4.0 ROUTE SELECTION PROCESS

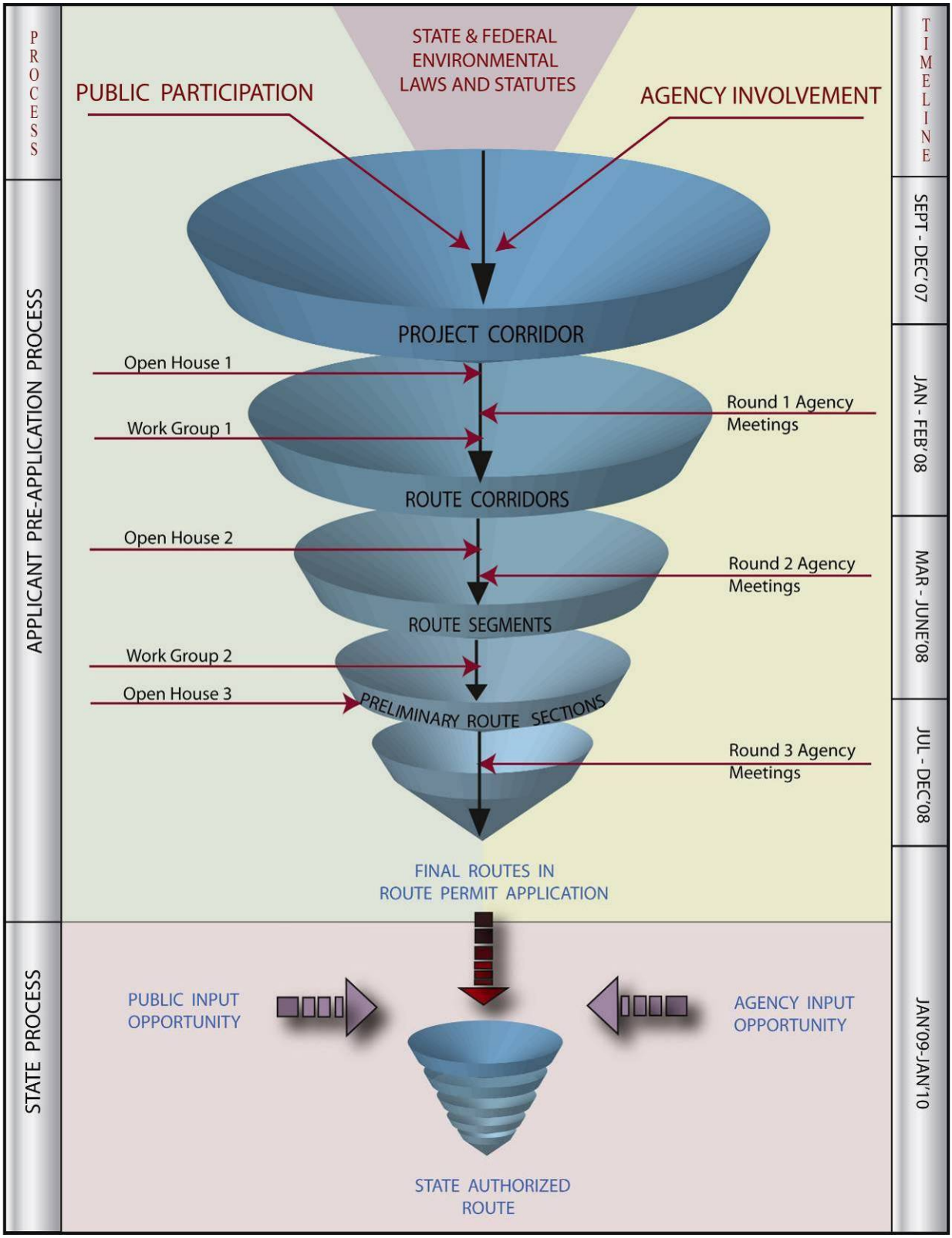
The 15-month route development process was driven by an extensive public participation and agency coordination effort. More than 23,000 addresses in the Project area received regular mailings, which informed landowners of the Project, described opportunities to be involved in the routing process, identified where additional information could be obtained, and explained how to submit comments to the Applicants. The Applicants gathered environmental data, collected public comments and applied the factors listed in Minnesota Rule 7849.5910 (and reflected in Minnesota Statutes Section 216E.03, subdivision 7) to develop the Preferred Route and the Alternate Route for the Project. This process is described in the sections below. Additional supporting information is provided in Appendix C.

