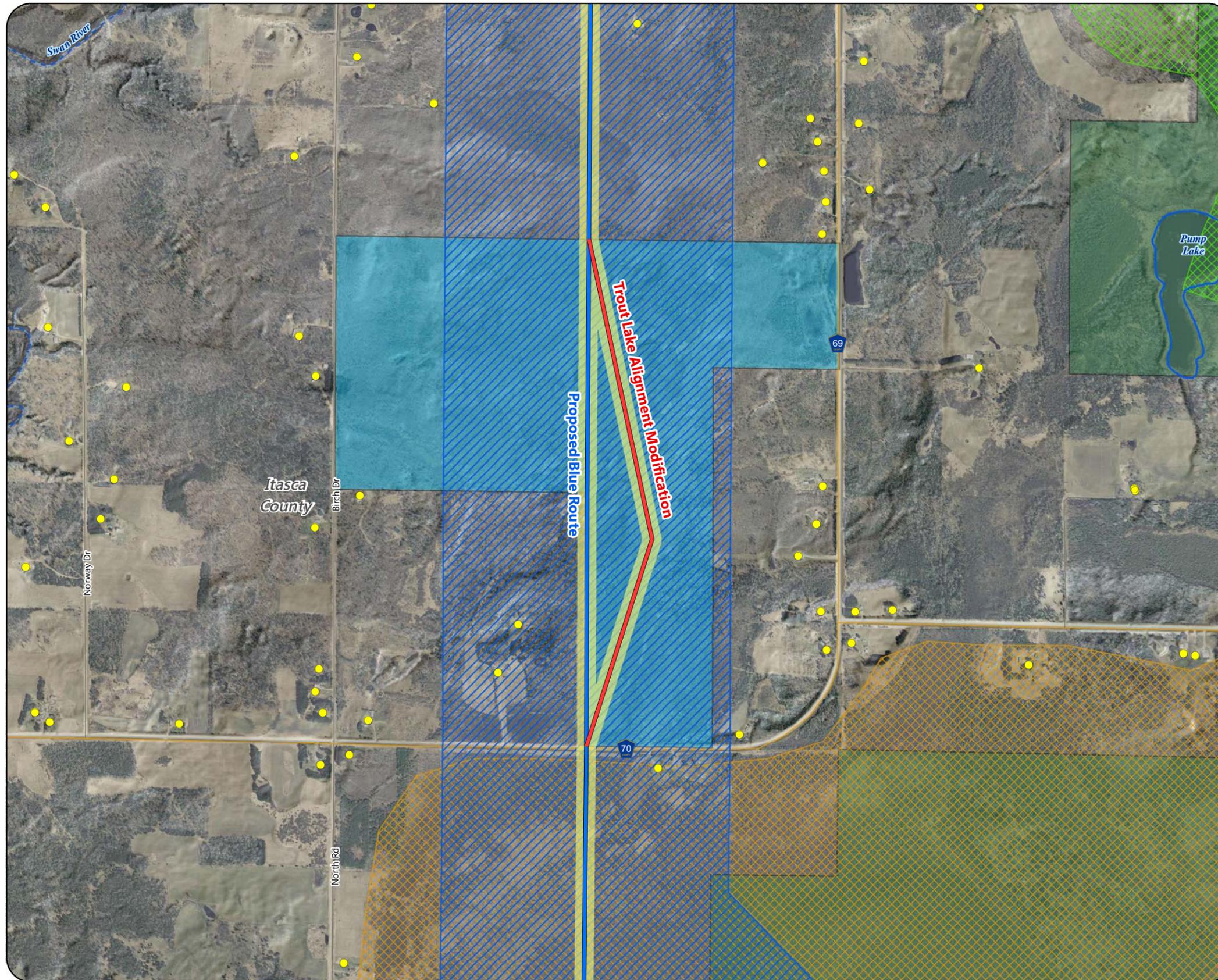
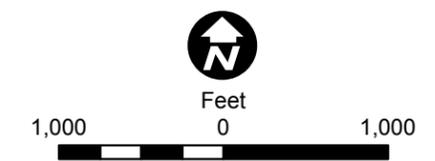


Map 6-74 Trout Lake Alignment Modification



- Proposed Route**
- Blue Route Anticipated Alignment
 - Blue Route Corridor
- Alternative**
- Trout Lake Alignment Modification
 - Anticipated Right-of-Way
- Existing Transmission Lines**
- 69 or 115 kV
 - Residence
 - NHD Watercourse
 - PWI Watercourse
 - PWI Waterbody
- Site of Biodiversity Significance (All Ranks Preliminary)**
- Moderate Significance
 - High Significance
- Land Ownership (Assumed)**
- Private Land
 - Corporate
 - State Land



Map 6-74

TROUT LAKE ALIGNMENT MODIFICATION
Great Northern Transmission Line
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6.6 Hops

There are five hops identified for the proposed Project as described in Chapter 4. Additional details are provided in Appendix E.

