

# **Appendix D**

## **Alternate Segment Analysis**

## APPENDIX D

### COMPARISON OF KEY ENVIRONMENTAL FACTORS FOR THE ALTERNATE SEGMENTS AND THE CORRESPONDING PORTION OF THE PROPOSED ROUTE

As described in Section 3.3 of the Route Permit application (Application), Big Bend analyzed three route alternate segments to the Proposed Route for which Big Bend continues to coordinate with landowners. All three alternate route segments are located in Watonwan County. An analysis of each Alternate Segment to its comparative segment on the Proposed Route, is included below along with detailed mapping. The Alternate Route Segments are also depicted on figures throughout the Application for comparison and reference. For each Alternate Route Segment, the comparative segment along the Proposed Route has signed a voluntary transmission easement with Big Bend. However, based on coordination with signed landowners, Big Bend continues its commitment to seek easements for the Alternate Segments.

#### **Alternate Red**

The Alternate Red Segment begins at the intersection of 610<sup>th</sup> Avenue and County State Aid Highway (CSAH) 10 on the border of Cottonwood and Watonwan Counties. The Alternate Red Segment follows the north side of CSAH 10 for 0.25 mile before turning south through agricultural field edge for half mile. The Alternate Red Segment then turns east for 0.7-mile to the west side of CSAH 2 and travels south paralleling CSAH 2 for one mile before rejoining the Proposed Route.

The Alternate Red Segment is approximately 2.5 miles in length, approximately 0.15 miles longer than the comparative segment on the Proposed Route. The Alternate Red Segment would have more of its length collocated with roads and is routed further from the Watonwan River. However, there is a 160-acre parcel currently under lease with another developer along one mile of this segment.

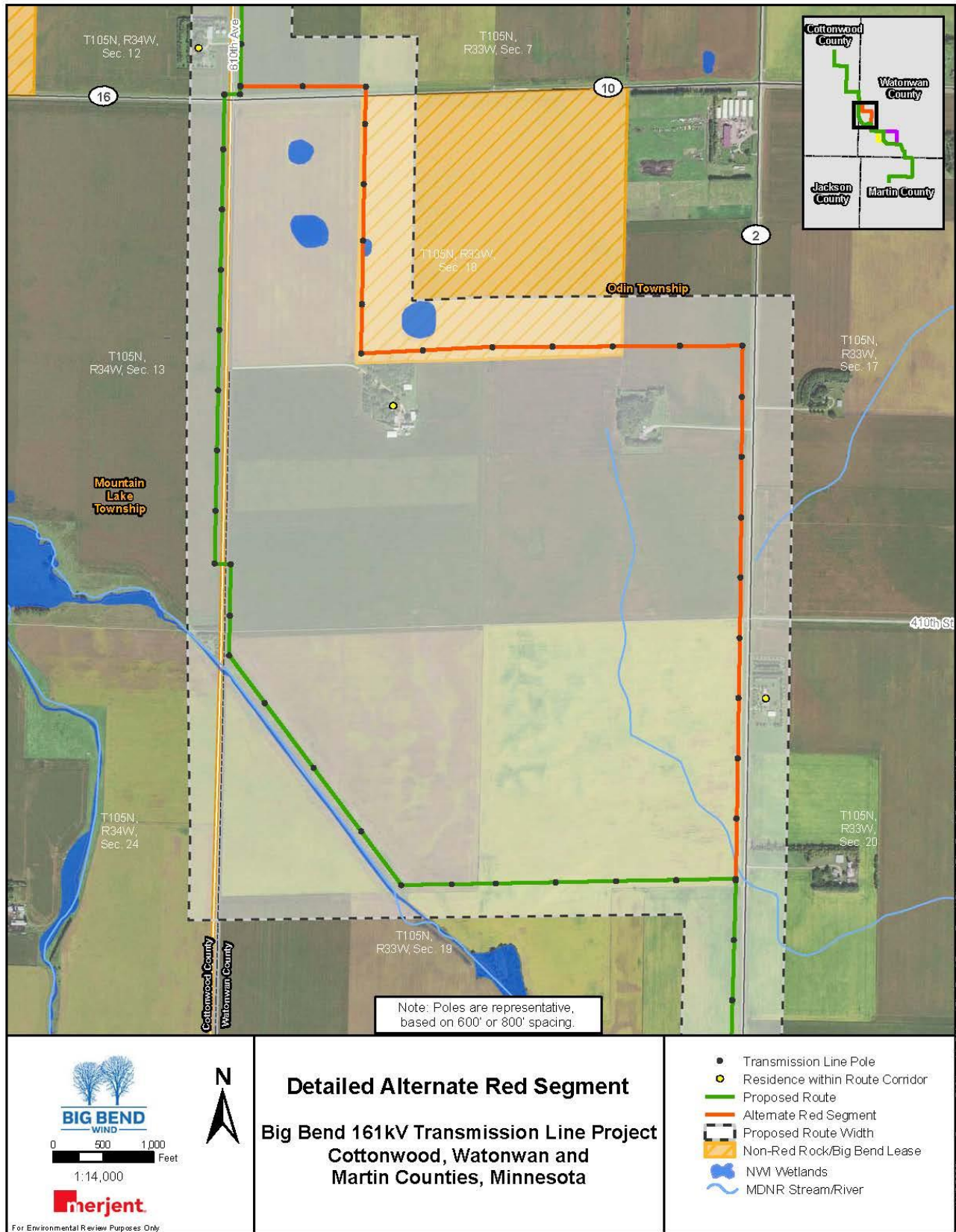
Due to its shorter length, the comparative segment on the Proposed Route crosses fewer acres of cultivated crop land and prime farmland. The Alternate Red segment is within 151 to 300 feet of one residence, while the Proposed Route is not within 500 feet of residences.

