

7.3 Lyon County Substation to Cedar Mountain Substation

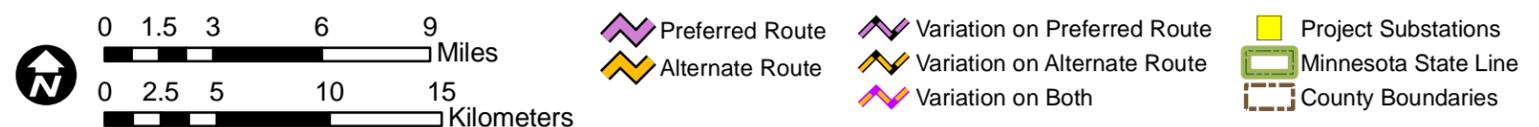
7.3.1 Description of Segment Alternatives

Segment 3 (Lyon County to Cedar Mountain) begins at the Lyon County Substation just east of Marshall and ends at the proposed Cedar Mountain Substation. Within Segment 3 there are seven route alternatives that were suggested during the public comment period. Six of the route alternatives (3P-01 thru 3P-06) are variations on the Preferred Route and one of the route alternatives (3A-01) is a variation on the Alternate Route. There are also four alignment alternatives within Segment 3 that were suggested during the public comment period.

The Preferred and Alternate Routes, all route alternatives and alignment alternatives are described in Section 7.3.1. Section 7.3.4 is an analysis and comparison of impacts by the Preferred and Alternate Routes and all suggested route alternatives.

| Lyon County to Cedar Mountain (Preferred Route) | | | |
|---|---|----------|--|
| Turn by Turn | Distance (miles) | Comments | |
| 1 | From the Lyon County Substation follow 290th St. east to Cnty Rd. 59 | 10.0 | |
| 2 | Turn south following Cnty Rd. 59 | 1.0 | |
| 3 | Turn east following Cnty Hwy 12 | 10.0 | Bisecting Daub's Lake WMA |
| 4 | Turn south following Cnty Rd 65 | 0.5 | |
| 5 | Turn east following field lines | 2.0 | |
| 6 | Continue east following 275th St. | 3.0 | Crosses the northern edge of the Luescher Barnum WMA |
| 7 | Turn south following Knox Ave. | 1.0 | |
| 8 | Turn east following field lines to the Brown County border (340th Ave.) | 15.0 | Crosses U.S. Hwy 71 and MN TH 67 |
| 9 | Turn north | 1.5 | |
| 10 | Turn east following 340th St. | 1.7 | Wider route (1.25 miles) to cross the MN River |
| 11 | Turn north following 327th Ave. | 1.3 | |
| 12 | Turn east | 0.3 | |
| 13 | Turn north following Cnty Hwy 8 | 1.2 | Crosses the MN River in Renville County; Cnty Hwy 8 that crosses the MN River will likely be decommissioned and removed in the future leaving no existing crossing |
| 14 | Continue north on Cnty Hwy 3 into the proposed Cedar Mountain Substation South area | 1.5 | Through Valley and up the bluff. Route narrows back to 1000 ft. Continues into the proposed Cedar Mountain Substation South area |

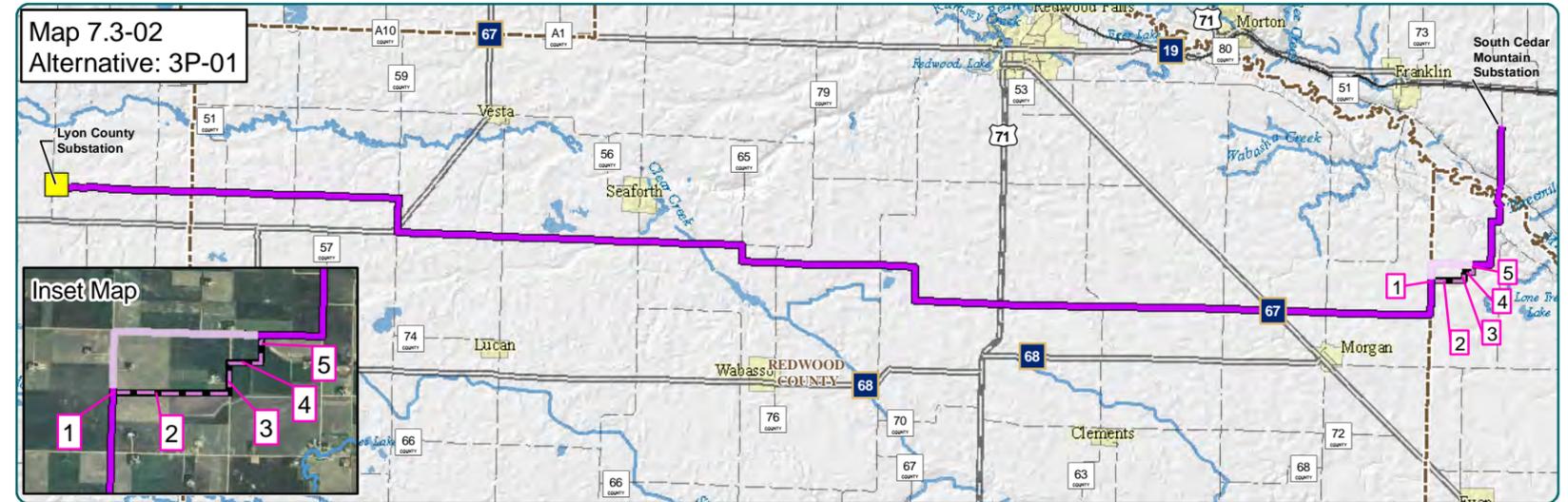
| Lyon County to Cedar Mountain (Alternate Route) | | | |
|---|--|----------|--|
| Turn by Turn | Distance (miles) | Comments | |
| 1 | From the Lyon County Substation follow 290th St. east | 1.0 | |
| 2 | Turn south following 320th Ave. | 2.5 | |
| 3 | Turn east following field line to TH 68 | 5.0 | |
| 4 | Turn north following TH 68 | 6.4 | |
| 5 | Turn east following TR 13 | 4.0 | |
| 6 | Turn north following Cnty Rd 59 | 1.0 | |
| 7 | Turn east following Cnty Hwy 46 | 2.5 | |
| 8 | Continue east on TH 19 to Cnty Hwy 7 | 4.5 | |
| 9 | Turn north following Cnty Hwy 7 | 1.5 | |
| 10 | Turn east following field lines | 9.4 | |
| 11 | Turn north | 0.5 | |
| 12 | Turn east following Cnty Hwy 25 | 0.5 | |
| 13 | Continue east on Cnty Hwy 25 following an existing 115 kV line | 1.3 | |
| 14 | Follow the existing 115 kV line and County Hwy 101 northeast across the MN River | 1.0 | |
| 15 | Turn east cross-country to existing 115 kV line | 0.3 | Crosses Cnty Hwy 15 |
| 16 | Turn southeast following the existing 115 kV line | 0.2 | |
| 17 | Turn east | 1.6 | |
| 18 | Continue east following 690th Ave. | 0.5 | |
| 19 | Turn north following 320th St. | 0.5 | |
| 20 | Turn east following field lines | 7.0 | Continue into the proposed Cedar Mountain Substation |



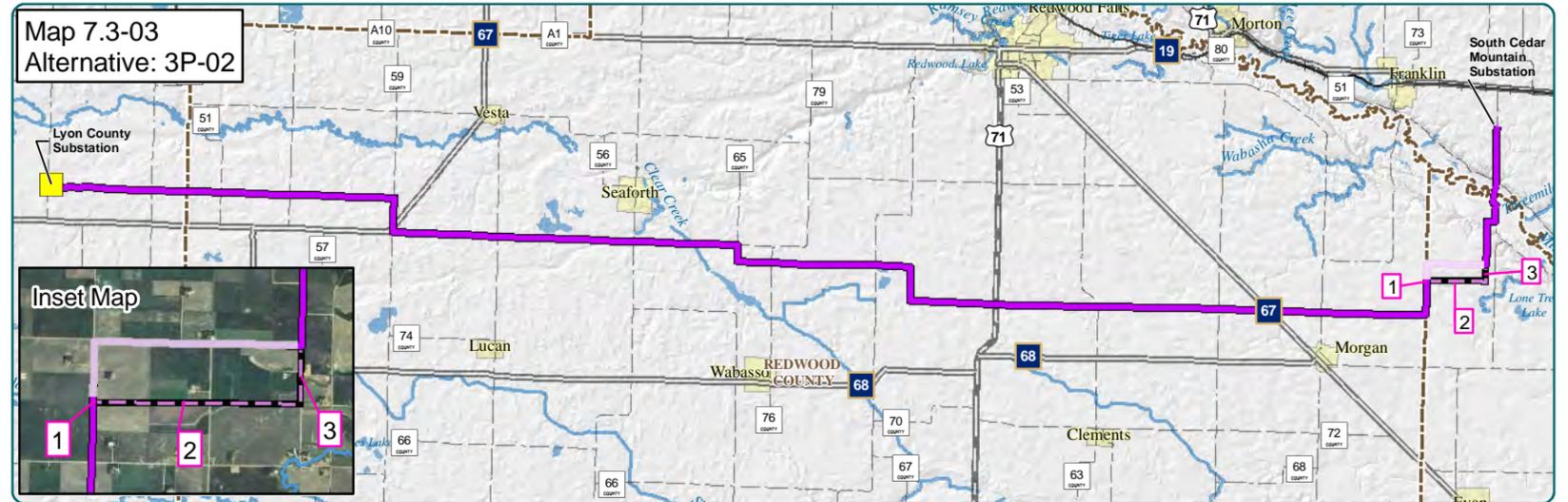
Section 7.3
Lyon County Substation to Cedar Mountain Substation Segment

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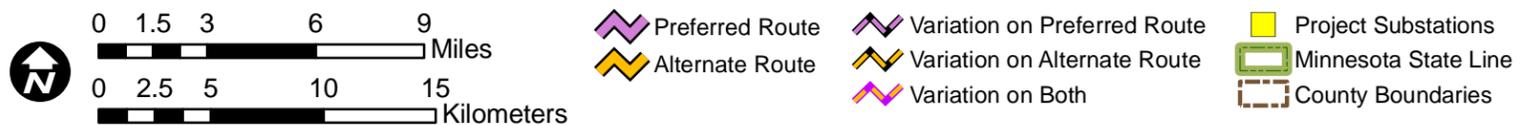
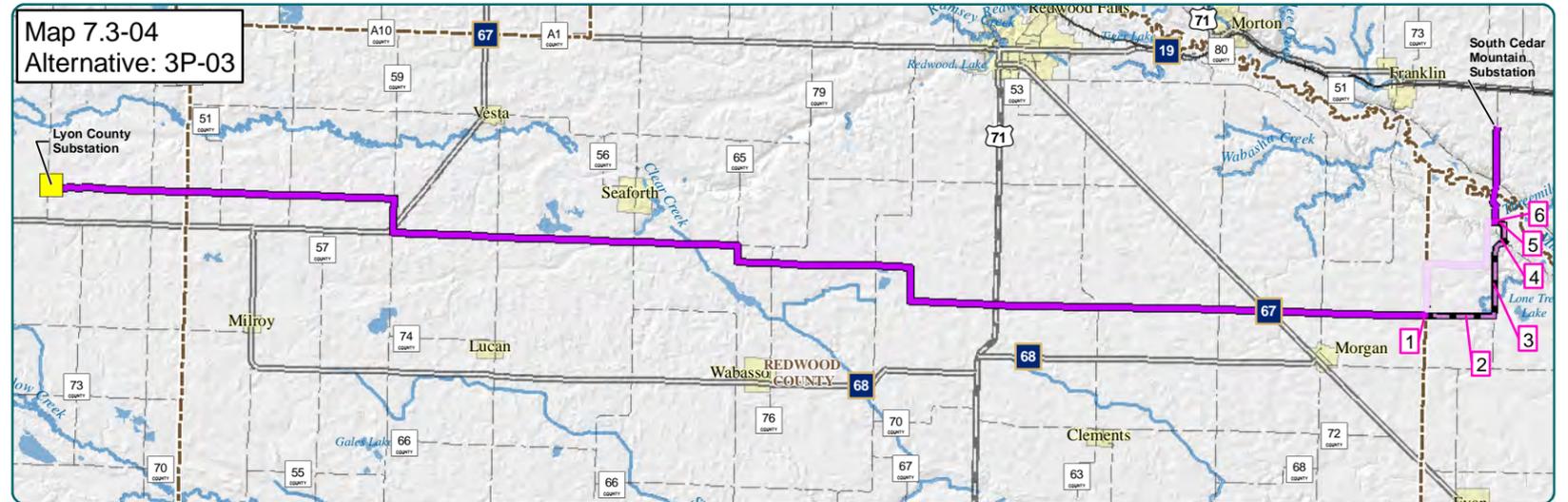
| Lyon County to Cedar Mountain (3P-01) | | |
|--|------------------|----------------------------|
| Turn by Turn | Distance (miles) | Comments |
| 1 Follow the preferred route until 1/2 mile north of 330th St. | | |
| 2 Turn east following field lines | 1.0 | |
| 3 Turn north following 330th Ave. | 0.25 | |
| 4 Turn east following field lines | 0.25 | |
| 5 Turn north following field lines | 0.25 | Returns to preferred route |



| Lyon County to Cedar Mountain (3P-02) | | |
|--|------------------|----------------------------|
| Turn by Turn | Distance (miles) | Comments |
| 1 Follow the preferred route until 1/2 mile north of 330th St. | | |
| 2 Turn east following field lines | 1.7 | |
| 3 Turn north following 327th Ave. | 0.5 | Returns to preferred route |

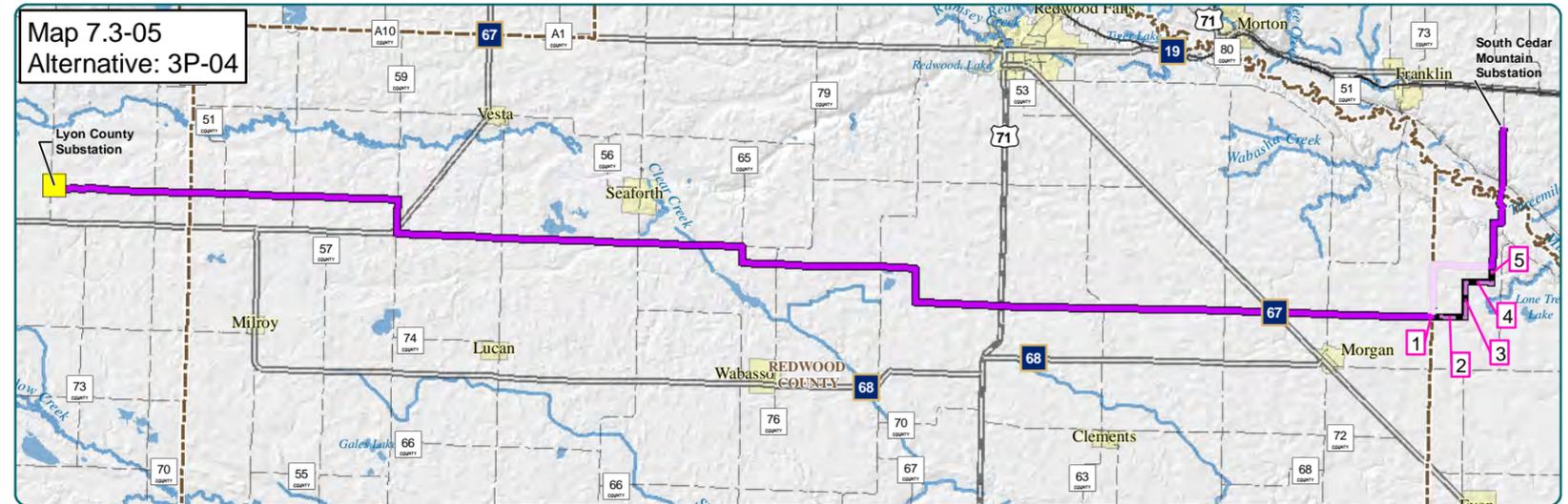


| Lyon County to Cedar Mountain (3P-03) | | |
|--|------------------|----------------------------|
| Turn by Turn | Distance (miles) | Comments |
| 1 Follow the preferred route until 340th Ave. | | |
| 2 Continue east cross-country to Cnty Hwy 8 | | |
| 3 Turn north following Cnty Hwy 8 to Cnty Hwy 10 | 2.3 | Crosses Cnty Hwy 10 |
| 4 Continue north following field line | 0.5 | |
| 5 Turn west following field line to Cnty Hwy 8 | 0.25 | |
| 6 Turn north following Cnty Hwy 8 | 0.05 | Returns to preferred route |

