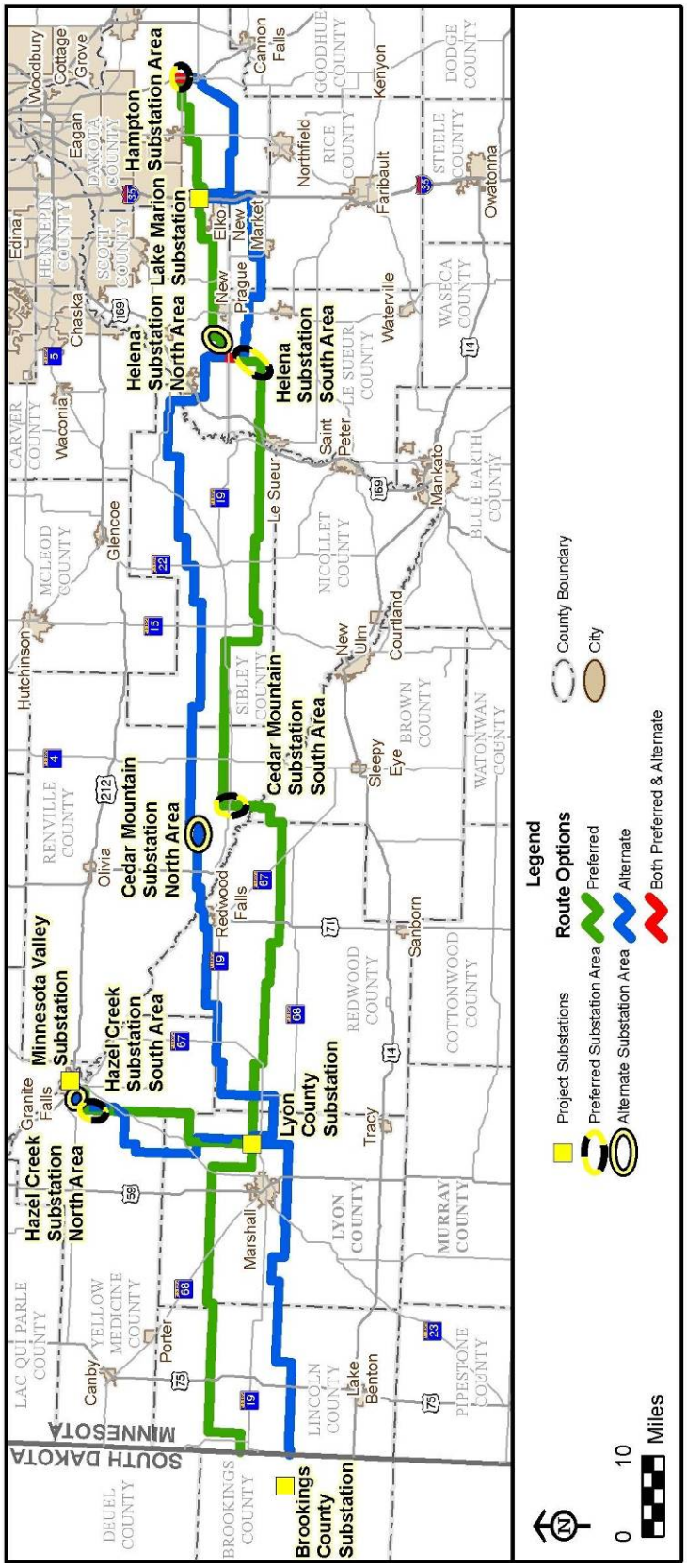
2.0 PROJECT INFORMATION

2.1 PROJECT LOCATION

The transmission facilities are proposed to be constructed across the state of Minnesota beginning in the west at the State border near Brookings County, South Dakota, to the southeast Twin Cities, near Hampton, Minnesota. The Minnesota portion of the Preferred Route is located in Lincoln, Lyon, Yellow Medicine, Chippewa, Redwood, Brown, Renville, Sibley, Le Sueur, Scott, and Dakota counties. The Minnesota portion of the Alternate Route crosses Lincoln, Lyon, Yellow Medicine, Chippewa, Redwood, Renville, Sibley, Le Sueur, Scott, Rice, and Dakota counties. Figure 2-1 shows an overview of the Project and Appendix A provides additional overview maps. Appendix B includes more detailed maps of the townships crossed by the proposed routes and substation locations described in this Application.

