

CHAPTER 12

12. Summary and Comparison of Impacts among Routes

This chapter provides a summary and comparison of various potential natural resource and social impacts for the three utility-proposed transmission line routes (Q1-Highway 35, Q1-Galesville, and the Arcadia Routes) and the alternative routes that the applicants developed in response to suggestions by WisDOT (STH 88 Connector Alternative) and WDNR staff (the Ettrick Connector Alternative). The applicants' original Q1 Route is included in the comparisons in case circumstances lead to its reconsideration. This chapter also attempts to discuss relevant issues of concern related to the various proposals, including scenarios for DPC's planned rebuild of its Q1 line if a Q1 Route is not approved. The last section of this chapter addresses cost comparisons among all the route alternatives.

12.1. DERIVATION OF PROPOSED ROUTES AND ALTERNATIVES

Under WEPA, an EIS must consider alternatives to the proposed action (Wis. Stat. § 1.11(2)(c)3.), and an EIS must clearly describe the alternatives being considered (Wis. Admin. Code § PSC 4.30(2)(c)). Alternatives to the proposed project as a solution to the expressed and verified need are discussed in Chapters 2 and 3. Alternative routes to be utilized if the project need is verified are discussed in Chapters 7 through 11.

Under Wis. Stat. § 196.025(2m)(c), PSCW and WDNR have the following obligation regarding transmission project route alternatives:

“...for a project identified in an application for a certificate under s. 196.491(3), the Commission and the department are required to consider only the location, site, or route for the project identified in the application and one alternative location, site, or route.”

PSCW made an effort during the pre-application process before the applicants' CPCN application filing to ensure that it had the two viable alternative routes required in Wis. Stat. § 196.025(2m)(c). It necessarily continued that effort during the application completeness review. The effort resulted in nine route alternatives considered in the draft EIS.

The three proposed routes plus the two optional STH 88 Connectors (which can be paired with the Q1-Highway 35 or Q1-Galesville Routes) plus the Ettrick Connector (with the Arcadia Route) total eight routes to summarize and compare. Inclusion of the original Q1 Route brings the total to nine. Their derivations are summarized below.

12.1.1. Three routes proposed by the applicants

The three routes proposed in the applicants' submittal are the Q1-Highway 35 Route, the Q1-Galesville Route, and the Arcadia Route. The applicants' originally-preferred Q1 Route was discarded as a primary proposal because of USFWS concerns, but comparable information was included for it in Appendix N of the CPCN application. The Q1-Highway 35 Route is an adaption of the Q1 Route proposed to get the proposed 345 kV line across the Black River bottom lands and include DPC's existing Q1 161 kV line as a double circuit, removing that line from its present position crossing the USFWS Refuge. The Q1-Galesville Route is an adaption of the Q1 Route proposed to avoid the Black River bottom lands, the Refuge, and the Van Loon State Wildlife Area completely. The Arcadia Route was proposed to provide an alternative to the Q1 path altogether.

The three Q1 Routes share route segments from the Mississippi River crossing at the city of Alma through the DPC Q1 ROW crossing the Trempealeau River. The Q1-Highway 35 Route crosses the Van Loon area parallel to and north of STH 35. The Arcadia and Q1-Galesville Routes separate and head in different directions at the south end of Alma but share the same route segments along STH 54/93 south of Galesville (avoiding the Van Loon), and the segments paralleling USH 53 east of the Van Loon through the village of Holmen to the Briggs Road Substation sites.

12.1.2. Routes resulting from WisDOT suggestion

WisDOT is frequently a cooperating agency and commenter on EIS documents for transmission line projects. In this case, however, WisDOT's concern about potential impacts to the GRRNSB has led it to obtain full party intervenor status in the CPCN review. While it cannot be a full party and also an EIS author, WisDOT has cooperated with the EIS preparation and provided information as requested.

During the pre-application process before the applicants filed their submittal to PSCW, WisDOT was an important participant and made the request that an alternative be considered to routing the new 345 kV transmission line along the Great River Road between Alma and the STH 35/88 intersection in the town of Milton. The suggested alternative was to follow the proposed Arcadia Route from Alma to STH 88 and then follow STH 88 south to connect to the proposed Q1-Highway 35 or Q1-Galesville Route and the eastern end of the project. To enable PSCW staff to consider this alternative fairly, staff made formal data requests to the applicants for comparable cost, engineering, and environmental information about the STH 88 Connector.

This alternative follows the Arcadia Route out of Alma eastward to STH 88 and then follows STH 88 southward through the Waumandee Creek valley to the originally-proposed Q1 Route. At Commission staff's request, the applicants' provided information on an alternative connector that would follow the STH 88 highway ROW, called Option A, but also information on another alternative connector suggested by the applicants that straightened the route through the valley to make it less difficult and less expensive to build, called Option B. Options A and B could be applied as Alternative Connectors to either the Q1-Highway 35 Route or the Q1-Galesville Route.¹⁸⁶

12.1.3. Route resulting from WDNR suggestion

WDNR is a co-author of this document as required under Wis. Stat. § 196.025(2m).

¹⁸⁶ They can also be applied to the original Q1 Route by considering the appropriate segments.

Early in the pre-application process, WDNR staff expressed concern about the high quality of the La Crosse Marsh and the Van Loon Wildlife Area. The La Crosse Marsh was where a substation terminus was considered. When all affected agencies and commenters (including those in Minnesota) agreed that the Mississippi River crossing should be at Alma rather than farther south, WDNR's concern about potential impacts to the Van Loon State Wildlife Area and associated wooded wetlands came to the forefront. Crossings of the Van Loon in the utilities' original Q1 Route and the proposed Q1-Highway 35 Route are subject to WDNR permit. Crossing locations on WDNR-owned lands would be exempt from the eminent domain laws. Both the Q1-Highway 35 Route and the original Q1 Route cross WDNR-owned lands. Proposed wetland construction and WDNR permits are subject to the practicable alternatives requirement in Wis. Admin. Code ch. NR 103.

In their CPCN application filing, the applicants proposed one path, made up of a string of route segments, that bypassed the Van Loon along STH 54/93 south of the city of Galesville (a path used for the eastern portions of both the Arcadia and Q1-Galesville Routes). In order to provide the Commission with two alternative paths that both avoid the Van Loon, WDNR staff suggested that the applicants seek a second path, perhaps further north, that would run eastward and bypass the Van Loon before turning toward La Crosse. In response, the applicants developed the Ettrick Connector for the Arcadia Route. To enable PSCW staff to consider this alternative fairly, staff made formal data requests to the applicants for comparable cost, engineering, and environmental information about the Ettrick Connector.

The Ettrick Connector alternative connects to the Arcadia Route at Fox Coulee near STH 93, running eastward toward Ettrick along an existing 69 kV ROW and then south along an existing 161 kV ROW toward the Black River to reconnect to the Arcadia Route (or the Q1-Galesville Route) just north of the Black River and continue southward to the substation sites near Holmen.

The Arcadia Route with the Ettrick Connector became one of the nine potential project routes being examined on an equal plane with each other that will be considered in the CPCN hearing and final Commission decision.