The Alternate Red segment crosses one unnamed stream, which is a Minnesota Department of Natural Resources (MNDNR)-designated Public Water Inventory (PWI) waterbody, while the comparative segment of the Proposed Route does not cross waterbodies. In addition, the Alternate Red segment crosses National Wetland Inventory (NWI)-mapped wetlands while the comparative segment of the Proposed Route avoid wetlands. However, the comparative segment of the Proposed Route crosses a Federal Emergency Management Agency (FEMA)-designated 100-year flood zone while the Alternate Red segment avoids flood zones. Neither of the segment alternatives cross designated Sites of Biodiversity Significance (SOBs), other designated lands, or conservation easements.

A comparison of the Alternate Red Segment and the corresponding segment of the Proposed Route is presented in Table 1 below. A figure depicting the Alternate Red Segment and the corresponding segment of the Proposed Route follows the table.

<b>Table 1 Comparison of Key Factors of the Alternate Red Segment and the Corresponding Portion of the Proposed Route</b>		
<b>Environmental Features</b>	<b>Alternate Red Segment</b>	<b>Proposed Route</b>
<b>General</b>		
Length (miles)	2.5	2.3
Right-of-Way (acres)	37.5	34.8
<b>Corridor Sharing</b>		
Paralleling Existing Transmission Line (miles)	--	--
Roads and Railroads (miles)	1.3	0.6
Property and Field Lines (miles)	1.0	0.9
No Linear Feature Sharing (miles)	0.2	0.8
Total Linear Feature Sharing (miles)	2.3	1.5
Total Linear Feature Sharing (percent)	92.0%	65.2%
<b>Proximity to Residences</b>		
Number of Residences 0 to 75 feet from Route Segment	--	--
Number of Residences 76 to 150 feet from Route Segment	--	--
Number of Residences 151 to 300 feet from Route Segment	1	--
Number of Residences 301 to 500 feet from Route Segment	--	--
Total Number of Residences within 500 feet of Route Segment	1	--
<b>Agricultural Impacts</b>		
Number of Structures in Cultivated Crop Land (estimated)	23	24
<b>Prime Farmland</b>		
Total All Categories of Prime Farmland Within the Right-of-Way (acres/percent)	37.5 / 100%	34.8 / 100%
Farmland of State Importance Within the Right-of-Way (acres/percent)	--	--
<b>Land Cover (NLCD, 2016)</b>		
Cultivated Crop Land Within Right-of-Way (acres/percent)	32.1 / 85.8%	29.6 / 85.1%
Hay/Pasture Land Within Right-of-Way (acres/percent)	--	--
Emergent Herbaceous Wetlands Within the Right-of-Way (acres/percent)	0.2 / 0.6%	--
Deciduous/Mixed Forest (acres/percent)	--	--
Herbaceous Land Within the Right-of-Way (acres/percent)	--	--
Developed Areas Within the Right-of-Way (acres/percent)	5.1 / 13.6%	5.2 / 14.9%
<b>Wetlands (NWI)</b>		
Total Wetlands Within the Right-of-Way (acres/percent)	0.2 / 0.5%	--
Non-Forested Wetlands Within the Right-of-Way (acres/percent)	0.2 / 0.5%	--
Forested Wetlands Within the Right-of-Way (acres/percent)	--	--
Number of Poles in Wetlands (estimated)	N/A	N/A
<b>PWI Waters</b>		
Number of Stream and River Crossings by Right-of-Way	1	--
Number or PWI Stream Crossings by Right-of-Way	1	--
<b>FEMA-designated Flood Zones</b>		
Total FEMA-designated 100-year floodplains (acres/percent)	--	11.7 / 33.6%

