

## 5.0 DESCRIPTION OF PREFERRED ROUTE AND ALTERNATE ROUTE

Minnesota statutes and rules require that an applicant for a route permit for an HVTL under the Full Permitting Process propose at least two routes. This chapter describes the Preferred Route and Alternate Route developed through the route selection process detailed in Chapter 4. A Project Overview Map is provided in Appendix A. The route descriptions are broken into route sections between substations, beginning on the west end and terminating on the east end. The route segments that comprise each of the proposed routes are shown in Appendix B. The segments that comprise the Preferred Route and the Alternate Route are summarized in Appendix C.

### 5.1 PREFERRED ROUTE

The Preferred Route includes six 345 kV transmission line sections between the South Dakota border and a proposed Hampton Substation near Hampton, Minnesota. The Preferred Route is approximately 237 miles long with an estimated cost of \$700 million. Moving from west to east, the Preferred Route begins near Hendricks, Minnesota, passes north of Marshall, and then takes a southerly route via Franklin and Le Sueur. The Preferred Route then heads north of New Prague and Elko New Market to terminate at the proposed substation near Hampton. The Lyon County–Hazel Creek–Minnesota Valley sections of the Preferred Route head north at the existing Lyon County Substation and follow an existing 115 kV transmission line corridor north to connect into a new Hazel Creek Substation. The route then crosses the Minnesota River near Granite Falls to connect into the existing Minnesota Valley Substation. The Preferred Route also crosses the Minnesota River southeast of Franklin (Brown County crossing) and just north of Le Sueur (Le Sueur Treatment Pond crossing). For the majority of the Project, a 1,000-foot route width is requested. Near new substations and in other environmentally sensitive areas, identified below, a route width of up to 1.25 miles is requested to accommodate more site-specific concerns. The Preferred Route is described below and shown on the maps in Appendix B and in Figure 5-1.

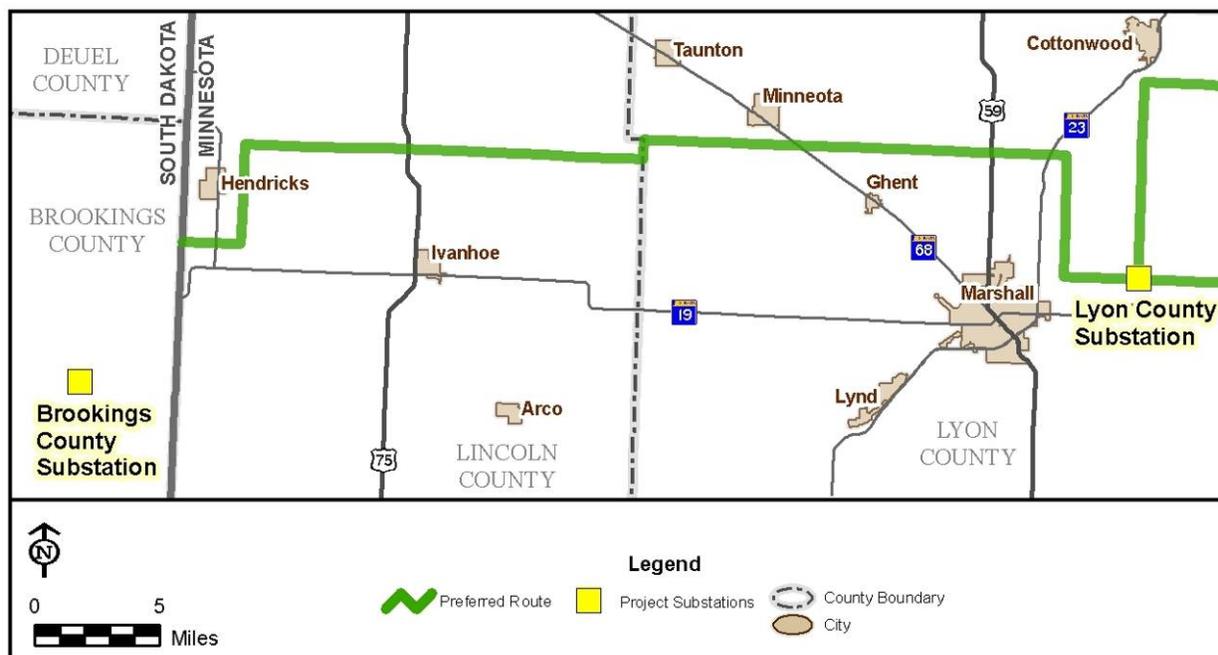
Figure 5-1. Preferred Route



### 5.1.1 BROOKINGS COUNTY TO LYON COUNTY

The Brookings County to Lyon County Preferred Route section begins at the South Dakota border and ends at the Lyon County Substation just east of Marshall. An overview of this section is shown in Figure 5-2. From the South Dakota border, the Preferred Route follows 290th Street east for 2.4 miles, crossing Minnesota Highway 271. At 30th Avenue, the route turns and heads north for four miles, east of Hendricks. At County Road 134, the route turns and heads east 16 miles. At the Lincoln-Lyon County border, the route heads north for one mile and then turns east, following 340th Street for 17 miles, crossing Minnesota Trunk Highway (“TH”) 68 and 23 and U.S. Highway 59. At 280th Avenue, the route heads south for five miles and then turns east for three miles on 290th Street, entering the Lyon County Substation.

