



WBI ENERGY TRANSMISSION, INC.

Wahpeton Expansion Project

**Resource Report 10
Alternatives**

Final

**Docket No.
CP22-XXX-000**

May 2022

**WBI ENERGY TRANSMISSION, INC.
WAHPETON EXPANSION PROJECT
RESOURCE REPORT 10—ALTERNATIVES**

Minimum Filing Requirements:	Addressed in Section:
1. Discuss the “no-action” alternative and the potential for accomplishing the proposed objectives through the use of other systems and/or energy conservation. Provide an analysis of the relative environmental benefits and costs for each alternative.— 18 CFR §380.12(l)(1)	Sections 10.1 through 10.5
2. Describe alternative routes or locations considered for each facility during the initial screening for the project. (i) For alternative routes considered in the initial screening for the project but eliminated, describe the environmental characteristics of each route or site, and the reasons for rejecting it. Identify the location of such alternatives on maps of sufficient scale to depict their location and relationship to the proposed action, and the relationship of the pipeline to existing rights-of-way. (ii) For alternative routes or locations considered for more in-depth consideration, describe the environmental characteristics of each route or site and the reasons for rejecting it. Provide comparative tables showing the differences in environmental characteristics for the alternative and proposed action. The location of any alternatives in this paragraph shall be provided on maps equivalent to those required in paragraph (c)(2) of this section. —18 CFR §380.12(l)(2)	Sections 10.6 and 10.7
Identify alternative sites considered for the location of major new aboveground facilities and provide sufficient comparative data to justify the selection of the proposed site— 18 CFR §380.12(l)(2)(ii)	Section 10.7
Federal Energy Regulatory Commission’s November 17, 2021 Comments on Draft Resource Report 10:	
1. As necessary, update table 10.6-2 with any additional route or facility adjustments, realignments, etc. that were incorporated into the final project design in response to stakeholder input during the pre-filing process that have resolved stakeholder comments.	Sections 10.6.1 and 10.6.2
2. Viewing the systems alternative discussion, it is not clear how natural gas is currently delivered to Wahpeton. Does WBI Energy currently provide natural gas service to Wahpeton? If not, who provides natural gas service and by what means?	Section 10.4.2
3. Revise sections 10.6 and 10.7 to ensure that data categories are consistent in tables (also include comparison tables in section 10.7) for all alternative routes/sites considered. Data categories should include (where applicable) total acreage affected by construction and operation, the extent of collocation, number of major waterbody crossings, acres of wetlands affected, acres of forest, acres of habitat for federally listed threatened and endangered species, number of National Register of Historic Places listed or eligible sites, acres of agricultural lands affected, number of roads and railroads crossed, acres of federal, state, or municipal lands affected, miles of steep vertical and side slopes crossed, and numbers of landowner parcels affected.	Sections 10.6 and 10.7
4. To further justify the selection of preferred alternatives, include more details about concerns expressed by landowners and city officials for Route Alternative 1, about landowner preferences to follow section lines and edges of fields for Route Alternative 2, and about unreceptive landowners for Route Alternative 3.	Section 10.6.1
5. Include an analysis of alternative sites for aboveground facilities, such as block valve and pig launcher/receiver settings, if siting concerns have been identified.	Section 10.7
Federal Energy Regulatory Commission’s April 4, 2022 Comments on Draft Resource Report 10	
1. Include a data comparison table for the Alliance Pipeline System Alternative and the planned route similar to table 10.6-1.	Section 10.4.1

<p>2. For Route Alternative 1, define numerically “some” landowners denied survey access. For Route Alternative 2, define numerically “some” fields are drain tiled. For Route Alternative 3, define numerically “some” landowners denied survey access. For the Abercrombie Route Alternative, define numerically “some” cultural resources sites could be eligible for listing on the National of Historic Places and how many landowner preferences were accommodated Register.</p>	<p>Route Alternatives 1, 2, and 3 were identified during the development of the base route. As such, while the objections/access denials of landowners, and drain tiles along these alternatives were noted, not every landowner was necessarily contacted or responded to WBI Energy’s inquiries. Moreover, while landowner objections were a factor in the early routing, the conclusions regarding the selection of the preferred route are not dependent solely on this information. The text of sections 10.6.1.1–10.6.1.3 has been revised accordingly.</p>
<p>3. Include updates for ongoing discussions with stakeholders regarding the siting of aboveground facilities.</p>	<p>No stakeholders (landowners or otherwise) have objected to the locations of WBI Energy’s proposed aboveground facilities. The Federal Aviation Administration had some concerns about the pipeline route associated with the initial Kindred Border Station site (see discussion of MDU—Kindred Border Station Alternative A) but these concerns were resolved when the site was moved to the proposed site (see section 10.7.1). All of the landowners of the proposed aboveground facility sites (border stations, valve settings, etc.) have verbally agreed to allow the use of the proposed sites. WBI Energy plans to provide official offers to the landowners and obtain written agreements for the land in 2023.</p>
<p>4. For Route Alternative 1, define numerically “some” landowners denied survey access. In section 10.7.2 indicate how much forest impact would be associated with Alternative Site B. The text states that “Alternative A is very near a residence,” but table 10.7.2 indicates that Alternative Site B is closest to a residence. Clarify the apparent discrepancy.</p>	<p>See revised section 10.7.2 and table 10.7.2.</p>
<p>5. Discuss a minor variation that would shift the planned route slightly east near MP 56.8, thereby avoiding two crossings of the Wild Rice River.</p>	<p>Section 10.6.2.7</p>
<p>6. Provide a discussion of whether the planned guided bores could be extended at MPs 51, 13.7, and 33.4 to avoid some forest and wetland impacts.</p>	<p>Section 10.8</p>

**WBI ENERGY TRANSMISSION, INC.
WAHPETON EXPANSION PROJECT
RESOURCE REPORT 10—ALTERNATIVES**

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APPENDICES

Appendix 10A Alternatives Figures

ACRONYMS AND ABBREVIATIONS

ATWS	additional temporary workspace
EIA	U.S. Energy Information Administration
FAA	The Federal Aviation Administration
FERC	Federal Energy Regulatory Commission
Great Lakes	Great Lakes Gas Transmission
MDU	Montana-Dakota Utilities Co.
MP	milepost
NHD	National Hydrography Dataset
Northern Border	Northern Border Pipeline Company
NPS	National Park Service
NWI	National Wetland Inventory
Project	Wahpeton Expansion Project
Viking	Viking Gas Transmission Company
WBI Energy	WBI Energy Transmission, Inc.

**WBI ENERGY TRANSMISSION, INC.
WAHPETON EXPANSION PROJECT**

10.0 RESOURCE REPORT 10—ALTERNATIVES

WBI Energy Transmission, Inc. (WBI Energy) proposes to construct, modify, operate, and maintain the Wahpeton Expansion Project (Project). The Project will involve the construction of approximately 60.5 miles of 12-inch-diameter natural gas transmission pipeline from WBI Energy's existing Mapleton Compressor Station near Mapleton, North Dakota to a new Montana-Dakota Utilities Company (MDU)—Wahpeton Border Station near Wahpeton, North Dakota. The Project will also include minor modifications at the Mapleton Compressor Station; a new MDU—Kindred Border Station near Kindred, North Dakota; new block valve settings; and new pig launcher/receiver settings. The Project may also include newly constructed farm taps along the pipeline route. The proposed Project facilities will be located in Cass and Richland Counties, North Dakota. Figure 1.1-1 of Resource Report 1 provides an overview of the proposed pipeline and associated facilities.

Resource Report 10 describes alternatives that WBI Energy has evaluated to determine whether they would be reasonable and environmentally preferable to the proposed Project. Alternatives considered include the no-action alternative, alternative energy sources and energy conservation, system alternatives, facility alternatives, route alternatives and variations, and aboveground facility site alternatives. This analysis includes route variations and site alternatives contained in WBI Energy's preliminary draft of Resource Report 10¹ and a number of new route alternatives/variations and aboveground facility site alternatives identified after the preliminary draft was submitted.