12.2. COMPARISON OF NATURAL RESOURCE IMPACTS AMONG ROUTES

Expected permanent natural resource impacts for any of the routes include: loss or degradation of natural communities and rare species habitat; upland forest clearing, loss of wooded wetlands and conversion to an open wetland type, loss of wetland or agricultural acreage due to structure placements, and aesthetic effects due to the physical presence of the line and tree clearing associated with the ROW.

12.2.1. Potential impacts to rare species and communities

Each of the routes crosses multiple landscapes and natural communities. To compare potential habitat impacts for the different routes effectively, it is important to consider more than the absolute total of habitat types crossed. Additional factors for consideration include the length of the ROW that crosses the habitat, the areal size of the habitat, the distance to or contiguity with adjacent natural habitat, and the surrounding land use.

Similarly, 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 route segments that are readily accessible and/or on public lands. For this project, there is useful and reliable information for species occurrences and much of the

natural habitat along the Q1-Highway 35 Route, as well as the original Q1 Route. Important habitats and natural communities along the Q1-Galesville Route are contiguous with habitats and natural communities that have been inventoried or assessed by the WDNR along the Q1-Highway 35 Route, so reasonable extrapolations from the latter can be made.

Much of the length of the Arcadia Route shares ROW with the existing Alma-Tremval 161 kV transmission line between Alma and Arcadia. Along the shared segments the existing ROW would need to be widened anywhere from 26.7 to 76.1 feet, with one exception where 100 percent of the width is shared along Segment 13C. Thus, the applicants had access to much of the affected area for their habitat assessments, but the natural communities and rare species that may exist along the segments specific to the Arcadia routes have generally not been studied for conservation or resource purposes. Because of this, there is less species and habitat information available for these routes than for the Q1 Routes.

Table 12.2-1 is a general comparison of the habitat types along undeveloped portions of the routes, particularly the utility-proposed routes in the CPCN application and the original Q1 Route. This information provides a basis for considering natural resource impacts likely to occur as a result of constructing and operating a 345 kV transmission line on the routes. Crop lands, pasture lands, and tree farms are not included although they can provide resources for animals, including rare species, as well as buffer habitat from urban and residential disturbances.

Table 12.2-1 Summary of habitat types potentially affected by routes*

Route	Prairie/Grassland (acres)	Upland Shrub (acres)	Upland Forested (acres)	Wetland Forested (acres)	Wetland Non-Forested (acres)
Q1-Highway 35	36.7	0.9	184.9	55.5**	37.6
Q1-Highway 35 with STH 88 Connector A	42.4	0.9	228.5	65.3**	45.4
Q1-Highway 35 with STH 88 Connector B	47.0	0.9	228.5	65.3**	45.4
Q1-Galesville	21.9	2.5	225.1	42.4	42.9
Q1-Galesville with STH 88 Connector A	27.8	3.8	268.3	52.0	51.7
Q1-Galesville with STH 88 Connector B	32.4	3.8	268.3	51.3	55.1
Original Q1 Route	17.8	0.9	176.6	54.5	75.0
Arcadia	34.9	4.0	262.5	45.9	65.0
Arcadia-Ettrick Connector	46.1	4.7	298.8	55.4	90.4

*This includes permanent and temporary disturbance within the ROW and outside the ROW for access.

** Preliminary analysis by the applicants and WDNR staff of the potential route re-alignments proposed by the applicants in their December 23, 2011 Supplemental Comments on the draft Environmental Impact Statement (PSC Reference # 157490. See Appendix F.), appears to conclude that moving the centerline farther north from STH 35 as it passes through the Black River bottomlands increases the potential affected acreage in these wetland communities.

Where routes are located within the landscape determines the type of habitat impacts that can be anticipated. The original Q1 Route and Q1-Highway 35 Route would predominantly impact wetland and forested communities within some relatively large habitat areas. The original Q1 Route affects more of the Van Loon/Black River Bottoms wetlands, whereas the Q1-Highway 35 Route affects less of the Van Loon but also impacts the New Amsterdam Grassland area. The Q1-Galesville Route avoids more of the Van Loon/Black River Bottoms and thus has fewer habitat impacts than either the original Q1 Route or the Q1-Highway 35 Route, making protection of rare species during construction easier to manage.

The larger habitat areas of concern crossed by the Arcadia and Arcadia-Ettrick routes are predominantly upland natural communities because the lowland/wetland areas are fragmented by agricultural land use.

These routes would thus potentially impact more upland habitats and species than the Q1 Route variations.

Some portions of routes follow creek valleys, such as the STH 88 Connector options (Waumandee Creek), Segment 13A and 13B1 of the Arcadia Route (Little Tamarack Creek), or Segment 3ET of the Arcadia-Ettrick Connector (Beaver Creek). This type of route segment would create challenges for working in adjacent riparian habitats.

Table 12.2-2 shows the number of rare species that potentially could occur within approximately 2.0 miles of each of the proposed routes based on occurrences recorded in the WDNR NHI. The columns show the number of endangered (E), threatened (Th), and special concern (SC) species separated by hyphens.

Table 12.2-2 Summary of NHI rare species occurrences by proposed route

Taxa	Q1-Highway 35 (E-Th-SC)	Q1-Highway 35 with STH 88 Connector A (E-Th-SC)	Q1-Highway 35 with STH 88 Connector A (E-Th-SC)	Q1-Galesville (E-Th-SC)	Q1-Galesville with STH 88 Connector A (E-Th-SC)	Q1-Galesville with STH 88 Connector A (E-Th-SC)	Original Q1 Route (E-Th-SC)	Arcadia (E-Th-SC)	Arcadia Ettrick Connector (E-Th-SC)
Bird	2-6-7*	1-6-7	1-6-7	2-6-7	1-6-7	1-6-7	2-6-7	1-3-3	1-3-3
Butterfly	1-0-4	1-0-4	1-0-4	1-0-2	1-0-2	1-0-2	1-0-4	0-0-1	0-0-1
Mammal	0-0-0	0-0-3	0-0-3	0-0-1	0-0-4	0-0-4	0-0-0	0-0-1	0-0-4
Snake	1-0-2	1-0-2	1-0-2	1-0-2	1-0-2	1-0-2	1-0-2	1-0-2	1-0-1
Terrestrial Snail	0-1-0	0-1-0	0-1-0	0-1-0	0-1-0	0-1-0	0-1-0	0-1-0	0-1-0
Turtle	0-2-1	0-2-1	0-2-1	0-2-0	0-2-0	0-2-0	0-2-1	0-1-0	0-2-0
Dragonfly/ Mayfly	1-0-6	0-0-3	0-0-3	1-0-5	0-0-4	0-0-4	1-0-6	1-0-5	0-0-4
Mussel	5-3-4	6-3-4	6-3-4	4-4-4	4-4-4	4-4-4	5-3-4	0-1-1	0-1-1
Fish	4-5-7	4-7-11	4-7-11	4-5-9	5-4-11	5-4-11	6-5-7	4-5-9	5-6-10
Plants	0-7-11	0-8-14	0-8-14	0-8-10	0-8-15	0-8-15	0-7-10	0-5-13	0-5-13
Total	14-24-42	13-27-49	13-27-49	13-26-40	12-25-49	12-25-49	16-24-41	7-16-35	7-18-37

Note: E-Th-SC = Number of species that are state listed as Endangered-Threatened-Special Concern

The NHI database is a record of existing sources of information and, as previously stated, more is known about lands with public access. The Arcadia Route and the Arcadia-Ettrick Route show distinctly fewer NHI species occurrences than the Q1 Route alternatives but that does not necessarily mean that the route would impact fewer rare species. The Arcadia routes cross more private property so the database may present an incomplete picture of the rare species that occupy the landscape through which these routes pass. Additional rare species that have not been identified might be present along any of these routes, or species that have already been identified might be present in additional route locations not represented in the NHI data.

