

**APPENDIX G**  
**SUMMARY OF APPLICATION FACTORS**

## **Appendix G.1**

### **Supplemental Information to Section 4.3**

### ***Supplement to Section 4.3.1 Alternative Route 1***

Alternative Route 1 and the Proposed Route share the same route for the first 1,701 feet of the Proposed Route (*see Figure F-1, Appendix F*). At this point Alternative Route 1 deviates from the Proposed Route on a more westerly course for approximately 550 feet to existing Structure 077 of Line 0831.

Alternative Route 1 is within or adjacent to the existing rights-of-way of transportation (railroad and highway) and utilities for approximately 38 percent of the length of this route. Approximately 38 percent of Alternative Route 1 is within the Orono Substation Site with the remainder of the route (24 percent) taking a direct route across HFA land to existing Line 0831 and Structure 077. Approximately 90 percent of the route crosses undeveloped, open land and approximately 10 percent of the route crosses forest land (see Section 6.3). The route crosses land zoned primarily for residential purposes (see Section 6.2.2). One residence is located within 200 feet of the Alternative Route 1 centerline. Cultural resource site information is the same as that for the Proposed Route (i.e., 34 sites are located within one mile, as described above) (see also Section 6.4). Alternative Route 1 does not cross any PWI watercourses. However, Alternate Route 1 spans approximately 1,840 feet of PWI wetland (see Section 6.5.4).

Alternative Route 1 is not preferable to the Proposed Route because it will not fulfill one main objective of the Project, that being to minimize impacts to residences. As discussed in Section 4.2.2, Xcel Energy is working with the two landowners whose properties are currently crossed by existing Line 0831 to remove the Line 0831 from the properties and move the line north of their respective property lines onto adjacent HFA property. Alternative Route 1 also requires the clearing of some mature trees through the middle of one of the residential lots for right-of-way purposes.

### ***Supplement to Section 4.3.2 Alternative Route 2***

Alternative Route 2 utilizes the portion of the Proposed Route (866 feet) prior to the Proposed Route turning westerly at the BNSF railroad right-of-way (*see Figure F-1, Appendix F*). At this point Alternative Route 2 continues north an approximate 326 feet and crosses the BNSF railroad, a Metropolitan Council sewer line, U.S. Highway 12 and an existing Xcel Energy distribution line. Upon exiting U.S. Highway 12 right-of-way, Alternative Route 2 enters the Three Rivers Park District's Baker Park Reserve. From here Alternative Route 2 continues westerly approximately 974 feet across Baker Park Reserve property connecting to existing Xcel Energy 115 kV transmission Line 0831 (*see Figure F-1*). The existing tower (Structure 076) located at this connection point lies within 30 feet of a paved bike path within Baker Park Reserve. Alternative Route 2 was rejected due to the number of transportation crossings (e.g. the BNSF railroad, U.S. Highway 12), the location of an existing Metropolitan Council sewer line located between the railroad and highway, and potential disruption to the bike path and impact to Baker Park Reserve property (see **Figure B.7 in Appendix B**). In comparison, the Proposed Route does not cross the BNSF railroad, the Metropolitan Council sewer line, U.S. Highway 12, or enter the Baker Park Reserve property. Although Structure 076 lies within Baker Park Reserve and will be replaced as part of the Project, the Proposed Route for the new transmission line is proposed to be placed within Baker Park Reserve.

Alternative Route 2 is within or adjacent to the existing rights-of-way of transportation (railroad and highway) and utilities for approximately 45 percent of the length of the route, with the remainder of

the route paralleling property lines. Approximately 15 percent of the route crosses undeveloped, open land and approximately 40 percent of the route crosses forest land (see Section 6.3). The route crosses land zoned primarily for residential purposes (see Section 6.2.2), although nearly half of this route is within the Baker Park Reserve. No residences are located within 200 feet of the Alternative Route 2 centerline. Cultural resource site information is the same as that for the Proposed Route (i.e., 34 sites located within one mile, as described above) (see also Section 6.4). Alternative Route 2 does not cross any PWI watercourses. However, Alternative Route 2 spans approximately 1,755 feet of PWI wetland (see Section 6.5.4).

Alternative Route 2 follows utility, road, and railroad corridors for 45 percent of the route, compared to a greater percentage (57 percent) associated with the Proposed Route. Alternative Route 2 is not preferable to the Proposed Route because it does not fulfill two main objectives of the Project, those being: i) maximizing the use of existing transportation rights-of-way and transmission line alignments; and ii) minimizing the impacts to Baker Park Reserve, when compared to the Proposed Route.