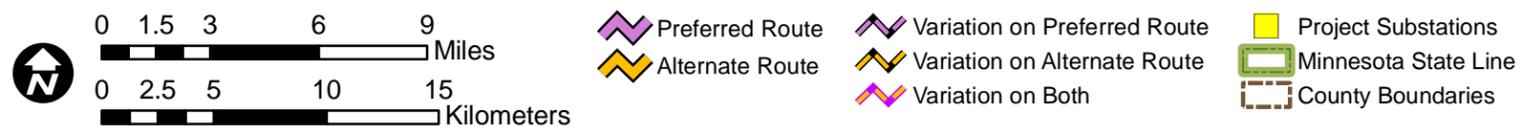
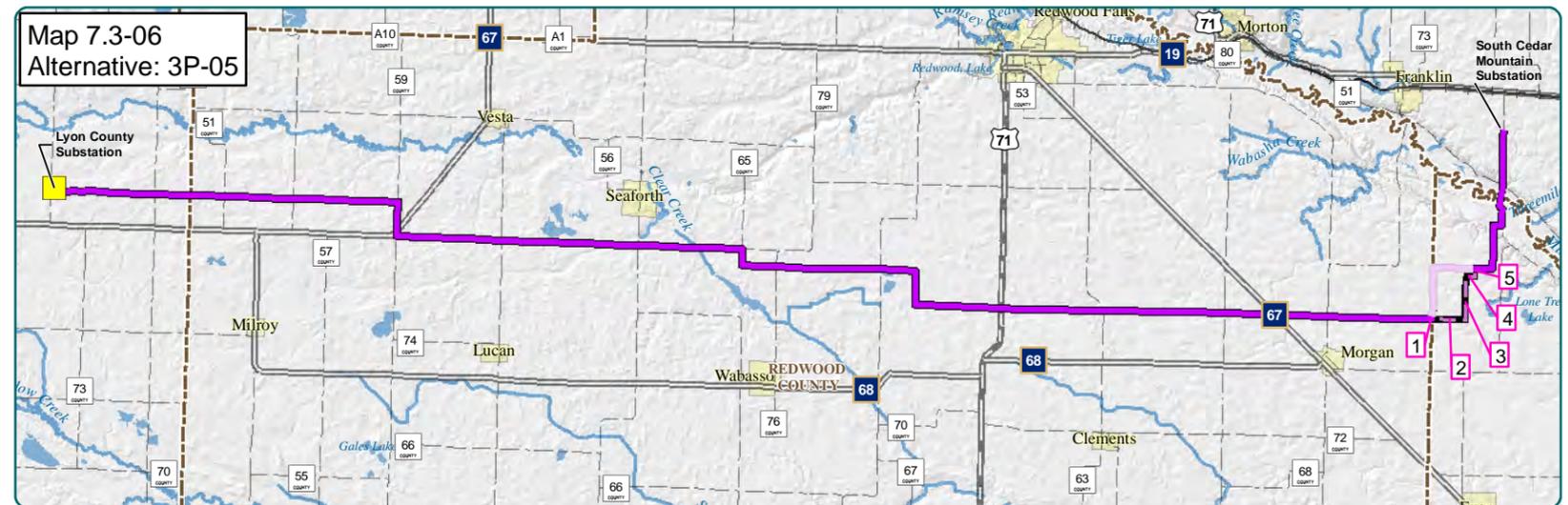


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| Lyon County to Cedar Mountain (3P-04) | | |
|--|------------------|----------------------------|
| Turn by Turn | Distance (miles) | Comments |
| 1 Follow the preferred route until 340th Ave. | | |
| 2 Continue east cross-country to 330th Ave. | 1.0 | |
| 3 Turn north following 330th Ave. | 1.0 | |
| 4 Turn east following field line to 327th Ave. | 0.8 | |
| 5 Turn north following 327th Ave. | 0.5 | Returns to preferred route |



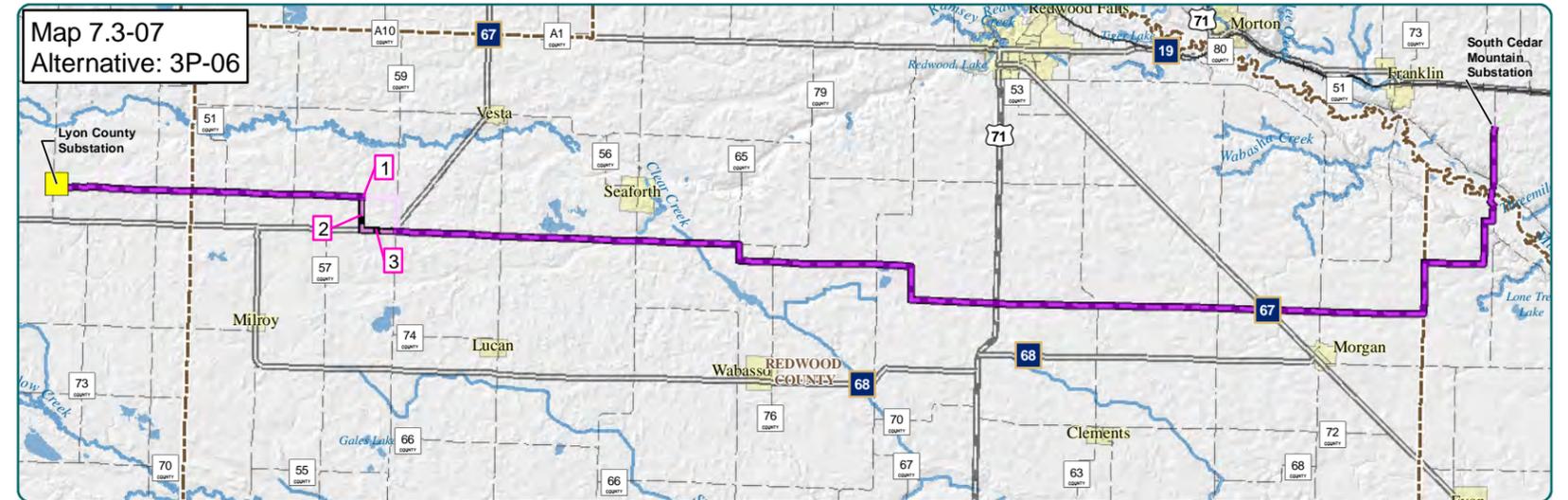
| Lyon County to Cedar Mountain (3P-05) | | |
|---|------------------|----------------------------|
| Turn by Turn | Distance (miles) | Comments |
| 1 Follow the preferred route until 340th Ave. | | |
| 2 Continue east cross-country to 330th Ave. | 1.0 | |
| 3 Turn north following 330th Ave. | 1.25 | |
| 4 Turn east following field line | 0.25 | |
| 5 Turn north following field line | 0.25 | Returns to preferred route |



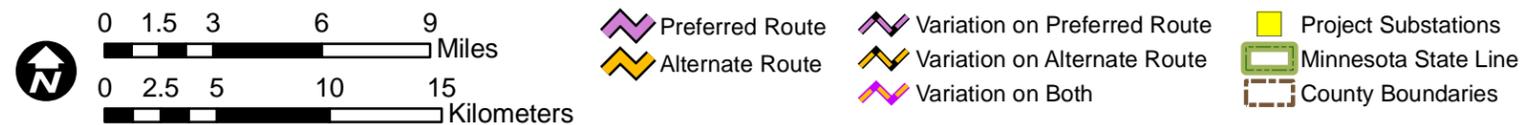
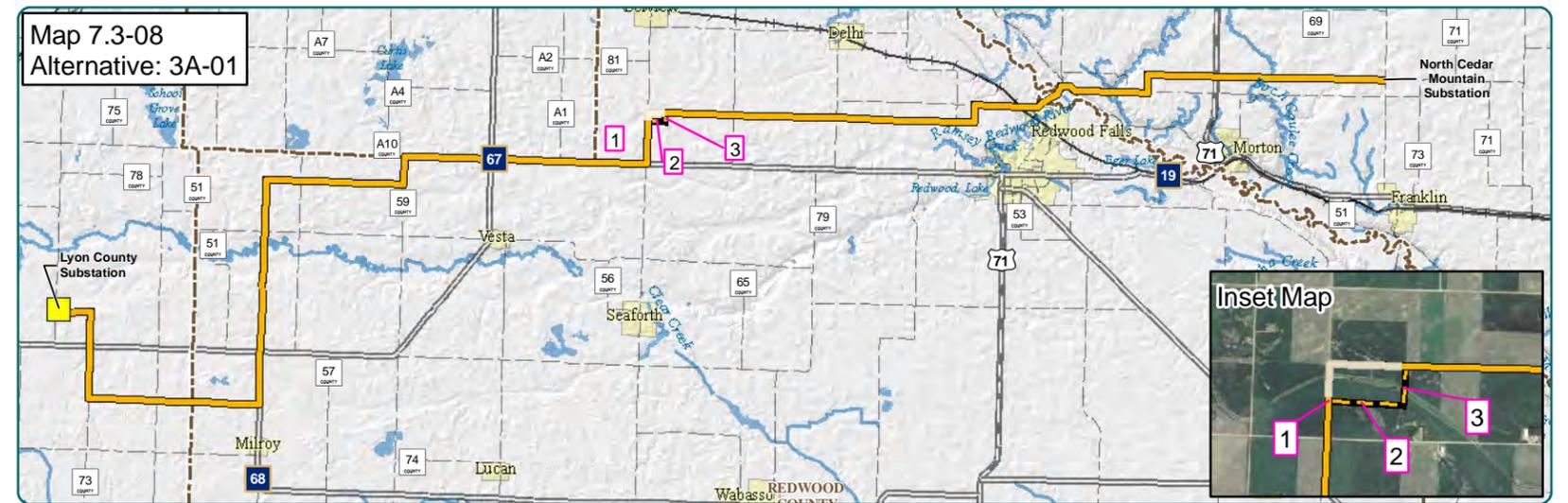
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Lyon County Substation to Cedar Mountain Substation Segment

| Lyon County to Cedar Mountain (3P-06) | | |
|---------------------------------------|---|----------|
| Turn by Turn | Distance (miles) | Comments |
| 1 | Follow the preferred route until Crown Ave. | |
| 2 | Turn south following field line to TH 19 | 1.0 |
| 3 | Turn east following TH 19 | 1.0 |



| Lyon County to Cedar Mountain (3A-01) | | |
|---------------------------------------|--|----------|
| Turn by Turn | Distance (miles) | Comments |
| 1 | Follow the alternate route until 1/4 mile north of 350th St. | |
| 2 | Turn east following field lines | 0.5 |
| 3 | Turn north following field lines | 0.25 |

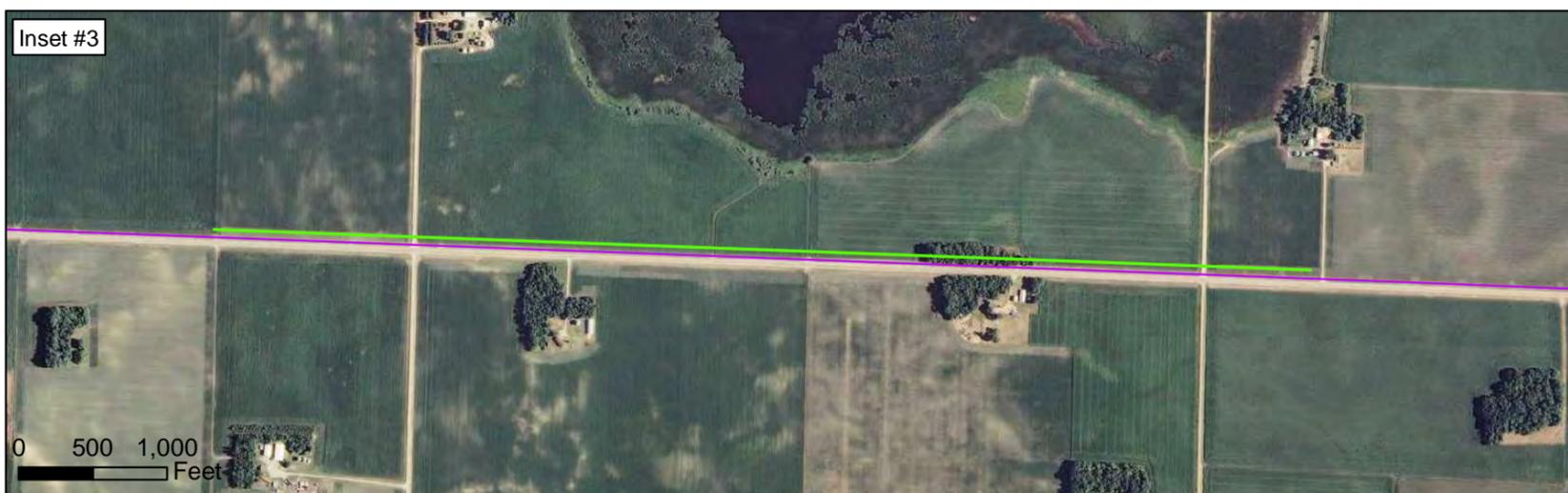
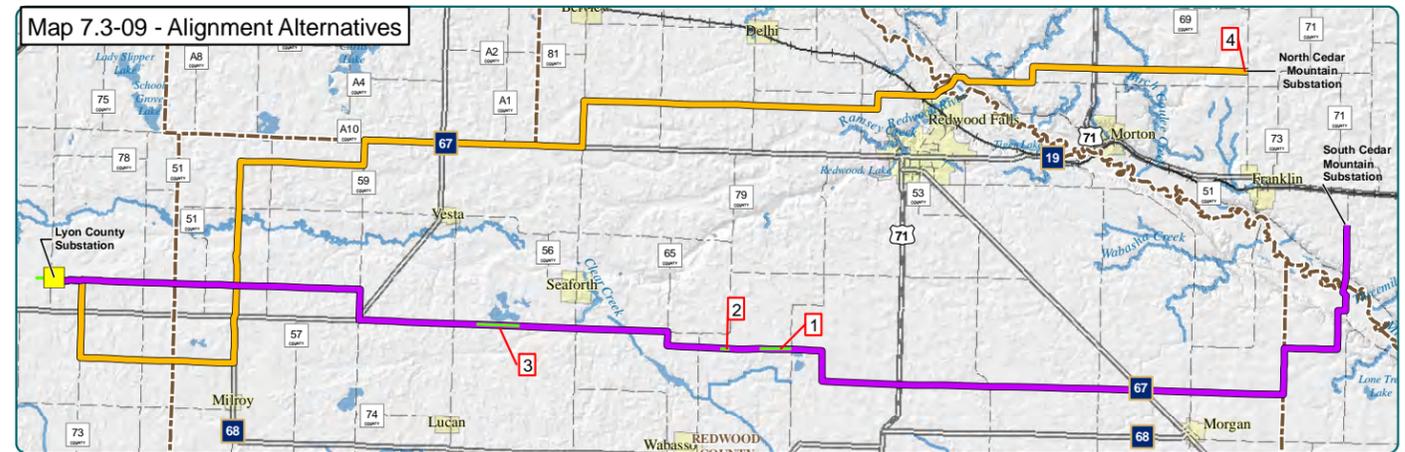


7.3.1.1 Alignment Alternatives

Segment 3 has four alignment alternatives that were suggested during the public comment period.

- 1) Route: Preferred (Inset #1)
Description: Run the line on the north side of 275th St.
Purpose: To keep the line on the opposite side of the road of a house
- 2) Route: Preferred (Inset #2)
Description: Use structures that would allow spanning the field west of 275th St. so that poles would not have to be placed in the field

- 3) Route: Preferred (Inset #3)
Description: Run the line on the north side of County Rd 12 as it passes their farmstead. (already the side of the proposed alignment)
Purpose: To keep the line on the opposite side of the road of the farmstead
- 4) Route: Alternate (Inset #4)
Description: Keep pole out of field. Place on field line.
Purpose: To keep poles out of field to allow farming.



7.3.2 Environmental Setting—Lyon County Substation to Cedar Mountain Substation

This segment of the route extends from the existing Lyon County Substation to the proposed Cedar Mountain Substation South area. This section is located in Lyon, Redwood, Renville, and Brown counties and, depending on the route alternative, includes a major Upper Minnesota River crossing and two Redwood River crossings. According to the ECS, the route lies within the Minnesota River Prairie Subsection of the Prairie Parkland Province. The Minnesota River Prairie landscape is dominated by large till plains on either side of the Minnesota River, and is characterized by gently rolling terrain, except where it is split by the broad Minnesota River Valley. The elevation changes from 800 feet to 1,130 feet AMSL, with the highest elevation in the west and the lowest at the Granite Falls crossing at the Minnesota River. The elevation typically increases out from the river crossings.

Presettlement vegetation consisted primarily of tallgrass prairie with small islands of wet prairie. Forested areas grew within the floodplains of the Minnesota River. The primary present-day use of the land along this segment of the route is agriculture; few remnants of native vegetation are present (DNR 2008). Many of the wetlands have been drained and most of the smaller watercourses have been channelized

to increase the acreage of land available for agricultural production. The Minnesota River Prairie Subsection has been called the heart of the Minnesota Cornbelt (Wright 1972).

The majority of this segment of the route crosses cropland used to grow corn and soybeans. With the exception of Redwood Falls, most of the communities within or near this section are small farm-based towns, including Vesta, Delhi, Morton, Seaforth, and Franklin. Redwood Falls is a level three regional trade center that is defined as a complete shopping center (Casey 1999).

7.3.3 Socioeconomic Setting—Lyon County Substation to Cedar Mountain Substation

This segment is located in a sparsely-populated, rural portion of Minnesota. The Preferred Route crosses parts of Lyon, Redwood, Brown, and Renville Counties. The Alternate Route crosses parts of Lyon, Redwood, and Renville Counties. The primary industries for Lyon, Redwood, Brown, and Renville Counties include educational, health and social services, agriculture, manufacturing, and retail trade. Table 7.3.3-1 shows the differences in population, minority population percentage, and median age across the counties spanned by this segment of the Project.

Table 7.3.3-1. Socioeconomic stats in Lyon, Redwood, Brown, and Renville Counties

| County | 2008 Population | Total Minority Population | Minority Population Percentage | Median Age |
|----------|-----------------|---------------------------|--------------------------------|------------|
| Lyon | 24,844 | 2,385 | 9.6 | 36 |
| Redwood | 15,493 | 1,441 | 9.3 | 42 |
| Brown | 25,862 | 1,138 | 4.4 | 41 |
| Renville | 15,861 | 1,332 | 8.4 | 41 |

Source: U.S. Census Bureau

7.3.4 Analysis of Segment Alternatives for Lyon County Substation to Cedar Mountain Substation

The analysis of segment alternatives includes the following:

- Human settlement
- Public health and safety
- Air quality
- Interference
- Property values
- Archaeological and historic resources
- Land use compatibility
- Land based economics
- Transportation and public services
- Recreation
- Water resources
- Flora and fauna
- Rare and unique natural resources/critical habitat

See Section 6 for a general overview of the potential impacts to the resources listed above and a summary of the mitigation measures that would be utilized to minimize impacts to these resources. General overview maps are present throughout Section 7; however, more detailed maps are provided in Appendix A.

