

CHAPTER
11

11. Ettrick Connector Alternative

11.1. ROUTE DESCRIPTION

The Ettrick Connector Alternative would provide an alternative path for the proposed Arcadia Route to reach the Briggs Road Substation site without passing through the Van Loon Wildlife Area. This alternative route path was provided by the applicants in response to a request by WDNR staff that a second path be sought to provide a possible practicable alternative to projected wetland impacts in the Van Loon Wildlife Area.¹²⁸

It connects to the Arcadia Route at Segment 11G in the area of an existing 69 kV tap east of STH 93 at the intersection of Prondzinski Lane and Fox Coulee Lane. From that point, the transmission line would follow Segments 1 ET, 2ET, 3ET, and 4 ET up Fox Coulee along Hovell Lane, eastward over the ridge and into the Beaver Creek valley as a double circuit with the 69 kV line to connect with the existing NSPW Tremval-Mayfair 161 kV line. The route then turns southward, double-circuiting the 345/161 line along the existing ROW to reconnect with the Arcadia Route at Segment 17A east of USH 53 and north of the Black River. From there, the line would follow the proposed Arcadia Route to the Briggs Road Substation site. The connector can be tracked in Figures Vol. 2-1G, 2-1S, and 2-1T. A visualization of the connector alternative is shown on the map in Figure 11.1-1.

The Connector would be supported on double-circuit structures all the way, with either a DPC 69 kV line on Segments 1ET, 2ET, and 3ET or the NSPW 161 kV line on Segment 4ET. Typical double-circuit, 345/161 kV structures are illustrated in Figures 1, 3, and 5 in Appendix A.

The Connector is about 14 miles long, making the Arcadia Route about 57 miles long instead of 55.

¹²⁸ A practicable alternative is sought as part of the requirements of Wis. Admin. Code ch. NR 103.

Figure 11.1-1 Etrick Connector Alternative Route



11.2. GEOGRAPHY

11.2.1. Topography

The Arcadia-Etrick Connector Alternative is in the Western Coulees and Ridges Ecological Landscape.¹²⁹ This landscape is common in southwestern and west-central Wisconsin. It is characterized by highly eroded, thoroughly-dissected upland with high, narrow ridges and deep, steep-sided valleys. Constant geologic erosion occurs where slopes are steep and very steep. Some areas, such as those identified as stony and rocky land, have so much runoff that geologic erosion almost keeps pace with the weathering of bedrock and the initial stages of soil formation.

The topography and its challenges vary along different parts of the proposed transmission route.

The Arcadia-Etrick Connector Alternative uses the northwestern portion of the Arcadia Route (Segments 1, 2A1, 10B2, 10C, and 11A through 11F and part of 11G), departs on its own for a distance of about 13.8 miles, and then rejoins the Arcadia Route north of the Black River and uses Segments 17A through

¹²⁹ Ecological Landscapes of Wisconsin, WDNR website: <http://dnr.wi.gov/landscapes>.

18H. The Arcadia Route is described in Chapter 10, Section 10.1. This section focuses on the relevant geographical information about the Ettrick Connector itself.

At the south end of Segment 11G1, the Ettrick Connector separates from the Arcadia Route and turns eastward up the Fox Coulee as Segment 1ET, where the new line would be double-circuited with an existing DPC 69 kV line. The segment starts at an elevation of about 790 feet AMSL and gradually climbs up the coulee to the east a little over 2 miles to the headwaters of a Tamarack Creek tributary. It follows the existing line to the top of the ridge at approximately 1,240 feet AMSL. Segment 2ET continues east over repeated topographic fluctuations of uplands and lowlands, reaching the relatively level Beaver Creek Valley at an elevation of about 730 feet AMSL. The Connector route stays within this broad lowland for a distance of approximately 3.0 miles, gradually climbing to an elevation of about 780 feet AMSL before leaving the valley for the uplands at its eastern end. At Segment 4ET, the route turns south to join an existing 161 kV transmission line corridor in which the new line would be double-circuited with the existing line. The northern 4.5 miles of this segment are a typical straight cross-country ROW, following neither roads nor field boundaries. It crosses alternately uplands and lowlands across relief ranging between 300 and 400 feet or more. At its south end, reaching the Decorah Prairie lowlands of the Black River Valley, Segment 4ET stays at an elevation of about 750 feet AMSL for slightly more than 1.0 mile and reconnects with the Arcadia Route just north of the floodplain of the Black River.

Some portions of the Arcadia-Ettrick Alternative, such as the eastern portion of Segment 3ET and much of Segment 4ET, have topographic changes that would present notable construction difficulties and relatively long access routes.

