

Appendix I

Alternative Segments

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**ALTERNATIVE SEGMENTS
Big Stone South to Alexandria 345 kV
Transmission Line Project**

**MPUC DOCKET NO. E017, ET10/TL-23-160
October 2024**

As described in Section 3 and Section 5 of the Application, in some locations the Applicants identified Segment Alternatives to address stakeholder feedback or routing constraints in the Project Study Area. Segment Alternatives were included in the Application along the South and North Segment Route Options when the impacts were generally considered comparable, but different, than the corresponding Subsegment included in the end-to-end route. A description of each Segment Alternative and corresponding Subsegment within the Route Option is presented below. To assist with the Commission’s review of Segment Alternatives and Subsegments, this appendix provides tables to outline the constraints along the Segment Alternative compared to the corresponding Subsegment of the Route Option.

For the purpose of the Segment Alternative comparison tables, the following datasets were used:

- Land Cover (e.g., agricultural and forested land crossing) – 2021 National Land Cover Database (NLCD). Please note that this national database does not always present information that matches current aerial photography and on the ground conditions. Segment Alternative descriptions provided in the sections below were written based on aerial photography and site visits and may not directly correlate with the numbers provided in data tables.
- Agricultural land includes cultivated crop, pasture, and hay NLCD categories.
- Forested land includes mixed, deciduous, and evergreen forest NLCD categories.
- Wetlands – National Wetland Inventory (NWI) Minnesota Department of Natural Resources.
- Streams – National Hydrography Dataset
- Residences – Residences were manually digitized using 2023 National Agricultural Imagery Program (NAIP) aerial photography. Digital points were placed on the center of residences to capture potential route alternatives that may be located on either side of a residence.

Segment Alternative S18

Route Option South 2 includes an approximately 2.4-mile-long Segment Alternative S18, which is provided as an alternative to Subsegment S14 to avoid four additional homes. This Segment Alternative parallels Route Option South 1 along the quarter section line of Section 9 in Akron Township for 0.5 mile, then turns north, crossing agricultural land for approximately 1.5 miles, then turns west and parallels Township Road 155 until it rejoins Route Option South 2 at the intersection of Township Road 155 and 620th Avenue (Figure 1). A comparison of Subsegment S14 and Segment Alternative S18 is provided in Table 1.