6.6.1 West Section

There are five hops identified for the proposed Project in the West Section – Hops 1, 2, 3, 4, and 5. Hops 1, 2, and 3 provide a connection for the Proposed Blue/Orange Route and Variation in the Cedar Bend WMA Variation Area to the variations in the Beltrami North and Beltrami North Central variation areas. Hops 3 and 4 provide a connection for the Proposed Blue/Orange Route and Beltrami North Variation 1 in the Beltrami North Variation Area to the Beltrami North Central Variations 3 and 4 in the Beltrami North Central Variation Area. Hop 5 provides a connection from the south end of Beltrami North Central variations 4 and 5 west to the Proposed Orange Route.

Hop 1

Hop 1 is located in the southeastern portion of the Cedar Bend WMA Variation Area (Map 4-5) and the northwestern corner of the Beltrami North Central Variation Area (Map 4-7). The length of Hop 1 is approximately 0.7 miles (Map 6-75). The closest residence to this hop is approximate 0.7 miles to the northwest. Land ownership includes only state forest lands; it crosses Lake of the Woods and Beltrami Island state forests (Map 6-13). Hop 1 crosses the existing 500 kV transmission line. The entire length of the hop crosses either shrub or forested wetlands (Map 6-13). This hop crosses MBS Sites of Biodiversity Significance ranked as high or moderate significance (Map 6-14).

Hop 2

Hop 2 is located in the southeastern portion of the Cedar Bend WMA Variation Area (Map 4-5) and the northwestern corner of the Beltrami North Central Variation Area (Map 4-7). The length of Hop 2 is approximately one mile (Map 6-75). The closest residence to this hop is approximate 0.7 miles to the northwest. Land ownership includes only state forest lands. The hop crosses Lake of the Woods and Beltrami Island state forests (Maps 6-13 and 6-23). Hop 2 parallels an existing 230 kV transmission line for its entire length. The entire length of the hop crosses either shrub or forested wetlands (Maps 6-13 and 6-23). This hop crosses MBS Sites of Biodiversity Significance ranked as high or moderate significance (Maps 6-14 and 6-24).

Hop 3

Hop 3 is located in the southeastern portion of the Cedar Bend WMA Variation Area (Map 4-5) and the northwestern corner of the Beltrami North Central Variation Area (Map 4-7). The length of Hop 3 is approximately 1.2 miles (Map 6-75). The closest residence to this hop is approximate 1.3 miles to the northwest. Land ownership includes only state forest lands; it crosses Beltrami Island state forest (Map 5-5). Hop 3 crosses the existing 500 kV transmission line. The entire length of the hop crosses either shrub or forested wetlands (Maps 6-13 and 6-23). This hop crosses MBS Sites of Biodiversity Significance ranked as high or moderate significance (Maps 6-14 and 6-24).

Hop 4

Hop 4 is located in the eastern portion of the Beltrami North Variation Area (Map 4-6) and the northwestern corner of the Beltrami North Central Variation Area (Map 4-7). The length of Hop 4 is approximately one mile (Map 6-75). The closest residence to this hop is approximate 1.2 miles to the northwest. Land ownership includes only state forest lands; it crosses Beltrami Island state forest (Map 6-18). Hop 4 does not cross any existing transmission lines. The entire length of the hop crosses either shrub or forested wetlands (Map 6-18). This hop crosses MBS Sites of Biodiversity Significance ranked as high significance (Map 6-19).

Hop 5

Hop 5 is located in the southwestern portion of the Beltrami North Central Variation Area (Map 4-7). The length of Hop 5 is approximately 3.5 miles (Map 6-76). The closest residence to this hop is approximate 0.4 miles to the north. Land ownership includes private and state forest; it crosses Lake of the Woods and Beltrami Island state forests (Map 6-18). The Border Trails snowmobile trail crosses this hop once (Map 5-5). The eastern end of the hop crosses an unnamed watercourse (Map 6-76). Hop 5 crosses the existing 500 kV transmission line. The entire length of the hop crosses emergent, shrub, or forested wetlands (Map 6-18). This hop crosses MBS Sites of Biodiversity Significance ranked as high or unknown significance (Map 6-19).

