CHAPTER

9

9. Environmental Analysis: Q1-STH 88 Connector Alternative

9.1. ROUTE DESCRIPTIONS

9.1.1. Reason for the alternatives

Concerns expressed by WisDOT about potential impacts of the proposed transmission line[119] on GRR led WisDOT staff to request a comparable evaluation of an alternative route that avoided GRR along the Mississippi River upriver from the mouth of Waumandee Creek.[120] From Waumandee Creek north toward Alma, the new line on the proposed Q1 Routes follow GRR, potentially interfering with GRR users' views of the river or the river bluffs and potentially violating the requirements of WisDOT-held scenic easements.[121] Beyond the mouth of Waumandee Creek, the proposed line following the Q1 Routes would turn inland away from the river and away from GRR.

The WisDOT-suggested alternative route would leave Alma to the east following an existing 161 kV transmission ROW as far as STH 88 and then following STH 88 south to connect to one of the Q1 Routes.[122]

9.1.2. Route descriptions

Two options are being considered for the STH 88 connector segments, Option A and Option B. Option A follows STH 88 as suggested by WisDOT. STH 88 is a winding, two-lane county highway with associated farmsteads and wetlands. Option B, developed by the applicants, follows a somewhat straighter path in the same valleys to allow for smoother transmission line engineering and construction than would be possible along STH 88 itself.

As with the Q1 Routes, the Q1-STH 88 Alternatives begin with the Mississippi River crossing at Alma in Buffalo County, crossing Trempealeau County and ending at the proposed Briggs Road Substation site near the village of Holmen in La Crosse County. The routes containing the Q1-STH 88 Alternatives consist of route segments shown in Table 9.1-1, beginning with the Mississippi River crossing, continuing with the east-west portion in common with the Arcadia Route and the STH 88 "Connector Segments," and ending with the segments that comprise the remainder of either the Q1-Highway 35 Route or the

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[119] See Sections 7.4.8 in Chapter 7 and 8.4.8 in Chapter 8 of the draft EIS.
[120] Letter from Mike Berg, Deputy Secretary, WisDOT, to William Fannucchi. January 27, 2011. PSC REF #144025.
[121] See Section 7.4.8 on the Q1 Routes and GRR.
[122] The route eastward from Alma would coincide with the proposed Arcadia Route, discussed in Chapter 10. At the south end of the suggested STH 88 segment, the new line would join the Q1-Highway 35 Route or Q1-Galesville Route, discussed in Chapters 7 and 8, respectively.

Q1-Galesville Route. The two connector-segment Options A and B are shown by the 88-series segments on the map in Figures Vol. 2-1B, Vol. 2-1R, Vol. 2-1M, and Vol. 2-1N.

Table 9.1-1 Q1-STH 88 Alternatives connector and route segment combinations

Route Portion	Option A with Q1-Highway 35	Option A with Q1-Galesville	Option B with Q1-Highway 35	Option B with Q1-Galesville
Mississippi River Crossing	1	1	1	1
Arcadia Portion	2A1, 2A2, 10B1 (or 2A1, 10B2) and 10C1, 10C2	2A1, 2A2, 10B1 (or 2A1, 10B2) and 10C1, 10C2	2A1, 2A2, 10B1 (or 2A1, 10B2) and 10C1	2A1, 2A2, 10B1 (or 2A1, 10B2) and 10C1
STH 88 Connector	88A, 88B, 2E2	88A, 88B, 2E2	88C, 88D, 88E, 88F, 88G, 2E2	88C, 88D, 88E, 88F, 88G, 2E2
Q1 Route Remainder	2F, 2G, 2H, 2I, 3, 8A, 8B, 8C, 9, 18H	2F, 2G, 2H, 2I, 6, 12, 13B2, 13C, 13D, 13E, 17A, 17B, 18A, 18B, 18C, 18D, !8E, 18F, 18G, 18H	2F, 2G, 2H, 2I, 3, 8A, 8B, 8C, 9, 18H	2F, 2G, 2H, 2I, 6, 12, 13B2, 13C, 13D, 13E, 17A, 17B, 18A, 18B, 18C, 18D, !8E, 18F, 18G, 18H

Visualizations of the Q1-STH 88 Alternative connectors in the project area are shown in Figures 9.1-1 and 9.1-2, with the applicants' preferred Alma alternative segments highlighted.[123]

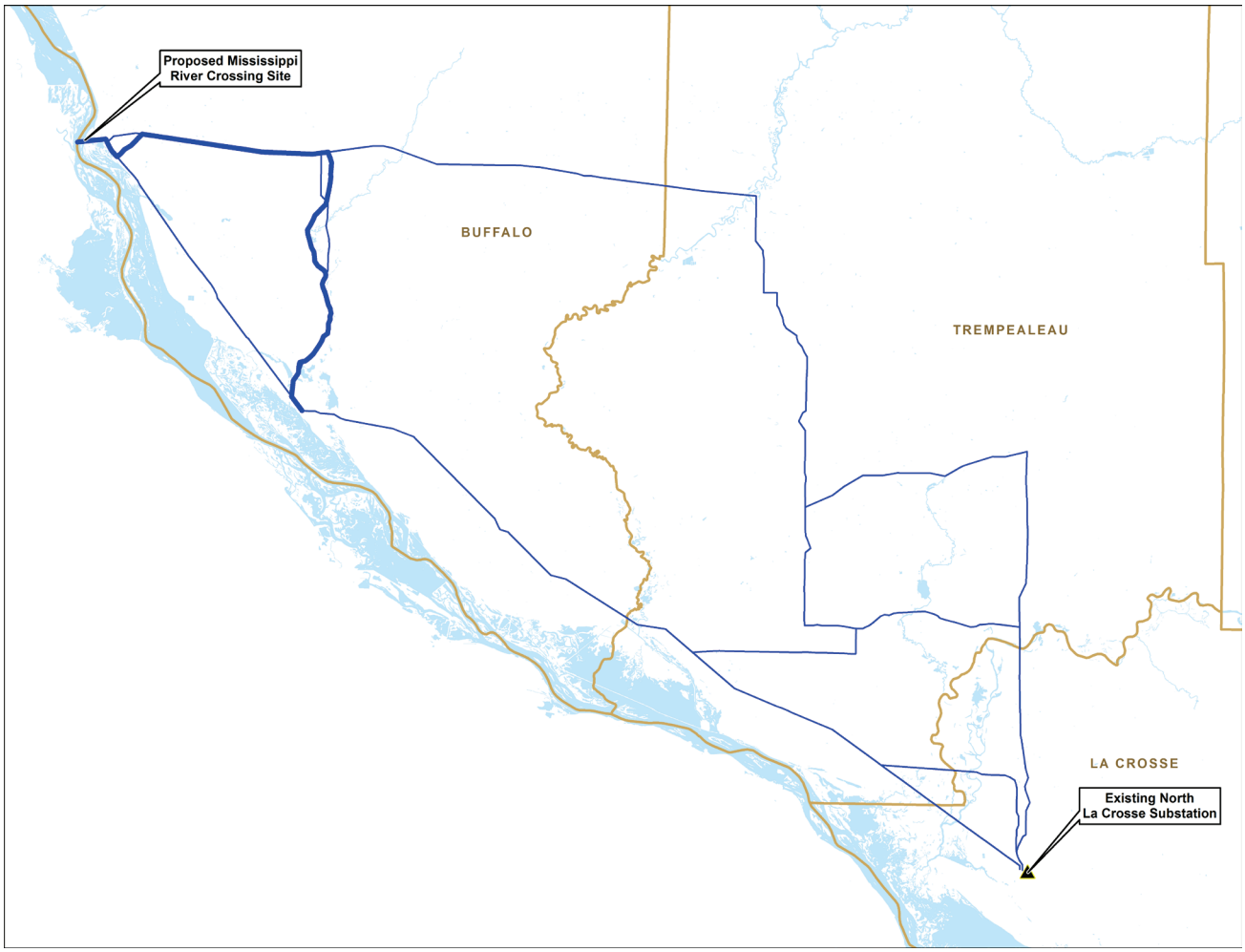
The Q1-STH 88 Alternative Routes, utilizing Options A or B, is exactly the same as the Arcadia Route in the north and west. They are exactly the same as the Q1-Highway 35 or Q1-Galesville Routes from the point where the 88-series segments meet the BNSF railway west to Briggs Road.