Many of the impacts to aquatic plant, fish, mussel, and dragonfly/mayfly species can be avoided or minimized by avoiding direct impacts to waterways through the use of bridges, access from opposite banks, and implementation of strict erosion control measures. On the other hand, it would be more difficult to address impacts to terrestrial and wetland species such as snails, turtles, snakes, and birds because the complexity of environmental and land use concerns along this project make successful implementation of avoidance and minimization measures for all species at all locations very difficult. For example, rare turtles and snakes in the project area are known to attempt hibernation in locations that may not freeze. Therefore, the usual methods of avoidance such as winter construction in this part of the state might not be as successful as for other similar construction projects in other locations.

Rare birds might be disturbed by the activity and noise from construction during critical periods of the breeding season and abandon their nests. Birds that prefer woody or forested habitat could suffer indirect

impacts through the loss of habitat, reduction in habitat quality, and increased predation allowed after ROW clearing. Bird diverters may be required on some portions of the routes to help avoid additional impacts to the species after construction has been completed.

The Commission or WDNR could require one or more methods to avoid impacts to rare species, including but not limited to specifying the timing of construction, use of construction barriers, or changes in the design of the transmission line. Additionally, the Commission may order an expert to be present during construction of portions of the route to monitor for potential impacts. If WDNR determines that construction activities could still result in the harm or “take” of a threatened or endangered species, an applicant can apply for an Incidental Take Permit from WDNR. Based in part on the conservation plan included in that application, WDNR would determine whether the criteria for issuing an Incidental Take Permit could be met according to Wis. Stat. § 29.604(6m)(f)1.

12.2.2. Potential forest losses

Table 12.2-3 compares each route and alternative with respect to forests affected by new ROW. While upland forest clearing is always a concern, WDNR has expressed strong concerns about the quality of local wetland forests that would be crossed and impacted by different project routes. Clearing of wetland forest permanently alters both wetland hydrology and biology.

Table 12.2-3 Comparison of potential upland forest impact for each route

Route	Route Length (miles)	New Upland Forest Affected (acres)	New Wetland Forest Affected (acres)	Total Forested Area Cleared (acres)
Q1-Highway 35	43.0	94.50	33.30*	127.8*
Q1-Highway 35 with STH 88 Connector A	49.7	128.40	48.30*	176.7*
Q1-Highway 35 with STH 88 Connector B	49.0	128.10	48.00*	176.1*
Q1-Galesville	48.4	111.90	20.00	131.9
Q1-Galesville with STH 88 Connector A	55.0	145.80	34.99	180.8
Q1-Galesville with STH 88 Connector B	54.4	145.52	34.68	180.2
Original Q1	41.3	87.60	36.30	123.9
Arcadia	54.8	140.00	21.10	161.1
Arcadia–Ettrick Connector	57.0	148.10	27.30	175.4

*The proposed re-alignments for longitudinal segments that parallel the GRRNSB provided by the applicants in their December 23, 2011, letter to the PSCW¹⁸⁷ appear to increase the affected acreage of new forest wetland community on these routes. See Appendix F.

Table 12.2-3 shows that, except for the original Q1 Route, the Q1-Highway 35 Route would be the shortest proposed or suggested route and affect the least amount of woodland overall. The Q1-Galesville Route would affect slightly more woodland overall but notably less wooded wetland, the least of any route considered. The Arcadia Route would clear almost as little wooded wetland but notably more upland forests and the greatest amount of woodland overall of the three utility-proposed routes.

Substituting the STH 88 Connector options increases the amounts of upland and wetland forests affected for both the Q1-Highway 35 Route and the Q1-Galesville Route. Comparing potential wetland forest impacts of the Q1 routes with the STH 88 Connectors to the impacts of the Arcadia Route, the relative

¹⁸⁷ PSCW REF #157490.

impact of the Q1 Routes becomes greater. When upland forest impacts are compared, the Arcadia Route still has more impact than the Q1-Highway 35 Route with STH 88 Connector Options but the Q1-Galesville Route with STH 88 Connector Options would have more impact than the proposed Arcadia Route.

Substituting the Ettrick Connector into the Arcadia Route increases both upland and wetland forest impacts. The Arcadia-Ettrick Route has the greatest amount of upland forest clearing of any route under consideration. Its potential wetland forest impact would be less, though, than that of the Q1-Highway 35 Route with or without the STH 88 Connector and less than that of the Q1-Galesville Route with the STH 88 Connector.

12.2.3. Potential Impacts to rivers and streams

The routes cross both the mouths of three larger local river systems (Waumandee Creek and the Black and Trempealeau Rivers) and many tributaries that feed these waterways. The differences between the various routes in relation to waterway impacts relates to the number of streams that are crossed, the quality of the streams, where the stream crossings occur within the watershed (at the mouth, upstream or at feeder stream), and the type of impact (temporary clear span bridge or permanent structures within the waterway).

The original Q1 and the Q1-Highway 35 routes impact the floodplains/bottomlands and river mouths of these river systems. The Arcadia Route primarily affects the headwaters of Waumandee Creek and tributaries to the river systems. The remaining routes cross a combination of the river floodplains and upstream tributaries.

Table 12.2-4 compares each route with respect to the numbers of rivers and streams that are crossed. Some streams are identified as Areas of Special Natural Resource Interest (ASNRI), Priority Navigable Waterways (PNWs), Outstanding Resource Waters (ORWs), Exceptional Resource Waters (ERWs), or trout waters by WDNR. These designations are given to waterways that have special characteristics or features that generally require additional environmental protections. Their fish populations could change if shading vegetation is removed, sedimentation increases, habitat features are lost or disturbed, and/or thermal loading increases. Some waterway crossings would be spanned while others could require temporary bridging. All waterways that bisect the ROW would be impacted by long-term vegetation management and maintenance of the utility line.

The numbers and types of bridge structures that would be required for each route option are detailed in Table 12.2-4.

From the information presented in Table 12.2-4, it appears that the original Q1 Route would cross the largest number of streams and the most high-quality streams, and would require the most TCSBs during construction. The Arcadia route options would require the second largest number of TCSBs, but few of those streams have special designations. Issues associated with high-quality stream crossings include construction timing, proper erosion control, and removal of vegetation along the stream banks, all of which could increase the potential for soil runoff, increased sedimentation into the waterway and degradation of the aquatic habitat.