11.2.2. Soils

In Trempealeau County, the limestone that underlays the Dubuque soils and stony and rocky land is thin or completely eroded away, and sandstone predominates. Segment 1ET starts in a lowland valley dominated by Houghton Muck with Ettrick silt loam soils as the route travels up gradient along the river bed. Both soils occur on bottom lands and floodplains along streams and rivers and have the additional hazard of severe stream bank erosion in cultivated and pastured areas. There is also a significant hazard of flooding and the water table is near the surface. Most of the lowland in the coulee is covered in reed canary grass and related old pasture species. The upland region to the east is dominated by Seaton-Palsgrove-Dubuque-Fayette-LaFarge-Eleva-Norden soil associations. These soils consist of well-drained silty and loamy soils with a silt loam or sandy loam surface over non-calcareous silty loess or over loamy, sandy, or clayey residuum or colluvium, potentially rich but highly erodible. About 60 percent of this association is moderately steep or steeper. Peripheral to the limestone ridgetops are steep, stony, and rocky escarpments that drop sharply down to moderately steep valley slopes. The difference in elevation from the ridgetops to the valley bottoms ranges from 300 to 400 feet.

Segment 3ET is dominated by sandy alluvial soils in the nearly level bottom lands of the Beaver Creek Valley. The soil is wetland soil stratified with light-colored and dark-colored sediment deposited by floodwaters.

Segment 4ET again crosses the varied topography of the uplands described previously before continuing through the relatively flat lowlands of its southern end. The soils in the lowlands of Segment 4ET are predominately silty loams of the Downs Soil series. This soil consists of nearly level, well-drained soils on valley benches.

The uplands of this alternative route have shallow soils with bedrock located less than five feet below the surface in most places. Only in the river valley bottoms is the depth to bedrock 50 to 100 feet below

ground or greater. Five proposed transmission structures would be located on steep stony and rocky land which has shallow and fragile soils. With shallow soils to bedrock, there might be a need for blasting as well as augering to install the transmission foundations. Increased potential for environmental impacts would be anticipated from construction on steep wooded hillsides found along the edges of the uplands and areas identified as having erosion issues. Additionally, steep wooded hillsides might contain rare species that may be impacted by the proposed construction (see Section 11.3.2).

11.2.3. Land cover in general

The land use in Buffalo, Trempealeau, and La Crosse Counties is almost entirely agricultural. The flat areas that are not too wet in the lowlands and not too steep in the uplands are farmed. Numerous creeks dissect the uplands and run through the hillsides toward the Mississippi River. These steep hillsides are forested with exposed outcroppings. The variable relief makes a significant portion of the land area non-developable. Roads wind in and around steep gradients, following river valleys to some degree. Straight line transmission routes, with the exception of those along the Mississippi River Valley, present environmental complications.

The woodlands of the lowlands are dominated by willow, soft maple, box elder, ash, elm, cottonwood, and river birch trees, and prairie vegetation. Extensive stands of bottom land hardwoods such as elm and cottonwood are found in the vicinity of the Black and Mississippi Rivers. 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, hickory, and basswood continue to grow along the steep hillsides.

Human populations have remained somewhat static over the past 30 years except for the area in and around the city of La Crosse where populations have increased more than 20 percent since 2000. The village of Holmen, north of La Crosse, continues to grow. In the rural areas, the population densities have remained relatively low. Small urban areas are located along major highways and on the flatter river valleys.

11.3. NATURAL RESOURCES AND IMPACTS

11.3.1. Woodlands

A general discussion of potential woodland impacts can be found in Chapter 5, Section 5.5.17. Particular woodlands along the Ettrick Connector Alternative are discussed here where potential specific impacts are likely.

11.3.1.1. Existing environment

Like much of the project area, the Ettrick Connector is punctuated by alternating bluff lands and stream valleys. Upland woods contain mostly broad-leaved deciduous forest with oak and maple as the predominant hardwood trees. Oaks, hickory, and basswood continue to grow along the steep hillsides. The woodlands of the lowland stream valleys are typical of southwest Wisconsin, dominated by willow, soft maple, box elder, ash, elm, cottonwood, and river birch trees, and prairie vegetation.

11.3.1.2. Potential impact

As part of the Arcadia Route, the Ettrick Connector would increase the amount of woodland that would have to be cleared for the ROW. Overall, there would be about 148 new acres of upland woodland to be cleared along the Arcadia-Ettrick Route, including the Ettrick Connector and the portions of the Arcadia

Route that complete the connection between the project endpoints. The Arcadia Route would be cut off south of Segment 11G1 below Fox Coulee and would be rejoined north of the Black River where Segment 4ET meets Segment 17A. The 148 acres of woodland loss is greater than the clearing requirements for the proposed Arcadia Route or for any other route.

The proposed ROW for the new line is about 150 feet wide, in many cases an expansion of the existing 161 kV or 69 kV ROW. Xcel, as the lead utility for the project, provided a visualization of the tree clearing that would be required for the ROW. It is shown in Figure 4.2-1 in Chapter 4.