To be considered preferable to the proposed Project, an alternative must provide a significant environmental advantage over the Project, meet the objectives and timeframes of the Project, and be technically and economically feasible and practicable. As discussed in Resource Report 1, the primary objective of the Project is to provide an incremental 20,600 equivalent dekatherms of natural gas per day by November 1, 2024 to help meet a growing demand for natural gas in southeastern North Dakota and, more specifically, to provide MDU, a local distribution company, additional uninterrupted natural gas supply to Wahpeton, North Dakota and to extend natural gas service to the community of Kindred, North Dakota for the first time as requested by city officials and residents.

10.1 NO-ACTION ALTERNATIVE

Under the no-action alternative, the Project would not be built and the environmental impacts associated with construction and operation of the proposed facilities would not occur. By not constructing the Project, however, WBI Energy would be unable to satisfy the request for firm natural gas transportation service by MDU to Wahpeton and Kindred and for which WBI Energy has a signed precedent agreement with MDU. Under the no-action alternative, other natural gas pipeline companies could propose to construct similar, new facilities to meet the demand for the transportation of the contracted volume of natural gas. Such actions would likely result in impacts similar to or greater than the proposed Project and might not meet the Project's objectives within

¹ WBI Energy filed Preliminary Draft Resource Reports 1 and 10 on 10/27/2021 (Accession Number 20211027-5174).

the proposed timeframe. Therefore, the no-action alternative is not practical and provides no advantage over the proposed Project.

10.2 ALTERNATIVE ENERGY SOURCES

The use of alternative energy sources—such as solar, wind, geothermal, or biofuels—are not reasonable options to meet the objectives of the Project. As described in Resource Report 1, WBI Energy proposes to provide an additional 20,600 equivalent dekatherms of natural gas per day to help meet a growing demand for natural gas in southeastern North Dakota. More specifically, MDU has contracted with WBI Energy to receive firm natural gas transportation service in order to provide additional uninterrupted natural gas supply to Wahpeton and to extend natural gas service to the community of Kindred for the first time, which has been requested by city officials and residents. Alternative energy sources would not meet these Project objectives.

10.3 ENERGY CONSERVATION

Energy conservation could help alleviate some of the nation's growing demand for energy. State and federal energy conservation measures most likely will continue to play an increasing role in slowing the growth of energy demand in the country. However, it is unlikely that these measures will offset the regional demand for new natural gas supply. The U.S. Energy Information Administration (EIA) indicates in their 2021 Annual Energy Outlook that even with the enacted energy efficiency policies and increases in energy prices, total primary energy consumption—including fuels used for electricity generation—is projected to grow on average by 0.5 percent per year from 2020 to 2050 (EIA, 2021). Natural gas consumption is expected to increase by a similar amount (i.e., on average, 0.5 percent per year). To meet this demand, along with the increased demand in the export of natural gas, the EIA predicts that total domestic production of natural gas in the United States will grow from about 32 trillion cubic feet in 2021 to about 43 trillion cubic feet by 2050 (EIA, 2021). The anticipated growth in natural gas demand is driven primarily by its increased use for electric power generation and industrial applications.

Reduction in the need for additional energy is the preferred option wherever possible. Conservation of energy reduces the demand for limited existing reserves. Although energy conservation measures will be important elements in addressing future energy demands, it is unlikely that they will be able to offset the anticipated demand in the foreseeable future. Thus, energy conservation alone is not a viable alternative to the Project as it does not preclude the already identified need for natural gas infrastructure projects like that proposed by WBI Energy.

10.4 SYSTEM ALTERNATIVES

System alternatives would make use of other existing, modified, or proposed pipeline systems to meet the objectives of the Project. Use of a system alternative would make it unnecessary to construct all or part of the proposed Project, though some modifications or additions to the existing or proposed systems may be required. Such modifications or additions would result in environmental impacts; however, the impacts could be less than, similar to, or greater than those associated with construction of the proposed Project.

North Dakota and the adjacent states have a broad network of high-pressure, high-volume natural gas pipelines. Of these, WBI Energy identified four existing systems that potentially could meet the objectives of the Project: Alliance Pipeline, Viking Gas Transmission Company (Viking), Northern Border Pipeline Company (Northern Border), and Great Lakes Gas Transmission Company (Great Lakes; see figure 10.4-1 in appendix 10A). Each of these existing systems is

described below, followed by a discussion of the potential for these pipelines to serve as system alternatives to the proposed Project. WBI Energy is not aware of any proposed pipeline systems in southeastern North Dakota that could meet the objectives of the Project.

10.4.1 Alliance Pipeline System Alternative

According to its website, the Alliance Pipeline system consists of 2,391 miles of integrated Canadian and U.S. natural gas transmission pipelines, delivering liquids-rich natural gas from the Western Canadian Sedimentary Basin and the Williston Basin to the Chicago market hub. The U.S. portion of the system consists of approximately 887 miles of 36-inch-diameter pipeline with a maximum operating pressure of 1,935 pounds per square inch. The system has been in commercial service since December 2000 and delivers an average of 1.6 billion standard cubic feet of natural gas per day to the Chicago market.

At its nearest point, the Alliance Pipeline is approximately 17.1 miles southwest of Wahpeton. The closest existing MDU interconnect with the Alliance Pipeline is near Fairmont, North Dakota—approximately 24.2 miles south of Wahpeton. To serve both Wahpeton and Kindred, WBI Energy has assumed that Alliance Pipeline would construct a new pipeline from somewhere near the MDU / Alliance Pipeline interconnect around Fairmont north to Wahpeton and then extend northwest to Kindred. It should be noted that Alliance Pipeline has not proposed a system alternative project, so the route that might be used for such a system alternative is highly speculative. WBI Energy has assumed an Alliance Pipeline system alternative would not follow a straight route and would likely follow road and property lines and implement resource avoidance measures similar to the proposed Wahpeton Expansion Pipeline. Under this premise, WBI Energy developed a hypothetical route that Alliance Pipeline (assessed here as the Alliance Pipeline System Alternative) could potentially utilize. This route is illustrated on figure 10.4-2 in appendix 10A. An environmental comparison of this alternative to the proposed route, based on publicly available information, is provided in table 10.4-1. This comparison excludes the portion of the pipeline route between Kindred and Wahpeton, which, to serve customers in Kindred, would be the same for the Alliance Pipeline System Alternative as the proposed Project.

TABLE 10.4-1		
Wahpeton Expansion Project Comparison of Alliance Pipeline System Alternative to the Corresponding Segments of Proposed Route		
Criteria	System Alternative Route	Proposed Route
Alliance Pipeline System Alternative^a		
Length (miles)	24.2	23.3
Land affected by construction (acres)	219.9	211.2
Land within permanent right-of-way (acres)	146.6	141.4
Length collocated/uncollocated (miles)	8.6/15.6	15.3/8.0
Percent collocated	36	66
National Hydrography Dataset (NHD) waterbody crossings (number)	11	9
Major (>100 feet) waterbody crossings (number)	0	0
National Wetland Inventory (NWI) total wetlands affected (acres)	1.0	2.7
National Wetland Inventory (NWI) forested and scrub shrub wetlands affected (ac)	0.16	0.02
Forestland affected (acres)	1.7	0.1

TABLE 10.4-1

Wahpeton Expansion Project		
Comparison of Alliance Pipeline System Alternative to the Corresponding Segments of Proposed Route		
Criteria	System Alternative Route	Proposed Route
Agricultural land affected (acres)	209.3	207.3
Steep slopes (>15%) crossed (feet)	106	53
Road/railroad crossings (number)	34	38
Residences within 50 feet of the centerline (number)	2	0
Federal/state/municipal land crossed (acres)	0	0
Cultural sites crossed/within 50 feet ^b (number)	unknown ^c	0

Source: U.S. Fish and Wildlife Service, 2016; U.S. Geological Survey, National Hydrography, n.d; NDGISHUB-DOT, 2009.

^a A standard 75-foot-wide corridor for the alternative and proposed route was used to calculate the acreages of any construction impacts; and a 50-foot-wide corridor was used to calculate the acreages of any permanent impacts.

^b Cultural resource sites include previously mapped sites identified by the Class I literature search and sites identified within 50 feet of potential workspace during WBI Energy’s Class III field surveys that cannot be determined ineligible for listing on the National Register of Historic Places without further evaluation.

