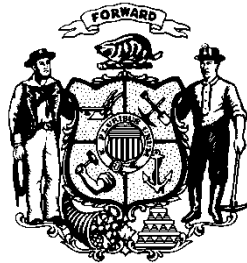


November 2011

**PUBLIC SERVICE COMMISSION OF WISCONSIN
WISCONSIN DEPARTMENT OF NATURAL RESOURCES**



Public Service Commission of Wisconsin
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**Alma-La Crosse
345 kV Transmission
Project Volume 1
Draft Environmental Impact Statement**

**PSCW Docket 5-CE-136
Date Issued: November 2011**

PUBLIC SERVICE COMMISSION OF WISCONSIN
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

CapX2020

Alma-La Crosse

345 kV Transmission Project

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This draft Environmental Impact Statement for the proposed CapX2020 Alma-La Crosse 345 kilovolt transmission line project is progress towards compliance with the Public Service Commission's requirement under Wis. Stat. § 1.11 and Wis. Admin. Code § PSC 4.30. It also is progress toward compliance with the Department of Natural Resources requirements under Wis. Admin. Code § NR 150.22.

By:  Date: November 1, '11
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To the Reader

This draft environmental impact statement (EIS) fulfills part of the requirements of the Wisconsin Environmental Policy Act (WEPA), Wis. Stat. § 1.11. WEPA requires state agencies to consider environmental factors when making major decisions. The purpose of this draft EIS is to provide the decision makers, the public, and other stakeholders with an analysis of the economic, social, cultural, and environmental impacts that could result from the construction of the new power line and its associated facilities. This document has been prepared jointly by the Public Service Commission of Wisconsin (Commission or PSCW) and the Wisconsin Department of Natural Resources (WDNR).

You are encouraged to comment on this draft EIS. The state agency comment period on this draft EIS ends on December 23, 2011. Please use the PSCW docket number 5-CE-136 on all e-mail and correspondence. Written comments should be addressed to:

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Comments received during the comment period will be used to prepare the final EIS, which will become part of the record used by the Commission to make its final decisions on this project. At this time, the Commission decision on the proposed project is expected in June 2012.

The Commission decision on the merits of this project will be based on the record of a public hearing that will be held about 30 days after the final EIS is issued. When the final EIS is prepared, the Commission will issue a Notice of Hearing. The hearing will satisfy the WEPA requirements of the Commission and WDNR. The final EIS and testimony from the public hearing will be included in the hearing record.

If necessary, WDNR will hold separate hearings on its water permits or other WDNR regulatory actions discussed in this draft EIS.

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Executive Summary

APPLICATION

The Public Service Commission of Wisconsin (PSCW or Commission) has before it an application for a Certificate of Public Convenience and Necessity (CPCN) for a new 345 kilovolt (kV) electric transmission line and substation, submitted as part of the major CapX2020 Transmission Expansion Initiative (CapX2020) by three Wisconsin electric utilities. The three utility applicants for the project are Northern States Power Company–Wisconsin (NSPW), Dairyland Power Cooperative (DPC), and WPPI Energy (WPPI). The 345 kV line would extend from the Wisconsin border in the Mississippi River west of Alma, Wisconsin, in Buffalo County, through Trempealeau County to a new 345/161 kV substation, known as the Briggs Road Substation, to be built on the southwest side of Holmen, Wisconsin, in La Crosse County.

CAPX2020

The three utilities are members of a larger group, the CapX2020 Utilities, a group of 11 electric utilities¹ that examined the regional transmission infrastructure in order to address a variety of emerging and related transmission concerns that have arisen in the multi-state area. The proposed project is part of a larger, multi-utility project called the Hampton-Rochester-La Crosse 345 kV Transmission Project. In their application, the utilities state that the purposes of the project are: (1) to serve increasing electric demand in the La Crosse, Wisconsin, and Winona and Rochester, Minnesota, areas; (2) to maintain the reliability of the regional electrical system; and (3) to support means for getting local electric generation output into the electric grid. More recently, the utilities have stated that another advantage of the new line is to enhance power transfers into Wisconsin from states west of the Mississippi River. The majority of the Hampton-Rochester-La Crosse project would be in Minnesota. The various parts of the CapX2020 project are subject to regulations administered in several states plus certain federal agencies. The portion of the proposed Hampton-Rochester-La Crosse project that is outside of Wisconsin extends from the Mississippi River westward into Minnesota to Rochester and northward and is subject to Minnesota state laws. The portion in Wisconsin, the proposed Alma-La Crosse Transmission Project, extends from the same place in the Mississippi River eastward through the city of Alma and southeast toward the city of La Crosse. It is subject to Wisconsin state laws.