The original Q1 Route, with the largest number of waterway impacts, is primarily associated with the crossing of the Black River and Van Loon wetland complex. Because it is such a highly-valued habitat resource, potential construction impacts within and adjacent to the Van Loon would be a significant risk of this route.

The Q1-Galesville Route has the fewest crossings of waterways, avoids the Van Loon complex entirely, and would require the least number of structures within the waterway.

Table 12.2-4 Route comparison reflecting number of regulated structures for each route option, and associated waterway designations*

Route	Approximate Number of Waterway Crossings Along ROW	Number of ROW Crossings of Outstanding or Exceptional Waterways and Trout Streams	Proposed Number of TCSBs	Proposed Number of Bridges Placed Below the OHWM	Proposed Number of Bridges with In-stream Supports	Proposed Number of Poles Located Below the OHWM	Total Number of Chapter 30 Bridge/Structure Permits per Route Option
Q1-Highway 35 Route	43	0	3 (1 is located in ASNRI waters)	6	1	0	10
Q1-Highway 35/STH 88 Option A	43	0	5 (1 is located in ASNRI waters)	6	0	0	11
Q1-Highway 35/STH 88 Option B	43	0	5 (1 is located in ASNRI waters)	6	0	0	11
Q1 Galesville Route	48	00	4 (1 is located in ASNRI waters)	1	1	0	6
Q1 Galesville STH 88 Option A	48	0	7 (1 is located in ASNRI waters)	1	0	0	8
Q1 Galesville STH 88 Option B	48	0	7 (1 is located in ASNRI waters)	1	0	0	8
Q1 Route (original)	41	1	5 (3 are located in ASNRI waters, and 1 is located in a PNW)	18 (11 are located in ASNRI waters)	1	0	24
Arcadia Route	55	2**	14 (2 are located on trout streams)	1	0	0	15
Arcadia-Ettrick Route	57	4***	15 (2 are located on trout streams)	1	0	0	16

*Source: Applicants' response to staff data request. December 20, 2011.

**Tamarack Creek

***Tamarack, Abraham Coulee, Beaver, and an unnamed creek.

ASNRI - Area of Special Natural Resource Interest, as defined in Wis. Admin. Code § NR 1.05.

PNW - Priority Navigable Waterway, as defined in Wis. Admin. Code § NR 1.07.

Outstanding/Exceptional Resources are defined in Wis. Stat. § 281.15.

12.2.4. Potential wetland impacts

The numbers of wetlands or wetland acreage affected is an important factor to consider, but it may not be as critical as the hydrologic and biological quality of the affected wetland(s). As noted above, there is strong concern about the change in quality that could occur in certain forested wetlands. As discussed in Section 7.3.4 in Chapter 7, the wetlands of the Van Loon are the state's highest priority wetlands in the project area.

The importance of the Van Loon notwithstanding, Table 12.2-5 compares each route and alternative with respect to the numbers and acreages of wetlands that are crossed. The wetlands of the Van Loon are represented in the numbers and acreages shown for the Q1-Highway 35 Route and the original Q1 Route. The acreages under Total Wetlands Affected are broken down into four categories in the four columns on the right side of the table.

Table 12.2-5 only identifies the quantity of wetlands that would be impacted by the potential routes. Consideration of wetland quality and type is as important, if not more important, when comparing impacts along each route. Wetland size, contiguity with or distance to other natural community types, dominant vegetation species, and hydrology provide additional valuable information about a wetland's quality and functional values. Additionally, forested wetlands are considered more vulnerable and possibly more valuable than other types of wetlands because they are permanently lost when ROW clearing occurs and are rarely replaced when off-site wetland restoration/mitigation is required by regulatory agencies. In the case of transmission construction, forested wetlands would be replaced by lower-quality, grassy meadow wetlands. The natural restoration of all affected wetlands could be further complicated by the potential introduction of non-native species. Once non-native species become established within the transmission ROW, the ability of the wetland complex to function properly and its species diversity would both be diminished.

Of all the routes under consideration, the original Q1 Route not only has the highest percentage of its ROW within wetlands, it also crosses (Segment 5B) the large, forested, floodplains wetlands of the Van Loon and Black River bottoms. Much of the area encompassing these high-quality wetlands is owned or managed by the state or federal government. Because of the quality of these natural areas, which provide habitat to a diversity of species, USFWS has stated that it will not approve easements through the Refuge for the original Q1 Route. The Q1-Highway 35 Route crosses a smaller portion of the Van Loon Wildlife Area and Black River bottoms than the original Q1 Route (Segment 8B); however, significant natural resource concerns persist. WDNR owns a parcel of woodland (approximately 10 acres) along the proposed route. If this route were chosen, at least 1.7 acres of the woodland would be cleared for the new ROW, bisecting the forest complex. WDNR permitting of the route through the Van Loon is problematic and subject to the practicable alternative requirements of Wis. Admin. Code ch. NR 103.

Table 12.2-5 Comparison of potential wetland effects for each route

Route	Total Acres of Wetlands Affected/ Percentage of Total ROW Acres	Number of Structures in Wetlands	New Forested Wetland Affected (acres)	Existing ROW Forested Wetland (acres)	New Non-Forested Wetland Affected (acres)	Existing ROW Non-Forested Wetland (acres)
Q1-Highway 35	83.5/10.6%	78	33.3*	21.8	13.6	14.9
Q1-Highway 35 with STH 88 Connector A*	109.0/11.9%	67	48.3*	20.8	28.4	11.6
Q1-Highway 35 with STH 88 Connector B*	111.2/12.3%	65	48.0*	20.0	32.7	10.6
Q1-Galesville	63.7/7.2%	50	20.0	14.9	14.5	14.3
Q1-Galesville with STH 88 Connector A**	60.7/8.4%	30	27.5	10.6	20.5	2.2
Q1-Galesville with STH 88 Connector B**	62.9/8.8%	27	27.2	9.7	24.8	1.2
Original Q1 Route	118.8/15.4%	105	36.3	28.0	28.7	25.8
Arcadia	95.6/9.5%	64	21.1	17.7	34.3	22.6
Arcadia – Ettrick Connector	142.9/13.7%	119	27.3	29.6	45.7	40.3

* The proposed re-alignments for longitudinal segments that parallel the GRRNSB provided by the applicants in a December 23, 2011 letter to the PSCW¹⁸⁸ appear to increase the affected acreage of new forest wetland community on these routes. See Appendix F.

**Source for number of structures in wetland for STH 88 Connector options was personal email communication from applicants.

12.3. COMPARISON OF COMMUNITY IMPACTS

12.3.1. Recreational resources

This project is not expected to have any adverse effect on public trails. However, there are many areas of public recreation value that might be adversely affected.

