticipated within the socioeconomic study area from the Preferred and Alternative Routes would be the same as those identified in Chapter 7.2.5. Potential impacts to services such as police, fire, hospital/emergency service, and social services within the study area are discussed in Chapter 8.2.7.

8.2.6 Recreation and Tourism

There are a variety of outdoor recreational and tourism opportunities in the North Rochester–Mississippi River 345 kV section, where popular activities include snowmobiling, biking, hiking, canoeing, boating, fishing, camping, swimming, hunting, and nature observation. Data identifying recreational resources were gathered from local, state, and federal agencies. Private recreational resources, such as golf courses and camps, were identified through aerial maps or field verification. The MDNR's 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.

8.2.6.1 Existing Environment

The majority of the land within the Preferred and Alternative Routes is private and does not provide public recreation opportunities. Most public recreation opportunities are located near the Zumbro and the Mississippi rivers. Tourism opportunities along the Preferred and Alternative Routes are associated with the recreational resources described below. Figure 8.2-3 shows recreation resources in the North Rochester–Mississippi River 345 kV section. Recreation resources near the Preferred and Alternative Routes are discussed separately below.

Preferred Route

Public recreation resources in the vicinity of the Preferred Route include (generally listed west to east) snowmobile trails, the Isaak Walton League WMA, the Zumbro River and Lake Zumbro, the RJD Memorial Hardwood State Forest (including the Snake Creek Management Unit), Great River Road Scenic Byway, McCarthy Lake WMA, and the Upper Mississippi National Wildlife and Fish Refuge. Private recreation resources include summer camp properties along the west shore of the Zumbro River.

Wildlife Management Areas (WMAs): The Preferred Route follows an established transmission line corridor through the McCarthy Lake WMA between US-61 and the Mississippi River, along the existing Dairyland Q-3 line. In addition to serving conservation purposes, McCarthy Lake WMA provides recreational activities such as hunting, birding, and wildlife viewing. The Preferred Route crosses the McCarthy Lake WMA for approximately 0.91 mile, and approximately 128 acres of the McCarthy Lake WMA occur within 500 feet of the Preferred Route centerline. No developed recreation facilities associated with the McCarthy Lake WMA occur within the Preferred Route.

Snowmobile Trails: A description of snowmobile trails in Minnesota is provided in Chapter 7.2.6. The Preferred Route crosses multiple snowmobile trails between the North Rochester Substation and the Mississippi River Crossing, including snowmobile trails that are part of a trail system associated with the Snake Creek Management Unit.

Lake Zumbro/Zumbro River: The Preferred Route crosses the Zumbro River at White Bridge Road, which is approximately 2 miles south of Lake Zumbro. Lake Zumbro provides recreational opportunities including boating, water skiing, tubing, fishing, and swimming. The Zumbro River provides river-based recreation opportunities including boating, fishing, and swimming. Lake Zumbro is the only lake in the area that allows boats with gas engines (Rochester Angler 2009). The majority of lakeshore property is privately owned; however, there are two public boat ramps on the lake. One public boat ramp, managed by MDNR, is approximately 0.1 mile south of the Preferred Route.

RJD Memorial Hardwood State Forest, Snake Creek Management Unit: The Preferred Route follows an established transmission corridor through approximately 2.2 miles. The RJD Memorial Hardwood State Forest covers approximately 2 million acres of land across seven Minnesota counties and provides off-highway vehicle trails, camping sites, picnic sites, and fishing for recreational users. The Snake Creek Unit includes several miles of designated trails for hiking, cross country skiing, motorcycles, ATVs, and snowmobiles. Recreation facilities in this unit include three parking lots and two picnic grounds. The Preferred Route crosses one motorized and one non-motorized trail associated with the Snake Creek

Unit where the Dairyland Q-3 line is currently located on the south side of Wabasha CR-14, and also crosses a non-motorized trail system on the north side of Wabasha CR-14.

Great River Road Scenic Byway: The Preferred Route crosses US-61 once south of Kellogg where the existing Dairyland Q-3 line is located. US-61 is designated as the Great River Road National Scenic Byway, a scenic byway that parallels the Mississippi River from northern Minnesota south through southern Mississippi. The Great River Road provides opportunities to view scenery and wildlife along the Minnesota landscape, as well as access to recreation opportunities and local communities along the Mississippi River.

Mississippi River and Upper Mississippi River National Wildlife and Fish Refuge: At the Mississippi River, the Preferred Route crosses approximately 0.5 mile of the Upper Mississippi National Wildlife and Fish Refuge. The Upper Mississippi River National Wildlife and Fish Refuge is 240,000 acres in size, 261 river-miles long on the Upper Mississippi River. Recreational opportunities in the Refuge include boating, hunting, hiking, swimming, fishing, and viewing wildlife. The Mississippi River itself provides opportunities for boating, angling, and viewing wildlife. No public access points or developed recreational facilities are located within 1 mile of the Preferred Route in Minnesota.

Alternative Route

The following information pertains to recreation resources near the Alternative Route only between the proposed North Rochester Substation and the Dairyland Q-3 line. Impacts to recreation resources between the Dairyland Q-3 line and the Mississippi River would be the same as those described for the Preferred Route, because the Preferred and Alternative Routes share an alignment in this area. This would apply to the following resources identified in the previous section; RJD Memorial Hardwood State Forest, Snake Creek Management Unit, Great River Road Scenic Byway, McCarthy Lake WMA, the Upper Mississippi National Fish and Wildlife Refuge, and snowmobile trails crossed by the Dairyland Q-3 line.

Public recreation resources in the vicinity of the Alternative Route between the North Rochester Substation and the Dairyland Q-3 line include (generally listed west to east): snowmobile trails, and the Zumbro River. Private recreation resources include the Steeplechase Ski and Snowboard Resort property.

Snowmobile Trails: A description of snowmobile trails in Minnesota is provided in Chapter 7.2.6. Snowmobile trails crossed and/or paralleled by the alternative are similar to those described for the Preferred Route.

Zumbro River: The Zumbro River provides recreational opportunities including boating, fishing, and swimming. Land surrounding the river near the Alternative Route is privately owned; however, public recreation may occur as public access points are located further upstream. No public access or boat ramps were identified within 1 mile of the Alternative Route.

Private Recreation Opportunities: The Alternative Route crosses approximately 0.4 mile of a property known as the Steeplechase Ski and Snowboard Resort, located west of the Zumbro River and south of Mazeppa. The Alternative Route would not affect the operation of the ski resort.

8.2.6.2 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 across recreational resources to minimize impacts.

The transmission line would have direct visual impacts on recreation areas that would be crossed by the Preferred Route. The transmission line also would likely be visible from recreation areas located 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. West of the Dairyland Q-3 line, a new visual impact would likely be created at snowmobile trails that cross or parallel the Preferred Route, at the Zumbro River, and at Lake Zumbro. Visual impacts to recreation areas along the Dairyland Q-3 line would be similar in nature because an existing transmission line and associated cleared ROW already occur on the landscape. Similar impacts along the Preferred Route would occur at snowmobile trails crossed by the Preferred Route along the Dairyland Q-3 line, the RJD Memorial Hardwood State Forest, the Snake Creek Management Unit, Great River Road Scenic Byway, McCarthy Lake WMA, and the Upper Mississippi National Wildlife and Fish Refuge. The degree of visual impact at these areas would depend on proximity to the transmission line, vegetative screening, and terrain. The Applicant would work with private landowners, as well as federal, state, and local agencies to reduce visual impacts to recreational areas. As discussed in Chapter 8.2.4, the transmission line would be designed to minimize impacts to aesthetics.

Recreation areas that crossed by the Alternative Route would be directly impacted visually by the transmission line. The transmission line also would likely be visible from recreation areas located adjacent to the Alternative 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. West of the Dairyland Q-3 line, a new visual impact would likely be created at snowmobile trails that cross or parallel the Preferred Route, at the Steeplechase property, and at the Zumbro River. Visual impacts along the Dairyland Q-3 line would be the same as those identified for the Preferred Route. The Applicant would work with private landowners, as well as federal, state, and local agencies to reduce visual impacts to recreational areas.

Impacts and mitigation for snowmobile trails crossed or paralleled by the routes is described in Chapter 7.2.6.

8.2.7 Public Services and Health and Safety

Public services and facilities along the Preferred Route are generally defined as services provided by government entities, including hospitals, fire and police departments, schools, public parks, and water supply or wastewater disposal systems. Public services also include pipelines, transmission lines, and other utility infrastructure. Figure 8.2-4 shows existing transmission lines and natural gas pipelines within

the North Rochester–Mississippi River 345 kV section. Chapter 7.2.7 describes methodology for identifying and analyzing potential impacts to public services, health, and safety.

8.2.7.1 Existing Environment

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

Residents outside of incorporated cities in southeastern Minnesota generally rely on groundwater as their source of drinking water (MDNR 2009p). Rural residents and businesses in Goodhue, Wabasha, and Olmsted counties typically get their water from private wells and SSTs provide sanitary waste water treatment. Electricity in the area is typically provided by Xcel Energy and Goodhue County Cooperative. Natural Gas is provided by Xcel Energy and Minnesota Energy Resources. No municipal areas are located along the Preferred or Alternative Routes, so no public services are offered by municipalities.

Electric distribution lines, cable television, and telephone lines providing service to adjacent homes and businesses are located along many of the roads the Preferred Route follows. These lines do not present a barrier to construction and operation of the transmission line. The Preferred Route follows the following existing high-voltage transmission lines:

- An existing 69 kV transmission line owned by Xcel Energy for approximately 3.5 miles, north of Plainview.
- The Dairyland Q-3 line for approximately 12 miles.

The Alternative Route follows the Dairyland Q-3 line for approximately 9 miles, and no other high-voltage transmission lines.

The Preferred Route crosses one natural gas pipeline approximately 1.4 miles east of 80th Avenue NE. The Alternative Route crosses two natural gas pipelines approximately 1 mile east of CR-23. These existing utility lines do not present a barrier to construction and operation of the proposed transmission line; however, it may be necessary for the Applicant to work with other public service utilities to relocate their facilities if they may conflict with the construction or operation of the proposed transmission line.

8.2.7.2 Impacts and Mitigation

The Preferred and Alternative Routes are not anticipated to directly or indirectly impact the operation of existing public services or public health and safety. Minimal disruptions to electric, services may take place during construction if the transmission line passes or cross over existing utilities.

Mitigation measures to be implemented during construction of the transmission line and measures to ensure that there are disruptions to public services are negligible are described in Chapter 7.2.7.

The construction and operation of the Preferred Route for the transmission line is not anticipated to impact public health and safety. Chapter 7.2.7 provides a detailed discussion regarding public health and safety measures that would be implemented during construction and operation of the Project.

8.2.8 Transportation

Transportation corridors were identified along the route using GIS data. Future transportation facilities and plans were identified through consultation with Mn/DOT and county public works or planning departments.

Public airports and aviation facilities also were considered for potential impacts by the Preferred and Alternative Routes. 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. The FAA also has developed guidelines for the proximity of structures to VOR systems. Chapter 7.2.8 provides detailed information about these guidelines.

8.2.8.1 Existing Environment

Roads, railroads, and public airports and aviation facilities are identified if located near the Preferred or Alternative Routes on Figure 8.2-5.

Roadways

The Preferred and Alternative Routes parallel the types of roads listed in Table 8.2-7. Road ROWs typically associated with highways, county roads, and township roads are described in Chapter 7.2.8.1.

Table 8.2-7:
Preferred and Alternative Routes: Types of Roads Paralleled

Road Type	Preferred Route	Alternative Route
Length paralleling Interstate Highways	0.0	0.0
Length Paralleling U.S. Highways	1.0	0.0
Length Paralleling State Highways	0.0	0.0
Length Paralleling County Roads	2.3	2.3
Length Paralleling Local Roads	0.0	0.0

Railroads

Where the routes share an alignment, the Preferred and Alternative Routes cross one railroad. The routes cross the Canadian Pacific Railroad approximately 3.5 miles southwest of the Mississippi River crossing.

Airports and Airplane Safety

There are no public airports in proximity to the Preferred or Alternative Route.

8.2.8.2 Impacts and Mitigation

Roadways

Chapter 7.2.8 discusses potential impacts along roadways and provides mitigation measures to minimize those impacts.

Railroads

Chapter 7.2.8 discusses potential impacts along railroads and provides mitigation measures to minimize those impacts.

Airports and Airplane Safety

Chapter 7.2.8 discusses potential impacts to airports. There are no public airports or aviation facilities near the Preferred or Alternative Routes that warrant review by the FAA or Mn/DOT.

8.2.9 Electrical Interference

A discussion regarding the potential effects on radio, television, cellular phone, and GPS devices is included in Chapter 7.2.9.

8.2.9.1 Existing Environment

There are two communication towers located within 500 feet of the Preferred Route centerline, and four communications towers located within 500 feet of the Alternative Route centerline. Communication facilities are identified on Figure 8.2-6.

8.2.9.2 Impacts and Mitigation

There is a potential for interference to occur with communication facilities. More information regarding interference and mitigation measures to reduce interference are included in Chapter 7.2.9.

8.3 Land Based Economies

8.3.1 Agriculture

Agricultural resources evaluated in this Application include areas with land cover identified as cropland, prime farmland, center pivot irrigation systems, farmland preservation easements, and organic farms. Background information and methodology are provided in Chapter 7.3.1.

8.3.1.1 Existing Environment

The Preferred Route is located in Goodhue, Wabasha, and Olmsted counties. The Alternative Route is located in Goodhue County and Wabasha counties (Figure 8.2-1).

The number of farms in Goodhue County has decreased by 2 percent, while the average farm size has increased by 3 percent between 2002 and 2007. 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, and hogs and pigs. In 2007, Goodhue County ranked number five for production of oats. In 2008, Goodhue County ranked number five for production of milk cows and five for production of milk in 2007 (USDA 2006, 2008).

The number of farms in Wabasha County has decreased by 2 percent, while the average farm size has increased by 1 percent between 2002 and 2007. Total agricultural sales in Wabasha County have increased by 51 percent, with crop sales at $52,253,000 (36 percent) and livestock sales at $91,958,000 (64 percent). Crops in Wabasha County are primarily corn and forage, and livestock are primarily cattle and calves and egg layers. In 2007, Wabasha County ranked number two in the state for production of fruits, tree nuts, and berries and number four in the state for production of milk and other dairy products (USDA 2007).

The number of farms in Olmsted County has decreased by 1 percent, while the amount of land in farms has decreased by 5 percent between 2002 and 2007. Total agricultural sales in Olmsted County have increased by 49 percent with crop sales at $83,020,000 (54 percent) and livestock sales at $71,904,000 (46 percent). Primary agricultural crops in Olmsted County are primarily corn and soybeans; the primary livestock raised are turkeys and hogs (USDA 2007a). Olmsted County did not rank in the top producers of crops or livestock in the state of Minnesota.

Figure 8.2-1 shows land cover type in the North Rochester–Mississippi River 345 kV section. Approximately 3,397 acres of land (61 percent) in the Preferred Route are cropland, with approximately 495 acres (61 percent) of cropland within the 150-foot ROW. Approximately 2,976 acres of land (59 percent) in the Alternative Route are cropland, with approximately 450 acres (59 percent) of cropland within the 150-foot ROW.

Figure 8.3-1 shows soils considered prime farmland, prime farmland when drained, and farmland of statewide importance. Approximately 561acres (69 percent) of soils in the 150-foot ROW of the Preferred Route are considered prime farmland, prime when drained, or farmland of statewide importance. Approximately 495 acres (65 percent) of soils in the 150-foot ROW of the Alternative Route are considered prime farmland, prime when drained, or farmland of statewide importance.

Other agricultural resources located near the Preferred Route also are identified in Figure 8.3-1. No center pivot irrigation systems, farmland preservation easements or organic farms were identified along the Preferred or Alternative Routes. Comments submitted by the public, however, identified two private tree farms located along the Alternative Route. One tree farm is located directly east of the shoreline of the Zumbro River, and is crossed by the Alternative Route for approximately 1,000 feet. An additional tree

farm is located approximately 0.5 mile east of the Zumbro River. The Alternative Route follows the northern property line bounding the tree farm parcel, paralleling the property line for approximately 1,300 feet.

8.3.1.2 Impacts and Mitigation

Chapter 7.3.1 provides detailed information regarding impacts to agricultural operations and potential mitigation measures. A detailed quantification of permanent and temporary impacts to agricultural resources is provided in Appendix P.

The Applicant estimates that the permanent impacts in agricultural fields would be approximately 1,000 square feet per structure. Along the Preferred Route, the Applicant estimates approximately 143,000 square feet or approximately 3.3 acres of cropland would be permanently impacted. Along the Alternative Route, the Applicant estimates approximately 131,000 square feet or approximately 3 acres of cropland would be permanently impacted.

During construction, temporary impacts, such as soil compaction and crop damage, are likely to occur in a small area around each structure. The Applicant estimates that the temporary impacts in agricultural fields would be 1 acre per span for construction. Along the Preferred Route, the Applicant estimates that approximately 246 acres of agricultural land would be temporarily impacted by transmission line construction. Along the Alternative Route, the Applicant estimates that approximately 231 acres of agricultural land would be temporarily impacted by transmission line construction.

Because the Preferred and Alternative Routes do not cross center pivot irrigation systems, farmland preservation easements, or organic farms, no impacts to these resources are anticipated with either route.

8.3.2 Forestry

Chapter 7.3.2 provides background information regarding forestry within the Project area, and methodology for identifying potential impacts to forestry resources. For the purpose of this Application, potential impacts to forestry resources would occur if the routes occur in AHPs. Impacts may include tree clearing within the 150-foot ROW or in construction staging areas. Impacts to forested areas outside of economically important forestry areas are discussed in Chapter 8.5.3, Flora.

8.3.2.1 Existing Environment

Figure 8.2-1 shows forested areas in the North Rochester–Mississippi River 345 kV section. Forested areas along the Preferred Route between the proposed North Rochester Substation and the Dairyland Q-3 line are mostly located near drainages, waterways including Dry Run Creek and the Zumbro River, near farmsteads, and along field windbreaks. The Preferred Route crosses forested areas near the Zumbro River, along the Dairyland Q-3 line through the bluffs west of the Mississippi River, including approximately 12.7 miles of privately owned land in the RJD State Forest, and approximately

2.1 miles of the MDNR owned and managed RJD State Forest. Within the Preferred Route ROW, there would be approximately 94 acres of forested land.

Forested areas along the Alternative Route between the proposed North Rochester Substation and the Dairyland Q-3 line are located near the Zumbro River and other waterways and drainages, near farmsteads, and along field windbreaks. The Alternative Route crosses approximately 2.4 miles of MDNR-owned and managed RJD State Forest and crosses approximately 27 miles of privately owned land in the RJD State Forest. Within the Alternative Route ROW, there is approximately 121 acres of forested land. The Alternative Route shares an alignment with the Preferred Route through the forested bluffs west of the Mississippi River.

According to the MDNR Forestry Division Fiscal Year 2010 Harvest Plans (MDNR 2009i), the Preferred or Alternative Routes do not cross any townships that have AHPs.

8.3.2.2 Impacts and Mitigation

Impacts may include tree clearing within the 150-foot ROW or in construction staging areas. The Alternative Route would likely require more tree clearing because there is more forested land within the150-foot ROW. Impacts and mitigation measures associated with tree clearing within the 150-foot ROW are discussed in Chapter 8.5.3, Flora.

No impacts to economically important forestry resources are anticipated and therefore no mitigation measures are proposed.