The Alliance Pipeline system alternative developed by WBI Energy would require approximately 24.2 miles of pipeline between the Alliance Pipeline and Wahpeton and, from there, approximately 36.7 miles of pipeline (following the same route as the proposed Project) to serve the town of Kindred. This pipeline would likely require a construction right-of-way width similar to WBI Energy’s proposed 75-foot width. Given that the system alternative is 0.9 mile longer than the corresponding segment of the proposed route (from the Mapleton Compressor Station to MDU—Kindred Border Station), it would disturb approximately 8.7 acres more land than the proposed route. It would also be collocated for a shorter distance and, therefore, would result in more greenfield right-of-way than the proposed route. Preliminary evaluations indicate land use along the Alliance Pipeline system alternative is similar to the proposed Project route. Thus, the resource impacts of the Alliance Pipeline system alternative would be comparable to the proposed Project route and would consist primarily of agricultural impacts. The Alliance Pipeline System Alternative would cross slightly more forestland and two more National Hydrography Dataset (NHD) mapped waterbodies than the proposed route and, although it would reduce mapped National Wetland Inventory (NWI) wetland impacts by 1.7 acres, it would also result in a slight increase in forest/scrub shrub wetland impacts. It would also result in the clearing of 1.6 acre of additional forestland. Given these factors, it appears that the Alliance Pipeline System Alternative would not offer any significant environmental advantage.

WBI Energy’s understanding of the Alliance Pipeline system is that it currently has available capacity and, as such, would not require any additional facilities other than the new pipeline described above. However, the Alliance Pipeline gas stream contains liquids that are currently processed at the Aux Sable processing complex in Illinois, making Alliance Pipeline commercially less attractive than the proposed Project. In order to ensure acceptable gas quality for Project customers, a gas processing facility would need to be constructed to remove liquids from the gas stream. Liquids extracted from the gas stream would be reinjected into the Alliance Pipeline. Any liquids that are unable to be separated out and reinjected into the Alliance Pipeline would need to be purchased from Aux Sable at the appropriate market value for each component. The processing and/or reimbursement of natural gas liquids from the gas stream would increase the cost. For this reason (higher cost to the customers) and because it would not offer any

significant environmental advantage, this alternative is considered less preferable than the proposed Project.

10.4.2 Viking Gas Transmission Company System Alternatives

Viking is owned and operated by ONEOK, Inc. According to Viking's website, Viking's interstate pipeline system connects with four major pipeline systems (TC Energy, Northern Natural Gas Company, Great Lakes, and ANR Pipeline Company), allowing it to serve strategic markets in North Dakota, Minnesota, and Wisconsin. WBI Energy currently interconnects with Viking's mainline system near Felton, Minnesota. Viking also has a lateral that serves Fargo, North Dakota. Although this lateral is closer to the Project area, WBI Energy understands it is at or near capacity and has a lower maximum allowable operating pressure than the Viking mainline, which makes it incapable of providing the proposed Project volumes without additional compression. WBI Energy evaluated two potential system alternatives based on the Viking system.

One potential system alternative to the proposed Project would be for Viking to install a new pipeline from its mainline system south of Felton, Minnesota (possibly in the Hawley, Minnesota area) to Wahpeton. The majority of this alternative would be constructed in Minnesota on the east side of the Red River. Like the proposed Project, this alternative would likely consist of a similarly sized pipeline with no additional compression required. WBI Energy estimates that the Viking system alternative would require approximately 60 miles of new pipeline to deliver natural gas to Wahpeton. Approximately 36.7 miles of additional pipeline would also need to be constructed between Wahpeton and Kindred. Given that this alternative would increase the amount of pipeline required by 36.7 miles, the cost and the environmental impacts of this alternative would be greater than the proposed Project. For these reasons, this alternative was considered less preferable than the proposed Project.

A second potential system alternative would be for MDU to replace the current Great Plains Natural Gas Company² (Great Plains) pipeline between Vergas, Minnesota and Breckenridge, Minnesota. Currently, MDU provides natural gas service to Wahpeton via the Great Plains system. Great Plains has an interconnect with Viking near Vergas and distributes natural gas to 19 communities along its 66-mile route to Wahpeton. The Great Plains pipeline does not have the capacity to deliver the additional natural gas volumes requested by the Project and, therefore, would need to be replaced. The replacement pipeline would begin at Great Plain's existing interconnect with Viking at Vergas. From there, it would follow the existing Great Plains pipeline alignment to Breckenridge, Minnesota and cross the Red River to Wahpeton. This alternative would require approximately 66 miles of new pipeline. From Wahpeton, MDU would need to construct another 36.7 miles of new pipeline to serve Kindred. With over 100 miles of new pipeline, this alternative would substantially increase the length and cost of the pipeline compared to the proposed Project. It would also increase impacts on wetlands and waterbodies, which are numerous between Vergas and Fergus Falls, Minnesota. For these reasons, this alternative is considered less preferable than the proposed Project.

² Great Plains Natural Gas Company is a division of MDU and is both a local distribution company and transporter of natural gas to industrial, commercial, and residential customers in 18 western Minnesota communities and the North Dakota community of Wahpeton.

10.4.3 Northern Border Pipeline Company System Alternative

Northern Border is a major natural gas transportation system that links the Midwestern United States with reserves in the Western Canadian Sedimentary Basin and transporting natural gas produced in the Williston and Powder River Basins in the United States. Currently, WBI Energy has five interconnects with Northern Border in northwestern and central North Dakota.

The Northern Border system alternative would require approximately 132 miles of new pipeline from the vicinity of Aberdeen, South Dakota to Wahpeton. From there, additional pipeline would be needed to deliver natural gas to Kindred. Not only would this alternative substantially increase the length of the pipeline (more than doubling its length), but the route between Aberdeen and Wahpeton would cross substantially more wetlands and waterbodies than the proposed route. Due to the increased environmental impacts and increased cost, this alternative is less preferable than the proposed Project.

10.4.4 Great Lakes Gas Transmission Company System Alternative

According to its website, Great Lakes' system is a 2,115-mile-long system that delivers Canadian natural gas from Western Canada's natural gas basins to population centers in Minnesota, Wisconsin, Michigan, and Eastern Canada. The closest the Great Lakes pipeline comes to the proposed Project is in the vicinity of Clearbrook, Minnesota. The Great Lakes system alternative would likely require 100 or more miles of new pipeline to transport the requested capacity of natural gas from the Great Lakes pipeline to Kindred (the closer of the two Project delivery locations). From there, it would require additional pipeline to deliver gas to Wahpeton. Not only would this substantially increase the length of the pipeline (roughly doubling the pipeline length), but the route between Clearbrook and Kindred would cross substantially more wetlands and waterbodies than the proposed route, including the Red River. Due to the increased environmental impacts and cost, this alternative is less preferable than the proposed Project.

10.5 FACILITY ALTERNATIVES

Facility alternatives are those alternatives that consider modifications to the proposed Project facilities including varying diameter pipelines, increased compression, and the reduction of proposed pipeline facilities. WBI Energy identified one potential facility system alternative. An analysis of this alternative is provided below.

10.5.1 Eight-Inch-Diameter Pipeline Facility System Alternative

WBI Energy considered the potential to construct a new 8-inch-diameter pipeline instead of a 12-inch-diameter pipeline between the Mapleton Compressor Station and Wahpeton. Like the proposed Project, this alternative would transport gas from the east via WBI Energy's existing interconnect with Viking near Felton to the Mapleton Compressor Station. An 8-inch diameter pipeline would be constructed from the Mapleton Compressor Station to the proposed delivery points at Kindred and Wahpeton. This alternative would utilize the same right-of-way, require the same length of pipeline, and would have the same pipeline impacts as the proposed Project pipeline. However, this alternative would require the installation of a new 300-horsepower compressor unit at the existing Mapleton Compressor Station. This new compressor unit would increase fuel use, Project costs, and emissions and, ultimately, result in greater environmental impact than the proposed Project. For these reasons, it was not selected.