Figure 1 Segment Alternative S18

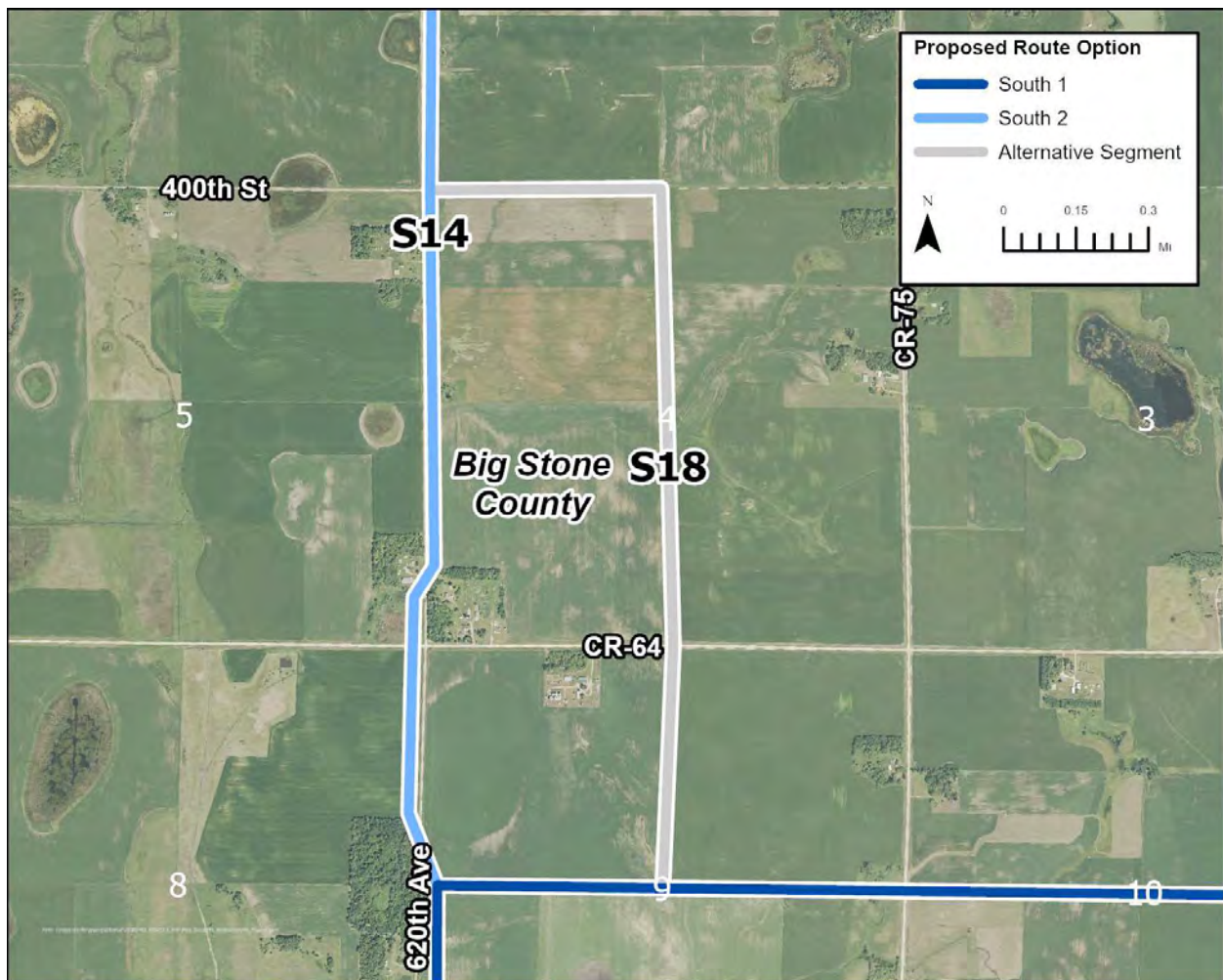


Table 1 Comparison of S18 to S14

Resource Type	Subsegment	
	S14 ¹	S18 ²
Total Length of Route (miles)	1.46	2.39
Double-Circuit with Existing Transmission Line (miles)	0	0
Parallels Existing Transmission Line (miles)	0	0
Follows Other Existing Linear Infrastructure (miles)	1.46	2.39
Residences within 0-75 feet (number)	0	0
Residences within 76-150 feet (number)	0	0
Residences within 151-300 feet (number)	3	0
Residences within 301-500 feet (number)	0	0
Upland Forest (acres)	0.24	0
Forested Wetlands (acres)	0	0
Non-Forested Wetlands (acres)	2.80	0
Agricultural Land (acres)	18.31	43.53
Waterbody Crossings	1	2

¹Route Option South 2.

²Segment Alternative S18.

Segment Alternative S18 is approximately 0.93 mile longer than Subsegment S14, and both Segment Alternative S18 and Subsegment S14 would follow existing linear infrastructure for the entirety of their length. Segment Alternative S18 would result in less impacts to residences within 151-300 feet, upland forest, or non-forested wetlands, but would have one more water crossing and impact more acres of agricultural land than Subsegment S14.

Segment Alternative N9

Route Option North 1 includes an approximately 3.0-mile-long Segment Alternative N9, which is provided as an alternative to Subsegment N2 due to routing constraints at the State Highway 55 crossing and the limited routing options available along County Road 21 SW. Segment Alternative N9 runs east, perpendicular to Route Option North 1 along a quarter section paralleling 130th Street to the north, then turns north, parallels State Highway 114, and turns northwest to span State Highway 55 perpendicularly. It then continues north, generally paralleling State Highway 114 until it rejoins Route Option North 1 near the intersection of State Highway 114 and County Road 76 (Figure 2). A comparison of Subsegment N2 and Segment Alternative N9 is provided in Table 2.