4.1 SUMMARY OF ROUTE SELECTION PROCESS AND GUIDING FACTORS

The Applicants began their analysis by collecting Geographic Information System ("GIS") data from local, State and federal agencies for a 12-mile-wide corridor from the Brookings County Substation to Hampton ("Project Corridor"). Applicants used this data set, along with data collected during field visits to the Project Corridor, to develop an initial Project base map. Through a series of public and agency meetings, the Applicants refined the Project Corridor into narrower bands of potential route areas within the Project Corridor. These "route corridors" were further refined into more than 1,800 "route segments" that ranged in length from a fraction of a mile to several miles. These segments were then linked to make the connections between substations ("Preliminary Route Sections"). Applicants then compared and analyzed the route segments to develop two distinct routes, the Preferred Route and the Alternate Route. Figure 4-1 represents this route selection process.

The Applicants held several types of meetings as part of the route selection process. The first public meetings were called open houses, described in Section 10.3.1. A second type was routing work group meetings, described in Section 10.3.2. Several rounds of both types of meetings were held during the route selection process.

Figure 4-1. Overview of the Route Selection Process



The primary set of principles guiding the route selection process was the factors set forth in Minnesota Rules 7849.5910:

A. effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services;

B. effects on public health and safety;

C. effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining;

D. effects on archaeological and historic resources;

E. effects on the natural environment, including effects on air and water quality resources and flora and fauna;

F. effects on rare and unique natural resources;

G. application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity;

H. use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries;

I. use of existing large electric power generating plant sites;

J. use of existing transportation, pipeline, and electrical transmission systems or rights-of-way;

K. electrical system reliability;

L. costs of constructing, operating, and maintaining the facility which are dependent on design and route;

M. adverse human and natural environmental effects which cannot be avoided; and

N. irreversible and irretrievable commitments of resources.

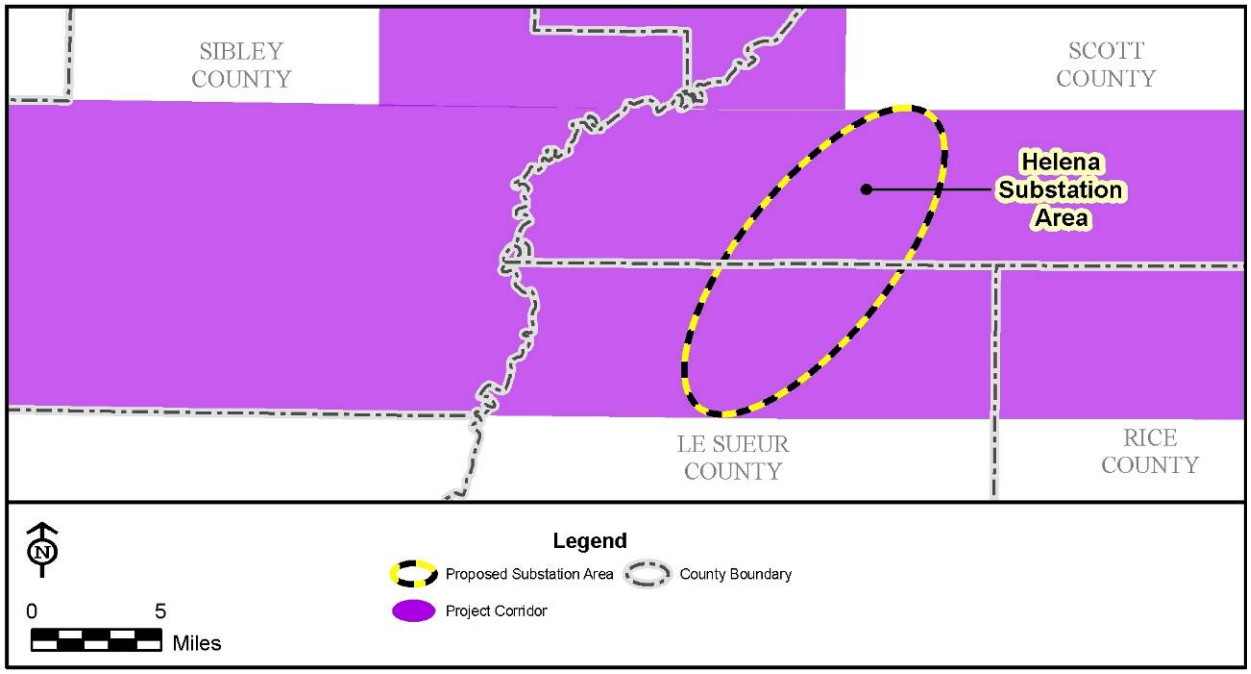
These State routing criteria established the guidelines the Applicants applied when making decisions about potentially eliminating routes or advancing certain segments and in developing the routes proposed in this Application. The Applicants analyzed the route segments at increasingly detailed levels following each round of public and agency involvement.