8.3.3 Mining

Mining resources have been identified along the Preferred Route to understand the potential impact to current and future mining operations and to understand the area geology when determining structure locations. The Applicant used mining data from the Mn/DOT Aggregate Sources Interactive Map.

8.3.3.1 Existing Environment

Goodhue, Wabasha, and Olmsted counties were identified by the MDNR as being located in a region where there are many crushed stone operations. No aggregate mines were identified within 1 mile of the Preferred Route. One aggregate mine, the Hammons/Milestone mine, was identified within 1 mile of the Alternative Route and is within 500 feet of the Alternative Route centerline to the north and approximately 1 mile southwest of Hammond (Figure 8.3-2).

8.3.3.2 Impacts and Mitigation

Because no mines occur along the Preferred Route, no impacts are anticipated. The transmission line is not anticipated to impact the Hammons/Milestone mine along the Alternative Route. 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.

8.4 Archaeological and Historic Resources

8.4.1 Archaeological

Chapter 7.4.1 describes the methodology used to identify and evaluate potential impacts to archaeological resources, and describes impacts and mitigation measures.

8.4.1.1 Project Area

Preferred Route

Nine archaeological sites were documented in the Project area within 1 mile of the Preferred Route centerline. Two of the sites are listed as single artifacts. Four sites are listed as unknown types. One site was listed as earthworks and artifact scatter. One site is listed as a lithic scatter that has been determined as not eligible for listing on the NRHP. One site is listed as a lithic scatter that is recommended to be eligible for listing on the NRHP. Eligibility of the remaining sites has not been determined (MVAC 2008). A list of archaeological sites along the Preferred Route is located in Appendix Q.

Alternative Route

Nine archaeological sites were documented in the Project area within 1 mile of the alternative centerline. Three of the sites have been listed as single artifacts. One site was listed as earthworks and artifact scatter. Four sites have been listed as unknown types. One site was listed as a lithic scatter that has been determined as not eligible for listing on the NRHP. Eligibility of the remaining sites has not been determined (MVAC 2008). A list of archaeological sites along the Alternative Route is located in Appendix Q.

8.4.1.2 Impacts and Mitigation

The sites identified in the Class I are not anticipated to be impacted by the construction of the transmission line along the Preferred or Alternative Routes. Chapter 7.4.1 describes mitigation measures should any additional archaeological resources be identified during construction of the transmission line.

8.4.2 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. A list of architectural properties within the Project area is located in Appendix Q.

8.4.2.1 Existing Environment

There are no NRHP-recognized sites located within 1 mile of the Preferred or Alternative Routes.

There are 29 architecture sites within 1 mile of the Preferred Route and 21 within 1 mile of the Alternative Route that have not yet been evaluated for eligibility on the NRHP.

8.4.2.2 Impacts and Mitigation

Chapter 7.4.2 describes the mitigation approach associated with the discovery of historic resources.

8.4.3 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.

8.4.3.1 Existing Environment

No designated historic landscapes were referenced in the Class I (MVAC 2008).

8.4.3.2 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.

8.5 Natural Environment

8.5.1 Air Quality

Chapter 7.5.1 provides background information about assessment of impacts to air quality.

8.5.1.1 Existing Environment

The Existing Environment information presented in Chapter 7.5.1.1 is the same for this section of the 345 kV line (North Rochester to Mississippi River).

8.5.1.2 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.

8.5.2 Water Resources

Water resources considered in this Application include streams and rivers, impaired waters, wetlands, FEMA floodplains, and BWSR easements. Chapter 7.5.2 provides information on state and federal regulations regarding water resources as well as wetland classification descriptions.

8.5.2.1 Existing Environment

Streams

All streams crossed by the 150-foot ROW of the Preferred Route are listed in Table 8.5-1. The Preferred Route crosses 18 streams, 7 of which are PWI streams under the regulatory jurisdiction of MDNR (MDNR 2009). Silver Creek, East Indian Creek, an unnamed tributary to Snake Creek, Snake Creek, Gorman Creek, Dry Run Creek and the Zumbro River are designated PWI streams (MDNR 2009).

The Preferred Route crosses the Zumbro River just north of White Bridge Road. Downstream of the Zumbro Dam, the Zumbro River is considered impaired due to fecal coliform and mercury and PCBs in fish tissue. Upstream of the Zumbro Dam, Lake Zumbro is considered impaired due to excess nutrients/eutrophication (MPCA 2008). The Applicant anticipates that all streams and surface water along the Preferred Route would be spanned and that no structures would be located within these water features.

All streams crossed by the proposed 150-foot ROW of the Alternative Route are listed in Table 8.5-2. The Alternative Route crosses 24 streams, 11 of which are PWI streams under the regulatory jurisdiction of MDNR (MDNR 2009). Hammond Creek, Silver Creek, the Zumbro River, Long Creek, Middle Creek, West Indian Creek, the unnamed tributary to Snake Creek, Snake Creek, Gorman Creek, and the unnamed tributary to the Mississippi River are classified as PWI streams (MDNR 2009).

Table 8.5-1:
Streams Crossed by 150-foot ROW of the Preferred Route

Waterbody Name	Number of Crossings	PWI Stream (Yes/No)
Unnamed Perennial/Intermittent Stream, Tributary to Hammond Creek	5	No
Unnamed Perennial/Intermittent Stream, Tributary to Silver Creek	4	No
Silver Creek	1	Yes
Unnamed Perennial/Intermittent Stream, Tributary to Long Creek	9	No
Unnamed Perennial/Intermittent Stream, Tributary to Middle Creek	6	No
Unnamed Perennial/Intermittent Stream, Tributary to West Indian Creek	7	No
Unnamed Perennial/Intermittent Stream, Tributary to East Indian Creek	9	No
East Indian Creek	3	Yes
Unnamed Perennial/Intermittent Stream, Tributary to Snake Creek	1	Yes
Unnamed Perennial/Intermittent Stream, Tributary to Snake Creek	5	No
Snake Creek	1	Yes
Unnamed Perennial/Intermittent Stream, Tributary to Gorman Creek	5	No
Gorman Creek	1	Yes
Dry Run Creek	1	Yes
Unnamed Perennial/Intermittent Stream, Tributary to Dry Run Creek	5	No
Unnamed Perennial/Intermittent Stream, Tributary to Zumbro River, Middle Fork	8	No
Unnamed Perennial/Intermittent Stream, Tributary to Zumbro River	8	No
Zumbro River	1	Yes

Table 8.5-2:
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 Hammond Creek	6	No
Hammond Creek	1	Yes
Unnamed Perennial/Intermittent Stream, Tributary to Silver Spring creek	1	No
Silver Creek	3	Yes
Unnamed Perennial/Intermittent Stream, Tributary to Zumbro River	1	No
Zumbro River	1	Yes
Long Creek	1	Yes
Unnamed Perennial/Intermittent Stream, Tributary to Long Creek	9	No
Unnamed Perennial/Intermittent Stream, Tributary to Middle Creek	3	No
Middle Creek	1	Yes
Unnamed Perennial/Intermittent Stream, Tributary to West Indian Creek	5	No
West Indian Creek	1	Yes
Unnamed Perennial/Intermittent Stream, Tributary to East Indian Creek	8	No
Unnamed Perennial/Intermittent Stream, Tributary to Snake Creek	1	Yes
Unnamed Perennial/Intermittent Stream, Tributary to Snake Creek	4	No
Snake Creek	1	Yes
Unnamed Perennial/Intermittent Stream, Tributary to Gorman Creek	4	No
Gorman Creek	1	Yes
Unnamed Perennial/Intermittent Stream, Tributary to Mississippi River	2	Yes
Unnamed Perennial/Intermittent Stream, Tributary to Dry Run Creek	5	No
Unnamed Perennial/Intermittent Stream, Tributary to Zumbro River, North Fork	6	No
Unnamed Perennial/Intermittent Stream, Tributary to Zumbro River	3	No
Zumbro River	1	Yes
Unnamed Perennial/Intermittent Stream, Tributary to Hammond Creek	3	No

The Alternative Route crosses the Zumbro River approximately 2 miles downstream of the Zumbro Dam. The stretch of the Zumbro River crossed by the Alternative Route is considered impaired due to fecal coliform and mercury and PCBs in fish tissue. West Indian Creek is considered impaired due to mercury in fish tissue from its headwaters to the north line of T109, R11W, Section 28 (MPCA 2008). The Applicant anticipates that all streams and surface water along the Alternative Route would be spanned and that no structures would be located within these water features.

Wetlands

Chapter 7.5.2 provides a definition of palustrine, riverine, and lacustrine wetland classes, as well as a classification of PFO.

A summary of wetlands crossed by the 150-foot ROW of the Preferred Route is shown in Table 8.5-3. The 150-foot ROW of the Preferred Route crosses 15 different types of NWI wetlands in 26 different locations, including 2 locations mapped as MDNR PWI wetlands. The total area of NWI wetlands within the 150-foot ROW of the Preferred Route is approximately 37 acres, or 4.5 percent of the total ROW acreage.

Table 8.5-3:
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	26	37.0	4.5	2
L1UBHh	3	6.0	0.7	1
PEM/SS1C	1	0.5	0.1	0
PEMC	1	1.5	0.2	0
PEMCh	6	15.5	1.9	0
PFO/SS1Ch	1	5.9	0.7	0
PFO1A	3	0.7	0.1	0
PFO1Ah	2	1.5	0.2	0
PFO1Ch	4	3.0	0.4	1
PSS/FO1Ch	3	1.9	0.2	0
PUBGh	2	0.5	0.1	0

NWI Wetlands based on NWI data; % of ROW calculated as acreage within the ROW; Source: USFWS NWI, MDNR PWI.
L1UBHh—Lacustrine, Limnetic, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded wetlands.
PEMC—Palustrine, Emergent, Seasonally Flooded wetlands.
PEMCh—Palustrine, Emergent, Seasonally Flooded, Diked/Impounded wetlands.
PFO/SS1Ch—Palustrine, Forested / Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded, Diked/Impounded wetlands.
PFO1A—Palustrine, Forested, Broad-Leaved Deciduous, Temporarily Flooded wetlands.
PFO1Ah—Palustrine, Forested, Broad-Leaved Deciduous, Temporarily Flooded, Diked/Impounded wetlands.
PFO1Ch—Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded, Diked/Impounded wetlands.
PSS/FO1Ch—Palustrine, Scrub-Shrub / Forested, Broad-Leaved Deciduous, Seasonally Flooded, Diked/Impounded wetlands.
PUBGh—Palustrine, Unconsolidated Bottom, Intermittently Exposed, Diked/Impounded wetlands.

A summary of wetlands crossed by the alternative 150-foot ROW is shown in Table 8.5-4. The 150-foot ROW of the Alternative Route crosses 13 different types of NWI wetlands in 248 different locations, including three locations mapped as MDNR PWI wetlands. The total area of NWI wetlands within the 150-foot ROW of the Alternative Route is approximately 37.8 acres, or 4.9 percent of the total ROW acreage.

Table 8.5-4:
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	24	37.8	4.9	3
L1UBHh	1	3.12	0.4	1
PEMA	2	1.42	0.2	0
PEMC	1	1.48	0.2	0
PEMCh	2	15.52	2.0	0
PFO	2	1.89	0.2	1
PFO/SS1Ch	1	5.89	0.8	0
PFO1A	4	0.87	0.1	0
PFO1Ah	1	1.53	0.2	0
PFO1Ch	3	3.02	0.4	1
PSS/FO1Ch	2	1.92	0.3	0
PSS1A	1	0.12	0.0	0
PUBGh	3	0.7	0.1	0
PUBH	1	0.32	0.0	0

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

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

PEMA—Palustrine, Emergent, Temporarily Flooded wetlands.

PEMC—Palustrine, Emergent, Seasonally Flooded wetlands.

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

PFO—Palustrine, Forested wetlands.

PFO/SS1Ch—Palustrine, Forested / Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded, Diked/Impounded wetlands.

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

PFO1Ah—Palustrine, Forested, Broad-Leaved Deciduous, Temporarily Flooded, Diked/Impounded wetlands.

PFO1Ch—Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded, Diked/Impounded wetlands.

PSS/FO1Ch—Palustrine, Scrub-Shrub / Forested, Broad-Leaved Deciduous, Seasonally Flooded, Diked/Impounded wetlands.

PSS1A—Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Temporarily Flooded wetlands.

PUBH—Palustrine, Unconsolidated Bottom, Permanently Flooded wetlands.

Wetlands crossed by the Preferred and Alternative Routes that could not be spanned are located along the existing Dairyland Q-3 line, where the Preferred and Alternative Routes share an alignment east of US-61. Here, the Preferred and Alternative Routes cross five wetlands that are longer than the typical span distance of 1,000 feet, requiring six structures to be placed in these wetlands. These wetlands currently have structures with existing transmission line. These structures would be replaced and both the existing 161 kV line and the proposed 345 kV line would be on the new structures.

FEMA 100-year Floodplains

A summary of FEMA 100-year floodplains crossed by the 150-foot ROW of the Preferred and Alternative Routes is shown in Table 8.5-5.

Table 8.5-5:
FEMA 100-Year Floodplains Crossed by the 150-foot ROW of the Preferred and Alternative Routes

Route	Preferred Route	Alternative Route
Length (miles)	44.8	42.0
Acres in ROW[1,2]	81.4	763.9
Number of Floodplains Crossed	4	3
Floodplains within ROW (acres)	71.5	75.2
Percent of ROW that crosses Floodplains	9.3%	9.8%
Number of Floodplain Crossings over 1,000 feet	1	2
Lengths (feet) of Floodplains over 1,000 feet crossed by ROW	19,111—Gorman Creek/Mississippi River	19,111—Gorman Creek/Mississippi River 1,927—Zumbro River

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 segment.

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 Preferred Route crosses FEMA 100-year floodplains at four locations. The total area of floodplains within the 150-foot ROW is 71.5 acres. The Preferred Route crosses one floodplain area longer than the typical span distance of 1,000 feet. These floodplains are located along the existing Dairyland Q-3 line, where the Preferred and Alternative Routes share an alignment east of US-61. These floodplains are associated with Gorman Creek and the Mississippi River and are approximately 3.6 miles long, requiring 19 structures to be placed in the floodplains. As with the wetlands mentioned in the previous section, these floodplains currently have structures associated with the exiting Dairyland Q-3 line. The existing line would be placed on new structures with the proposed 345 kV line in this area.

The Alternative Route crosses FEMA 100-year floodplains at three locations, including the floodplain associated with Gorman Creek and the Mississippi River described above. In addition, the Alternative Route crosses a floodplain associated with the Zumbro River for a distance of 1,927 feet, requiring one structure to be placed within the floodplain. In total, the Alternative Route requires 20 structures to be

placed in FEMA 100-year floodplains. The total area of floodplains within the 150-foot ROW of the Alternative Route is 75.2 acres (Table 8.5-5). These structures, as well as those mentioned above, would displace less than 100 cubic feet of flood storage volume each.

Minnesota Board of Water and Soil Resources Easements

One BWSR perpetual easement is crossed by the 150-foot ROW of the Preferred Route. The easement, located approximately 3.5 miles north of Oronoco, is 2.5 miles east of the intersection of 510th Street and 210th Avenue in Goodhue County. It is a perpetual easement approximately 560 feet wide where it would be spanned by the transmission line constructed in the Preferred Route.

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

8.5.2.2 Impacts and Mitigation

General impacts and mitigation strategies for water resources are described in detail Chapter 7.5.2. The following describes potential impacts to streams, wetlands, FEMA floodplains, and BWSR easements associated with the Preferred and Alternative Routes in the North Rochester-Mississippi River 345 kV section.

Streams

The Applicant anticipates that all streams and surface water features along the Preferred or Alternative Routes would be spanned and that no structures would be located within these waters. Therefore, no permanent impacts are anticipated. Potential temporary impacts to streams and mitigation strategies are discussed in Chapter 7.5.2.

Wetlands

Permanent impacts to wetlands would occur if structures are placed in a wetland. In the Mississippi River valley along the existing Dairyland Q-3 line, the Preferred and Alternative Routes share an alignment across five wetlands located in the McCarthy Lake WMA that are longer than the typical span distance of 1,000 feet, requiring six structures to be placed within wetland boundaries if the maximum span was used. Approximately 330 square feet (less than 1 acre) of permanent impacts are anticipated as a result of structure placement in this area for both the Preferred and Alternative Routes.

Potential impacts to the McCarthy Lake wetland areas can be measured by the number of structures in the wetland or by the additional tree clearing that would be needed in the wetland. While a final design has not yet been completed, the transmission line would have span lengths as long as or longer than the existing spans and would therefore not require any increase in number of structures in wetland areas. As shown below, the McCarthy Lake wetland is primarily a scrub shrub wetland and tree clearing would be limited to approximately 2.3 acres. This assumes that a 150-foot ROW would be required. The actual width may vary from this assumption (Figure 8.5-4).

There are many design alternatives that can be used to reduce impacts to wetlands in the McCarthy Lake WMA. The Applicant will work with MDNR to determine a final design configuration. The Applicant will coordinate with USACE, MDNR, and the BWSR to identify a final appropriate structure placement in all wetlands within the permitted route.

Tall growing trees would be removed throughout the entire 150-foot ROW during construction of the transmission line in forested wetlands. After construction, vegetation maintenance procedures would be implemented under transmission lines to prohibit the establishment of new trees. Based on published NWI mapping, the Applicant anticipates that the Preferred Route would require clearing approximately 5.2 acres of forested wetlands and the Alternative Route would require clearing approximately 7.3 acres of forested wetlands. Of these impacts, tree clearing in approximately 5.2 acres of the forested wetlands are along the portion of the route where the Preferred and Alternative Routes share an alignment with the Dairyland Q-3 line. The actual area of required clearing will likely be substantially less due to an apparent overestimation of forested area in the published NWI mapping.

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 of access roads or smaller a construction footprint in the ROW. The Applicant anticipates that approximately 41.8 acres or 41.3 acres of temporary impacts would occur in wetlands along the Preferred and Alternative Routes, respectively.

FEMA 100-Year Floodplains

Structures in FEMA floodplains would displace permeable surface within the floodplain. There would be 19 structures placed within FEMA floodplains associated with Gorman Creek and the Mississippi River along the existing Q-3 transmission line where the Preferred and Alternative Routes share an alignment. This would amount to approximately less than 1 acre (1,045 square feet) of permanent impacts to this floodplain. In addition to permanent impacts in the Gorman Creek/Mississippi River floodplain, the Alternative Route requires one additional structure in a FEMA floodplain area associated with the Zumbro River that is not located along existing transmission corridor. The Alternative Route therefore requires a total of 20 structures in floodplain areas, resulting in displacement of less than 100 cubic feet of flood storage volume per structure. Based on this, impacts of structures within FEMA floodplains are not anticipated to have an effect on flooding. As with structure placement in wetlands, the Applicant will coordinate with USACE and MDNR to identify a final appropriate structure placement in floodplains.

Minnesota Board of Water and Soil Resources Easements

No impacts to the BWSR easement area located in the 150-foot ROW of the Preferred Route are anticipated because the easement area is less than 1,000 feet and can be spanned. No parcels with BWSR easements are crossed by the 150-foot Alternative Route ROW, therefore no impacts are anticipated.

8.5.3 Flora

Common plant species and plant communities known to occur in the Project area, including the North Rochester–Mississippi River 345 kV section, are described in Chapter 7.5.3. Data on vegetation that currently exists and that historically existed in the Project area were gathered from the MDNR MCBS.