Figure 2 Segment Alternative N9

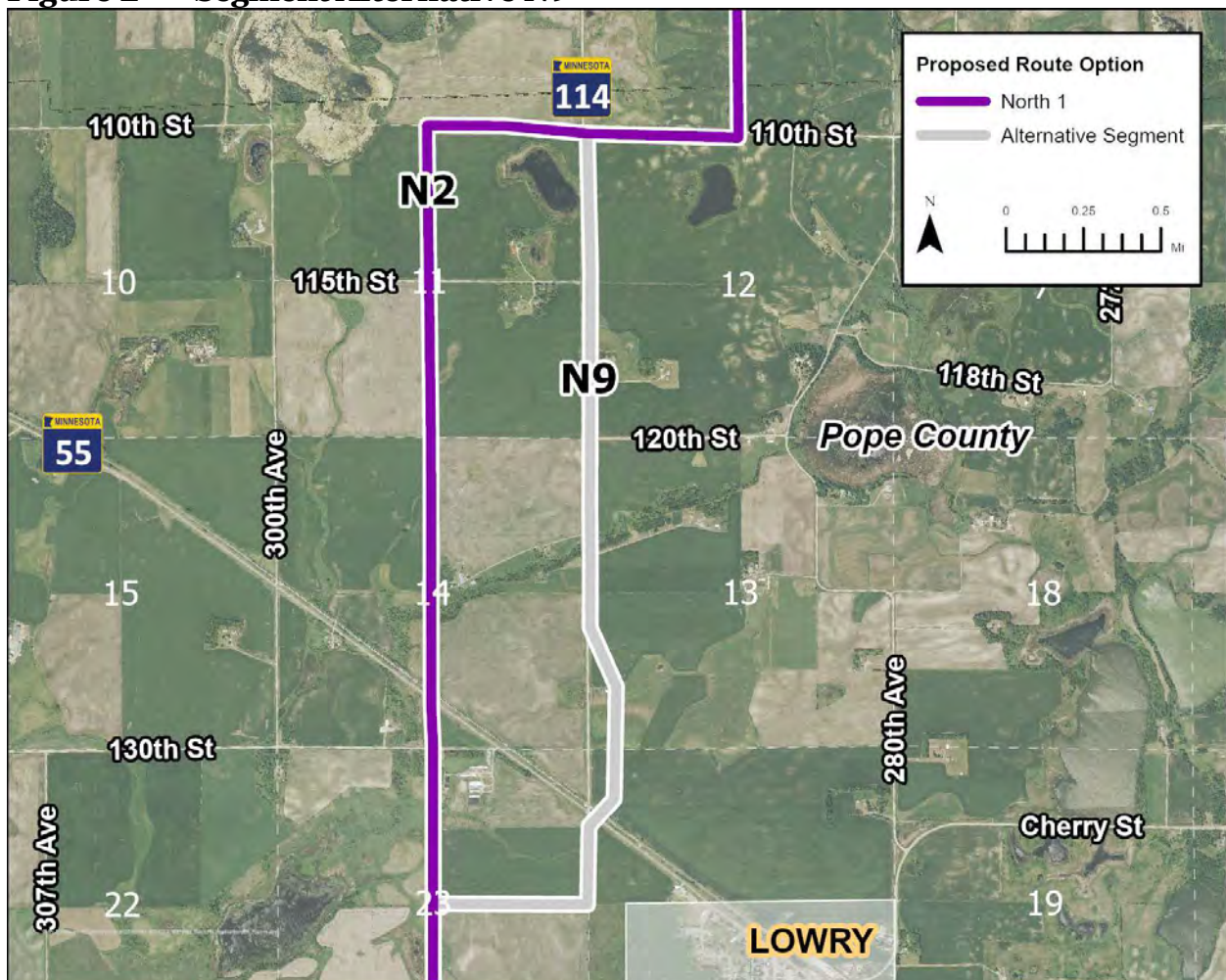


Table 2 Comparison of N9 to N2

Resource Type	Subsegment	
	N2 ¹	N9 ²
Total Length of Route (miles)	3.03	3.04
Double-Circuit with Existing Transmission Line (miles)	0	0
Parallels Existing Transmission Line (miles)	0	0
Follows Other Existing Linear Infrastructure (miles)	3.03	3.04
Residences within 0-75 feet (number)	0	0
Residences within 76-150 feet (number)	0	0
Residences within 151-300 feet (number)	1	1
Residences within 301-500 feet (number)	1	0
Upland Forest (acres)	3.25	0
Forested Wetlands (acres)	0	0
Non-Forested Wetlands (acres)	0.58	0.54
Agricultural Land (acres)	49.06	45.21
Waterbody Crossings	3	2

¹Route Option North 1.

²Segment Alternative N9.