10.6 ROUTE ALTERNATIVES AND ROUTE VARIATIONS

The goal of the proposed route selection analysis was to identify a Project alignment that represents a minimal and acceptable level of environmental impact coupled with attainment of the Project goals. WBI Energy considered several factors in developing the pipeline route including:

- overall pipeline length with the objective of minimizing the amount of new pipe and, therefore, the amount of land disturbance between WBI Energy’s existing pipeline and the proposed MDU delivery locations;
- landowner and other stakeholder input regarding where the proposed pipeline would have the least impact on properties (input from landowners was taken into account during permission to survey discussions and landowner meetings and open houses held in September and November 2021);
- the presence of public and tribal lands with the objective of avoiding these lands;
- the presence and configuration of environmental resources and topography including wetlands, waterbodies, and other feature crossings (e.g., roads and railroads) with the objective of avoiding sensitive features where possible and, where avoidance is not possible, designing each crossing to minimize impact on the resource or feature (e.g., utilizing the guided bore method, crossing waterbodies perpendicularly to the extent possible);
- proximity to cities, towns, residences, schools, and recreational areas with the objective of avoiding these resources and locating the pipeline away from these resources to the extent practicable;
- land uses with the objective of minimizing farming impacts by keeping the pipeline on the edge of fields and section lines, avoiding diagonal crossings of fields to the extent possible, and minimizing impacts on drain tile systems;
- presence of existing corridors with the objective of maximizing collocation with existing corridors, which in the Project area consists primarily of road corridors;
- planned public works projects with the objective of avoiding conflicts with these projects, including the nearby proposed Fargo–Moorhead Diversion project;³ and

³ The U.S. Army Corps of Engineers, St. Paul District, is working in partnership with the following cities to complete this flood risk management project: Fargo, North Dakota; West Fargo, North Dakota; Moorhead, Minnesota; and the Fargo–Moorhead Diversion Authority (U.S. Army Corps of Engineers, 2015). The project is intended to provide flood risk reduction for the more than 230,000 people and 70 square miles of infrastructure in the communities of Fargo, Moorhead, West Fargo, Horace, and Harwood. It includes building a 30-mile-long diversion channel in North Dakota with upstream staging, a 20-mile-long southern embankment, 19 highway bridges, four railroad bridges, three gated structures, two aqueduct structures, several drop structures, and an open culvert structure (U.S. Army Corps of Engineers, 2020). It is the first U.S. Army Corps of Engineers project to use a public-private partnership. Non-federal construction of the diversion channel using a public-private partnership is expected to begin in spring 2022 (U.S. Army Corps of Engineers, 2015).

- field review of the Project areas to confirm information obtained by other methods and to identify any issues that may not have previously been considered.

10.6.1 Route Alternatives

WBI Energy’s application of the shortest length criterion resulted in an initial route that was more direct than the currently proposed route, running, more or less, diagonally from the Mapleton Compressor Station to the MDU—Wahpeton Border Station. WBI Energy’s subsequent application of other criteria resulted in route changes that eliminated four sections of the previously identified route. One of these sections is in Cass County and is hereafter referred to as Route Alternative 1. The other three are located in Richland County and are hereafter referred to as Route Alternatives 2 and 3 and the Abercrombie Route Alternative. Route Alternatives 1, 2, and 3 are depicted in appendix 10A on figures 10.6-1, 10.6-2, and 10.6-3. The Abercrombie Route Alternative is shown on figure 10.6-4 in appendix 10A. All of these alternatives are compared to the corresponding segments of the currently proposed route.⁴ The comparative analyses are provided below.

10.6.1.1 Route Alternative 1

As shown in appendix 10A on figure 10.6-1, Route Alternative 1 begins in Cass County at the Mapleton Compressor Station (milepost [MP] 0.00) and proceeds due west for a short distance before turning south on the west side of the community of Mapleton. From there, it proceeds south and crosses the Maple River and Interstate 94. After crossing the interstate, the alternative proceeds southeast until it rejoins the proposed route at MP 9.25 near 40th Street SE. As discussed above, this alternative was part of the initial route. It was eliminated following discussions with area landowners and Mapleton city officials who expressed concerns about the alignment, which crosses a golf course on the west side of Mapleton and several fields in a diagonal manner.

Table 10.6-1 provides an environmental comparison of the alternative to the corresponding segment of the proposed route.

TABLE 10.6-1		
Wahpeton Expansion Project		
Comparison of Route Alternative 1 to the Corresponding Segment of Proposed Route		
Criteria	Alternative	Proposed Route
Route Alternative 1^a		
Length (miles)	7.54	9.25
Land affected by construction (acres)	68.5	84.1
Land within permanent right-of-way (acres)	45.70	56.1
Length collocated/uncollocated (miles)	2.08/5.46	3.49/5.76
Percent collocated	28	38
NHD waterbody crossings (number)	7	6

⁴ In the preliminary draft of Resource Report 10, Route Alternative 3 was compared to a previous iteration of the proposed route, which was subsequently modified. This assessment compares Route Alternative 3 to the corresponding segment of the currently proposed route.

TABLE 10.6-1

**Wahpeton Expansion Project
Comparison of Route Alternative 1 to the Corresponding Segment of Proposed Route**

Criteria	Alternative	Proposed Route
Major (>100 feet) waterbody crossings (number)	0	0
NWI wetlands affected (acres)	0.1	1.1
Forestland affected (acres)	0.0	0.0
Agricultural land affected (acres)	65.5	80.7
Steep slopes (>15%) crossed (feet)	0	6
Road/railroad crossings (number)	11/1	16/1
Residences within 50 feet of the centerline (number)	0	0
Federal/state/municipal land crossed (acres)	0	0
Landowners affected (number)	18	27
Cultural sites crossed/within 50 feet ^b (number)	unknown	0

Source: U.S. Fish and Wildlife Service, 2016; U.S. Geological Survey, National Hydrography, n.d; NDGISHUB-DOT, 2009.

^a A standard 75-foot-wide corridor for the alternative and proposed route was used to calculate the acreages of any construction impacts; and a 50-foot-wide corridor is used to calculate the acreages of any permanent impacts.

^b Cultural resource sites include previously mapped sites identified by the Class I literature search and sites identified within 50 feet of potential workspace during WBI Energy’s Class III field surveys that cannot be determined ineligible for listing on The National Register of Historic Places without further evaluation.

As indicated in table 10.6-1, the alternative is similar to the proposed route with respect to terrain, land uses, and miles of greenfield (unallocated) right-of-way created, but it is 1.7 miles shorter and would impact 1 acre less of NWI-mapped wetlands than the corresponding segment of the proposed route. The alternative would also reduce the number of landowners affected, although this is not a significant factor given that all of the landowners along the proposed route are amenable to the proposed route. Moreover, the owner of the land on the north side of the Maple River along Alternative 1 denied WBI Energy access for survey and, thus, was not amenable to the alternative. The crossing of the Maple River along the alternative would also be at a tight bend in the river that would put a portion of the right-of-way very close to the river’s edge. The alternative also crosses one more NHD mapped waterbody. Additionally, as previously mentioned, it crosses a section of a golf course that includes a cart path and one fairway and cuts diagonally across a number of agricultural fields for approximately 4.2 miles. For these reasons and because some landowners denied survey access along the alternative route and city officials expressed preference for the proposed route at a city council meeting, the alternative was rejected in favor of the proposed route.

10.6.1.2 Route Alternative 2

As shown on figure 10.6-2 in appendix 10A, Route Alternative 2 begins in Richland County south of the MDU—Kindred Border Station at the intersection of County Road 26 and 55th Street SE (MP 26.62) and proceeds due south for about 1 mile. From there, the alternative proceeds due east for a short distance and crosses County Road 26. It then continues in a southeasterly direction for about 3.8 miles until it rejoins the proposed route at MP 32.37 about 1 mile east of the city of Walcott, North Dakota. As discussed above, this alternative was part of the initial route. This alternative is similar to the proposed route with respect to land uses crossed.

An environmental comparison of the Route Alternative 2 to the corresponding segment of the proposed route is included in table 10.6-2.