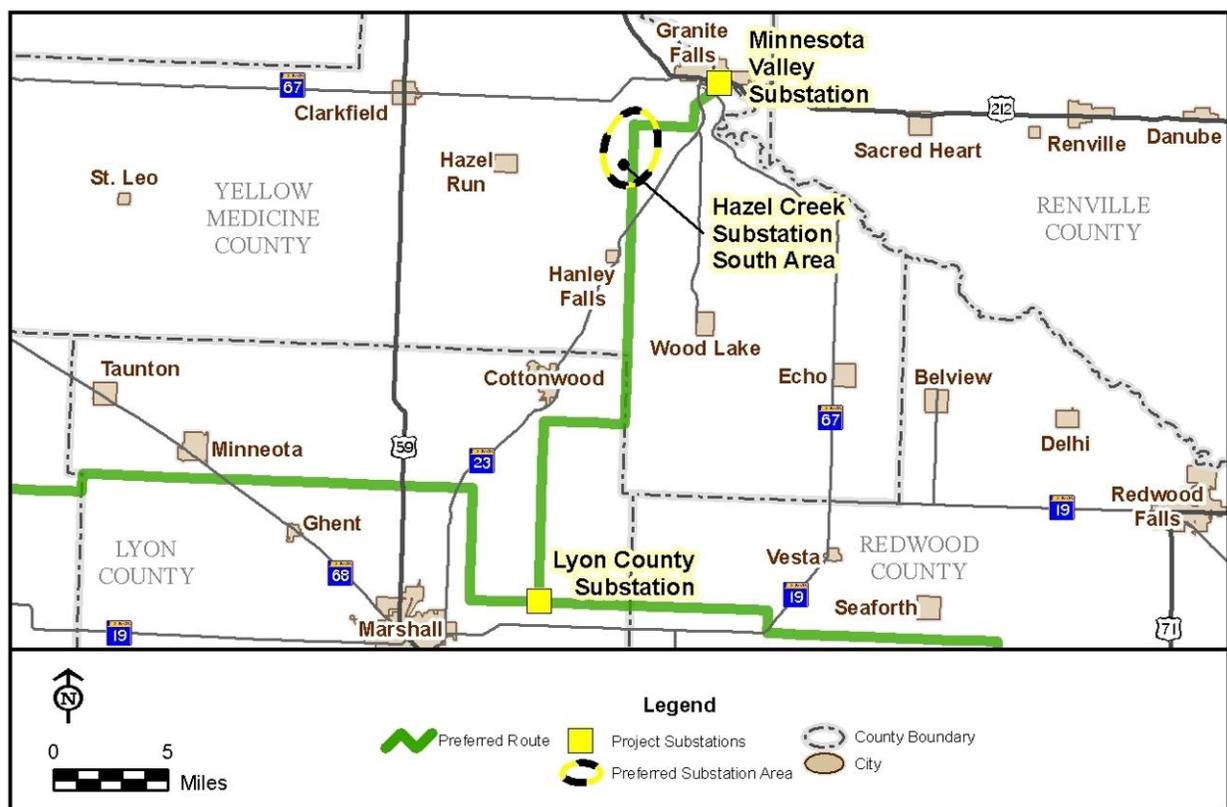
Figure 5-2. Preferred Route, Brookings County to Lyon County



### 5.1.2 LYON COUNTY TO MINNESOTA VALLEY

The Lyon County to Minnesota Valley Preferred Route section begins at the Lyon County Substation located just east of Marshall and ends at the Minnesota Valley Substation on the southeast side of Granite Falls. An overview of this section is shown in Figure 5-3. The Preferred Route follows the existing Lyon County to Minnesota Valley 115 kV transmission line for its entire length. The route exits the Lyon County Substation and follows County Highway 9 north for eight miles to County Highway 24. The route then turns east for 3.5 miles following County Highway 24 to 520th Street/County Road B3. At this point, the route turns north along 520th Street/County Road B3 for 13 miles, connecting to the proposed Hazel Creek Substation. The route turns east following 260th Avenue for 2.6 miles, then turns north for one mile. The route then descends into the Minnesota River Valley, heading northeast for 2.4 miles following the existing 115 kV transmission line ROW. This section bisects two U.S. Fish and Wildlife Service (“USFWS”) easement areas, and crosses THs 23 and 67 and the Minnesota River at the Granite Falls Crossing before reaching the Minnesota Valley Substation on the north side of the Minnesota River.

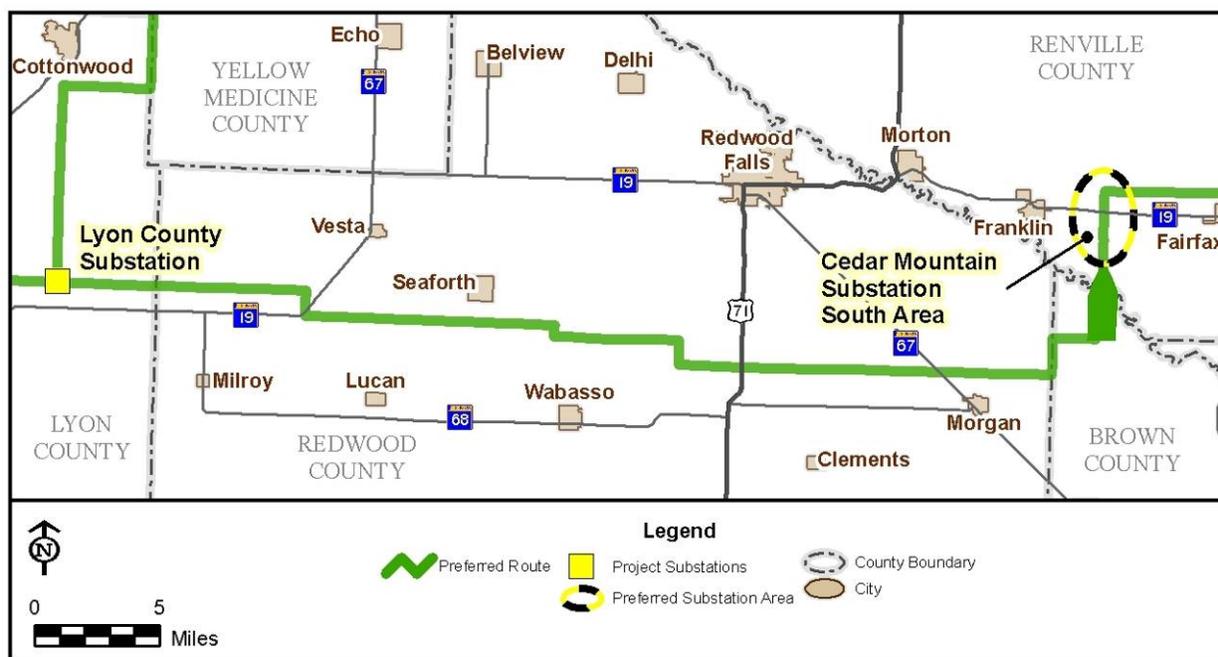
Figure 5-3. Preferred Route, Lyon County to Minnesota Valley