Segment Alternative N9 is 0.01 mile longer than Subsegment N2, and both Subsegment N2 and Segment Alternative N9 would follow existing linear infrastructure for the entirety of their length. Segment Alternative N9 would result in fewer impacts to residences within 301-500 feet and less acres of impacts to upland forest, non-forested wetlands, agricultural land, and introduce one less waterbody crossing along the proposed length.

Segment Alternative N10

Route Option North 1 includes an approximate 2.1-mile-long Segment Alternative N10, which is provided as an alternative to Subsegment N4, in Lake Mary Township, Douglas County, Minnesota. This alternative was proposed to avoid the pinch point paralleling County Road 21 SW between waterbodies and several homes. Segment Alternative N10 starts at County Road 21 SW and runs east for 0.5 mile along a quarter section paralleling County Road 4 SW to the north, turns north and continues generally parallel to County Road 21 SW, follows a tree line, spans Mud Lake, and then turns west to rejoin Route Option North 1 (Figure 3). A comparison of Subsegment N4 and Segment Alternative N10 is provided in Table 3.

Figure 3 Segment Alternative N10

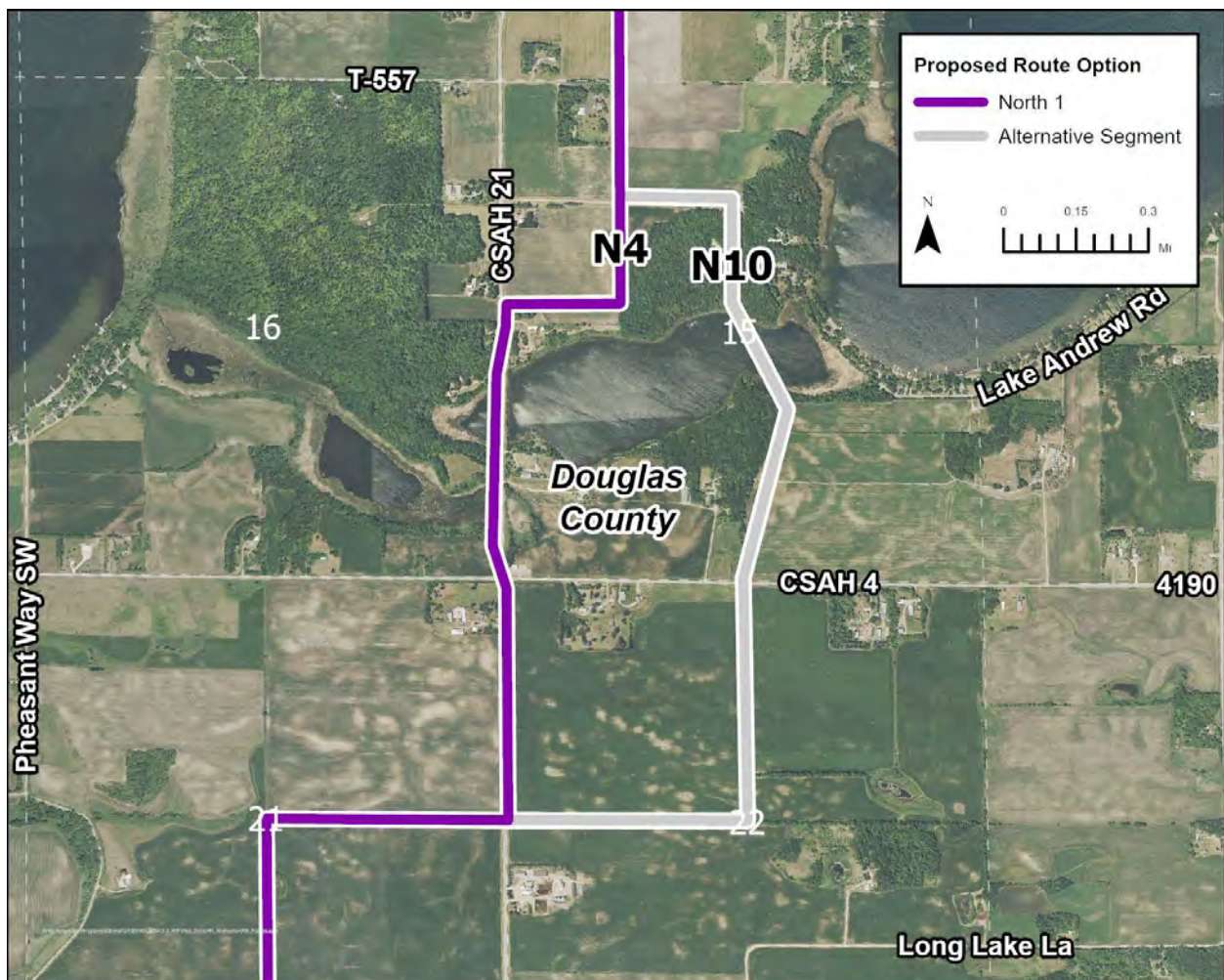


Table 3 Comparison of N10 to N4

Resource Type	Subsegment	
	N4 ¹	N10 ²
Total Length of Route (miles)	1.53	2.05
Double-Circuit with Existing Transmission Line (miles)	0	0
Parallels Existing Transmission Line (miles)	0	0
Follows Other Existing Linear Infrastructure (miles)	1.07	2.05
Residences within 0-75 feet (number)	0	0
Residences within 76-150 feet (number)	0	0
Residences within 151-300 feet (number)	5	0
Residences within 301-500 feet (number)	3	0
Upland Forest (acres)	0.62	5.61
Forested Wetlands (acres)	0	0
Non-Forested Wetlands (acres)	2.12	0.37
Agricultural Land (acres)	15.88	28.87
Waterbody Crossings	2	1

¹Route Option North 1.

²Segment Alternative N10.

Segment Alternative N10 is approximately 0.52 mile longer than Subsegment N4. Segment Alternative N10 would follow existing linear infrastructure for the entirety of its length and Subsegment N4 would follow existing linear infrastructure for 1.07 miles. Subsegment N4 would introduce new transmission line right-of-way (ROW) for approximately 0.46 mile. Segment Alternative N10 would result in fewer impacts to residences within 151–500 feet, less acres of impacts to non-forested wetlands, and would have one less waterbody crossing than Subsegment N4. Segment Alternative N10 would have greater impacts to upland forests and agricultural land when compared to Subsegment N4.