4.2 PROCESS CHRONOLOGY AND DETAILS

4.2.1 PROJECT CORRIDOR: SEPTEMBER 2007 TO MARCH 2008

In September 2007, the Applicants held public open house routing meetings throughout the Project area. At these meetings, the initial Project Corridor was presented on aerial photograph background maps. Figure 4-2 shows an example of a Project Corridor map. These meetings were held at 10 central locations throughout the Project area. Public open house meetings are described in detail in Section 10.3.1. During these meetings, the Applicants described the Project, answered questions and sought input on routing opportunities and constraints in the Project Corridor. The Applicants included all comments in a database. Comments that related to a particular location were recorded and later digitized into a GIS comment database. Additional public outreach efforts are described in Chapter 10.0.

Figure 4-2. Example of a Project Corridor Map (Cedar Mountain-Helena Section)



During the first round of agency meetings in January and February 2008, the same Project Corridor map was presented in 14 meetings with stakeholders, including federal, State, and local agencies. The Applicants sought initial comments from meeting participants similar to those solicited at the public open houses. The agencies described sources of concern, recommended avoidance areas, and suggested route segments. Agency involvement is described in detail in Section 10.1.

In February and March 2008, the Applicants conducted eight routing work group meetings across the Project area to discuss route selection within the Project Corridor. At these meetings, facilitators guided small group discussions to identify the issues within each county that should be considered when developing routes. Resources valued by the meeting participants were identified and opinions and comments regarding routing the Project were collected. Routing work group meetings are described in detail in Section 10.3.2.

Concurrent with public and agency involvement, the Applicants updated GIS data from public sources and agencies. The data collection component of the route selection process was important to identify resources and features as accurately and completely as possible.

Following these meetings, the Applicants reviewed public and agency comments and began the initial route analysis. Avoidance areas were identified and screened based on certain regulatory, zoning and land use requirements, and engineering considerations. For example, the Commission's routing rules prohibit the routing of transmission line facilities in scientific and natural areas ("SNAs") or State parks (Minnesota Rules 7749.5930). Transmission line construction is also limited near airports due to Federal Aviation Administration ("FAA") height restrictions, which prohibit transmission line structures above a certain height depending on the distance from the specific airport. Additionally, areas with a concentration of open water or large lakes were also avoided, due

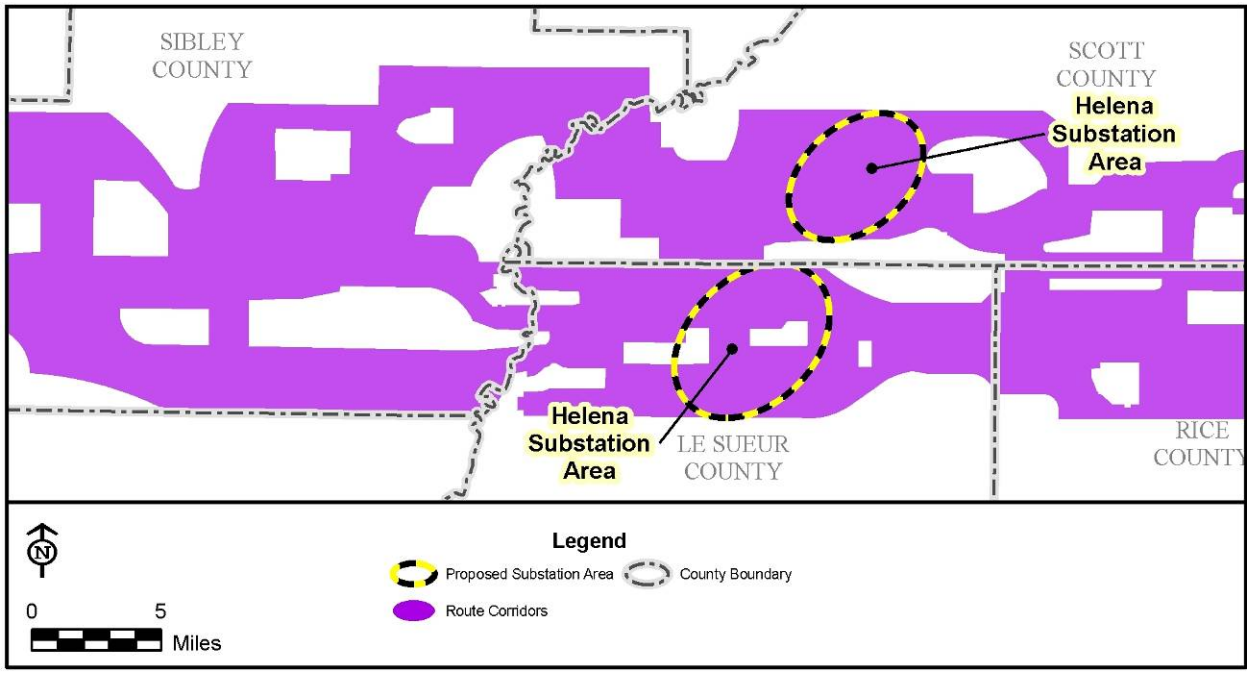
to the engineering and environmental impacts (*e.g.*, fish and avian impacts) associated with these areas.