Option A begins at the eastern end of Segment 10C2, where the Arcadia Route crosses STH 88. It follows STH 88 southward along Segment 88A for about 8.3 miles as a new transmission feature along the existing road in valleys shared with Screechowl Creek and Waumandee Creek. On this stretch, the line would wind with STH 88 across Block Road, Blank Hill Road, CTH E, CTH O, and then Oak Valley Road and Waumandee Creek Road. It would require ROW on farmland, in wetlands, and in woodlands along the way. The route then follows Segment 88B, crossing GRR, Waumandee Creek, Bensel Pond, and farmland to connect to Segment 2E2 at the railway. Segment 2E2 is part of the proposed Q1 Routes and leads to route segments in common with the Q1-Highway 35 or Q1-Galesville Routes.

Option B begins at the eastern end of Segment 10C1, 6.0 miles east of Alma and just west of STH 88, cutting off Segment 10C2. Segment 88C extends southward in a new corridor and ROW, crossing Block Road and Plank Road and running along Blank Hill Road to cross STH 88 and CTH E. It runs along foothills, passing through farmland and some woodland, and crosses Waumandee Creek north of Schoepps Valley Road. South of Schoepps Valley Road, Option B connects with the STH 88 ROW. South of Oak Valley Road, it separates slightly from STH 88 as Segment 88E and crosses Waumandee Creek again. South of the crossing, the route rejoins the STH 88 ROW, crossing farmland and Waumandee Creek Road. South of that, it separates again from STH 88 and rejoins it, crossing GRR and meeting the Q1 Route Segment 2E2 along the BNSF railway.

[123] See Section 10.1 in the following chapter for an explanation of the Alma alternatives.

Figure 9.1-1 Q1-STH 88 Connector Alternative Option A

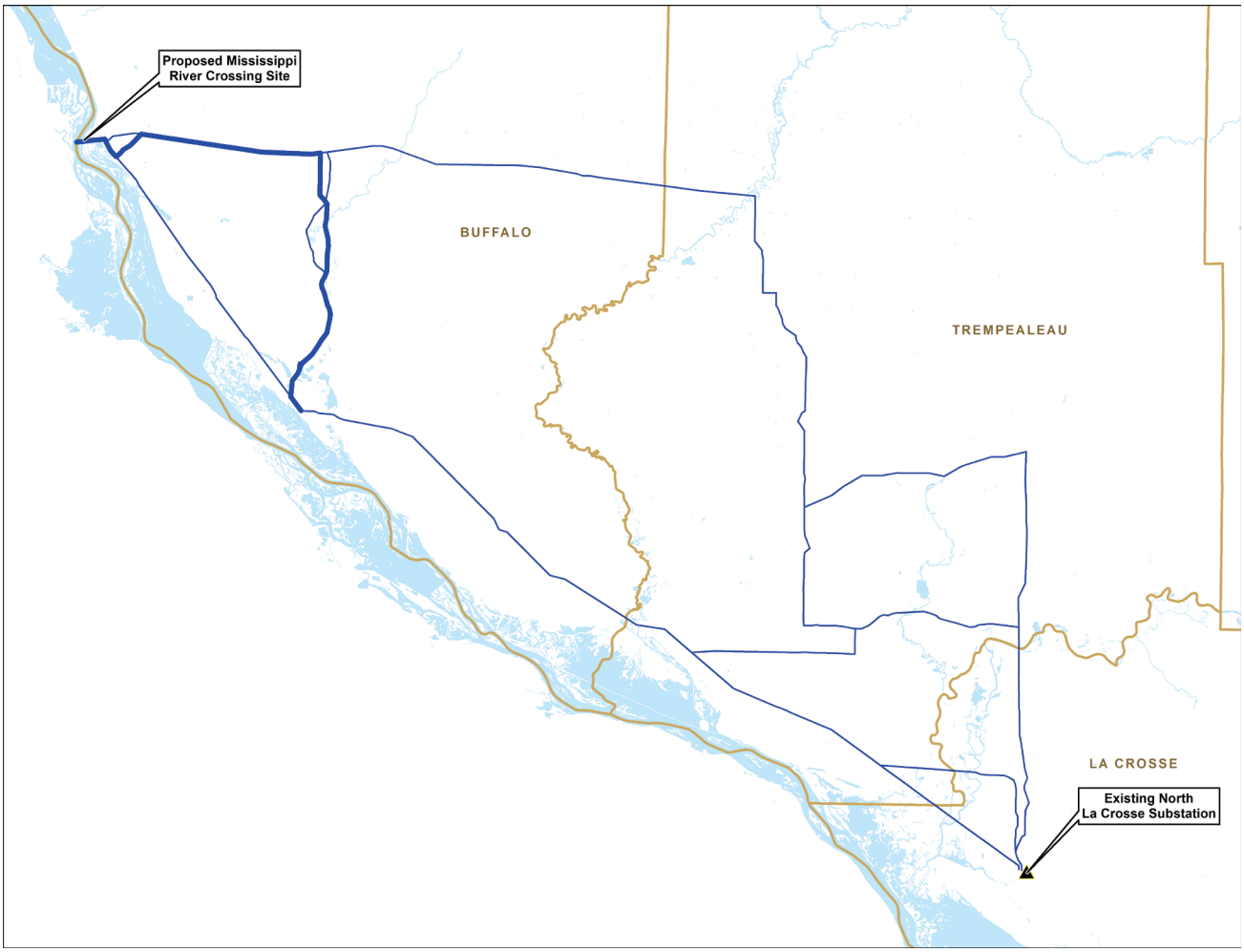


The Q1 Routes would be longer using the STH 88 Connectors. The Option A Connector is 18.6 miles long, and the Option B Connector is 18.0 miles long. Routes using the STH 88 Connectors for the Q1-Highway 35 Route would be 49.7 miles long using Option A and 49.0 miles long using Option B, as opposed to the 43 miles for the proposed Q1-Highway 35 Route. Routes using Option A and Option B for the Q1-Galesville Route would be 55.0 and 55.4 miles long, respectively, instead of 48.4 miles for the proposed Q1-Galesville Route.

9.1.3. ROW requirements

The Q1 Routes with the STH 88 Connectors share less ROW with existing transmission lines, roads, or railroads. With Options A or B, there is a decrease of over 10 percent in transmission ROW sharing from that of the Q1-Highway 35 Route. There also would be a decrease of almost 10 percent corridor sharing as compared to the Q1-Galesville Route. Because the railroad runs along the Mississippi River, there is also a notable decrease in railroad ROW sharing for Options A or B. Both options share more road ROW, but this does not necessarily reflect decreased environmental impact because the STH 88 road corridor twists through farmland, woodlands, and wetlands.

Figure 9.1-2 Q1-STH 88 Connector Alternative Option B



The ROW requirement would be 150 feet in width, similar to other parts of the proposed project. On Option A, Segment 88A runs along STH 88 and would share 100 percent of the road ROW which is 60 feet in width, requiring 90 feet of new ROW. Segment 88B, which extends south from STH 88 to the BNSF railway corridor, also would require 150 feet of new ROW.

9.1.4. Structures

The new transmission line on the STH 88 Connector segments would, in most cases, be constructed on steel, self-supporting single poles on concrete foundations with the three main conductors hung as either I-string or V-string configurations, as shown in Appendix A, Figures 21, 23, 25, and 27 or 28.

9.2. GEOGRAPHY

9.2.1. Geology

Like the proposed routes, the Route 88 Alternatives are located in Wisconsin's Driftless Area, bypassed by the glaciers from the north. STH 88 follows a valley that is part of the eroded, dissected area plain. In the bottoms and river lowlands, the remaining bedrock is older Cambrian sandstone with some dolomite and shale. The valley has been modified by Late Pleistocene glacial meltwater streams, later non-glacial

streams, and wind deposition and erosion processes. Waumandee Creek and its tributaries have been affected by the torrential flows of meltwater in this region. Valley trains of gravel and sand were deposited from the outwash. Over time, the smaller streams eroded into their floodplains and meandered inside the larger outwash valleys. In a relatively short time period, a large portion of the flood plains of glacial times was removed, leaving narrow, dissected terraces and the meandering stream.