This discussion also identifies noxious weeds recognized by the state of Minnesota and by counties within the North Rochester–Mississippi River 345 kV section of the proposed Project.

8.5.3.1 Existing Environment

Figure 8.1-2 shows ECS classifications in the North Rochester–Mississippi River 345 kV section. The Preferred and Alternative Routes are located within the Rochester Plateau and the Blufflands Subsection of the Paleozoic Plateau Section (MDNR 2009a). MCBS surveys demonstrate that historically, the predominant vegetation communities in the Rochester Plateau Subsection were tallgrass prairie and bur oak Savanna. The Rochester Plateau is described in greater detail in Chapter 7.5.3. Historically, the predominant vegetation communities in the Blufflands Subsection were tallgrass prairie, and bur oak savanna along ridge tops and dry upper slopes, and red oak, white oak, shagbark hickory, and basswood forests were present along moist slopes, and red oak, basswood, and black walnut forests were present in protected valleys (MDNR 2009). The Blufflands are described in greater detail in Chapter 7.5.3.

Figure 8.2-1 shows current land cover in the North Rochester–Mississippi River 345 kV section. The existing land cover types associated with the Preferred Route for this section of the Project include cropland (62 percent); grassland (21 percent), forestland (11 percent), shrubland (2 percent), aquatic sites (2 percent), and transportation (e.g., roadways) (1 percent). The existing dominant vegetation communities associated with the Alternative Route for this section include cropland (59 percent); grassland (21 percent); and forestland (14 percent). The remaining 6 percent of the land cover for the Alternative Route include small percentages of aquatic sites, urban sites, and shrublands.

The state of Minnesota has a total of eleven species of noxious weeds on their primary list, as identified in Chapter 7.5.3 (Table 7.5-6). Goodhue, Olmsted, and Wabasha Counties, do not have secondary county-specific noxious weeds lists.

8.5.3.2 Impacts and Mitigation

Impacts to vegetation and proposed mitigation are discussed in detail within Chapter 7.5.3. Impacts may include both temporary and permanent effects. The impacts include localized physical disturbance caused by construction equipment during site preparation, such as grading, excavation, and soil stockpiling. There may be clearing of local vegetation for access roads. In forested areas, trees or shrubs that interfere with safety and equipment operation would be removed. Permanent vegetative changes would take place at each new pole footprint (55 square feet) and with the 150-foot ROW that occurs in the forested communities.

The Applicant would continue to work with the MDNR and USFWS to avoid and reduce impacts to sensitive flora along the Preferred and Alternative Routes. The Applicant would comply with Minnesota noxious weed laws as described in the Minn. R. ch.1505 and would observe county weed lists where they occur.

8.5.4 Fauna

This chapter evaluates designated wildlife habitat and conservation areas that occur within 1 mile of the Preferred and Alternative Route centerlines of the North Rochester to Mississippi River section. Potential habitat and conservation areas reviewed include NWRs, USFWS WPAs, GBCAs, MDNR WMAs, MDNR AMAs, MDNR designated trout streams, MDNR SNAs, MDNR MCBS areas of biodiversity significance, and conservation easement lands (e.g., CRP, CREP, RIM, and WRP). Areas along each route were evaluated following the methods described in Chapter 7.5.4, and the following sections summarize the results of the evaluation for the Preferred and Alternative Routes.

8.5.4.1 Existing Environment

A general discussion of wildlife species within the Project area is provided in Chapter 7.5.4, and a complete list of common mammals, birds, reptiles, amphibians, and fish known to occur in this region of Minnesota is included in Appendix R. In addition, Figure 8.5-2 shows conservation easements and designated wildlife areas near the Preferred and Alternative Routes of this section.

Preferred Route

A number of wildlife conservation and management areas occur along the Preferred Route of this section. The Preferred Route crosses an estimated 0.5 mile of the Upper Mississippi River National Wildlife and Fish Refuge. The Refuge is a 240,000-acre National Wildlife Refuge located in and along 261 miles of the Upper Mississippi River. It extends from Wabasha, Minnesota, south to Rock Island, Illinois. The Refuge was established to protect high quality breeding habitat for migratory birds, as well as habitat for fish and other wildlife and plants (USFWS 2009). Similarly, the Preferred Route crosses an estimated 0.9 mile of the McCarthy Lake WMA (128 acres). McCarthy Lake WMA is managed by MDNR to maintain diverse wildlife communities. Four AMAs are located within 1 mile of the Preferred Route. Two separate units East Indian Creek AMA are located 2,600 and 4,700 feet south of the Preferred Route. Two separate units of the Snake Creek AMA are located in proximity to the route, one is 444 feet south of the route, and the other is 4,083 feet south of the Preferred Route. Other MDNR-designated resource areas crossed by the Preferred Route include two state-designated trout streams, East Indian Creek and Snake Creek. In addition, two IBAs occur in the vicinity of the Preferred Route, one IBA is crossed by the route in two locations. The Whitewater Valley IBA is immediately south of the Preferred Route. While the Whitewater Valley IBA is outside of 1 mile of the Preferred Route, it contains a variety of habitats that support at least 242 species of birds, many of which are listed as species of conservation concern. In addition, it is contiguous with the Upper Mississippi Wildlife Refuge IBA which serves as a major migratory corridor. The Upper Mississippi NWR IBA is crossed by the Preferred Route for 1.9 miles. Home to 305 species of birds, the Upper Mississippi NWR IBA is particularly significant for migratory waterfowl. It is estimated that

approximately 40 percent of the nation's waterfowl pass through this area during migration. The Upper Mississippi NWR IBA also contains significant waterbird nesting colonies as well as nationally significant Bald Eagle winter concentration areas. Up to 358 wintering Bald Eagles have been observed using this IBA (National Audubon Society 2009). Although it is not designated as wildlife habitat, the Zumbro River, which is crossed by the routes, provides habitat for many aquatic species including fish and waterfowl. No state-designated SNAs, USFWS WPAs, or USFWS designated GBCAs occur within 1 mile of the Preferred Route centerline.

In addition to designated conservation and management areas, several land easements that provide potential wildlife habitat occur within 1 mile of the Preferred Route. A total of 383 CRP lands occur within 1 mile of the Preferred Route centerline and 27 of these are within the Preferred Route (i.e., within 500 feet of the centerline). No CREP lands or federally designated WRPs occur within 1 mile of the Preferred Route.

Alternative Route

A number of wildlife conservation and management areas occur along the Alternative Route of this section, many of which overlap with the Preferred Route. Both the Alternative and Preferred Routes share a common alignment along the existing Dairyland Q-3 transmission line from just south of County Highway 14 northeast to the Mississippi River in Wabasha County. The Alternative Route crosses or passes the following conservation and management areas in the same location as the Preferred Route: the Upper Mississippi River National Wildlife and Fish Refuge, the McCarthy Lake WMA, Snake Creek (a MDNR designated trout stream), the Whitewater Valleys IBA, and the Upper Mississippi NWR IBA. These resources are described in detail under the Preferred Route discussion above and not repeated herein.

In addition to the areas shared with the Preferred Route, the Alternative Route also has other conservation and management areas within 1 mile. Four AMAs are located in proximity to the Alternative Route, although none of these are located within the route or crossed by the route centerline. Long Creek AMA is located approximately 2,500 feet north of the Alternative Route. West Indian Creek AMA is located approximately 4,000 feet north of the route. Similar to the Preferred Route, two separate units of the Snake Creek AMA are located in proximity to the route, one is 444 feet south of the route, and the other is 4,083 feet south of the route. The Alternative Route crosses two state-designated trout streams - Hammond Creek and Long Creek. The Alternative Route also crosses the Zumbro River in a rural area with little human activity and no existing infrastructure. No state-designated SNAs, USFWS WPAs, or USFWS designated GBCAs occur within 1 mile of the Alternative Route centerline.

Potential wildlife habitat in the form of land easements also occur within 1 mile of the Alternative Route. A total of 401 CRP lands occur within 1 mile of the Alternative Route centerline and 19 of these are within the Alternative Route (i.e., within 500 feet of the centerline). No CREP lands or federally designated WRPs occur within 1 mile of the Alternative Route.

8.5.4.2 Impacts and Mitigation

Chapter 7.5.4 identifies and discusses potential temporary and permanent impacts to fauna, as well as avian specific impacts, that may occur in the Project area as a result of transmission line construction. These impacts, as well as the avoidance and mitigation measures proposed to address them are not repeated herein; however, specific areas where impacts to fauna may occur along the Preferred or Alternative Routes of the North Rochester to Mississippi River section are summarized below. The Upper Mississippi River Wildlife and Fish Refuge and McCarthy Lake WMA are crossed by the Preferred and Alternative Routes. Both are likely to be impacted by the construction of the transmission line. Impacts may include permanent removal of potentially suitable habitat (structure footprints), temporary habitat alteration or disturbance associated with construction activities, direct harm or mortality for wildlife unable to avoid construction activities (bird eggs, nestlings, small mammals, amphibians, and reptiles), and temporary displacement of wildlife caused by increased human activity. These impacts are not expected to impact local populations or survivorship because they would occur within the existing Dairyland Q-3 line corridor, and other unaffected habitats are available nearby to support displaced individuals. If necessary, field surveys to obtain more route specific wildlife data would be completed once a route is permitted.

With the exception of the Mississippi River, all water bodies would be spanned by the transmission line; therefore, direct impacts to lakes and rivers would be avoided. Impacts to fisheries would be minor to negligible because of conservation measures and practices that would reduce the potential for surface runoff and sedimentation to aquatic habitats. None of the AMAs are located within the route, and would not be intersected by the Project ROW, therefore no impacts to AMAs are anticipated. It is possible that some trees may need to be cleared along the banks of the state-designated trout streams where the transmission line crosses. Tree removal at the crossings may reduce shading; however, the impact is unlikely to cause population-level effects to trout or other aquatic species.

Special consideration is being given to the structure designs at the Mississippi River crossing near the Upper Mississippi River National Wildlife and Fish Refuge and Upper Mississippi NWR IBA. Applicants have been and will continue to work with the USFWS, Minnesota DNR, and Wisconsin DNR on designing river crossing structures to minimize potential avian impacts. Based on coordination to date, several potential structure designs have been produced (Appendix E). In general, structure designs that minimize ROW width tend to be higher while lower structures require more ROW width. The Applicants and agencies have arrived at an informal and general consensus that the preferable configuration is one that minimizes structure height and consolidates crossing wires in the fewest number of horizontal planes. Additional coordination will occur through the federal EIS process, the Wisconsin state permitting process, and the USFWS Special Use Permit process.

8.5.5 Rare and Unique Resources

Chapter 7.5.5 discusses the methodology used to identify potential impacts to rare and unique resources in the Project area, as well as the legal frameworks that govern them. The following sections summarize the results of the rare and unique resources evaluation for the Preferred and Alternative Routes of the North Rochester–Mississippi River section.

8.5.5.1 Existing Environment

Preferred Route

A review of the MDNR NHIS database revealed one federal candidate mussel species, 45 state listed species, and nine rare native plant communities with element occurrence records within one mile of the preferred route. Tables 8.5-6 and 8.5-7 summarize the results of the MDNR NHIS database review for element occurrence records of state rare and unique species as well as rare native plant communities within 1 mile of the Preferred Route centerline.

Fifteen MCBS sites occur within 1 mile of the Preferred Route centerline, four of which are crossed by the Preferred Route and described in further detail here. The first area is considered a site of moderate biodiversity significance and is comprised of a Red Oak-White Oak Forest. It is located just east of the Zumbro River and is crossed by the Preferred Route for 0.9 mile. No NHIS element occurrences occur in the vicinity of this site. The second area also is considered a site of moderate biodiversity significance and contains two ecological community classifications: Red Oak-White Oak Forest and Dry Bedrock Bluff Prairie. The site is located just west of US-61 and is crossed for 0.3 mile. NHIS data indicate several rare reptile occurrences for this area including a state threatened snake species and two unlisted but rare snake species. The third area, considered to be a site of high biodiversity significance, consists of a Sedge Meadow that is crossed four times by the Preferred Route for a total of 0.9 mile. This area is just west of the Mississippi River within the McCarthy Lake WMA and is known to have occurrences of a state threatened turtle, as well as nesting records of one listed bird species and another unlisted but rare bird species. Finally, the fourth area is considered to have outstanding biodiversity significance and is crossed for 0.5 mile just west of the Mississippi River on land managed by the USFWS as part of the Upper Mississippi River National Wildlife and Fish Refuge. This area primarily consists of Silver Maple-Virginia Creeper Floodplain Forest, with some Silver Maple-Green Ash-Cottonwood Terrace Forest. Several rare or unique resources occur in the immediate vicinity of this area. Nesting records exist for two state special concern bird species in this area, as well as a record of a known winter roost site in the area for one of them. A record for a threatened turtle species exist immediately south of the route in this area. In addition, several rare plant records are located in the immediate vicinity of the Preferred Route in this area including a state threatened plant species, two state special concern plant species, and four unlisted but rare plant species. Of the four areas of biodiversity significance crossed by the Preferred Route and reviewed above, three are already crossed by the existing Dairyland Q-3 line in the same locations. The one exception is the area of moderate biodiversity significance that occurs east of the Zumbro River. Figure 8.5-3 shows all MCBS areas near the Preferred Route.

Table 8.5-6:
Preferred Route: Rare and Unique Species

Common Name	Scientific Name	Status
Wildlife Species		
Mollusks		
Black sandshelll	*Ligumia recta*	SC
Creek heelsplitter	*Lasmigona compressa*	SC
Mucket	*Actinonaias ligamentina*	ST
Fluted-shell	*Lasmigona costata*	SC
Ellipse	*Venustaconcha ellipsiformis*	ST
Hickorynut	*Obovaria olivaria*	SC
Monkeyface	*Quadrula metanevra*	ST
Pistolgrip	*Tritogonia verrucosa*	ST
Rock pocketbook	*Arcidens confragosus*	SE
Round pigtoe	*Pleurobema coccineum*	ST
Sheepnose	*Plethobasus cyphyus*	FC, SE
Washboard	*Megalonaias nervosa*	ST
Insects and *Arachnids*		
Jumping spider	*Phidippus apacheanus*	SC
Jumping spider	*Metaphidippus arizonensis*	SC
Jumping spider	*Sassacus papenhoei*	SC
Leonard's skipper	*Hesperia leonardus leonardus*	SC
Regal fritillary	*Speyeria idalia*	SC
Birds		
Acadian Flycatcher	*Empidonax virescens*	SC
Bald Eagle	*Haliaeetus leucocephalus*	SC
Bell's Vireo	*Vireo bellii*	Not Listed
Peregrine Falcon	*Falco peregrines*	ST
Red-shouldered Hawk	*Buteo lineatus*	SC
Sandhill Crane	*Grus Canadensis*	Not Listed
Upland Sandpiper	*Bartramia longicauda*	Not Listed

Table 8.5-6:
Preferred Route: Rare and Unique Species

Common Name	Scientific Name	Status
Reptiles		
Blanding's turtle	*Emydoidea blandingii*	ST
Eastern hognose snake	*Heterodon platirhinos*	Not Listed
Eastern racer	*Coluber constrictor*	SC
Gopher snake	*Pituophis catenifer*	SC
Milk snake	*Lampropeltis triangulum*	Not Listed
Timber rattlesnake	*Crotalus horridus*	ST
Eastern fox snake	*Elaphe vulpine*	Not Listed
Wood turtle	*Clemmys insculpta*	ST
Fish		
Blue sucker	*Cycleptus elongates*	SC
Crystal darter	*Ammocrypta asprella*	SC
Paddlefish	*Polyodon spathula*	ST
Pallid shiner	*Notropis amnis*	SC
Pirate perch	*Aphredoderus sayanus*	SC
Pugnose minnow	*Opsopoeodus emiliae*	Not Listed
Shovelnose sturgeon	*Scaphirhynchus platorynchus*	Not Listed
Plant Species		
Herbaceous Plants		
American ginseng	*Panax quinquefolius*	SC
Clasping milkweed	*Asclepias amplexicaulis*	SC
Clustered broomrape	*Orobanche fasciculate*	SC
Glade mallow	*Napaea dioica*	ST
Green dragon	*Arisaema dracontium*	Not Listed
Hill's thistle	*Cirsium hillii*	SC
Lilia-leaved twayblade	*Liparis liliifolia*	Not Listed
Long-bearded hawkweed	*Hieracium longipilum*	Not Listed
Moschatel	*Adoxa moschatellina*	SC
One-flowered broomrape	*Orobanche uniflora*	SC
Rhombic-petaled evening primrose	*Oenothera rhombipetala*	SC
Rock sandwort	*Minuartia dawsonensis*	SC

Table 8.5-6:
Preferred Route: Rare and Unique Species

Common Name	Scientific Name	Status
Stemless tick-trefoil	*Desmodium nudiflorum*	SC
Sweet-smelling Indian-plantain	*Cacalia suaveolens*	SE
White baneberry	*Actaea pachypoda*	Not Listed
Widgeon-grass	*Ruppia maritime*	SC
Grass and Grass-like Plants		
Cattail sedge	*Carex typhina*	SC
Davis' sedge	*Carex davisii*	ST
Gray's sedge	*Carex grayi*	Not Listed
Muskingum sedge	*Carex muskingumensis*	Not Listed
Yellow-fruited sedge	*Carex annectens*	SC
Trees and Shrubs		
Buttonbush	*Cephalanthus occidentalis*	Not Listed
Kentucky coffee-tree	*Gymnocladus dioica*	Not Listed
Swamp white oak	*Quercus bicolor*	Not Listed

FC Federal Candidate SC Species of concern SE State Endangered
ST State threatened

Table 8.5-7:
Preferred Route: Rare Native Communities

Community Type	Notes
Calcareous Fen (Southeastern)	Located in McCarthy Lake WMA.
Dry Bedrock Bluff Prairie (Southern)	Six small prairies of varying plant species diversity. Additionally, there is a 12+-acre prairie on steep SW-facing slope, on south side of peninsula on E side of Zumbro Lake.
Dry Sand—Gravel Prairie (Southern)	Two small prairies located on the Zumbro River, 0.50 mile downstream from the Zumbro Dam.
Native Plant Community, Undetermined Class	Seven areas varying in size, plant species dominance, and landscape position. At least one area features mature red oak forest.
Seepage Meadow/Carr, Tussock Sedge	Small sedge dominated meadow fed by seepage from base of 40-foot, east facing terrace slope along Snake Creek.
Silver Maple—(Virginia Creeper) Floodplain Forest	Vast expanse of mature to immature forest, varying in quality and canopy cover. Dominated by silver maple.
Silver Maple-Green Ash-Cottonwood Terrace Forest	Three areas of relatively low quality, but intact forest dominated variously by silver maple, eastern cottonwood, American elm, green ash, black ash, black willow and peachleaf willow.
Southern Dry-Mesic Oak Forest	Mature forest dominated by northern red oak, white oak, and paper birch. Some small white pine stands and maple/basswood forest slopes of terrace. South of the Zumbro Dam.
Swamp White Oak Terrace Forest	Narrow strip of mature forest dominated by swamp white oak and green ash.

Alternative Route

A review of the MDNR NHIS database revealed one federal candidate mussel species, 50 state listed species, and 11 rare native plant communities with element occurrence records within 1 mile of the Alternative Route. Tables 8.5-8 and 8.5-9 summarize the results of the MDNR NHIS database review for element occurrence records of rare and unique species, and rare native plant communities within 1 mile of the Alternative Route centerline.