After the first round of open houses, agency meetings, routing work groups, and data collection, the Project Corridor was refined and Route corridors, one mile to four miles wide, were developed. Route corridors are discussed in the next section.

4.2.2 ROUTE CORRIDORS: MARCH TO MAY 2008

Using the narrowed Route corridors like those shown in Figure 4-3 as a starting point, the Applicants continued to solicit public input through a second round of seven routing open houses. The Applicants sought suggestions for possible route segments and asked participants to identify important features and resources. The meeting participants discussed how stakeholders valued different State routing criteria. This information was documented on hard copy aerial maps and in the GIS database.

Figure 4-3. Example of a Route Corridors Map



The Applicants also had seven agency meetings to clarify requirements for transmission line routing across lands with State and federal interests, ascertain key interests of the various agencies, and establish protocol for ongoing communication. Data collection continued, including records from the open house and data gathered from agencies. A comprehensive database of GIS information was compiled.

After these meetings took place, the Applicants reviewed public and agency comments and developed possible route segments throughout the Route corridors that ranged from a fraction of one mile to several miles in length. The Applicants' goal was to develop many possible route segments, which would be presented to the public and agencies before routes were identified. In accordance with State routing criteria, route segments typically followed existing infrastructure including roads, transmission lines, pipelines, and fence rows between agricultural fields. All route

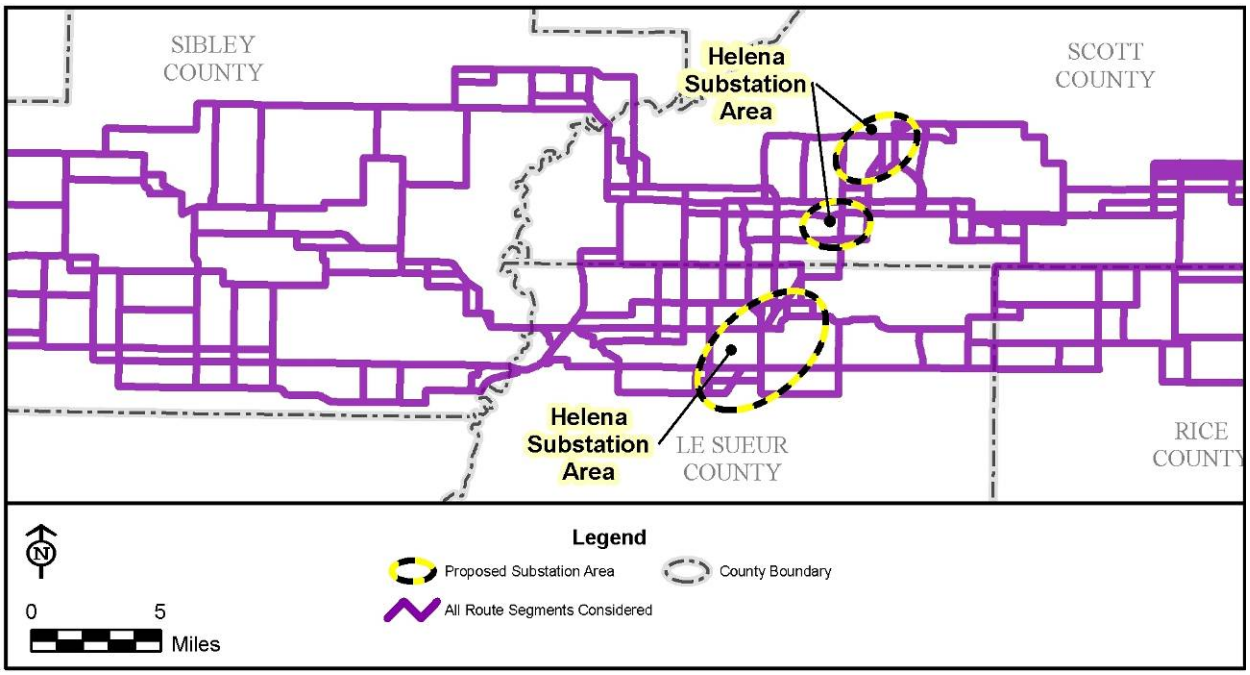
segments suggested in public and agency meetings were included, including some segments located outside the Project Corridor. An example of a route segments map is shown in Figure 4-4.