7.3.4.1 Human Settlement—Analysis of Segment Alternatives for the Lyon County Substation to Cedar Mountain Substation

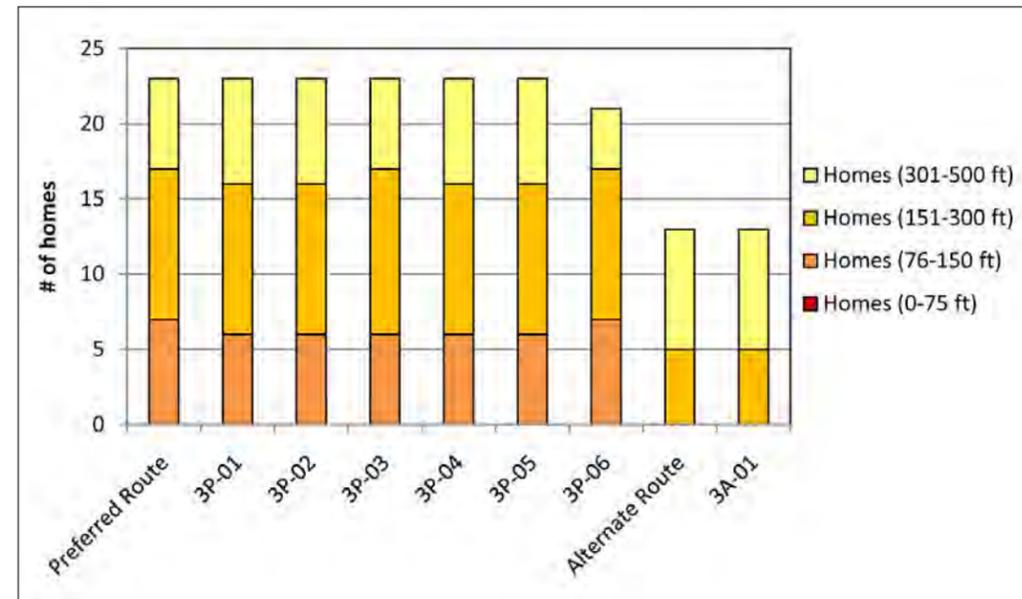
Impacts to human settlement have been assessed by looking at a variety of factors including noise, aesthetics, proximity to structures, displacement, tree groves and windbreaks, existing utilities, and domestic water well installation and maintenance. Section 6.1 provides detailed discussion of each of these potential impact areas.

The extent to which particular route alternatives may impact these features is primarily linked to the proximity of the proposed route alternatives to human settlement areas. Aesthetic impacts to humans, for example, are expected to be greatest where the line is located nearest to human settlement features such as homes, businesses, schools, daycares, hospitals, churches, and cemeteries. If the transmission line is in close proximity to human settlement areas, other features of these areas could also be impacted. For example, tree groves and wind breaks are frequently established to protect homes and other structures. Therefore, the potential for impacts to tree groves and wind breaks may be closely correlated with the proximity of the line to homes.

Displacement impacts are also dependent upon the proximity of the transmission line to homes. For electrical safety code and maintenance reasons, utilities would not generally allow residences or other buildings within the actual ROW easement for an HVTL.

Because of the close correlation between the extent to which particular route alternatives may impact human settlement and the proximity of the proposed route alternatives to homes and

Figure 7.3.4.1-1. Proximity of homes along each proposed route alternative



Source: Field survey observations, comments from Project public meetings and aerial photograph interpretation by HDR, 12/29/08, updated by Barr 7/21/09

In some areas the current proposed alignment (right side) would avoid impacts to homes and tree groves. A change of alignment in these areas should be avoided.



Source: Barr photograph, 2009

other human settlement features like schools, churches, cemeteries, nursing homes and hospitals, this impact summary focuses on the proximity of the proposed route alternatives to these features. For each alternative, pinch points, or narrow areas where human settlement impacts would be difficult to avoid, have also been identified.

A narrow area where mature tree groves exist on both sides of the road is shown along proposed route alternative 3P-03.



Source: Barr photograph, 2009

Proximity to homes for each of the proposed alternatives for the route segment from Lyon County Substation to the Cedar Mountain Substation (shown in Map 7.3-10 and Appendix A) is summarized in Figure 7.3.4.1-1.

Figure 7.3.4.1-1 compares the number of homes within 75 feet, 150 feet, 300 feet, and 500 feet of

the centerline of each route alternative in this segment.

The number of homes within 500 feet of the proposed route centerline is fairly consistent across the Preferred Route and associated route alternatives, with the number of homes within 500 feet of the centerline ranging from 21 to 23. Both the Alternate Route and proposed route alternative 3A-01 have 13 houses within 500 feet of the route centerline. Additionally, the nearest homes along these two route alternatives are greater than 150 feet away from the route centerline. There are no homes within 75 feet of the proposed centerline for any of the proposed route alternatives.

There are several narrow areas, particularly in the eastern portion of this segment where careful consideration is needed. The first narrow area is located just north of Milroy along the Preferred Route and all proposed variations on the Preferred Route. The proposed route alignment is along the south side of the road, but it should be noted that there is a home located very near to the road along the north side. Any change in alignment in this area would result in greater impacts to this home and the associated trees and other structures.

Further west, there are several narrow areas along the Preferred Route and proposed variations on the Preferred Route. Just southwest of the Minnesota River Crossing, near the proposed South Cedar Mountain Substation, the Preferred Route and proposed route alternative 3P-06 run along the south side of the road. In this area, it should be noted that there is a home and a shed located very near to the road along the south side. Slightly north of this area, there is another

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narrow spot where mature groves of trees are present on both sides of the road along proposed route alternative 3P-03. This route alternative would require the removal of mature tree groves regardless of the alignment chosen. A third narrow area occurs just north of the Minnesota River Crossing near the proposed South Cedar Mountain Substation where a house and a grove of mature oak trees are located very close to the west side of the road. This is another area where the current proposed alignment is not an issue, but it should be noted that a change in alignment could result in greater impacts to this home and associated tree groves.

Proximity to other human settlement features is not a prominent concern along this route segment. Across the entire segment, no schools, churches and cemeteries, nursing homes or hospitals are located within 500 feet of any proposed route centerline.

Mitigation

General mitigation measures to minimize impacts to human settlement are discussed in Section 6.1. Within this route segment, impacts to human settlement can be managed through choosing a route that minimizes the proximity of the line to homes as well as minimizing the total number of homes located within the Project route width. In this route segment the Alternate Route has the fewest homes within the 1,000-foot route width.

In the narrow areas just north of Milroy, impacts to the home could be minimized by keeping the line on the south side of the road. Mitigation of purely visual impacts would require undergrounding of the line or routing the line around or behind this home. In the narrow areas further west along the Preferred Route and route

alternative 3P-06 and in the narrow area just north of the Minnesota River Crossing near the proposed South Cedar Mountain Substation, impacts to homes could also be minimized by keeping the line on the opposite side of the road. Mitigation of purely visual impacts would require undergrounding of the line or routing the line around or behind this home. Tree grove impacts associated with route alternative 3P-03 could only be minimized by choosing a different route.

7.3.4.2 Public Health and Safety—Analysis of Segment Alternatives for the Lyon County Substation to Cedar Mountain Substation

Public health and safety impacts associated with this Project are not anticipated. Any perceived risk of health impacts from electric and magnetic fields is likely to be correlated with the proximity of human dwellings to the proposed line. Information on the proximity of homes to each proposed route alternative within this route segment is provided in Sections 6.2 and 7.3.4.1.

7.3.4.3 Air Quality—Analysis of Segment Alternatives for the Lyon County Substation to Cedar Mountain Substation

Detailed discussion of potential air quality impacts are provided in Section 6.3. Potential air quality impacts are primarily associated with the production of small amounts of ozone and oxides of nitrogen in the air surrounding transmission line conductors and the potential release of small amounts of SF₆ during operation and maintenance of certain electrical substation equipment. These features do not vary notably between the proposed route alternatives in this segment. Thus, the nature of impacts to air quality are not expected to vary notably from one route alternative to the next. The operation of the

proposed transmission line would not create any potential for the concentration of these pollutants to exceed existing air quality standards.

7.3.4.4 Interference—Analysis of Segment Alternatives for the Lyon County Substation to Cedar Mountain Substation

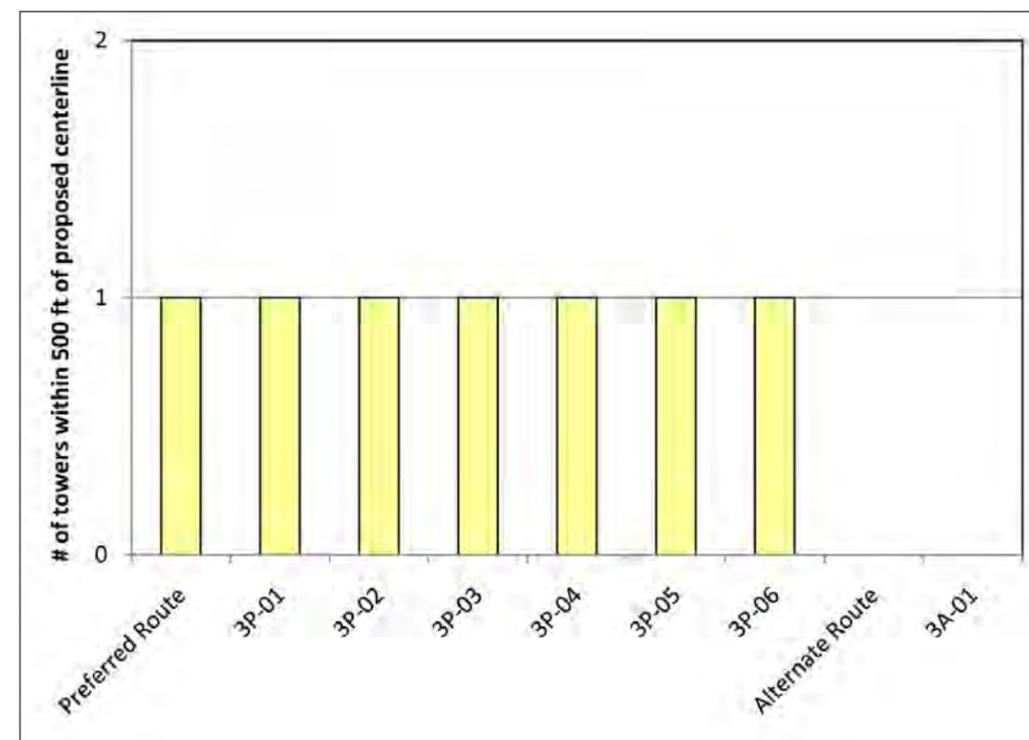
The nature of impacts related to interference, are not likely to vary notably between route segments or route alternatives. Impacts are expected to be greatest very close to the line for AM radio reception and very minor for all other types of reception. The placement of structures may also result in interference. Structure placement would be coordinated so as not interfere with microwave communication corridors.

Figure 7.3.4.4-1 shows the number of communication towers within 500 feet of the

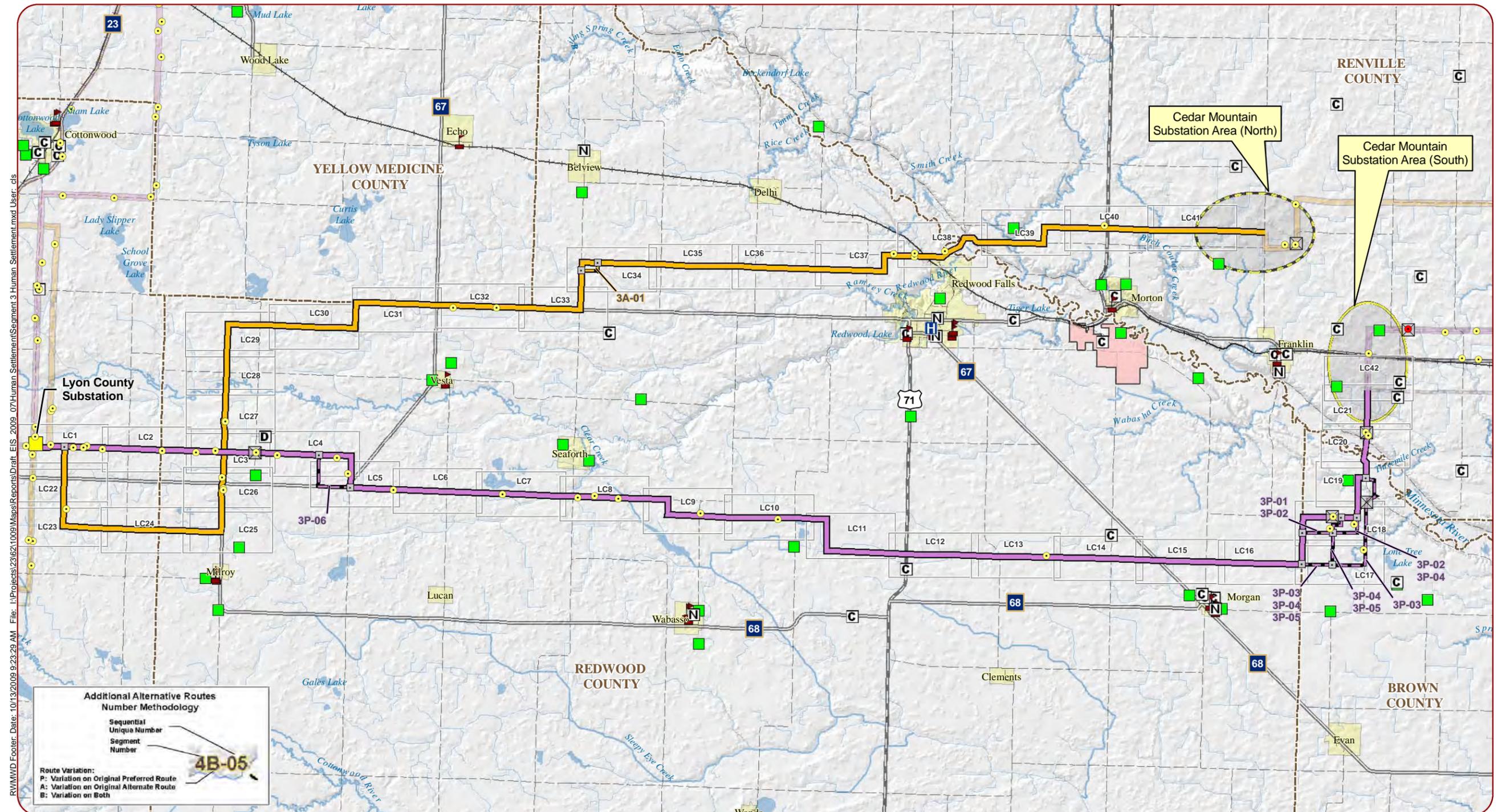
proposed centerline for each route alternative in the Lyon County Substation to Cedar Mountain Substation segment.

Section 6.4 provides an overview of potential impacts from interference and outlines general steps that would be taken to mitigate impacts from interference.

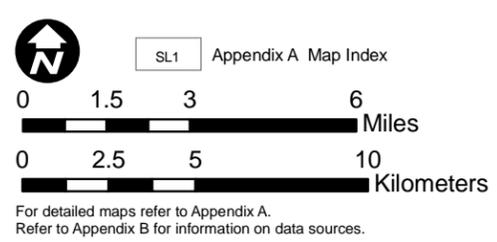
Figure 7.3.4.4-1. Number of towers within 500 feet of proposed centerline for each proposed route alternative



Source: Federal Communications Commission. Data added by HDR based on public comments 12/29/08, updated by Barr September 2009

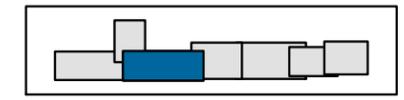


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|-------------------------------|--|--------------------|
| Original Alignments | Project Substations | Hospitals |
| Preferred Route | Proposed Substation Areas | Nursing Homes |
| Alternate Route | Preferred | Observed Day Cares |
| Additional Alternative Routes | Alternate | Schools |
| Variation on Preferred Route | County Boundaries | Churches |
| Variation on Alternate Route | Residences within 75 Feet of Alternatives | Cemeteries |
| Variation on Both | Residences within 500 Feet of Alternatives | Tribal Land |
| | Narrows | |

Map 7.3-10
Human Settlement Map
Segment 3, Lyon County Substation to
Cedar Mountain Substation Area



Source: Refer to Appendix B for information on data sources

Section 7.3
Lyon County Substation to Cedar Mountain Substation Segment

7.3.4.5 Property Values—Analysis of Segment Alternatives for the Lyon County Substation to Cedar Mountain Substation

Impacts to property values are a concern of many residents near existing or proposed transmission lines. Research assessing the relationship between property value and proximity to transmission lines suggests that the presence of a transmission line is one of several factors that interact to affect the value of a particular property. Since property value is influenced by many other factors that may vary widely from one property to the next and that may vary over time and across different regions, the results of current research is limited. Current studies have been unable to provide detailed quantitative assessments of how transmission lines may impact property values at the scale necessary to provide insight in comparing property value impacts across proposed route alternatives within this section or across this Project.

7.3.4.6 Historical and Archaeological Resources—Analysis of Segment Alternatives for the Lyon County Substation to Cedar Mountain Substation

Within the Lyon County to Minnesota Valley Substation segment, available SHPO records have been used to identify known archaeological resources, historical structures and historic landscapes within one-half mile on either side of the proposed centerline for each route alternative. In order to protect information about the specific location of certain resources that may be vulnerable to unauthorized removal of artifacts or other unauthorized disturbances, SHPO records only provide a township, range and section for certain resources. If any part of one of these identified areas is within one-half mile of a proposed route centerline, it has been assumed

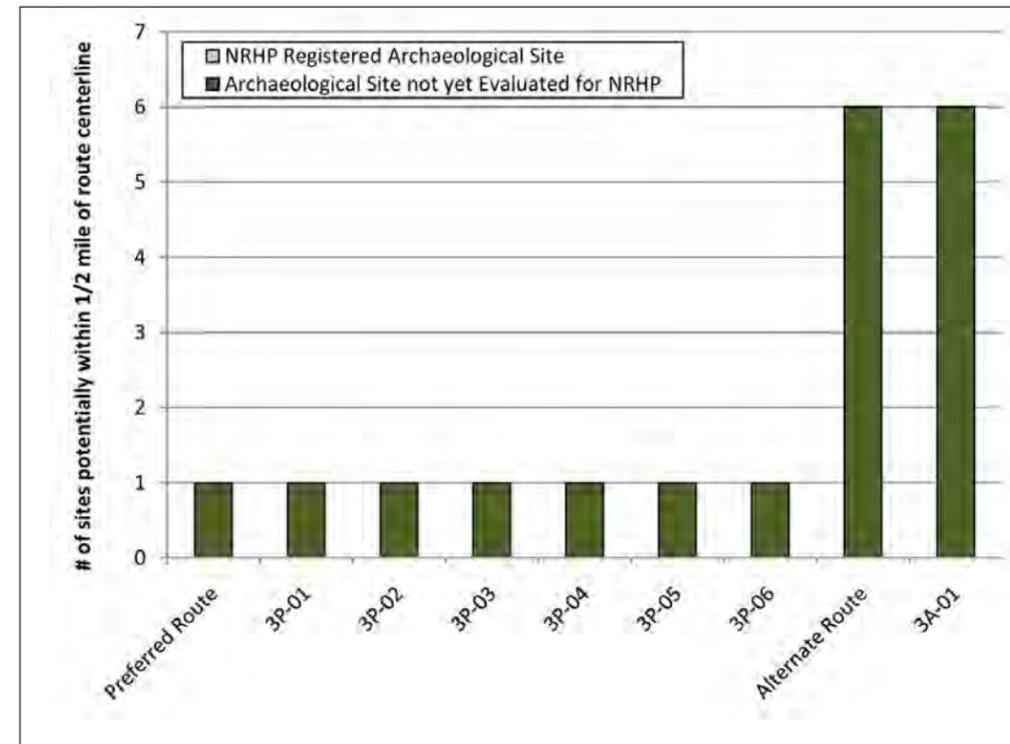
that the resource is potentially within the relevant area. Due to the uncertainty about the exact location of certain SHPO identified resources, total impacts have been characterized in terms of the total number of sites potentially within one-half mile of the route centerline.