Figure 2-1. Project Overview, Minnesota Portion



2.2 PROJECT PROPOSAL

The Project is designed to meet three needs: 1) regional reliability, 2) generator outlet, and 3) community reliability. The precise configuration for the Project, substation to substation, is as follows: Brookings County – Lyon County – Cedar Mountain – Helena – Lake Marion – Hampton and Lyon County – Hazel Creek – Minnesota Valley. The combined length of the transmission line facilities in Minnesota will be 237 to 262 miles long, depending on whether the Preferred Route or Alternate Route is selected. The sections between the Lyon County and Helena substations will be constructed as double circuit 345 kV. All other sections will be constructed on double circuit-capable poles with one circuit strung upon installation. It is anticipated that the second circuit will be installed on these poles at some point in the future when conditions warrant. All sections except the Hazel Creek – Minnesota Valley section will be operated at 345 kV. The Hazel Creek – Minnesota Valley section will be constructed at 345 kV specifications but will initially be operated at 230 kV.

The specific components of the Project, including associated facilities, are described below:

- **Brookings County Substation – Lyon County Substation 345 kV transmission line:** This section will be built with double circuit structures, with one circuit strung at the time of installation. A second circuit can be added to this double circuit-capable section in the future when conditions warrant. The length of this section in Minnesota is approximately 50 miles long (an additional four to eight miles extends to the Brookings County Substation in South Dakota) and passes through Lincoln and Lyon counties.
- **Lyon County Substation – Hazel Creek Substation – Minnesota Valley Substation 345 kV transmission line:** These sections will also be constructed as double circuit structures with one circuit strung upon installation. The new facilities will replace the existing Lyon County – Minnesota Valley 115 kV transmission line. The Hazel Creek Substation – Minnesota Valley Substation section will be initially operated at 230 kV. The section is approximately 29 to 34 miles long and passes through Lyon, Yellow Medicine, and Chippewa counties.
- **Lyon County Substation – Cedar Mountain Substation – Helena Substation 345 kV transmission line:** These sections will be constructed as double circuit facilities, *i.e.*, two circuits operational upon installation. The Lyon County to Cedar Mountain section is 51 to 53 miles long and passes through Lyon, Redwood, Brown, and Renville counties. The Cedar Mountain to Helena section is 62 to 74 miles long and passes through Renville, Sibley, Le Sueur, and Scott counties.
- **Helena Substation – Lake Marion Substation – Hampton Substation 345 kV transmission line:** These sections will be constructed as double circuit structures with one circuit strung upon installation. The Helena to Lake Marion section is 26 to 31 miles long and passes through Le Sueur, Rice, and Scott counties. The Lake Marion to Hampton section is 18 to 24 miles long and passes through Scott and Dakota counties.
- A new Hazel Creek Substation south of Granite Falls, Minnesota.
- A new Helena Substation near New Prague, Minnesota. This new substation will be located in either Helena or Derrynane Township west of New Prague.
- A new Cedar Mountain Substation near Franklin, Minnesota.
- A new Hampton Substation near Hampton, Minnesota.

- Modifications and additions to four substations (Brookings County, Lyon County, Lake Marion and Minnesota Valley) to accommodate the new transmission line facilities.
- Transmission system connections between the Cedar Mountain Substation and the existing Minnesota Valley – Franklin – New Ulm 115 kV transmission line; the Helena Substation and the existing Wilmarth – Blue Lake 345 kV transmission line; and the Hampton Substation and the existing Prairie Island – Blue Lake 345 kV transmission line.