Depending on which route is selected, the proposed 345 kV transmission line may have some disruptive impacts on recreational lands including at or near the Mississippi River crossing common to all routes, on the original Q1 Route in the Refuge in the Black River bottom lands, in the Van Loon State Wildlife Area crossed by the original Q1 Route and the Q1-Highway 35 Route, and at the Holland Sand Prairie State Natural Area north of Holmen along the Arcadia and Q1-Galesville Routes. There is also a canoe landing on the Black River along Segment 17A which is common to the Arcadia and Q1-Galesville Routes.

12.3.2. High-voltage impact fees

Different municipalities and counties would receive different amounts of shared revenue dollars depending on the route chosen. The distribution of thousands to hundreds of thousands of dollars on an annual basis would be a positive impact to these communities. Local governments may use the annual payments for any purpose. Regardless of the route chosen, Buffalo, La Crosse, and Trempealeau Counties would receive a one-time environmental impact payment between \$400,000 and more than \$2.5 million.

¹⁸⁸ PSCW REF #157490.

12.3.3. Proximity of the routes to residences, schools, daycare centers, and businesses

Table 12.3.2-1 shows the relative locations of residential buildings and businesses within 300 feet of the proposed centerlines for each of the proposed and alternative routes. There are no schools or day care centers within 300 feet of the project routes.

Table 12.3-1 Comparison of residential and commercial buildings within 300 feet of the centerline by route

Route	Length (miles)	Distance from the Proposed Centerline (feet)					Totals Within 300 Feet	
		0-25	26-50	51-100	101-150	151-300	Residences	Commercial
Q1-Highway 35 Route*	43.0	0	0	14	8	52	74	1
Q1-Highway 35 Route with STH 88 Connector A*	49.7	0	0	13	13	53	79	1
Q1-Highway 35 Route with STH 88 Connector B*	49.0	0	0	12	7	48	67	1
Q1-Galesville Route*	48.4	0	0 ^a	14 ^b	11 ^c	84	109 ^d	2
Q1-Galesville Route with STH 88 Connector A	55.0	0	0 ^a	13 ^b	16 ^c	85	114 ^d	2
Q1-Galesville Route with STH 88 Connector B	54.4	0	0 ^a	12 ^b	10 ^c	80	102 ^d	2
Original Q1 Route	41.3	0	0	13	6	42	61	1
Arcadia Route	54.8	0	0 ^a	9 ^b	15 ^c	78	102 ^d	2
Arcadia Route with Ettrick Connector	57.0	0	0	7	7	42	56	2

* The proposed re-alignments for longitudinal segments that parallel the GRRNSB provided by the applicants in a December 23, 2011 letter to the PSCW¹⁸⁹ could affect the number of residences and other buildings within 300 feet of the centerline on these routes. See Appendix F.

a. An 8-unit apartment building under construction in Galesville is not included in this table.

b. An 8-unit apartment building under construction in Galesville is not included in this table.

c. An 8-unit apartment building under construction in Galesville is not included in this table.

d. Three 8-unit apartment buildings under construction in Galesville are not included in this table.

None of the routes under consideration would have homes closer than 50 feet from the centerline, but because the ROW is 150 feet wide, any residences or portions of them that are less than 75 feet from the centerline would be within the ROW. The Q1-Highway 35 and Q1-Galesville Routes each have 14 homes within 100 feet of the proposed centerline. The STH 88 Connectors each have a few less. The Arcadia Route has nine homes within 100 feet; utilization of the Ettrick Connector decreases that number to seven. In addition to single-family homes, there are three new apartment buildings being constructed within 50, 100, and 150 feet of the Q1-Galesville and Arcadia Routes.

Because the greatest single concentration of homes in the project area is along STH 54/USH53 on the south side of Galesville, all of the routes that utilize Segments 13B1, 13B2, and 13 C (the Arcadia Route and all of the Q1-Galesville alternatives) have the highest number of residences in close proximity to the line.

¹⁸⁹ PSCW REF #57490.

12.3.4. Potential effects on the Great River Road National Scenic Byway and WisDOT Scenic Easements and this project application

Each of the proposed routes crosses, parallels, or shares ROW with the GRRNSB at some point, for different lengths. Routes utilizing the STH 88 Connector Alternative options and the Ettrick Connector also affect the GRRNSB to a lesser extent. The state owns scenic easements along the GRRNSB that are administered by WisDOT. See the maps in Figure Vol. 2-1. Because the proposed transmission project could result in taller, metal towers being placed within view of the GRRNSB, there are concerns about aesthetic impacts for certain routes under consideration. The Q1-Highway 35 Route follows the GRRNSB for about 20 of its approximately 43 miles (Route Segments 2A through 2D and 8A through 18H). The Q1-Galesville Route would share or parallel the GRRNSB's ROW for about 15 miles, all in common with portions the Q1-Highway 35 Route. The northernmost and southernmost segments of these routes, Segment 2A1 (or 2A1 and 2A2) and Segment 18H, are segments common to all proposed routes, and they also share ROW with the GRRNSB.

WisDOT's stated inability to issue permits for paralleling the GRRNSB or release scenic easements along it could have a severe impact on the viability of several of the proposed routes and the transmission project application. If WisDOT cannot (as it states in its December 23, 2011, comments on the draft EIS¹⁹⁰) issue permits and release scenic easement rights for the project along the GRRNSB in Segments 2A through 2D, 2I by the Trempealeau River, and/or 8A through 8C, 9, and 18H, and if realignments proposed by the applicants in their December 23, 2011, Supplemental Comments on the draft EIS¹⁹¹ do not resolve this problem, then none of the nine routes considered in this EIS are viable alternatives.

If solutions can be found for the transmission line-GRRNSB relationship on Segments 2A1, 2A2, and 18H, the Q1-Galesville Route with an STH 88 Connector may still be available for Commission consideration, along with the Arcadia and Arcadia-Ettrick Routes. These routes share ten fewer miles with the GRRNSB because the STH 88 Connector bypasses the GRRNSB between Alma and Waumandee Creek. The Arcadia Route with or without the Ettrick Connector would have the least impact on the GRRNSB, paralleling it for only a short distance near Alma and then paralleling it or sharing ROW with it for the route's southernmost three miles (Segments 18B through 18H).

If solutions can be found for the transmission line-GRRNSB relationship on Segments 8A, 8B, 8C, and 9 in addition to the solution for Segment 18H, then the Q1-Highway 35 Route with an STH 88 Connector remains in the mix.¹⁹²

If the realignment solution proposed by the applicants for Segments 2A through 2D resolves the concerns, all routes remain available for consideration in terms of WisDOT permitting and scenic easements.

¹⁹⁰ PSCW REF #157481.

¹⁹¹ Letter from Thomas G. Hillstrom, Xcel Energy, to William Fannucchi of PSCW staff. Supplemental Comments on Draft Environmental Impact Statement. December 23, 2011. PSCW REF #157490.

¹⁹² Disregarding WDNR concerns about the Black River crossing in Segment 8B. See Sections 7.3.2 through 7.3.4 in Chapter 7 and also Sections 12.2 and 12.7 in this chapter.