6.6.2 Central Section

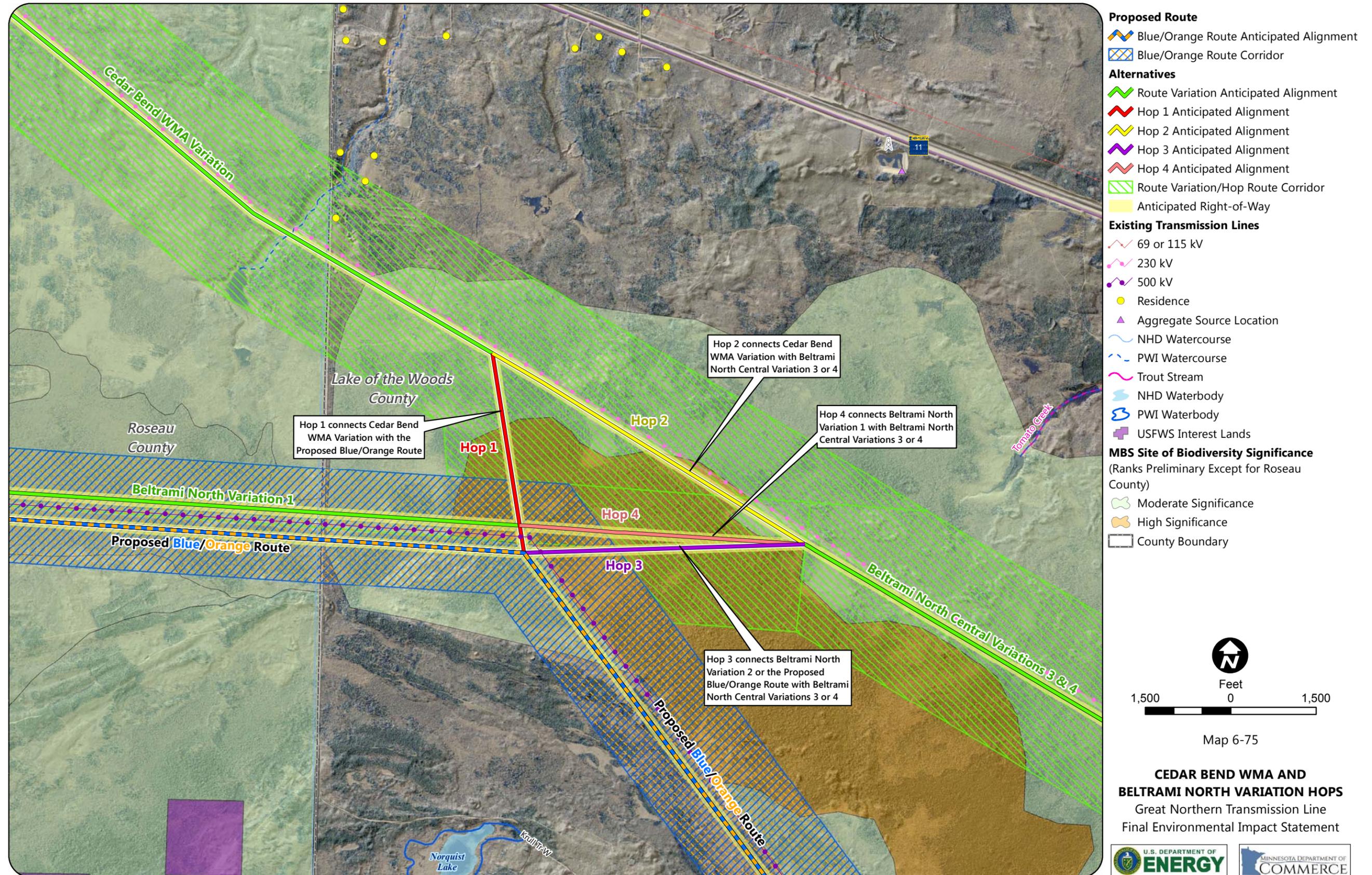
There are no hops identified in the Central Section.