More information on the substations follows in Section 2.4.

For the 345 kV facilities, the Applicants propose to use single steel structures, which will typically require a 150-foot right-of-way ("ROW") for the majority of the route. In some limited circumstances, specialty structures, such as H-frames or triple circuit poles, may be used. In such cases, a ROW of up to 180 feet may be required. Up to 100 feet of ROW will be required for the 115 kV transmission line connections to the Cedar Mountain Substation near Franklin.

2.3 ROUTE WIDTH

The PPSA, Minnesota Statutes Chapter 216E, directs the Commission to locate transmission lines in a manner that "minimize[s] adverse human and environmental impact while ensuring continuing electric power system reliability and integrity and ensuring that electric energy needs are met and fulfilled in an orderly and timely fashion." Minn. Stat. § 216E.02, subd. 1. The PPSA further authorizes the Commission to meet its routing responsibility by designating a "route" for a new transmission line when it issues a Route Permit. The route may have "a variable width of up to 1.25 miles," within which the ROW for the facilities can be located.

The purpose of the Route Permitting process is not to establish an exact centerline for a transmission line but rather to establish a general alignment that best balances competing land use, human settlement, and environmental interests. Once a route is established by the Commission, the utility then does more detailed engineering and contacts landowners to gather additional detailed information about the circumstances of their property. Only after considering all inputs does the utility establish an exact centerline and pole placement. A "route" designation by the Commission should be wide enough to provide flexibility for the utility to work with landowners to adjust final design. Once the utility establishes a centerline and structure placement, construction drawings are provided to the Commission so the Commission can confirm the utility's plans are consistent with the Route Permit.

At the same time, a "route" designation cannot be so wide that it is unclear what the intended general alignment of the transmission line is meant to be. In a forest setting where there are large expanses of woodlands without discernable property boundaries or other obvious routing opportunities, it may be appropriate to establish a "route" a mile or more wide so that the utility can work with resource managers and property owners to establish a centerline. However, in an agricultural or mixed use setting there typically are multiple alignment choices with different types of impacts within a mile-wide "route" corridor. Thus, a narrower "route" is usually appropriate.

For this Project, the Applicants propose a "route" approximately 1,000 feet wide for the majority of the Project. Roads, property boundaries, fence lines, and other routing opportunities typically are found in quarter-mile intervals in the land use settings in the Project area. Human settlement in rural areas also tends to have a similar quarter-mile pattern. By narrowing the "route" to 1,000 feet, the intended alignment and associated land use features are more clear. In areas near new substations, Applicants request a route width of up to 1.25 miles to accommodate system interconnections. The

Applicants also request a route width of up to 1.25 miles in the following areas to address site specific concerns:

Preferred Route

- At the Brown County crossing of the Minnesota River near County Highway 8 in Brown County,
- At the Le Sueur Wastewater Treatment Pond crossing of the Minnesota River near Le Sueur,
- In Helena Township, along 270th Street from 0.5 mile east of Church Avenue to Aberdeen Avenue,
- Along the Preferred Route, east of Natchez Avenue and just north of 245th Street, approaching the Lake Marion Substation from the west,
- South and east out of the Lake Marion Substation along Pillsbury Avenue.

Alternate Route

- At the crossing of the Redwood River southwest of Marshall,
- On the west side of the Redwood crossing of the Minnesota River, northeast of Redwood Falls, and
- Along I-35 and Pillsbury Avenue into and out of the Lake Marion Substation.

Typically the land use feature the Applicants anticipate following with the transmission line is in the center of the proposed "route" and identified on the maps as the route centerline. The Applicants have used the route centerline to estimate the various impact measures presented in the analysis. In some circumstances the impacts of the transmission line may be more sensitive to the centerline chosen. For example, along the interstate highway, agricultural impacts will be different depending on how close poles can be placed to the edge of the road ROW. In those circumstances, the Applicants provide more detailed analysis of several alignments within the proposed "route". See Appendix E.