In addition to the actual loss of trees, indirect impacts would likely result from increasing the width of the already disturbed corridor. Edge effects, such as changes in vegetation structure, light conditions, and moisture conditions would encroach further into the interior of the remaining forest. The increase in edge-to-interior ratio is 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 some local wildlife, including increased exposure to predators.

Where the existing 161 kV or 69 kV line has a cleared ROW through woodlands, along Segment 1ET or 4ET, for instance, the new double-circuit line would require a wider ROW. On steeper, larger slopes, however, the applicants indicate that they would cut trees on the downslope only as far as necessary to avoid tree-transmission contact. Considering clearance requirements plus an additional number of feet for future growth, there would likely be trees on the valley floor that would never grow into the wire on some high spans. These trees would not need to be cut. There are a few locations along the Connector Alternative where this could be the case.

This section of the draft EIS focuses on the four route segments making up the Ettrick Connector Alternative. A discussion of the Arcadia Route forests can be found in Chapter 10, Section 10.3.1.

Along Segment 1ET, the new line would follow the existing 69 kV ROW over the ridge between Hovell Lane and Brenegan Lane. The ridge is forested, and the ROW would be expanded to 150 feet in width, further widening the only break in the woodland over a 3.0-mile stretch. It is possible that the downslope trees could be lower than the clearance requirements and the full ROW would only be cleared near the top of the slope, but this would not be known unless the Connector Alternative was approved and final engineering was done.

Segments 2ET and 3ET include places where woods adjacent to Beaver Creek or Abraham Coulee Creek were cleared. The woods are not extensive, but likely provide some shading of the creeks. Their removal could result in some warming of the streams. See Section 11.3.3 for the waterways discussion.

Segment 4ET requires widening the ROW for the existing 161 kV line to the south. Numerous forested hills would be crossed, resulting in a large amount of additional tree clearing. These large forest blocks would be adversely impacted through increased areas of edge effect and decreased interior forest habitat for birds and other wildlife. Almost 20 acres of newly cleared woodland would result over a distance of about 6.0 miles.

11.3.2. 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 Arcadia and Arcadia-Ettrick Routes are both longer than the Q1 Routes. The wetland areas along the

Arcadia Route and Ettrick Connector 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 compared to the Q1 Routes. The Ettrick Connector follows Beaver Creek and its tributaries in some areas. Existing older transmission lines often follow creek lines away from agricultural land use, which create challenges for working in adjacent riparian habitats. Table 11.3-1 shows relative amounts of different types of habitat along the Ettrick Connector.

Table 11.3-1 Habitat types potentially affected by routes

Route	Habitat Type					Total In ROW
	Forested Upland	Forested Wetland	Non-Forested Wetland	Grassland	Shrub Upland	
Ettrick Connector	265.09	56.43	85.8	46.8	0.02	454.32

The NHI database shows two occurrences near the Ettrick Connector, both for mobile wildlife species. 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.

11.3.3. Rivers and streams

This section describes the streams and basins where the proposed project route would be located and the smaller watersheds within the basin that could be affected by the project.

11.3.3.1. Basin information

The Ettrick Connector Alternative is a variation on the proposed Arcadia Route. From the tap at the foot of Fox Coulee west to the crossing of the Mississippi River, the route is identical to the Arcadia Route. Like the other routes for this project, the Ettrick Connector is located in the BBT group. Along the Arcadia Route, the BBT group includes the Little Buffalo River watershed, the Waumandee Creek Watershed, the Middle and Lower Trempealeau River Watersheds, the Beaver Creek and Lake Marinuka Watershed, and the Lower Black River Watershed. Along the Ettrick Connector, the line would run through the Lower Trempealeau River Watershed, the Beaver Creek and Lake Marinuka Watershed, and the Lower Black River Watershed. These are illustrated in Figure Vol. 2-4. The floodplains associated with the stream outflows are shown in Figure Vol. 2-5.

11.3.3.2. Hydrologic features

West of the Fox Coulee tap, the hydrologic features would be as described in the chapter on the Arcadia Route.

The Arcadia Route’s southward stretch along Segments 11A through 11G1 from Arcadia takes it into the Lower Trempealeau River Watershed, which is dominated by forests and agriculture, and empties into the Mississippi River near the unincorporated village of Marshland below the reaches of the Arcadia Route and west of the Ettrick Connector. The streams in the Fox Coulee, the location for Segment 1ET, feed this watershed.