Twenty-one MCBS sites occur within 1 mile of the Alternative Route centerline. Six of these sites are crossed by the Alternative Route and summarized here. Two of the sites are classified as having moderate biodiversity and are crossed by the Alternative Route for approximately 0.8 mile collectively. The first is located west of the Zumbro River just east of US-52. It is comprised of a Red Oak-White Oak Forest; however, according to the MDNR NHIS database no rare or unique resources occur in this area. The second area of moderate biodiversity significance is located east of the Zumbro River, and west of US-63. This site is comprised of Dry Bedrock Bluff Prairie and contains a state special concern plant species population. In addition, a nesting record for a state special concern bird species exists approximately 1 mile north of this area. The third area of biodiversity significance, which is classified as outstanding, is crossed by the Alternative Route for 0.2 mile in a parcel owned by the MNDR as part of the RJD State Forest. This area is comprised of several unique habitat classifications including Southern Dry Cliff, White Pine-Hardwood Forest, and Algific Talus. This area also is the site of Kruger Cave, a large

dolomite cave with several entrances that serves as a winter hibernaculum for bats. This area also supports populations of a state threatened plant species and state special concern plant species. The remaining three areas of biodiversity significance along the Alternate Route are shared with a portion of the Preferred Route and have already been summarized in the previous section. The first area is considered a site of moderate biodiversity significance located just west of US-61 and crossed for 0.3 mile. The second is an area of high biodiversity significance that is crossed four times for a total of approximately 0.5 mile just west of the Mississippi River in the McCarthy Lake WMA. The third is an area of outstanding biodiversity significance that is crossed for 0.9 mile west of the Mississippi River on land managed by the USFWS as part of the Upper Mississippi River National Wildlife and Fish Refuge. These three areas shared between the Preferred and Alternative Routes, are already crossed by the existing Dairyland Q-3 line in the same locations. Figure 8.5-3 shows all MCBS areas near the Alternative Route.

Table 8.5-8:
Alternative Route: Rare and Unique Species

Common Name	Scientific Name	Status
Wildlife Species		
Mollusks		
Black sandshell	*Ligumia recta*	SC
Fluted-shell	*Lasmigona costata*	SC
Hickorynut	*Obovaria olivaria*	SC
Monkeyface	*Quadrula metanevra*	ST
Pistolgrip	*Tritogonia verrucosa*	ST
Rock pocketbook	*Arcidens confragosus*	SE
Round pigtoe	*Pleurobema coccineum*	ST
Sheepnose	*Plethobasus cyphyus*	FC, SE
Washboard	*Megalonaias nervosa*	ST
Insects and Arachnids		
A jumping spider	*Phidippus apacheanus*	SC
A jumping spider	*Metaphidippus arizonensis*	SC
A jumping spider	*Sassacus papenhoei*	SC
Leonard's skipper	*Hesperia leonardus leonardus*	SC
Regal fritillary	*Speyeria idalia*	SC
Birds		
Acadian Flycatcher	*Empidonax virescens*	SC
Bald Eagle	*Haliaeetus leucocephalus*	SC
Bell's Vireo	*Vireo bellii*	Not Listed
Loggerhead Shrike	*Lanius ludovicianus*	ST

Table 8.5-8:
Alternative Route: Rare and Unique Species

Common Name	Scientific Name	Status
Louisiana Waterthrush	*Seiurus motacilla*	SC
Peregrine Falcon	*Falco peregrinus*	ST
Red-shouldered Hawk	*Buteo lineatus*	SC
Sandhill Crane	*Grus canadensis*	Not Listed
Upland Sandpiper	*Bartramia longicauda*	Not Listed
Reptiles		
Blanding's turtle	*Emydoidea blandingii*	ST
Eastern hognose snake	*Heterodon platirhinos*	Not Listed
Eastern racer	*Coluber constrictor*	SC
Gopher snake	*Pituophis catenifer*	SC
Milk snake	*Lampropeltis triangulum*	Not Listed
Timber rattlesnake	*Crotalus horridus*	ST
Wood turtle	*Clemmys insculpta*	ST
Fish		
Blue sucker	*Cycleptus elongatus*	SC
Crystal darter	*Ammocrypta asprella*	SC
Paddlefish	*Polyodon spathula*	ST
Pallid shiner	*Notropis amnis*	SC
Pirate perch	*Aphredoderus sayanus*	SC
Pugnose minnow	*Opsopoeodus emiliae*	Not Listed
Shovelnose sturgeon	*Scaphirhynchus platorynchus*	Not Listed
Bats		
Eastern pipistrelle	*Pipistrellus subflavus*	SC
Plant Species		
Herbaceous Plants		
American ginseng	*Panax quinquefolius*	SC
Clasping milkweed	*Asclepias amplexicaulis*	SC
Cliff goldenrod	*Solidago sciaphila*	SC
Goldie's fern	*Dryopteris goldiana*	SC
Green dragon	*Arisaema dracontium*	Not Listed
Hill's thistle	*Cirsium hillii*	SC

Table 8.5-8:
Alternative Route: Rare and Unique Species

Common Name	Scientific Name	Status
Jewelled shooting star	*Dodecatheon amethystinum*	Not Listed
Lilia-leaved twayblade	*Liparis liliifolia*	Not Listed
Long-bearded hawkweed	*Hieracium longipilum*	Not Listed
Moschatel	*Adoxa moschatellina*	SC
One-flowered broomrape	*Orobanche uniflora*	SC
Rhombic-petaled Evening Primrose	*Oenothera rhombipetala*	SC
Silvery Spleenwort	*Deparia acrostichoides*	Not Listed
Stemless tick-trefoil	*Desmodium nudiflorum*	SC
Squirrel-corn	*Dicentra canadensis*	SC
Sweet-smelling Indian-plantain	*Cacalia suaveolens*	SE
Twinleaf	*Jeffersonia diphylla*	SC
White baneberry	*Actaea pachypoda*	Not Listed
Widgeon-grass	*Ruppia maritima*	SC
Grass and Grass-like Plants		
Cattail sedge	*Carex typhina*	SC
Davis' sedge	*Carex davisii*	ST
Gray's sedge	*Carex grayi*	Not Listed
James' sedge	*Carex jamesii*	ST
Muskingum sedge	*Carex muskingumensis*	Not Listed
Spreading sedge	*Carex laxiculmis*	ST
Wood's sedge	*Carex woodii*	SC
Yellow-fruited sedge	*Carex annectens*	SC
Trees and Shrubs		
Buttonbush	*Cephalanthus occidentalis*	Not Listed
Kentucky coffee-tree	*Gymnocladus dioica*	Not Listed
Swamp white oak	*Quercus bicolor*	Not Listed

FC Federal Candidate SE State Endangered SC Species of Concern
ST State Threatened

Table 8.5-9:
Alternative Route: Rare Native Communities

Community Type	Notes
Algific Talus	Two weakly algific slopes on lower to mid portions of steep N to E facing slopes in the upper reaches of West Indian Creek. Talus moist, cool, often large, blocky, and moss covered.
Calcareous Fen (Southeastern)	Fen located in McCarthy Lake WMA. Ideal site for calciphile moss.
Dry Bedrock Bluff Prairie (Southern)	Fourteen distinct small prairie locations on southern to western aspects. Varying native plant dominance and percent cover with non-native plants present throughout.
Dry Sand-Gravel Prairie (Southern)	Series of 4 small, relatively high quality prairies and 1 larger low quality prairie on slopes of sand/gravel terrace along Zumbro River dominated by native vegetation 0.75 mile NE of Hammond, MN.
Native Plant Community, Undetermined	Twelve distinct areas with varying dominant vegetation class and canopy cover. Steep upland slopes dominated by sugar maple to flat wetlands dominated by sedges. Also an old second growth forest dominated by red oak, American basswood, and northern pin oak.
Seepage Meadow/Carr, Tussock Sedge	Small sedge dominated meadow fed by seepage from base of 40-foot, E facing terrace slope along Snake Creek.
Silver Maple-(Virginia Creeper) Floodplain Forest	Vast expanse of mature to immature forest varying in quality. Canopy varies from 60-90% cover dominated by silver maple.
Silver Maple-Green Ash-Cottonwood Terrace Forest	Three areas of relatively low quality yet intact forest. Mixed canopy variously dominated by silver maple, eastern cottonwood, American elm, green and black ash, black and peachleaf willow.
Southern Dry Cliff	Six distinct areas ranging in height from 3-30 meters with aspects in all directions.
Southern Dry-Mesic Oak Forest	Mature forest dominated by red oak (to 77cm DBH). Many layered subcanopy and native, diverse shrub cover.
Swamp White Oak Terrace Forest	Narrow strip of mature forest located along main channel of Mississippi River at the head of West Newton Chute. Dominated by swamp white oak and green ash with canopy cover 80-100%.

8.5.5.2 Impacts and Mitigation

MCBS areas of biodiversity significance and MDNR-listed native plant communities are known to support rare and unique species. Additionally, wetlands, streams, and river systems may provide habitat for special status species. As summarized in Chapter 7.5.5.2, such areas would be avoided where practicable. Similarly, other mitigation measures as described in Chapter 7.5.5.2 would be used to avoid and minimize impacts to rare and unique species and other protected resources. 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 warranted.

8.6 Summary of Impacts

Table 8.6-1 presents a summary of comparison of environmental resource impacts for the Preferred and Alternative Routes based on the State routing factors. Using this comparison, the Applicant concluded that the Preferred Route best conserves natural resources, minimizes potential environmental and human settlement impacts as well as minimizing land use conflicts.

Table 8.6-1:
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	2	0
Number of Residences 150-300 feet from route centerline	6	5
Density (residences/linear mile within 300 feet of route centerline)	0.2	0.1
Recreation and Tourism		
McCarthy WMA crossed	0.9 mile	0.9 mile
RJD State Forest crossed	2.1 miles	2.4 miles
Upper Mississippi National Wildlife Refuge lands crossed	0.5 mile	0.5 mile
Effects on Land-Based Economics		
Agriculture		
Permanent Impact	3.4 acres	3.1 acres
Temporary Impact	246 acres	231 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		
Archaeological	9	9
Architectural		
National Register of Historic Places (NRHP)	0	0
Architectural	29	21
Natural Environment		
Water Resources		
Permanent Wetlands Impacts	<1 acre	<1 acre
Temporary Wetlands Impacts	7 acres	7 acres
Potential Tree Clearing in Wetlands	5.2	5.4
Stream Crossings	80	72
Permanent Impacts to Floodplains	<1 acre	<1 acre

Table 8.6-1:
Summary Comparison of Impacts for Preferred and Alternative Routes

Resource Category	Preferred Route	Alternative Route
Flora		
Percent Cropland	61	59
Percent Grassland	25	21
Percent Shrubland	2	2
Percent Forested Land	11	16
Percent Aquatic	2	2
Fauna		
Conservation Reserve Program Lands Crossed	27	19
Conservation Reserve Enhancement Program Lands Crossed	0	0
Length of Important Bird Areas Crossed	1.9 miles	1.9 miles
Length of Grassland Bird Conservation Areas Crossed	0 mile	0 mile
Number of Federal Rare and Unique Species Known to Occur Within 1 mile of Route Centerline		
Threatened	0	0
Endangered	0	0
Candidate	1	1
Number of State Rare and Unique Species Known to Occur Within 1 mile of Route Centerline		
Threatened	12	13
Endangered	3	3
Species of Concern	30	34
DNR Rare Native Communities	1,744	2,724
Length of Outstanding Biodiversity Sites Crossed	0.5 mile	0.5 mile
Length of High Biodiversity Sites Crossed	0.9 mile	0.9 mile
Length of Moderate Biodiversity Sites Crossed	1.2 miles	0.8 mile
Use or Paralleling of existing ROW (transportation, pipeline, and electrical transmission systems) and property lines		
Total length of route (miles)	44.8	41.9
Length following Transmission Line (miles)	14.4	9.2
Percentage of route following Transmission Line	32%	22%
Length following road but not Transmission Line (miles)	2.8	1.6
Percentage of route following road but not Transmission Line	7%	4%
Length following property line but not transmission line or roads (miles)	18.5	12.4
Percentage of route following property line but not transmission line or roads	41%	29%
Total length following transmission line, roads, or property lines (miles)	35.7	23.3

Table 8.6-1:
Summary Comparison of Impacts for Preferred and Alternative Routes

Resource Category	Preferred Route	Alternative Route
Percentage of route following transmission line, roads or property lines	80%	55%
Length not following transmission line, roads or property lines (miles)	9.0	18.7
Percentage of route not following transmission line, roads or property lines	20%	45%
Estimated Costs (millions)		
Cost	$106	$101

8.7 Zumbro Dam Route Option to the Preferred Route

The Zumbro Dam Route Option provides an alternative to the preferred Zumbro River crossing at the Zumbro Dam (Figure 8.1-1). The Route Option is located in Goodhue and Wabasha counties, and a detailed geographical description of the Route Option is provided in Chapter 6.2.2.3.

8.7.1 Potential Impacts

The following provides a comparison of the existing environment and potential impacts between the Zumbro Dam Route Option and the Preferred White Bridge Road Route. Mitigation measures to reduce impacts resulting from construction and operation of the transmission line would be the same as those described in Chapters 8.2 through 8.5. Differences between the Zumbro Dam Route Option and the Preferred White Bridge Road Route were quantified based on the geographic extent of the Preferred Route shown in Figure 8.7-1. This chapter is intended to provide an overview of how potential impacts differ between the Zumbo Dam Route Option and the Preferred Route. Additional impact data are provided in Table 8.7-5.

8.7.1.1 Land Cover and Land Use

When compared with the Preferred White Bridge Road Route land cover and land use data, the Zumbro Dam Route Option follows a greater percentage of existing linear corridors (transmission lines and roads) and would have fewer impacts on agricultural resources than the Preferred Route. A comparison of the land cover types along the Preferred Route and this Route Option is listed in Table 8.7-1. The Zumbro Dam Route Option crosses a greater length of the following land cover types; forest and aquatic. The Preferred Route crosses a greater percentage of cropland, grassland, shrubland, and transportation land cover type (Figure 8.2-1).

Table 8.7-1
Zumbro Dam Route Option: Land Cover Summary

Land Use Type	Preferred White Bridge Road Route Percent of Route	Zumbro Dam Route Option Percent of Route Option
Cropland	56	57
Grassland	32	26
Shrubland (total)	<1	<1
Lowland Shrub	<1	—
Upland Shrub	—	—
Forest (total)	11	16
Bur/White Oak	2	1
Cottonwood	—	—
Maple/Basswood	<1	—
All Others	9	15
Aquatic (total)	1	1
Open water	1	1
Marshland	—	—
Urban (total)	1	1
High Intensity Urban	—	—
Low Intensity Urban	—	—
Transportation	1	<1
Total Acreage	100(+/—1%)	100(+/—1%)

Source: Minnesota Gap Data.

[1] All acreages rounded to the nearest whole number.

8.7.1.2 Displacements

Residences identified within 300 feet of the Zumbro Dam Route Option and the Preferred White Bridge Road Routes are shown on Table 8.7-2. There are three additional residences within 300 feet of the Zumbro Dam Route Option when compared with the Preferred Route. Residential density along the Zumbro Dam Route Option is slightly higher than residential density along the Preferred Route.

Table 8.7-2:
Residences in Proximity to the Preferred Route and Zumbro Dam Route Option Centerlines

Proximity (feet)	Preferred White Bridge Road Route	Zumbro Dam Route Option
0–75 (within ROW)[1]	0	0
75–150	0	0
150–300	2	5
Density (residences/linear mile)	0.2	0.5

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

8.7.1.3 Aesthetics

The Zumbro Dam Route Option parallels existing transmission lines for 8 percent of its length for approximately 0.8 mile west of the Zumbro Dam. The Zumbro Dam Route Option crosses mostly gently rolling agricultural lands east and west of the Zumbro River, but terrain is hillier with more forested areas near the Zumbro River compared to the Preferred Route, and tree clearing would likely be required on the east and west banks of the river.

Aesthetic values crossing forested areas, including bluffs near the Zumbro River, would be impacted by the Zumbro Dam Route Option where tree removal within the 150-foot ROW would create new or expanded openings and increase the visibility of the transmission line. The 345 kV transmission line would be visible 50 to 95 feet above tree canopies, which is estimated to be an average of 80 feet high. The Zumbro Dam Route Option would likely be visible from campgrounds and residential areas on the shoreline of the Zumbro River, as well as to water-based recreationists in both the Zumbro River downstream and on Lake Zumbro upstream. The transmission line constructed along the Route Option extends over the existing tree canopy, and the expanded ROW would require removal of trees near the Zumbro River. Due to the width of Zumbro Lake, the Zumbro Dam Route Option would be visible to boaters and anglers near the Zumbro Dam, and for over 0.5 mile from the surface and shoreline of Lake Zumbro.

Because both the Route Option and the Preferred White Bridge Road Route would require some tree clearing in an area characterized by residential and recreational land use, and no existing transmission line crosses the river at these locations, impacts to aesthetics would be similar for both routes.

8.7.1.4 Recreation and Tourism

Most of the land surrounding both of the routes is private and does not provide for public recreation or tourism opportunities. Recreational resources in proximity to the routes are shown in Figure 8.2-3. Both routes cross and/or parallel snowmobile trails identified on Figure 8.2-3. The Zumbro Dam Route Option

is adjacent to private recreation resources including the Ponderosa Campground, Camp Victory, and Woodlawn Camp.

Neither of the routes cross WMAs, but the Zumbro Dam Route Option is located within 1 mile of the Isaak Walton League WMA. The Isaak Walton League WMA is located west of the Zumbro River approximately 3 miles northeast of Oronoco. The WMA is managed for forest wildlife species including deer, turkey, squirrels, and other small game species (MDNR 2009p). The Isaak Walton League WMA may attract hunters to the area to hunt for deer, small game, forest game birds, pheasant, and turkey (MDNR 2009p).

8.7.1.5 Public Services

At the Zumbro Dam Route Option there is an existing crossing of the river (Zumbro Dam and Hydroelectric Generation Facility). The Preferred White Bridge Road route does not parallel any existing transmission lines, but it crosses a 69 kV transmission line owned by Xcel Energy and a 34.5 kV distribution line owned by RPU, both identified on Figure 8.2-4.

8.7.1.6 Transportation

The Zumbro Dam Route Option and Preferred White Bridge Road Route parallel roads for a similar distance. The Zumbro Dam Route Option parallels approximately 1 mile less transportation ROW when compared with the Preferred Route. The Zumbro Dam Route Option parallels 375th Avenue for approximately 0.4 mile. The Preferred White Bridge Road Route parallels Ash Road NW for approximately 1 mile and parallels 53rd Avenue Northwest and White Bridge Road Northwest for less than 1 mile each.

8.7.1.7 Land-Based Economics

The Zumbro Dam Route Option would have less of an impact on agricultural land, as it would permanently impact approximately 0.3 acre less cropland than the Preferred Route and would temporarily impact approximately 9 acres less cropland than the Preferred Route (Appendix P).

Neither of the route options would cause impacts to economically viable forestry resources. The Preferred White Bridge Road Route crosses fewer acres of forested lands than the Preferred Route (136 acres and 196 acres, respectively). Forested areas along both route options are concentrated in the immediate vicinity of the Zumbro River (Figure 8.2-1). Neither route option crosses the MDNR-managed lands.

8.7.1.8 Archaeological and Historic Resources

Archaeological and historic resources are similar along both the Preferred Route and the Route Option. There are no archaeological sites documented in the Project area within 1 mile of either the Zumbro Dam Route Option or Preferred Route centerline. The Zumbro Hydroelectric Generating Plant is the only NRHP-listed site within 1 mile of the Zumbro Dam Route Option, and there are no NRHP-listed sites within 1 mile of the Preferred White Bridge Road Route. There is one additional architectural site within 1 mile of the Preferred White Bridge Road Route when compared to the Zumbro Dam Route Option.