Within the SHPO records, particular consideration is given to historical and archaeological resources listed on the National Park Service’s NRHP as these locations have been identified as critical national resources and are protected by the *National Historic Preservation Act of 1966*.

Potential historical and archaeological resource impacts for each of the proposed alternatives for the route segment from Lyon County Substation to the Cedar Mountain Substation (shown in Map 7.3-01 and Appendix A) are summarized in Figures 7.3.4.6-1 to 7.3.4.6-2.

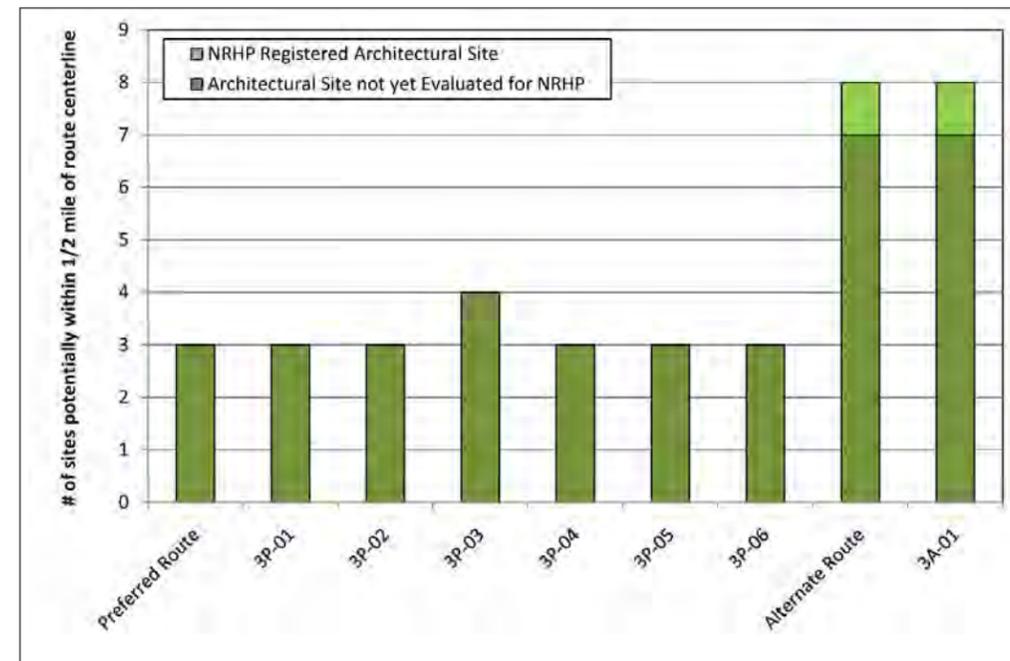
Figure 7.3.4.6-1 compares the number of archaeological sites within one-half mile on either side of the proposed centerline for each route alternative in this segment. No NRHP registered archaeological sites are located within one-half mile of the centerline of any route alternative in this segment. None of the archaeological sites potentially located within one-half mile of the centerline of the route have been evaluated for eligibility for listing on the NRHP and thus, these sites have not been evaluated for significance. The majority of the proposed route alternatives have only one archaeological site within one-half mile of the centerline. The Alternate Route and proposed route alternative 3A-01 each have six archaeological sites within one-half mile of the centerline.

Figure 7.3.4.6-1. Number of archaeological sites along proposed route alternatives



Source: SHPO

Figure 7.3.4.6-2. Number of historical architectural sites along proposed route alternatives



Source: SHPO

Figure 7.3.4.6-2 compares the number of historical architectural sites within one-half mile on either side of the proposed centerline for each route alternative in this segment.

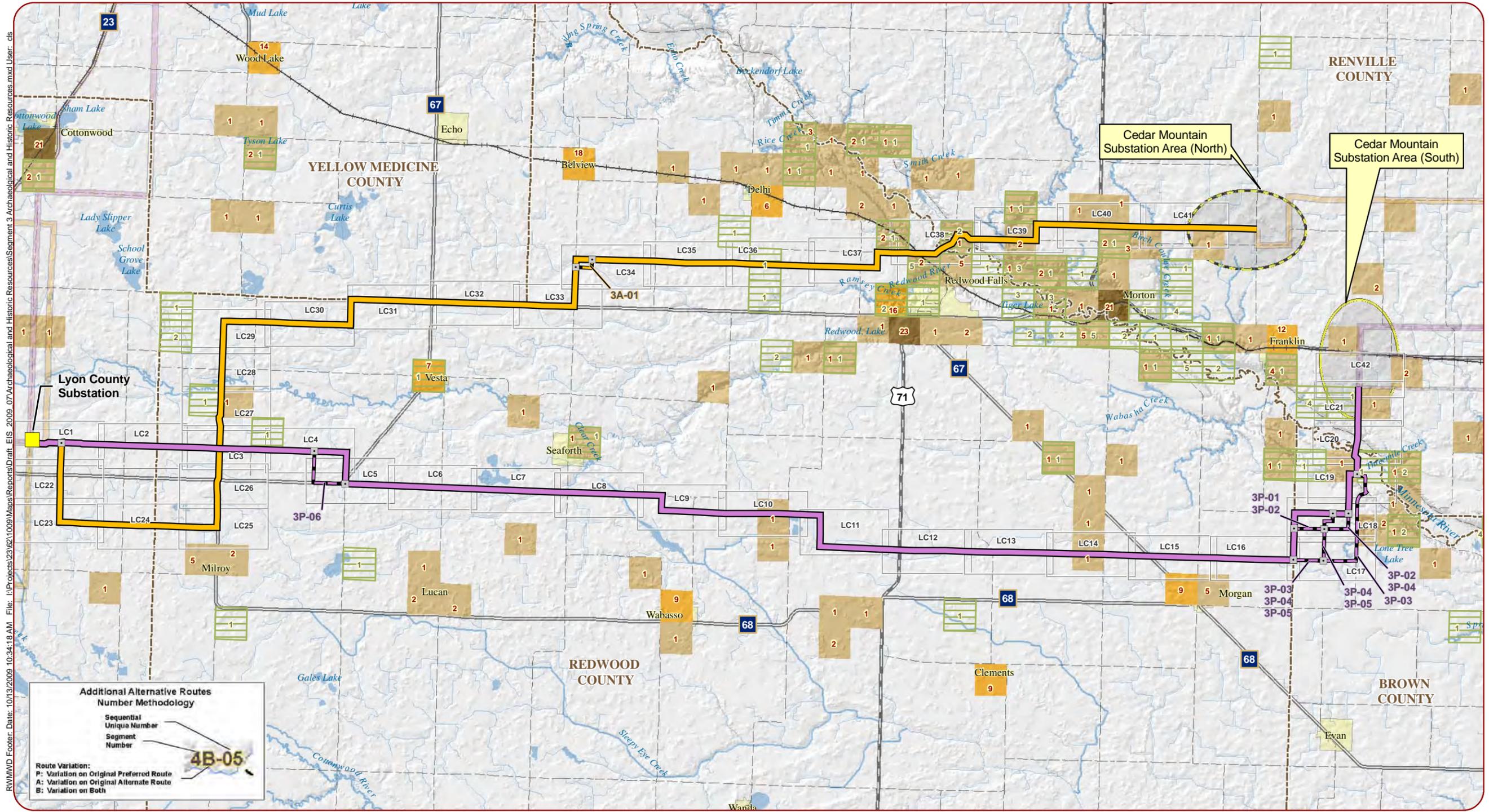
One NRHP registered historical architectural site is located within one-half mile of the Alternate Route centerline and the proposed route alternative 3A-01 centerline in this segment. The Honnor-Hosken House (site RW-NRC-003), an NRHP registered site and a landmark in the city of Redwood Falls, is located within one-half mile of both route centerlines. These two proposed route alternatives also have the highest number of total sites within one-half mile of their centerlines. Aside from the Martin Honnor-Hosken House, all other architectural sites potentially located within the one-half mile of the route have not been evaluated for eligibility for listing on the NRHP and thus, have not been evaluated for significance.

Mitigation

Project planning and engineering efforts would strive to avoid any sites within the proposed route width for each alternative. Preferred Route and associated route alternatives have the fewest archaeological sites potentially within one-half mile of the route centerline. Preferred Route and associated route alternatives (except for 3P-03) also have the fewest historical architectural sites potentially within one-half mile of the route centerline. At this time it is not clear which route would have the fewest actual impacts on archaeological or historical resources or what the magnitude of the impacts since a complete assessment of all sites for NRHP status has not been completed. Specific mitigation plans cannot be made until a complete assessment of these sites has been made. For any resources within the

route width, once the Project ROW is accessible, the applicants, as indicated in the RPA, would sponsor an archaeological investigation to locate these sites and provide a report to the OES and SHPO on the existing conditions, site management recommendations, and efforts, if known, to avoid, minimize, or treat impacts related to construction and maintenance of the Project. Planning specific mitigation measures Mitigation would entail compensating for the losses of properties that are eligible for listing on the NRHP. The applicants have also indicated that they may invite other parties (particularly Native American tribes and other state and federal permitting or land management agencies) to assist in the development of the avoidance, minimization, or treatment measures. Section 6.6 provides an overview of potential impacts to archaeological and historical resources and outlines general steps that would be taken to mitigate impacts to these resources. Specific mitigation plans cannot be made until the steps described above have been completed.

Section 7.3
Lyon County Substation to Cedar Mountain Substation Segment



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Additional Alternative Routes Number Methodology

Sequential Unique Number
Segment Number

Route Variation:
 P: Variation on Original Preferred Route
 A: Variation on Original Alternate Route
 B: Variation on Both

SL1 Appendix A Map Index

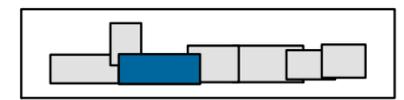
0 1.5 3 6 Miles

0 2.5 5 10 Kilometers

For detailed maps refer to Appendix A.
Refer to Appendix B for information on data sources.

| | | |
|-------------------------------|---------------------------|----------------------|
| Original Alignments | Project Substations | Archaeological Sites |
| Preferred Route | Proposed Substation Areas | 1 - 5 |
| Alternate Route | Preferred | 6 - 10 |
| Additional Alternative Routes | Alternate | 11 - 15 |
| Variation on Preferred Route | County Boundaries | Historical Sites |
| Variation on Alternate Route | | 1 - 5 |
| Variation on Both | | 6 - 20 |
| | | >20 |

Map 7.3-11
Archaeological & Historic Resources Map
Segment 3, Lyon County Substation to
Cedar Mountain Substation Area



Source: Refer to Appendix B for information on data sources

7.3.4.7 Land Use Compatibility—Analysis of Segment Alternatives for the Lyon County Substation to Cedar Mountain Substation

Impacts to current land use can be caused by activities associated with transmission line development. These impacts may range from temporary construction impacts to permanent impacts introduced where structure, substation, and line placement disturb current land uses or future land use plans. Current land use and zoning and available plans for future development have been evaluated in order to assess the compatibility of the proposed route alternatives with these land uses.

Current land cover types along the 150 foot right of way (ROW) for each route alternative in this route segment have been reviewed and are summarized in Figure 7.3.4.7-1.

The proposed routes in this segment are located on or adjacent to agricultural land in crop, pasture or grassland use. The Preferred Route runs through the Daub’s Lake WMA and runs adjacent to the Luescher-Barnum WMA in Redwood County. The Alternate Route passes through a small portion of the City of Redwood Falls Protection Zone (Urban Expansion District) north of the existing city limits. Commercial and industrial land uses are principally located in urban centers or near major transportation facilities. Redwood County has zoned much of the county’s unincorporated land under the agricultural or rural residential districts. In the small part of Brown County affected by the Project, the routes cross land zoned under the Agricultural/Shoreland zoning districts.

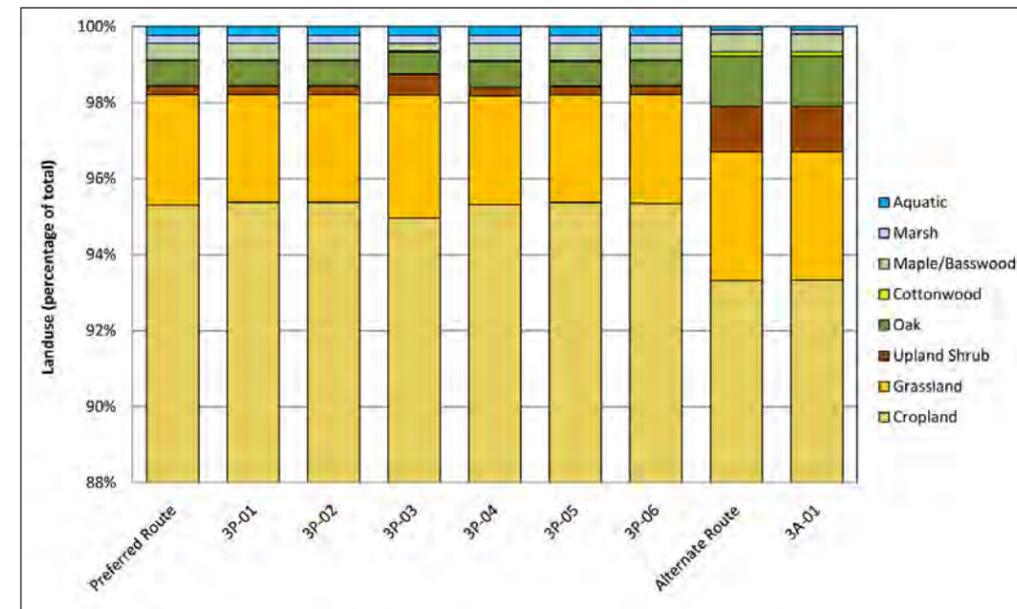
Transmission lines may affect agricultural land use in this segment by the amount of land removed from productive use by the footprint of each tower. Tower placement may also affect the operation of irrigation equipment if present as well as crop spraying operations. Stray voltage and cattle may be a compatibility concern.

Single pole towers would be the primary tower type used for the Project and they use relatively little land compared to other tower types. Transmission towers and lines also change the visual quality of views within the agricultural landscape, however, due to the relatively low population densities and small numbers of travelers along most route alternatives, this potential impact does not affect many people. Impacts during tower construction may include the potential for destruction of crops within the grading/ construction zoning and the compacting of soils by construction equipment and activities.

The major impact on residential areas, the Urban Expansion district in Redwood Falls, may include changes to viewsheds for some properties and minor potential noise impacts during construction for properties in close proximity to the transmission line. Individual property values may be negatively affected depending on proximity to, and views of, the transmission line.