The thousands of years of sediment continually deposited on the valley floor has also been eroded by the meandering creeks. Agricultural practices in the 1800s left the protective covering of sod and forest litter exposed and accelerated erosion processes. In some drainageways this post-settlement alluvium is quite significant. Buried topsoils can be found in many places, and the newer, deposited soil materials on the valley surfaces have younger, less developed profiles.

9.2.2. Topography

Both options for the Q1–STH 88 Route Alternative are in the Western Coulees and Ridges Ecological Landscape,[124] which includes the southwestern and west-central portions of Wisconsin. This landscape is characterized by highly eroded, thoroughly-dissected upland with high, narrow ridges and deep, steep-sided valleys. The elevation of the limestone ridges is about 1,200 feet, or about 500 feet above the adjacent valleys.

The Q1-STH 88 Route Alternative begins after the crossing the Mississippi River floodplain (Segment 1) and the short distance down the Mississippi River Valley (Segments 2A1 and 2A2). From there, the Alternative would follow Segment 10B1 to the northeast along the Arcadia Route, up a steep river valley, climbing at a 10 percent gradient to an elevation of 1,260 feet AMSL. Alternative route Segment 10B2 is similar to Segment 10B1 but climbs a steeper bluff with a gradient of approximately 30 percent, before arriving at the uplands.

For 10 miles, Segments 10C1 and 10C2 extend from the bluff top overlooking the Mississippi River to the Waumandee River Valley along the western portion of the proposed Arcadia Route. The segments cross upland ridges and river valleys, with elevation changes ranging from 1260 feet AMSL to lows of 780 feet AMSL at the eastern end. Approximately one mile of off-ROW access would be required.

Segments for Option A (Segments 88A and 88B) and Option B (Segments 88C, 88D, 88E, 88F, and 88G) both follow the Waumandee Creek Valley. The Option A route is aligned along the winding STH 88 ROW, whereas the Option B route is a more straightened alignment on new ROW. There is also slightly less variation topographically on Option B as opposed to Option A, making it potentially easier to construct. Both options start at an elevation of approximately 780 feet AMSL in the valley and end at the mouth of Waumandee Creek in the Mississippi River Valley at an elevation of approximately 650 feet AMSL.

The STH 88 Connector, regardless of option, then rejoins either the Q1-Highway 35 Route (see Section 7.2.2.) or the Q1-Galesville Route (see Section 8.2.2) via Segment 2E2 located within the flatter Mississippi River Valley.

[124] Ecological Landscapes of Wisconsin, WDNR website: http::dnr.wi.gov/landscapes.

9.2.3. Soils

The soil types and their distribution in the STH 88 valley are greatly influenced by the bedrock of the region, the rainfall and water movement, and the vegetation and land use. They also are products of wind-borne loess, water-borne alluvium, and colluvium from the bases of the surrounding ridges.

Loess, alluvium, and colluvium form the uppermost geologic deposits and, in addition to the bedrock, are the parent materials for many of the soils. The sedimentary bedrock of sandstones and dolomitic limestone are overlain by soils of silt loams (loess) and sandy loams. Soil types range from shallow silty clay loams on steep rocky land to deep silt loams on the valley bottoms, with smaller areas of sandy outwash soils. Aeolian silt deposits are present and range from 0.5 to 16 feet deep with decreasing depths from southwest to northeast.

The STH 88 Connector alternatives start in the west in the same place and soils that the other routes would occupy. They extend over the Mississippi River bluffs at Alma, either by the short Segment 10B2 or the longer 10B1.

Segments 10C1 and 10C2 vary between soil associations of the uplands and the loamy and silty soils of the lowlands. In Buffalo County, upland soils continue to be dominated by Fayette on the hill tops and steep stony and rocky land, Downs, and Dubuque soil units on the hillsides. Valley side slopes have thinner topsoil and can be more susceptible to erosion with slopes up to 25 percent. Depth to bedrock varies from 5.0 feet or less in the uplands and between 5.0 and 50 feet below the ground surface in the river valleys. Whether the connector segments start at the east end of Segment 10C1 or the east end of Segment 10C2, the surrounding soils are mostly the silty stream terrace Bertrand and Richwood soils. A route may also be located on the lower portions of slopes in the sandy Boone and Hixton soils. Depth to bedrock ranges from 50 to 100 feet below the ground surface in the center of the river valley and gets progressively shallower as the elevation increases up the valley slopes. Approximately six transmission structures on Option A would be located in areas where most bedrock is within 5.0 feet of the ground surface and could require blasting, as well as augering. No structures for Option B would be located in the area's shallow bedrock.

As the Q1-STH 88 Connector options rejoin the Q1 Routes (see Chapters 7 and 8 of this draft EIS), they cross the flat sandy stream terraces and the soils of the overflow bottom lands with loamy alluvial soils. In this area, bedrock is located greater than 100 feet below the surface.

9.2.4. Landcover in general

The land use of Buffalo County is almost entirely agricultural, and so is the land use in the Waumandee valley. Flat areas that are not too wet in the lowlands and not too sloped in the uplands are farmed. Numerous creeks dissect the uplands and run through the hillsides toward Waumandee Creek and the Mississippi River. The variable relief makes a significant portion of the land area non-developable. Roads, such as STH 88, wind in and around steep gradients, following valleys to some degree. Straight line routes, with the exception of along the Mississippi River Valley are not possible.

The woodlands of the lowlands are dominated by willow, soft maple, box elder, ash, elm, cottonwood, and river birch trees, and prairie vegetation. Upland woods which in pre-settlement times were populated with oaks today are mostly broad-leaved deciduous forest with oak and maple as the predominant hardwood. Oaks continue to grow along the steep hillsides.

Population densities in the STH 88 valley remain low. Because Option A follows the state highway, it comes closer to more homes; whereas the new cross-country ROW for Option B would impact agricultural fields to a greater extent even though both options cross rural areas.

9.3. NATURAL RESOURCES AND IMPACTS

9.3.1. Woodlands

A general discussion of potential woodland impacts can be found in Chapter 5, Section 5.5.17. Particular woodlands along the STH 88 Connector Alternatives are discussed here where potential specific impacts are noted.

9.3.1.1. Existing environment

In relation to the rest of the project area, the STH 88 Connectors follow one of the stream valleys bordered by wooded uplands supporting mostly broad-leaved deciduous forest with oak and maple as the predominant hardwood trees. The woodlands of lowland stream valleys like the Waumandee Creek valley are typical of southwest Wisconsin, dominated by willow, soft maple, box elder, ash, elm, cottonwood, and river birch trees, and prairie vegetation. Waumandee Creek is discussed further in Section 9.3.3.

9.3.2. Potential impact

As potential replacements for the portion of the Q1 Routes that lies between Alma and the mouth of Waumandee Creek, the STH 88 Connector Alternatives increase the amount of forest affected by the Q1-Highway 35 or Q1-Galesville Routes.

The proposed ROW for the new line is 150 feet wide, expanding 90 feet beyond the existing highway ROW when following STH 88. Xcel, as the lead utility for the project, provided a general visualization of the tree clearing that would be required for the ROW. A staff rendition of this visualization is shown in Figure 7.3-1 in Chapter 7.

In addition to the actual loss of trees, indirect impacts would likely result from increasing the width of the existing road corridor. Edge effects such as changes in vegetation structure, light conditions, and moisture conditions would encroach further into the interior of the forest. The increase in edge-to-interior ratio would be a measure of forest fragmentation. Large corridors in a forest block generally provide conduits for the introduction of invasive plant and animal species and result in barriers to the movement of local wildlife, including increased exposure to predators. Where the woods shade a stream, the thermal loading resulting from the loss of the tree shade could increase the temperature of the stream thereby altering stream species composition.