8.7.1.9 Natural Resources

The Zumbro Dam Route Option would result in permanent tree clearing in 1.2 acres of forested wetlands, but would not permanently impact other types of wetlands or FEMA floodplains. The Preferred White Bridge Road Route would not result in any permanent impacts to wetlands, forested wetlands, or FEMA floodplains. Wetlands, FEMA Floodplains, and streams crossed by each route option are identified on Figure 8.5-1.

The Zumbro Dam Route Option crosses the Zumbro River in a location without existing aerial infrastructure and where impacts to a high quality Maple Basswood forest (Maple Basswood) would occur on the east bank of the river. Similarly to the Preferred White Bridge Road Route, no NWRs, WPAs, GBCAs, SNAs, or IBAs are located in the vicinity of this crossing. However, the Isaak Walton League WMA is within 1 mile and south of the Zumbro Dam Route Option. This WMA is comprised of an oak forest located on steep terrain and it is managed to promote forest wildlife. When comparing conservation easement lands between the two Zumbro River crossings, the Preferred White Bridge Road Route has 25 more CRP lands than the Zumbro Dam Route Option. Conservation easements are identified on Figure 8.5-2.

Rare and unique species and MDNR rare native plant communities located within 1 mile of the Preferred Route and Route Option are summarized in Tables 8.7-3 and 8.7-4 respectively. A greater number of MDNR rare native plant communities occur within 1 mile of the Zumbro Dam Route Option centerline compared to the Preferred White Bridge Road Route. In addition, more state special concern species occurrences exist within 1 mile of the Zumbro Dam Route Option centerline compared to the Preferred Route. Both route options have an equal number state threatened species occurrences within 1 mile of the route centerline.

Each route crosses areas that have been identified as having biodiversity significance. The Zumbro Dam Route Option crosses an area having high biodiversity significance for 0.6 mile. This area is comprised of Sugar Maple-Basswood Forest and Red Oak-White Oak Forest. MDNR NHIS data document occurrences of three state special concern plant species in this area, as well as a state threatened mussel at the river crossing. The Preferred White Bridge Road Route crosses an area having moderate biodiversity for 0.9 mile. This area is the Red Oak-White Oak Forest described above in the Preferred Route section. Both areas are located adjacent to the Zumbro River on the east side (Figure 8.5-3).

8.7.2 Summary of Potential Impacts

Table 8.7-5 provides a summary comparison of the potential resource impacts of the Zumbro Dam Route Option and the Preferred White Bridge Road Route, based on the factors set forth in Minn. R. 7850.4100. Using this comparison, the Applicant concluded that the Preferred White Bridge Road route best conserves natural resources, minimizes potential environmental and human settlement impacts, as well as minimizing other land use conflicts, and would be the most cost-efficient option.

Table 8.7-3:
Preferred White Bridge Road Route and Preferred Zumbro Dam Route Option: Rare and Unique Species

Common Name	Scientific Name	Status
Preferred White Bridge Road Route		
Wildlife Species		
Mollusks		
Creek heelsplitter	*Lasmigona compressa*	SC
Elktoe	*Alasmidonta marginata*	ST
Fluted-shell	*Lasmigona costata*	SC
Birds		
Bald Eagle	*Haliaeetus leucocephalus*	SC
Vegetation Species		
Herbaceous Plants		
Tuberous Indian-plantain	*Arnoglossum plantagineum*	ST
Glade mallow	*Napaea dioica*	ST
Jewelled shooting star	*Dodecatheon amethystinum*	Non-listed
Zumbro Dam Route Option		
Wildlife Species		
Mollusks		
Ellipse	*Venustaconcha ellipsiformis*	ST
Fluted-shell	*Lasmigona costata*	SC
Mucket	*Actinonaias ligamentina*	ST
Reptiles		
Eastern fox snake	*Elaphe vulpine*	Non-listed
Timber rattlesnake	*Crotalus horridus*	ST
Vegetation Species		
Herbaceous Plants		
American ginseng	*Panax quinquefolius*	SC
Clustered broomrape	*Orobanche fasciculate*	SC
Hill's thistle	*Cirsium hillii*	SC
Moschatel	*Adoxa moschatellina*	SC
Rock sandwort	*Minuartia dawsonensis*	SC
Stemless tick-trefoil	*Desmodium nudiflorum*	SC

Source MDNR (2007).

SC State Species of concern ST State threatened

Table 8.7-4:
Preferred White Bridge Road Route and Preferred Zumbro Dam Route Option: Rare Native Communities

Community Type	Notes
Preferred White Bridge Road Route	
Dry Bedrock Bluff Prairie (Southern) Type	Bluff prairie of native and non-native species with moderate species diversity on small outcrops on SW-facing slope at top of Zumbro River valley.
Sugar Maple – Basswood – (Bitternut Hickory) Forest	Young maple-basswood forest dominated by red oak, northern pin oak, paper birch, and sugar maple. On 20-70 degree N facing slope with scattered cliff communities on outcrops.
Native Plant Community, Undetermined Class	Moderately mature dry-mesic forest dominated by red and white oak. Located on moderate slopes along SW side of Lake Zumbro.
Preferred Zumbro Dam Route	
Dry Bedrock Bluff Prairie (Southern) Type	12+-acre prairie on steep, SW facing slope on south side of peninsula on east side of Zumbro River.
Dry Sand – Gravel Prairie (Southern) Type	2 small prairies on S & W facing slope with 80-90% slopes along Zumbro River 0.5 mile downstream from dam. Moderate species diversity, exotics occasional/frequent.
Native Plant Community, Undetermined Class	Mature forest contains 80 – 90 percent cover, dominated by red oak with some basswood. Infrequent occurrences of black walnut, black oak, bur oak, and black cherry. Understory includes butternut hickory, birches, and elms.
Southern Dry – Mesic Oak Forest Class	Dry-mesic oak forest with small white pine stand on slopes and bench of sand/gravel terrace, and small maple-basswood forest on steep, north facing slope where terrace is absent. Along Zumbro River just downstream of dam, canopy covers 70-90%.

Table 8.7-5:
Summary Comparison of Impacts for the Preferred White Bridge Road Route and Zumbro Dam Route Option

Resource Category	Zumbro Dam Route Option	Preferred White Bridge Road Route
Residences		
Number of Residences 0-75 feet from route centerline	0	0
Number of Residences 75-150 feet from route centerline	0	0
Number of Residences 150-300 feet from route centerline	2	5
Density (residences/linear mile within 300 feet of route centerline)	0.2	0.5
Recreation and Tourism		
No impacts to recreation and tourism are anticipated		

Table 8.7-5:
Summary Comparison of Impacts for the Preferred White Bridge Road Route and Zumbro Dam Route Option

Resource Category	Zumbro Dam Route Option	Preferred White Bridge Road Route
Effects on Land-Based Economics		
Agriculture		
Permanent Impact	0.5 acre	0.8 acre
Temporary Impact	57 acres	66 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		
Archaeological	0	0
Architectural		
National Register of Historic Places (NRHP)	1	0
Architectural	9	10
Natural Environment		
Water Resources		
Permanent Wetlands Impacts	0	0
Temporary Wetlands Impacts	0	0
Potential Tree Clearing in Wetlands	1.2	0
Stream Crossings	13	18
Permanent Impacts to Floodplains	0	0
Flora		
Percent Cropland	57	58
Percent Grassland	26	30
Percent Shrubland	0	<1
Percent Forested Land	16	9
Percent Aquatic	1	1
Fauna		
Conservation Reserve Program Lands Crossed	7	32
Conservation Reserve Enhancement Program Lands Crossed	0	0
Length of Important Bird Areas Crossed	0 miles	0 miles
Length of Grassland Bird Conservation Areas Crossed	0 miles	0 miles

Table 8.7-5:
Summary Comparison of Impacts for the Preferred White Bridge Road Route and Zumbro Dam Route Option

Resource Category	Zumbro Dam Route Option	Preferred White Bridge Road Route
Number of Federal Rare and Unique Species Known to Occur Within 1 mile of Route Centerline		
Threatened	0	0
Endangered	0	0
Candidate	0	0
Number of State Rare and Unique Species Known to Occur Within 1 mile of Route Centerline		
Threatened	3	3
Endangered	0	0
Species of Concern	7	3
DNR Rare Native Communities	109	21
Length of Outstanding Biodiversity Sites Crossed	0	0
Length of High Biodiversity Sites Crossed	0.6 mile	0
Length of Moderate Biodiversity Sites Crossed	0	0.9 mile
Use or Paralleling of existing ROW (transportation, pipeline, and electrical transmission systems), and property lines		
Total length of route (miles)	10.1	11.9
Length following Transmission Line (miles)	0.8	0
Percentage of route following Transmission Line	8%	0%
Length following road but not Transmission Line (miles)	0.4	3.9
Percentage of route following road but not Transmission Line	4%	33%
Length following property line but not transmission line or roads (miles)	3.2	5.9
Percentage of route following property line but not transmission line or roads	32%	50%
Total length following transmission line, roads, or property lines (miles)	4.4	9.1
Percentage of route following transmission line, roads or property lines	44%	77%
Length not following transmission line, roads or property lines (miles)	5.7	2.8
Percentage of route not following transmission line, roads or property lines	56%	23%

8.8 McCarthy Lake Route Option

The McCarthy Lake Route Option is located between US-61 and the Mississippi River around the WMA and provides an alternative to the Preferred Route (the existing Dairyland Q-3 line currently located in the WMA). A detailed geographical description of the McCarthy Lake Route Option is provided in Chapter 8.8.

The Applicant is proposing to upgrade the existing Dairyland Q-3 line through the McCarthy Lake to accommodate a double circuit 345 kV/161 kV transmission line. Currently, there is an 80-foot ROW through the WMA, which is a shorter and more direct route than the McCarthy Lake Route Option. The Project can be designed to stay within the existing 80-foot ROW, if necessary. The McCarthy Lake Route Option adds 1.8 miles to the Preferred Route and requires additional angle structures. The additional length and greater number of angle structures associated with the McCarthy Lake Route Option would result in additional costs.

In January 2009, the MDNR provided comments regarding several sensitive resources in the area that may be of concern should there be an expansion of existing ROW or a new route located adjacent to the existing Dairyland Q-3 161 kV transmission line. Resources identified in the MDNR comments include restoration work by The Nature Conservancy, owner of the Weaver Dunes Scientific and Natural Area property southeast of the WMA, the National Audubon Society designation of the area as an IBA, and the restoration of a dredged soil disposal site by the USACE. The MDNR also references the MDNR-owned Kellogg-Weaver Dunes SNA southeast of the WMA, the Snake Creek unit of the RJD Memorial Hardwood Forest, and the McCarthy Lake WMA and Weaver Bottoms of the Mississippi River, which are important waterfowl stopovers during migration seasons. The Kellogg-Weaver Dunes SNA provides important habitat for several state-listed species of plants and animals, including wood and Blanding's turtles.

8.8.1 Potential Impacts

The following provides a comparison of the existing environment and potential impacts of the Preferred Route and the McCarthy Lake Route Option through the WMA. Mitigation measures to reduce impacts resulting from construction and operation of the transmission line would be the same as those described in Chapters 8.2 through 8.5. Differences between the McCarthy Lake Route Option and the Preferred Route were quantified based on the geographic extent of the Preferred Route shown in Figure 8.8-1. A route width of 1,000 feet was used to calculate existing conditions and a 150-foot ROW was used to calculate temporary and permanent impacts.

The final structure configuration through the WMA has not yet been identified, so impacts associated with the Preferred Route would be incremental because of the existing 80-foot ROW. At most, an additional 70 feet (35 feet on either side of the line) would be required to expand the ROW. This chapter is intended to provide an overview of how potential impacts differ between the McCarthy Lake Route Option and the Preferred Route. Additional impact data are provided in Table 8.8-5.

8.8.1.1 Land Cover and Land Use

When compared with the Preferred Route land cover and land use data, the McCarthy Route Option follows a smaller percentage of existing linear corridors (transmission lines and roads) and would have more impacts on agricultural resources than the Preferred Route. Land cover type along each route option is identified in Table 8.8-1, below. The McCarthy Lake Route Option has more of the following land cover types; cropland, grassland, forested, aquatic and transportation land cover. The Preferred Route crosses a greater percentage of shrubland (Figure 8.2-1).

Table 8.8-1:
McCarthy lake Route Option: Land Cover Summary

	Preferred Route	McCarthy Lake Route Option
Land Cover Type	Percent of Route	Percent of Route Option
Cropland	31	39
Grassland	34	39
Shrubland (total)	17	0
Lowland Shrub	14	0
Upland Shrub	3	0
Forest (total)	1	3
Bur/White Oak	—	0
Cottonwood	—	0
Maple/Basswood	—	0
All Others	<1	3
Aquatic (total)	17	4
Open water	—	0
Marshland	17	4
Urban (total)	1	14
High Intensity Urban	-	1
Low Intensity Urban	—	—
Transportation	<1	13
Total Acreage	100(+/—1%)	100 (+/— 1%)

Source: Minnesota Gap Data.

[1] All acreages rounded to the nearest whole number.

8.8.1.2 Displacements

Residences identified within 300 feet of the McCarthy Lake and Preferred Routes are shown on Table 8.8-2. Overall, there are three additional residences within 300 feet of the McCarthy Lake Route Option compared to the Preferred Route. Residential density along the McCarthy Lake Route Option is higher than residential density along the Preferred Route.

Table 8.8-2:
Residences in Proximity to McCarthy Lake Route Option and Preferred Route Centerlines

Proximity (feet)	McCarthy Lake Route Option	Preferred Route
0–75 (within ROW)[1]	0	0
75–150	1	0
150–300	3	1
Density (residences/linear mile)	1.6	0.4

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

8.8.1.3 Aesthetics

The McCarthy Lake bypass option does not follow existing transmission corridors. The McCarthy Lake Route Option follows the western boundary of the McCarthy Lake WMA in the Mississippi River Valley for approximately 1 mile along the east side of US-61, which is designated as part of the Great River Road Scenic Byway (Figure 8.8.1). Some tree clearing would be required in this area, which would be visible from the US-61 in addition to the transmission structures. Aesthetic impacts to travelers along US-61 would be greater than impacts associated with the Preferred and Alternative Routes that follow the existing Dairyland Q-3 line due to the creation of a new linear transmission corridor.

8.8.1.4 Recreation and Tourism

Most of the land surrounding the McCarthy Lake Route Option is private and does not provide for public recreation or tourism opportunities. Conversely, land surrounding the Preferred Route is mostly under the jurisdiction of MDNR. Recreational resources in proximity to the route options are shown in Figure 8.2-3. The McCarthy Lake Route Option crosses approximately 0.25 mile (30 acres within Route Option) and 0.1 mile (11 acres within Route Option) of McCarthy Lake WMA and the MDNR-managed RJD State Forest, respectively. The Preferred Route crosses approximately 0.9 mile (128 acres within Route Option) and 1.9 miles (12 acres within Route Option) of the McCarthy Lake WMA and the MDNR-managed RJD State Forest, respectively.

Impacts to snowmobile trails would be similar for both route options. The majority of snowmobile trails crossed or paralleled by both route options are located within the RJD State Forest.

8.8.1.5 Public Services

The McCarthy Lake Route Option does not parallel or cross any existing transmission lines, but it does cross a 69 kV transmission line owned by Xcel Energy and a 34.5 kV distribution line owned by RPU, both identified on Figure 8.2-4. The Preferred Route parallels the Dairyland Q-3 line for its entire length (2.5 miles), identified on Figure 8.2-4.

8.8.1.6 Transportation

The Preferred Route does not parallel any roads or railroads in this area. The McCarthy Lake Route Option does parallel the Canadian Pacific Railroad for approximately 2 miles. The Route Option parallels roads for 88 percent of its length, including US-61 for 1.4 miles; Old US-61 (161st Ave.) for approximately 1 mile, 159th Avenue for 0.3 mile, and Wabasha CR-84 for 1.5 miles, all identified on Figure 7.2-6.

8.8.1.7 Land-Based Economics

The McCarthy Lake Route Option would have greater impacts on agricultural land, as it would permanently impact approximately 0.3 acre more cropland than the Preferred Route and would temporarily impact approximately 9 acres more cropland than the Preferred Route (Appendix P).

Neither of the Preferred Route or Route Option would cause impacts to economically viable forestry resources. The McCarthy Lake Route Option crosses more acres of forested lands than the Preferred Route (24 acres and 7 acres, respectively).

8.8.1.8 Archaeological and Historic Resources

Archaeological and historic resources are similar along both routes. There are no archaeological sites documented in the Project area within 1 mile of either the McCarthy Lake Route Option or Preferred Route centerline. There are no NRHP-listed sites within 1 mile of either of the routes, and there are an equal number of architectural sites located within 1 mile of each route centerline.

8.8.1.9 Natural Resources

The McCarthy Lake Route Option would require tree clearing in approximately 1.6 acres of forested wetlands and would permanently impact less than 1 acre of FEMA floodplains. No permanent impacts to other types of wetlands would occur along the McCarthy Lake Route Option. The Preferred Route would require tree clearing in approximately 8 acres of forested wetlands, and would permanently impact less than 1 acre of other types of wetlands and FEMA floodplains. Wetlands, FEMA floodplains, and streams crossed by each route are identified on Figure 8.5-1.

The Preferred Route crosses a greater length (1.2 miles more) of the Upper Mississippi NWR IBA than the McCarthy Lake Route Option, identified on Figure 8.5-2. A greater number of MDNR Rare Native Plant Communities occur within 1 mile of the Preferred Route centerline compared to the McCarthy Lake Route Option. Avian species in the vicinity of the McCarthy Lake Route Option are the same as those described for the Preferred Route in Chapter 8.5.4. The Preferred Route contains one additional state

species. One state endangered, 3 state threatened and 14 state species of concern occur within 1 mile of the McCarthy Lake Route Option, and one state endangered, 4 state threatened and 14 state species of concern occur within 1 mile of the Preferred Route centerline. Tables 8.8-3 and 8.8-4 summarize the rare and unique species and MDNR rare native plant species.