Impact on property values varies depending on a range of other factors including current market conditions, proximity and access to open space, commercial services and community services such as schools. Land used for pole structures may change or reduce the current and future functionality of the property depending on its size as well as its current and future use. The height of vegetation allowed within the

Figure 7.3.4.7-1. Land cover types along each route alternative



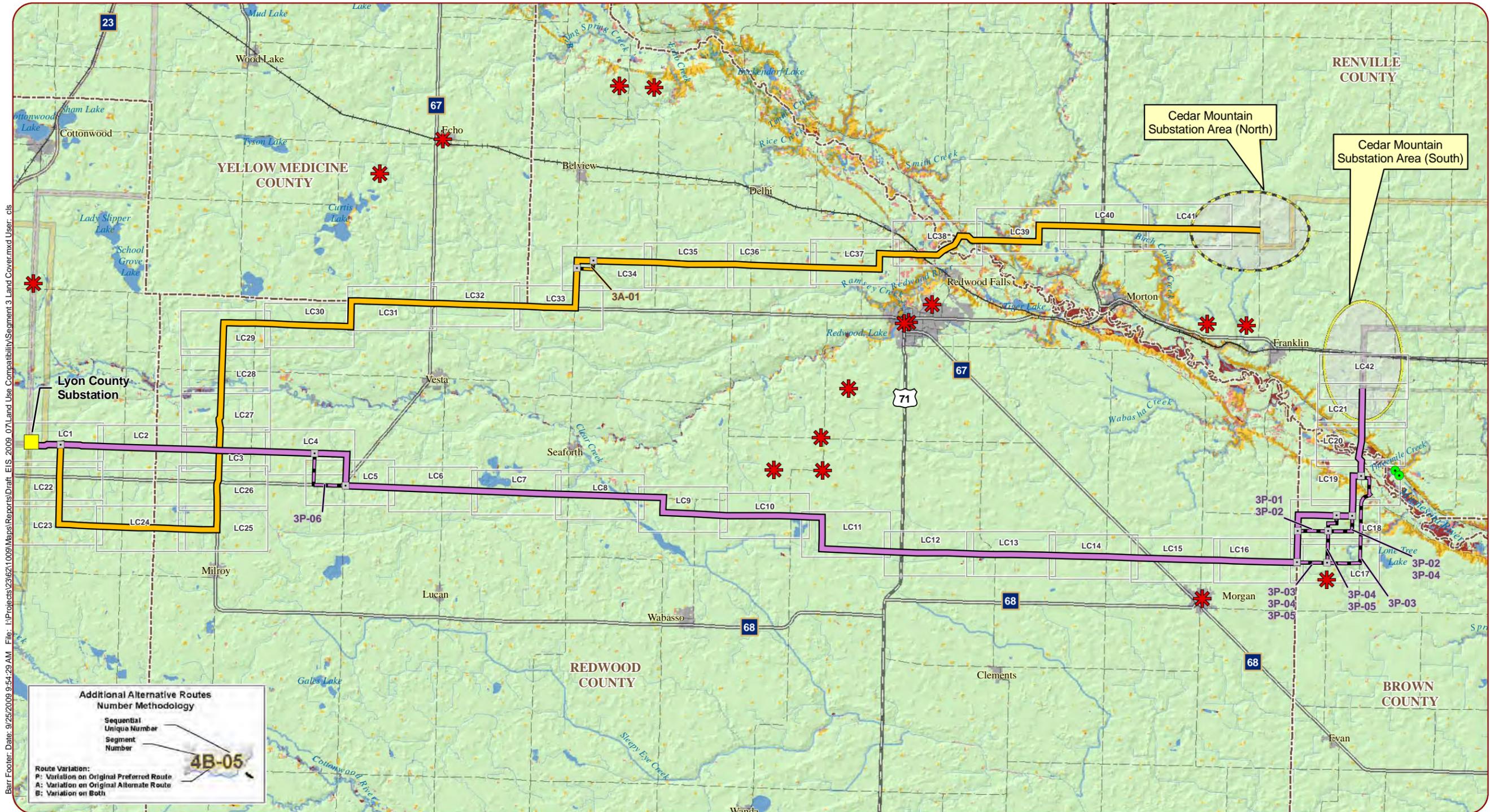
Source: DNR, Department of Forestry 06/06/2002

transmission line easement is generally limited to 25 feet which may conflict with the property owner’s desire for landscaping. Maintenance activities within the easement may pose temporary and periodic conflicts with use and enjoyment of the property

Mitigation

General measures to minimize impacts to Land Use Compatibility are discussed in Section 6.7. Within this route segment impacts to land use compatibility would be addressed primarily through BMPs to reduce impacts to agricultural areas during construction, operation and maintenance.

Section 7.3
Lyon County Substation to Cedar Mountain Substation Segment



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Additional Alternative Routes Number Methodology

Sequential Unique Number
Segment Number

4B-05

Route Variation:
 P: Variation on Original Preferred Route
 A: Variation on Original Alternate Route
 B: Variation on Both

SL1 Appendix A Map Index

0 1.5 3 6 Miles

0 2.5 5 10 Kilometers

For detailed maps refer to Appendix A.
Refer to Appendix B for information on data sources.

| | | | |
|-------------------------------|---------------------------|--------------------------|------------------------------|
| Original Alignments | Project Substations | Land Cover | Upland Conifer-Deciduous mix |
| Preferred Route | Proposed Substation Areas | Upland Conifer Forest | Aquatic Environments |
| Alternate Route | Preferred | Upland Deciduous Forest | Crop/Grass |
| Additional Alternative Routes | Alternate | Lowland Deciduous Forest | Non-Vegetated |
| Variation on Preferred Route | County Boundaries | Lowland Conifer Forest | Shrubland |
| Variation on Alternate Route | Organic Farms | | |
| Variation on Both | Center Pivot Irrigation | | |

Map 7.3-12
Land Use Compatibility Map
 Segment 3, Lyon County Substation to Cedar Mountain Substation Area

Source: Refer to Appendix B for information on data sources

7.3.4.8 Land Based Economies—Analysis of Segment Alternatives for the Lyon County Substation to Cedar Mountain Substation

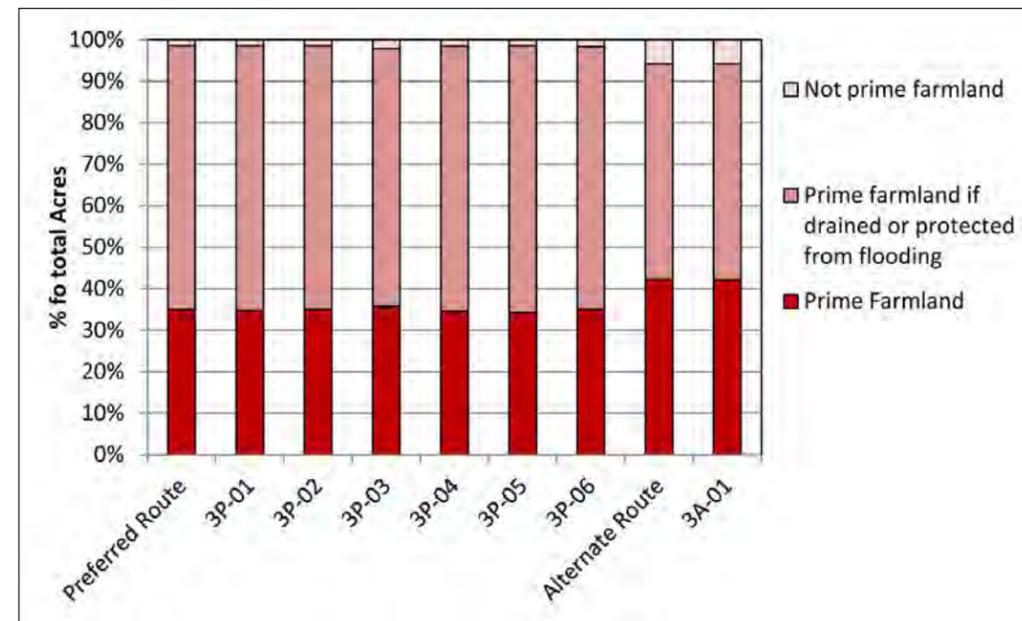
The primary land based economies along this route segment are agriculture based. Agricultural economies in the area may include livestock and dairy farms as well as bee-keeping. No mining or forestry operations are expected to be impacted by the Project.

The highest yield agricultural activities include cultivation of corn, soybeans and oats as well as raising cattle. Much of the agricultural land is designated as “prime farmland,” indicating land that this land is most desirable for agricultural production. The Project would result in permanent and temporary impacts to farmland. Permanent impacts would occur as a result of structure placement along the route centerline. It is estimated that the permanent impacts in agricultural fields would be 1,000 square feet per pole. During construction, temporary impacts, such as soil compaction and crop damage within the ROW, are possible. Temporary impacts in agricultural fields are estimated to be one acre per pole for construction activities.

Figure 7.3.4.8-1 shows the amount of prime farmland within the ROW of each of the proposed route alternatives in this segment.

The percentage of prime farmland within the ROW is greatest for the Alternate Route and associated route alternatives. The percentage of prime farmland within the ROW does not change notably among the Preferred Route and associated route alternatives.

Figure 7.3.4.8-1. Farmland and non-farmland within ROW of proposed route alternatives



Source: U.S. Department of Agriculture, Natural Resources Conservation Service

The locations of organic farms are shown in map. While certain proposed route alternatives are in closer proximity to organic farms than other proposed route alternatives, the implementation of mitigative measures described below would prevent impacts to organic farm status.

Mitigation

While the presence of an HVTL near an organic agricultural area does not directly impact organic status, special procedures must be followed during the construction and maintenance activities associated with HVTLs to avoid impacts to organic farms. The applicant has worked with the MDA to develop an AIMP for this Project. The overall objective of this AIMP is to identify measures the Utilities would take to avoid, mitigate, repair and/or provide compensation for impacts that may result from transmission line construction projects on agricultural land in Minnesota. The AIMP includes an appendix that

outlines mitigation measures and procedures specific to construction and maintenance procedures near Organic Agricultural Land as described in the National Organic Program Rules, 7 CFR Parts 205.100, 205.202, and 205.101. By following the procedures outlined in the AIMP, impacts to Agricultural land based economies due to construction and maintenance of the line can be eliminated or mitigated.

7.3.4.9 Transportation and Public Services— Analysis of Segment Alternatives for the Lyon County Substation to Cedar Mountain Substation

Roadways, Railroads and Emergency Services

The nature of impacts to roadways, railroads and emergency services are not expected to vary notably from one route segment to the next or from one route alternative to the next. Impacts are expected to be limited to temporary impacts along roads and railroad corridors due to construction and maintenance of the line. Section 6.9 provides an overview of potential impacts to transportation and emergency services.

Airports and Landing Strips

Potential impacts to airports and landing strips are expected to vary by route depending on the proximity of the line to the airport and the particular characteristics of the airport in question. Map 7.3-13 shows the location of airports along this section of the route

Consideration was given to these airports which included unregistered airports, Schmidt Private Airport and Lothert’s Farm Strip, all of which appear to be outside the area of concern for the proposed routes.

Fuhr Flying Service is a private non-public use airport located approximately 2.5 miles east southeast of Seaforth. The facility has one turf runway measuring 2,600 x 100 feet that is aligned south to north. There are 4 single engine aircraft and one glider is based at this facility. The runway at this facility is approximately 2,788 feet from the new proposed route. Runway orientation information is not available to determine if the proposed route alternatives

would impinge upon the 20:1 approach slope to this airstrip.

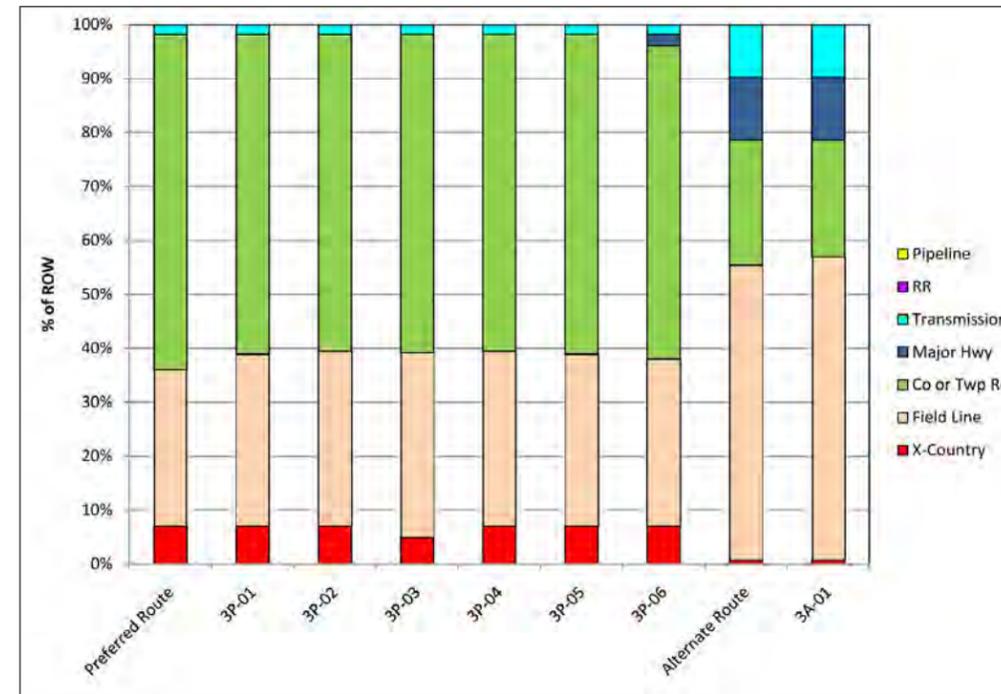
Proximity to the Redwood Falls Municipal Airport has also been evaluated. This airport is a public use airport facility with two operating runways. The airport is located within the city of Redwood Falls. The primary runway (Runway 12/30) is aligned northwest to southeast with an approach slope of 34:1. The second runway (Runway 05/23) is a grass-topped turf facility directionally aligned northeast to southwest, diagonally bisecting the primary runway, with an approach slope of 20:1. Runway 12/30 is an asphalt runway that measures 4,001 X 100 feet and runway 05/23 is a turf runway that measures 2,081 X 200 feet. The northern edge of the primary surface of Runway 12/30 is approximately two miles from the Alternate Route. According to the current airport layout plan and airspace development restrictions, this route would pass through the 10,000 foot horizontal zone radius of the airport, restricting structures in this area to below 150 feet above the airport surface.

Right of Way Sharing

Sharing ROW with existing infrastructure can minimize the ROW needed for the transmission line, minimizing impacts to adjacent property. In Map 7.3-13, areas where the ROW for the proposed route alternatives would share existing transportation, transmission line or pipeline infrastructure have been identified.

Figure 7.3.4.9-1 shows the percentage of total line distance where ROW is shared with existing infrastructure under each route alternative in this segment. Areas where proposed routes follow field lines (survey lines, natural division lines

Figure 7.3.4.9-1. Shared ROW types along each route alternative



Source: Field survey observations, comments from project public meetings and aerial photograph interpretation by HDR. 12/29/08, updated by Barr 9/01/09

and agricultural field boundaries), or cut cross-country through fields, pastures, and forests have been highlighted. In these areas there is no opportunity to minimize impacts to property by sharing existing ROW area.

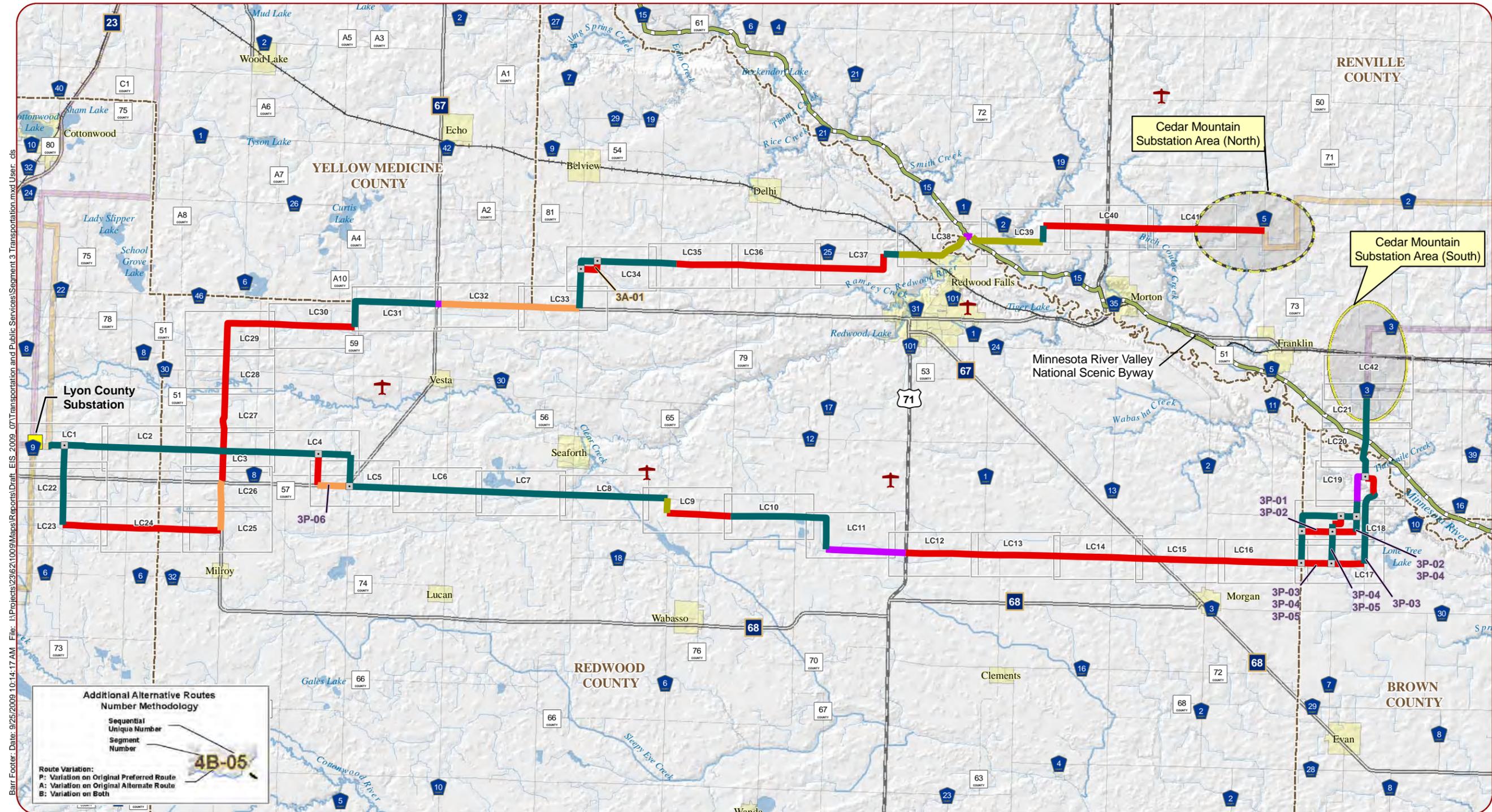
The Preferred Route shares the greatest percentage of its ROW with existing infrastructure and all route alternatives associated with the Preferred Route have similar amounts of shared ROW. The Alternate Route and associated route alternative both share less than 45 percent of their ROW with existing infrastructure.

Mitigation

General mitigation measures to minimize impacts to Transportation and Public Services are discussed in Section 6.9. Within this route impacts to transportation are expected to be limited to airports. The only airport within this route

segment where potential impacts are known is the Redwood Falls Municipal Airport. The northern edge of the primary surface of Runway 12/30 is approximately two miles from the Alternate Route. Impacts to this airport could be avoided by using pole structures in this area with a height limited to less than 150 feet

It should also be noted that by choosing routes that maximize the amount of shared ROW with existing roads, transmission lines, pipeline or railroad can mitigate impacts to surrounding land. Within this segment the Preferred Route has the greatest amount of shared ROW.



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Additional Alternative Routes Number Methodology

Sequential Unique Number
Segment Number

4B-05

Route Variation:
P: Variation on Original Preferred Route
A: Variation on Original Alternate Route
B: Variation on Both

0 1.5 3 6 Miles
0 2.5 5 10 Kilometers

For detailed maps refer to Appendix A.
Refer to Appendix B for information on data sources.