12.4. SCENARIOS FOR A DPC Q1 161 KV REBUILD RESULTING FROM COMMISSION ROUTING DECISIONS

The existing DPC 161 kV line, called the Q1 line, is nearing the end of its useful life. DPC has determined that it must either rebuild or replace the line, regardless of the outcome of this proposed project. The proposed project discussed in Section 3.3.1 would replace the Q1 line if certain routing alternatives were selected and force a different scenario for the Q1 line if others were selected. Table 12.4-1 illustrates different Q1 rebuild scenarios for different routing decisions that could be made in this project review.

Table 12.4-1 Q1 rebuild scenarios based on different Alma-Holmen routes

Project Route or Segment	Additional Q-1 Rebuild Needed (miles)				Q1
	Alma–Milton	Milton–Trempealeau	Trempealeau–Holmen	Total	
Q1 Route Alternatives					
Q1-Highway 35	0	0	0	0	The Q1 line would be completely rebuilt as part of the project.
Q1-Galesville	0	0	13 to 20	13 to 20	About 27 miles of the Q1 line would be rebuilt as part of the project.
STH 88 Connector	10	0	0	10	Increases Q1 rebuild needed for Q1-Highway 35 Route or Q1-Galesville Route
Arcadia Route Alternatives					
Arcadia	10	16	13 to 20	39 to 46	Complete stand-alone rebuild of the Q1 line would be needed.
Arcadia-Ettrick	10	16	13 to 20	39 to 46	Complete stand-alone rebuild of the Q1 line would be needed.

Table 12.4-1 shows that the Commission's decisions in this docket would result in different options for DPC's Q1 line rebuild. The Arcadia Route and the Arcadia Route with the Ettrick Connector affect the Q1 line only at the north end of the project at Alma on Segments 2A1 and 2A2. If either of these routes is approved, DPC would need to address its need to rebuild nearly all of the Q1 line in the project area.

The Q1-Highway 35 Route, on the other hand, would replace all of the existing Q1 line and rebuild it as part of a double-circuit 345/161kV line as part of this project. Use of the Q1-Galesville Route would require DPC to rebuild the portion of the Q1 line between Delaney Road and Briggs Road in the south part of the project, and use of the STH 88 Connector for either the Q1-Highway 35 Route or the Q1-Galesville Route would require DPC to rebuild the portion of the Q1 line between Alma and STH 88 in the north part of the project.

Between Alma and Trempealeau, a rebuild of the Q1 line could be on the existing alignment if needed.

Between Trempealeau and Holmen, RUS and USFWS requested that DPC examine alternative routes for the Q1 rebuild. DPC has produced a Technical Memorandum that summarizes the potential impacts related to crossing the Black River.¹⁹³ In it, the five alternatives are briefly compared. The alternative routes are summarized in Table 12.4-2.

¹⁹³ DPC Q-1 Rebuild Comparison of Alternatives. Technical Memorandum. September 28, 2011.

Table 12.4-2 Q1 rebuild options between Trempealeau and Holmen crossing the Black River

Rebuild Alternative	Length (miles)	DPC-Expected Cost	Existing Infrastructure at the Black River
Existing Q1 Alignment	13.2	\$10,500,000	Q1 161 kV line
STH 35	15.0	\$12,200,000	STH 35
Seven Bridges Road	16.2	\$15,800,000	Xcel Energy 69 kV line
Galesville double circuit with CapX 345 kV project	19.9	\$14,900,000	STH 54/93 and USH 53
Galesville single circuit 161 kV line	19.9	\$17,200,000	STH 54/93 and USH 53

DPC is assuming a 100-foot ROW width for a rebuild, depending on the width that would be allowed by the USFWS permit. Assuming that width, there could be an expansion of the existing ROW needed for any of the alternatives. If new ROW is needed, the rebuild would need a CPCN from the Commission.

The CPCN process involves analyses of the costs and impacts and a hearing. As shown in Table 12.4-2, the existing alignment would cost the least, and the Galesville Route would cost the most, especially as a single-circuit 161 kV line. The Q1-Highway 35 alternative would result in the greatest loss of forested wetlands, followed by the Seven Bridges alternative, while the existing Q1 alignment would have the lowest impact on forested wetlands. The Galesville Route would affect the highest acreage of upland forest, and the existing alignment would affect the least. The existing alignment would require crossing the most waterways. The Galesville Route has the highest number of residences close by.

12.5. SUMMARY AND COMPARISON OF SELECTED IMPACTS FOR ALL ROUTES

12.5.1. Potential impacts

On the western end of the project, every route alternative includes a Mississippi River crossing at Alma and the potential impacts associated with it in the Refuge. At the eastern terminus, every route alternative includes the proposed Briggs Road Substation and the potential impacts associated with that new large facility, which would replace several acres of agricultural land at one of two alternative sites.

In between these endpoints, however, the proposed and suggested route alternatives generally affect four basic impact areas, with some alternatives affecting more than one and some areas including more than one route alternative. Without ranking them, the four main areas of impact appear to be:

- The GRRNSB area along the Mississippi River between Alma and the mouth of Waumandee Creek;
- Woodlands, wetlands, and farms in the hill-and-valley country inland from the Mississippi River;
- Concentrations of homes, particularly south of Galesville and in Holmen;
- Black River bottomlands, including the Van Loon State Wildlife Area, an extraordinarily high-quality wetland riverine complex.

Concerns have been expressed about each of these areas of impact. WisDOT has expressed strong concerns about potential aesthetic impacts to the GRRNSB and potential violation of state scenic easements that it manages. WDNR has expressed strong concerns about potential impacts to the Van Loon wooded wetlands and rare species. Private landowners, homeowners, and farm operators have expressed concerns about potential impacts to the resources on their properties and adverse aesthetic impacts on their rural landscape. Citizens in the village of Holmen have expressed concerns about the routes that would take the line through populated areas and near their public schools.

Table 12.5-1 summarizes and compares some of the major ROW characteristics and selected potential impacts for the proposed transmission line routes, including routes utilizing connector alternatives.

It is important to note these values are estimates for the routes and route combinations. Even slight variations from these routes could substantially alter the cost estimates.¹⁹⁴ The ranges in the estimated costs for the route combinations shown in Table 12.6-1 and in Section 4.5 are based on the feasibility studies done by the applicants earlier in the project review. They do not precisely reflect the ultimate or final costs for the project.

Table 12.5-1 Comparison of potential impacts among routes and alternatives

Route	Length (miles)	New ROW (acres)	Percent of ROW Length Shared	Agricultural Land Crossed (acres)	Approximate Number of Stream Crossings	Wetland Area Affected (acres)	New Wooded Wetland Affected (acres)	New Upland Forest Area Cleared (acres)	Number of Residences within 300 Feet of the Centerline
Q1-Highway 35	43.0	404.4	94%	325.2	43	83.5	33.3	94.5	74
Q1-Highway 35 with STH 88 Connector A	49.7	509.2	90%	399.4	43	109.0	48.3	128.4	79
Q1-Highway 35 with STH 88 Connector B	49.0	543.9	79%	417.9	43	111.2	48.0	128.1	67
Q1-Galesville	48.4	497.0	79%	367.5	48	63.7	20.0	111.9	109
Q1-Galesville with STH 88 Connector A	55.0	601.8	78%	441.7	48	60.7	27.5	145.8	114
Q1-Galesville with STH 88 Connector B	54.4	636.5	67%	460.2	48	62.9	27.2	145.5	102
Original Q1	41.3	377.1	96%	328.4	41	118.8	36.3	87.6	61
Arcadia	54.8	519.5	90%	445.3	55	95.6	21.1	140.0	102
Arcadia–Ettrick Connector (Segments 11G1, 1ET, 2ET, 3ET, 4ET)	57.0	530.4	88%	468.0	57	142.9	27.3	148.1	57

* Changes in the area of the transmission line ROW shared with highway ROW based on the proposed realignment of several segments that overlapped STH 35 have not been calculated. See PSCW REF #157490 and Appendix F for more information.