Table 8.8-3:
McCarthy Lake Route Option and Preferred Route: Rare and Unique Species

Common Name	Scientific Name	Status
McCarthy Lake Route Option		
Wildlife Species		
Insects and Arachnids		
A jumping spider	*Phidippus apacheanus*	SC
A jumping spider	*Metaphidippus arizonensis*	SC
A jumping spider	*Sassacus papenhoei*	SC
Leonard's Skipper	*Hesperia leonardus leonardus*	SC
Birds		
Acadian Flycatcher	*Empidonax virescens*	SC
Bald Eagle	*Haliaeetus leucocephalus*	SC
Bell's Vireo	*Vireo bellii*	Non Listed
Red-shouldered Hawk	*Buteo lineatus*	SC
Sandhill Crane	*Grus canadensis*	Non Listed
Upland Sandpiper	*Bartramia longicauda*	Non Listed
Reptiles		
Blanding's turtle	*Emydoidea blandingii*	ST
Eastern fox snake	*Elaphe vulpina*	Non Listed
Eastern hognose snake	*Heterodon platirhinos*	Non Listed
Eastern racer	*Coluber constrictor*	SC
Milk snake	*Lampropeltis triangulum*	Non Listed
Timber rattlesnake	*Crotalus horridus*	ST
Fish		
Blue sucker	*Cycleptus elongatus*	SC
Lake sturgeon	*Acipenser fulvescens*	SC
Pirate perch	*Aphredoderus sayanus*	SC

Table 8.8-3:
McCarthy Lake Route Option and Preferred Route: Rare and Unique Species

Common Name	Scientific Name	Status
Plant Species		
Herbaceous Plants		
Clasping milkweed	*Asclepias amplexicaulis*	SC
Green dragon	*Arisaema dracontium*	Non Listed
Long-bearded hawkweed	*Hieracium longipilum*	Non Listed
Rhombic-petaled evening primrose	*Oenothera rhombipetala*	SC
Sweet-smelling Indian-plantain	*Cacalia suaveolens*	SE
Grass and Grass-like Plants		
Cattail sedge	*Carex typhina*	SC
Davis' sedge	*Carex davisii*	ST
Gray's sedge	*Carex grayi*	Non Listed
Muskingum sedge	*Carex muskingumensis*	Non Listed
Trees and Shrubs		
Buttonbush	*Cephalanthus occidentalis*	Non Listed
Swamp white oak	*Quercus bicolor*	Non Listed
Preferred Route		
Insects and Arachnids		
A jumping spider	*Phidippus apacheanus*	SC
A jumping spider	*Metaphidippus arizonensis*	SC
A jumping spider	*Sassacus papenhoei*	SC
Leonard's skipper	*Hesperia leonardus leonardus*	SC
Birds		
Acadian Flycatcher	*Empidonax virescens*	SC
Bald Eagle	*Haliaeetus leucocephalus*	SC
Bell's Vireo	*Vireo bellii*	Non Listed
Red-shouldered Hawk	*Buteo lineatus*	SC
Sandhill Crane	*Grus canadensis*	Non Listed
Reptiles		
Blanding's turtle	*Emydoidea blandingii*	ST
Eastern hognose snake	*Heterodon platirhinos*	Non Listed
Eastern racer	*Coluber constrictor*	SC

Table 8.8-3:
McCarthy Lake Route Option and Preferred Route: Rare and Unique Species

Common Name	Scientific Name	Status
Gopher snake	*Pituophis catenifer*	SC
Milk snake	*Lampropeltis triangulum*	Non Listed
Timber rattlesnake	*Cotalus horridus*	ST
Wood turtle	*Clemmys insculpta*	ST
Fish		
Blue sucker	*Cycleptus elongates*	SC
Pirate perch	*Aphredoderus sayanus*	SC
Plant Species		
Herbaceous Plants		
Clasping milkweed	*Asclepias amplexicaulis*	SC
Green dragon	*Arisaema dracontium*	Non Listed
Long-bearded hawkweed	*Hieracium longipilum*	Non Listed
Rhombic-petaled evening primrose	*Oenothera rhombipetala*	SC
Sweet-smelling Indian-plantain	*Cacalia suaveolens*	SE
Grass and Grass-like Plants		
Cattail sedge	*Carex typhina*	SC
Davis' sedge	*Carex davisii*	ST
Gray's sedge	*Carex grayi*	Non Listed
Muskingum sedge	*Carex muskingumensis*	Non Listed
Trees and Shrubs		
Buttonbush		Non Listed
Swamp white oak		Non Listed

FC Federal Candidate SC Species of Concern ST State Threatened

Table 8.8-4:
McCarthy Lake Route Option and Preferred Route: Rare Native Communities

Community Type	Notes
McCarthy Lake Route Option	
Calcareous Fen	Located within WMA, little species information collected, quality habitat for calciphile moss.
Dry Bedrock Bluff Prairie	Three small prairies on upper slopes of snake creek. Native species dominate, but moderately low diversity.
Native Plant Community, Undetermined Class	Four areas varying in size, plant species dominance, and landscape position. At least two features contain fen/meadow communities.
Seepage Meadow/Carr, Tussock Sedge Subtype	Small sedge dominated meadow fed by seepage from terrace slope along snake creek.
Silver Maple - (Virginia Creeper) Floodplain Forest	Vast expanse of mature to immature forest, canopy cover varies from 60 to 90 percent. Dominated by sugar maple, plains cottonwood, green ash, black willow, and American elm.
Southern Dry-Mesic Oak Forest	Mature forest dominated by red maple, basswood, paper birch, and sugar maple. Structurally diverse native stand.
Preferred Route	
Calcareous Fen (Southeastern)	Located in McCarthy Lake WMA.
Dry Bedrock Bluff Prairie (Southern)	Six small prairies of varying plant species diversity. Additionally, there is a 12+-acre prairie on steep SW-facing slope, on south side of peninsula on E side of Zumbro Lake.
Native Prairie, Undetermined Class	Large fen/meadow in large wetland complex formed by old channels of the Zumbro River. Emergent marsh and floodplain forest, Shrub cover patchy (10 to 60 percent) including dogwood, willow, and birch.
Native Prairie, Undetermined Class	Large fen/meadow in large wetland complex formed by old channels of the Zumbro River. Emergent marsh and floodplain forest, Shrub cover patchy (10 to 70 percent) including dogwood, willow, and birch.
Native Prairie, Undetermined Class	Three areas of shrub dominated wetland in extensive complex formed by old channels of the Zumbro River. Emergent marsh and floodplain forest, Shrub cover patchy (60 to 100 percent) including dogwood, willow, and birch.
Native Prairie, Undetermined Class	Floating mat in old channel of Zumbro River. Dominated by sedges including hairy sedge and prairie sedge. Some invasion of cattails was observed.
Seepage Meadow/Carr, Tussock Sedge	Small sedge dominated meadow fed by seepage from base of 40-foot, east facing terrace slope along Snake Creek.
Silver Maple—(Virginia Creeper) Floodplain Forest	Vast expanse of mature to immature forest, varying in quality and canopy cover. Dominated by silver maple.
Silver Maple-Green Ash-Cottonwood Terrace Forest	Three areas of relatively low quality, but intact forest dominated variously by silver maple, eastern cottonwood, American elm, green ash, black ash, black willow, and peachleaf willow.
Southern Dry-Mesic Oak Forest	Mature forest dominated by northern red oak, white oak, and paper birch. Some small white pine stands and maple/basswood forest slopes of terrace.

Both the route option and Preferred Route cross areas that have been identified as having high biodiversity. The McCarthy Lake Route Option crosses an area having high biodiversity for 0.1 mile and the Preferred Route crosses an area having high biodiversity for 0.9 mile. Both areas are located within the McCarthy Lake WMA (Figure 8.5-3) and are described in Chapter 8.5.5.

8.8.2 Summary of Potential Impacts

Table 8.8-5 provides a summary comparison of the potential resource impacts of the McCarthy Lake Route and the Preferred Route, based on the factors set forth in Minnesota Rule 7850.4100. Using this comparison, the Applicant concluded that the Preferred Route best conserves natural resources, minimizes potential environmental and human settlement impacts as well as minimizing other land use conflicts, and would be the most cost-efficient option.

Table 8.8-5:
Summary Comparison of Impacts for McCarthy Lake Route Option and Preferred Route

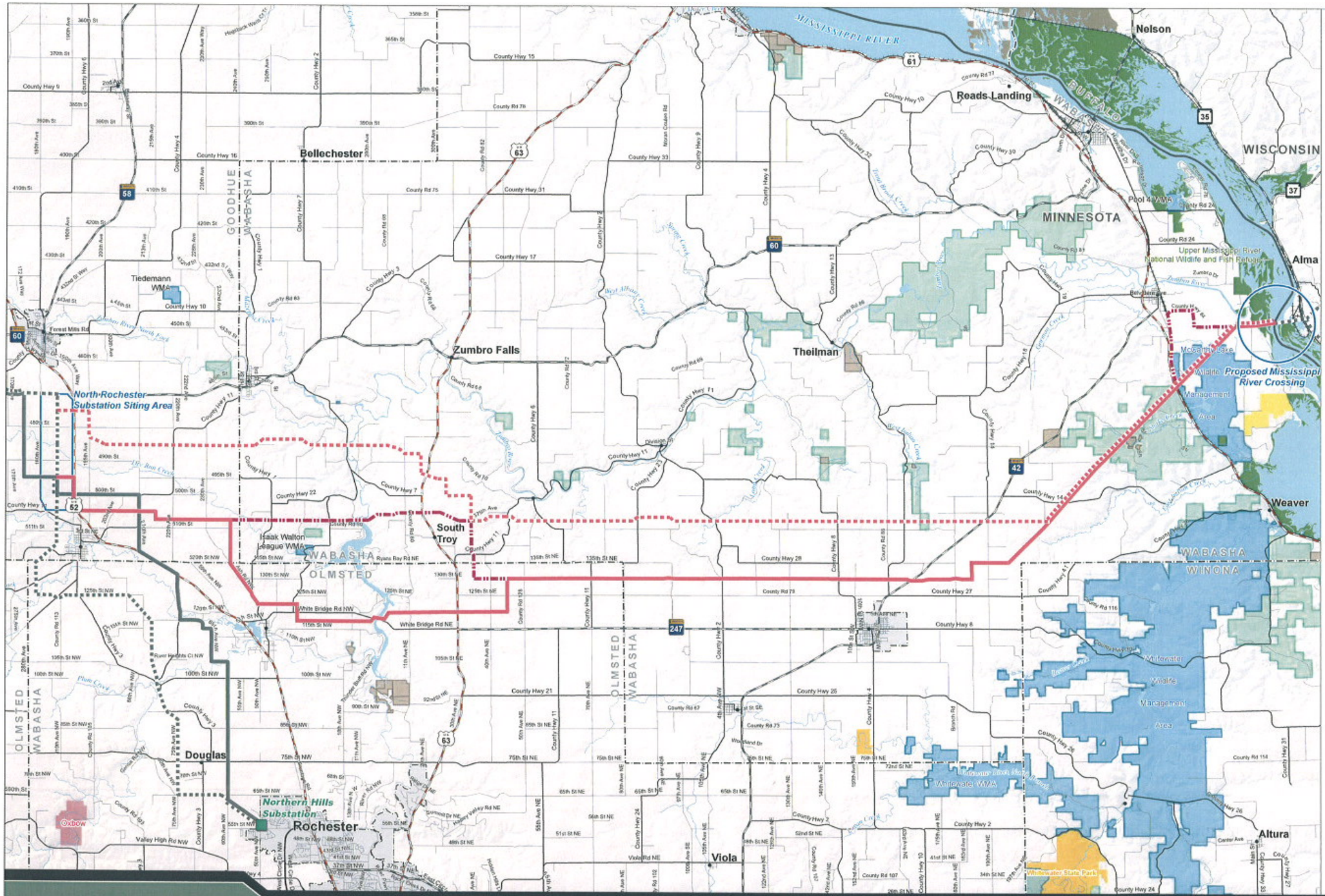
Resource Category	McCarthy Lake Route Option	Preferred Route
Residences		
Number of Residences 0-75 feet from route centerline	0	0
Number of Residences 75-150 feet from route centerline	1	0
Number of Residences 150-300 feet from route centerline	3	1
Density (residences/linear mile within 300 feet of route centerline)	1.6	0.4
Recreation and Tourism		
McCarthy WMA crossed	0.3	0.9
RJD State Forest crossed	0	1.9 miles
Effects on Land-Based Economics		
Agriculture		
Permanent Impact	0.4 acre	0.1 acre
Temporary Impact	26 acres	17 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		
Archaeological	6	6
Architectural		
National Register of Historic Places (NRHP)	0	0
Architectural	0	0

Table 8.8-5:
Summary Comparison of Impacts for McCarthy Lake Route Option and Preferred Route

Resource Category	McCarthy Lake Route Option	Preferred Route
Natural Environment		
Water Resources		
Permanent Wetlands Impacts	<1 acre	<1 acre
Temporary Wetlands Impacts	2 acres	5 acres
Potential Tree Clearing in Wetlands	0.9 acre	2.3 acres
Stream Crossings	3	4
Permanent Impacts to Floodplains	<1 acre	<1 acre
Flora		
Percent Cropland	39	31
Percent Grassland	39	34
Percent Shrubland	0	17
Percent Forested Land	3	<1
Percent Aquatic	18	4
Fauna		
Conservation Reserve Program Lands Crossed	0	0
Conservation Reserve Enhancement Program Lands Crossed	0	0
Length of Important Bird Areas Crossed	0.1 mile	1.4 miles
Length of Grassland Bird Conservation Areas Crossed	0 mile	0 mile
Number of Federal Rare and Unique Species Known to Occur Within 1 mile of Route Centerline		
Threatened	0	0
Endangered	0	0
Candidate	0	0
Number of State Rare and Unique Species Known to Occur Within 1 mile of Route Centerline		
Threatened	3	4
Endangered	14	13
Species of Concern	6	10
DNR Rare Native Communities	301	506
Length of Outstanding Biodiversity Sites Crossed	0	0
Length of High Biodiversity Sites Crossed	0.1 mile	0.9 mile
Length of Moderate Biodiversity Sites Crossed	0	0

Table 8.8-5:
Summary Comparison of Impacts for McCarthy Lake Route Option and Preferred Route

Resource Category	McCarthy Lake Route Option	Preferred Route
Use or Paralleling of existing ROW (transportation, pipeline, and electrical transmission systems) and property lines		
Total length of route (miles)	4.7 miles	2.5 miles
Length following Transmission Line (miles)	0	2.5 miles
Percentage of route following Transmission Line	0	100
Length following road but not Transmission Line (miles)	4.6 miles	0
Percentage of route following road but not Transmission Line	97	0
Length following property line but not transmission line or roads (miles)	0	0
Percentage of route following property line but not transmission line or roads	0	0
Total length following transmission line, roads, or property lines (miles)	4.6 miles	2.5 miles
Percentage of route following transmission line, roads or property lines	96	100
Length not following transmission line, roads or property lines (miles)	0.1	0
Percentage of route not following transmission line, roads or property lines	3	0
Estimated Costs (millions)		
Cost	$10	$5



North Rochester - Mississippi River 345 kV Section

Jurisdiction

Proposed Features

North Rochester - MS River Routes

- Preferred Route
- Alternative Route
- Route Option

Project Routes

- Preferred Route
- Alternative Route

Jurisdiction
(MNDNR, USGS, NPS, TNC)

- Municipality
- County Park
- Wildlife Management Area
- Minnesota State Forest Land
- Minnesota Land Trust
- Minnesota State Park
- The Nature Conservancy
- Wisconsin Department of Natural Resources
- U.S. Fish and Wildlife Service

0 1 2 Miles

Scale 1:89,000 when printed at 22x34

Map Extent

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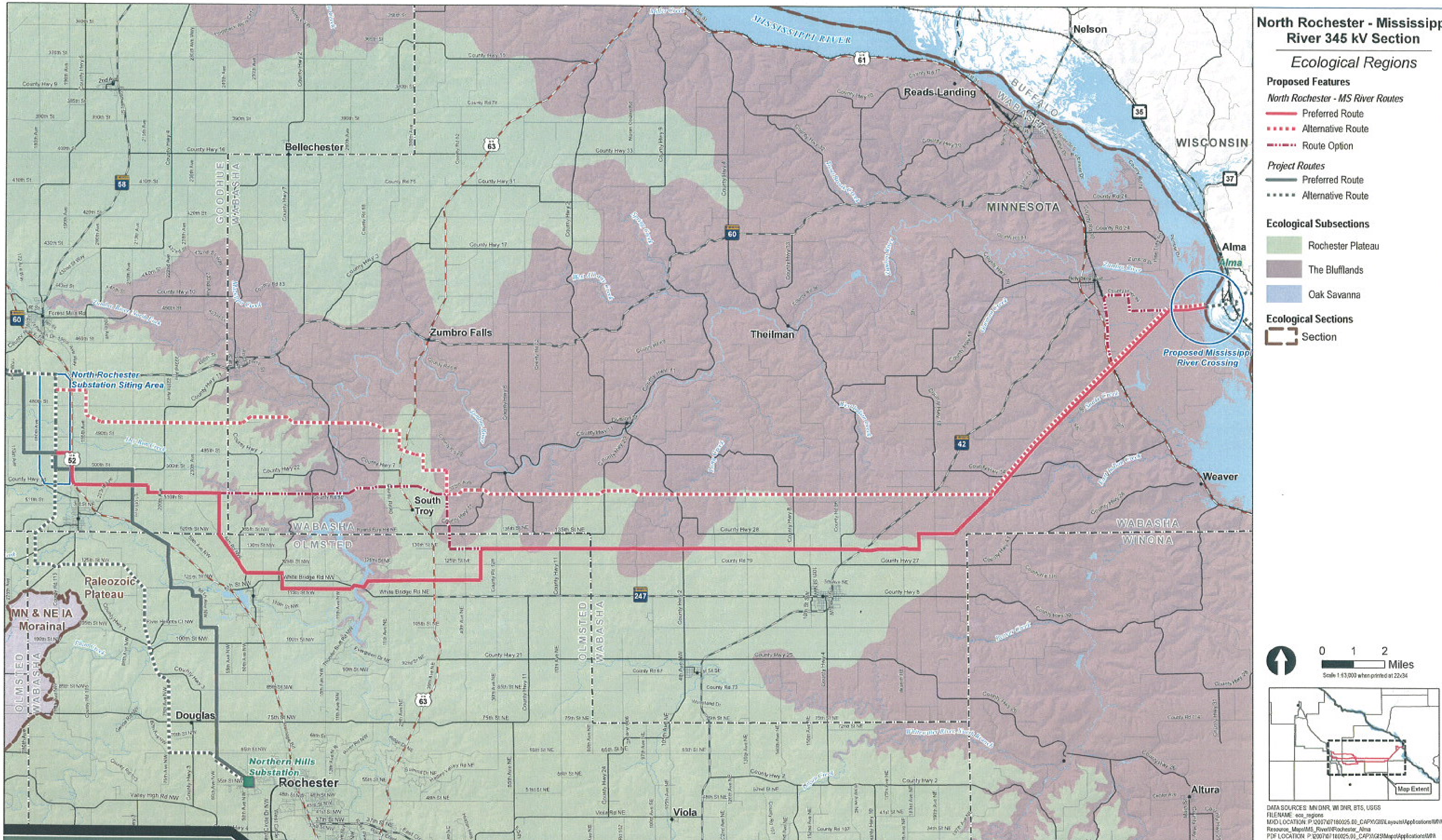
CapX2020