6.6.3 East Section

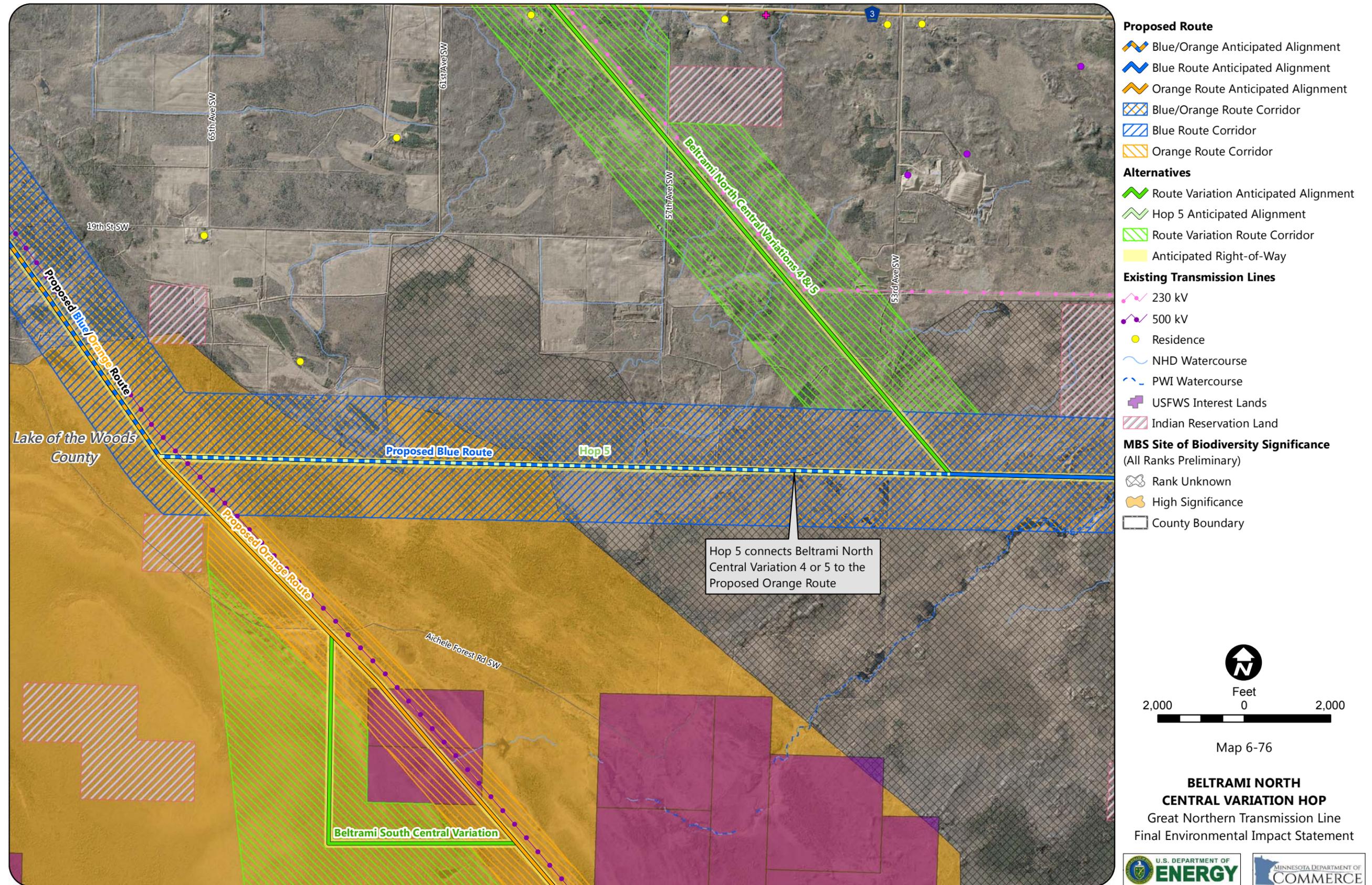
There are no hops identified in the East Section.

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Map 6-75 Cedar Bend WMA and Beltrami North Variation Hops



Map 6-76 Beltrami North Central Variation Hop



6.7 Associated Facilities

The associated facilities for the proposed Project include the 500 kV Series Compensation Station, regeneration stations, and **proposed Iron Range 500 kV Substation**. Information regarding these associated facilities are provided in Chapter 2. Additional details are provided in Appendix E.

6.7.1 West Section

The associated facility located in the West Section are two regeneration stations and the proposed 500 kV Series Compensation Station.

6.7.1.1 Proposed Regeneration Stations

There are two proposed regeneration stations located along the Proposed Blue/Orange Route within the West Section (Map 6-77). The Warroad SCS and Rd 2 regeneration stations are located in the central portion of the Beltrami North Variation Area (Map 4-6) and Beltrami North Central Variation Area (Map 4-7), respectively.

The site for the Warroad SCS regeneration station is located in an upland area adjacent to the Proposed Blue/Orange Route on the east side of CSAH 2 (Map 6-18). There is a residence located approximately 0.6 miles northwest of the site (Map 6-16). Winter Road River is located approximately 0.1 mile north of the site (Map 6-18). Land ownership consists of private lands (Map 6-16).

The site for the Rd 2 regeneration station is located in an upland area adjacent to Route 5 (Map 6-23). There is a residence located approximately 0.13 miles south of the site (Map 6-21). Land ownership is private lands (Map 6-21).

6.7.1.2 Proposed 500 kV Series Compensation Station

The 60-acre site for the proposed 500 kV Series Compensation Station is located in the central portion of the Beltrami North Variation Area (Map 4-6). The nearest residence is located approximately 0.4 miles north of the site (Map 6-78). Land ownership includes private land with MnDNR-identified potential mineral resources (Map 6-16) and scattered NWI-identified emergent wetlands (Map 6-78). Based on U.S. Geological Survey (USGS) GAP land cover data, the southern half of the site is in the USDA Farm Service Agency Conservation Reserve Program.

The 500 kV Series Compensation Station would contain 500 kV series capacitor banks and other large-scale electrical equipment and structures

similar to those comprising most large substations. Depending on its location and surrounding elements in the landscape, the 500 kV Series Compensation Station could contrast strongly with its surroundings. It may be noticeable in foreground or middle ground views from residences or other sensitive visual resources, therefore it has the potential to result in significant aesthetic impacts.