To the east, the route runs through the Beaver Creek and Lake Marinuka Watershed and south through the Lower Black River Watershed. Beaver Creek is an important local feature in the Ettrick Connector project area. The Beaver Creek Watershed drains approximately 160 square miles in Trempealeau and Jackson Counties and empties into the Lower Black River Watershed. The north and south forks of

Beaver Creek originate in Jackson County and meet in Ettrick in Trempealeau County to form Beaver Creek. The creek is impounded in Galesville to form the 98-acre Lake Marinuka. Beaver Creek joins the Black River at the western edge of the Van Loon State Wildlife Area. The Beaver Creek and Lake Marinuka Watershed has drainage characteristics typical of Wisconsin's unglaciated areas. The topography is dissected with high, narrow, irregular divides, steep bluffs, moderate slopes, and broad open valleys. Local relief results in stream gradients which vary from 70 to 150 feet per mile in the headwaters, 20 to 40 feet in the middle reaches of main channels, and less than 10 feet per mile in the lower main channel reaches. As the stream gradient decreases, stream flow velocities also decrease and deposition of sand and silt occurs. Movement and deposition of material in streams is a natural process; however, it may be accelerated by poor land management activities. The route runs through the Lower Black River Watershed, crossing the Black River near USH 53 and staying east and upland from the Van Loon Wildlife Area.

11.3.3.3. Potential waterway impacts specific to this route

Many of the waterways along the distinct Ettrick Connector segment are located in forested areas or have vegetation that provides cover and filters potential soil pollutants. The greatest impact to these waterways would be the loss of shrub and forest riparian vegetation that can help reduce thermal loading, and minimize sedimentation and nonpoint source pollution runoff.

Because the Ettrick Connector is an alternative to the Arcadia Route (see the map in Figure Vol. 2-1 Index), the waterway impacts west of the Fox Coulee (see Figure Vol. 2-1G) would be identical to those described for the Arcadia Route. Potential impacts would include those indicated at the Mississippi River crossing, the waterway paralleling and within the ROW for Segment 10C, and the crossing of Tamarack Creek tributary by Segments 11 F and 11G1.

Segment 1ET in the Fox Coulee has a lengthy section where waterways are located along the proposed ROW. These waterways are associated with Fox Coulee Creek and Tamarack Creek, which are designated trout streams by WDNR. Figure Vol. 2-4 shows Tamarack Creek as a Class 3 trout stream. Depending on how much land clearing is associated with this portion of the segment, a Chapter 30 grading permit may be necessary for "disturbing more than 10,000 feet on the bank." Additional clearing of vegetation along the waterway would adversely impact the cool water fishery and could also lead to additional infiltration of sediments or other nonpoint source pollutants.

Segment 2ET crosses Abraham Coulee Creek, which is a Class 1 trout stream. Where the creek would be crossed, there is little woodland cover. Clearing of woody vegetation for the ROW could potentially expose that place in the creek to additional thermal loading.

The ROW for Segment 3ET follows the meandering waterway, Beaver Creek. As shown in Figure Vol. 2-4, Beaver Creek is a designated Class 2 trout stream. Depending on how much land clearing is associated with this portion of the segment, a Chapter 30 grading permit may be necessary for "disturbing more than 10,000 feet on the bank." Additional clearing of vegetation along the waterway would adversely impact the cool water fishery and could also lead to additional infiltration of sediments or other nonpoint source pollutants. Segment 4ET crosses tributaries to Dutch Creek, a Class 1 trout stream. Additional clearing of vegetation at the waterway crossing would adversely impact the cool water fishery and could also lead to additional infiltration of sediments or other nonpoint source pollutants.

An access road associated with Segment 4ET would be located directly adjacent to Silver Creek. Depending on how much land clearing is associated with it, a Chapter 30 grading permit may be necessary for "disturbing more than 10,000 feet on the bank." Additional clearing of vegetation along the waterway

would adversely impact the fishery, and could also lead to additional infiltration of sediments or other nonpoint source pollutants. If the access road used the proposed ROW, this additional waterway impact could be avoided.

11.3.4. Wetlands

There are several small wetlands along the Etrick Connector that can be examined using the maps in Figures Vol. 2-1 G, 2-1S, 2-1T, and 2-1I. Acreages are shown in Table 11.3-2.

Table 11.3-2 Wetland Impacts along the Etrick Connector route alternative in acres

Route Name	Forested Wetland (Existing ROW)	Forested Wetland (New ROW)	Total Forested Wetland (New and Existing)	Non-forested Wetlands (Existing ROW)	Non-forested Wetlands (New ROW)	Total Non-forested Wetland (New and Existing)	Total Wetland Impacts (New and Existing)
Etrick Connector	14.78	13.61	28.39	26.75	22.05	48.8	77.19

The table shows that a total of 77.19 wetland acres are located along the proposed ROW. Of that, 17 percent are new, forested-wetlands within the ROW that would be converted to shrub or sedge meadow wetlands.

A discussion of wetlands by route segment follows. The Etrick Connector connects the western portion of the proposed Arcadia Route to the south end of the Arcadia Route at Segment 11G1. Wetlands along the Arcadia Route are discussed in Section 10.3.4 of Chapter 10.