TABLE 10.6-2		
Wahpeton Expansion Project Comparison of Route Alternative 2 to the Corresponding Segment of Proposed Route		
Criteria	Alternative	Proposed Route
Route Alternative 2^a		
Length (miles)	4.49	5.75
Land affected by construction (acres)	40.8	52.3
Land within permanent right-of-way (acres)	28.6	34.8
Length collocated/uncollocated (miles)	2.44/2.05	1.61/4.14
Percent collocated	54	28
NHD waterbody crossings (number)	1	8
Major (>100 feet) waterbody crossings (number)	0	0
NWI wetlands affected (acres)	0.3	<0.1
Forestland affected (acres)	0.0	0.0
Agricultural land affected (acres)	38.6	51.0
Steep slopes (>15%) crossed (feet)	0	2
Road/railroad crossings (number)	9/0	7/0
Residences within 50 feet of the centerline (number)	0	0
Federal/state/municipal land crossed (acres)	0	0
Landowners affected (number)	13	18
Cultural sites crossed/within 50 feet ^b (number)	unknown	0

Source: U.S. Fish and Wildlife Service, 2016; U.S. Geological Survey, National Hydrography, n.d; NDGISHUB-DOT, 2009.

^a A standard 75-foot-wide corridor for the alternative and proposed route was used to calculate the acreages of any construction impacts; and a 50-foot-wide corridor was used to calculate the acreages of any permanent impacts.

^b Cultural resource sites include previously mapped sites identified by the Class I literature search and sites identified within 50 feet of potential workspace during WBI Energy's Class III field surveys that cannot be determined ineligible for listing on the National Register of Historic Places without further evaluation.

Table 10.6-2 indicates that both routes cross mostly flat and gently sloping terrain, but the alternative is 1.26 miles shorter, would reduce the number of landowners affected and land disturbance, and would increase collocation. The alternative also reduces waterbody crossings, although the significance of this difference is diminished by the fact that all but one of the eight waterbodies crossed by the proposed route are actually manmade canals associated with farming activities and not natural waterbodies. Additionally, the alternative would impact slightly more (~0.2 acre) of NWI-mapped wetland and cut diagonally across multiple farm fields for approximately 3.5 miles. For these reasons and to follow section lines and edges of fields to minimize agricultural impacts, Route Alternative 2 was considered less preferable than the proposed route and was rejected.

10.6.1.3 Route Alternative 3

As shown on figure 10.6-3 in appendix 10A, Route Alternative 3 begins in Richland County east of Colfax, North Dakota near MP 39.51 and the intersection of 170th Avenue SE and County

Road 4⁵. The alternative proceeds due south for 2.3 miles, turns southeast and follows the Red River Valley and Western Railroad for about 4.0 miles until it rejoins the proposed route near MP 47.32. It then follows the same alignment as the proposed route for approximately 1.6 miles (first along the railroad for a short distance [about 0.1 mile] and then east and south following roads). At this point, it breaks away from the proposed route a second time and continues south following 173rd Avenue SE south (as opposed to going east like the proposed route) for another 1.1 miles until it reaches the Red River Valley and Western Railroad again. It then turns and follows the railroad southeast for 2.6 miles until it crosses 74th Street SE. After crossing to the south side of the street, it turns and proceeds east adjacent to 74th Street SE for approximately 3.6 miles until it rejoins the proposed route at MP 57.51, a short distance after crossing the Wild Rice River, near 178th Avenue SE.

An environmental comparison of the Route Alternative 3 to the corresponding segment of the proposed route is included in table 10.6-3.

TABLE 10.6-3 Wahpeton Expansion Project Comparison of Route Alternative 3 to the Corresponding Segments of Proposed Route		
Criteria	Alternative	Proposed Route
Route Alternative 3^a		
Length (miles)	15.43	17.97
Land affected by construction (acres)	140.3	163.4
Land within permanent right-of-way (acres)	93.5	108.9
Length collocated/uncollocated (miles)	13.83/1.60	10.60/7.37
Percent collocated	90	59
NHD waterbody crossings (number)	9	7
Major (>100 feet) waterbody crossings (number)	0	0
NWI wetlands affected (acres)	4.8	1.1
Forestland affected (acres)	0.0	0.4
Agricultural land affected (acres)	123.8	155.9
Steep slopes (>15%) crossed (feet)	9	59
Road/railroad crossings (number)	28/1	22/1
Residences within 50 feet of the centerline (number)	0	0
Federal/state/municipal land crossed (acres)	0	0
Landowners affected (number)	35	36
Cultural sites crossed/within 50 feet ^b (number)	unknown	0
<hr/> Source: U.S. Fish and Wildlife Service, 2016; U.S. Geological Survey, National Hydrography, n.d; NDGISHUB-DOT, 2009. ^a A standard 75-foot-wide corridor for the alternative and proposed route was used to calculate the acreages of any construction impacts; and a 50-foot-wide corridor was used to calculate the acreages of any permanent impacts.		

⁵ This alternative is the same as what was assessed in the preliminary draft of Resource Report 10 but it is compared to a different proposed route alignment. Following submittal of the preliminary draft to the Federal Energy Regulatory Commission, WBI Energy rejected the previously proposed route and adopted a new proposed route (see the Abercrombie Route Alternative assessment).

TABLE 10.6-3		
Wahpeton Expansion Project Comparison of Route Alternative 3 to the Corresponding Segments of Proposed Route		
Criteria	Alternative	Proposed Route
^b Cultural resource sites include previously mapped sites identified by the Class I literature search and sites identified within 50 feet of potential workspace during WBI Energy's Class III field surveys that cannot be determined ineligible for listing on the National Register of Historic Places without further evaluation.		

The alternative takes a more direct (and generally diagonal) path than the proposed route, which increases collocation and reduces the length of the pipeline by about 2.5 miles. As indicated in table 10.6-3, the two routes cross similar, mostly flat, and gently sloping terrain and are similar with respect to land uses—although the alternative would disturb less land overall including less agricultural land and avoids the 0.4 acre of forestland along the proposed route.

Neither route crosses federal or state land or passes within 50 feet of any residences, although the alternative is closer to more residences. Both routes also cross about the same number of landowners. However, the alternative crosses three more NHD-mapped waterbodies and would impact 3.7 more acres of NWI-mapped wetlands than the corresponding segment of the proposed route.

Another difference between the alternative and corresponding segment of the proposed route concerns the North Country National Scenic Trail. The North Country National Scenic Trail is a footpath stretching approximately 4,600 miles (7,400 kilometers) from Crown Point in eastern New York to Lake Sakakawea State Park in central North Dakota. The trail is administered by the National Park Service (NPS); managed by federal, state, and local agencies; and built and maintained primarily by the volunteers of the North Country Trail Association and its partners. Both the proposed route and alternative cross the trail one time at County Road 4, where the trail is on the road. The road would be crossed by guided bore so the surface of the road and trail would not be impacted by trenching along either route. However, the proposed route is also adjacent to the trail between MPs 42 and 43.4. The trail in this area is on County Road 4 and 172nd Ave SE and will not be directly impacted by the proposed route, which is on the north side of County Road 4 and west side of 172nd Ave SE. However, people walking on the trail/road could experience additional noise, dust, and visual impacts during construction, but these effects would be temporary and would have no long-term impact on the trail or trail users.

As described in Resource Report 8, WBI Energy has discussed the proposed route with both the NPS and North Country Trail Association. The primary issues the NPS and North Country Trail Association identified during the meeting were the timing of construction, safety of trail users where the trail is close to the construction right-of-way, and access to the trail during construction. The closest the construction will come to the North Country National Scenic Trail is at MP 36.8 where the proposed workspace abuts the railroad and trail crosses 63rd Street. There is also an access point within WBI Energy's proposed workspace that the North Country Trail Association uses for access to maintain the trail. The NPS/North Country Trail Association indicated there should be a fence between the trail and the construction zone in this area. It was suggested that increased signage before and after the construction zone to warn trail users about the construction could also be helpful. The NPS and North Country Trail Association said they want to ensure there is good communication at the time of construction so they can post trail alerts as needed and notify users well in advance. WBI Energy will work with NPS and North Country Trail Association to communicate when active construction is planned so trail alerts can

be posted and will coordinate with trail maintenance staff regarding use of the access road to minimize disruption.