- Project Substations
- Proposed Substation Areas
- Preferred
- Alternate
- County Boundaries
- Airport
- Scenic Byway
- Pipeline
- County or Township Road
- Major Highway
- Municipal Street
- Railroad
- Transmission
- Non-ROW Sharing Field Line
- Cross-Country

Map 7.3-13
Transportation Map
Segment 3, Lyon County Substation to Cedar Mountain Substation Area



Source: Refer to Appendix B for information on data sources

Section 7.3
Lyon County Substation to Cedar Mountain Substation Segment

7.3.4.10 Recreation—Analysis of Segment Alternatives for the Lyon County Substation to Cedar Mountain Substation

The proposed Project has the potential to impact recreational resources in areas where pole placement may result in temporary construction related disturbances or even permanent impacts. In some areas, viewshed impacts from the transmission line may affect recreators. In order to capture the range of potential impacts to recreation in the region, recreational features within various distances of the line have been evaluated.

Within this segment, no impacts to SNAs and state and federal parks are expected. SNAs and state and federal parks are beyond the range where any direct impacts may occur and all of these features are outside the range where viewshed effects are possible.

The Minnesota River Valley National Scenic Byway runs from Browns Valley to Belle Plaine and is primarily used as a visual source of recreation to view the scenery of the River Valley. The Byway takes travelers along 287 miles of the Minnesota River Valley through hardwood forests, prairie grasses, 3.8 billion year old granite outcrops, agriculture, state and local parks and historic sites. All proposed route alternatives within this segment cross the Minnesota River Valley National Scenic Byway and have the potential to cause visual impacts in this area.

Potential recreational resource impacts for each of the proposed alternatives for the route segment from Lyon County Substation to Cedar Mountain Substation (shown in Map 7.3-14 and Appendix A) are summarized in Figures 7.3.4.10-1 to 7.3.4.10-3.

Figure 7.3.4.10-1 compares the proximity to WMAs under each route alternative in this segment. WMAs play a large role in Minnesota’s outdoor recreation system as they offer opportunities for hunting.

Impacts to WMAs under the various route alternatives are discussed further in Section 7.3.4.12.

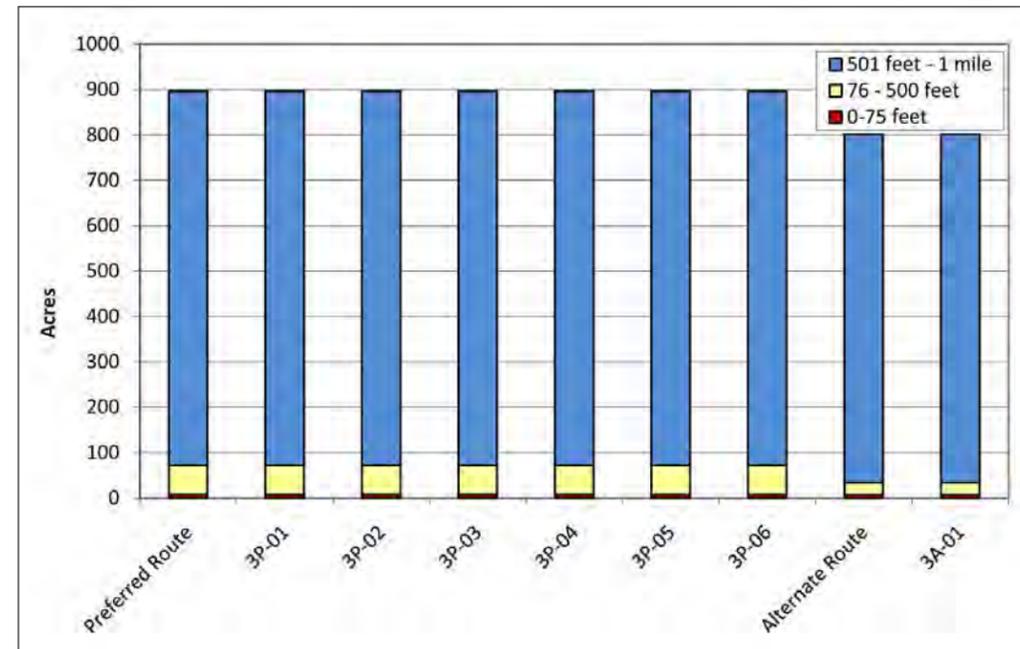
Figure 7.3.4.10-2 compares the proximity to a variety of recreational resources including local parks and recreation areas and areas used for sporting activities under each route alternative in this segment.

All proposed route alternatives along this segment have a similar number of recreational resources nearby.

Minnesota’s state, county and local trail systems offer recreational opportunities ranging from snowmobiling to cycling. Figure 7.3.4.10-3 compares potential snowmobile trail impacts across the various route alternatives in this route segment. Project impacts to trail systems may range from temporary construction impacts on trails immediately adjacent to the line to visual impacts for recreators in areas where the line is visible from the trail.

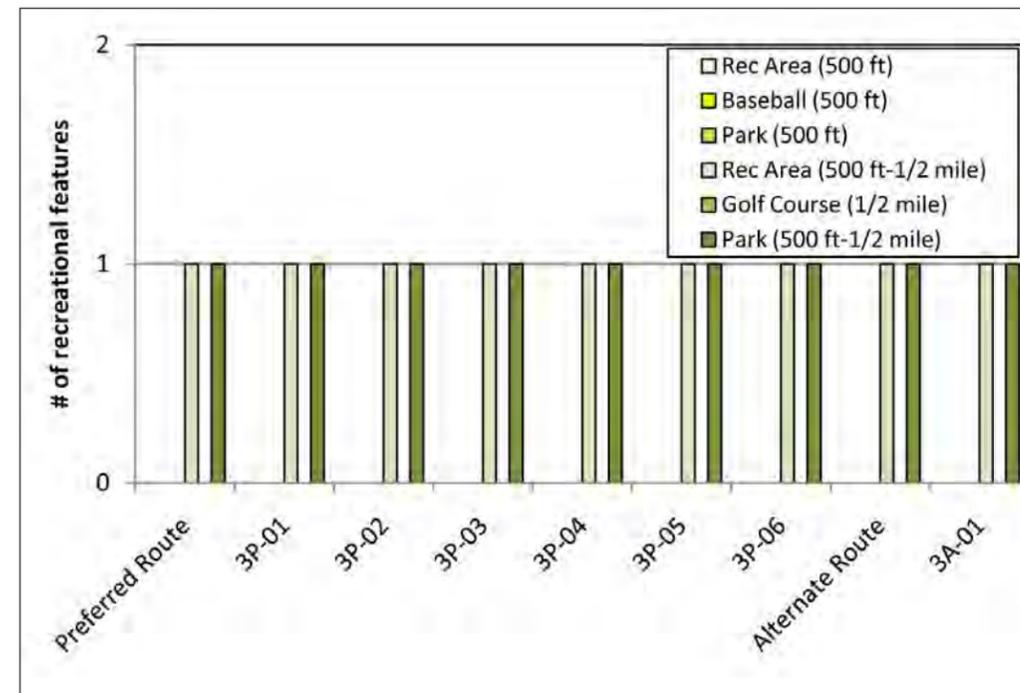
All route alternatives along this segment have a similar number of snowmobile trail crossings and the majority of the route alternatives have similar potential for impact in terms of the number of miles of trail within 500 feet of the proposed route centerlines. The Alternate Route and route alternative 3A-01 have a notably higher total mileage of snowmobile trail within 500 feet of the proposed centerline.

Figure 7.3.4.10-1. WMAs along each route alternative



Source: DNR, Division of Fish and Wildlife 02/14/2006

Figure 7.3.4.10-2. Recreational resource areas along each route alternative

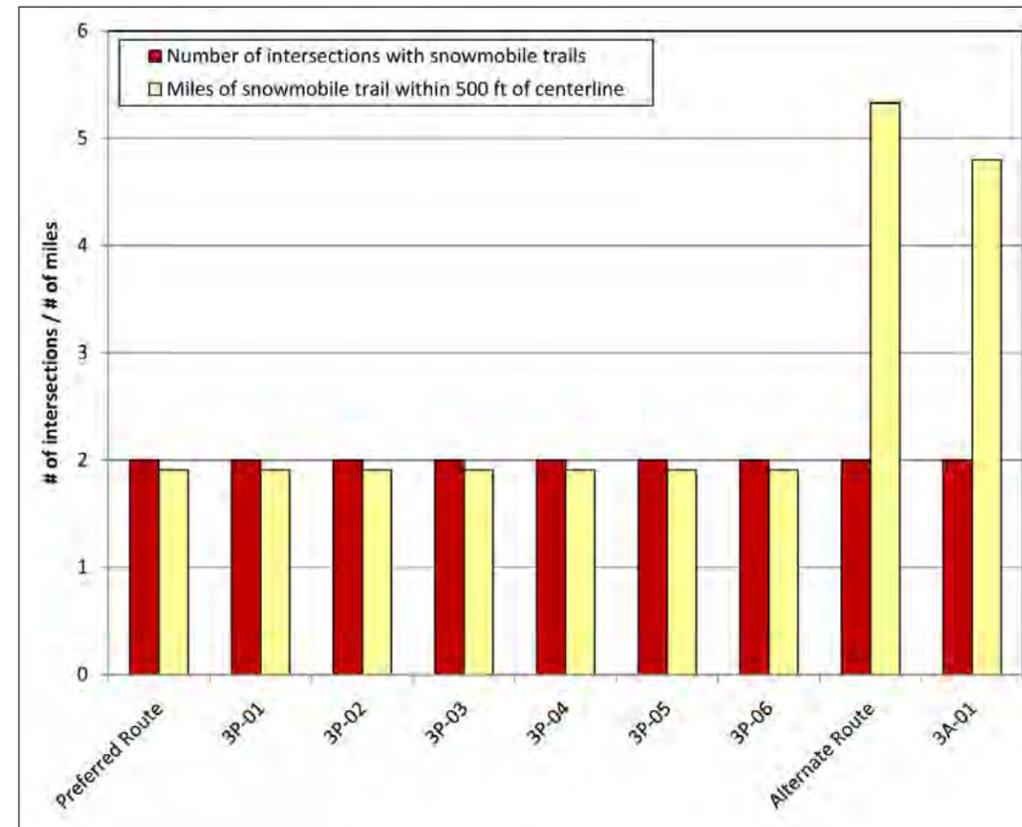


Source: Field survey observations, comments from project public meetings and aerial photograph interpretation by HDR. 12/29/08

Mitigation

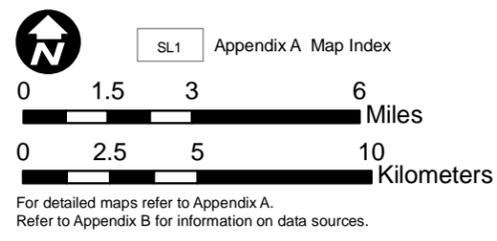
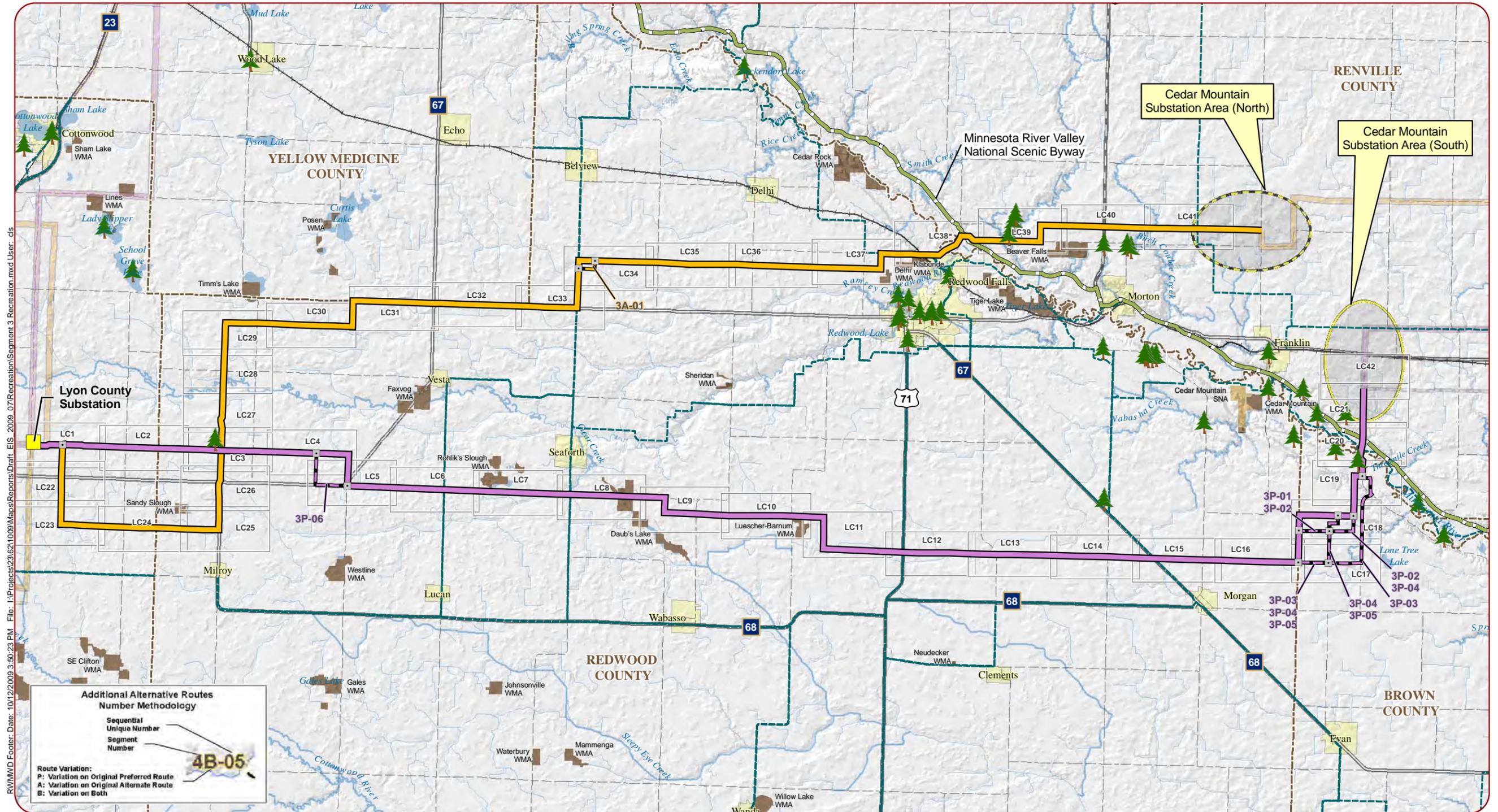
General mitigation measures to minimize impacts to recreation are discussed in Section 6.10. Because the impacts to recreational areas are primarily visual, impacts to recreational resources can be managed through choosing a route that minimizes the proximity of the line to recreational resources. Each proposed route impacts different recreational resources to a different degree, so minimizing impacts to certain resources may involve a tradeoff that results in greater impacts to other recreational resources. Within this route segment, the Alternate Route and route alternative 3A-01 have the fewest WMA areas within the route width. It should be noted that for WMAs that are directly adjacent to the proposed routes, placing poles so that they span WMA areas can help to reduce temporary and permanent impacts related to construction and pole placement. All routes have similar impacts to parks and sporting areas, and the Preferred Route and associated route alternatives have the fewest impacts to snowmobile trails.

Figure 7.3.4.10-3. Snowmobile trails along each route alternative



Source: DNR, Division of Trails and Waterways 06/01/2003

Section 7.3
Lyon County Substation to Cedar Mountain Substation Segment



- Original Alignments
- Preferred Route
- Alternate Route
- Additional Alternative Routes
- Variation on Preferred Route
- Variation on Alternate Route
- Variation on Both
- Project Substations
- Proposed Substation Areas
- Preferred
- Alternate
- County Boundaries
- Recreation Area
- Regional Existing Trail
- Regional Planned Trail
- Regional Proposed Trail
- State Existing Trail
- Snowmobile Trail
- Scenic Byway
- Regional Park
- Scientific and Natural Area
- State Park
- State Recreation Area
- State Wayside
- Wildlife Management Area
- Wildlife Refuge

Map 7.3-14
Recreation Map
Segment 3, Lyon County Substation to
Cedar Mountain Substation Area

Source: Refer to Appendix B for information on data sources

7.3.4.11 Water Resources—Analysis of Segment Alternatives for the Lyon County Substation to Cedar Mountain Substation

A variety of data sources (see Appendix B) were used to identify water resources within the 150-foot ROW and 1,000-foot route width of each route alternative within the Lyon County Substation to Cedar Mountain Substation segment. Map 7.3-15 and Appendix A identify the water resources within the vicinity of each route alternative; see Map 7.3-16 for wetlands present beyond the 150-foot ROW of each route alternative. Several rivers, streams, and ditches (collectively referred to “watercourses” below) would be crossed by the route alternatives within this segment. The major rivers running through this segment include the Redwood River and the Minnesota River (Map 7.3-15). The Redwood River runs through the alternatives to the Alternate Route, while the Minnesota River runs through all route alternatives within this segment.

The Preferred Route and associated route alternatives would cross the Minnesota River in Brown County (Brown County Crossing), at Brown County Highway 8 and Renville County Highway 3 (Map 7.3-15). Large transmission structures would be required to cross an existing 115 kV transmission line on the eastern river bluff, which may create some visual impact. The Alternate Route and associated route alternatives would cross the Minnesota River north of Redwood Falls (Redwood Crossing; Map 7.3-15). This crossing would follow an existing 115 kV transmission line and road that crosses the river at this location. A Scenic Byway runs along the east side of the river; routing to the top of the eastern river bluff may create a visual impact.

