4. ALTERNATIVES CONSIDERED AND REJECTED

This section addresses Minn. Rules 4400.2100 (Alternative Permitting Process), which requires an applicant to identify any routes or sites considered and the reasons for rejecting them.

4.1 Alternative Substation Sites and Routes Considered for Route Area 1 – Tower Substation to County Highway 26

Alternative substation sites and routes considered and rejected for Route Area 1 are shown on Figure 4-1.

4.1.1 Alternative Tower Substation Sites

Highway 169 Alternative Substation Site

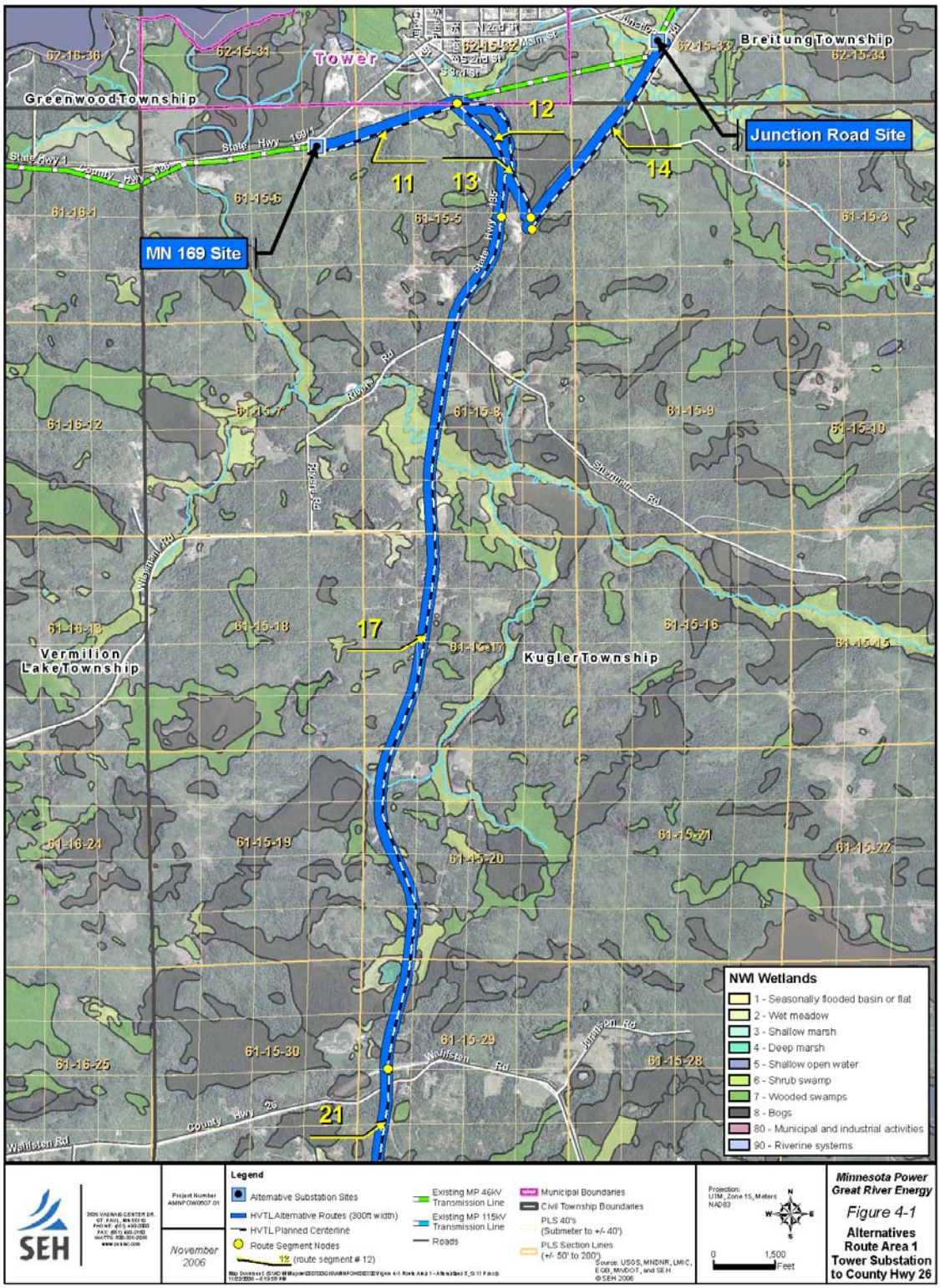
This site is located southwest of Tower on a land parcel owned by the Minnesota Department of Natural Resources (MDNR). There is satisfactory access off of Highway 169 and satisfactory vegetative screening between Highway 169 and the alternative substation site. The substation footprint would be located underneath the 46 kV Line #32, providing an excellent opportunity to interconnect Line #32 to the proposed 115/46 kV substation. Extensive site preparation would be required to remove the existing concrete roadbed (old Highway 169) and to blast/remove the rock present on the only level location on the site. Small wetland pockets are also present on the site. The 115 kV line to this site would be approximately 1.2 miles longer than the 115 kV line to the proposed substation site (Highway 135 site). The time period required to obtain ownership of the MDNR parcel would be expected to be longer than the proposed site, which could impact the property acquisition/construction schedule.