4.2.3 ROUTE SEGMENTS/ROUTE SEGMENT CHAINS: MAY TO AUGUST 2008

A comprehensive effort to identify potential route segments was undertaken in the third stage of the route selection process. As with the previous stage, public participation, agency involvement, and data collection drove the revision of the routes.

This portion of the route selection process started with public participation in a second round of routing work group meetings. Participants at these seven meetings commented on concerns related to the route segments (Figure 4-4) within each county across the Project area. Upon public request, several additional route segments outside of the initial Project Corridor were considered.

Figure 4-4. Example of a Route Segments Map



4.2.3.1 State Routing Criteria

To further refine the route segments, the Applicants applied the State routing criteria guided by the input received from public and private stakeholders.

Many of the concerns voiced at the routing public open houses, routing work group meetings, and agency meetings were universal across the Project area. The most common concern was to minimize impacts to homes. Another common theme was to collocate the route with existing corridors such as roads, existing transmission lines, and fence lines where possible to minimize impacts.

Meeting participants in agricultural areas of the Project area tended to value land use in the context of economic outputs of the land. Concerns regarding impacts to agricultural production were commonly voiced at these public meetings. Communities near developing urban areas generally valued land use in the context of suburban development pressure. Stakeholders tended to value agricultural and environmental preservation.

4.2.3.2 Route Segment Analysis

Once route segments were identified, Applicants completed a detailed analysis of the relative merits of the segments with respect to State routing criteria (Minn. R. 7849.5910). All route segments suggested by stakeholders were included in the route segment analysis.

To compare route segments, the Applicants reviewed aerial photo maps with natural resource and human environment data layers visible. Public comments were denoted on the maps and referenced in a GIS database. The Applicants considered the data collected during agency meetings, routing open houses and routing work group meetings, and regularly referenced public comments while comparing route segments. The suitability of each route segment in relation to the State routing criteria was documented in GIS. Applicants analyzed more than 1,800 route segments and narrowed it to approximately 430 route segments.

The remaining segments were then combined with other route segments to create "route segment chains" between locations where route segments converge, such as substations and river crossings. Between these "convergence points," route segment chains that best minimized impacts consistent with the State routing criteria were documented as a unit. Route segment chains were typically five to 15 miles long. If there were several common route segment chains, each was comparatively analyzed to others in the same geographic area by applying the State routing criteria again. The Applicants also considered the comments expressed in the public and agency participation process. The impacts of route segments within a chain were evaluated and compared to the impacts of route segment chains connecting the same geographic areas.

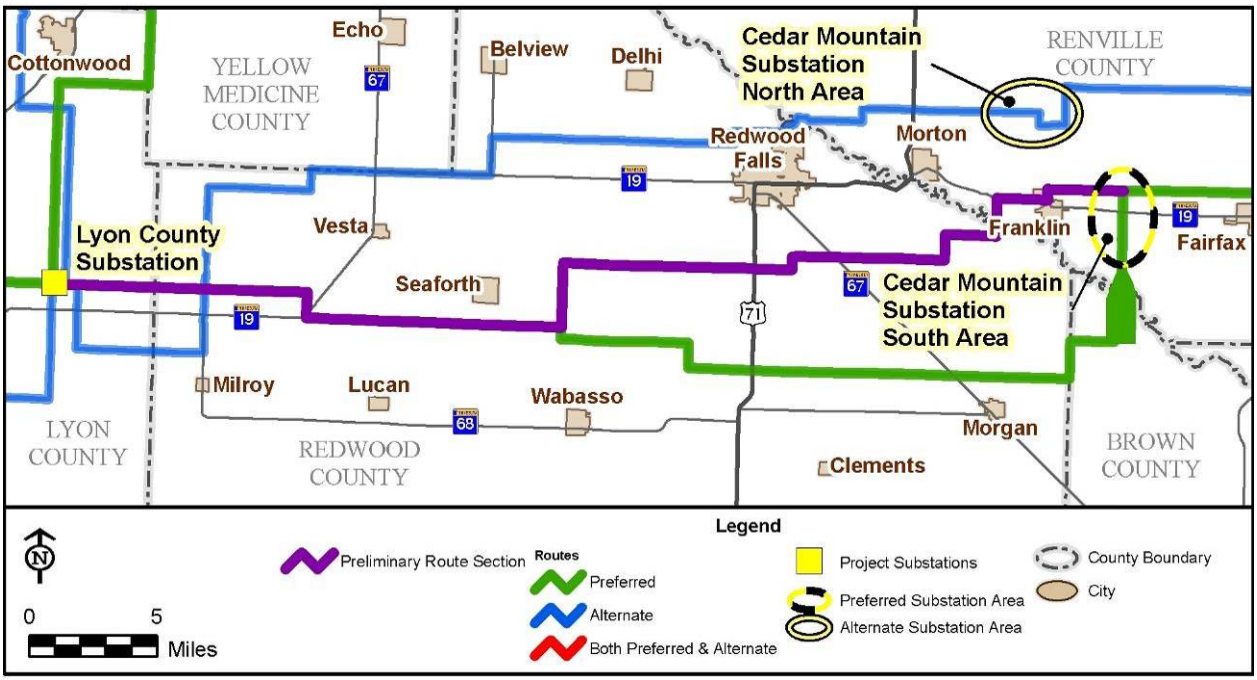
Rationale for each selection was documented for combinations of route segment chains and is summarized in Section 10.4.