6.7.2 Central Section

The associated facilities located in the Central Section are the four proposed regeneration stations.

6.7.2.1 Proposed Regeneration Stations

There are four proposed regeneration stations located along the Proposed Blue Route and one proposed regeneration station located along the Proposed Orange Route within the Central Section (Map 6-77). The Rd 158 regeneration station is located in the northern portion of the Pine Island Variation Area. The two options for the Hwy 71 regeneration station are located in the southern portion of the C2 Segment Option Variation Area. The third Hwy 71 regeneration station is located in the northern portion of the J2 Segment Option Variation Area.

The site for the Rd 158 regeneration station is located in an upland area adjacent to Route 5 (Map 6-28). There is a residence located approximately 0.1 miles and 0.2 miles to the southeast and northeast of the site, respectively (Map 6-26). Land ownership is private lands (Map 6-26).

The site for the Hwy 71 regeneration station (option 1) is located in an emergent and forested wetland area adjacent to State Highway 71 (Map 6-43). There is a residence located approximately 2.5 north of the site (Map 6-41). Land ownership is state forest lands (Map 6-41). This site is located within a MBS Site of Biodiversity Significance ranked as unknown significance (Map 6-44).

The site for the Hwy 71 regeneration station (option 2) is located in an upland area adjacent to State Highway 71 (Map 6-43). There is a residence located approximately 2 miles north of the site (Map 6-41). An unnamed river is located approximately 0.1 mile northeast of the site (Land ownership is state forest lands (Map 6-43). Land ownership is state forest lands (Map 6-43).

The site for the third Hwy 71 regeneration station is located in an upland area between State Highway 71 to the west and a forest wetland to the east (Map 6-48). There is a residence located

approximately 1.4 miles southwest of the site (Map 6-46). Land ownership is state forest lands (Map 6-46). This site is located within a MBS Site of Biodiversity Significance ranked as unknown significance (Map 6-49). The regeneration stations consist of fairly small buildings that house infrastructure to boost the data signal passing through the optical fiber cable associated with the transmission line. Although the regeneration stations may contrast somewhat with their surroundings, the new transmission line nearby would produce stronger contrast and be more dominant due to its substantially taller height and contrasting form.

6.7.3 East Section

The associated facility located in the East Section is the two proposed regeneration stations and the proposed **Iron Range** 500 kV Substation.

6.7.3.1 Proposed Regeneration Stations

There is one proposed regeneration station located along the Proposed Blue Route and one proposed regeneration station located along the Proposed Orange Route within the East Section (Map 6-77). The Rd 287 and Hwy 1 regeneration stations are located in the southeastern portion of the Effie Variation Area.

The site for the Rd 287 regeneration station is located in an upland area just south of the intersection of CSAH 42 and CR 287 (Map 6-53). There is a residence located approximately 0.4 miles southwest of the site (Map 6-51). The Big Fork River is located approximately 0.5 miles west of the site (Map 6-53). Land ownership is private lands (Map 6-51).

The site for the Hwy 1 regeneration station is located in an upland area near the intersection of State Highway 1 and Township Road 751 (Map 6-53). The closest residence is located approximately 0.2 miles northwest of the site (Map 6-51). Land ownership is county-administered state forest lands (Map 6-51).