### ***Supplement to Section 4.3.3 Alternative Route 3***

Alternative Route 3 and the Proposed Route share the same route from the point the routes leave the proposed substation expansion to approximately 1,000 feet west of the point both routes turn westerly along the BNSF railroad right-of-way (see **Figure F-1, Appendix F**). At this location Alternative Route 3 extends both to the north and to the west to make connections with Xcel Energy's existing 115 kV transmission Line 0831. The northerly connection includes a 329 foot span across the BNSF railroad, the Metropolitan Council sewer line, U.S. Highway 12, and enters into Baker Park Reserve property making the northern connection to transmission Line 0831 at existing Structure 076. Similar to the Proposed Route, this northern connection would require that existing Structure 076 be replaced by a steel single pole. The westerly connection of Alternative Route 3, south of the BNSF railroad and U.S. Highway 12, spans across HFA land, and spans a residential lot for approximately 384 feet to connect to Xcel Energy's existing 115 kV transmission Line 0831 at Structure 077. The existing 115 kV line between the two connection points that spans the BNSF railroad, the Metropolitan Council sewer line and U.S. Highway 12 in Alternative Route 3 would be removed from service. However, a new span for the northern connection to Line 0831 would cross over the BNSF railroad, the Metropolitan Council sewer line and U.S. Highway 12.

Alternative Route 3 is within or adjacent to the existing rights-of-way of the transportation (railroad and highway) for approximately 43 percent of the length of the route compared to a greater percentage (57 percent) associated with the Proposed Route. Approximately 77 percent of the route crosses undeveloped open land, as opposed to 86 percent for the Proposed Route, and approximately one percent of the route crosses forest land (see Section 6.3). The route crosses land zoned primarily for residential purposes (see Section 6.2.2). One residence is located within 200 feet of the Alternative Route 3 centerline. Cultural resource site information is the same as that for the Proposed Route (i.e., 34 sites located within one mile, as described above) (see also Section 6.4). Alternative Route 3 does not cross any PWI watercourses. However, Alternate Route 3 spans approximately 2,168 feet of PWI wetland (see Section 6.5.4).

Alternative Route 3 is not preferable to the Proposed Route because it does not fulfill one main objective of the Project, that being minimize to impacts to residences. As discussed in section 4.2.2 Xcel Energy is working with two residential landowners to remove the existing 115 kV transmission

line from their residential lots within the HFA and move it north onto HFA land. Alternative Route 3 also requires the clearing of some mature trees through the middle of one of the residential lots for right-of-way purposes.

#### ***Supplement to Section 4.3.4 Alternative Route 4***

Alternative Route 4 was evaluated for the potential to parallel the existing GRE 69 kV transmission Line BD right-of-way (see **Figure F-1, Appendix F**). Alternative Route 4 exits the proposed substation expansion area northeasterly for approximately 100 feet over Xcel Energy property before turning southeasterly for an additional approximate 160 feet. Alternative Route 4 then parallels the GRE Line BD for approximately 3,130 of the route. Alternative Route 4 would continue east for approximately 607 feet prior to turning north. Upon turning north Alternative Route 4 would continue to follow the GRE Line BD north for approximately 2,523 feet leaving Xcel Energy's property and crossing over the BNSF railroad, the Metropolitan Council sewer line, U.S. Highway 12 and entering Barker Park Reserve. At this point the GRE Line BD turns east. Alternative Route 4 would continue north for approximately 350 feet across the Baker Park Reserve requiring new right-of-way that would not be co-located with other utility rights-of-way. Alternative Route 4 is the longest of the four routes evaluated for the Project.

Alternative Route 4 is within or adjacent to the existing GRE 69 kV Line BD right-of-way for approximately 84 percent of the length of the route, with the remainder of the route within Xcel Energy property and Baker Park Reserve lands. Approximately 99 percent of the route crosses undeveloped, open land and approximately one percent of the route crosses forest land (see Section 6.3). The route crosses land zoned primarily for residential purposes (see Section 6.2.2), although approximately 32 percent of this Alternative Route is within the Baker Park Reserve. All but 300 feet of the route is within the City of Orono municipal boundaries. The remaining 300 feet is within the municipal boundaries of the City of Medina. No residences are located within 200 feet of the Alternative Route 4 centerline. Two improved paths within the Baker Park Reserve are crossed by this alternative route. Cultural resource site information is the same as that for the Proposed Route (i.e., 34 sites located within one mile, as described above) (see also Section 6.4). Alternate Route 4 does not cross any PWI watercourses, however, Alternate Route 4 spans approximately 3,480 feet of PWI wetland (see Section 6.5.4).