### 5.1.3 LYON COUNTY TO CEDAR MOUNTAIN

The Lyon County to Cedar Mountain Preferred Route section begins at the Lyon County Substation and ends at the proposed Cedar Mountain Substation. An overview of this section is shown in Figure 5-4. The Preferred Route follows 290th Street east out of the Lyon County Substation for 10 miles to County Road 5. At this point, the route turns south for one mile before turning east on County Road 12. The route follows County Road 12 for 10 miles, bisecting Daub’s Lake WMA. At County Road 65, the Preferred Route heads south for 0.5 miles, then turns east, following field lines for two miles. The route continues east, following 275th Street for three miles, crossing the northern edge of the Luescher-Barnum WMA. At Knox Avenue, the route heads south for a mile and then follows a field line east, crossing U.S. Highway 71 and Minnesota TH 67 until it reaches the Brown County border (340th Avenue). At 340th Avenue, the route turns north for 1.5 miles. The route then turns east on 340th Street for 1.8 miles. Beginning at this point the Applicants request a wider route (1.25 miles) to cross the Minnesota River. The wider route is requested to allow for engineering and environmental considerations at the crossing. The Preferred Route heads north along 327th Avenue for 1.3 miles, then travels over the bluff into the Minnesota River Valley. Once in the valley, the route continues north on Brown County Highway 8, crosses the Minnesota River then continues north along Renville County Highway 3 through the valley and up the bluff. The route then narrows back to 1,000 feet and continues north into the proposed Cedar Mountain Substation South area. The actual route alignment may change to accommodate interconnection at the new Cedar Mountain Substation area, which includes a 1.25 mile route width for the new substation connection.

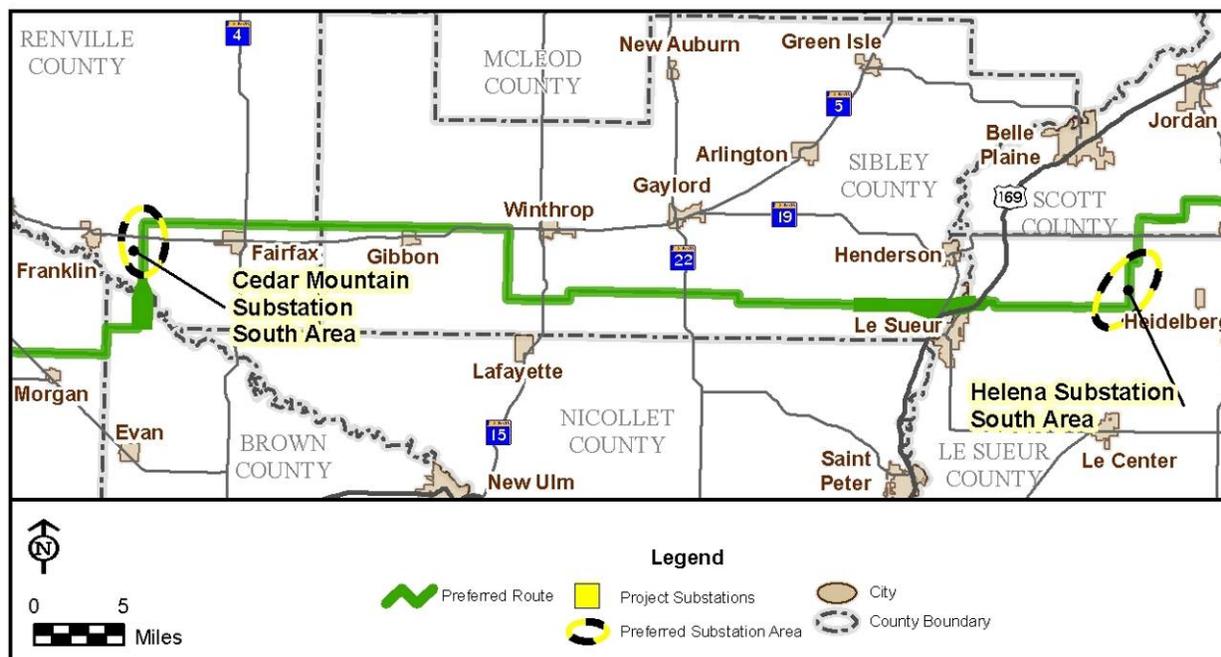
Figure 5-4. Preferred Route, Lyon County to Cedar Mountain



#### 5.1.4 CEDAR MOUNTAIN TO HELENA

The Cedar Mountain to Helena Preferred Route section begins at the proposed Cedar Mountain Substation South area and ends at the proposed Helena Substation South area west of New Prague. An overview of this section is shown in Figure 5-5. The route may change to accommodate the location of the new Cedar Mountain Substation. The Preferred Route follows County Road 71/74/660th Avenue east out of the Cedar Mountain Substation South area for 10 miles in Renville County. Once in Sibley County, the route continues east along Township Road 12 for four miles before continuing east along mostly field lines for 3.5 miles. The route continues east along Minnesota TH 19 for three miles before heading south along Township Road 45 for two miles and following a field line for 1.5 miles and Township Road 44 for 0.5 miles south. At this point, the Preferred Route turns east following a field line for two miles then following Township Road 238 for 1.5 miles. The route then heads north for 0.5 miles along County Road 57 and turns east for 9.5 miles, following existing field lines and Township Road 230. At 190th Street/County Highway 13, the route heads south for 0.5 miles and turns east and follows County Highway 8 for one mile, Township Road 89 for four miles, and County Highway 18 for 1.8 miles before continuing east along a field line for 4.5 miles. The Preferred Route widens to approximately one mile as it moves east to allow flexibility in crossing the Minnesota River at the Le Sueur Treatment Pond crossing. The route crosses the Minnesota River along U.S. Highway 169, just north of Le Sueur. After crossing the river, the Preferred Route follows U.S. Highway 169 for one mile to County Highway 28. The route follows County Highway 28 east for one mile. The route then turns south for 0.25 miles, then east along 320th Street/County Road 156 for 7.75 miles before turning north for one mile along County Highway 32 into the Helena Substation area.