Segment 1ET begins where the existing 69 kV line in the Fox Coulee connects to the existing 69 kV line parallel to STH 93 on the proposed Arcadia Route. This segment, heading west through the Fox Coulee along Hovell Lane runs mostly through a large wet-meadow wetland that is a monotypic stand of reed canary grass. Nine transmission poles would be located within this wetland. East of the large wetland complex, this segment follows the existing 69 kV line out of the wetland and over the ridge.

Across the ridge, Segment 2ET runs cross-country, crossing large swaths of farmland. There are a few small stream crossings that have riparian wetland vegetation. Impacts to these wetland areas are expected to be minimal. No temporary bridges or crossings by construction equipment are expected.

The west end of Segment 3ET enters a large wet-meadow floodplain complex with some forested areas, south of CTH T and associated with Beaver Creek. Nine transmission poles would likely be located within this wetland complex that parallels Beaver Creek as the new line is constructed in and around the wetland complex along CTH T, CTH TT, and USH 53. Clearing of woody vegetation in the ROW through the wetlands along Beaver Creek could adversely impact Beaver Creek, which is a Class 2 trout stream, by increasing thermal and non-point source pollution. See Figure Vol. 2-4 and Figure Vol. 2-1S.

The line would make a hard turn on a hillside beyond Beaver Creek, where the 161 kV Tremval-Mayfair transmission line runs along the west side of Etrick and south toward Holmen and La Crosse. The north end of Segment 4ET starts here, following the existing 161 kV corridor through a hill-and-valley region with a larger forested complex and less wetland landscape. Some of the wetland is forested wetland. Many of the wetlands along this ROW are actively farmed. Along this segment one new pole would likely be located within a mesic wetland that is associated with the riparian zone of a meandering stream. The line would also require an expanded ROW across Dutch Creek, a Class 1 trout stream. Removal of additional woody vegetation in the wetlands around the creek would result in additional thermal loading of

the stream waters and potential adverse impacts on local trout habitat. Within Segment 4ET, the applicants also propose to locate an access road directly adjacent to Silver Creek. WDNR recommends that the applicant work with WDNR to re-locate this access route or otherwise minimize impacts along this route.

The very important Van Loon wetlands would not be directly affected by construction or operation of the new transmission line along the Ettrick Connector Alternative because this route bypasses the Van Loon Bottoms as it crosses the Black River at Hunters Bridge on USH 53 and runs parallel to USH 53 and east of it. At Hunters Bridge, however, the Ettrick Alternative would require trees to be removed from the expanded transmission line ROW.

11.3.5. Archeological resources

WHS's archeological sites database does not show any listed archeological sites within or adjacent to the proposed ROW of the Ettrick Connector that could be affected by construction activities.

11.4. COMMUNITY IMPACTS

11.4.1. Aesthetics and visual impacts

The Ettrick Connector route covers landscapes generally similar to those covered by the proposed Arcadia Route discussed in Chapter 10. This discussion, like the discussion in that chapter, 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.

If utilized, this Connector would likely be part of the Arcadia Route and the potential visual effects described in Chapter 10 for the Arcadia Route would apply for those portions of this route. Aesthetic considerations for the Arcadia Route north and west of the Fox Coulee tap near STH 93 and south of the Black River by USH 53 are described in Chapter 10, Section 10.4.1. Below, potential visual impacts along the four "ET" segments are considered.

The project area for the Ettrick Connector lies between the intersection of the Fox Coulee and Tamarack Creek valley in the west, the Beaver Creek valley and Ettrick in the east, and the Black River valley in the southeast. Fox Coulee follows a tributary creek/wetland that leads to Tamarack Creek. Going up the coulee, there are wetlands, farm fields, and buildings, and near the top, hardwood forest. The forest is part of a large, long (north-south) ridge-top forest broken at occasional locations by small roads and the 69 kV ROW. On the east side of the ridge, there are more forest blocks and smaller, irregularly-shaped farm fields. No road is crossed until Brenegan Lane is reached about 2.0 miles from the ridge top. Segment 2ET runs through relatively flat farmland parallel to the existing 69 kV line ROW, joining it east of CTH T in the Beaver Creek lands, and passing through the hamlet of Frenchville. The area is relatively flat with woodlands and the wetland complexes around Beaver Creek. USH 53 runs through this area also. West of Ettrick, the project area changes from the Beaver Creek valley to the wooded uplands to the south. Between this point and the flatter farmland north of the river, the landscape is an undulating hill-and-valley land with forests on the high grounds and creek valleys and farm fields in the valleys. The creeks crossed are part of the dendritic pattern of tributary streams for Beaver Creek and the Black River.

Structures expected to be utilized for the Ettrick Connector would be similar to those suggested for the Arcadia Route: steel, about 130 to 195 feet tall and about five to seven feet in diameter, with surfaces that are either oxidized to rust brown or galvanized gray. The spans between structures would vary between 600 feet and 1,500 feet depending on the landscape to be spanned.