This section of the draft EIS focuses on the route segments making up the STH 88 Connector Options A and B. Discussions of the Q1-Highway 35 and Q1-Galesville Route forests can be found in Chapters 7 and 8, and Sections 7.3.1 and 8.3.1, respectively. A discussion of the western portion of the Arcadia Route can be found in Chapter 10, Section 10.3.1.

The two options beginning at the 10C1/10C2 juncture of the Arcadia Route both run across lowland. While Segment 88A of Option A begins in cropland, Segment 88C of Option B runs through narrow forest lands bordering Little Waumandee Creek; the ROW clearing would remove vegetation that shades the creek and helps cool the aquatic habitat (See Section 9.3.4). Segment 88A results in trimming along creek woodlands further south. Both segments skirt portions of the eastern edge of the Mississippi Valley Conservancy's Hohman Tract forest. See Figure Vol. 2-1R. They also each require tree clearing in

different portions of the Conservancy's Kube-Waumandee Tract. Segment 88C crosses the creek, requiring tree clearing in the vicinity of the crossing. Segment 88A requires some tree clearing along the edge of the tract near STH 88. Both segments cross and require ROW clearing through wooded wetlands associated with Waumandee Creek.

South of Schoepps Valley Road, Segments 88A and 88D (continued from Segment 88C) join to follow STH 88, removing more wooded wetland edge along Waumandee Creek. South of Oak Valley Road, the two options separate again, with Option B Segment 88E running through cropland. Both Segments 88A, running along the highway, and 88E cross two tributaries to Waumandee Creek and Waumandee Creek itself in this area, requiring the clearing of forest for the ROW. East and south of the creek, Segment 88A joins Option B Segment 88F along the highway again, passing on the opposite side of the highway from a large wooded ridge before crossing more wetlands to the south.

Overall, from the Arcadia Route interconnection in the north to the Q1 Routes interconnection in the south, the STH 88 Connector Alternative using Option A would likely require clearing an additional 10.7 acres of upland forest to expand the ROW beyond STH 88.[125] Using Option B would require clearing an additional 10.4 acres of upland forest. The portion of the Q1 Routes that are avoided by these connector alternatives would require removal of about 6.5 acres of upland woods for new ROW.

9.3.3. Endangered resources

When comparing potential impacts to rare species, the numbers of occurrences recorded in the NHI database, or the results of habitat assessments and the incidental observations recorded during those assessments, are generally skewed towards segments that are readily accessible and/or on public lands. The STH 88 Connector options take the Q1 Routes away from the Mississippi River between Alma and the south end of STH 88 near the mouth of Waumandee Creek. The western end of the STH 88 Connector route alternatives is identical to the Arcadia Route (see Chapter 10). The Arcadia Route traverses more upland landscapes in the interior of habitat areas on private lands, so the information is relatively more general and the conclusions more estimative. The wetland areas along the Arcadia Routes are fragmented by agricultural land use and the larger habitat areas are predominantly upland natural communities. Because of this, there are potentially more impacts to upland habitats and upland species than when compared to the Q1 Routes.

The NHI database shows no occurrences along either of the STH 88 Connector options. The NHI database and the applicants' work provide information primarily from public lands or indirectly through habitat assessments. Our interpretation of suitable habitat is often limited by our knowledge of a species habits and life-cycle. For these reasons, other rare species may be present, or species that have already been identified may be present in additional locations in potentially affected areas.

Notwithstanding the limitations described above in looking at absolute numbers of occurrences, the routes incorporating the STH 88 Connector Options A and B do not appreciably change the nature and number of the species occurrences from those identified in the Q1-Highway 35 and Q1-Galesville Routes. This is because the segments that these connectors replace do not contain a significant portion of the species occurrences.

[125] Clearing of wooded wetland is discussed in more detail in Section 9.3.4.

9.3.4. Streams

The STH 88 Connector Alternative Options are both in the Waumandee Creek valley and would be located in the Waumandee Creek Watershed, which feeds directly into the Mississippi River.

9.3.4.1. Basin information

The STH 88 Options and the Waumandee Creek watershed are both be located in the BBT group. The ridge tops and valleys of the area generally support forests and agriculture, respectively. The driftless terrain drains to the Mississippi's wide floodplains. The watershed is illustrated in Figure Vol. 2-4, and its floodplain is shown in Figure Vol. 2-5.

9.3.4.2. Hydrologic features

The Waumandee Creek Watershed is approximately 142,060 acres in size and consists of 508 miles of streams and rivers, 3,011 acres of lakes, and 8,254 acres of wetlands. The watershed is dominated by forests and agriculture. Segments 88A through G are all associated to some degree with Waumandee Creek or its tributary streams.

9.3.4.3. Ecological landscapes

The watershed is part of the Western Coulee and Ridges Ecological Landscape of southwestern and west-central Wisconsin, characterized by highly eroded, driftless topography and relatively extensive forested landscape. Historical vegetation consisted of southern hardwood forests, oak savanna, scattered prairies, and floodplain forests and marshes along the major rivers. With Euro-American settlement, most of the level land on ridge tops and valley bottoms was cleared of oak savanna, prairie, and forest for agriculture. The steep slopes between valley bottom and ridge top, unsuitable for raising crops, grew into oak-dominated forests after the ubiquitous pre-settlement wildfires were suppressed. Current vegetation is a mix of forest (40 percent), agriculture, and grassland with some wetlands in the valley.

Nonpoint source water pollution is a concern. Nonpoint source water pollution is usually a result of agricultural practices that allow soil erosion or runoff. The Waumandee Creek Watershed was selected as a priority watershed project in 1985 under the Wisconsin Nonpoint Source Pollution Abatement Program. The Waumandee Creek Watershed has severe nonpoint source pollution impacts degrading all of the streams. Many of the streams have also been severely channelized which significantly reduces the potential to improve fishery habitat in these streams.

Trout streams of different qualities are illustrated in Figure Vol. 2-4. Waumandee Creek and its tributaries are not classified as Class 1, 2, or 3 trout streams. Figure Vol. 2-3 shows that no Outstanding or Exceptional Resource Waters are located in the part of the watershed that lies within the project area.

9.3.4.4. Potential specific impacts

The western end of the STH 88 Connector Alternative is identical to the western end of the Arcadia Route, discussed in Section 10.3.4 in Chapter 10. The eastern end of the alternative is identical either to the Q1-Highway 35 Route or the Q1-Galesville Route, discussed in Sections 7.3.4 and 8.3.4. This section focuses on the actual STH 88 Connector in the Waumandee Watershed.

Segment 88A of Option A parallels Waumandee Creek in various locations. Depending on how much land clearing is associated with this portion of the segment, a Wis. Stat. ch. 30 grading permit may be necessary for "disturbing more than 10,000 feet on the bank." The creek is located along several hundred feet of the ROW on this segment. Additional clearing of woodland vegetation along the waterway would

adversely impact its cool water fishery, and could also lead to additional infiltration of sediments or other nonpoint source pollutants.

Segment 88C and Segment 88D also parallel Waumandee Creek in places. The primary concerns that are discussed for Segment 88A also apply. If the line for this option were shifted to the west side of the roadway, the waterway impacts would be reduced or avoided.

9.3.5. Wetlands

See Figures Vol. 2-1B, 2-1R, and 2-1M to find the STH 88 Route Connector Options, and the Route Segments and associated wetlands.

9.3.5.1. Option A

There are several small wetlands along STH 88 Option A.

Segment 88A follows the existing STH 88 road corridor and runs mostly through active agricultural lands. However, it appears that several transmission poles might be located in wetlands. One might be located in a roadside floodplain wet meadow. Another three poles could be located in forested floodplain wetlands near a stream corridor. Another 13 poles could be located in floodplain wetlands near STH 88 that have varied vegetative cover. If this route option is approved, full wetland delineations would need to be completed.

Segment 88B crosses a larger wetland complex associated with Bensel Pond, south of the existing Q1 transmission line. According to the Wisconsin Wetland Inventory, this wetland complex appears to be in crop production.

9.3.5.2. Option B

There are several small wetlands along the STH 88 Option B.