Reasons to reject—This alternative would have extensive site preparation cost, greater transmission line construction costs, and the possibility of a protracted land parcel ownership process.

Junction Road Alternative Substation Site

This site is located east of Tower adjacent to the MP Tower 46/4 kV Substation, where MP owns an eight-acre parcel. There is satisfactory access to the site via Highway 169 and the graveled Junction Road. Although vegetative screening at the site is limited, the Junction Road is not a heavily traveled road and there are no homes in visual proximity to the site. The substation footprint would be located adjacent to Line #32, providing a good opportunity for interconnection to a substation. The site is a wetland except for the filled area occupied by the 46/4 kV substation. The 115 kV transmission line to the site would be 1.1 miles longer than to the proposed Highway 135 substation site.

Figure 4-1 Alternative Substation Sites and Transmission Line Routes Considered for Route Area 1



Reasons to reject—There would be extensive permitting requirements for filling in jurisdictional wetlands and extensive site preparation costs at this site. The transmission line costs would be greater than for the proposed substation site.

4.1.2 Alternative Route Segments (RS) – Route Area 1

Alternative RS 11 (0.71 miles)
Follows the Line #32 existing corridor from the Highway 169 alternative substation site to Highway 135.

Alternative RS 12 (0.61 miles)
Follows the Highway 135 corridor from Line #32 to the road access to the Highway 135 proposed substation site.

Alternative RS 13 (0.73 miles)
Follows the old railroad grade/snowmobile trail from the intersection with Line #32 to near the Highway 135 proposed substation site.

Alternative RS 14 (1.11 miles)
Follows the old railroad grade from the Junction Road alternative substation site to near the Highway 135 proposed substation site.

Reasons to reject—All of the above alternative route segments (RS 11 through 14) provide transmission line paths to the two alternative Tower Substation sites only. They would not be used as a path to the proposed Highway 135 Tower Substation site. Note that RS 12 and RS 13 are presently planned as primary route segments for the two lower voltage 46 kV circuits (and future 69 kV circuit) from the proposed Highway 135 Tower Substation site to the 46 kV Line #32.

Alternative RS 17 (4.09 miles)
Follows Highway 135 from the proposed Highway 135 Tower Substation site to County Highway 26 (Wahlsten Road). The intended centerline is on the east side of Highway 135, which is a linear existing corridor that provides a practical routing option between the two Project endpoints. An electric distribution line follows Highway 135 and provides service to the 18 homes and the Kugler Town Hall located along the highway. The homes are located close to the highway and there are natural and/or planted tree screens between the highway and all of the homes. The right-of-way clearing conducted in association with installation of a single pole design 115 kV line along Highway 135 would remove a significant width of the natural and/or planted vegetative screen between the homes and Highway 135.