<b>Table 1 Comparison of Key Factors of the Alternate Red Segment and the Corresponding Portion of the Proposed Route</b>		
<b>Environmental Features</b>	<b>Alternate Red Segment</b>	<b>Proposed Route</b>
Number of Poles in FEMA-designated 100-year floodplains (estimated)	N/A	5
<b>Cultural Resources</b>		
Total Number of Previously Recorded Archaeological Sites and/or Historic Architectural Resources Within Route	--	--
Total Number of Previously Recorded Archaeological Sites and/or Historic Architectural Resources Within 1 mile of Route	--	1



**Alternate Yellow**

The Alternate Yellow Segment begins at the intersection of 420th Street and a township minimum maintenance road that runs north to south along the half-section line between CSAH 2 and County Road 128. The Alternate Yellow Segment follows the township road south for three-quarters of a mile before turning east and following a parcel line/field edge half mile east to Country Road 128 and the Proposed Route. The Alternate Yellow Segment is the same length as its comparative segment on the Proposed Route.

The residence on the west side of County Road 128 along the Proposed Route has signed a voluntary easement for the transmission line. However, the landowner is concerned about aesthetics. The Alternate Yellow Segment would cross the property on the west side of the residence, which has existing vegetative screening (i.e., trees). Lastly, the Alternate Yellow Segment crosses fewer parcels than the comparative segment on the Proposed Route (one instead of two).

The comparative segment on the Proposed Route and the Alternate Yellow segment are the same length and both segment alternatives are co-located with linear features for the entirety of their lengths. However, the Alternate Yellow segment crosses fewer acres of cultivated crop land and prime farmland. Neither of the segment alternatives is within 500 feet of residences.