Segment Alternative N11

Route Option North 2 includes an approximate 2.0-mile-long Segment Alternative N11, which is provided as an alternative to Subsegment N7, in Hudson Township, Douglas County, Minnesota. This alternative was proposed to avoid spanning several gravel pits and to parallel the Soo Line Railroad and existing HVTL for a longer duration. Segment Alternative N11 starts at County Road 87 SE and continues north to parallel County Road 87 SE and the Soo Line Railroad where the Route Option North 2 turns west. This alternative continues north for 1.4 miles and then turns west to parallel an existing HVTL and continues paralleling the HVTL until it rejoins Route Option North 2 (Figure 4). A comparison of Subsegment N7 and Segment Alternative N11 is provided in Table 4.

Figure 4 Segment Alternative N11



Table 4 Comparison of N11 to N7

Resource Type	Subsegment	
	N7 ¹	N11 ¹
Total Length of Route (miles)	2.12	2.07
Double-Circuit with Existing Transmission Line (miles)	0	0
Parallels Existing Transmission Line (miles)	0	0.55
Follows Other Existing Linear Infrastructure (miles)	2.12	1.52
Residences within 0-75 feet (number)	0	0
Residences within 76-150 feet (number)	0	0
Residences within 151-300 feet (number)	0	1
Residences within 301-500 feet (number)	0	1
Upland Forest (acres)	1.69	0
Forested Wetlands (acres)	0.94	0.27
Non-Forested Wetlands (acres)	7.13	6.38
Agricultural Land (acres)	24.99	23.26
Waterbody Crossings	1	3

¹Route Option North 2²Segment Alternative N11

Subsegment N7 is approximately 0.05 mile longer than Segment Alternative N11. Subsegment N7 would follow existing linear infrastructure for its entire length. Segment Alternative N11 would parallel an existing transmission line ROW for 0.55 mile and other existing linear infrastructure (i.e., railroad) for 1.52 miles. Segment Alternative N11 would impact less acres of upland forest, forested and non-forested wetlands, and agricultural land than Subsegment N7. However, Segment Alternative N11 would impact more residences within 151-500 feet and has a greater number of waterbody crossings.