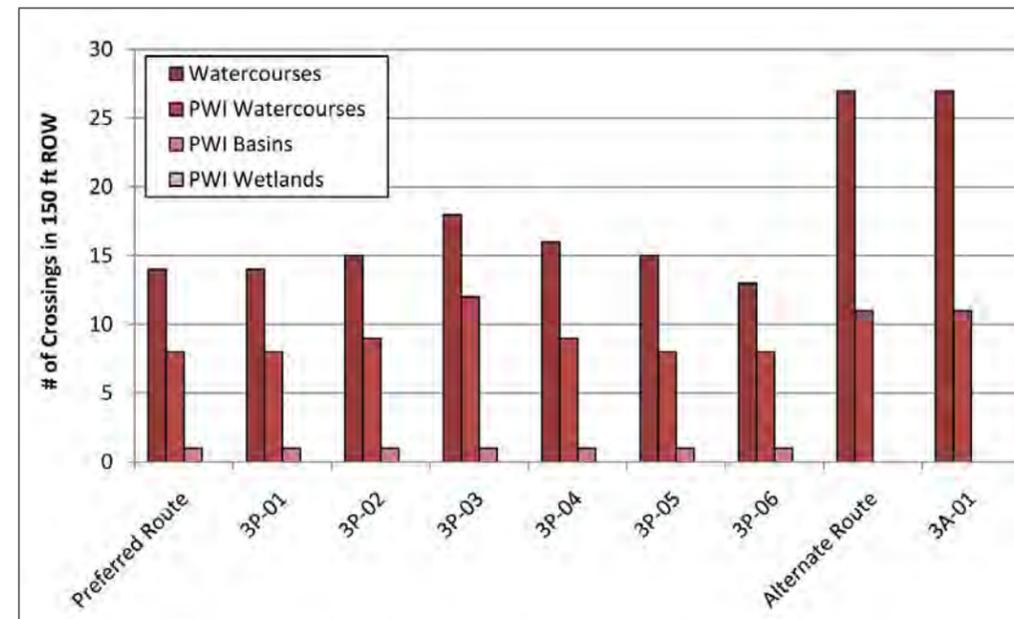
In addition, the Minnesota River is designated a Wild and Scenic River at this crossing (Map 7.3-15 and Appendix A).

Impacts to woodlands would be moderate for either the Brown County or Redwood Minnesota River Crossings. In addition, because the 100 year floodplain associated with the Minnesota River at these crossings is wider than 1,000, one or more transmission structures may have to be placed within designated 100 year floodplain. See Appendix I of the RPA for additional information on the Brown County and Redwood Crossings.

Figure 7.3.4.11-1 summarizes the number of watercourse and PWI crossings that would occur within each route alternative in this segment. The Alternate Route and associated route alternatives have the most watercourse crossings in their 150-foot ROW relative to the other route alternatives in this segment (Figure 7.3.4.11-1). The number of PWI watercourse crossings ranges between 8 and 12 for the route alternatives within this segment, with route alternative 3P-03 and the Alternate Route and associated route alternatives having the most PWI watercourse crossings (Figure 7.3.4.11-1). The Preferred Route and associated route alternatives have one PWI basin within their 150-foot ROW, while the Alternate Route and associated route alternatives do not have any PWI basins within their 150-foot ROW (Figure 7.3.4.11-1). There are no PWI wetlands or designated trout streams located within the 150-foot ROW or the 1,000-foot route width of any of the route alternatives within this segment.

Wetlands within the vicinity of the route alternatives within this segment consist mostly of small scattered freshwater emergent wetlands, with a few freshwater ponds, riverine wetlands,

Figure 7.3.4.11-1. Number of stream and PWI crossings within the 150-foot ROW of each route alternative



Source: DNR, Division of Waters 07/31/2008

Figure 7.3.4.11-2. Acres of wetland and forested wetland within the proposed 150-foot ROW of each route alternative

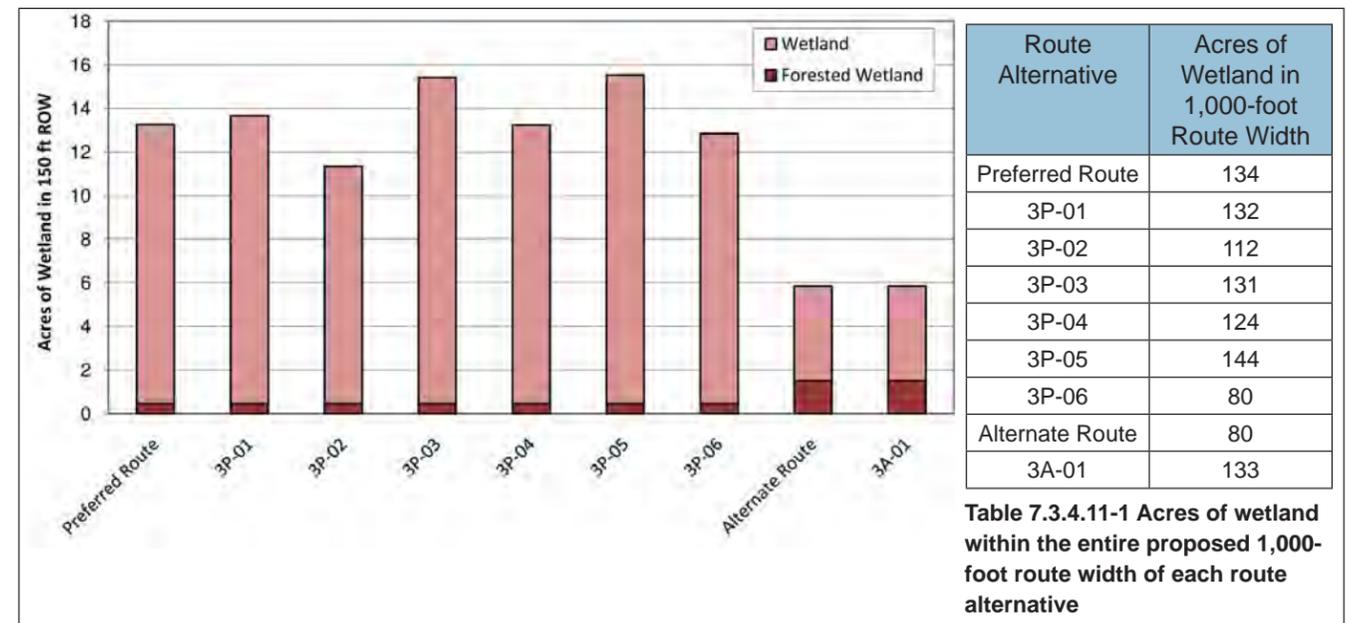


Table 7.3.4.11-1 Acres of wetland within the entire proposed 1,000-foot route width of each route alternative

Source: U.S. Fish and Wildlife Service, Division of Habitat and Resource Conservation

and forested and shrub dominated wetlands also present. Figure 7.3.4.11-2 summarizes the total acres of wetland and forested wetland that are located within the 150-foot ROW of each route alternative within this segment. The Alternate Route and associated route alternative have the fewest total acres of wetland within their 150-

foot ROW; however, these two route alternatives have significantly more acres of forested wetland within their 150-foot ROW relative to the other seven route alternatives within this segment (Figure 7.3.4.11-2). The majority of the forested wetlands present within the 150-foot ROW of these two route alternatives are located where the

Environmental Impacts

route alternatives cross the Redwood River; the Preferred Route and associated route alternatives do not cross the Redwood River within this segment (Map 7.3-15). The segment 3 Alternate Route and the 3P-06 route alternative have the fewest acres of wetland within their 1,000-foot route width (Table 7.3.4.11-1).

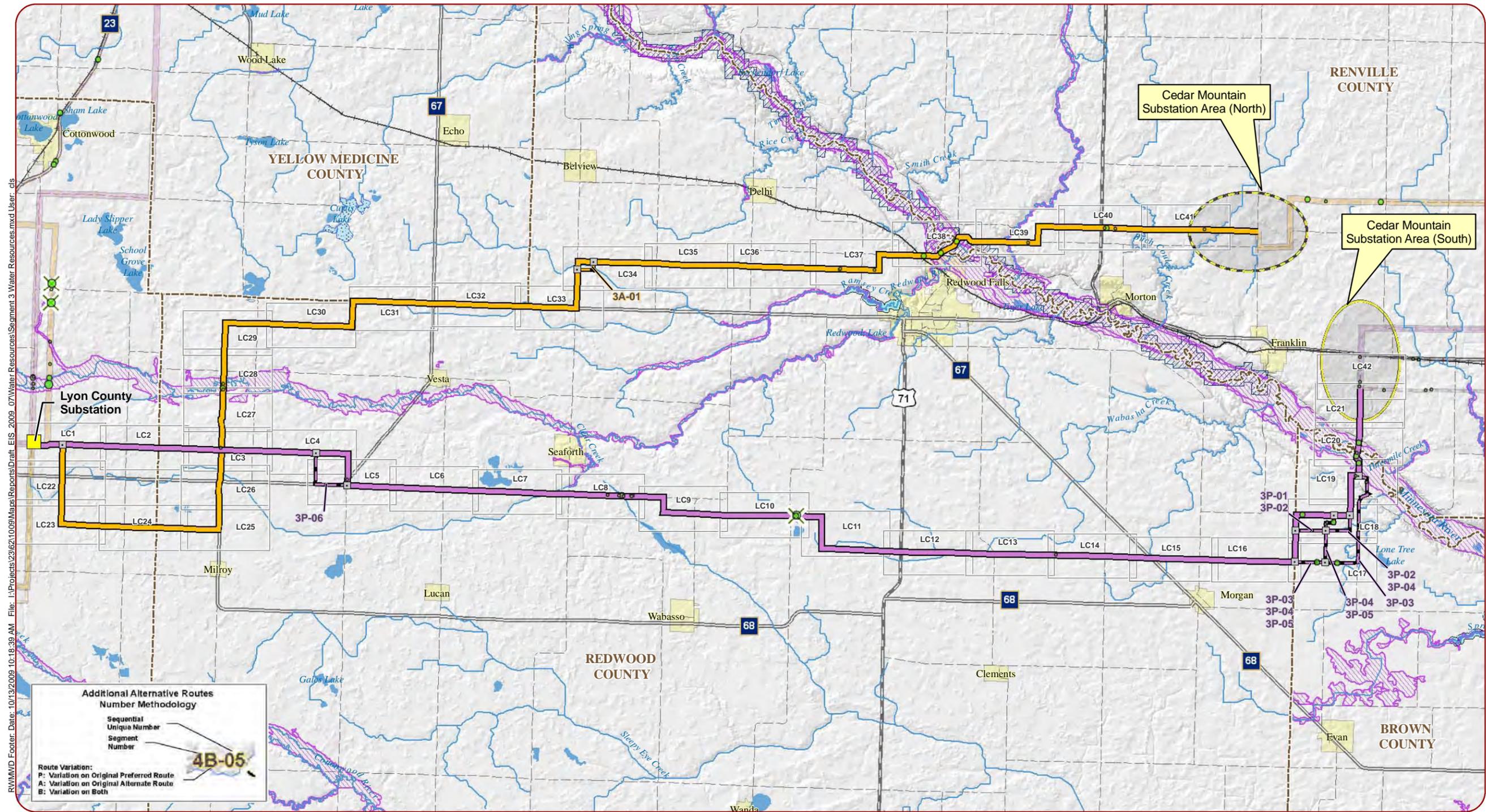
Although wetlands would be spanned to the extent possible, there is one wetland within the Preferred Route and associated route alternatives that is wider than 1,000 feet and may require placement of one or more poles within it. However, following detailed route planning, it is possible that these wetlands could be spanned or avoided.

Mitigation

General mitigation measures that would be employed to minimize impacts to water resources are discussed in Section 6.11. Within this route segment, impacts to water resources can be managed by choosing a route alternative that minimizes the proximity of the line to watercourses, lakes, and wetlands. Because all watercourses and lakes would be spanned, no structures would be placed within these features and no direct impacts to watercourses and lakes are anticipated. However, one or more poles may have to be placed within designated 100 year floodplain at the Minnesota River crossings. Potential indirect impacts to watercourses and lakes, such as increases in turbidity, may be minimized through use of BMPs and by choosing a route alternative with fewer watercourse and PWI crossings. The Preferred Route and associated route alternatives (except route alternative 3P-03) have fewer watercourse and PWI watercourse crossings than the Alternate Route and associated route alternative; however,

the Alternate Route and associated route alternative would not require crossing a PWI basin, while the Preferred Route and associated route alternatives would.

Temporary impacts to wetlands may occur if they need to be crossed during construction. Utilizing BMPs and choosing the Alternate Route or associated route alternative, which have the least acres of wetland within the 150-foot ROW would minimize temporary impacts to wetlands. Permanent impacts to wetlands may occur if structures need to be placed within wetland boundaries; choosing the Alternate Route or associated route alternative, neither of which have wetlands wider than 1,000 feet within the 150-foot ROW, would minimize these impacts. Permanent impacts to wetlands may also occur if the wetlands within the 150-foot ROW are currently forested. Forested wetlands may undergo a conversion to non-forested wetlands because vegetation maintenance procedures under transmission lines may prohibit trees from establishing. Although the Alternate Route and associated route alternative have the fewest total acres of wetland within the 150-foot ROW, these two route alternatives have the most forested wetland within the ROW. Choosing the Preferred Route or one of the associated route alternatives to the Preferred Route would minimize impacts to forested wetlands.



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Additional Alternative Routes Number Methodology

Sequential Unique Number
Segment Number

Route Variation:
 P: Variation on Original Preferred Route
 A: Variation on Original Alternate Route
 B: Variation on Both

SL1 Appendix A Map Index

0 1.5 3 6 Miles

0 2.5 5 10 Kilometers

For detailed maps refer to Appendix A.
Refer to Appendix B for information on data sources.

| | | | |
|-------------------------------|---------------------------|--|------------------------------------|
| Original Alignments | Project Substations | Wetland Crossings > 1,000 Feet | Designated Wildlife Lakes |
| Preferred Route | Proposed Substation Areas | Wetland Area (acres) within 150-foot ROW | Public Waters Inventory Basins |
| Alternate Route | Preferred | 0.0 - 0.5 | Public Water Inventory Watercourse |
| Additional Alternative Routes | Alternate | 0.6 - 2.5 | |
| Variation on Preferred Route | County Boundaries | 2.6 - 5.0 | |
| Variation on Alternate Route | Q3 FEMA Floodplain | 5.1 - 10.0 | |
| Variation on Both | Trout Streams | 10.1 - 20.4 | |
| | Wild and Scenic Rivers | | |

Map 7.3-15
Water Resources Map
Segment 3, Lyon County Substation to Cedar Mountain Substation Area



Source: Refer to Appendix B for information on data sources

Section 7.3
Lyon County Substation to Cedar Mountain Substation Segment

7.3.4.12 Flora and Fauna—Analysis of Segment Alternatives for the Lyon County Substation to Cedar Mountain Substation

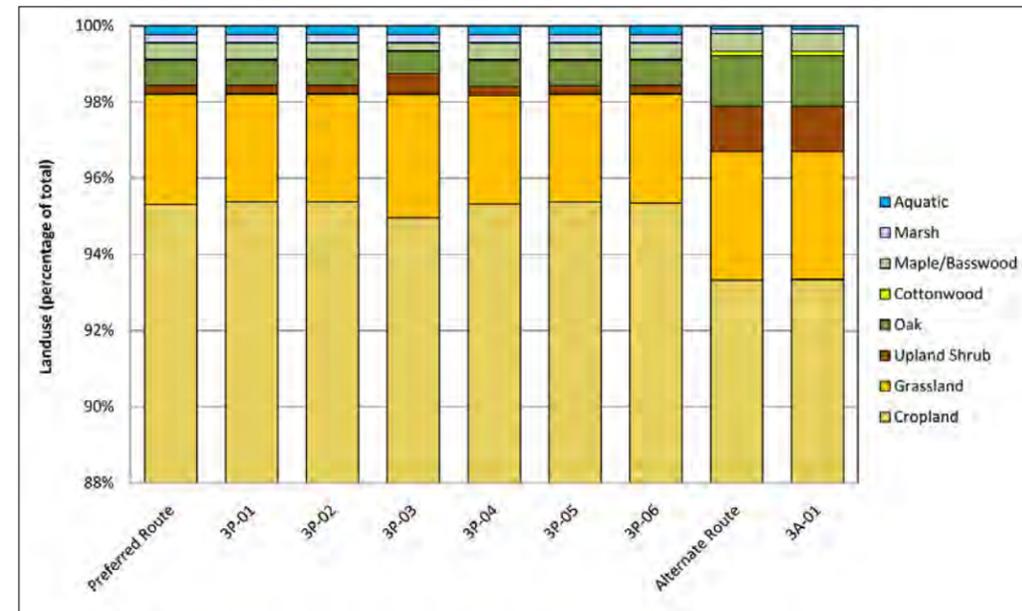
Flora

Vegetation communities on this segment were evaluated using GAP Level 3 data and DNR NHIS data (Maps 7.3-12 and 7.3-17). The GAP database provides information on general vegetative cover; details on GAP data are provided in Section 6.12. The NHIS database identifies unique and/or native plant community types. Native plant community types are discussed in detail in Section 6.13.

Figure 7.3.4.12-1 and Map 7.3-12 summarize the GAP vegetation data within the 150-foot ROW of each route alternative in this segment. There is little variation in vegetation cover between the route alternatives. Cropland is the dominant vegetation type across all of the route alternatives within this segment, covering at least 80 percent of the 150-foot ROW for all alternatives in this segment. Grasslands comprise most of the remaining vegetation cover within each route alternative. Other types present include upland shrublands, oak and cottonwood woods, marshes and wet forested areas.

Several DNR-designated unique native plant community types are located within the route alternatives within this segment; these include southern dry hill prairies, southern dry prairies, dry sand-gravel prairies, southern mesic prairies, silver maple and southern bedrock outcrops. These native plant community types occur in all route alternatives in this segment See Appendix D for details on the number of occurrences of these communities within one mile of the centerline and within the 150-foot ROW of each route alternative.