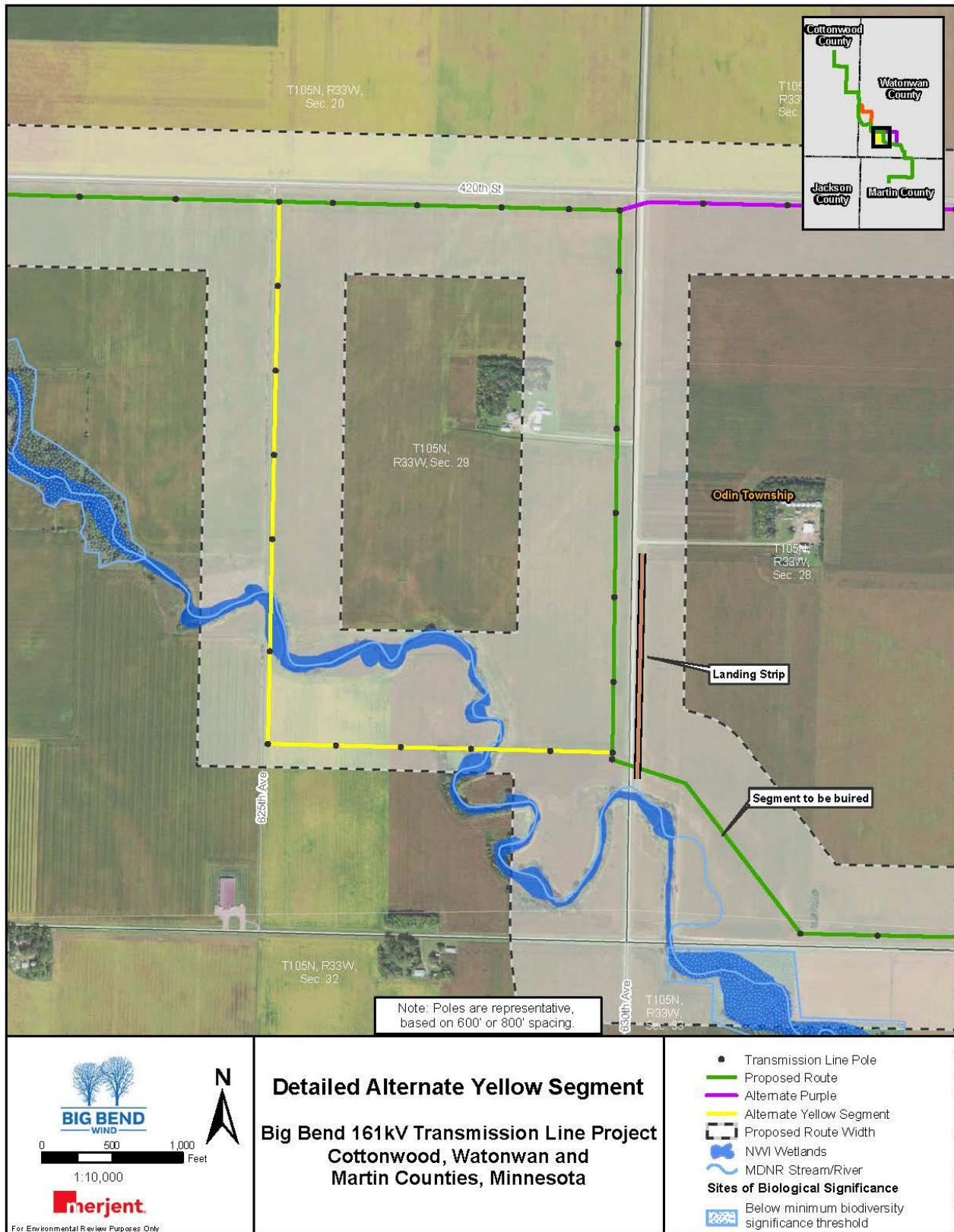
The Alternate Yellow segment crosses the South Fork of the Watonwan River twice, which is a MNDNR-designated PWI waterbody, while the comparative segment of the Proposed Route does not cross waterbodies. In addition, Alternate Yellow segment crosses NWI-mapped wetlands and a FEMA-designated 100-year flood zone while the comparative segment of the Proposed Route avoids these features. Neither of the segment alternatives cross designated SOBs, other designated lands, or conservation easements.

A comparison of the Alternate Yellow Segment and the corresponding segment of the Proposed Route is presented in Table 2 below. A figure depicting the Alternate Yellow Segment and the corresponding segment of the Proposed Route follows the table.