Segment 88C starts off from the Arcadia Route connection in the north crossing a wetland complex associated with a meandering stream. The segment heads cross-country, parallel to but not within the Little Waumandee Creek floodplain and wetland complex. Although this segment crosses several small wetlands associated with stream crossings, the majority of the segment crosses active crop lands. There might be one pole located within a wetland associated with Waumandee Creek. This wetland appears to be wet meadow and may be actively grazed.

As can be seen in Figure Vol. 2-1M, Segments 88D through 88F would cross wetlands summarized in the discussions about Segment 88A, and Segment 88G would cross wetlands summarized in the discussions on Segment 88A and Segment 88B. Potential wetland impacts are as discussed for Segments 88A and 88B above.

Wetland impacts do not differ substantially between Option A and Option B because the alternatives essentially follow the same corridors. However, Option A passes over wetlands along the existing STH 88 roadway, while Option B affects wetland areas that are not directly associated with the roadway.

9.3.6. Archeological resources/historic properties

9.3.6.1. Option A

WHS's archeological sites database shows three known archeological sites that appear to be within or adjacent to the proposed ROW of the STH 88 Option A Connector. Whether within or adjacent to the proposed ROW, these archeological resources could be affected by construction activities.

It is likely that these sites would require additional field investigations. One site is the Anchorage Cemetery, located on Segment 88A. Another is the burial site Rieck Graves, also on Segment 88A, where it coincides with Segment 88F of Option B. The third archeological site is a historic Euro-American cabin/homestead on Segment 88A.

WHS and PSCW would require that the investigations be done by a qualified archeologist able to assess each site's location and boundaries and its current integrity. The cemetery and Rieck Graves would require compliance not only with the Wisconsin Historic Preservation Act but also with the Wisconsin Burial Sites Preservation Law.

9.3.6.2. Option B

The archeological sites database shows two known archeological sites that appear to be within or adjacent to the proposed ROW of the STH 88 Option B Connector and could be affected by construction activities.

It is likely that these sites would require additional field investigations. One site is a prehistoric campsite containing pottery fragments and lithic scatter, located on Segment 88G. The second is the Rieck Graves burial site on Segment 88F.

WHS and PSCW would require that the investigations be done by a qualified archeologist able to assess each site's location and boundaries and its current integrity. The Rieck Graves would require compliance not only with the Wisconsin Historic Preservation Act but also with the Wisconsin Burial Sites Preservation Law.

9.4. COMMUNITY IMPACTS

9.4.1. Aesthetic and visual impacts

This discussion of visual impacts is based on visits to the project area and the following underlying assumptions:

- Different types of viewers may have different levels of visual sensitivity.
- The setting can influence the degree of visual impact.
- The viewing conditions can influence the degree of visual impact.

The STH 88 Alternatives begin in the west as part of the proposed Arcadia Route, discussed in Chapter 10. The potential visual impacts at the Mississippi River crossing would be the same as for the Arcadia Route and the Q1-Highway 35 and Q1-Galesville Routes. The transmission line would run up and over the river bluffs along Segment 10B1 or 10B2, creating the same visual impact discussed in Section 10.4.1 of Chapter 10. This would include a linear clearing of bluff forest that would be visible from the Mississippi River Valley and those traveling along GRR (STH 35). Still following the Arcadia Route, the line would cross the upland ridges and valleys of Segment 10C. The visual environment along

this portion of the route is characterized by irregular-shaped agricultural fields perched on the relatively flat hilltops which are thoroughly dissected by steep forested hillsides and numerous deep valleys, entirely cross-country. While the proposed line would be double-circuited with an existing transmission line and share its ROW, the ROW would be almost doubled in width (an additional 35 feet on each side). It would be sited primarily within agricultural fields in an attempt to span the steep valleys and dense woodlands of the smaller waterways. Still, significant clearing of woodlands, which surround most agricultural fields, would be required for the ROW and any improved or new construction access roads. The route crosses rural and undeveloped landscapes.

Departing from the east-west 161 kV transmission ROW, a line built on either of the two STH 88 Connector Alternative Routes would turn south on single-pole single-circuit structures like those diagramed in Appendix A, Figure 23 and others. Segment 88A of Option A hugs the ROW of STH 88 from this point to its southern terminus at STH 35. Option B departs from the road ROW and goes cross-country for most of its first half (Segment 88C) and at several other locations for an overall slightly straighter route. There are a number of residences located within 300 feet of the centerline of Option A, so the route periodically moves across the road to avoid homes.

Both options include ROW shared with STH 88. However, the transmission line ROW would be cleared for an additional 90 feet beyond the highway ROW for co-located portions of the route and, along the cross-country portions of Option B, a full 150-foot wide ROW would be cleared of vegetation. In this primarily agricultural area, there are many wooded areas between agricultural fields and the natural areas associated with the Waumandee Creek and its tributaries. Cleared woodlands for the ROW and the new structures would be highly visible. Regardless of whether Option A or B were chosen, the line continues south through the Waumandee Creek Valley and would have a negative aesthetic impact on the residents along STH 88 and other highway users. Residents have expressed concerns about aesthetics in public sessions held by Commission staff. In the northern half of the STH 88 Alternative, Option A might be more visible to residents and users of STH 88 than Option B.

The line would be a dominant new feature in the valley, where the only other electric lines are distribution lines. The surface of the new poles would likely be brown oxidized steel in an attempt to blend in the structures with the woods and farmland. Near the base, the poles might be five to seven feet wide or wider if they are located where the line turns or changes direction. Two-pole structures, each five to eight feet at the base, may be used where particularly sharp or tight turns occur.

At the south end of Waumandee Creek (near Segment 2E2), the route turns southeast with the existing Q1 transmission line and crosses the hills and valleys west of the Trempealeau River, the farmlands west of the Black River, passing either through or around the Van Loon State Wildlife Area to USH 53. This portion of the routes creates impacts identical to those potentially expected along the Q1-Highway 35 or Q1-Galesville Routes.

9.4.2. Agriculture

Significant portions of STH 88 Alternative Options A or B cross land used for agricultural purposes (41 to 48 percent). Agricultural uses include row crops and animal husbandry. Of the agricultural acres within the proposed ROW, most is cropped with a small percentage in pasture. The majority of the crops are corn and soybeans. Option A would likely create fewer farm land impacts than Option B because the line would be located close to the highway and along the edge of farm fields. The cross-country portion of Option B passes through farm fields and wooded fence rows. Some Option B transmission structures would be located within farm fields. Constructing some portions of this transmission line could be disruptive to field work.

No pivot irrigation systems appear to be installed along the STH 88 Alternative routes.

Limited aerial applications of herbicides, fungicides, and pesticides might occur along the route, though no specific information is known. The applicant should work with landowners whose aerial spraying would be affected by transmission line placement to minimize potential impacts.

Farms with livestock or farms that practice organic farming would require specific protection measures during construction to avoid the spread of farm pests and diseases and to protect organic certifications. Additional concerns for organic farms may arise with the removal of tree buffers for the ROWs. The removal of a buffer may threaten a crop's organic status by increasing the potential for herbicide drift from adjacent fields. The number of properties that would require some form of protective measures along this route is unknown at this time. Biosecurity and organic farm impacts can be minimized if the applicant works with agricultural landowners well in advance of construction, gives advance notice of construction activities, and follows through with agreed-to protection measures. The applicants estimate $5,000 per mile for various agricultural protection measures.

There are less than ten confined animal operations located within 300 feet of the centerline of either STH 88 option. None of these buildings would be within 100 feet. There are also six non-residential agricultural buildings within 300 feet of the centerline of Option A and three non-residential agricultural buildings within 300 feet of the centerline of Option B. Concerns associated with the presence of confined animal buildings are stray voltage and the relationship of distribution lines to the proposed high-voltage lines. For a detailed discussion of this issue see Section 5.3.

Wisconsin Stat. §§ 182.017(7)(c) through (h) is a list of landowner rights, many of which address issues which are of particular import to agricultural landowners and their fields. These mitigation measures apply to landowners whose property is directly affected by the construction of a high-voltage transmission line and include the proper segregation of topsoils, post-construction restoration of the land, repair of damaged fences and drainage tile, scheduling construction as much as practicable when the land is frozen or at the landowner's request, removal of construction debris and rocks, and payment for crop damage. A detailed discussion of landowners' statutory rights is included in Section 5.3.