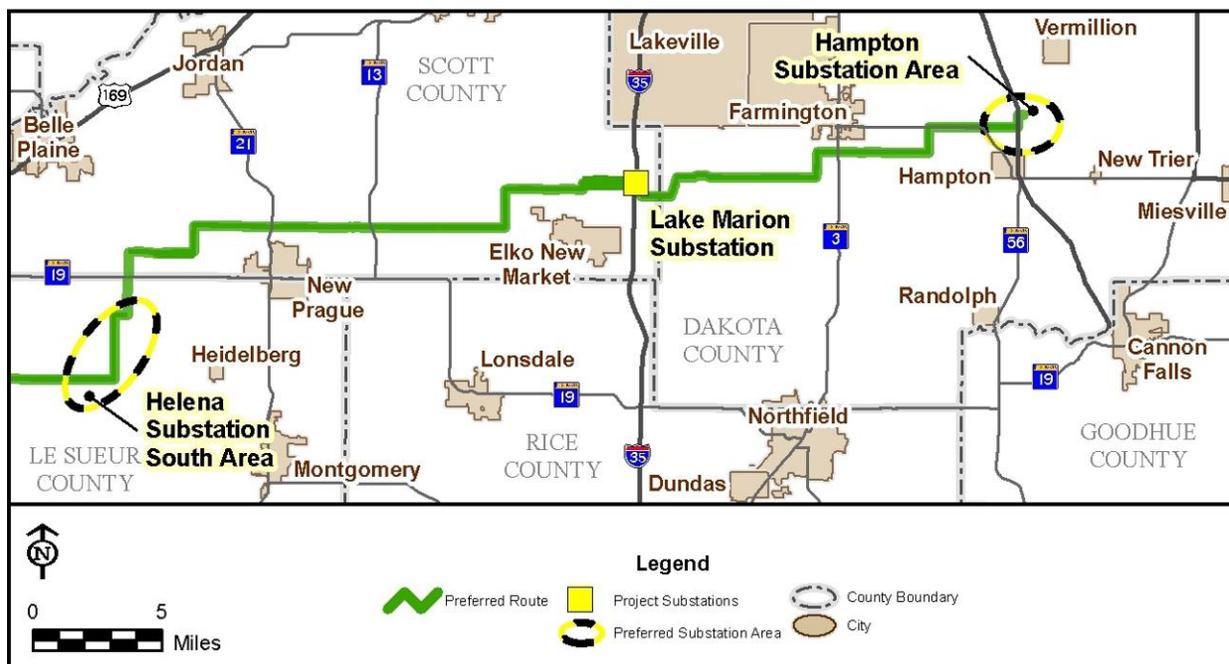
Figure 5-5. Preferred Route, Cedar Mountain to Helena



### 5.1.5 HELENA TO LAKE MARION

The Helena to Lake Marion Preferred Route section begins at the proposed Helena Substation South area and ends at the Lake Marion Substation northeast of Elko New Market. An overview of this section is shown in Figure 5-6. The Preferred Route heads north along County Highway 32 for one mile, then east on County Rd 122 for 0.5 miles, then north along a field line for 1.5 miles to Minnesota TH 19, where it continues north into Scott County following Fabor Avenue for one mile. At 270th Street, the Preferred Route turns east for 2.5 miles. The route turns north for one mile at Aberdeen Avenue, and then turns east at County Highway 2/260th Street for 12 miles, running along the edge of the future Cedar Lake Regional Park. At Jonquil Avenue the route turns north cross-country for 0.5 mile, then follows private roads for one mile before turning east for three miles following a mixture of field lines and cross-country. At Natchez Avenue, the Applicants request a wider route, 0.6 mile wide, to allow for flexibility in avoiding impacts and engineering considerations with the Lake Marion Substation. The wider route runs from Natchez Avenue east to the Lake Marion Substation, east of I-35.

Figure 5-6. Preferred Route, Helena to Lake Marion to Hampton



### 5.1.6 LAKE MARION TO HAMPTON

The Lake Marion to Hampton Preferred Route section begins at the Lake Marion Substation northeast of Elko New Market and ends at the proposed Hampton Substation area north of the City of Hampton. An overview of this section is shown in Figure 5-6. The Preferred Route heads south along Pillsbury Avenue for 0.5 miles then turns east following field lines for 1.1 miles. The route turns northeast to follow Dodd Boulevard/County Highway 9 northeast for 0.8 miles to 240th Street. The route follows 240th Street east for 2.3 miles, and then field lines for two miles, which transitions to an existing pipeline along a field line for 1.15 miles. The route turns north following the pipeline and railroad ROW for one mile before turning east along field lines for 1.8 miles, then east along 230th Street for 2.5 miles. The route heads one mile north following a field line then heads east following TH 50 for 2.1 miles and field lines for 1.3 miles. The route then turns north along U.S. Highway 52 for 0.5 miles, entering the proposed Hampton Substation area.