In summary, the routes the Applicants propose are approximately 1,000 feet wide and centered on the proposed alignment for the majority of the route. In some places a route width of up to 1.25 miles is requested to facilitate system interconnection and to address specific land use concerns. By keeping the "route" at these widths, the Applicants maintain the ability to work closely with landowners to develop detailed design and pole placement. If there is environmental or land use information that should cause the route to be narrowed further in some areas, the Applicants hope interested parties will bring it forward during this routing proceeding.

2.4 ASSOCIATED FACILITIES

The associated facilities for the Project include construction of four new substations, modifications to four existing substations and transmission line connections required for the Project to meet the needs identified. The four new substations are: Hazel Creek, Cedar Mountain, Helena, and Hampton. Applicants will seek to acquire 40 acres for each of these substations to ensure adequate space for planned facilities, future facilities and buffer area. The existing substations are Brookings County (South Dakota), Lyon County, Minnesota Valley and Lake Marion.

All existing substations except for the Minnesota Valley Substation will be expanded. The anticipated expansion areas for these substations will be up to 16 acres. The detailed location plans will be dependent on the final route selection and final substation design. See Appendix D.1 for a map of the existing substations and proposed substation area locations. Transmission system connections are required at the Cedar Mountain, Helena and Hampton substations. The Minnesota substations and system connections are described in more detail below.

2.4.1 LYON COUNTY SUBSTATION (EXISTING)

The Project includes the expansion of the existing Lyon County 115/69 kV Substation by adding four to six acres of fenced and graded substation area and associated equipment. The substation expansion is proposed to extend to the north and east and may require acquisition of additional land depending on final transmission line route selection and final substation design (Appendix D.2). The substation expansion will upgrade the system with 345 kV equipment, including one 345 kV breaker and a half-yard with nine breaker positions and five breakers. One new 345 kV transformer (448 MVA), one future 345 kV transformer position and associated line switches, foundations, steel structures, and control panels will be installed to integrate this transformer into the existing equipment. The existing 115 kV yard will be expanded with two additional breakers and a total of six breaker positions. Two circuit breakers and capacitor banks will be installed.

2.4.2 HAZEL CREEK SUBSTATION (NEW)

Construction of a new Hazel Creek 345/230/115 kV substation will require five to 10 acres of fenced and graded substation area. The Applicants have identified two substation siting areas (Appendix D.3). The north area ("Hazel Creek Substation North area") is located in Minnesota Falls Township, south of TH 67 and north of 260th Avenue. The south area ("Hazel Creek Substation South area") is located in Minnesota Falls and Hazel Run townships generally between County Highway 43 and 530th Street. Equipment to be installed includes 345 kV equipment (one 345 kV breaker and a half-yard with nine breaker positions and five breakers with one new 345 kV (336 MVA) transformer and one future 345 kV transformer position), 230 kV equipment (a 230 kV yard with nine breaker positions and five breakers, one new 230 kV transformer, and one future 230 kV transformer position), and reactive support on the 115 kV yard. The substation will also include the associated line switches, foundations, steel structures and control panels. The substation yard will require access roads.

2.4.3 MINNESOTA VALLEY SUBSTATION (EXISTING)

Equipment additions to the existing Minnesota Valley 115/69 kV Substation are required for the Project (Appendix D.4). These additions include a 230 kV breaker and a half-yard with nine breaker positions and five breakers and the associated foundations, steel structures and control panels. It is not anticipated that additional land will be required to accommodate the upgraded facilities.

2.4.4 CEDAR MOUNTAIN SUBSTATION (NEW)

A new Cedar Mountain Substation near Franklin is also proposed. The Applicants have identified two substation siting areas, depending on the final route selection, one southeast of Franklin ("Cedar Mountain Substation South area") (Appendix D.5) and one north of Franklin ("Cedar Mountain Substation North area") (Appendix D.6). The new substation will require four to six acres of fenced and graded area depending on the final route selection and final substation design. The new substation will be designed and constructed with a 345 kV breaker and a half-yard with nine breaker positions and five breakers, one 345 kV transformer (448 MVA) and one future transformer

position. A 115 kV breaker and a half-yard will be constructed with six to nine breaker positions and two breakers and a 115 kV bus with circuit breakers and reactive support. The new substation will require line switches, a control house, relay panels, foundations, steel structures, and switches. The substation yard will require access roads.