ALMA-LA CROSSE 345 KV PROJECT

For the Alma-La Crosse 345 kV Transmission Project, the applicants propose to construct a 345 kV electric transmission line about 40 to 55 miles long, depending on the route. The proposed route alternatives mostly follow existing 161 or 69 kV transmission line corridors. The new line would, in most places, be a double-circuit, 345/161 kV line on single poles. The right-of-way (ROW) would be about 150 feet wide. Wider ROWs up to 280 feet would be necessary for specialty poles such as those for the Mississippi River crossing or those needed for supporting long spans between hilltops in the Wisconsin

¹The CapX2020 Utilities are Central Minnesota Municipal Power Agency, Dairyland Power Cooperative, Great River Energy, Minnesota Power, Minnesota Power Cooperative, Missouri River Energy Services, Otter Tail Power Company, Rochester Public Utilities, Southern Minnesota Municipal Power Agency, WPPI Energy, and Xcel Energy, parent company of NSPW.

coulee landscape. The eastern terminus of the project would be a new 345/161 kV substation, the Briggs Road Substation, southwest of the village of Holmen.

Three route alternatives for the proposed 345 kV transmission line are proposed by the applicants: the Q1-Highway 35 Route; the Q1-Galesville Route, and the Arcadia Route. Several other route possibilities have been identified based on suggestions from Wisconsin state agencies. The STH 88 Connector Alternatives to the Q1 Routes and the Ettrick Connector Alternative to the Arcadia Route are a result of concerns raised by the Wisconsin Department of Transportation (WisDOT) and the Wisconsin Department of Natural Resources (WDNR), respectively. The applicants' originally-proposed Q1 Route remains under consideration as well. All in all, nine route alternatives are being evaluated.

The overall cost of the project is expected to range from about \$195 million to about \$224 million, depending on the route selected by the Commission. The applicants state that final ownership percentages among the three utilities would be determined after all regulatory decisions are made if the project is approved. The final ownership percentages determine final capital expenditure commitments from the individual applicants.

If the project is approved, based on the expected timeframe for other milestones, an in-service date of June 2016 would be likely.

NEED FOR THE PROPOSED PROJECT

One of the stated reasons for this new line is to address the community load serving needs in the La Crosse/Winona area. In addition to the Winona area in Minnesota, the areas in Wisconsin served by this line are Buffalo, Trempealeau, and La Crosse Counties, including the communities of Alma, Buffalo City, Fountain City, Arcadia, Galesville, Trempealeau, Holmen, Onalaska, La Crosse, and the surrounding rural areas.

It is not clear that there will be sufficient population growth in the La Crosse/Winona area to justify the projected increase in demand for electricity presented in the CPCN application. Peak load growth in the La Crosse/Winona area from 2002 to 2010 was 6.2 percent or an average annual growth rate of 0.77 percent. Population growth during this same time period was 4.3 percent or an average annual growth rate of 0.54 percent. The population in the La Crosse/Winona area is projected to increase at an average annual rate of 0.49 percent from 2010 to 2030. However, the applicants have projected the average annual growth in peak load over the same time period to be 1.7 percent. This projected peak load growth rate is more than twice the historical peak load growth rate, even though the projected population growth rate is lower than the historical population growth rate.

Table ES-1 shows a comparison of the peak loads using the applicants' forecasted growth rate with the most likely growth rate MISO Scenario and the highest growth rate MISO Scenario. Given the growing consensus that economic recovery will be slow, the heavy support for the first scenario by MISO stakeholders and the population forecasts for the La Crosse/Winona area, the lower MISO forecast shown in Table ES-1 seems most likely.