### 5.2 ALTERNATE ROUTE

The Alternate Route includes six 345 kV transmission line sections between the South Dakota border and a proposed Hampton Substation near Hampton, Minnesota. The Alternate Route is approximately 262 miles long with an estimated cost of \$755 million. Moving from west to east, the Alternate Route begins near Hendricks, Minnesota, passes south of Marshall, and then takes a northerly route via Redwood Falls, Franklin, and Belle Plaine. The Alternate Route then heads south of New Prague and Elko New Market to terminate at the proposed substation near Hampton. The Lyon County–Hazel Creek–Minnesota Valley sections of the Alternate Route head north from the Lyon County Substation along an existing 69 kV line for approximately seven miles and then follow field lines and roads and connect to a new Hazel Creek Substation before crossing the Minnesota River at the Granite Falls crossing to connect into the existing Minnesota Valley Substation. The Alternate Route also crosses the Minnesota River near Redwood Falls and near Belle Plaine at the

West Belle Plaine crossing. The Alternate Route is described below and shown on the detailed maps in Appendix B and in Figure 5-7.

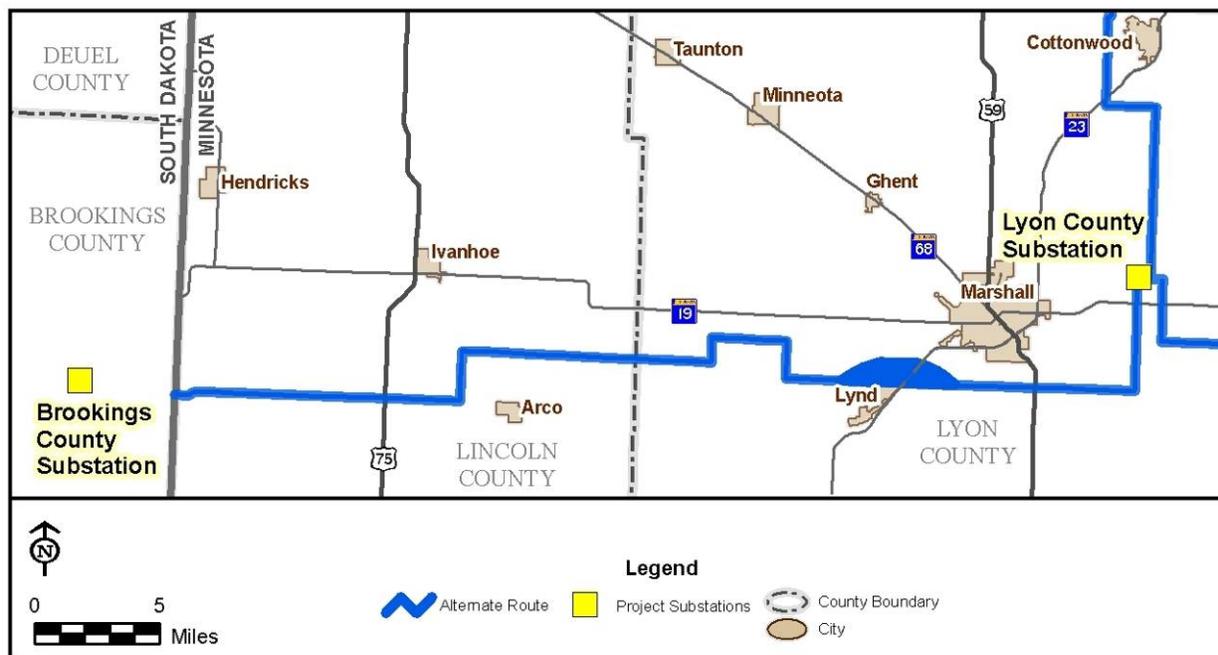
Figure 5-7. Alternate Route



### 5.2.1 BROOKINGS COUNTY TO LYON COUNTY

The Alternate Route for the Brookings County to Lyon County section begins at the South Dakota border and ends at the Lyon County Substation just east of Marshall. An overview of this section is shown in Figure 5-8. The route follows an existing 115 kV transmission line and County Road 137 east for 0.6 miles, then heads northeast across agricultural land, continuing to follow the existing transmission line for 0.3 miles and then turns east following the existing transmission line for 8.5 miles and County Road 15 for 10 miles to County Road 110. The route heads north for two miles on County Road 110 to County Road 125. The route follows County Road 125 east for 10 miles, crossing the north edge of Coot WMA and Thostenson WMA. After entering Lyon County, the route crosses the south edge of a USFWS easement and Furgamme WMA. The route heads north for one mile on 140th Avenue/County Highway 13 and then heads east on 260th Street for three miles. The route then heads south for 1.5 miles on County Highway 15 before turning east on field lines for two miles. At this point, the route width expands to allow for flexibility in crossing the Redwood River. The route then continues east for 2.5 miles before crossing the Redwood River south of Marshall. The center of the Alternate Route at the crossing is just south of 250th Street. The expanded route continues east, crossing TH 23, for 2.5 miles. The route then narrows back to 1,000 feet at County Highway 7 and continues east along mostly field lines for seven miles to County Highway 9. The route turns north following 310th Avenue and an existing 115 kV line ROW for 4.5 miles, entering the Lyon County Substation.