For the reasons described above (its greater impact on wetlands and waterbodies), Route Alternative 3 was considered less preferable than the proposed route and was rejected.

10.6.1.4 Abercrombie Route Alternative

WBI Energy revised the proposed route between MPs 44.39 and 53.92 after submitting the Preliminary Draft of Resource Report 10. This change was made to accommodate landowner preferences and avoid a number of cultural resource sites that were discovered during the 2021 surveys along a segment of the previously proposed route that is referred to in this analysis as the Abercrombie Route Alternative. As shown on figure 10.6-4 in appendix 10A, the Abercrombie Route Alternative deviates from the proposed route in Richland County at the intersection of 72nd Avenue SE and 67th Street SE. From there, the alternative proceeds east for about 4.5 miles generally parallel to 67th Street SE until it reaches 176^{1/2} Avenue SE, just south of the community of Abercrombie. It then proceeds south for about 3.0 miles until it crosses 70th Street SE. After crossing the street, it proceeds east for about 1.5 miles to the west side of 178th Avenue SE. It then turns and goes south again for about 0.5 mile until it rejoins the proposed route near MP 53.92.

An environmental comparison of the Abercrombie Route Alternative to the corresponding segment of the proposed route is included in table 10.6-4.

TABLE 10.6-4		
Wahpeton Expansion Project		
Comparison of Abercrombie Route Alternative to the Corresponding Segments of Proposed Route		
Criteria	Alternative	Proposed Route
Abercrombie Alternative^a		
Length (miles)	9.51	9.48
Land affected by construction (acres)	86.5	86.2
Land within permanent right-of-way (acres)	57.6	57.4
Length collocated/uncollocated (miles)	7.37/2.14	4.85/4.63
Percent collocated	77	51
NHD waterbody crossings (number)	6	4
Major (>100 feet) waterbody crossings (number)	0	0
NWI wetlands affected (acres)	0.2	1.0
Forestland affected (acres)	0.2	0.1
Agricultural land affected (acres)	80.3	80.7
Steep slopes (>15%) crossed (feet)	25	27
Road/railroad crossings (number)	13/1	12/1
Residences within 50 feet of the centerline (number)	0	0
Federal/State/Municipal land crossed (acres)	0	0
Landowners affected (number)	22	22
Cultural sites crossed/within 50 feet ^b (number)	4	0

Source: U.S. Fish and Wildlife Service, 2016; U.S. Geological Survey, National Hydrography, n.d; NDGISHUB-DOT, 2009.

^a	A standard 75-foot-wide corridor for the alternative and proposed route was used to calculate the acreages of any construction impacts; and a 50-foot-wide corridor is used to calculate the acreages of any permanent impacts.
^b	Cultural resource sites include previously mapped sites identified by the Class I literature search and sites identified within 50 feet of potential workspace during WBI Energy's Class III field surveys that cannot be determined ineligible for listing on the National Register of Historic Places without further evaluation.

As shown in the table, the alternative and proposed route both cross mostly flat and gently sloping terrain. The two routes cross the same number of landowners and are about the same length, but the alternative is more collocated and would create less greenfield right-of-way. Neither route passes within 50 feet of a residence, but there are more residences near the alternative. The alternative and proposed routes are similar with respect to land uses and cover type as both routes cross predominantly agricultural lands and only a small amount of forestland. In the case of the alternative, the forestland is located near a residence near the intersection of 174th Ave SE and 67th St SE and at a few small waterbody crossings; in the case of the proposed route, the forestland is located at the crossing of Antelope Creek and the Wild Rice River. The alternative crosses two more NHD-mapped waterbodies but would impact 0.8 acre less of NWI-mapped emergent wetland than the corresponding segment of the proposed route.

The main difference between the two routes is that WBI Energy discovered a number of cultural resource sites (at least four of which WBI Energy's archeologists believe could be eligible for listing on the National Register) along the alternative route during field surveys, whereas no cultural resource sites were identified by the field surveys along the proposed route. Primarily for this reason and to accommodate landowner preferences, the Abercrombie Route Alternative was considered less preferable than the proposed route and was rejected.

10.6.2 Route Variations

WBI Energy's application of routing criteria described above also resulted in the evaluation of a number of minor route variations that primarily follow roads and section lines and avoid diagonal crossings of agricultural fields, roads, railroads, and waterbodies. The initial route variations WBI Energy identified are listed in table 10.6-5. As indicated in the table, many of these variations were requested by landowners and most have been incorporated into the proposed route although some were rejected and others were superseded by subsequent variations in the same location. These variations, which were the earliest iterations of WBI Energy's efforts to establish a baseline (preliminary) route, are based on the qualitative application of the routing criteria and, as such, these were not quantitatively documented as WBI Energy's subsequent variations have been (see the Maple River, Bishop, Bartholomay, Erickson, Moe, and Antelope Creek/Wild Rice River route variations at the end of this section).

TABLE 10.6-5 Wahpeton Expansion Project Initial Route Variations Adopted or Rejected			
Variation Number	Date	Variation Description	Adopted or Rejected
Variation 1	4/20/2021	This variation revised the route in multiple locations after conducting field reviews. Modifications were adopted to address environmental concerns and improve river crossing locations, to minimize impacts on other utilities, and drain tile fields.	Adopted into the proposed route. Some areas are still part of the currently proposed route; some were superseded by subsequent variations.

TABLE 10.6-5

**Wahpeton Expansion Project
Initial Route Variations Adopted or Rejected**

Variation Number	Date	Variation Description	Adopted or Rejected
Variation 2	5/19/2021	This variation was considered to avoid crossing fields diagonally in an area northeast of Walcott.	While this variation was adopted, much of the variation was superseded by subsequent variations.
Variation 3	5/19/2021	This route variation was considered to address a potential alternate location for the MDU—Kindred Border Station.	Ultimately rejected at the request of the landowner.
Variation 4	6/18/2021	This variation involved revisions following the first round of field survey, primarily to square the route up to tract/section lines and improve crossing of manmade and environmental features in Cass County.	Adopted into the proposed route. While the majority of this variation is reflected in the currently proposed route, some modifications were superseded by subsequent variations.
Variation 5	7/1/2021	This variation involved revisions primarily in two areas east and south of Walcott all the way to I-29 and again in the last 2 to 3 miles of the route, including changing the point of ending—all as a result of landowner preferences.	Adopted into the proposed route. While the majority of this variation is reflected in the currently proposed route, some modifications were superseded by subsequent variations.
Variation 6	7/10/2021	This variation involved minor revisions in Cass County between 42 nd and 43 rd Street SE to avoid clipping a tract with the construction right-of-way.	Adopted into the currently proposed route.
Variation 7	7/22/2021	This variation involved a slight centerline offset to avoid a landowner.	Adopted into an interim route, but ultimately eliminated when Variation 9 was implemented.
Variation 8	8/6/2021	Revisions in two locations: in the area crossing I-29 to route across more receptive landowners and approximately 3 miles southeast of the I-29 crossing to route across a landowner following the section lines to minimize impact to cultivated fields.	Adopted into the currently proposed route. About half of this variation was superseded by Variation 9.
Variation 9	8/11/2021	This variation involved revisions to accommodate landowner preferences to minimize cultivated field disturbance in the areas just west and east of the I-29 crossing.	Adopted but some areas of this variation have been superseded by subsequent variations.
Variation 10	8/12/2021	This variation involved a minor centerline offset just southeast of Walcott to avoid existing farm buildings and roads.	Adopted into currently proposed route.
Variation 11	8/24/2021	This variation involved revisions incorporating route variations for the southern half of the line based on discussions with the affected landowners.	Adopted but nearly all of this variation has been superseded by subsequent variations.
Variation 12	8/26/2021	This variation involved a revision on the first tract encountered in Richland County to accommodate a landowner preference.	Incorporated into the currently proposed route.
Variation 13	9/29/2021	This variation involved revisions to serve potential town/landowner taps and route the pipeline across receptive landowner properties.	Adopted into the currently proposed route.