Reasons to reject—There are 18 homes (and the Kugler Town Hall) along this route segment compared to no homes along the RS 16 (the Proposed Route). The transmission line construction would result in the permanent removal of the vegetative screen between the homes and Highway 135. Several landowners

have provided comments that they would seriously oppose removal of the trees between their homes and Highway 135.

4.2 Alternative Routes Considered for Route Area 2 – County Highway 26 to East Taylor Road

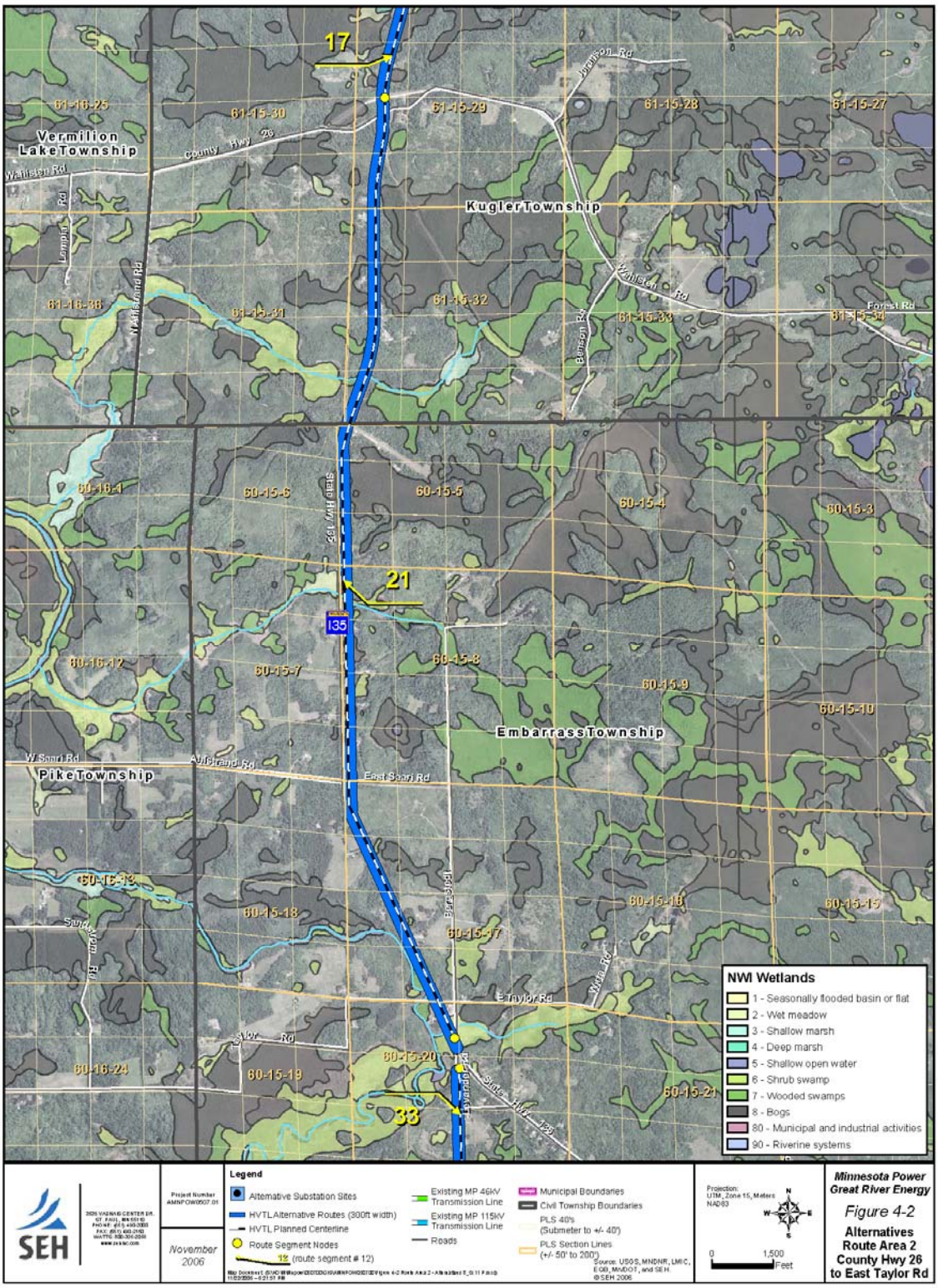
Alternative routes considered and rejected for Route Area 2 are shown on Figure 4-2.