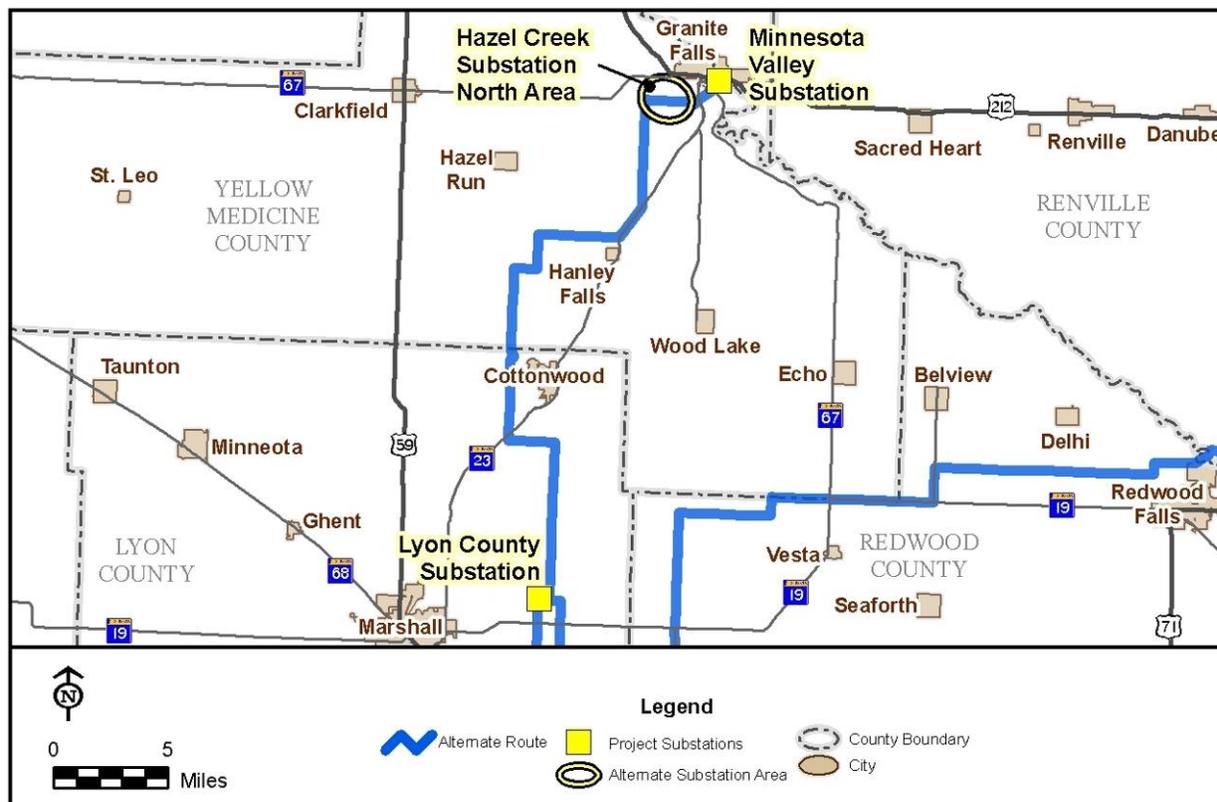
Figure 5-8. Alternate Route, Brookings County to Lyon County



### 5.2.2 LYON COUNTY TO MINNESOTA VALLEY

The Lyon County to Minnesota Valley Alternate Route section begins at the Lyon County Substation located just east of Marshall and ends at the Minnesota Valley Substation on the southeast side of Granite Falls. An overview of this section is shown in Figure 5-9. The Alternate Route exits the Lyon County Substation and heads east for 0.5 miles and then heads north for seven miles, following an existing 69 kV transmission line along field lines to County Road 67. The route then heads west two miles, following County Road 67 for one mile and field lines for one mile to 290th Avenue. At this point, the route heads north for four miles along 290th Avenue, crossing the east edge of the Gabriel Anderson WMA, to the Yellow Medicine County-Lyon County border. The route continues north along field lines for one mile, then along 470th Street for 2.5 miles. It then turns east for one mile following an existing 69 kV transmission line across field lines and then north for 1.5 miles along 480th Street. The route heads east for 3.5 miles just north of Hanley Falls, following 210th Avenue to TH 23, then northeast following TH 23 and Burlington Northern Santa Fe (“BNSF”) railroad tracks for 1.5 miles. The route turns north for 4.7 miles along field lines to 270th Avenue, then turns east along 270th Avenue for two miles before intersecting an existing 115 kV transmission line and the Preferred Route. At this point, the Alternate Route and the Preferred Route share the same alignment across the Minnesota River and into the Minnesota Valley Substation.

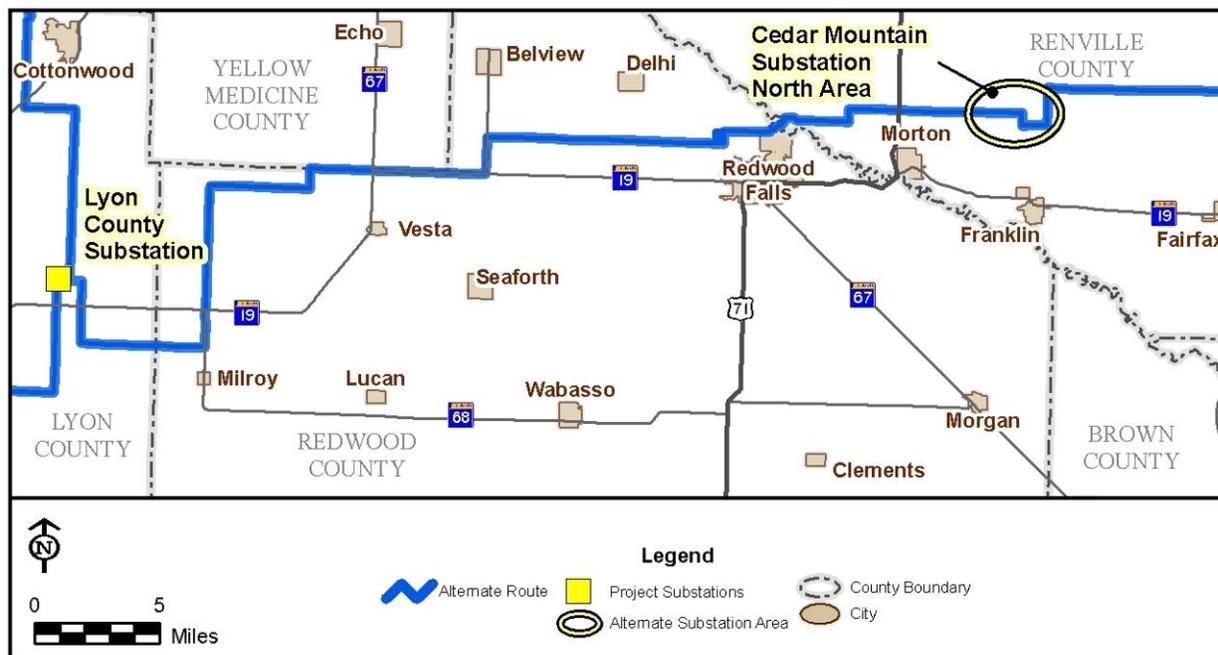
Figure 5-9. Alternate Route, Lyon County to Minnesota Valley