4.2.3.3 Preliminary Route Sections

In the next stage of route development, the route segment chains were combined to develop Preliminary Route Sections composed of combinations of route segment chains that created linear routes between substations. See Figure 4-5 for an example of a Preliminary Route Sections map.

Internal quality assessment and quality control procedures were utilized to ensure the selection process and results were accurate, consistent, rational, and inclusive of all data and comments in the Applicants' inventory. The Preliminary Route Sections remained under consideration through final public and agency outreach activities.

Figure 4-5. Example of a Preliminary Route Sections Map



4.2.4 FINALIZATION OF PREFERRED AND ALTERNATE ROUTE: AUGUST TO NOVEMBER 2008

To finalize the routes proposed in this Application, Applicants sought further input from the public and interested agencies.

The Preliminary Route Sections were presented at the final round of routing public open house meetings in August 2008 (at six locations) and comments were sought from participants. As with all previous open houses, questions were addressed and comments heard, and locations of features and resources important to participants were recorded. Comments on the Preliminary Route Sections and any new routes suggested by the public were documented for further evaluation.

In fall 2008, the Applicants held a final round of approximately 20 meetings with local, State and federal agencies. Impacts were summarized and compared to Preliminary Route Sections in the vicinity. State routing criteria were applied and public and agency comments were considered. Comments and Preliminary Route Sections adjustment suggestions as of mid-October 2008 were considered and incorporated into the Route Permit Application.

4.3 RATIONALE FOR SELECTING PREFERRED ROUTE

The Applicants selected the routes based on the factors identified in the State routing criteria, and considered the varying values placed on these resources as evidenced by the diverse and sometimes conflicting opinions heard during the public and agency involvement process. The Applicants chose one distinct Preferred Route and one distinct Alternate Route to submit to the OES in the Route Permit Application. Both routes minimize adverse human and environmental impacts while ensuring continuing electrical power system reliability, and are consistent with State goals to conserve resources, minimize environmental impacts, and minimize human settlement and other land use

conflicts. Applicants concluded that the Preferred Route was preferred over the Alternate Route because it impacts fewer homes within 500 feet of the proposed route centerline, makes better use of existing ROWs, minimizes impacts to prime farmland, minimizes impacts to natural resources and archaeological sites, and has fewer overall line miles. Because the Preferred Route has fewer overall line miles, it impacts less land, including agricultural land, and is less costly.

Table 4-1summarizes the Applicants' application of the factors set forth in Minnesota Rule 7849.5910 to the Preferred Route and Alternate Route. This analysis is based on the alignment proposed for Preferred Route and the alignment proposed for the Alternate Route.