Alternative RS 21 (4.49 miles)
Follows Highway 135 from Wahlsten Road to the intersection with Bergstedt Road. The intended centerline is located on the east side of Highway 135, which provides a practical corridor for routing a 115 kV transmission line. There are 17 homes located along this section of Highway 135, with most maintaining a screen of trees between the home and the highway to minimize visual and noise impacts. Construction of the proposed line along this route alternative would remove a significant portion of the vegetative screen.

There is a grass landing strip in the NW corner of Section 5 that ends within 200 feet of Highway 135. The proposed transmission line and existing landing strip could not co-exist along alternative RS 21, as the transmission line structures would be above the glide slope on the NW end of the landing strip. The landing strip would need to be purchased and retired to allow construction/operation of the proposed transmission line along this route alternative.

Reasons to reject—There are 17 homes along the alternative RS 21 compared to two homes and a church within and two homes adjacent to the Proposed Route in Route Area 2. Construction of the proposed transmission line along Highway 135 would require removal of the screen of trees between the 17 homes and Highway 135. Several landowners have provided comments noting their strong interest in retention of the tree screen between their homes and Highway 135. This alternative route segment is totally incompatible with the continued safe operation of the airplane grass landing strip.

Figure 4-2 Alternative Transmission Line Routes Considered for Route Area 2



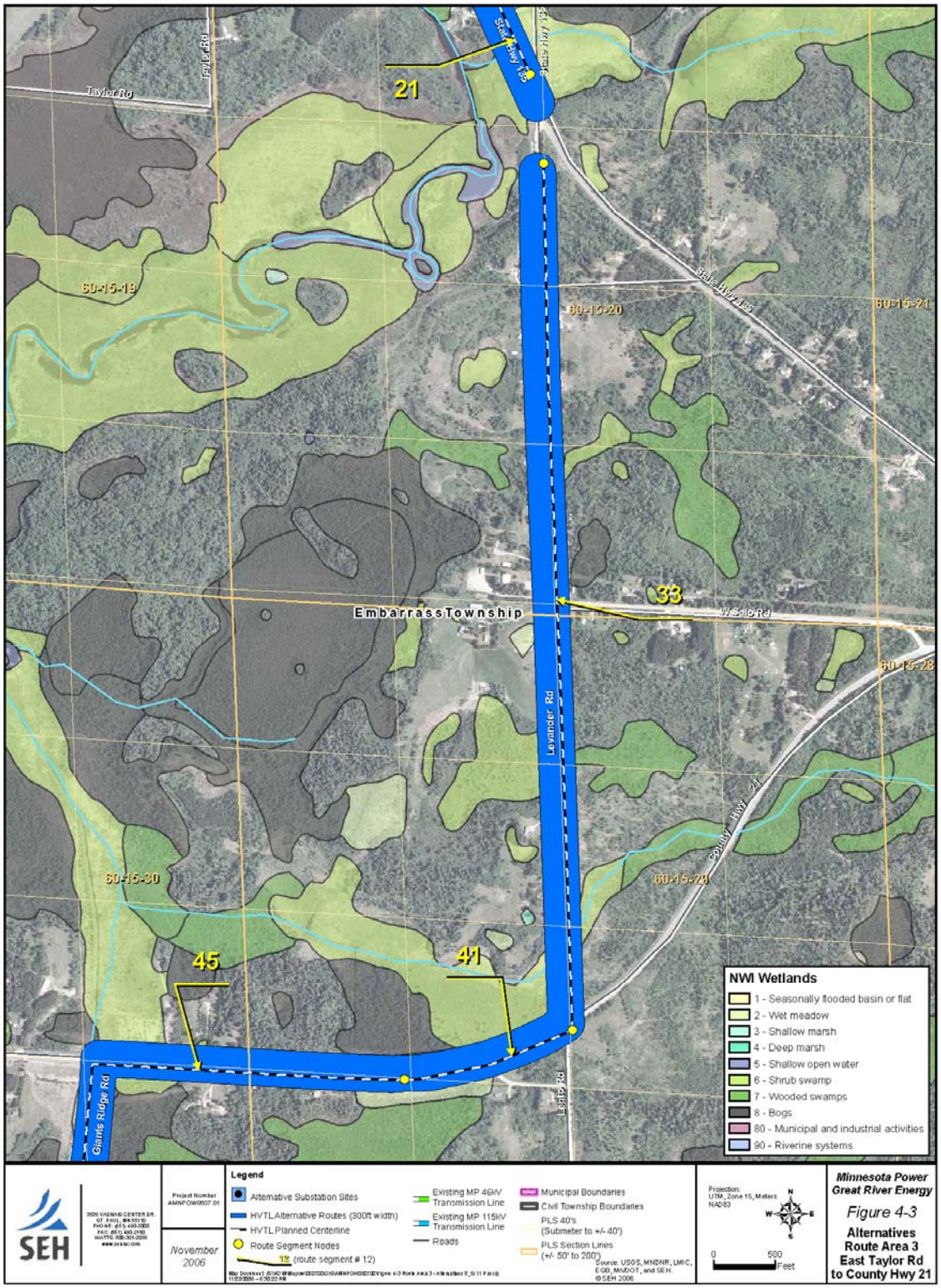
4.3 Alternative Routes Considered for Route Area 3 – East Taylor Road to County Highway 21