6.7.3.2 Proposed Iron Range 500 kV Substation

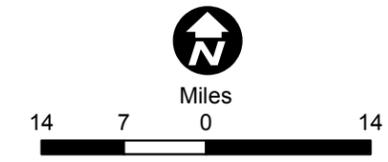
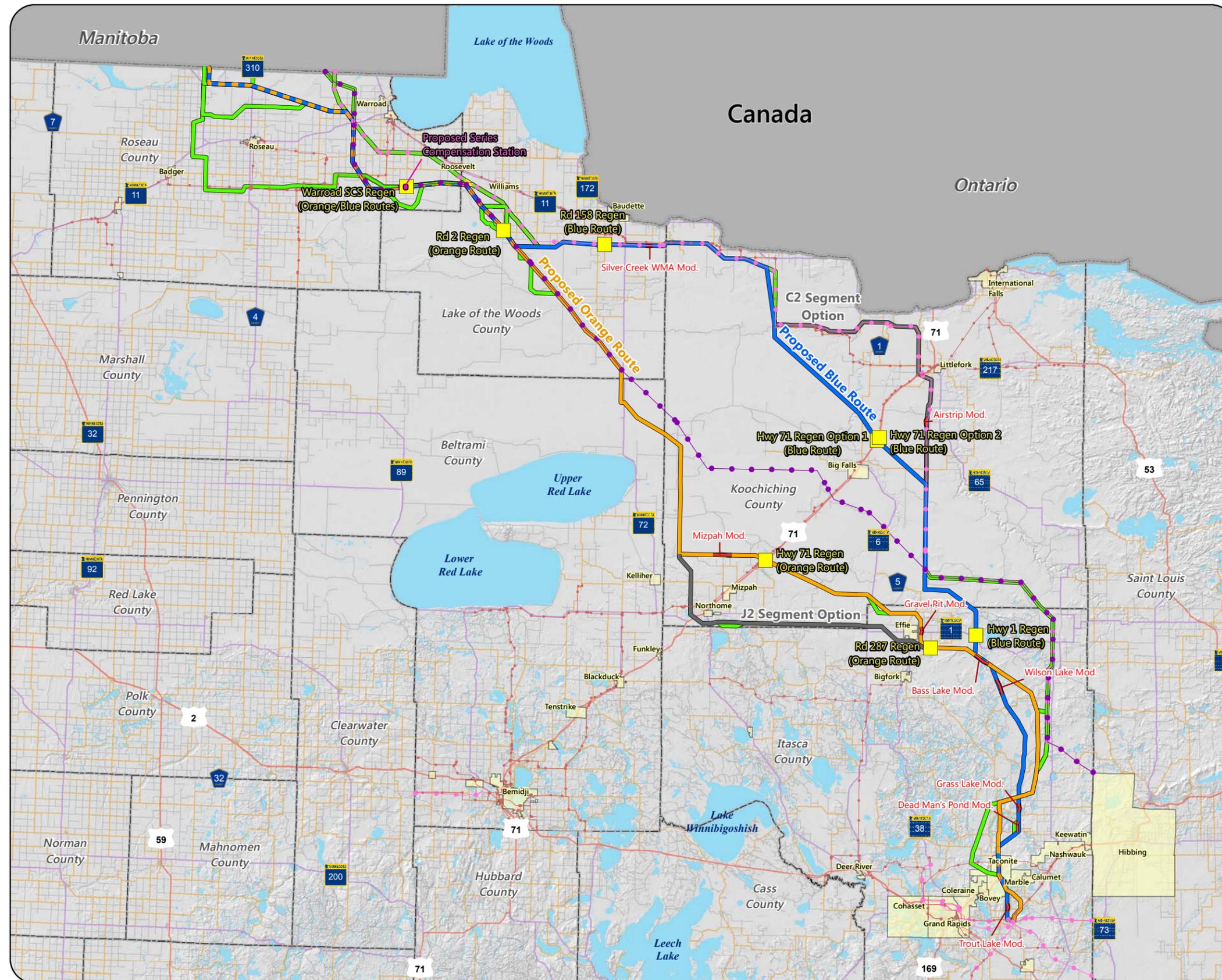
The proposed Iron Range 500 kV Substation would be located at the terminus of the Proposed Blue Route or the Proposed Orange Route adjacent to and approximately 0.25 miles east of the existing Blackberry Substation in the Blackberry Variation Area in the East Section (Map 6-79). There are existing transmission line corridors on the southwest and southeast sides of the **proposed** fenced

substation area. Three residences are located north of the **proposed** fenced substation site: 0.14 miles north from the northwest corner, 0.11 miles northeast of the northeast corner, and 0.24 miles northeast of the northeast corner (Map 6-79). Noise levels for the proposed **Iron Range** 500 kV Substation is discussed in Section 5.2.1.2.

The fenced area of the **proposed** substation is approximately **23** acres (Map 6-79). There are two access roads that connect from CR 434 to the northeast and northwest areas of the **proposed** substation. The access roads cross upland areas and are each 0.5 miles in length. Near CR 434, the access roads are 20 feet wide and lead to a parking lot just outside the fenced area that is approximately 70 feet by 60 feet. The north-central portion of the fenced area of the **proposed** substation directly impacts 0.3 acres of a shallow marsh/forested wetland complex (Map 6-79). Wetlands are identified south of the **proposed** fenced substation site, but would not be impacted by the proposed Project. No other natural resources were identified within or nearby the **proposed** fenced substation area.

The proposed **Iron Range 500 kV** Substation would contain many of the same elements as the existing substation and be similar in appearance and scale to it. Several existing large transmission lines extend through the area in the immediate vicinity of the new substation and enter the existing substation nearby. Because the **proposed Iron Range 500 kV** Substation would be visible in the same views from surrounding locations, the addition of the proposed substation adjacent to the existing substation and transmission lines would result in only an incremental increase in contrast for these views. The incremental increase in contrast would be slightly greater where the proposed substation is located between the existing substation and viewers and slightly less where the proposed substation is located on the opposite side of the existing substation from viewers.