Table ES-1 Comparison of peak load projections in MW

Year	Applicants' Rate of 1.70%	MISO Rate of 0.78%	MISO Rate of 1.28%
2015	514.98	469.29	481.05
2020	547.57	487.88	512.63
2025	583	507.21	546.29
2030	620	527.30	582.16

The applicants identified possible future overloads and low voltages on the transmission system under normal, first contingency, and multiple contingency conditions in the La Crosse/Winona (Project) area. They performed contingency analyses in accordance with North American Electric Reliability Corporation (NERC) standards and their planning criteria. These analyses examined the performance of the transmission system under contingency conditions, when a single element or a combination of multiple elements of the transmission system suddenly failed. The La Crosse/Winona area is mainly served by a network of 161 kV and 69 kV transmission lines. The four 161 kV transmission lines are Alma-Marshland-La Crosse Tap, Alma-Tremval-La Crosse, Genoa-Coulee, and Genoa-La Crosse Tap.²

The applicants state that the growing demand for electricity in the La Crosse/Winona area would exceed the capabilities of the existing electrical system to deliver power reliably under contingency conditions. At this time, that conclusion is still being questioned.

Existing transmission and generation

The transmission system’s ability to serve the La Crosse/Winona area reliably depends on the operating status of the local major power plants shown in Table ES-2.

Table ES-2 Power plants serving the La Crosse/Winona area

Plant	Capacity (MW)	Fuel Type	Distance from La Crosse (miles)
John P. Madgett	395	Coal	40
Alma Units 1-5	208	Coal	40
Genoa Unit 3	377	Coal	20
French Island Units 1 and 2	26	Refuse	Within the City of La Crosse
French Island Unit 4	70	Oil	Within the City of La Crosse
French Island Unit 3	70	Oil	Currently not operating

The NERC Operating System Guideline requires that an area transmission system be capable of successful operation in the event of failure of two of its elements. The applicants identified an N-1 critical contingency that limited load serving capability to 460 MW with the operation of all generating units at Alma and Genoa. With additions of two 60 megavolt amperes reactive (MVAR) capacitor banks to the La Crosse area 161 kV system, the load serving capability increased by 10 MW to 470 MW. With operation of the 70 MW peaking French Island Peaking Unit 4 generation, the load serving capability could be increased to about 540 MW. Commission staff considers that reactivating the French Island Unit 3 generator could further increase the load serving capability to 610 MW.

The applicants identify an N-2 critical contingency that limited load serving capability up to 430 MW and indicate that additional electrical infrastructure is needed to provide load serving capability for customer loads greater than 430 MW. Commission staff considers that operation of French Island Unit 4 could increase the load serving capability to 500 MW and that reactivating French Island Unit 3 could increase it to 570 MW.

SYSTEM ALTERNATIVES

The applicants’ analysis shows that if nothing is done, load-serving capability in the area will be limited to 610 MW in the event of a critical N-1 contingency and limited to 460 MW in the event of a critical N-2 contingency. Otherwise, the applicants state that transmission grid reliability would require the

²The La Crosse-Monroe County 161 kV line does not provide a meaningful source to the greater La Crosse area because it is the strongest source for Sparta and Tomah, given the relatively weak transmission source from the east.

demand/supply ratio to stay level until 2020 with a reduction of 98 MW of demand or an increase of 98 MW of generation in the La Crosse area. They conclude that neither additional generation nor demand-side management (DSM) would satisfy their need for local service reliability, generation support, and regional reliability. Energy efficiency and load management do not provide region-wide benefits, and additional local generation would not provide region-wide benefit without the addition of transmission. They also would not supply the additional transmission connections that a 345 kV line would offer with respect to improving the ability of the system to withstand contingencies. The applicants also state that neither DSM nor the addition of local generation can provide the bulk transmission capability across the Minnesota/Wisconsin border that could enable future power transfers into Wisconsin to support generation development elsewhere. In fact, current generation resources to meet the needs of the area appear adequate, and projected reserve margins and the need for economical energy typically drive investment decisions for generation. In addition, the installation of any large generation typically requires an increase in transmission capacity to move the power from the source.