TABLE 10.6-5			
Wahpeton Expansion Project Initial Route Variations Adopted or Rejected			
Variation Number	Date	Variation Description	Adopted or Rejected
Variation 14	9/30/2021	This variation involved a revision to avoid a foreign line and also parallel said line as requested by the landowners.	Adopted into the currently proposed route.
Variation 15	10/4/2021	This variation involved several minor revisions to improve point of intersection deflections, offsets from section lines, and to avoid a tract at the crossing of the Wild Rice River.	Adopted into the currently proposed route.

The route variations that were identified by WBI Energy after it submitted the Preliminary Draft of Resource Report 10 were quantitatively evaluated. Detailed assessments of each of these variations is presented below.

10.6.2.1 Maple River Route Variation

WBI Energy revised the proposed route between MPs 0.00 and 1.68 in Cass County after the 2021 field surveys identified a cultural resource site along a segment of the previously proposed route. The segment of the previously proposed route containing this cultural resource site is referred to in this assessment as the Maple River Variation. As shown on figure 10.6-5 in appendix 10A, both the proposed route and variation begin at the Mapleton Compressor Station. From there, the Maple River Variation proceeds south and then west for a short distance. It then proceeds south a second time and crosses the Maple River. Shortly after crossing the river, it turns and proceeds east for about 1,400 feet until it rejoins the proposed route at MP 1.68.

An environmental comparison of the Maple River Route Variation to the corresponding segment of the proposed route is included in table 10.6-6.

TABLE 10.6-6		
Wahpeton Expansion Project Comparison of Maple River Route Variation to the Corresponding Segments of Proposed Route		
Criteria	Variation	Proposed Route
Maple River Route Variation^a		
Length (miles)	0.91	1.68
Land affected by construction (acres)	8.3	15.3
Land within permanent right-of-way (acres)	5.5	10.2
Length collocated/uncollocated (miles)	0.36/0.55	0.0/1.68
Percent collocated	40	0
NHD waterbody crossings (number)	1	1
Major (>100 feet) waterbody crossings (number)	0	0
NWI wetlands affected (acres)	0.0	<0.1
Forestland affected (acres)	0.0	0.0
Agricultural land affected (acres)	7.7	14.9
Steep slopes crossed (feet)	0	0

TABLE 10.6-6

Wahpeton Expansion Project		
Comparison of Maple River Route Variation to the Corresponding Segments of Proposed Route		
Road/railroad crossings (number)	2/0	2/0
Residences within 50 feet of the centerline (number)	0	0
Federal/state/municipal land crossed (acres)	0	0
Landowners affected (number)	3	3
Cultural sites crossed/within 50 feet ^b (number)	1	0

Source: U.S. Fish and Wildlife Service, 2016; U.S. Geological Survey, National Hydrography, n.d.; NDGISHUB-DOT, 2009; NDGISHUB-DOT, 2018.

^a A standard 75-foot-wide corridor for the variation and proposed route was used to calculate the acreages of any construction impacts; and a 50-foot-wide corridor was used to calculate the acreages of any permanent impacts.

^b Cultural resource sites include previously mapped sites identified by the Class I literature search and sites identified within 50 feet of potential workspace during WBI Energy’s Class III field surveys that cannot be determined ineligible for listing on the National Register of Historic Places without further evaluation.

As indicated in the table, the routes are similar with respect to land use and terrain but the variation is shorter than the corresponding segment of the proposed route and, therefore, would result in less land disturbance overall. Both routes affect the same three landowners and neither route is collocated with other rights-of-way or passes close to any residences or other structures. Both routes cross the Maple River and the proposed route crosses a very narrow wetland adjacent to the river, but the alternative crosses the river at a narrow bend that would require workspace very close to the river’s edge for an extended distance. The proposed route crosses the river at a larger and broader bend that minimizes the amount of workspace near the river. The variation would also impact a cultural resource site on the east side of the Maple River, which WBI Energy’s surveys indicate is avoided by the corresponding segment of the proposed route. This cultural resource site was previously recorded but WBI Energy’s archeologists determined it encompasses a much larger area than previously known. WBI Energy’s archeologists believe this site could be eligible for listing on the NRHP. For these reasons, WBI Energy determined that the proposed route, which improves the river crossing location and avoids the cultural resource site, is environmentally preferable to the variation.

10.6.2.2 Bishop Route Variation

WBI Energy revised the proposed route between MPs 1.70 and 1.92 in Cass County after the 2021 field surveys identified a cultural resource site along a segment of the previously proposed route. The segment of the previously proposed route containing this cultural resource site is referred to in this assessment as the Bishop Route Variation. As shown on figure 10.6-6 in appendix 10A, the variation deviates from the proposed route in Cass County on the east side of the Maple River. It proceeds east essentially on a diagonal between MPs 1.70 and 1.92 for approximately 0.22 mile and then rejoins the proposed route.

An environmental comparison of the Bishop Route Variation to the corresponding segment of the proposed route is included in table 10.6-7.

TABLE 10.6-7

**Wahpeton Expansion Project
Comparison of Bishop Route Variation to the Corresponding Segments of Proposed Route**

Criteria	Variation	Proposed Route
Bishop Route Variation^a		
Length (miles)	0.21	0.22
Land affected by construction (acres)	1.9	2.0
Land within permanent right-of-way (acres)	1.3	1.3
Length collocated/uncollocated (miles)	0.0/0.21	0.0/0.22
Percent collocated	0	0
NHD waterbody crossings (number)	0	0
Major (>100 feet) waterbody crossings (number)	0	0
NWI wetlands affected (acres)	0.0	0.0
Forestland affected (acres)	0.0	0.0
Agricultural land affected (acres)	1.9	2.0
Steep slopes (>15%) crossed (feet)	0	0
Road/railroad crossings (number)	0/0	0/0
Residences within 50 feet of the centerline (number)	0	0
Federal/state/municipal land crossed (acres)	0	0
Landowners affected (number)	1	1
Cultural sites crossed/within 50 feet ^b (number)	1	0

Source: U.S. Fish and Wildlife Service, 2016; U.S. Geological Survey, National Hydrography, n.d; NDGISHUB-DOT, 2009; NDGISHUB-DOT, 2018.

^a A standard 75-foot-wide corridor for the variation and proposed route was used to calculate the acreages of any construction impacts; and a 50-foot-wide corridor was used to calculate the acreages of any permanent impacts.

^b Cultural resource sites include previously mapped sites identified by the Class I literature search and sites identified within 50 feet of potential workspace during WBI Energy's Class III field surveys that cannot be determined ineligible for listing on the National Register of Historic Places without further evaluation.

As shown in the table, the routes are similar in length and the type of terrain and resources crossed. Both routes impact the same landowner and neither route crosses any NWI-mapped wetlands or NHD-mapped waterbodies. Additionally, neither route passes close to any residences or other structures. The primary difference between the two routes is that the variation crosses a cultural resource site, which was discovered during WBI Energy's surveys. WBI Energy's surveys indicate this cultural site is avoided by the corresponding segment of the proposed route. For this reason, WBI Energy determined that the proposed route is environmentally preferable to the alternative.

10.6.2.3 Bartholomay Route Variation

WBI Energy revised the proposed route between MPs 9.27 and 10.63 in Cass County after the 2021 field surveys identified a cultural resource site along a segment of the previously proposed route. The segment of the previously proposed route containing this cultural resource site is referred to in this assessment as the Bartholomay Route Variation. As shown on figure 10.6-7 in appendix 10A, the variation deviates from the proposed route in Cass County on the west side of a tributary to the Sheyenne River. It proceeds in a southeasterly direction to the

south of, but no more than 500 feet from, the proposed route for approximately 1.3 miles until it rejoins the proposed route at MP 10.63.

An environmental comparison of the Bartholomay Route Variation to the corresponding segment of the proposed route is included in table 10.6-8.