<b>Table 2 Comparison of Key Factors of the Alternate Yellow Segment and the Corresponding Portion of the Proposed Route</b>		
<b>Environmental Features</b>	<b>Alternate Yellow Segment</b>	<b>Proposed Route</b>
<b>General</b>		
Length (miles)	1.2	1.2
Right-of-Way (acres)	18.8	21.5
<b>Corridor Sharing</b>		
Paralleling Existing Transmission Line (miles)	--	--
Roads and Railroads (miles)	0.7	1.2
Property and Field Lines (miles)	0.5	--
No Linear Feature Sharing (miles)	--	--
Total Linear Feature Sharing (miles)	1.2	1.2
Total Linear Feature Sharing (percent)	100%	100%

<b>Table 2            Comparison of Key Factors of the Alternate Yellow Segment and the Corresponding Portion of the Proposed Route</b>		
<b>Environmental Features</b>	<b>Alternate Yellow Segment</b>	<b>Proposed Route</b>
<b>Proximity to Residences</b>		
Number of Residences 0 to 75 feet from Route Segment	--	--
Number of Residences 76 to 150 feet from Route Segment	--	--
Number of Residences 151 to 300 feet from Route Segment	--	--
Number of Residences 301 to 500 feet from Route Segment	--	--
Total Number of Residences within 500 feet of Route Segment	--	--
<b>Agricultural Impacts</b>		
Number of Structures in Cultivated Crop Land (estimated)	12	13
<b>Prime Farmland</b>		
Total All Categories of Prime Farmland Within the Right-of-Way (acres/percent)	14.9 / 79.3%	21.5 / 100%
Farmland of State Importance Within the Right-of-Way (acres/percent)	0.7 / 3.7%	<0.1 / <0.1%
<b>Land Cover (NLCD, 2016)</b>		
Cultivated Crop Land Within Right-of-Way (acres/percent)	16.5 / 87.5%	21.0 / 97.9%
Hay/Pasture Land Within Right-of-Way (acres/percent)	--	--
Emergent Herbaceous Wetlands Within the Right-of-Way (acres/percent)	--	--
Deciduous/Mixed Forest (acres/percent)	--	--
Herbaceous Land Within the Right-of-Way (acres/percent)	--	--
Developed Areas Within the Right-of-Way (acres/percent)	2.4 / 12.5%	0.4 / 2.1%
<b>Wetlands (NWI)</b>		
Total Wetlands Within the Right-of-Way (acres/percent)	1.3 / 6.9%	--
Non-Forested Wetlands Within the Right-of-Way (acres/percent)	1.3 / 6.9%	--
Forested Wetlands Within the Right-of-Way (acres/percent)	--	--
Number of Poles in Wetlands (estimated)	1	N/A
<b>PWI Waters</b>		
Number of Stream and River Crossings by Right-of-Way	1	--
Number or PWI Stream Crossings by Right-of-Way	2	--
<b>FEMA-designated Flood Zones</b>		
Total FEMA-designated 100-year floodplains (acres/percent)	1.5 / 8.0%	--
Number of Poles in FEMA-designated 100-year floodplains (estimated)	1	N/A
<b>Cultural Resources</b>		
Total Number of Previously Recorded Archaeological Sites and/or Historic Architectural Resources Within Route	--	--
Total Number of Previously Recorded Archaeological Sites and/or Historic Architectural Resources Within 1 mile of Route	1	1







**Alternate Purple**

The Alternate Purple Segment begins at the intersection of 420th Street and County Road 128 and follows the south side of 420th east for mile before turning south along a township minimum maintenance road for one mile and rejoining the Proposed Route.

The Alternate Purple Segment addresses the same aesthetic concerns as the Yellow Segment. Additionally, the Alternate Purple Segment would eliminate the need to bury approximately 0.35-mile of the Proposed Route due to an existing landing strip located on the east side of County Road 128, north of the Watonwan River and south of the farmstead driveway. Lastly, the Alternate Purple Segment crosses fewer parcels than the comparative segment of the Proposed Route (three instead of four). The comparative segment on the Proposed Route and the Alternate Purple segment similar in length; however, the Alternate Purple segment is co-located with linear features for the entirety of its length while the comparative segment of the Proposed Route is co-located with linear features for about 79 percent of its length. Neither of the segment alternatives is within 500 feet of residences.