As shown in Table 12.5-1, the shortest of the route alternatives is the original Q1 Route, and the longest is the Arcadia Route with the Ettrick Connector. The route with the least need for new ROW is the original Q1 Route, while the route that would require the most new ROW is the Q1-Galesville Route with STH 88 Connector Option B. The Q1-Galesville and Arcadia alternatives are longer than the original Q1 Route or Q1-Highway 35 alternatives. The Arcadia alternatives and the STH 88 Connector alternatives for the Q1 Routes would require more new ROW.

Using Table 12.5-1, the routes can be compared also in terms of the above-listed general areas of impact.

¹⁹⁴ Some changes to the route alignments have been suggested by the applicants in their December 23, 2011, Supplemental Comments on the Draft Environmental Impact Statement. PSCW REF #157490.

- The Q1 Routes all follow the Q1 line along the Mississippi River and have the same effects on the Great River Road west of Waumandee Creek, while the others, including the Q1 Routes with STH 88 Connectors, do not.
- The original Q1 Route and the Q1-Highway 35 Route alternatives require the most wooded wetland clearing, while the Arcadia Route and Q1-Galesville Route alternatives require the least. Total woodland clearing would be greatest along the Arcadia Route, the Q1-Galesville Route with STH 88 Connector options, and the Arcadia-Ettrick Connector alternative, while the original Q1 Route and utility-proposed Q1-Highway 35 and Q1-Galesville Routes would have the least total woodland cleared. The Arcadia Routes and the Q1-Galesville Routes with an STH 88 Connector cross the most farmland, while the original Q1 Route and Q1-Highway 35 Route cross the least.
- The routes passing within 300 feet of the most homes would be the Q1-Galesville Route alternatives and the Arcadia Route.
- The original Q1 Route and the Q1-Highway 35 Route have direct impacts on the Black River in the Van Loon Wildlife Area and their associated natural communities and rare species while the others would not.

If the project is approved and a route selected, the Commission and WDNR may set conditions on project construction and operation.

12.5.2. Environmental and agricultural monitors

While construction conditions specified in the Commission's order and WDNR's permit should avoid, minimize, and mitigate for the potential adverse impacts of an approved project, it is sometimes useful to employ an IEM and/or an agricultural monitor on some projects. These monitors can assist in ensuring compliance with regulatory requirements. Additionally, their presence on the construction project often proactively prevents impacts from occurring by working closely with the construction personnel. The concept of using an IEM was brought up earlier in this final EIS. In Section 5.2.5 of Chapter 5, there is a brief discussion of how an IEM may function for projects with the potential for impacts to high-quality natural resources. In Section 5.5.2.3 there is a brief discussion of the how agricultural monitors are useful where significant or fragile agricultural lands would be crossed.

There could conceivably be a need for both types of monitors during construction of the Alma-La Crosse project if it is approved. Of the four main areas of impact discussed in the previous subsection, three of them involve natural or agricultural resources. The hill-and-valley landscapes include steep slopes, valley wetlands, woodlands, and the potential for impacts to protected species, excessive erosion, introductions of invasive species, and impacts to waterways due to the difficult terrain. The Mississippi River crossing, common to all the examined routes, is certainly located in a vulnerable environment in the Refuge, as are the mouths of streams entering the Mississippi River at different places. The Black River bottomlands, including the Van Loon State Wildlife Area, is also a vulnerable environment. In addition, a large amount of agricultural land would be crossed, regardless of route. WDATCP (as well as PSCW) could request and make use of an agricultural monitor to ensure compliance with Commission order conditions and utility agreements with WDATCP to protect farm lands and restore them properly after construction. Highly erodible soils in the project area, as well as general concerns over preservation of soil productivity, weed control, irrigation systems, and valued trees are among the issues that are of specific concern to agricultural landowners, and would make an agricultural monitor potentially useful.

12.5.2.1. Independent environmental monitor

IEMs have been required by the Commission in three transmission construction projects. The projects were the Arrowhead-Weston (docket 5-CE-113), Gardner Park-Central Wisconsin and Morgan-Werner

West also known as GCMW (dockets 137-CE-122 and 137-CE-123), and Rockdale-West Middleton (docket 137-CE-147). The Commission determined in each of these dockets that one or more IEMs should be hired due to the scope of the projects, the diversity of landscapes through which the transmission would pass, and the presence of sensitive natural resources. As third-party independent monitors, IEMs reported directly to PSCW staff, as opposed to either the applicants or construction subcontractors. IEMs were charged with reporting incidents and stopping work, if appropriate, when construction practices violated any applicable permit, approval, order, and agreements issued by regulatory agencies or were likely to cause non-approved impacts to the environment or private properties.

Construction activities that were subject to monitoring and reporting by IEMs included activities that might impact wetlands and bodies of water, habitats and occurrences of protected species, archeological sites, agricultural fields or facilities, state and federal properties, and private property with detailed construction agreements or specific issues such as organic farming practices or trees valued by the landowner. In these dockets, PSCW, WDNR, and WDATCP staff submitted testimony that an IEM was critical in obtaining a clear and current record of construction activities and environmental protection measures being implemented. The utilities were required to pay the salaries and expenses of IEMs, as reviewed and approved by PSCW staff. The IEM's scope of work for these transmission projects, as determined necessary by PSCW staff, varied from complete coverage of all utility construction activities to coverage for only specific areas or specific construction activities.

To ensure that all sensitive resources along the approved route are identified and appropriate environmental mitigation measures are planned, the PSCW has required the applicants to develop a Construction and Mitigation Plan (subject to approval by PSCW and WDNR staff) prior to the start of construction. Consultation with other regulatory agencies ensured that sensitive sites were identified and would be properly protected. The PSCW-approved plans became a useful communication and training tool for the contractors, construction crews, IEMs, and PSCW staff and other regulatory agencies. The PSCW-approved plans included current contact information, general construction and mitigation practices, specific construction and mitigation measures needed at sensitive resource locations, and maps identifying all pertinent structures and resources. Additionally, during the construction of GCMW and Rockdale-West Middleton, an extranet site was maintained by the utility which allowed quick and verifiable access to project documentation and utility field reports for regulatory agencies, contractors, subcontractors, and IEMs.