The full width of the ROW would be cleared for construction of the proposed line, including ROW land on properties currently planted with trees such as plantations or orchards. Under Wisconsin law (see Section 5.3), landowners must be compensated for any crop damage caused by construction or maintenance of a high-voltage transmission line. Additionally, landowners must be afforded a reasonable time prior to commencement of construction to harvest any trees located within the easement boundaries and, if the landowner fails to do so, the landowner still retains title to all trees cut by the utility. However, after construction is completed, the utility would most likely not approve of re-vegetating the transmission easement with trees. Changing the use of the easement land may present a loss to the landowner. The applicant should work with tree farm and plantation landowners to minimize construction impacts and determine allowable post-construction use of the land within the easement.

Refer to Chapter 5, Section 5.5.2, for a discussion of potential impacts associated with transmission line construction and operation in agricultural fields. The AIS prepared by WDATCP will contain discussions of potential impacts of the line on farm fields. Its Executive Summary will be placed in Appendix C when it is completed.

9.4.3. Airports and airstrips

No public use airports or private air strips would be impacted by any of the proposed route connector options.

9.4.4. Electric distribution line issues

There are distribution lines along the routes owned by NSPW and Riverland. Because of issues associated with stray voltage and its potential effect on confined animals (mostly dairy cows), the routes were analyzed for areas where distribution lines may be located too close to the proposed transmission lines. There is a general consensus that distribution lines located less than 150 feet from a transmission line and parallel to the transmission line for more than 1,000 feet continuous can cause impacts to farms housing confined animals. The cause, impact, and mitigation of stray voltage or NEV are discussed in detail in Section 5.5.14.

For this project, distribution lines would be removed, relocated, and/or buried if they present a physical conflict to the proposed transmission line or if their proximity to the transmission line might result in NEV concerns. No distribution lines are proposed to be underbuilt on the new 345 kV structures.

The applicants identified locations along both Option A and Option B where distribution lines would be relocated. For Option A, approximately 5.5 miles of distribution lines along approximately 60 percent of Segments 88A and 88B would be relocated and buried away from the transmission line. For Option B, approximately 4 miles (45 percent of Segments 88C through 88G) of distribution lines would be reconstructed underground.

There might be some construction impacts associated with the removal of the existing structures and the installation of the new cables. Distribution lines would be removed using a two-axel bucket truck or, where access is difficult, a lineperson would climb the poles and detach the conductors and insulators. Existing distribution poles would be either pulled using vehicle mounted equipment where possible or cut off at ground level by chainsaw. The distribution line would be undergrounded using either a vibratory plow or directional boring techniques. Of these two techniques, directional boring produces less environmental impact and can be used to avoid protected resources such as wetlands and waterways. Impacts could be further minimized by working with the affected landowner well in advance of construction and through compensation to landowners for any damage to fields, infrastructure, or landscaping. Additional state and federal permits or approvals might be required prior to the start of construction.

The Commission may require the applicant to conduct pre-construction and post-construction testing of potentially impacted farms and lines.

9.4.5. Electric and magnetic fields

The majority of segments for this route would use existing transmission line corridors except for those segments proposed to be located along STH 88. The following information on EMF is provided to give readers an idea of the expected magnitude of the magnetic fields that could be produced by the proposed line under expected normal load conditions. This section also provides an estimate of the existing transmission line magnetic fields where existing transmission line ROW exists. In all cases, the magnetic fields provided are estimates only. Magnetic fields are proportional to the current flowing on a line at any given time. Because current flow is highly variable, only an estimate of the magnetic fields can be provided. For more information on EMF refer to Appendix B.

The information is provided by route segment. To locate the segment, refer to the map in Figure Vol. 2-1 Index.

9.4.5.1. West end segments common to utility-proposed routes

Segment 1
There is an existing 161/69 kV double-circuit transmission line along Segment. The proposed project would replace this line with a 161/345/161 kV triple-circuit transmission line on H-frame structures (see Appendix A, Figure 14). This segment is part of all the proposed routes. EMF analyses for it can be found in either Section 7.4.5 of Chapter 7 for the proposed Q1-Highway 35 Route, Section 8.4.5 of Chapter 8 for the proposed Q1-Galesville Route, or Section 10.4.5 of Chapter 10 for the proposed Arcadia Route.

Segments 2A1 and 2A2
Along Segments 2A1 and 2A2 there is an existing 161 kV single-circuit transmission line. The proposed project would replace this line with a 161/345 kV double-circuit transmission line on single-pole structures (see Appendix A, Figures 3, 5, 6). These two portions of Segment 2 are also part of the Q1-Highway 35 Route and the Q1-Galesville Route.

There is one residence within 300 feet of the proposed line. That residence is between 151 and 300 feet from the proposed line. No schools, daycare centers, or hospitals are within 300 feet of the proposed line.

The estimated magnetic field from the existing 161 kV line under normal load conditions is approximately 6 mG at 100 feet and decreases to about 3 mG at 150 feet. At 300 feet, the magnetic field from the existing line falls to approximately 0.8 mG. The estimated magnetic field from the proposed line under expected normal 2015 load conditions would be about 6 mG at 100 feet and would decrease to 3 mG at 150 feet. At 300 feet, the expected magnetic field would be about 0.9 mG.

9.4.5.2. Segments 10B2 or 10B1 (mutually-exclusive options)

Segment 10B2
This route segment is an alternative segment in the proposed Arcadia Route (see Chapter 10). It would require Segment 2A1 to connect it to the Mississippi River crossing, but not Segment 2A2. Approximately 80 percent of this segment would be built as a 345 kV transmission line on single-pole structures (see Appendix A, Figure 28). The remaining 20 percent, on its west end, would be built as a double-circuit 161/345 kV line, also on single-pole structures (see Appendix A, Figure 5).

There is one residence within 300 feet of the proposed line. That residence is located between 151 and 300 feet of the line. No schools, daycare centers, or hospitals are within 300 feet of the proposed line.

The estimated magnetic field from the single-circuit 345 kV line, using anticipated 2015 loads, would be about 6 mG at 100 feet. At 150 feet, the magnetic field falls to approximately 3 mG, and it is reduced to approximately 0.9 mG at 300 feet. For the double-circuit line, using anticipated 2015 loads, the magnetic field would be about 11 mG at 100 feet. At 150 feet, the magnetic field falls to approximately 6 mG, and it is reduced to approximately 1.8 mG at 300 feet.

Segment 10B1
This route segment is also part of the utility-proposed Arcadia Route (see Chapter 10). It would require Segment 2A1 and Segment 2A2 to connect it to the Mississippi River crossing in the west. There are no existing transmission lines along Segment 10B1. The proposed project would construct a 345 kV

single-circuit transmission line on single-pole structures along this segment (see Appendix A, Figures 21, 25).

No residences, schools, daycare centers, or hospitals are within 300 feet of the proposed line.

The estimated magnetic field from the proposed line, under expected 2015 load conditions, would be about 6.3 mG at 100 feet and would decrease to 3 mG at 150 feet. At 300 feet, the expected magnetic field would be about 0.9 mG.

9.4.5.3. Option A

Segment 10C1
There is an existing 161 kV single-circuit transmission line along Segment10C1. The proposed project would replace this line with a 161/345 kV double-circuit transmission line on single-pole structures (see Appendix A, Figure 3, 5).

There are three residences within 300 feet of the proposed line. All three residences are between 151 and 300 feet of the line. No schools, daycare centers, or hospitals are within 300 feet of the proposed line.

The estimated magnetic field from the existing 161 kV line under normal load conditions is approximately 21 mG at 50 feet and decreases to about 6 mG at 100 feet. At 150 feet, the magnetic field falls to approximately 3 mG and is reduced further to about 0.8 mG at 300 feet. The estimated magnetic field from the proposed line under expected 2015 load conditions would be about 23 mG at 50 feet and would decrease to 11 mG at 100 feet. At 150 feet, the expected magnetic field would be about 6 mG and would drop to about 2 mG at 300 feet.