Hampton • Rochester • La Crosse 345 kV Transmission Project

Jurisdiction Resource Map
MN Route Permit Application

8.1-1: North Rochester - Mississippi River Section Overview



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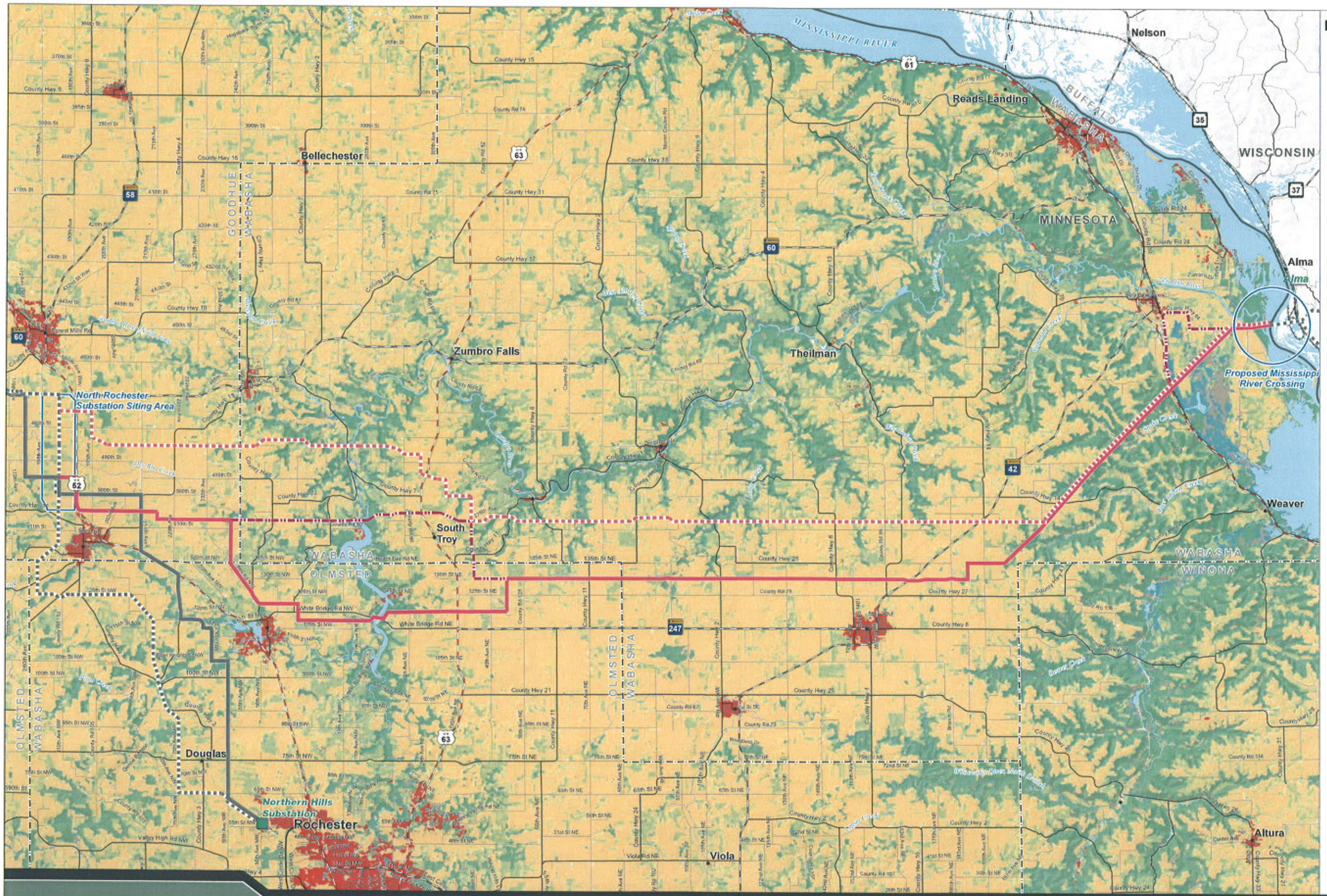
Ecological Regions Resource Map
MN Route Permit Application

8.1-2: MN DNR Environmental Classification System Provinces and Subsections



North Rochester - Mississippi River 345 kV Section

Land Cover

Proposed Features

North Rochester - MS River Routes

- Preferred Route
- Alternative Route
- Route Option

Project Routes

- Preferred Route
- Alternative Route

Land Cover
(MN GAP)

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

DATA SOURCES: MN DNR, WI DNR, BTS, USGS
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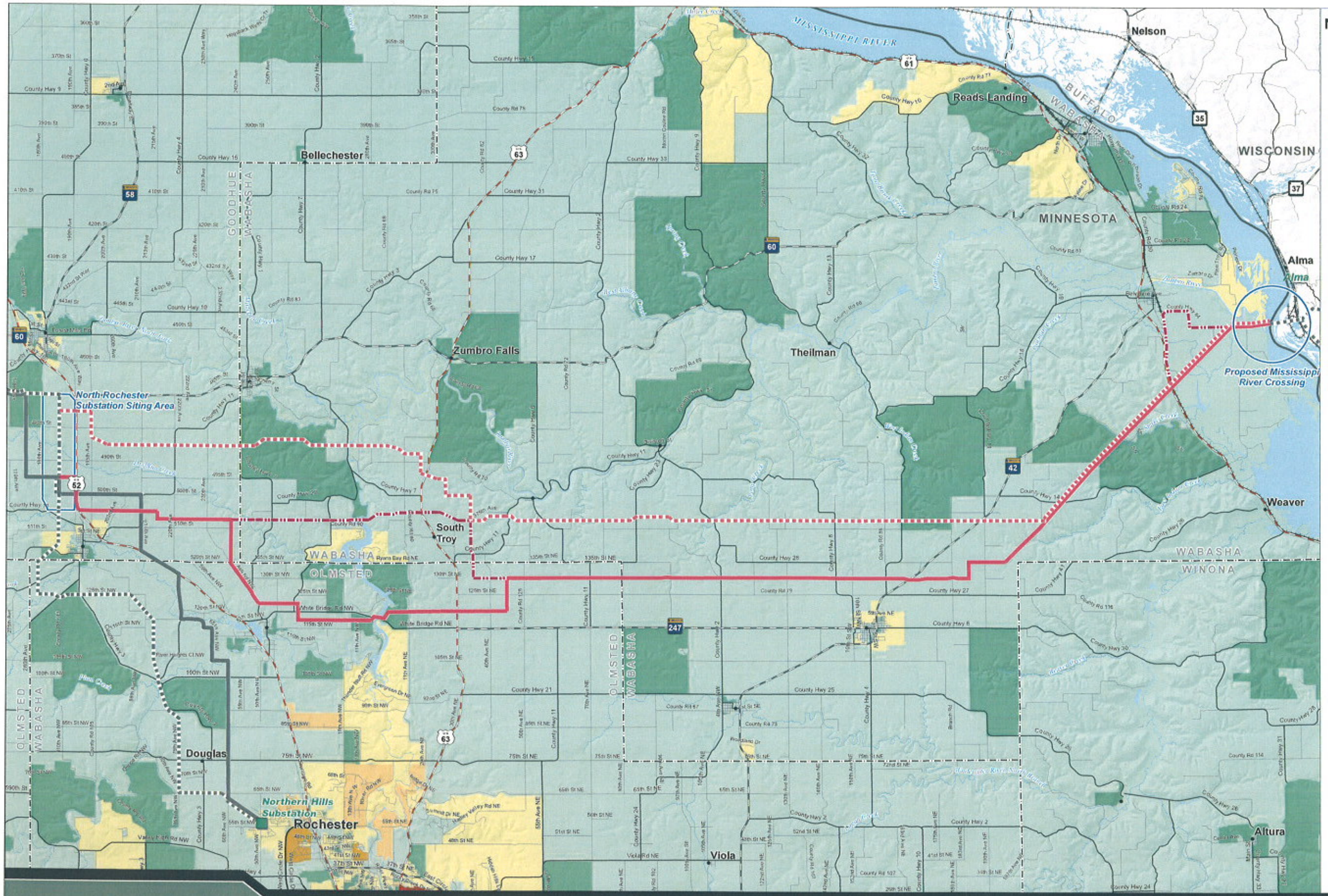
Hampton • Rochester • La Crosse 345 kV Transmission Project

Land Cover Resource Map
MN Route Permit Application

8.2-1: Land Cover



North Rochester - Mississippi River 345 kV Section

Population Density

Proposed Features

North Rochester - MS River Routes

- Preferred Route
- Alternative Route
- Route Option

Project Routes

- Preferred Route
- Alternative Route

Population Density
(People/Block Group)

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

0 1 2 Miles

Scale 1:63,000 when printed at 22x34

Map Extent

DATA SOURCES: MN DNR, WI DNR, BTS, USGS
FILENAME: population_density
MXD LOCATION: P:\2007\07180025.00_CAPX\GIS\Layouts\Applications\MN Resource_Maps\MS_River\NRochester_Alma
PDF LOCATION: P:\2007\07180025.00_CAPX\GIS\Maps\Applications\MN Resource_Maps\MS_River\NRochester_Alma

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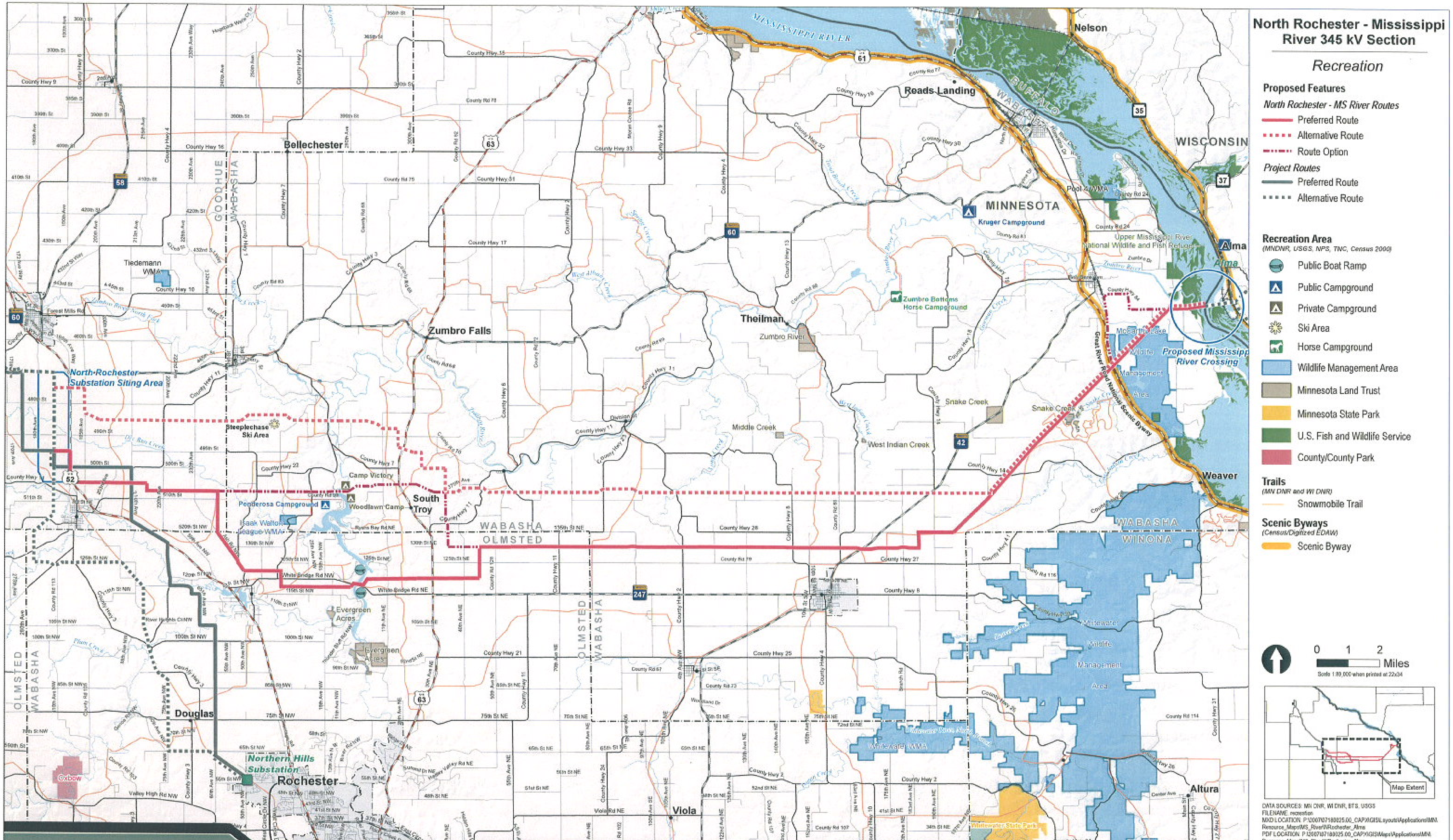
Population Density Resource Map
MN Route Permit Application

8.2-2: Population Density



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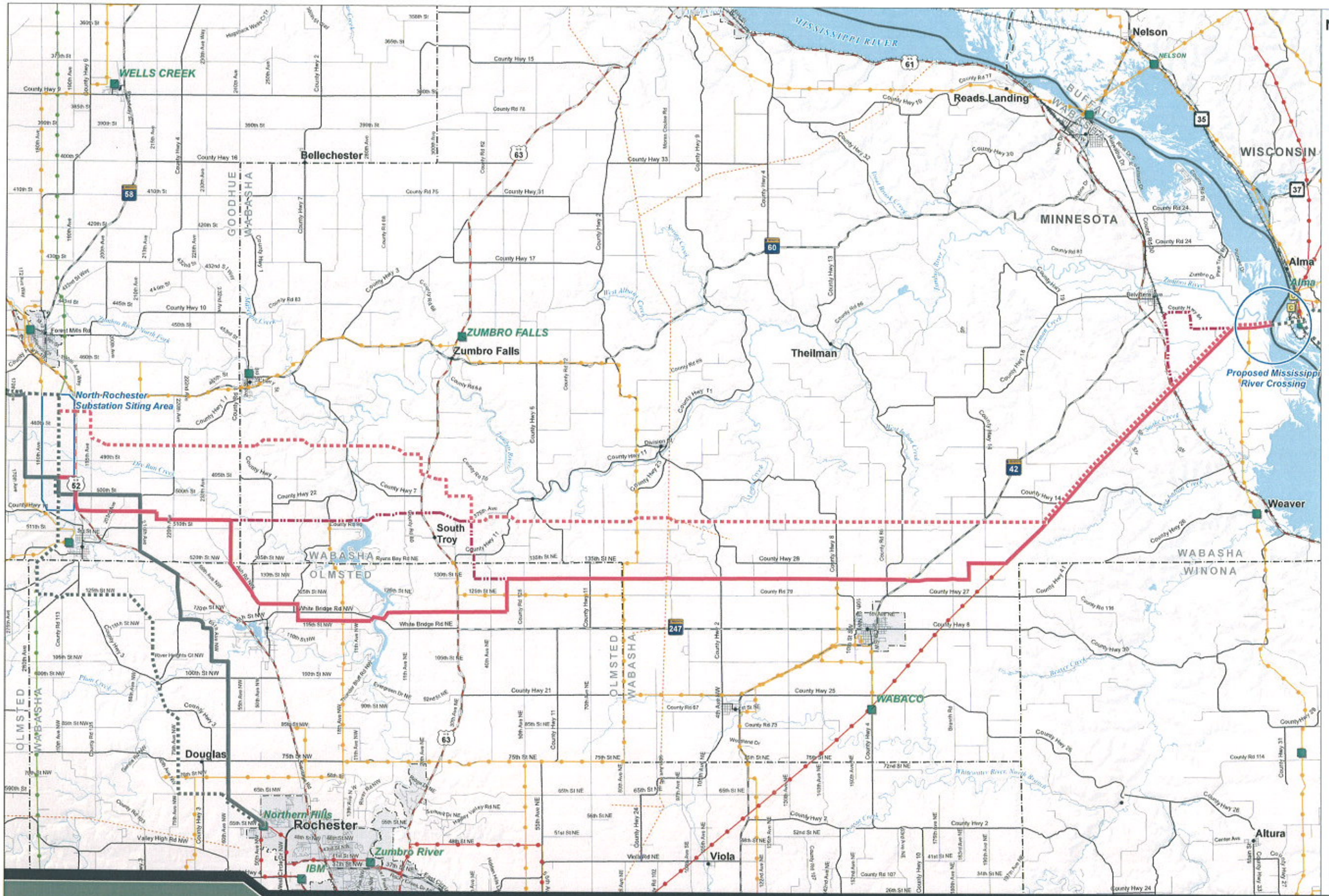
Recreation Resource Map
MN Route Permit Application

8.2-3: Recreation



North Rochester - Mississippi River 345 kV Section

Utilities

Proposed Features

North Rochester - MS River Routes

- Preferred Route
- Alternative Route
- Route Option

Project Routes

- Preferred Route
- Alternative Route

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 Platts)

- Existing Pipeline

0 1 2 Miles

Scale 1:63,000 when printed at 22x34

DATA SOURCES: MN DNR, WI DNR, BTS, USGS
FILENAME: utilities
MXD LOCATION: P:\2007\07180025.00_CAPX\GIS\Layouts\Applications\MN\Resource_Maps\MS_River\NRochester_Alma
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Utilities Resource Map
MN Route Permit Application

North Rochester - Mississippi River 345 kV Section

Transportation

Proposed Features

North Rochester - MS River Routes

- Preferred Route
- Alternative Route
- Route Option

Project Routes

- Preferred Route
- Alternative Route

Transportation
(Bureau of Transportation Statistics, Census)

- Interstate Highway
- US Highway
- State Highway
- Major Road
- Local Road
- Railroad
- Heliport

0 1 2 Miles

Scale 1:63,000 when printed at 22x34

Map Extent

DATA SOURCES: MN DNR, WI DNR, BTS, USGS
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Transportation Resource Map
MN Route Permit Application

North Rochester - Mississippi River 345 kV Section

Communication Facilities

Proposed Features

North Rochester - MS River Routes

- Preferred Route
- Alternative Route
- Route Option

Project Routes

- Preferred Route
- Alternative Route

Communications Facilities

(FCC 2007)

- AM
- Antenna Structure Registration
- BRS and EBS Transmitter
- Cellular
- FM
- Land Mobile Broadcast
- Microwave
- Paging
- TV

0 1 2 Miles

Scale 1:63,000 when printed at 22x34

Map Extent

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

FILENAME: fcc

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PDF LOCATION: P:\2007\07180025.00_CAPX\GIS\Maps\Applications\MN\Resource_Maps\MS_River\NRochester_Alma

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Communication Facilities
Resource Map
MN Route Permit Application

8.2-6: Communication Facilities

North Rochester - Mississippi River 345 kV Section

Prime Farmland

Proposed Features

North Rochester - MS River Routes

- Preferred Route
- Alternative Route
- Route Option

Project Routes

- Preferred Route
- Alternative Route

Prime Farmland
(NRCS SSURGO)

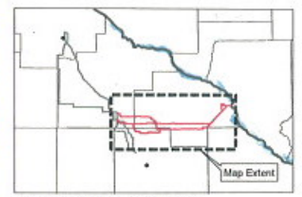
- Prime Farmland
- Prime farmland if drained
- Farmland of statewide importance

Agricultural Features

- Tree Farm

0 1 2 Miles

Scale 1:63,000 when printed at 22x34



DATA SOURCES: MN DNR, WI DNR, BTS, USGS
FILENAME: prime_farmland
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PDF LOCATION: P:\2007\07180025.00_CAPX\GIS\Maps\Applications\MN Resource_Maps\MS_River\NRochester_Alma