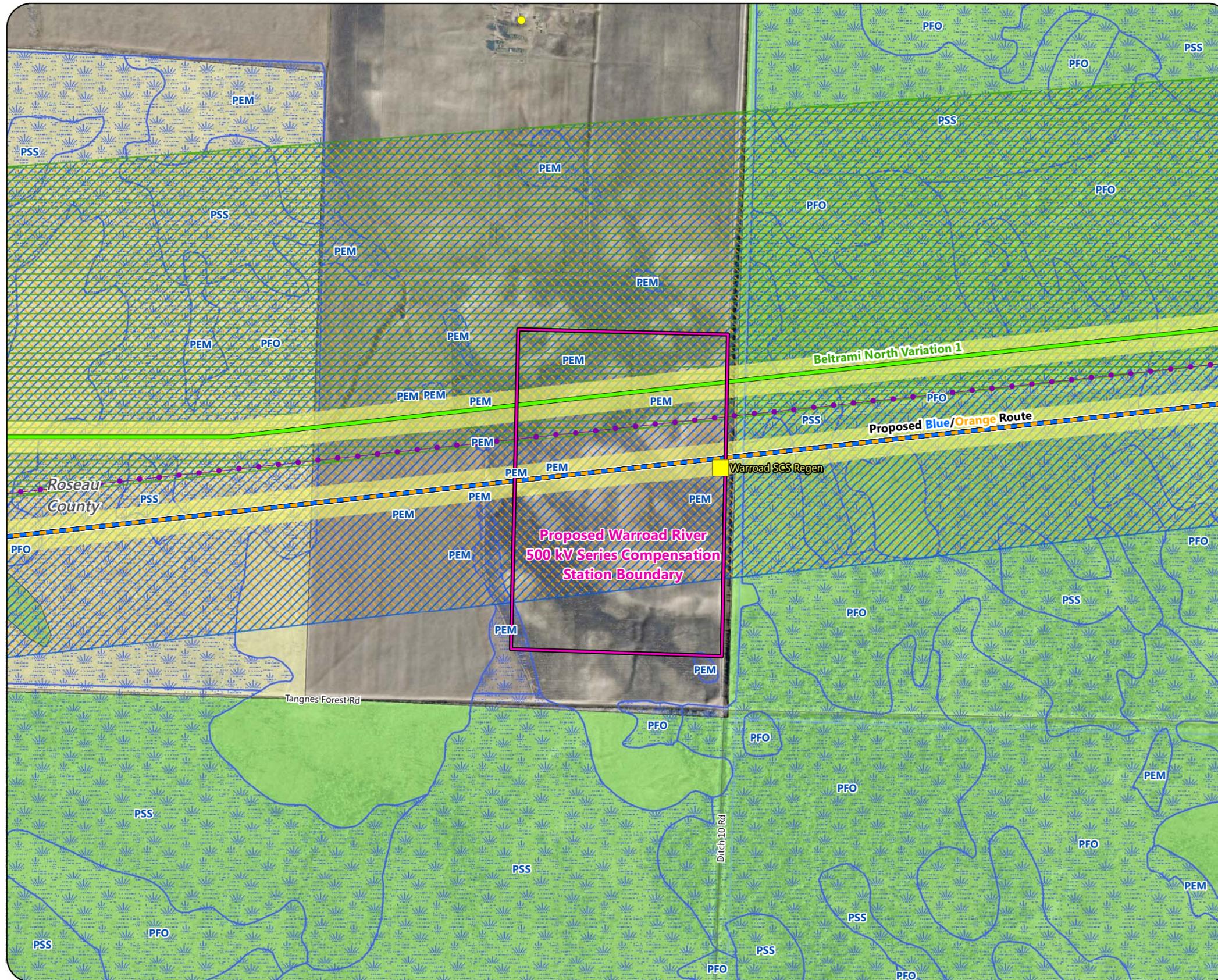
Map 6-77 Proposed Regeneration Site Locations



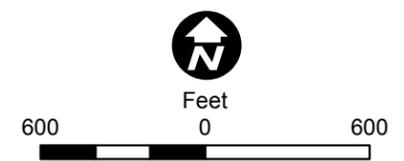
Map 6-77
PROPOSED REGENERATION SITE LOCATIONS
 Great Northern Transmission Line
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Map 6-78 Proposed Site of Series Compensation Facilities



- Proposed Regeneration Site Location
- Proposed Series Compensation Station Boundary
- Proposed Route**
- Blue/Orange Route Anticipated Alignment
- Alternatives**
- Route Variation Anticipated Alignment
- Anticipated Right-of-Way
- Proposed Blue Route
- Proposed Orange Route
- Variation Route
- Existing Transmission Lines**
- 500 kV
- Residence
- NHD Watercourse
- National Wetland Inventory
- MBS Site of Biodiversity Significance**
(Ranks Preliminary Except for Roseau Co.)
- Below
- Moderate Significance
- County Boundary