Segment 10C2
There is an existing 161 kV single-circuit transmission line along Segment 10C. The proposed project would replace this line with a 161/345 kV double-circuit transmission line on single-pole structures (see Appendix A, Figure 5).

No residences, schools, daycare centers, or hospitals are within 300 feet of the proposed line.

The estimated magnetic field from the existing 161 kV line under normal load conditions is approximately 6 mG at 100 feet and decreases to 3 mG at 150 feet. At 300 feet, the magnetic field falls to approximately 0.8 mG. The estimated magnetic field from the proposed line under expected 2015 load conditions would be about 11 mG at 100 feet and would decrease to 6 mG at 150 feet. At 300 feet, the expected magnetic field would be about 1.8 mG.

Segment 88A
There are no existing transmission lines along Segment 88A. The proposed project would construct a 345 kV single-circuit transmission line on single-pole structures (see Appendix A, Figure 21).

There are 20 residences within 300 feet of the proposed line. One residence is between 51 and 100 feet of the line, seven residences are between 101 and 150 feet, and 12 residences are between 151 and 300 feet of the line. No schools, daycare centers, or hospitals are within 300 feet of the proposed line.

The estimated magnetic field from the proposed line under expected 2015 load conditions would be about 18 mG at 50 feet and would decrease to about 6 mG at 100 feet. At 150 feet, the expected magnetic field would be about 3 mG and would drop to approximately 0.9 mG at 300 feet.

Segment 88B
There are no existing transmission lines along Segment 88B. The proposed project would construct a 345 kV single-circuit transmission line on single-pole structures (see Appendix A, Figure 21).

No residences, schools, daycare centers, or hospitals are within 300 feet of the proposed line.

The estimated magnetic field from the proposed line under expected 2015 load conditions would be about 18 mG at 50 feet and would decrease to 6 mG at 100 feet. At 150 feet, the expected magnetic field would be about 3 mG, and it would drop to 0.9 mG at 300 feet.

Segment 2E2
There are no existing transmission facilities along Segment 2E2. The proposed project would move an existing 161 kV line located to the east of the proposed new ROW and construct a 161/345 kV double-circuit transmission line on single-pole structures along this segment (see Appendix A, Figure 5).

There are two residences within 300 feet of the proposed line. Both residences are between 151 and 300 feet of the proposed facilities. No schools, daycare centers, or hospitals are within 300 feet of the proposed line.

The estimated magnetic field from the proposed line under expected 2015 load conditions would be about 6 mG at 100 feet. It would decrease to about 3 mG at 150 feet and would drop to approximately 0.9 mG at 300 feet.

9.4.5.4. Option B

Segment 10C1
There is an existing 161 kV single-circuit transmission line along Segment10C1. The proposed project would replace this line with a 161/345 kV double-circuit transmission line on single-pole structures (see Appendix A, Figure 3, 5).

There are three residences within 300 feet of the proposed line. All three residences are 151 and 300 feet of the line. No schools, daycare centers, or hospitals are within 300 feet of the proposed line.

The estimated magnetic field from the existing 161 kV line under normal load conditions is approximately 21 mG at 50 feet and decreases to about 6 mG at 100 feet. At 150 feet, the magnetic field falls to approximately 3 mG and is reduced further to about 0.8 mG at 300 feet. The estimated magnetic field from the proposed line under expected 2015 load conditions would be about 23 mG at 50 feet and would decrease to 11 mG at 100 feet. At 150 feet, the expected magnetic field would be about 6 mG, and it would drop to about 2 mG at 300 feet.

Segments 88C-G
There are no transmission lines located along Segments 88C-G. The proposed project would construct a 345 kV single-circuit transmission line on single-pole structures (see Appendix A, Figure 21, 23).

There are a total of eight residences within 300 feet of the proposed line. One residence, along Segment 88F, is between 101 and 150 feet of the line. The remaining seven residences are between 151 and 300 feet of the line. There are no schools, daycare centers, or hospitals within 300 feet of the proposed line.

The estimated magnetic field from the proposed line under expected 2015 load conditions would be about 18 mG at 50 feet and would decrease to 6 mG at 100 feet. At 150 feet, the expected magnetic field would be about 3 mG, and it would drop to 0.9 mG at 300 feet.

Segment 2E2
There are no existing transmission facilities along Segment 2E2. The proposed project would move an existing 161 kV line located to the east of the proposed new ROW and construct a 161/345 kV double-circuit transmission line on single-pole structures along this segment (see Appendix A, Figure 5).

There are two residences within 300 feet of the proposed line. Both residences are between 151 and 300 feet of the proposed facilities. No schools, daycare centers, or hospitals are within 300 feet of the proposed line.

The estimated magnetic field from the proposed line under expected 2015 load conditions would be about 6 mG at 100 feet. It would decrease to about 3 mG at 150 feet and would drop to approximately 0.9 mG at 300 feet.

9.4.5.5. East of STH 88

Starting at Segment 2F, Option A or B could connect to either the Q1-Highway 35 Route (see Chapter 7) or the Q1-Galesville Route (see Chapter 8) to connect to the proposed substation near Holmen. See Figures Vol. 2-1N through Vol. 2-1Q and Vol. 2-1I through Vol. 2-1K.

9.4.6. High-voltage impact fees

Wisconsin state statute requires compensation be paid to municipalities that are burdened by the construction of high-voltage transmission lines via a one-time environmental impact fee and an annual impact fee. Described in statutes and rules (Wis. Stat. §§ 16.969 and 196.491(3g), and Wis. Admin Code ch. ADM 46), the fees paid by the utility to the counties, cities, villages, and towns are based on the percentage of the length of the 345 kV line constructed through a political subdivision. The Commission determines what constitutes the "cost of the high-voltage transmission line" and the percentage applied to the various political subdivisions. Initial payments begin with an invoice issued no more than 60 days after the start of construction and the Commission transmits the required information to WDOA. The annual payments continue for the life of the transmission line. There are some restrictions on how the one-time environmental impact fee may be used but the annual fee may be used in any way the local government sees fit. A complete discussion of how these fees are calculated and disbursed can be found in Section 4.5.4.

Income to local governments on an annual basis that range from thousands to tens of thousands of dollars would be a positive impact to the community. The STH 88 Connector Alternatives might be used with the Q1-Highway 35 or the Q1-Galesville Route. Each variation would produce a different set of fees that would be distributed to the various governmental units. Based upon the applicant's calculations and assumptions for STH 88 Option A/Q1-Highway 35, the projected payments made to the municipalities would approximate those shown in Table 9.4-1. STH 88 Option B would produce similar, though slightly different payments.

Table 9.4-1 High-voltage impact fees expected to be paid to governmental units for STH 88 Option A/Q1-Highway 35 Route

Government Unit	One-Time Environmental Impact Fee	Annual Impact Fee	Total Payment During First Year of Construction*
Buffalo County	$2,605,085	N/A	$2,605,085
City of Alma	$161,449	$19,374	$180,823
Town of Belvidere	$427,555	$51,307	$478,862
Town of Buffalo	$526,534	$63,184	$589,718
Town of Cross	$252,314	$30,278	$282,592
Town of Milton	$573,589	$68,831	$642,420
Town of Lincoln	$79,507	$9,541	$89,048
Town of Waumandee	$584,136	$70,096	$654,232
La Crosse County	$418,631	N/A	$418,631
Town of Holland	$406,461	$48,775	$455,236
Town of Onalaska	$12,170	$1,460	$13,630
Trempealeau County	$1,003,578	N/A	$1,003,578
Town of Caledonia	$361,029	$43,323	$404,352
Town of Trempealeau	$642,550	$77,106	$719,656

* After the first year, only the annual impact fee would be paid.

Comparing Table 9.4-1 with Table 7.4-1, Buffalo County, the city of Alma, the town of Milton, the town of Lincoln, and the town of Waumandee would see more one-time fee dollars if one of the STH 88 Connector Alternative was used instead of the route segments along the Mississippi River. The city of Alma, town of Milton, town of Lincoln, and town of Waumandee would see higher annual impact fees also. The other municipalities listed in either table would see less.