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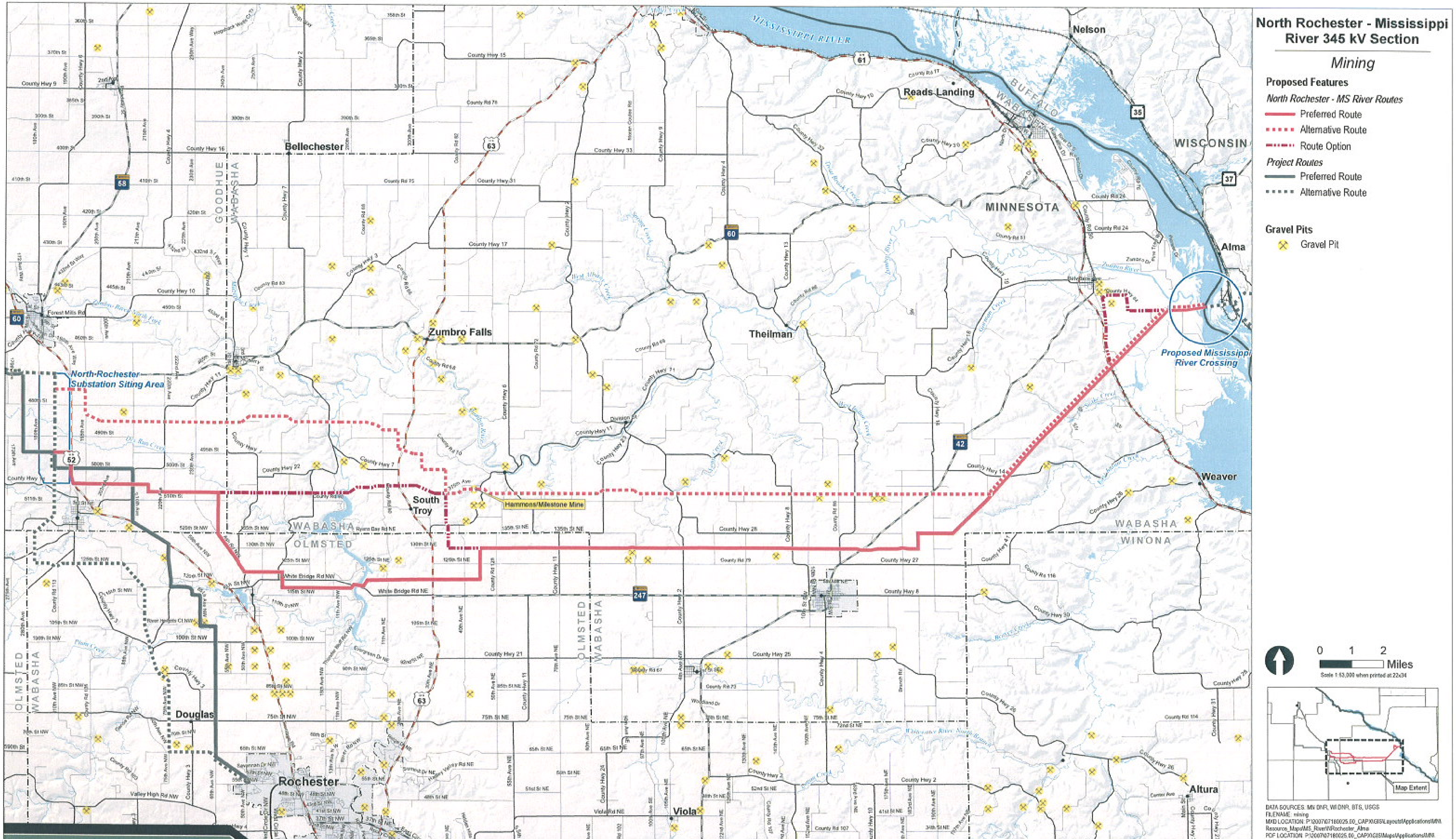
Prime Farmland Resource Map
MN Route Permit Application

8.3-1: Prime Farmland



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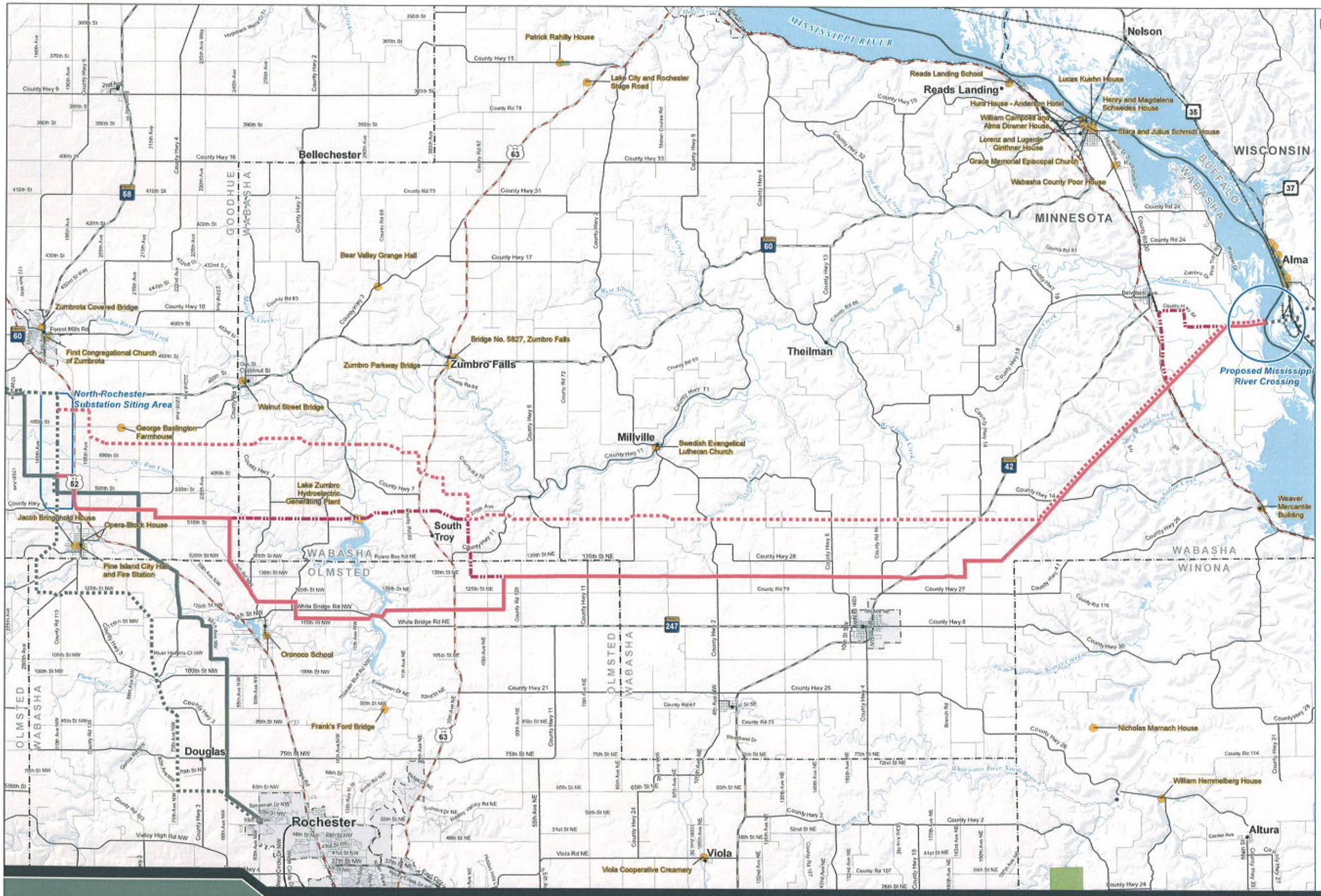
Mining Resource Map
MN Route Permit Application

8.3-2: Mining Resources



North Rochester - Mississippi River 345 kV Section

Historic Places

Proposed Features

North Rochester - MS River Routes

- Preferred Route
- Alternative Route
- Route Option

Project Routes

- Preferred Route
- Alternative Route

Historic Places

(National Register of Historic Places)

- Historic Place
- Historic Region

DATA SOURCES: MN DNR, WI DNR, BTS, USGS
FILENAME: historic_places
MXD LOCATION: P:\2007\07180025.00_CAPX\GIS\Layouts\Applications\MN\Resource_Maps\MS_River\NRochester_Alma
PDF LOCATION: P:\2007\07180025.00_CAPX\GIS\Maps\Applications\MN\Resource_Maps\MS_River\NRochester_Alma

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Historic Places Resource Map
MN Route Permit Application

8.4-1: Historic Places

North Rochester - Mississippi River 345 kV Section

Water Resources

Proposed Features

North Rochester - MS River Routes
- Preferred Route
- Alternative Route
- Route Option

Project Routes
- Preferred Route
- Alternative Route

Surface Water
(MNDOT, WIDNR 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

0 1 2 Miles
Scale 1:63,000 when printed at 22x34

Map Extent

DATA SOURCES: MN DNR, WI DNR, BTS, USGS
FILENAME: water_resources
MXD LOCATION: P:\2007\07180025.00_CAPX\GIS\Layouts\Applications\MN Resource_Maps\MS_River\NRochester_Alma
PDF LOCATION: P:\2007\07180025.00_CAPX\GIS\Maps\Applications\MN Resource_Maps\MS_River\NRochester_Alma

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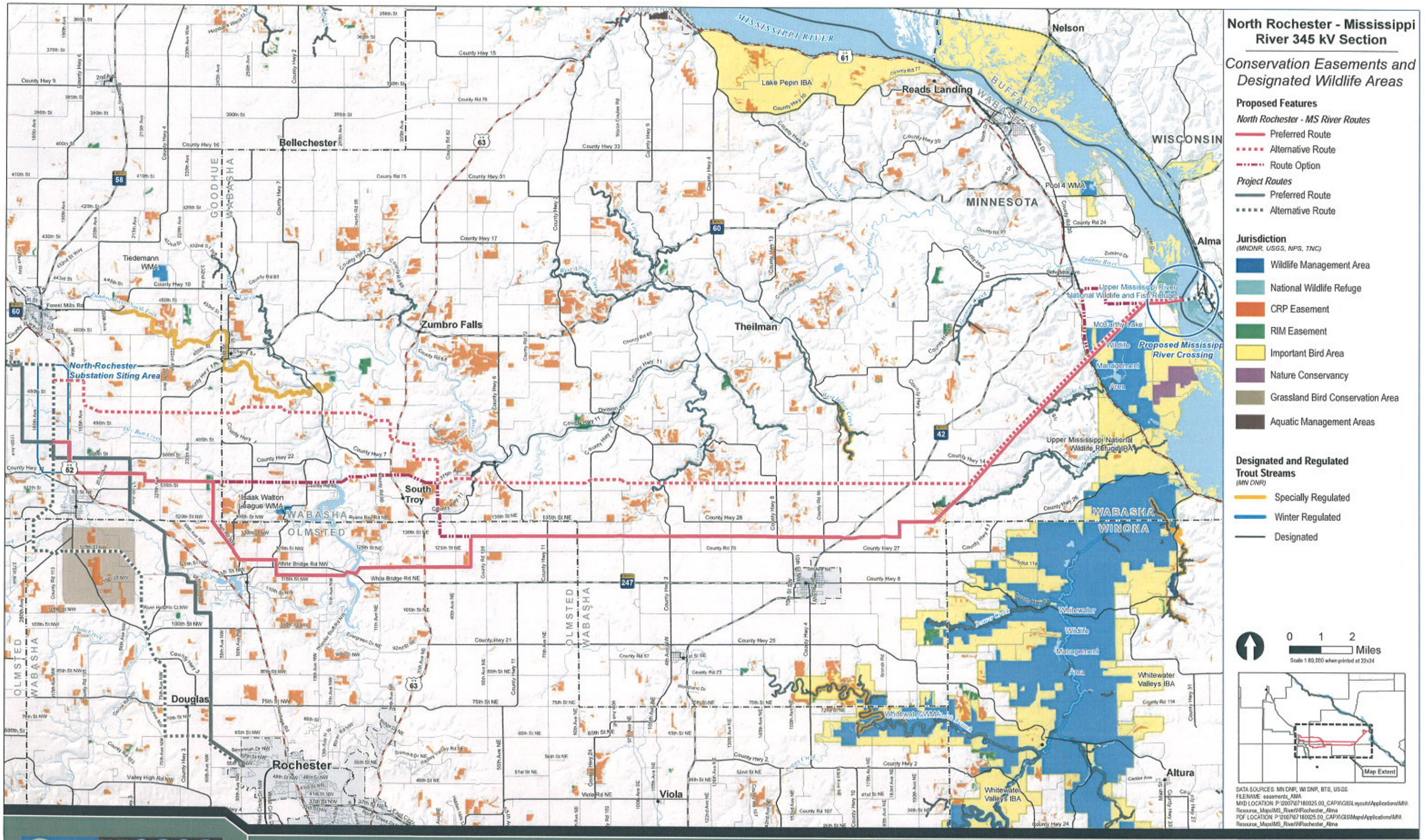
Water Resources Map
MN Route Permit Application

8.5-1: Water Resources



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

8.5-2: Conservation Easements and Designated Wildlife Areas

North Rochester - Mississippi River 345 kV Section

Biodiversity

Proposed Features

North Rochester - MS River Routes

- Preferred Route
- Alternative Route
- Route Option

Project Routes

- Preferred Route
- Alternative Route

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

0 1 2 Miles

Scale 1:63,000 when printed at 22x34

Map Extent

DATA SOURCES: MN DNR, WI DNR, BTS, USGS
FILENAME: biodiversity
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PDF LOCATION: P:\0007\07180025.00_CAPX\GIS\Maps\Applications\MN Resource_Maps\MS_River\NRochester_Alma

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Biodiversity Resource Map
MN Route Permit Application

8.5-3: Biodiversity

Figure 8.5-4: McCarthy Lake Proposed ROW

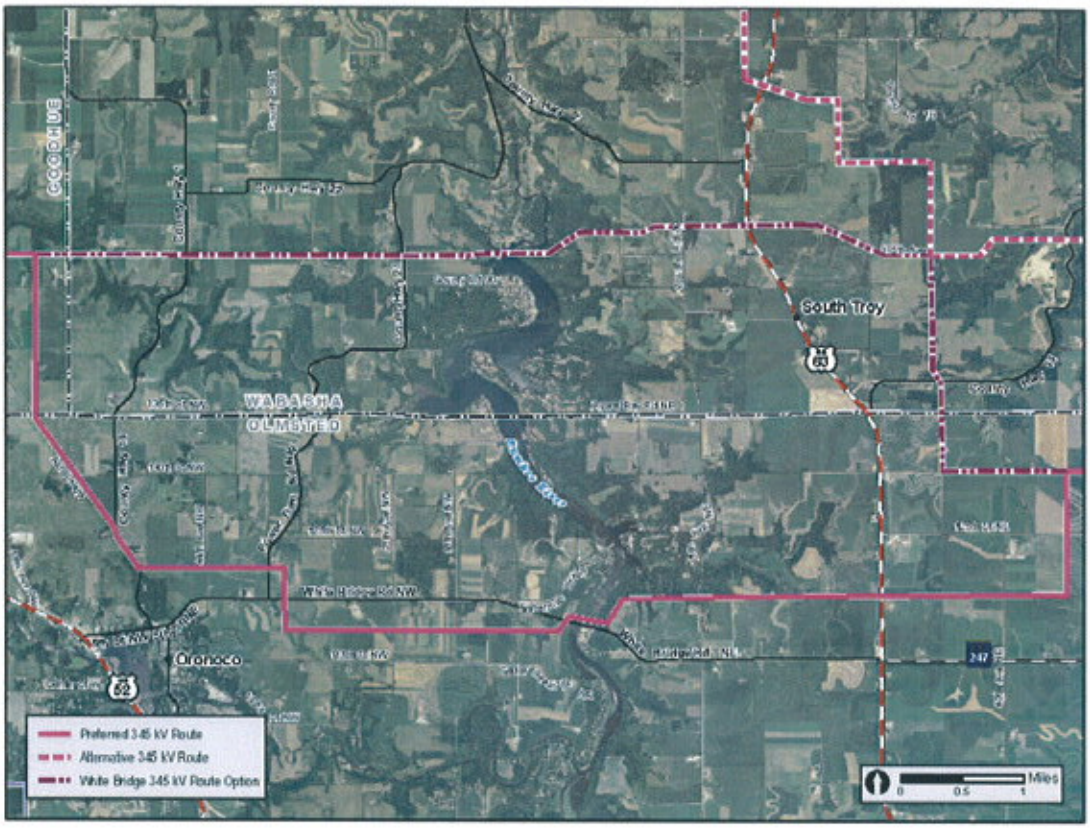

Figure 8.7-1: Zumbro Dam Route Option

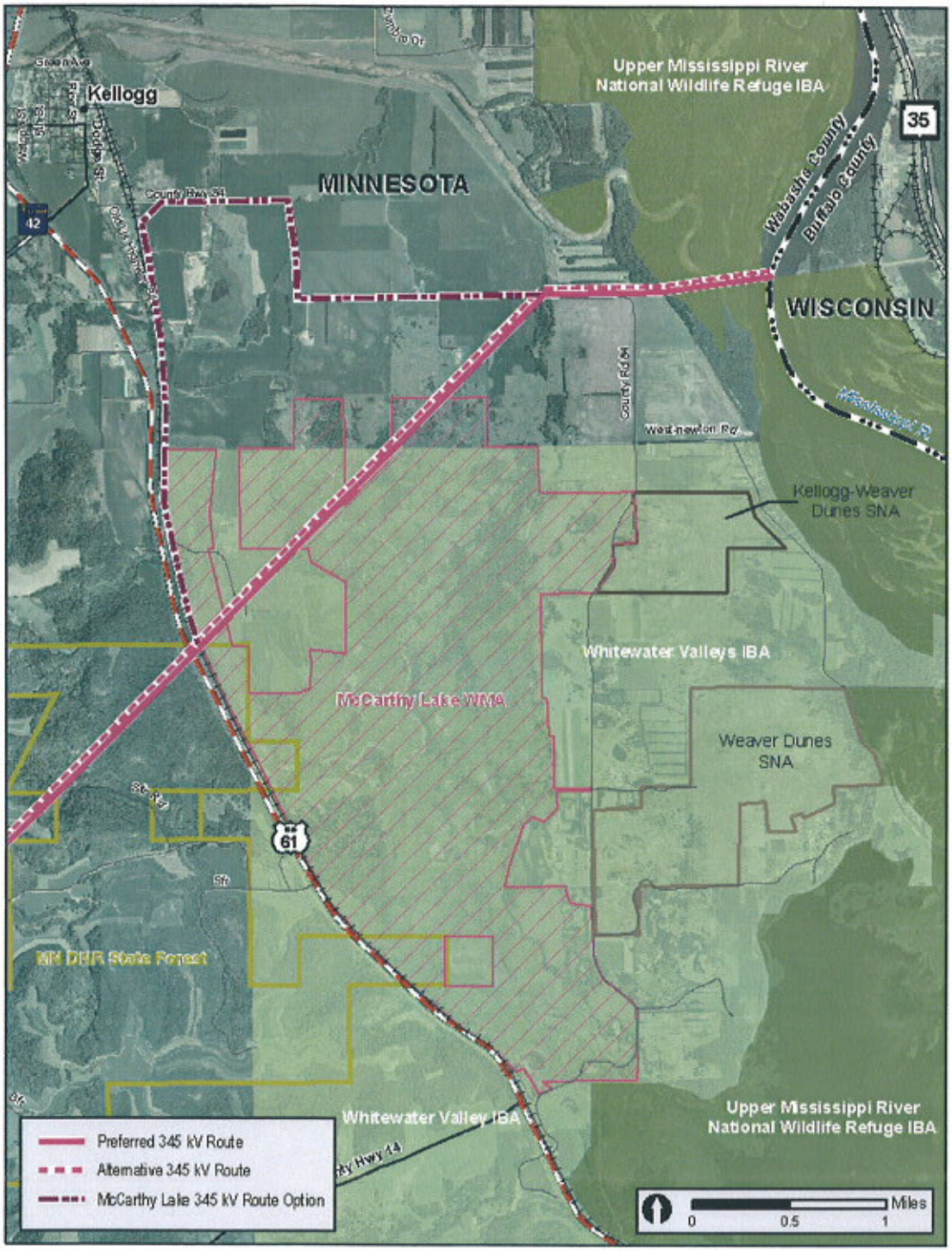

Figure 8.8-1: McCarthy Lake Route Option

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