Although the lengths of the segment alternatives are similar, the Alternate Purple segment would affect fewer acres of cultivated crop land and more acres of developed land than the comparative segment of the Proposed Route. However, the Alternate Purple segment crosses more acres of prime farmland than the comparative segment of the Proposed Route. A prime farmland designation is applied based on the soil characteristics in a given area and is not always consistent with how the land is used. In addition, the Alternate Purple segment crosses 0.8 acre of deciduous/mixed forest, while the comparative segment of the Proposed Route avoids forested areas.

Neither of the segment alternatives cross waterbodies, NWI-mapped wetlands, FEMA-designated 100-year flood zones designated SOBs, other designated lands, or conservation easements.

A comparison of the Alternate Purple Segment and the corresponding segment of the Proposed Route is presented in Table 3 below. A figure depicting the Alternate Purple Segment and the corresponding segment of the Proposed Route follows the table.

<b>Table 3 Comparison of Key Factors of the Alternate Purple Segment and the Corresponding Portion of the Proposed Route</b>		
<b>Environmental Features</b>	<b>Alternate Purple Segment</b>	<b>Proposed Route</b>
<b>General</b>		
Length (miles)	2.0	1.9
Right-of-Way (acres)	36.8	32.2
<b>Corridor Sharing</b>		
Paralleling Existing Transmission Line (miles)	--	--
Roads and Railroads (miles)	2.0	1.5
Property and Field Lines (miles)	--	--
No Linear Feature Sharing (miles)	--	0.4
Total Linear Feature Sharing (miles)	2.0	1.5
Total Linear Feature Sharing (percent)	100%	78.9%

<b>Table 3            Comparison of Key Factors of the Alternate Purple Segment and the Corresponding Portion of the Proposed Route</b>		
<b>Environmental Features</b>	<b>Alternate Purple Segment</b>	<b>Proposed Route</b>
<b>Proximity to Residences</b>		
Number of Residences 0 to 75 feet from Route Segment	--	--
Number of Residences 76 to 150 feet from Route Segment	--	--
Number of Residences 151 to 300 feet from Route Segment	--	--
Number of Residences 301 to 500 feet from Route Segment	--	--
Total Number of Residences within 500 feet of Route Segment	--	--
<b>Agricultural Impacts</b>		
Number of Structures in Cultivated Crop Land (estimated)	19	19
<b>Prime Farmland</b>		
Total All Categories of Prime Farmland Within the Right-of-Way (acres/percent)	36.8 / 100%	29.9 / 93.0%
Farmland of State Importance Within the Right-of-Way (acres/percent)	--	2.2 / 7.0%
<b>Land Cover (NLCD, 2016)</b>		
Cultivated Crop Land Within Right-of-Way (acres/percent)	22.4 / 61.0%	28.7 / 89.1%
Hay/Pasture Land Within Right-of-Way (acres/percent)	--	--
Emergent Herbaceous Wetlands Within the Right-of-Way (acres/percent)	--	--
Deciduous/Mixed Forest (acres/percent)	0.8 / 2.3%	--
Herbaceous Land Within the Right-of-Way (acres/percent)	--	--
Developed Areas Within the Right-of-Way (acres/percent)	13.5 / 36.8%	3.5 / 10.9%
<b>Wetlands (NWI)</b>		
Total Wetlands Within the Right-of-Way (acres/percent)	--	--
Non-Forested Wetlands Within the Right-of-Way (acres/percent)	--	--
Forested Wetlands Within the Right-of-Way (acres/percent)	--	--
Number of Poles in Wetlands (estimated)	N/A	N/A
<b>PWI Waters</b>		
Number of Stream and River Crossings by Right-of-Way	--	--
Number or PWI Stream Crossings by Right-of-Way	--	--
<b>FEMA-designated Flood Zones</b>		
Total FEMA-designated 100-year floodplains (acres/percent)	--	--
Number of Poles in FEMA-designated 100-year floodplains (estimated)	N/A	N/A
<b>Cultural Resources</b>		
Total Number of Previously Recorded Archaeological Sites and/or Historic Architectural Resources Within Route	--	--
Total Number of Previously Recorded Archaeological Sites and/or Historic Architectural Resources Within 1 mile of Route	2	1