### 5.2.3 LYON COUNTY TO CEDAR MOUNTAIN

The Lyon County to Cedar Mountain Alternate Route section begins at the Lyon County Substation and ends at the Cedar Mountain Substation North area. An overview of this section is shown in Figure 5-10. The Alternate Route exits the Lyon County Substation and heads east for one mile on 290th Street before heading south on 320th Avenue for 2.5 miles. The route turns east and follows a field line for five miles to TH 68, where it heads north for 6.5 miles. At this point, the route turns east and follows Township Road 13 for four miles to County Road 59. The route then follows County Road 59 north for one mile to County Highway 46, where it turns east for 2.5 miles, and then follows TH 19 east for 4.5 miles to County Highway 7. The route turns north following County Highway 7 for 1.5 miles, before turning east to follow field lines for 9.5 miles. The route then heads north 0.5 miles and turns east, following County Highway 25 for 0.5 miles. At this point, the route continues to follow County Highway 25 and an existing 115 kV transmission line for 1.3 miles into the Minnesota River Valley. The route then follows the existing transmission line and County Highway 101 across the Minnesota River (Redwood Falls crossing) for almost one mile before it turns east cross-country across County Highway 15 until it meets an existing 115 kV transmission line located on the bluff east of the Minnesota River. The Alternate Route then follows the existing transmission line south, then east for 2.25 miles before heading north for 0.5 miles at 320th Street. The route then turns east to follow field lines for seven miles. At County Highway 5 the route turns south for 0.5 miles before going one mile east on County Highway 2. The actual route alignment may change to accommodate interconnection at the new Cedar Mountain Substation North area.

Figure 5-10. Alternate Route, Lyon County to Cedar Mountain

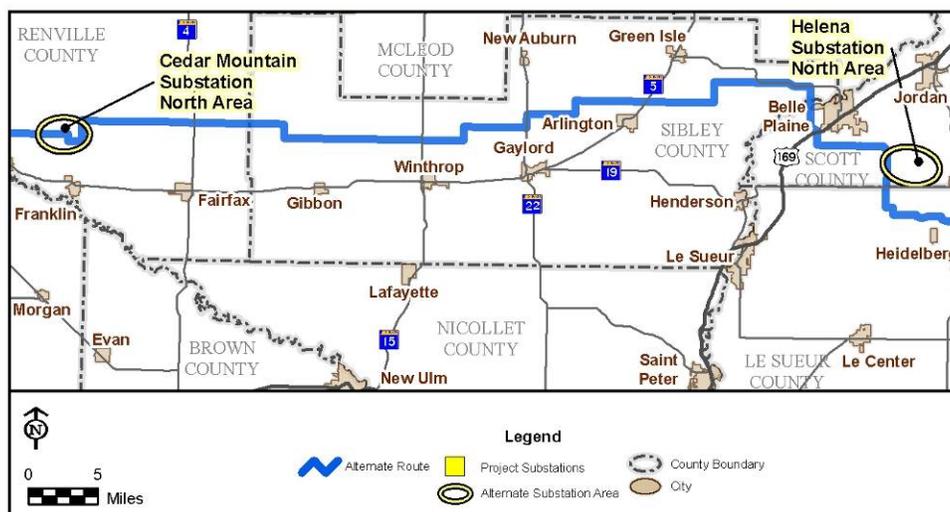


#### 5.2.4 CEDAR MOUNTAIN TO HELENA

The Cedar Mountain to Helena Alternate Route section begins at the proposed Cedar Mountain Substation North area and ends at the proposed Helena Substation North area west of New Prague. An overview of this section is shown in Figure 5-11. The Alternate Route heads north for 1.5 miles on 400th Street then turns east following a field line for one mile and 700th Avenue for two miles. The route then continues east along Renville County Highway 2 for nine miles, crossing TH 4, and along Sibley County Highway 10 for 1.5 miles. At this point, the route turns south for one mile on County Highway 22 and then turns east, following Township Road 193 for two miles, County Highway 10 for seven miles and field lines for four miles to County Highway 4, crossing TH 15. The route turns north for one mile following County Highway 4 and then turns east, following a combination of field lines and open fields for four miles and Township Road 184 for one mile, to TH 22, where it turns north for one mile. The route turns east following a township road for one mile, crossing a field for 0.5 miles, following County Highway 12 for 1.5 miles and crossing a field for 0.5 miles to County Highway 13. The route turns north following County Highway 13 for one mile and then turns east following a combination of field lines and 220th Street for 10 miles, crossing TH 5. At Township Road 128, the route heads 1.5 miles north and then turns east, following Township Road 161 for 0.5 miles, field lines for 1.65 miles, Township Road 160 for 0.85 mile and TH 25 for four miles. The route turns south for 1.7 miles following an existing 69 kV transmission line into the Minnesota River Valley and across the Minnesota River (West Belle Plaine crossing). The route continues south, then southeast along Stopperman Boulevard for 1.8 miles to U.S. Highway 169 and then south along German Road for one mile. The route then heads east along field lines for 1.5 miles, along 250th Street for 1.5 miles, through a field for 0.5 mile, along 250th Street for one mile, and across the north edge of O'Brien WMA for 0.2 mile. At this point, the route heads south, following Fabor Avenue for two miles, crossing the east edge of Michel Marsh WMA

at 270th Street. The route turns east along 270th Street for approximately one mile, then widens to one quarter mile to the Helena Substation North area for flexibility to avoid impacts.