Energy efficiency has been considered but, at this time, there is no regulatory authority to ensure energy user compliance with load reduction and energy efficiency goals. An effort would need to rely on voluntary compliance, and no mechanism has been identified that would ensure adequate participation over time. Because of the nature of human and economic activity, there would be no guarantee that a one-time measure in the area would have a lasting effect. Cost would also be an issue, or at least an unknown.

A wind project would have a capital cost of approximately \$2.2 million per MW of installed capacity. Unlike several other alternatives, there would be no fuel cost associated with a wind project but, based on even a 40 percent capacity factor, 245 MW of wind capacity would be needed to serve the electric demand and would cost approximately \$539 million. If wind power was to be imported from outside the La Crosse service area, that power would likely require additional transmission line facilities to be built. The voltage of the transmission lines might not need to be as high as the line proposed, but that would need to be evaluated.

Solar power has been considered but, assuming a 20 percent capacity factor, a system using the most efficient crystalline cells would need to be approximately 612.5 MW in size to provide 98 MW of capacity, and would require about 1.156 square miles to install.³ As with wind power, physical obstructions and local laws might increase the area needed for this capacity. Depending on where it was located, additional transmission line facilities might also be required.

If biomass power is sought, it appears that more than one biomass-fired generation plant would be needed. With a typical biomass supply and a new power plant site, 25 MW is an optimal size for a project in terms of capital costs and fuel supply costs. Smaller projects would be more expensive, relatively, and larger projects would likely require larger fuel acquisition radii. Three such biomass plants would not generate 98 MW, even if they could accomplish a 100 percent capacity factor. The optimum cost and size of a plant could cost about \$3,335 per kW for a 25 MW plant, including costs for environmental protection. At less than 25 MW, the capital cost per kW would increase and, at greater than 25 MW, the fuel supply cost would increase. The Commission recently approved a 50 MW, biomass-fired

³ The following numbers can be used to find the approximate system size that can be placed in a given space.

- Crystalline PV System: 8-11 watts/square foot
- Thin Film PV System: 5 watts/square foot
- HE Crystalline System: 17-18 watts/square foot

<http://www.nrel.gov/docs/fy10osti/46078.pdf>. December 2009.

cogeneration plant at a cost of about \$255 million.⁴ This cost is greater than the anticipated cost of the Alma-La Crosse 345 kV Transmission Project, and it provides only 50 MW of capacity.

The capital cost of one 100-MW natural gas-fired plant would likely be close to \$100 million, about half the expected cost of the proposed transmission project. However, in addition to the capital cost, there would be the costs associated with fuel, maintenance and installation of larger natural gas supply lines and improved transmission connections if the existing lines near the new plants do not have the capacity. Thus, the installation cost appears relatively high, and potential environmental impacts would remain to be assessed. In addition, based on the capacity factors or run time of existing peakers at French Island, small natural gas-fired plants would seldom run, making them uneconomical. Without a need for replacement or additional generation, natural gas capacity would not be profitable, and any new local generation would not meet criteria of reasonable need for PSCW approval.

The applicants evaluated several transmission system options or alternatives to serve the needs of the La Crosse/Winona area. These included:

- A reconductor option
- A 161 kV Red Wing La Crosse transmission line option
- A single-circuit 161 kV North Rochester-La Crosse transmission line option
- A double-circuit 161 kV North Rochester-La Crosse transmission line option
- A single-circuit 230 kV North Rochester-La Crosse transmission line option

The above transmission alternatives are compared in Table ES-3. The costs included in the table are planning-level costs used primarily for comparison purposes.