The Cedar Mountain Substation will connect with the Minnesota Valley - Franklin - New Ulm 115 kV transmission line. The new 115 kV transmission line will be a single circuit wood or steel horizontal post structure. The typical span length will be approximately 350 feet with a ROW of up to 100 feet.

The Applicants have identified two potential routes between the Franklin to New Ulm 115 kV transmission line and the Cedar Mountain Substation South area (Appendix D.7-D.9). The first alternative ("Reroute A") taps the existing Franklin to New Ulm 115 kV transmission line approximately one mile east of the existing Franklin Substation. It runs approximately 0.75 miles to the proposed Cedar Mountain Substation South area (Appendix D.7). The second alternative ("Reroute B") will tap the existing Franklin to New Ulm 115 kV transmission line and extends approximately 0.25 to 0.5 miles to the proposed Cedar Mountain Substation South area (Appendix D.8).

Additionally, the Applicants have identified one potential route between the Minnesota Valley to Franklin 115 kV transmission line and the Cedar Mountain Substation North area (Appendix D.9). The new transmission line ("Reroute C") taps the existing Minnesota Valley to Franklin 115 kV transmission line and would run approximately two miles to the proposed Cedar Mountain Substation North area (Appendix D.9). With Reroute C, there is an option to route the new 115 kV transmission line directly into the existing Franklin Substation. Additionally, the existing Minnesota Valley to Franklin 115 kV transmission line runs through the Cedar Mountain Substation North area, and could also be tapped for the proposed transmission line.

2.4.5 HELENA SUBSTATION (NEW)

The Project will require construction of a new substation near Helena. The Applicants have identified two substation siting areas, depending on the final route selection, one west of Heidelberg in Derrynane Township, Le Sueur County ("Helena Substation South area") and one northwest of New Prague in Belle Plaine and Helena townships, Scott County ("Helena Substation North area"). The substation fenced and graded area will be approximately three to five acres depending on final route selection and final substation design. The new substation will initially be designed and constructed with one 345 kV breaker and a half-yard with nine breaker positions and five breakers. The new substation will require line switches, a control house, relay panels, foundations, and steel structures. The substation yard will require access roads. The Helena Substation will also include sufficient space for a future 115 kV substation yard and a future 345 kV transformer.

The Helena Substation will also connect with the Wilmarth – Blue Lake 345 kV transmission line. If the Helena Substation is sited away from the Wilmarth – Blue Lake 345 kV transmission line, a tap may be required to interconnect it to the Helena Substation.

2.4.6 LAKE MARION SUBSTATION (EXISTING)

The Project will require an expansion of the existing Lake Marion Substation of 12 to 16 acres of fenced and graded substation area to house necessary equipment (Appendix D.12). The equipment includes a 345 kV breaker and a half-yard with six breaker positions and three breakers, one new 345 kV transformer (448 MVA) and one 345 kV transformer position. The expansion will also include

expansion of the 115 kV yard to breaker and a half configuration with a total of twelve breaker positions and five breakers, and a 115 kV bus with circuit breakers and capacitor banks. The construction will include the associated line switches, foundations, steel structures and control panels.

2.4.7 HAMPTON SUBSTATION (NEW)

The Project will require construction of a new substation near Hampton (Appendix D.13). The Applicants have identified one substation siting area for the substation ("Hampton Substation Area") that can be used as part of the Preferred Route or Alternate Route. The substation fenced and graded area will be approximately three to five acres depending on final route selection and final substation design. The new substation will be designed and constructed with one 345 kV breaker and a half-yard with nine breaker positions and five breakers. The new substation will require line switches, a control house, relay panels, foundations, and steel structures. The substation yard will require access roads.