Alternative Route 4 is not preferable to the Proposed Route because it will not fulfill two main objectives of the Project, those being: i) minimizing impacts to environmental and sensitive resources; and ii) minimizing the impacts to Baker Park Reserve, when compared to the Proposed Route. Additionally, Alternative Route 4 requires crossing the BNSF railroad, the Metropolitan Council sewer line and U.S. Highway 12 unlike the Proposed Route.

**Appendix G.2**  
**Detailed Description of Alternative Routes**

**TABLE G.1 Detailed Description of Alternative Routes**

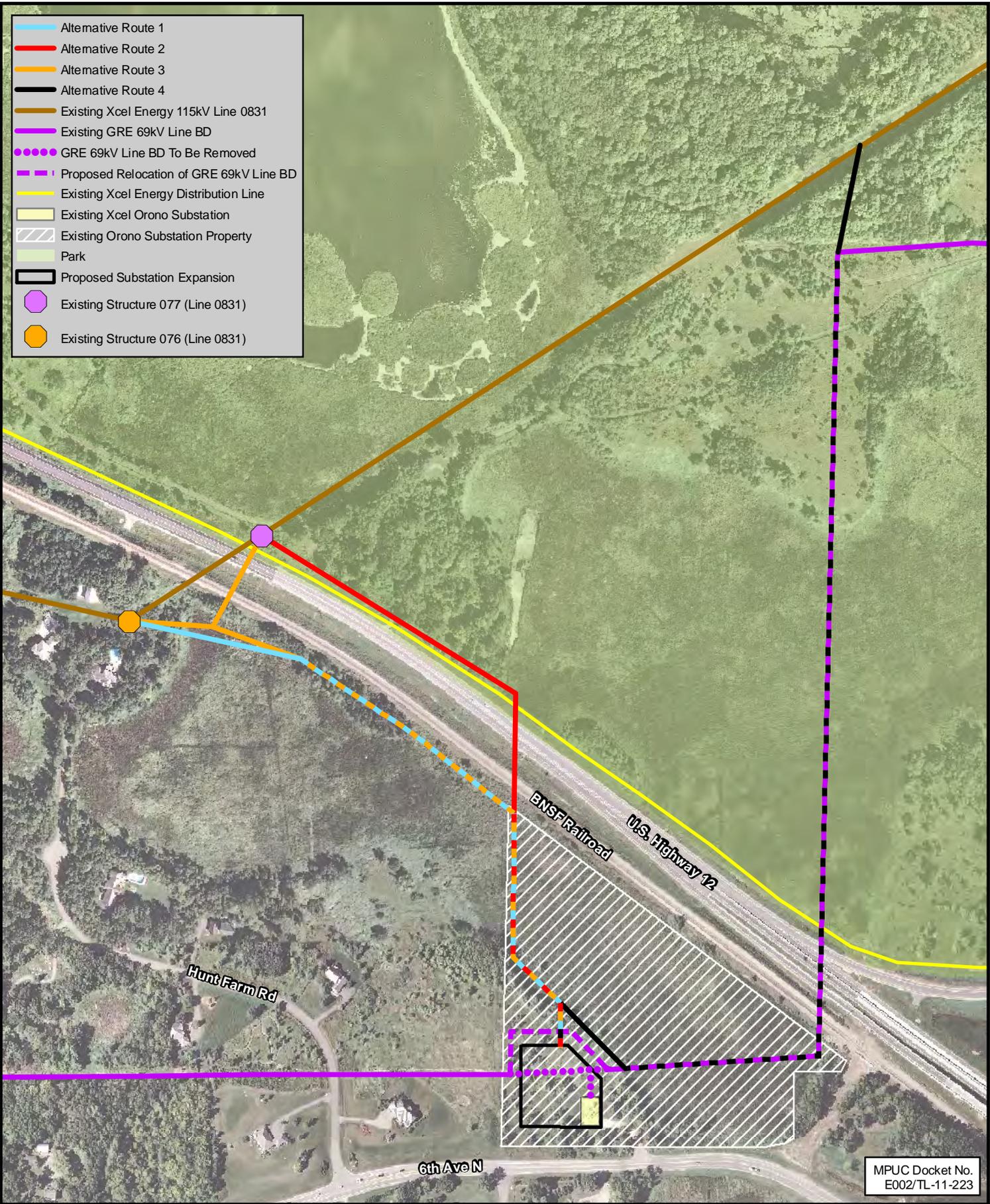
Route	Distance	Transportation Corridor and Public Waters Crossing
<b>Alternative Route 1: Orono Substation to Existing 115 kV Line 0831 south of U.S. Highway 12 (1,950 feet west of Orono Substation)</b>		
Northeast out of substation on Xcel Energy Property	100 feet	No features crossed
Northwest to Xcel Energy's west property line	311 feet	No features crossed
North along Xcel Energy's west property line to BNSF right-of-way	455	Unnamed Wetland
Northwest along BNSF right-of-way and within HFA property	835	Unnamed Wetland
Westerly across HFA property	550	Unnamed Wetland
<b>Total Length</b>	<b>2,251</b>	
<b>Alternate Route 2: Orono Substation to Existing Xcel Energy 115 kV Line 0831 north of U.S. Highway 12 (1,970 feet west of Orono Substation)</b>		
Northeast out of substation on Xcel Energy Property	100 feet	No features crossed
Northwest to Xcel Energy's west property line	311 feet	No features crossed
North to Baker Park Reserve	781 feet	U.S. Highway 12 BNSF Railroad Unnamed Wetland
Northwesterly across Baker Park Reserve	974 feet	Unnamed Wetland
<b>Total Length</b>	<b>2,166 feet</b>	
<b>Alternative Route 3: Orono Substation to Existing 115 kV Line 0831 north and south of U.S. Highway 12 (1,950 feet west of Orono Substation)</b>		
Northeast out of substation on Xcel Energy Property	100 feet	No features crossed
Northwest to Xcel Energy's west property line	311 feet	No features crossed
North along Xcel Energy's west property line to BNSF ROW	455 feet	Unnamed Wetland
Northwest paralleling BNSF right-of-way and Across private lands	1,000 feet	Unnamed Wetland
North to Xcel Energy's existing Structure 076 of Line 0831 and west to Xcel Energy's existing Structure 077 of Line 0831	713	U.S. Highway 12 BNSF Railroad Unnamed Wetland
<b>Total Length</b>	<b>2,579 feet</b>	
<b>Alternative Route 4: Orono Substation to Existing 115 kV Line 0831 north of U.S. Highway 12 (3,170 feet north of Orono Substation)</b>		