Table ES-3 Cost and performance comparison of transmission line alternatives based on 2010 dollar planning level estimates

Alternatives	La Crosse/Winona Area Load Serving Capability (MW)	Project Cost (\$ million)	Transmission Losses Cost (\$ million)	Total Cost (\$ million)*
345 kV Proposed Project	750 MW	201	0	201
Reconductor Option	600 MW	182	36	218
Transmission Line Option: 161 kV Red Wing-La Crosse	750 MW	332	3	335
Transmission Line Option: Single-Circuit 161 kV North Rochester-La Crosse	550 MW	70	32	102
Transmission Line Option: Double-Circuit 161 kV North Rochester-La Crosse	600 MW	95	23	118
Transmission Line Option: Single-Circuit 230 kV North Rochester-La Crosse	550 MW	83	18	101

* For this comparison, Total Cost = Project Cost + Transmission Losses Cost

The existing DPC 161 kV line, called the Q1 line, is nearing the end of its useful life but is still needed. DPC has determined that it must be either rebuild or replace the line. DPC plans to reconstruct, by 2013, the sections of Q1 that are not replaced by the project in this docket. Different DPC Q1 rebuild scenarios

⁴ PSC REF #148090, Final Decision, Wisconsin Electric Power Company Rothschild Biomass Cogeneration Project.

would result from different Commission route decisions for this project. The rebuild could require a separate CPCN from the Commission depending on whether new ROW would be needed.

PROPOSED PROJECT AND ROUTES

For this project, the applicants proposed three routes to make the connection from the Mississippi River crossing at the city of Alma in Buffalo County to a new substation in the La Crosse service area near the village of Holmen in La Crosse County. The route alternatives considered in this EIS are described below. There are nine routes in all, including alternatives.

Two of the routes, the **Q1-Highway 35 Route** and **Q1-Galesville Route**, follow an existing 161 kV corridor southward as a 345/161 kV double-circuit line on metal, single-pole structures along Great River Road (GRR) to the mouth of Waumandee Creek between the villages of Cochrane and Fountain City. At that point the routes leave the Mississippi River and extend inland, still following the existing 161 kV corridor as a double-circuit line. East of the Trempealeau River, these two routes diverge and follow very different paths to avoid or minimize different resource impacts.

The **Q1-Highway 35 Route** continues along the existing 161 kV transmission corridor as a double-circuit line to where the corridor intersects with STH 35 east of the village of Trempealeau. From that point, the route leaves the 161 kV corridor, takes the 161 kV line with it, and parallels STH 35 east as a double-circuit line across the Black River bottomlands and the Van Loon State Wildlife Area to the STH 35/USH 53 interchange, where it then follows USH 53 southward to a proposed substation site along Briggs Road southwest of Holmen. This route was proposed by the applicants as an alternative to their original proposal that followed the existing Q1 transmission corridor all the way to the substation site. The existing Q1 corridor in this area passes through the Black River bottomlands and the Upper Mississippi River National Wildlife and Fish Refuge.

The **Q1-Galesville Route** avoids the Black River bottomlands and the Van Loon Wildlife Area by diverging from the existing 161 kV corridor around Delaney Road east of the Trempealeau River and running eastward as a single-circuit line, connecting with STH 54 south of Galesville and intersecting with a different, north-south, 161 kV transmission corridor east of USH 53. From that point, it follows the transmission corridor, USH 53, CTH HD, and Briggs Road as a double-circuit line to the proposed substation site.

WisDOT has strong concerns about a route along GRR (STH 35) and has suggested an alternative, an **STH 88 Connector Alternative**, that would run from the Mississippi River crossing at Alma east as a 345/161 double-circuit line to a point north of Waumandee Creek valley and then south along STH 88 as a single-circuit line to connect to the Q1-Highway 35 or Q1-Galesville Route from the north. From the mouth of Waumandee Creek eastward, either of the two Q1 Routes would be the same. The applicants provided two optional paths down the valley along STH 88, **STH 88 Connector Option A** and **STH 88 Connector Option B**.

During the pre-application process, the applicants had proposed the original **Q1 Route** following the existing DPC “Q1” 161 kV line between Alma and the North La Crosse Substation in Holmen. The portion of the original Q1 Route that crosses the Mississippi River Wildlife and Fish Refuge may not be approved by the USFWS because a portion of it would require additional easement that may not be allowed under current land uses authorized on refuge property. However, in case project circumstances change, comparable information is provided about this route so that the Commission can make informed decisions if it determines that it should be considered.