Where the tap at the foot of the Fox Coulee occurs, there would be a new structural arrangement about a quarter-mile east of STH 93 at Prondzinski Lane across the highway from the Tamarack Creek wetland including the insulator and tap connections that:

- Allow the 69 kV line from Arcadia to pass from the double-circuit poles to the north to shorter, single-circuit poles to the south toward STH 54.
- Allow for an approximately 100 degree turn for the 345 kV line from the north toward the east and north up the coulee. This could require a two-pole structure with each pole about five to eight feet in diameter and up to 170 feet tall.
- Allow for the tap for the DPC 69 kV line to Ettrick, as part of a double-circuit system up Fox Coulee Lane and Hovell Lane.

Segment 1ET would extend from this structure up the coulee. The existing 69 kV line is relatively short, even for a 69 kV line, on wood poles installed in the wetland around the creek. About 11 homes are located in the valley near where the place where the tap and turn would be made. The new line would be a new, metallic, industrial visual feature for these residents. The line from Arcadia and the tap for Segment ET1 would be tall and visible to users of STH 93 and to users of the Tamarack Creek lands across STH 93.

Where Segment 1ET rises up the ridge, the existing 69 kV line and its cleared ROW are not visible from the Hovell Lane, which is a public road, or STH 93. The new line would be over twice as tall as the existing one, and the ROW through the ridge top forest would be over twice as wide as the existing one. These features could be more visible to residents, users of the coulee, and possibly users of STH 93 and the Tamarack wetland complexes. The line and new, wide ROW would also have aesthetic impacts for residents and users of the foothills on the east side of the ridge.

The double-circuit 345/69 kV line would also be a new, large, metallic feature viewable from USH 53, local county trunk highways, and smaller roads and farm fields of the Beaver Creek valley. There would be no significant forest clearings, but the structures would be, by far, the tallest structures in the area. Where Frenchville and USH 53 are crossed by the line, some of the adverse visual impacts of the line may be mitigated by the existing highway traffic and noise. However, closer to the creek and forest, the line with its tall structures and wide cleared ROW would have a substantial impact in what is otherwise a relatively natural area.

South of Ettrick, the new line would be double circuited with an existing 161 kV line, resulting in significantly more height and doubling the size of the ROW. The line would be relatively straight and entirely cross-country like the current line, not following existing roads, property boundaries, or field edges. Additionally, the region's continuous elevation changes might require the line to be sited primarily on hilltops in an attempt to span the valleys and woodlands associated with the smaller waterways. Significant clearing of woodlands that surrounds most of the agricultural fields would be required for the ROW and any improved or new access roads in this rural and undeveloped landscape.

11.4.2. Agriculture

The Ettrick Connector line would have a ROW that included about 50 acres of cropland not already within the existing transmission ROWs, with over 37 acres in Segments 2ET and 4 ET where the line would cross expanses of farmland. Very little pasture would be included in the new ROW. Agriculture in the area is essentially row crops, often with contour farming patterns, and animal husbandry. Rural residents are mostly associated with farms.

The area surrounding Segment 1ET is zoned Primary Agriculture. The area around Segment 2ET is zoned Rural Residential in the west but Exclusive Agriculture in the east. Segment 3ET also crosses a mix of Rural Residential and Exclusive Agriculture zoned land. Segment 4ET is zoned Rural Residential in the hilly north and Exclusive Agriculture in the south toward the Black River.

Specialized farming methods have not been identified along the Ettrick Connector. There appears to be no pivot irrigation. 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 or to protect organic certifications. Additional issues for organic farms might be caused by the removal of tree buffers for new ROWs or the enlargement of existing ROWs. The removal of a buffer might 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 yet unknown. Biosecurity and organic farm impacts can be minimized by the applicants working with agricultural landowners well in advance of construction, advance notice of construction activities, and follow-through with agreed-to protection measures. The applicants estimate \$5,000 per mile for various agricultural protection measures.

One animal confinement facility is located within 300 feet of the proposed centerline on Segment 1ET. 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 5.5.15 in Chapter 5 of the draft EIS.

Wisconsin Stat. § 182.017(7)(c) through (h) is a list of landowner rights, many of which address issues which are of particular importance 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 in 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.

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 farmed fields. Its Executive Summary will be included as an appendix in the final EIS.

11.4.3. Airports and airstrips

No public-use airports would be impacted by any of the proposed routes. The nearest public airport is the City of La Crosse Municipal Airport. The southern-most transmission structure for this proposed Arcadia Route is approximately 4.4 miles from the nearest runway, and the southern-most structure of the Ettrick

Connector is farther to the north. All proposed transmission structures are outside of the height limitation zoning map for the airport and not subject to any height restrictions.