Alternative routes considered and rejected for Route Area 3 are shown on Figure 4-3.

Alternative RS 33 (1.34 miles)
Follows Levander Road from the point of intersection with Highway 135, south to County Highway 21. There is a three-phase distribution line located on the east side of Levander Road. The intended centerline is located on the east side, which would require dismantling the LCP distribution circuit and construction of a 115 kV line with the three-phase distribution underbuild. Levander Road provides a linear corridor for the proposed transmission line. There are 13 homes located on this 1.34 mile long road. The Embarrass Town Hall and community recreation center are located on the west side of Levander Road.

Reasons to reject—There are 13 homes (and the Embarrass Town Hall) along this alternative route versus no homes along the Proposed Route (RS 32). Dismantling the LCP three-phase distribution line and constructing the 115 kV transmission line as a 115 kV single-pole design with distribution underbuild would result in shorter spans and an increased cost.

Figure 4-3 Alternative Transmission Line Routes Considered for Route Area 3



4.4 Alternative Routes Considered for Route Area 4 – County Highway 21 to Embarrass Switching Station and Alternative Switching Station Site

Alternative routes considered and rejected for Route Area 4 and the alternative switching station site are shown on Figure 4-4.

Alternative RS 41 (0.27 miles)
Follows County Highway 21 to the intersection with the Proposed Route (RS 32 and 42). The intended centerline is located on the south side of the highway.