A third route, the **Arcadia Route**, is also proposed by the applicants. It avoids GRR and the Black River bottomlands and the Van Loon Wildlife Area almost entirely. It is an overland route that, from Alma, follows an existing east-west 161 kV transmission corridor over the river bluffs as a 345/161 kV double-circuit line to a point across the Trempealeau River northeast of the city of Arcadia. It then turns south following an existing north-south 69 kV transmission corridor generally as a 345/69 kV double-circuit line to STH 54 east of Centerville, and from there it heads east on STH 54 and south of the city of Galesville along the same path as the Q1-Galesville Route to the substation.

The applicants developed the **Ettrick Connector Alternative** for the Arcadia Route in response to WDNR's suggestion to provide the Commission with a second set of route segments to avoid the Black River bottomlands and the Van Loon State Wildlife Area (besides the segments common to the Arcadia and Q1-Galesville Routes). This alternative diverges from the Arcadia Route where the existing 69 kV corridor crosses Fox Coulee Lane. It follows an east-west 69 kV corridor as a 345/69 kV double-circuit line (with the 69 kV portion built to 161 kV standards) along Fox Coulee and Hovell Lane, and across a ridge. It continues to follow the 69 kV corridor eastward into the Beaver Creek valley to an intersection with an existing north-south 161 kV corridor west of the village of Ettrick. It follows that 161 kV corridor southward to the Black River and, from there, follows the same path as the Arcadia or Q1-Galesville Routes to the proposed substation site.

POTENTIAL ENVIRONMENTAL AND SOCIAL 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 Mississippi River National Wildlife and Fish 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, 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 GRR 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
- Black River bottomlands, including the Van Loon State Wildlife Area, an extraordinarily high-quality wetland riverine complex

WisDOT has expressed strong concerns about potential aesthetic impacts to GRR 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.

Table ES-4 summarizes some of the potential natural resource and social impacts for each of the nine route options and alternatives.

As shown in Table ES-4, 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.

Table ES-4 Comparison of potential impacts among routes and alternatives

Route	Length (miles)	New ROW (acres)	Percent of ROW Length Shared	Agricultural Land Crossed (acres)	Number of Stream Crossings*	Wetland Area Affected (acres)	Wooded Wetland Crossed (acres)	Total Forest Area Cleared (acres)	Number of Residences within 300 Feet of the Centerline
Q1-Highway 35	43.0	404.4	94%	325.2	38	83.5	55.1	127.8	74
Q1-Highway 35 with STH 88 Connector A	49.7	509.2	90%	399.4	Unknown	109.0	69.1	176.7	79
Q1-Highway 35 with STH 88 Connector B	49.0	543.9	79%	417.9	Unknown	111.2	67.9	176.1	67
Q1-Galesville	48.4	497.0	79%	367.5	23	63.7	34.9	131.9	109
Q1-Galesville with STH 88 Connector A	55.0	601.8	78%	441.7	Unknown	60.7	38.1	180.8	114
Q1-Galesville with STH 88 Connector B	54.4	636.5	67%	460.2	Unknown	62.9	36.9	180.2	102
Q1 Original	41.3	377.1	96%	328.4	46	118.8	64.3	123.9	61
Arcadia	54.8	519.5	90%	445.3	42	95.6	38.8	161.1	102
Arcadia-Ettrick Connector	57.0	530.4	88%	468.0	63	142.9	56.9	175.4	57

* Stream data was not submitted in the CPCN Application for STH 88 Connector route segments.

Using Table ES-4, the routes can be compared in terms of the above-mentioned areas of impact.

- 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 alternatives require the most wooded wetland clearing, while the Arcadia Route and Q1-Galesville alternatives require the least. Total woodland clearing would be greatest along the Q1-STH 88 and Arcadia-Ettrick Connector alternatives, while the original Q1 Route and utility-proposed Q1-Highway 35 and Q1-Galesville Routes would have the least total woodland cleared.⁵ The Arcadia Routes and the Q1-Galesville Route 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 closest to the most homes would be the Q1-Galesville alternatives and the Arcadia Route.
- The original Q1 Route and the Q1-Highway 35 Route have direct impacts on the Black River (Van Loon) and its associated natural communities and rare species while the others would not.

⁵There is also the possibility of combining the original Q1 Route with an STH 88 Connector to avoid the Great River Road, but such a combination would likely have the maximum wooded wetland and total woodland impacts together.