12.5.2.2. Agricultural monitor

An agricultural monitor has been found to be useful for the most recent high-voltage transmission project, Rockdale-West Middleton (docket 137-CE-147) for construction activities that might impact agricultural lands. Prior to that, utilities have hired agricultural monitors on an as-needed basis or to step in after a problem in the field has occurred. Similar to IEMs, the leading benefits of an agricultural monitor are for regulators to obtain a current record of construction activities and agricultural protection measures and to proactively prevent or minimize potential impacts.

If this project is approved, the qualifications and responsibilities of an agricultural monitor would be included in an Agricultural Impact Mitigation Plan (AIMP) currently being drafted by the applicants and WDATCP. This plan is intended to minimize potential impacts of transmission line construction on agricultural lands. It would not apply to public or railroad ROW or private land that is not agricultural, unless it is crossed by agricultural tiles. The agricultural monitor would be funded by the applicants but would report directly to WDATCP. The monitor's primary purpose would be to audit the applicants' compliance with the AIMP. Instances of noncompliance would be reported to the applicants and WDATCP. The monitor would not have the authority to direct construction activities or stop

construction. The monitor would act as a liaison between landowners and WDATCP, if necessary. Regular compliance reports would be submitted to WDATCP.

12.6. SUMMARY AND COMPARISON OF ROUTE COSTS

Table 12.6-1 summarizes estimated project costs for the three utility-proposed project routes plus combinations of those three routes with the three Connector Alternatives proposed by WisDOT and WDNR. More detailed cost components are provided in Chapter 4, Section 4.5.

Table 12.6-1 Cost summary and comparison for all proposed routes and route/connector alternatives in dollars

Route	Transmission Costs*	Substation Costs	161 kV Re-route Costs	Total Costs
Q1 Routes				
Q1-Highway 35	\$162,932,000**	\$27,285,000	\$4,313,000	\$194,530,000
Q1-Highway 35 with STH 88 Connector, Option A	\$181,782,000**	\$27,285,000	\$4,313,000	\$213,380,000
Q1-Highway 35 with STH 88 Connector, Option B	\$176,032,000**	\$27,285,000	\$4,313,000	\$207,630,000
Q1-Galesville	\$172,248,000**	\$27,285,000	\$2,532,000	\$202,065,000
Q1-Galesville with STH 88 Connector, Option A	\$190,843,000	\$27,285,000	\$2,532,000	\$220,660,000
Q1-Galesville with STH 88 Connector, Option B	\$185,093,000	\$27,285,000	\$2,532,000	\$214,910,000
Original Q1	\$157,169,000	\$27,285,000	\$4,313,000	\$188,767,000
Arcadia Routes				
Arcadia	\$194,538,000	\$27,285,000	\$2,532,000	224,355,000
Arcadia with Ettrick Connector	\$203,753,000	\$27,285,000	\$2,532,000	233,570,000

* Transmission costs include pre-certification costs and high-voltage impact fees.

**The cost of the proposed realignment of longitudinal segments that overlap STH 35 ROW provided by the applicants in their Supplemental Comments on the Draft EIS has not been calculated.

12.7. VIABILITY OF PROJECT ROUTES

Each of the nine route alternatives considered in this final EIS has the potential to be not viable, depending on the actions of one or more agencies beyond the scope of the Commission's authority. Previous chapters discuss permitability issues for USFWS, WDNR, and WisDOT that could remove one or more routes as an alternative available for consideration by the Commission if it approves the project. The potentially unpermissible route segments are shown by agency and route in Table 12.7-1.

Table 12.7-1 Potentially unpermissible route segments for USFWS, WisDOT, and WDNR

Route Alternative	Potentially Unpermissible Segments		
	USFWS	WisDOT	WDNR
Original Q1	5B	2A1, 2A2, 2A3, 2B, 2C, 2D, 2I, 18H	5B
Q1-Highway 35		2A1, 2A2, 2A3, 2B, 2C, 2D, 2I, 8A, 8B, 8C, 9, 18H	8B
Q1-Highway 35 with STH 88 Option A		2I, 8A, 8B, 8C, 9, 18H	8B
Q1-Highway 35 with STH 88 Option B		2I, 8A, 8B, 8C, 9, 18H	8B
Q1-Galesville		2A1, 2A2, 2A3, 2B, 2C, 2D, 2I, 18H	
Q1-Galesville with STH 88 Option A		2I, 18H	
Q1-Galesville with STH 88 Option B		2I, 18H	
Arcadia*		2A1, 2A2, 18H	
Arcadia-Ettrick*		2A1, 2A2, 18H	

* The Arcadia routes could utilize Segment 10B2 so that only Segment 2A1 and not both 2A1 and 2A2 were needed to reach Segment 10B1.

Table 12.7-1 shows that every route under consideration in this final EIS is potentially problematic when considering permitability by other agencies. The applicants acknowledged the WisDOT concerns in supplemental comments on the draft EIS received at the Commission on December 23, 2011. These comments show belated potential realignments for the proposed transmission project in case WisDOT determines that it cannot issue utility permits for longitudinal installations along the Q1-Highway 35 or Q1-Galesville Routes.¹⁹⁵ The realignments, according to the applicants', would not require any longitudinal utility permits. Although the potential realignments might reduce the need for WisDOT permits, the natural resource and community impacts have not been verified or fully assessed and could be significant.

As discussed at the beginning of this chapter, PSCW made an effort to ensure that two viable alternative routes were included in the application as required under Wis. Stat. § 196.025(2m)(c). However, uncertainty regarding the permitability of these routes, and thus their viability as a project alternatives has continued to the date of EIS publication. It is possible that no permitable route alternatives are available even if the Commission determines that the project is needed.

However, if any of the above agencies determine that certain route segments are indeed permitable, the resulting route alternatives could be available for the Commission to consider for certification. Disregarding the original Q1 Route, which USFWS has clearly stated it will not permit due to the need for a ROW expansion along Segment 5B, the following possibilities still exist:

- The Q1-Galesville Route with STH 88 Connector Option A or B could be a viable choice if a solution between the applicants and WisDOT can be found for Segments 2I and 18H.
- The Arcadia and Arcadia-Ettrick Routes could be viable choices if a solution between the applicants and WisDOT can be found for Segments 2A1, 2A2, and 18H.
- The Q1-Galesville Route could be a viable choice if a solution between the applicants and WisDOT can be found for Segments 2A1 through 2D, 2I, and 18H.
- The Q1-Highway 35 Route with STH Connector Option A or B could be a viable choice if:
 - A solution between the applicants and WisDOT can be found for Segments 2I, 8A, 8B, 8C, 9, and 18H.
 - A solution between the applicants and WDNR can be found for Segment 8B.
- The Q1-Highway 35 Route could be a viable choice if:
 - A solution between the applicants and WisDOT can be found for Segments 2A1 through 2D, 2I, 8A, 8B, 8C, 9, and 18H.
 - A solution between the applicants and WDNR can be found for Segment 8B.

¹⁹⁵ Applicants' Supplemental Comments on DEIS. December 23, 2011 letter from Thomas G. Hillstrom, Xcel Energy, to William Fannucchi. PSCW REF #157490.