9.4.7. Highway concerns

Segment 88A of STH 88 Connector Option A follows STH 88, and Segments 88D and portions of other segments in Option B also follow STH 88. Safety, efficiency, and aesthetic considerations must be examined for drivers on this smaller, two-lane state highway.

Wisconsin Stat. § 86.16 allows utilities to locate their facilities along and across highway ROW with the written consent of the highway jurisdiction. However, wherever the line would need to share ROW or cross a state or federal highway, a permit must be obtained from WisDOT to ensure that the work does not adversely affect the safety, efficiency, and aesthetics of the highway, interfere with the highway's present use or future expansion, or require access for future utility maintenance directly from the highway lanes or shoulder.

Because both Option A and Option B follow at least a portion of STH 88 and overlap some of the highway's ROW as they connect the Arcadia segments with the Q1 Route segments, either would require WisDOT safety analyses and permits in order for transmission construction to occur.

9.4.8. Public lands

The STH 88 alternate route options are not located close to any federal or state-owned natural resource areas.

9.4.9. Land use compatibility

Most areas along the STH 88 Connector routes are rural in nature and are currently in agricultural or other undeveloped uses, such as forestry. These uses are expected to continue into the future. An electric transmission line is usually compatible with these surrounding land uses.

In general, residential uses are considered to be more sensitive to impacts from electric transmission lines than are commercial or industrial land uses, primarily because of potential aesthetic effects. Sharing a corridor with existing infrastructure, such as an existing transmission line or multi-lane highway, can mitigate impacts by causing incremental impacts instead of the entirely new impacts associated with a brand new corridor. About 91 percent of Option A and 25 percent of Option B use the existing two-lane highway corridor.

The STH 88 Connector routes pass through largely rural, sparsely-developed areas of Buffalo County, zoned for agricultural use, as they follow the valley containing STH 88. Their northern connections with the Arcadia Route are located along an existing DPC 161 kV transmission line ROW. Their southern connections with the Q1 Routes are at the BNSF railroad track adjacent to the Mississippi River.

9.4.10. Residences

9.4.10.1. Option A

One home would lie within 100 feet of the route centerline, with another seven homes between 100 and 150 feet from the centerline. Table 9.4-2 shows numbers of residences within increasing distances from the proposed transmission centerline.

Table 9.4-2 Residences within 300 feet of the STH-88 Option A Connector

SEGMENT	0'–25'	26'-50'	51'–100'	101'–150'	151'–300'
	From Route Centerline				
88A			1	7	12
2E2					2
Total	0	0	1	7	14

9.4.10.2. Option B

One home would lie within 100 feet of the route centerline, with another nine homes between 100 and 150 feet from the centerline. Table 9.4-3 shows numbers of residences within increasing distances from the proposed transmission centerline.

Table 9.4-3 Residences within 300 feet of the STH 88 Option B Connector

SEGMENT	0'–25'	26'-50'	51'–100'	101'–150'	151'–300'
	From Route Centerline				
88C					2
88D					2
88E					2
88F				1	1
2E2					2
Total	0	0		1	9

9.5. POTENTIAL STAGING/LAYDOWN AREAS AND OFF-ROW ACCESS ROADS—EXISTING CONDITIONS AND POTENTIAL IMPACTS

9.5.1. Staging areas

Construction staging areas would be required during the entire construction period for the storage of construction materials, transmission line poles, cables, equipment, vehicles, and related materials. The applicants identified potential staging areas on the basis of their location, access, security, and suitability for the efficient and safe warehousing of supplies. Environmental and landowner impacts were also considered. Identified sites have been evaluated for potential impacts to wetlands, streams, natural features, threatened and endangered resources, and cultural or archaeological resources. Sites were also evaluated as to vegetation clearance, excavation, and grading requirements. Sites that need minimal site preparation are preferred. For example, sites that are paved or have been previously graded and cleared of vegetation (parking lots, old gravel pits, and farm fields) are considered ideal locations for staging areas.

Staging areas outside the transmission line ROW would be obtained from private landowners through leases that would last until the end of construction. If it becomes necessary to secure additional staging areas near the route to temporarily store transmission line construction materials, a similar selection process as that used for the original site selection would be followed, including an environmental review.

In general, 20 acres would be used at each site, and an access path at least 30 feet wide would be required. Staging areas would not be located within wetlands. If a selected site is located near or upslope from a wetland or waterway, appropriate erosion control measures would be implemented to prevent impacts. In addition, access points for and the haul routes to and from these work sites would be selected, located, and designed to minimize disturbance to soils and sensitive natural resources to the greatest degree practicable as well as to minimize off-site tracking of soil. Each contractor would be required to have a Spill Prevention Control and Countermeasure Plan in place that would cover both the contractor's construction equipment and construction activities.

The proposed staging area sites are primarily agricultural. Soil compaction should be expected on croplands, although measures could be taken to alleviate this compaction once construction is completed. Any nearby homes could experience noise, dust, and visual impacts. Screening vegetation may mitigate these impacts in some cases. Roads between the staging areas and worksites would be impacted by construction traffic.

The proposed off-ROW sites nearest this route are described below:

- Staging Area 1 is a 40-acre parcel located along Segment 2B, north of the city of Buffalo, on the northeast corner of the intersection of the BNSF railroad and Foegen Road, in the town of Belvidere. The parcel has an approximately 3.0-acre wetland in its northeast corner and a home site along its southern edge. The 20-acre part that would be used for staging is cropland.
- Staging Area 2 is a 16-acre parcel located along Segment 2G, northeast of Fountain City, on the northeast corner of the intersection of STH 93 and CTH P, in the town of Cross. The staging area is cropland.
- Staging Area 9 is a 20-acre parcel located where Segment 10C crosses CTH N, southeast of Alma, in the town of Belvidere. The site is almost entirely cropland, except for a small area of forest and shrub land surrounding an intermittent stream. Open cropland surrounds the parcel.

NSPW may develop one or more additional staging areas near the STH 88 Connector routes, if a connector is included in the route chosen for construction.

9.5.2. Access paths

Construction access paths, for the most part, would follow existing paths identified for the maintenance of existing lines along the proposed route. These paths are generally able to support large equipment, but some tree clearing may be necessary to provide a 16-foot-wide path where they have grown in or to allow for larger equipment. Existing paths were developed over decades of use and coordination with landowners in order to minimize impacts to existing land uses and to avoid areas where large equipment cannot travel. Path widening, grading, or reinforcement may be necessary due to ground conditions at the time of construction or the use of special equipment. Best management practices would be used to prevent soil erosion from the paths where the ground would be disturbed.

Once construction is completed, the access paths would be restored to the landowner's satisfaction where the ground had been disturbed. Restoration would include grading to remove ruts and the establishment of ground cover to stabilize the soil. These activities would be regulated and monitored under a WDNR stormwater permit for construction activities.

The paths would also be used for future maintenance of the line. No specific ongoing maintenance measures for the paths are planned, but when access is needed, necessary improvements would be made at that time.

Clearing or trimming of oak trees during the growing season could possibly spread oak wilt to surrounding forests. Construction outside of the growing season or the immediate treatment of oak stumps or wounds could prevent this.

When access paths cross cropland, it is usually at the edges of fields. Impacts from rutting and soil mixing could be reduced if construction access using these paths takes place when the ground is frozen and avoided when soils are wet.

Access paths tend to be longer and more numerous in route areas dissected by ridges and valleys. Steep slopes can prevent direct access along the ROW path to pole locations. Off-ROW paths can also help reduce wetland and stream crossings by construction and maintenance equipment.

According to the applicants' preliminary access plan, the STH 88 Connector Option A would require two off-ROW construction access paths totaling 0.7 miles in length and 1.3 acres in area. These paths range in length from 1,150 to 2,340 feet. These paths would require the clearing of 0.02 acre of forest and would include 1.1 acres of cropland.

According to the applicants' preliminary access plan, the STH 88 Connector Option B would require 19 off-ROW construction access paths totaling 2.7 miles in length and 11.3 acres in area. These paths range in length from 20 to 2,340 feet. These paths would require the clearing of 0.1 acre of forest and would include 3.8 acres of cropland and 0.3 acre of grassland.