**TABLE G.1 Detailed Description of Alternative Routes**

<b>Route</b>	<b>Distance</b>	<b>Transportation Corridor and Public Waters Crossing</b>
Northeast out of substation on Xcel Energy Property	100 feet	No features crossed
Southeast on Xcel Energy Property	162 feet	No features crossed
East on Xcel Energy Property	607 feet	Unnamed Wetland
North across Baker Park Reserve to Xcel Energy's 115 kV transmission line	2,873 feet	U.S. Highway 12 BNSF Railroad Two Baker Park Reserve Paved Trails Unnamed Wetland
<b>Total Length</b>	<b>3,742 feet</b>	

## **Appendix G.3**

### **Figure G.1 - Alternative Routes**



MPUC Docket No.  
E002/TL-11-223



400  
Feet



Aerial Image Source:  
Aerial Express ECW Image  
dated Sept. 15, 2009



FIGURE G-1  
ORONO SUBSTATION REPLACEMENT AND NEW  
115 KV TRANSMISSION LINE PROJECT  
ALTERNATIVE ROUTES  
ORONO, MINNESOTA

DRN BY: TS	DATE: 3/7/11	PROJECT NO. 31810889	FIG. NO. G-1
CHK'D BY: DD	DATE: 3/7/11		

**Appendix G.4**  
**Comparison of Proposed and Alternative Routes**

## Appendix G.4: Comparison of Proposed and Alternative Routes

This table summarizes Xcel Energy's Application of the factors set forth in Minn. R. 7850.4100 for the Proposed and Alternate Routes.