The Hampton Substation will be designed to connect with the existing Prairie Island – Blue Lake 345 kV transmission line. To make this connection, the Prairie Island – Blue Lake 345 kV transmission line will need to be split prior to the connection point, creating two transmission lines. As a result, two transmission lines will be built to the new Hampton Substation. If the Hampton Substation is located within one mile of the Prairie Island – Blue Lake 345 kV transmission line, the two connecting transmission lines could be placed on double circuit structures consistent with North American Electric Reliability Corporation ("NERC") criteria. If the Hampton Substation is located more than one mile away, a portion or all of the two connecting transmission lines will be built on separate single circuit poles.

2.5 PROJECT SCHEDULE

An expected permitting and construction schedule for the Project is outlined below.

Minnesota Certificate of Need..... Spring 2009
Minnesota Route Permit.....January 2010
South Dakota Facility Permit.....January 2011
Environmental permits .....First Quarter 2012
Pre-construction activities ..... First Quarter 2010 to Third Quarter 2011
Construction..... Fourth Quarter 2011 to Second Quarter 2013
Project completion .....Second Quarter 2013

2.6 PROJECT COSTS ANALYSIS

2.6.1 PROJECT COSTS

The Project costs include the survey, engineering, materials, construction, ROW, and project management associated with the transmission line and substations. Project costs (estimated in 2007 dollars) are summarized in Table 2-1 and Table 2-2. The Hampton and Hazel Creek substations were not originally included in the Brookings County – Hampton Project cost estimates in the Certificate of Need proceedings, but are now included in the Project costs for this Route Application.

Table 2-1. Estimated Transmission Line Construction Costs, Preferred Route and Alternate Route

Route Section	Total Cost – Preferred Route (millions)[1]	Total Cost – Alternate Route (millions) [1]
Brookings County to Lyon County	$97.9	$97.9
Lyon County to Minnesota Valley	$62.7	$69.0
Lyon County to Cedar Mountain	$127.6	$129.2
Cedar Mountain to Helena	$152.5	$176.3
Helena to Lake Marion	$83.9	$93.5
Lake Marion to Hampton	$57.9	$72.2
Total	**$582.5**	**$638.1**

[1]Transmission costs include materials, engineering, survey, ROW, and project management in 2007 dollars.

Table 2-2. Substation Modifications and Construction Cost Estimate

Substation	Status	Total Cost[1]
Brookings County Substation	Existing	$3.8 million
Lyon County Substation	Existing	$17.2 million
Cedar Mountain Substation Area	To be constructed	$19.9 million
Helena Substation Area	To be constructed	$12.2 million
Lake Marion Substation	Existing	$17.3 million
Hampton Substation Area	To be constructed	$12.3 million
Hazel Creek Substation	To be constructed	$25.8 million
MN Valley Substation	Existing	$9.0 million
Total		**$117.5 million**

[1]Substation costs include materials, engineering, survey, ROW, and project management in 2007 dollars.

The total cost of the Project is between $700 million and $755 million.

2.6.2 OPERATION AND MAINTENANCE

The primary operating and maintenance cost for transmission lines is the cost of inspections, usually done monthly by air and by ground once a year. Annual operating and maintenance costs for transmission lines in Minnesota and the surrounding states vary depending upon the setting, the amount of vegetation management necessary, storm damage occurrences, structure types, materials used and the transmission line's age. For 115 kV through 345 kV transmission lines, past experience has shown that costs are approximately $300 to $500 per mile.

Substations require a certain amount of maintenance to keep them functioning in accordance with accepted operating parameters and the National Electric Safety Code ("NESC"). Transformers, circuit breakers, batteries, protective relays and other equipment need to be serviced periodically in accordance with the manufacturer's recommendation. The site itself must be kept free of vegetation and drainage must be maintained.

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