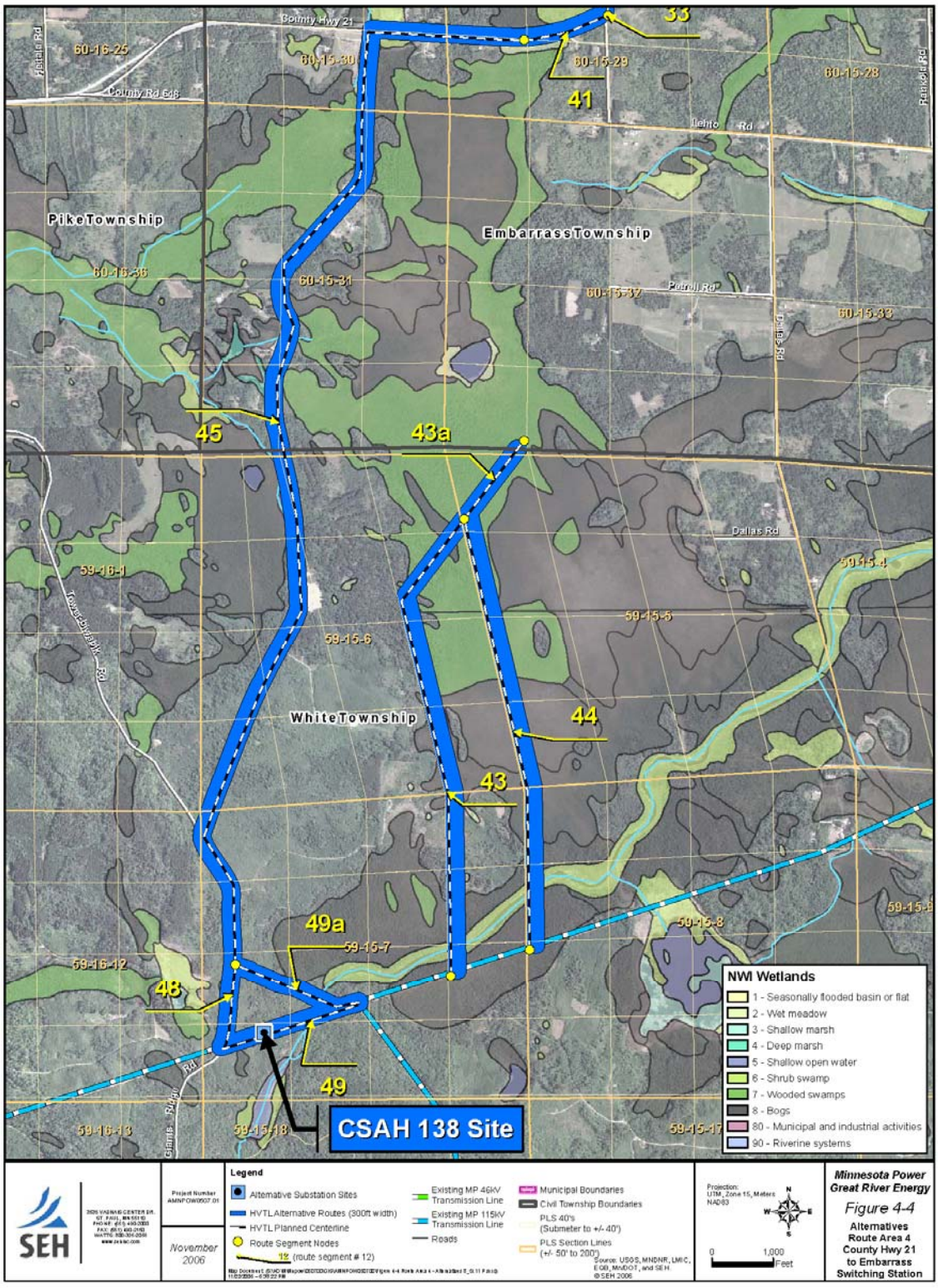
Reasons to reject—This route segment would not be needed because the adjoining alternative RS 33 has been rejected.

Alternative RS 45 (3.57 miles)
Follows County Highway 21 for 0.5 miles from the intersection with the Proposed Route west to the intersection with CSAH 138 (Giant's Ridge Road). CSAH 138 is followed south for 2.67 miles to the intersection with the access road to the proposed Embarrass Switching Station (alternative RS 49a). The intended centerline follows the south side of County Highway 21 and the east side of the Giant's Ridge Road. County Highway 21 and the Giant's Ridge Road provide a linear corridor for a transmission line route; however, there are six homes located along the highway and six homes located along Giant's Ridge Road. There is a single-phase distribution line located along the Giant's Ridge Road that services the six homes. Several landowners have indicated their sincere concern and opposition for the construction of the transmission line along Giant's Ridge Road.