Table G.2 Comparison of Proposed and Alternative Routes						
Issue	Proposed Route	Alternative Route 1	Alternative Route 2	Alternative Route 3	Alternative Route 4	Comparison of Routes
<b>Effects on Human Settlement</b>						
Structures within 200 feet of the route centerline	0	2	0	2	0	Similar impact – features will be avoided
Displacement	Proposed Route removes existing transmission facilities from two residential properties	No impact	No impact	No impact	No impact	Less impact on two residential properties with Proposed Route
Noise	No impact	No impact	No impact	No impact	No impact	Similar impact – none
Aesthetics	Viewshed will include transmission lines and poles	Viewshed will include transmission lines and poles	Viewshed will include transmission lines and poles	Viewshed will include transmission lines and poles	Viewshed will include transmission lines and poles	Alternate Routes 2, 3 and 4 will require transmission line and poles to be placed in Baker Park Reserve
Cultural Values	No impact	No impact	No impact	No impact	No impact	Similar impact – none
Recreation	No impact	No Impact	Transmission lines and poles will be placed within Baker Park Reserve	Transmission lines and poles will be placed within Baker Park Reserve	Transmission lines and poles will be placed within Baker Park Reserve	The Proposed Route does not require the transmission line be placed in Baker Park Reserve
Public Services	No impact	No impact	No impact	No impact	No impact	Similar impact – none
<b>Effects on Public Health and Safety</b>						
Public Health and Safety	No impact from noise or EMF	No impact from noise or EMF	No impact from noise or EMF	No impact from noise or EMF	No impact from noise or EMF	Similar impact – none



**Table G.2 Comparison of Proposed and Alternative Routes**

Issue	Proposed Route	Alternative Route 1	Alternative Route 2	Alternative Route 3	Alternative Route 4	Comparison of Routes
Flora	No State Listed Threatened or Endangered Flora within one mile of Project	No State Listed Threatened or Endangered Flora within one mile of Project	No State Listed Threatened or Endangered Flora within one mile of Project	No State Listed Threatened or Endangered Flora within one mile of Project	No State Listed Threatened or Endangered Flora within one mile of Project	Similar impact - None
Fauna	Trumpeter Swan (State Status of Threatened) was listed within one mile of the Project	Trumpeter Swan (State Status of Threatened) was listed within one mile of the Project	Trumpeter Swan (State Status of Threatened) was listed within one mile of the Project	Trumpeter Swan (State Status of Threatened) was listed within one mile of the Project	Trumpeter Swan (State Status of Threatened) was listed within one mile of the Project	Similar impact
Rare and Unique Natural Resources	Trumpeter Swan (State Status of Threatened) was listed within one mile of the Project	Trumpeter Swan (State Status of Threatened) was listed within one mile of the Project	Trumpeter Swan (State Status of Threatened) was listed within one mile of the Project	Trumpeter Swan (State Status of Threatened) was listed within one mile of the Project	Trumpeter Swan (State Status of Threatened) was listed within one mile of the Project	Similar impact
<b>Use of Existing Transportation, Pipeline, and Electrical Transmission Systems or Rights-of-Way</b>						
Existing Transportation, Pipeline, and Electrical Transmission Systems or Rights-of-Way	Approximately 1,795 feet, or 57 percent of route	Approximately 835 feet, or 38 percent of route	Approximately 974 feet, or 45 percent of route	Approximately 3,480 feet, or 93 percent of route; however, crosses Baker Park Reserve	Approximately 3,480 feet, or 93 percent of route	The Proposed Route will abut a greater percent of existing utility or transportation rights-of-way than Alt. Routes 1, 2 and 3. Alt. Route 4 abuts a greater amount of utility right-of-way; however, it is located in Baker Park Reserve.

**Table G.2 Comparison of Proposed and Alternative Routes**

<b>Issue</b>	<b>Proposed Route</b>	<b>Alternative Route 1</b>	<b>Alternative Route 2</b>	<b>Alternative Route 3</b>	<b>Alternative Route 4</b>	<b>Comparison of Routes</b>
<b>Electrical System Reliability</b>						
Electrical System Reliability	Provides reliability to system	Similar benefits				
<b>Cost of Constructing, Operating, and Maintaining the Facility That are Dependent on Design and Route</b>						
Costs	\$1,200,00.00					
<b>Adverse Human and Natural Environmental Effects That Cannot Be Avoided</b>						
General	Pole placement, potentially resulting in wetland impacts; potential need for tree removal	Pole placement, potentially resulting in wetland impacts; potential need for tree removal	Pole placement, potentially resulting in wetland impacts; potential need for tree removal	Pole placement, potentially resulting in wetland impacts; potential need for tree removal	Pole placement, potentially resulting in wetland impacts; potential need for tree removal	Similar impacts
<b>Irreversible and Irretrievable Commitments of Resources</b>						
General	Pole placement, potentially resulting in wetland impacts; potential need for tree removal	Pole placement, potentially resulting in wetland impacts; potential need for tree removal	Pole placement, potentially resulting in wetland impacts; potential need for tree removal	Pole placement, potentially resulting in wetland impacts; potential need for tree removal	Pole placement, potentially resulting in wetland impacts; potential need for tree removal	Similar impacts