The Holland Air Park is about 2.5 miles south of the end of Ettrick Connector Route Segment 4ET as shown on the map in Figure Vol. 2-1I. Its runway is a lighted asphalt surface about 60 feet long, oriented north-south with a 300-foot displaced threshold approach pattern to one side. Its distance and orientation make it unlikely that the proposed transmission line would adversely affect its safe use.

11.4.4. Electric distribution line issues

Along the proposed routes, there are distribution lines owned by NSPW and by Riverland. Because of issues associated with stray voltage and its potential effect on confined animals (mostly dairy cows), all routes have been analyzed for areas where distribution lines may be located too close to the proposed transmission lines. The cause, impact, and mitigation of stray voltage or NEV are discussed in detail in Section 5.5.15.

For this project, distribution lines would be removed, relocated, 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. NSPW and Riverland have opted to relocate distribution lines that are located less than 150 feet from a transmission line and parallel to the transmission line for a continuous distance greater than 1,000 feet because they can cause impacts to farms with confined animals. No distribution lines are proposed to be underbuilt on the new 345 kV structures.

Two three-phase distribution lines, by Fox Coulee Lane in Segment 1ET and by CTH T in Segment 3ET, have been determined to meet the threshold for relocation and would be buried at a total cost for the Ettrick Connector of about \$445,000.

There might be construction impacts associated the removal of the existing structures and the installation of the new cables. Distribution conductors and insulators would most likely be removed using a two-axle bucket truck or, where access is difficult, a lineperson would climb the poles and detach them. Existing distribution poles would be either pulled from the ground using vehicle mounted equipment where possible or cut off at the ground level by chainsaw. The new distribution line would be undergrounded using either a vibratory plow or directional boring techniques. Of the two techniques, directional boring produces the least impacts and can be used to avoid significant impacts to smaller areas of protected resources such as wetlands and waterways. Impacts can be further minimized by working with the affected landowner well in advance of construction and by compensating 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.

11.4.5. Electric and magnetic fields

The majority of segments for this route use existing transmission line corridors. 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. The Ettrick Alternative is identical to the Arcadia Route except that it would replace Segments 11G2 and 13A through E with Segments 1ET through 4ET (see Figure Vol. 2-1).

Segment 11G1

There is an existing 69 kV single-circuit transmission line along Segment 11G1. The proposed project would replace this line with a 345/69 kV double-circuit transmission line on single-pole structures (see Appendix A, Figure 1, 5).

There are five residences within 300 feet of the proposed line. Two residences are between 51 and 100 feet of the line, one residence is between 101 and 150 feet, and two 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 existing 69 kV line under normal load conditions is approximately 2.5 mG at 50 feet and decreases to 0.7 mG at 100 feet. At 150 feet, the magnetic field falls to approximately 0.3 mG and is reduced further to about 0.07 mG at 300 feet. The estimated magnetic field from the proposed line under expected 2015 load conditions would be about 15 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 would drop to 0.8 mG at 300 feet.

Segments 1ET and 2ET

There is an existing 69 kV single-circuit transmission line along Segments 1ET and 2ET. The proposed project would replace this line with a 345/161 kV double-circuit transmission line on single-pole structures (see Appendix A, Figure 1, 5). The 161 kV circuit would be operated at 69 kV.

There are four residences within 300 feet of the proposed line along these segments. One residence is between 51 and 100 feet of the line, one residence is between 101 and 150 feet, and two 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 existing 69 kV line under normal load conditions is approximately 1 mG at 50 feet and decreases to about 0.4 mG at 100 feet. At 150 feet, the magnetic field falls to approximately 0.2 mG, and it is reduced further to about 0.004 mG at 300 feet. The estimated magnetic field from the proposed line under expected 2015 load conditions would be about 17 mG at 50 feet and would decrease to 7 mG at 100 feet. At 150 feet, the expected magnetic field would be about 3 mG and would drop to 0.8 mG at 300 feet.

Segment 3ET

There is an existing 69 kV single-circuit transmission line along this Segment. The proposed project would replace this line with a 345/161 kV double-circuit transmission line on single-pole structures (see Appendix A, Figure 1, 5). The 161 kV circuit would be operated at 69 kV.

There are six residences within 300 feet of the proposed line along this segment. One residence is within 25 feet of the proposed line. One residence is between 101 and 150 feet, and four 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 existing 69 kV line under normal load conditions is approximately 1.7 mG at 25 feet, 1 mG at 50 feet, and about 0.4 mG at 100 feet. At 150 feet, the magnetic field falls to approximately 0.2 mG and is reduced further to about 0.004 mG at 300 feet. The estimated magnetic field from the proposed line under expected 2015 load conditions would be about 28 mG at 25 feet and 17 mG at 50 feet. The magnetic field would decrease to about 7 mG at 100 feet. At 150 feet, the expected magnetic field would be about 3 mG and would drop to 0.8 mG at 300 feet.