Table 4-1. Summary of Impacts and Factors Considered

Factor	Preferred Route and Associated Facilities	Alternate Route and Associated Facilities	Summary
Effects on Human Settlement			
Displacement	No displacement is anticipated.		
Noise	Transmission line and substation noise levels are not predicted to exceed Minnesota Pollution Control Agency ("MPCA") noise limits.		
Aesthetics	Will likely affect visual quality and area aesthetic within close proximity of the transmission line. Crosses the Minnesota River, a scenic byway, and a historic federal highway. Recreational resources are also located nearby. There are 310 homes within 500 feet of the route centerline.	Will likely affect visual quality and area aesthetic within close proximity of the route. Crosses the Minnesota River where it is designated scenic by the State of Minnesota, a scenic byway, and a historic federal highway. Recreational resources are also located nearby. There are 319 homes within 500 feet of the route centerline.	Both routes impact aesthetics similarly. The Alternate Route crosses the Minnesota River where the river is designated scenic. The Preferred Route does not cross the Minnesota River at any location where it is designated scenic. There are slightly fewer homes within 500 feet of the Preferred Route centerline.
Cultural Values	No impacts to cultural values are anticipated.		
Recreation	There are four Wildlife Management Areas ("WMAs") along the route, resulting in an estimated 275 ft^2 of permanent. There are twelve snowmobile trails that cross the route. There is also one SNA, but no Waterfowl Protection Areas ("WPAs") within a mile of the Preferred Route.	There are nine WMAs along the route, resulting in an estimated 495 ft^2 of permanent impacts. There are sixteen snowmobile trails that cross the route. There is also one SNA, and two WPAs within a mile of the Alternate Route.	The Preferred Route has fewer impacts to recreation resources.
Public Services	No impacts to Public Services are anticipated.		
Effects on Public Health and Safety			
Public Health and Safety	The Applicants will ensure that all safety requirements are met during the construction and operation of the proposed transmission line and associated facilities.		
Effects on Land-based Economies			
Agriculture	Approximately 25.2 acres of permanent impacts to agriculture are anticipated for construction of the transmission line. Approximately 42.3 acres of agricultural land would be impacted due to the construction of the Associated Facilities for the Preferred Route.	Approximately 26.5 acres of permanent impacts to agriculture are anticipated for construction of the transmission line. Approximately 42.4 acres of agricultural land would be impacted due to the construction of the Associated Facilities for the Alternate Route.	The Preferred Route permanently impacts approximately one acre less of agricultural land.
Forestry	No impacts to economically important forestry will occur.		
Tourism	No impacts to tourism are anticipated.		

Factor	Preferred Route and Associated Facilities	Alternate Route and Associated Facilities	Summary
Mining	There are three mines within the Preferred Route and one area for kaolin clay extraction. There are future plans in Eureka Township and along the Minnesota and Redwood River valleys for mining. There is shallow bedrock at Minnesota River crossing at Granite Falls and the Minnesota River crossing at Redwood Falls.	There are six mines within the Alternate Route. There is shallow bedrock at the Minnesota River crossing at Granite Falls and the Minnesota River crossing at Redwood Falls. A karst formation was identified near Chub Lake WMA.	There are fewer mining resources and fewer potential impacts to future mined resources within the Preferred Route.
Effects on Archaeological and Historic Resources			
Archaeological Resources	There are 68 recorded archaeological sites within one mile of the Preferred Route. The ROW along the proposed alignment crosses 27 acres of aquatic environment.	There are 110 recorded archaeological sites within one mile of the Alternate Route. The ROW along the proposed alignment crosses 44 acres of aquatic environment.	There are fewer recorded archaeological sites along the Preferred Route. One factor in predicting pre-contact archaeological site probability is proximity to water resources. The Preferred Route will cross fewer acres of aquatic environments and therefore likely has fewer high probability areas.
Historic Resources	There are 204 recorded historic sites within one mile of the Preferred Route.	There are 199 recorded historic sites within one mile of the Alternate Route.	There are slightly fewer recorded historic sites along the Alternate Route.
Effects on the Natural Environment			
Air Quality	The maximum one-hour concentration of ozone during worst case weather is estimated at 0.0007 ppm. This is well below both federal and State standards. No air quality impacts due to the operation of the transmission line are anticipated. Temporary air quality impacts caused by construction vehicle emissions and fugitive dust from ROW clearing are expected to occur.		
Water Quality	Approximately 440 square feet of wetlands and approximately six acres of forested wetlands will be impacted within the ROW of the Preferred Route. The route centerline crosses 158 streams.	Approximately 1,045 square feet of wetlands and approximately 11 acres of forested wetlands will be impacted within the ROW of the Alternate Route. The route centerline crosses 190 streams.	The Preferred Route has fewer direct wetland impacts and crosses fewer streams.