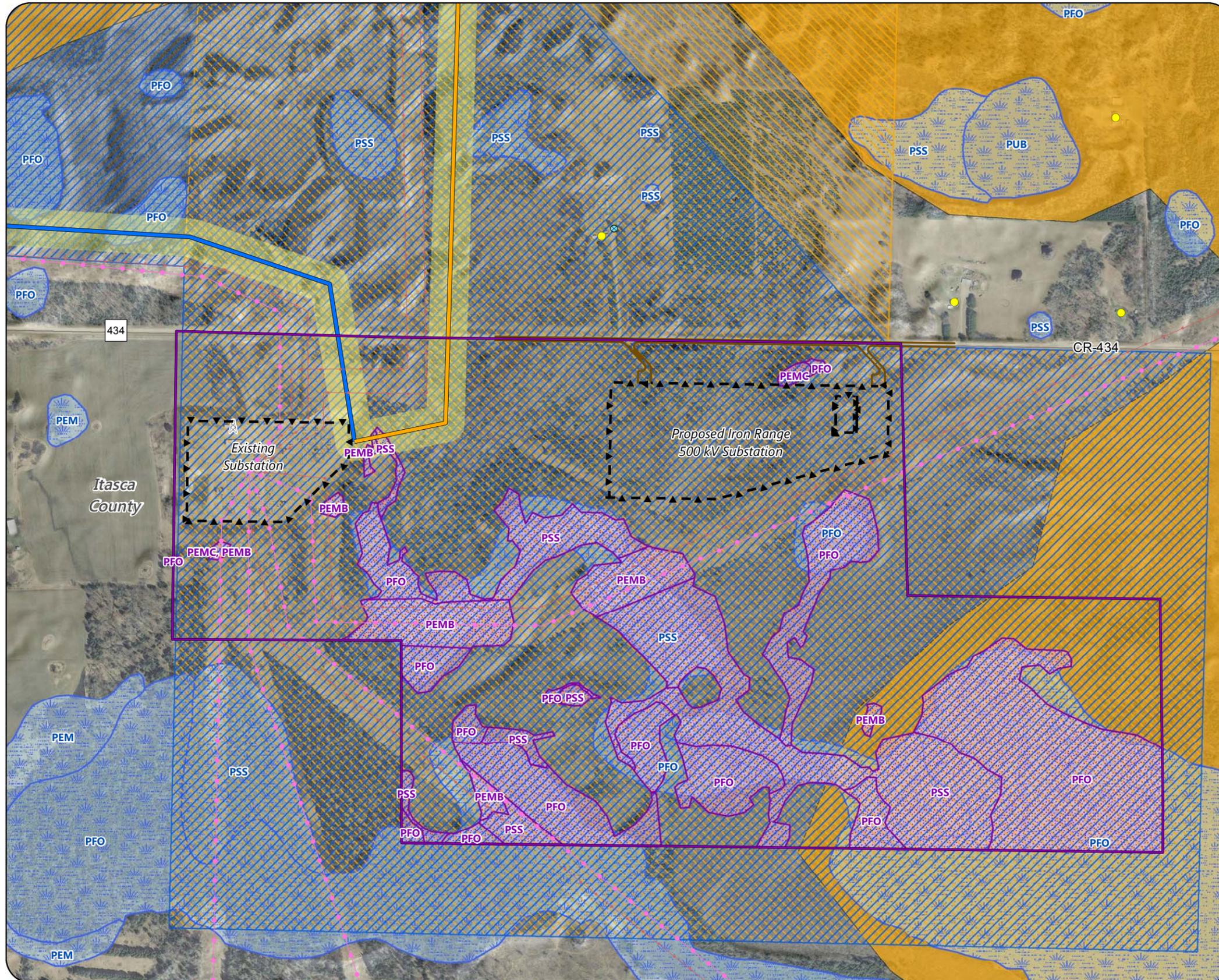


Map 6-78

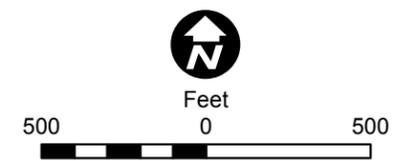
PROPOSED WARROAD RIVER 500 kV SERIES COMPENSATION STATION
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Map 6-79 Proposed Blackberry 500 kV Substation



- Proposed Routes**
- Blue Route Anticipated Alignment
 - Orange Route Anticipated Alignment
 - Anticipated Right-of-Way
 - Proposed Blue Route
 - Proposed Orange Route
- Proposed Iron Range 500 kV Substation Layout**
- Substation Study Area
 - Fence Line
 - Roads
- Existing Transmission Lines**
- 69 or 115 kV
 - 230 kV
 - Residence
 - Delineated Wetland Boundary
 - National Wetland Inventory
- MBS Site of Biodiversity Significance**
(All Ranks Preliminary)
- High Significance
 - County Boundary



Map 6-79

**PROPOSED IRON RANGE
500 kV SUBSTATION**
Great Northern Transmission Line
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