Segment 4ET

There is an existing 161 kV single-circuit transmission line along this Segment. The proposed project would replace this line with a 345/161 kV double-circuit transmission line on single-pole structures (see Appendix A, Figure 1, 5).

There are two residences within 300 feet of the proposed line. Both 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 existing 161 kV line under normal load conditions is approximately 4.5 mG at 50 feet and decreases to 1 mG at 100 feet. At 150 feet, the magnetic field falls to approximately 0.6 mG, and it is reduced to about 0.2 mG at 300 feet. The estimated magnetic field from the proposed line under expected 2015 load conditions would be about 15 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 0.8 mG at 300 feet.

South of STH 54

From the southern end of Segment 4ET just south of STH 54, this route alternative would use Segments 17A, 17B, and 18A through 18H to reach the proposed substation. See the Arcadia Route EMF discussion (Section 10.4.5 in Chapter 10) for information about these segments.

11.4.6. High-voltage impact fees

State statutes require compensation to 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 each of those political subdivisions. 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 can range from thousands to tens of thousands of dollars, which would be a positive impact to the community. The Ettrick Connector segments are all located in Trempealeau County in the towns of Trempealeau and Gale. They would replace segments located in the

towns of Trempealeau and Gale and the city of Galesville, with more of the Ettrick Connector line located in the town of Gale than in Trempealeau, and none of the Connector located in the city of Galesville. Comparing the Ettrick Connector as part of the Arcadia Route to the estimated impact fees due to municipalities in Table 10.4.1 for the proposed Arcadia Route, the town of Gale would see higher payments if the Connector were used, while the town of Trempealeau would see lower payments and the city of Galesville would see no payment.

11.4.7. Public lands

Public lands crossed by the utility-proposed Arcadia Route are discussed in Chapter 10, Section 10.4.7. The Connector itself does not appear to cross any public lands.

11.4.8. Highway concerns

Although the Arcadia Route could require construction activities in the ROWs of several state or federal highways, the Ettrick Connector itself would not run along or share ROW with any state or federal highways. There are two highway crossings on the Ettrick Connector. Segment 3ET crosses the ROW of USH 53 near CTH TT, and Segment 4ET crosses STH 54 near the segment's eastern connection with the Arcadia Route north of the Black River.

At these crossings, the project would require WisDOT safety analyses and permits in order for construction activities in the highway ROW to occur. 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 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.

11.4.9. Land use compatibility

Most areas along the Ettrick Connector Route 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 due to 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 85 percent of the route uses existing corridors.

The route predominantly crosses farmland with scattered single-family homes as it mainly follows existing transmission line ROWs. The Trempealeau County comprehensive plan designates much of this land as agricultural districts, which also allow for the preservation of woodlands, wetlands, natural areas, and the rural atmosphere of the townships.

As it heads east from its western connection with the proposed Arcadia Route, the Ettrick Connector follows an existing 69 kV ROW, deviating from the ROW for 2.1 miles to avoid passing close to several homes. Further east, it rejoins the 69 kV ROW before crossing the Gale-Ettrick-Trempealeau School District's school forest located near the northeast corner of the town of Gale. About 1.0 mile southwest of the village of Ettrick, the route leaves the 69 kV ROW to follow an existing 161 kV ROW to the southern connection with the proposed Arcadia Route north of the Black River.

11.4.10. Residences

Three homes are within 100 feet of the route centerline, with another three homes between 100 and 150 feet from the centerline. Table 11.4-1 shows numbers of residences within increasing distances from the proposed transmission centerline.

Table 11.4-1 Residences within 300 feet of the Etrick Connector

SEGMENT	0'-25'	26'-50'	51'-100'	101'-150'	151'-300'
	From Route Centerline				
11G1			2	1	2
1ET			1	1	1
2ET					1
3ET				1	4
4ET					2
Total		0	3	3	10

11.5. STAGING AND ACCESS

11.5.1. 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 have 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 archeological 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-foot-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 6 is a 13-acre cropland parcel located along Segment 17A, near its junction with Segment 13E. The site lies about 0.5 miles north of the Black River, between CTH AA and Segment 17A, in the town of Gale. Several homes lie north and south of the site, along CTH AA. Trees south of the site provide some screening for homes in that direction.
- Staging Area 8 is a 16-acre parcel located on the west side of STH 93, about 2.5 miles south of the city of Arcadia, in the town of Arcadia. The site is located in a gravel quarry surrounded by wooded land.

The applicants 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.

11.5.2. 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 Ettrick option would require 26 off-ROW construction access paths totaling 5.8 miles in length and 11.3 acres in area. These paths range in length from 70 to 7,140 feet. These paths would require the clearing of 4.2 acres of forest and would include 2.4 acres of cropland and 3.4 acres of grassland.