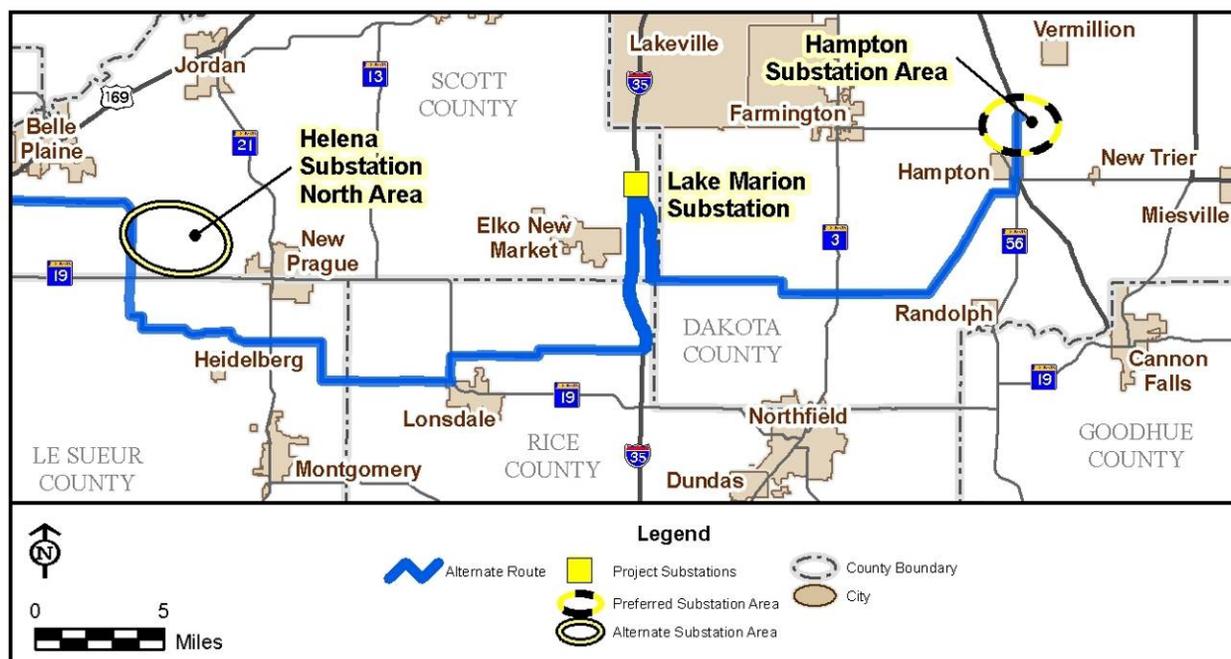
**Figure 5-11. Alternate Route, Cedar Mountain to Helena**



### 5.2.5 HELENA TO LAKE MARION

The Helena to Lake Marion Alternate Route section begins at the proposed Helena North Substation area and ends at the Lake Marion Substation northeast of Elko New Market. An overview of this section is provided in Figure 5-12. The Alternate Route heads south along Fabor Avenue for one mile, then follows field lines south for another 1.5 miles. At 296th Street the route turns east for 0.5 miles, then south for 0.5 miles on County Road 121. The route continues east on County Road 122 for 3.1 miles, following the south edge of Graham Lake. The route then cuts across agricultural fields for approximately one mile to County Road 143/171st Avenue, where it continues east along field lines for three miles, crossing TH 13 to County Road 146. The route turns south along County Rd 146 for 1.5 miles to Le Sueur County Highway 28 for one mile, Rice County Highway 2 east for four miles to TH 19 and the northwest corner of Lonsdale. The route jogs north for one mile on TH 19 and turns east to follow County Road 54/60th Street for 3.5 miles to Elmore Avenue. The route then heads north for 0.3 miles where it turns east on to 57th Street West for four miles to I-35. The Alternate Route heads north following I-35 for 6.75 miles to the Lake Marion Substation. The route widens to 3,000 feet to allow for flexibility to avoid impacts and for engineering considerations along I-35 and with the Lake Marion Substation.

Figure 5-12. Alternate Route, Helena to Lake Marion to Hampton



### 5.2.6 LAKE MARION TO HAMPTON

The Lake Marion to Hampton Alternate Route section begins at the Lake Marion Substation northeast of Elko New Market and ends at the proposed Hampton Substation area north of the City of Hampton. An overview of this section is shown in Figure 5-12. The Alternate Route exits the Lake Marion Substation and heads south for four miles following Pillsbury Avenue to County Highway 86. This section of the route is 2,800 feet wide to allow for flexibility in routing along Pillsbury Avenue. The route returns to 1,000-foot wide and turns east following County Highway 86 for five miles, crossing the south edge of Chub Lake WMA. The route turns south along field lines for 0.5 miles, then east for 5.8 miles following field lines and an existing pipeline to County Highway 47. The route then heads northeast for 4.5 miles following County Highway 47, then turns east for 0.8 miles along existing field lines. The route then turns north and northeast for 0.75 miles following field lines to U.S. Highway 52. The route then heads north through the east side Hampton for 2.5 miles following U.S. Highway 52 to enter the proposed Hampton Substation area. The actual route alignment may change to accommodate interconnection at the new Hampton Substation.

If the Alternate Route is selected, the portion of the line following U.S. Highway 52 would require coordination with the Twin Cities – La Crosse 345 kV project. The Twin Cities – La Crosse project is currently considering options in the vicinity of the proposed Project, including U.S. Highway 52. From a system planning perspective, these lines should be constructed as far from each other as reasonably possible. If the two 345 kV circuits are constructed on two separate structures, they would be treated separately in system analyses, that is, the loss of both lines would not be assumed in an N-1 analysis. However, if they are located parallel to each other, the risk of loss of both circuits due to a single catastrophic event such as a storm, would be the same. To minimize the risk of a coincident outage, the Applicants will seek to maximize the distance between the Project and the Twin Cities – La Crosse project.