Figure 7.3.4.12-1. Summary of GAP vegetation data within 150-foot ROW for each route alternative



Source: DNR, Department of Forestry 06/06/2002

Fauna

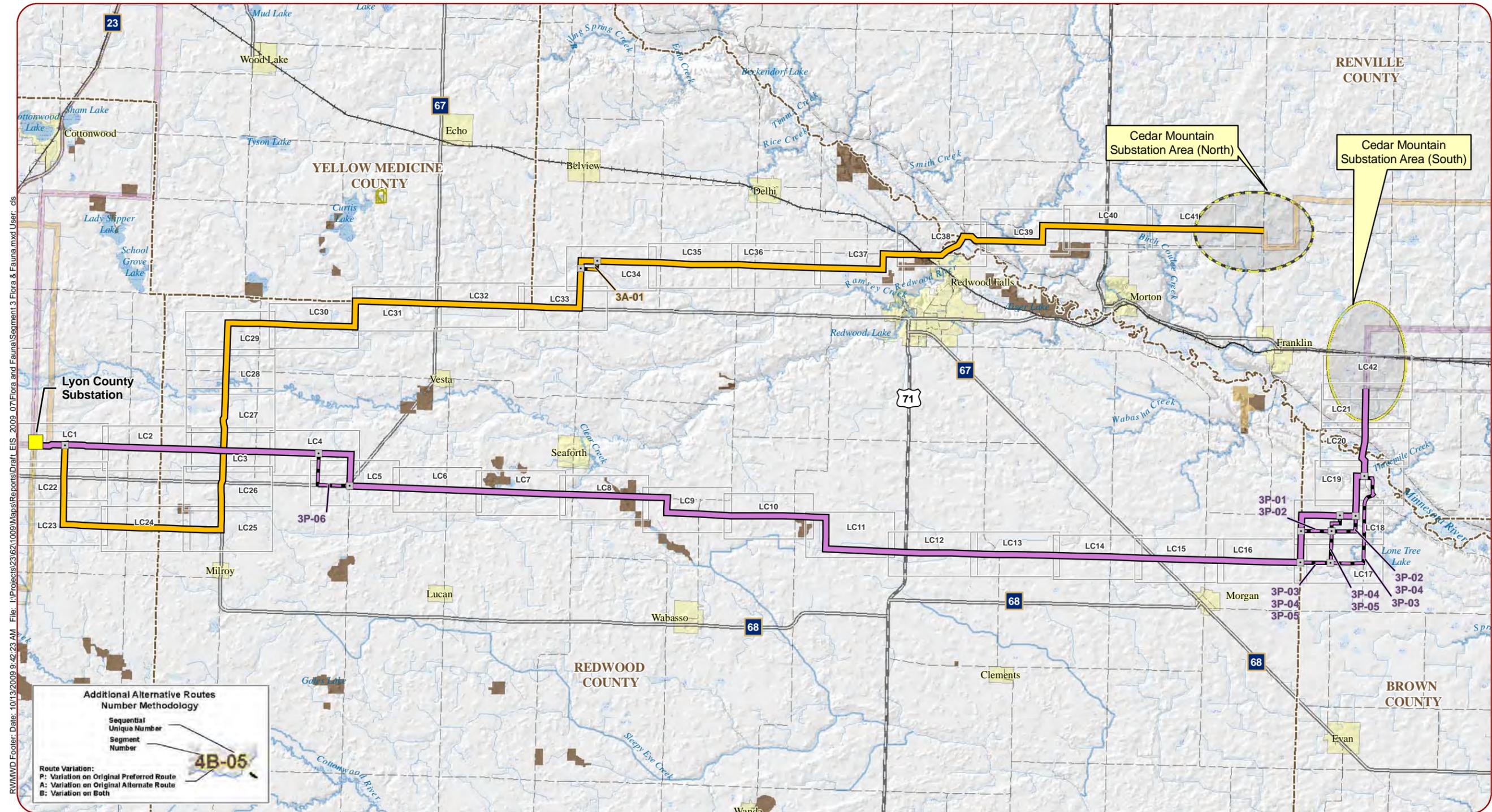
There are no WPAs or wildlife refuges in this segment (Map 7.3-16 and Appendix A). This segment has approximately 900 acres of Wildlife Management Areas (WMAs) within one mile of the route alternates, with no significant variation in potentially affected WMA acres between route alternatives. Therefore, the presence of wildlife species and wildlife habitat on this segment was evaluated using GAP Level 3 data and information. GAP information provides an overview of the vegetation communities present, and hence the availability of forage, cover and reproductive habitats for various wildlife species (see Section 6.12 for further details on GAP data). This segment of the route is dominated by cropland, interspersed with small patches of grassland and occasional woodlots or windbreaks. Wildlife species utilizing this segment of the route would be primarily deer, small mammals, perching birds and raptors, and common reptiles and amphibians.

Mitigation

General temporary and permanent impacts to vegetation and wildlife resources for this segment are described in Section 6.12. Habitats where native prairie remnants, other unique plant communities, and rock outcrops have been recorded or are likely to occur would be spanned as feasible.

Construction impacts to most vegetation cover types would be mitigated with seeding of disturbed areas with native plant species, unless the area is to be returned to agricultural use. Removal of trees would be minimized; however, in order to safely operate the transmission line, trees removed from beneath or immediately adjacent to the line cannot be replaced.

Avian collisions with the transmission line may also occur in this segment. The applicant would work with DNR and USFWS to identify areas that may require marking transmission line shield wires, bird flight diverters, or using alternate structures to reduce the likelihood of collisions.



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Additional Alternative Routes Number Methodology

Sequential Unique Number
Segment Number

4B-05

Route Variation:
 P: Variation on Original Preferred Route
 A: Variation on Original Alternate Route
 B: Variation on Both

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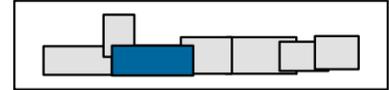
0 1.5 3 6 Miles

0 2.5 5 10 Kilometers

For detailed maps refer to Appendix A.
Refer to Appendix B for information on data sources.

- Original Alignments
- Project Substations
- Fish Technology Center
- Scientific and Natural Area
- Preferred Route
- Proposed Substation Areas
- Fisheries Research Station
- Wildlife Management Area
- Alternate Route
- Preferred
- National Fish Hatchery
- Wildlife Refuge
- Variation on Preferred Route
- Alternate
- National Wildlife Refuge
- Wetland (NWI)
- Variation on Alternate Route
- County Boundaries
- Waterfowl Production Area
- Variation on Both

Map 7.3-16
Flora & Fauna Map
Segment 3, Lyon County Substation to Cedar Mountain Substation Area



Source: Refer to Appendix B for information on data sources

Section 7.3
Lyon County Substation to Cedar Mountain Substation Segment

7.3.4.13 Rare and Unique Resources—Analysis of Segment Alternatives for the Lyon County Substation to Cedar Mountain Substation

Rare and unique resources were identified within one mile of each route alternative within the Lyon County Substation to Cedar Mountain Substation segment using the DNR NHIS, DNR state-designated railroad prairies, and MCBS databases (see Appendix B). The following discussions focus on federal and state protected species and rare and unique communities located within one mile of each route alternative. Data on rare communities, animal assemblages, and MCBS sites are summarized in this section; however, complete data sets for each route alternative are available in Appendix D. There is no legal protection for state special concern and non-status species within the State of Minnesota. These data are outside the focus of this discussion and are available in Appendix D. In addition, waterbodies and watercourses would be spanned; therefore it is anticipated that impacts to threatened and endangered aquatic species would be avoided. Because of this, aquatic species are mentioned but are not the focus of discussion.

Table 7.3.4.13-1 and Map 7.3-17 summarize the rare and unique resources documented within one mile of the route alternatives within this segment (see Appendix A for more detailed maps). However, in order to protect rare resources from exploitation or destruction, Map 7.3-17 and Appendix A do not indicate the names of species or communities identified within the NHIS database. There are several rare and unique resources present within the vicinity of this route segment, many of which are located within the area surrounding the Minnesota River (Map 7.3-17). In addition, there are several more rare and unique resources located within one mile of the segment 3 Alternate Route and the 3A-01 route alternative relative to all of the alternatives to the Preferred Route (Table 7.3.4.13-1, Map 7.3-17).

Three state-endangered species and four state-threatened species have been documented within one mile of various route alternatives within this segment, these include the following state-endangered species: the wartyback mussel (*Quadrula nodulata*), Wolf’s spike-rush (*Eleocharis*

wolfii), and the burrowing owl (*Speotyto cunicularia*), and the following state-threatened species: the mucket mussel (*Actinonaias ligamentina*), the round pigtoe mussel (*Pleurobema coccineum*), the paddlefish (*Polyodon spathula*), and the prairie bush clover (*Lespedeza leptostachya*), which is also federally-threatened. The non-aquatic listed species include Wolf’s spike-rush, the prairie bush clover, and the burrowing owl. These three species have only been documented within one mile of the segment 3 Alternate Route and the 3A-01 route alternative (Table 7.3.4.13-1).

The preferred habitat of Wolf’s spike-rush is not clear, as this plant species has been documented in both wetlands and rock outcrops (DNR 2009). The prairie bush clover is a vascular plant that inhabits remnants of native tall grass prairie (DNR 2009). The burrowing owl generally inhabits open, grazed pastures and native prairies (DNR 2009).

Rare communities and MCBS sites have been documented within one mile of each route alternative within this segment (Table 7.3.4.13-1, Map 7.3-17; see Appendix D for community types). There are not only more rare communities within one mile of the segment 3 Alternate Route and the 3A-01 route alternative, but these two route alternatives also have more rare communities located within their 150-foot ROWs (Table 7.3.4.13-1). Similarly, there are more MCBS sites located within one mile of these two route alternatives (Table 7.3.4.13-1). In addition, only these two route alternatives have MCBS sites within their 150-foot ROW (Table 7.3.4.13-1). A mussel sampling site is also located within one mile of these two route alternatives; however, because watercourses would be spanned, no impacts to this animal assemblage would occur. There are no state-designated railroad prairies within one mile of any route alternatives within this segment.

Mitigation

General mitigation measures that would be employed to minimize impacts to rare and unique resources are discussed in Section 6.13. See Section 6.12 for a discussion of the measures that would be utilized to minimize the impacts of avian collisions with transmission lines. Within this route segment, threatened and endangered species are found within one mile of each route alternative. As previously stated, waterbodies and watercourses would be spanned and BMPs would be employed to minimize erosion and sedimentation. Because of this, impacts to the three mussel species and the paddlefish are not anticipated. Impacts to the Wolf’s spike-rush would be minimized by spanning or avoiding wetlands, rock outcrops, and other areas where this species has been documented or by choosing a route alternative other than the Alternate Route or associated route alternative. Impacts to the prairie bush clover and the burrowing owl would be minimized by spanning or avoiding remnants of native prairie or by choosing a route alternative other than the Alternate Route or associated route alternative. If the rare species is unavoidable, a takings permit from the DNR may be required along with other conditions.

There are MCBS sites and DNR-listed rare natural communities within one mile of each route alternative within this segment. The placement of structures within MCBS and DNR-listed rare natural communities would be avoided or minimized by spanning them to the extent possible. Where structure placement cannot be avoided in these sensitive communities, rare species associated with these habitats could be affected. Choosing the Preferred Route or one of the route alternatives associated with the Preferred Route would minimize impacts to rare communities and MCBS sites.

Table 7.3.4.13-1. Summary of rare and unique resources within one mile of each route alternative

| Common Name | Scientific Name | Type | MN Status | U.S. Status | Route Alternatives | | | | | | | | |
|------------------------------------|--------------------------------|------------|-----------|-------------|--------------------|-------|-------|-------|-------|-------|-------|-----------|-------|
| | | | | | Preferred | 3P-01 | 3P-02 | 3P-03 | 3P-04 | 3P-05 | 3P-06 | Alternate | 3A-01 |
| Wartyback | <i>Quadrula nodulata</i> | Zoological | END | NONE | X | X | X | X | X | X | X | | |
| Wolf's Spike-rush | <i>Eleocharis wolfii</i> | Botanical | END | NONE | | | | | | | | X | X |
| Burrowing Owl | <i>Speotyto cunicularia</i> | Zoological | END | NONE | | | | | | | | X | X |
| Mucket | <i>Actinonaias ligamentina</i> | Zoological | THR | NONE | X | X | X | X | X | X | X | X | X |
| Round Pigtoe | <i>Pleurobema coccineum</i> | Zoological | THR | NONE | | | | | | | | X | X |
| Prairie Bush Clover | <i>Lespedeza leptostachya</i> | Botanical | THR | THR | | | | | | | | X | X |
| Paddlefish | <i>Polyodon spathula</i> | Zoological | THR | NONE | X | X | X | X | X | X | X | X | X |
| Rare Communities | | Ecological | na | na | 1/3 | 1/3 | 1/3 | 1/4 | 1/3 | 1/3 | 1/3 | 4/14 | 4/13 |
| Animal Assemblages | | Zoological | na | na | | | | | | | | 1 | 1 |
| State-Designated Railroad Prairies | | | na | na | | | | | | | | | |
| MCBS Sites | | | na | na | 14 | 14 | 14 | 17 | 14 | 14 | 14 | 5/34 | 5/34 |

Source: Natural Heritage Information System Rare Features Data Copyright 2009 State of Minnesota, Department of Natural Resources

An “X” indicates the presence of that particular species within 1 mile of centerline, while a blank cell indicates that a particular species, community, or site is not within 1 mile of the centerline.

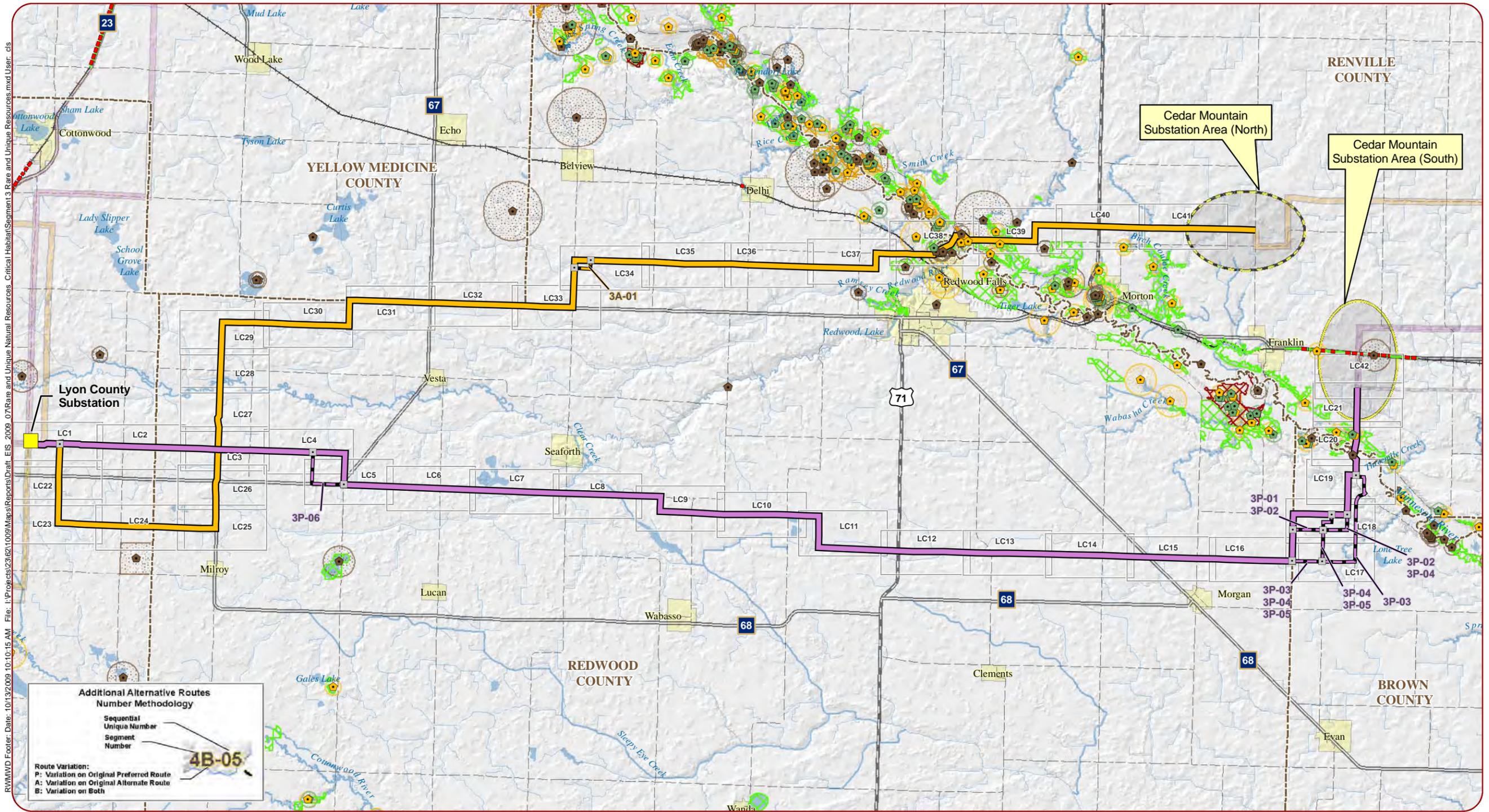
Rows in tan indicate non-aquatic state and/or federally-threatened or endangered species and rows in blue indicate aquatic state and/or federally-threatened or endangered species.

Cells in red indicate if and how many of the sites are located within the 150-foot ROW (e.g. 1/2 means that one of two total sites is located in the ROW).

“MCBS” = Minnesota County Biological Survey - data includes sites classified as outstanding, high, and moderate biodiversity significance.

Animal Assemblages includes colonial waterbird nesting sites and/or mussel sampling sites.

“END” = Endangered, “THR” = threatened, “None” = no federal status, “na” = not applicable.



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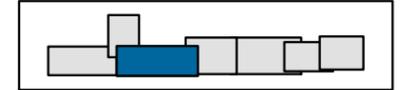
0 1.5 3 6 Miles

0 2.5 5 10 Kilometers

For detailed maps refer to Appendix A. Refer to Appendix B for information on data sources.

- | | | | |
|-------------------------------|---------------------------|-------------------------|--------------------------------|
| Original Alignments | Project Substations | MN DNR Natural Heritage | State-Designated RR Prairie |
| Preferred Route | Proposed Substation Areas | Botanical | MCBS Biodiversity Significance |
| Alternate Route | Preferred | Ecological | Moderate Significance |
| Additional Alternative Routes | Alternate | Zoological | High Significance |
| Variation on Preferred Route | County Boundaries | Botanical | Outstanding Significance |
| Variation on Alternate Route | | Ecological | |
| Variation on Both | | Zoological | |

Map 7.3-17
Rare & Unique Resources/Critical Habitat Map
Segment 3, Lyon County Substation to
Cedar Mountain Substation Area



Source: Refer to Appendix B for information on data sources

Section 7.3
Lyon County Substation to Cedar Mountain Substation Segment