Factor	Preferred Route and Associated Facilities	Alternate Route and Associated Facilities	Summary
Flora	Approximately 275 ft² of land will be permanently removed from WMA habitat and approximately 55 ft² of permanent impacts will occur in a Farmers Home Administration ("FmHA") United States Fish and Wildlife Service ("USFWS") easement. A total of 17 MCBS sites will be crossed.	Approximately 495 ft² of land will be permanently removed from WMA habitat. Approximately 55 ft² of permanent impacts will occur in a USFWS habitat easement. A total of 23 MCBS sites will be crossed.	Fewer habitats with native or restored flora will be impacted by the Preferred Route.
Fauna	Important Bird Areas ("IBAs") are crossed at the two Upper Minnesota Crossings. Grassland Bird Conservation Areas ("GBCA") areas are crossed by 22 miles of the Preferred Route.	IBAs are crossed at all three river crossings. GBCA areas are crossed by 30 miles of the Alternate Route.	The Alternate Route crosses more significant habitat areas than the Preferred Route. This includes 36% more GBCA areas and an additional IBA crossing.
Effects on Rare and Unique Natural Resources			
Rare and Unique Natural Resources	A total of 14 records of threatened and endangered species were recorded within one mile of the Preferred Route. One Minnesota County Biological Survey ("MCBS") outstanding significance area was identified.	A total of 20 records of threatened and endangered species were recorded within one mile of the Alternate Route. Also, one MCBS outstanding significance area was identified.	The Preferred Route has fewer recorded threatened and endangered species than the Alternate Route.
Application of Design Options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity			
General	The design options of the facilities along both the Preferred Route and Alternate Route maximize energy efficiencies and mitigate adverse environmental effects. The new substations are designed to accommodate facility additions in the future.		
Route Specific	The design of the transmission line will accommodate the addition of another circuit in the future along approximately 52% (123 miles) of the Preferred Route.	The design of the transmission line will accommodate the addition of another circuit in the future along 52% (136 miles) of the Alternate Route.	Both routes are designed to accommodate the addition of a future circuit. However, the Preferred Route would require addition of a future circuit along fewer miles of line.

Factor	Preferred Route and Associated Facilities	Alternate Route and Associated Facilities	Summary
Use or paralleling of existing ROW, survey lines, natural division lines, and agricultural field boundaries.			
Existing ROW, survey lines, natural division lines, and agricultural field boundaries.	Approximately 93.4% of the Preferred Route uses or parallels existing ROW, survey lines, natural division lines or agricultural field lines. Additionally, the new facilities will replace an existing section of the Lyon County-Minnesota Valley 115 kV transmission line between the Lyon County Substation and the Minnesota Valley Substation. Approximately 6.6% of the Preferred Route does not follow any of these existing corridors.	Approximately 93.5% of the Alternate Route uses or parallels existing ROW, survey lines, natural division lines and agricultural field lines. Approximately 6.5% of the Alternate Route does not follow any of these existing corridors.	The amount of ROW use is similar.
Use of Existing Transportation, Pipeline and Electrical Transmission Systems or ROWs			
Existing Transportation, Pipeline and Electrical Transmission systems or ROWs	Approximately 76.2% of the route follows the ROWs of existing transportation, pipeline and electrical transmission systems.	Approximately 70.0% of the route follows the ROWs of existing transportation, pipeline and electrical transmission systems.	The Preferred Route follows a greater percentage of existing transportation, pipeline and electrical transmission systems ROWs.
Electrical System Reliability			
Electrical System Reliability	Both routes would support the reliable operation of the transmission system.		
Costs of Constructing, Operating and Maintaining the Facility which are Dependent on Design and Route			
Costs	The distance of the Preferred Route is 236.8 miles and has an estimated cost of $700 million.	The distance of the Alternate Route is 262.0 miles and has an estimated cost of $755 million.	The shorter distance of the Preferred Route (by 25.2 miles) contributes to a lower overall cost of the Project.
Adverse Human and Natural Environmental Effects Which Cannot be Avoided.			
General	Unavoidable adverse impacts include the physical impacts to the land (primarily agricultural land) due to the construction of the Project. The Applicants will implement measures as described in the environmental analysis and as identified by regulatory agencies to minimize these unavoidable adverse environmental effects.		The Preferred Route permanently impacts fewer acres of land.
Route specific	Approximately 25.4 acres of permanent agricultural land impact are anticipated for the Preferred Route.	Approximately 26.8 acres of permanent agricultural land impact are anticipated for the Alternate Route.	

Factor	Preferred Route and Associated Facilities	Alternate Route and Associated Facilities	Summary
Irreversible and Irretrievable Commitments of Resources			
General	Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources have on future generations. Irreversible effects result primarily from use or destruction of a specific resource that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action. There are few commitments of resources associated with this Project that are irreversible and irretrievable, but those few are resources primarily related to construction. Construction resources that will be used to construct the Project include aggregate resources, concrete, steel, and hydrocarbon fuel. During construction, vehicles will be traveling to and from the site, utilizing hydrocarbon fuels. These commitments of resources are similar for both routes proposed.		The Preferred Route has approximately 10% fewer poles and a shorter length, resulting in fewer commitments of resources.
Route specific	The overall length of the Preferred Route is 237 miles, which would require approximately 1,250 poles.	The overall length of the Alternate Route is 262 miles, which would require approximately 1,380 poles.	

Based on this comparison, the Applicants concluded that the Preferred Route best conserves natural resources, minimizes environmental impacts and minimizes human settlement and other land use conflicts.