Reasons to reject—There are 12 homes along County Highway 21 and the Giant's Ridge Road compared to no homes along the Proposed Route (RS 42, 44a, 46, and 47). Following the Giant's Ridge Road would require many more angle structures, resulting in a higher construction cost.

Alternatives RS 48 (0.41 miles), 49a (0.41 miles), and 49 (0.31 miles)
Alternative RS 48 follows Giant's Ridge Road and the existing 115 kV line (#34 line) from the end of RS 45 to the CSAH 138 alternative switching station site. There are no homes along this 0.41 mile long route segment. The intended centerline is on the east side of CSAH 138 and south side of Line #34. Alternative RS 49a is 0.41 miles long and follows an existing access trail to Lines #34, #34 tap line, and the #34/#34 tap switching structure. The access trail has a limited use; to access the MP transmission facilities for performing maintenance. There is a wooden bridge over the Embarrass River. Alternative RS 49 follows the 115 kV transmission line right-of-way (Line #34) between the CSAH 138 alternative switching station site and the proposed Embarrass Switching Station site.

Figure 4-4 Alternative Transmission Line Routes Considered for Route Area 4 and Alternative Switching Station Site



Reasons to reject—Alternative RS 48, 49, and 49a are directly associated with route alternative RS 45 and the CSAH 138 alternative switching station site, which were analyzed and rejected. Therefore, they would not be used as route segments to the proposed Embarrass Switching Station site.

Alternatives RS 43a (0.31 miles) and 43 (1.50 miles)

RS 43a is a short connector route segment between the Proposed Route and two alternative route segments (RS 43 and 44). It creates a diagonal crossing of a wetland in Section 5. RS 43 starts at the north end of alternative RS 44 and follows a 1/16 line through Sections 5 and 7, crossing the Embarrass River before joining the Proposed Route (RS 46 and 47). This cross-country alternative segment first diagonally crosses one 40-acre parcel and follows the property lines along four 40-acre parcels. This alternative route segment bisects a privately-owned high ground peninsula in Section 7 that is used for silvicultural and recreational purposes. A new crossing of the Embarrass River and a new right-of-way would be required for the entire segment length.

Reasons to reject—A private landowner has voiced strong opposition to creating a new right-of-way across his accessible, useable high ground rather than locating the Proposed Route on non-accessible private, corporate, and public land.

Alternative RS 44 (1.35 miles)

RS 44 follows the 1/16 subdivision line along five 40-acre parcels before intersecting again with the Proposed Route in Section 8. This alternative route segment traverses private, corporate, and public land, which is primarily a non-accessible wetland. Winter construction would be required to minimize environmental impacts, reduce construction costs, and provide stable access. A private landowner provided evidence of the location of the Height of Land Portage, which is on the National Register of Historic Places (ID# 92000842). The “portage” is believed to be located near and would be crossed by this segment near the Embarrass River. A sketch map provides a general, but not specific, location of the portage.

Reasons to reject—Avoidance of the Height of Land Portage is the primary reason to reject this alternative route segment in favor of the Proposed Route.

County State Aid Highway (CSAH) 138 Alternative Switching Station Site

This site is located on the 115 kV Line #34 right-of-way and east of CSAH 138 (Giant’s Ridge Road). The Iron Range Resources (IRR) own the property and are developing plans to subdivide the area for residential lots in connection with their Giant’s Ridge recreation area development. A new access road would be required across three potential residential lots. The proposed transmission line would need to be 0.3 miles longer to connect to this alternative site, and Line #34 tap would also need to be extended 0.3 miles.

Reasons to reject—The landowner, IRR, does not favor this site for the Embarrass Switching Station due to the impact of the switching station footprint, the need for a new access road, and the construction of two 115 kV transmission lines across land that they intend to subdivide into residential lots. There would be additional Project costs due to constructing a new access road and the additional 0.6 miles of transmission line construction.