TABLE 10.6-8		
Wahpeton Expansion Project		
Comparison of Bartholomay Route Variation to the Corresponding Segments of Proposed Route		
Criteria	Variation	Proposed Route
Bartholomay Route Variation^a		
Length (miles)	1.35	1.36
Land affected by construction (acres)	12.3	12.4
Land within permanent right-of-way (acres)	8.2	8.2
Length collocated/uncollocated (miles)	0.0/12.3	0.0/12.3
Percent collocated	0	0
NHD waterbody crossings (number)	1	1
Major (>100 feet) waterbody crossings (number)	0	0
NWI wetlands affected (acres)	0.0	0.0
Forestland affected (acres)	0.0	0.0
Agricultural land affected (acres)	12.3	12.4
Steep slopes (>15%) crossed (feet)	0	0
Road/railroad crossings (number)	0/0	0/0
Residences within 50 feet of the centerline (number)	0	0
Federal/state/municipal land crossed (acres)	0	0
Landowners affected (number)	2	2
Cultural sites crossed/within 50 feet ^b (number)	1	0

Source: U.S. Fish and Wildlife Service, 2016; U.S. Geological Survey, National Hydrography, n.d; NDGISHUB-DOT, 2009; NDGISHUB-DOT, 2018.

^a A standard 75-foot-wide corridor for the variation and proposed route was used to calculate the acreages of any construction impacts; and a 50-foot-wide corridor is used to calculate the acreages of any permanent impacts.

^b Cultural resource sites include previously mapped sites identified by the Class I literature search and sites identified within 50 feet of potential workspace during WBI Energy's Class III field surveys that cannot be determined ineligible for listing on the National Register of Historic Places without further evaluation.

As shown in the table, the routes are similar in length and the type of terrain and resources crossed. Both routes cross a tributary to the Sheyenne River, impact the same two landowners, and neither route crosses any NWI-mapped wetlands or passes close to any residences or other structures. The primary difference between the two routes is that the variation crosses a cultural resource site, which was discovered during WBI Energy's surveys. WBI Energy's surveys indicate this cultural resource site is avoided by the corresponding segment of the proposed route. For this reason, WBI Energy determined that the proposed route is environmentally preferable to the alternative.

10.6.2.4 Erickson Route Variation

WBI Energy revised the route between MPs 26.71 and 28.28 in Richland County after the 2021 field surveys identified a cultural resource site along a segment of the previously proposed route. The segment of the previously proposed route containing this cultural resource site is referred to in this assessment as the Erickson Route Variation. As shown on figure 10.6-8 in appendix 10A, the variation deviates from the proposed route on the north side of 55th Street SE between 166th Ave SE (County Road 26) and 168th Avenue SE. From there, the variation proceeds east essentially parallel to, but offset up to 550 feet to the south of, the proposed route for approximately 1.56 miles and then rejoins the proposed route about 0.5 mile east of 167th Avenue SE.

An environmental comparison of the Erickson Route Variation to the corresponding segment of the proposed route is included in table 10.6-9.

TABLE 10.6-9		
Wahpeton Expansion Project		
Comparison of Erickson Route Variation to the Corresponding Segments of Proposed Route		
Criteria	Variation	Proposed Route
Erickson Route Variation^a		
Length (miles)	1.47	1.57
Land affected by construction (acres)	13.4	14.3
Land within permanent right-of-way (acres)	8.9	9.5
Length collocated/uncollocated (miles)	1.47/0.0	0.0/1.57
Percent collocated	100	0
NHD waterbody crossings (number)	1	1
Major (>100 feet) waterbody crossings (number)	0	0
NWI wetlands affected (acres)	<0.1	0.0
Forestland affected (acres)	0.0	0.0
Agricultural land affected (acres)	12.0	14.0
Steep slopes (15%) crossed (feet)	0	2
Road/railroad crossings (number)	1/0	1/0
Residences within 50 feet of the centerline (number)	0	0
Federal/state/municipal land crossed (acres)	0	0
Landowners affected (number)	5	5
Cultural sites crossed/within 50 feet ^b (number)	1	0
<p>Source: U.S. Fish and Wildlife Service, 2016; U.S. Geological Survey, National Hydrography, n.d; NDGISHUB-DOT, 2009; NDGISHUB-DOT, 2018.</p> <p>^a A standard 75-foot-wide corridor for the variation and proposed route was used to calculate the acreages of any construction impacts; and a 50-foot-wide corridor was used to calculate the acreages of any permanent impacts.</p> <p>^b Cultural resource sites include previously mapped sites identified by the Class I literature search and sites identified within 50 feet of potential workspace during WBI Energy's Class III field surveys that cannot be determined ineligible for listing on the National Register of Historic Places without further evaluation.</p>		

As shown in the table, the routes are similar in length (the proposed route is 0.1 mile longer than the alternative) and the type of terrain and resources crossed. Both routes cross one NHD-

mapped waterbody and would impact the same five landowners. Neither route passes close to any residences or other structures. The primary difference between the two routes is that the variation crosses a cultural resource site, which was discovered during WBI Energy’s surveys. WBI Energy’s surveys indicate this cultural resource site is avoided by the corresponding segment of the proposed route. For this reason, WBI Energy determined that the proposed route is environmentally preferable to the alternative.

10.6.2.5 Moe Route Variation

WBI Energy revised the route between MPs 34.99 and 35.73 in Richland County after the 2021 field surveys identified a cultural resource site along a segment of the previously proposed route. The segment of the previously proposed route containing this cultural resource site is referred to in this assessment as the Moe Route Variation. As shown on figure 10.6-9 in appendix 10A, the variation deviates from the proposed route in Richland County north of 62nd Street SE and rejoins the proposed route just south of 62nd Street SE. In this area, both the preferred route and variation generally follow the eastern side of the Red River Valley and Western Railroad, with the variation slightly farther (approximately 60 to 65 feet) from the railroad than the proposed route. The North Country National Scenic Trail, which is described in section 10.6.1.3 and in more detail in Resource Report 8, also follows the railroad in this area and along the same side of the tracks (east side) as the proposed route and variation. As such, the trail would be more than 240 feet from the proposed route centerline and more than 290 feet from the variation centerline at its closest point.

An environmental comparison of the Moe Route Variation to the corresponding segment of the proposed route is included in table 10.6-10.

TABLE 10.6-10		
Wahpeton Expansion Project		
Comparison of Moe Route Variation to the Corresponding Segments of Proposed Route		
Criteria	Variation	Proposed Route
Moe Route Variation^a		
Length (miles)	0.74	0.74
Land affected by construction (acres)	6.7	6.7
Land within permanent right-of-way (acres)	4.5	4.5
Length collocated/uncollocated (miles)	0.0/0.74	0.0/0.74
Percent collocated	0	0
NHD waterbody crossings (number)	0	0
Major (>100 feet) waterbody crossings (number)	0	0
NWI wetlands affected (acres)	1.0	0.9
Forestland affected (acres)	0.0	0.0
Agricultural land affected (acres)	2.2	2.2
Steep slopes (>15%) crossed (feet)	0	0
Road/railroad crossings (number)	1/0	1/0
Residences within 50 feet of the centerline (number)	0	0
Federal/state/municipal land crossed (acres)	0	0
Landowners affected (number)	2	2

Cultural sites crossed/within 50 feet ^b (number)	1	0
<p>Source: U.S. Fish and Wildlife Service, 2016; U.S. Geological Survey, National Hydrography, n.d; NDGISHUB-DOT, 2009; NDGISHUB-DOT, 2018.</p> <p>^a A standard 75-foot-wide corridor for the variation and proposed route was used to calculate the acreages of any construction impacts; and a 50-foot-wide corridor is used to calculate the acreages of any permanent impacts.</p> <p>^b Cultural resource sites include previously mapped sites identified by the Class I literature search and sites identified within 50 feet of potential workspace during WBI Energy’s Class III field surveys that cannot be determined ineligible for listing on the National Register of Historic Places without further evaluation.</p>		

As shown in the table, the routes are similar in length and the type of terrain and resources crossed, although the variation would impact slightly more NWI-mapped wetlands. Both routes cross the same two landowners and neither route crosses any mapped waterbodies or passes close to any residences or other structures. The primary difference between the two routes is that the variation crosses a cultural resource site, which was discovered during WBI Energy’s surveys. WBI Energy’s surveys indicate this cultural resource site is avoided by the proposed route. For these reasons, WBI Energy determined that the proposed route is environmentally preferable to the alternative.

10.6.2.6 Antelope Creek/Wild Rice River Route Variations

In response to the Federal Energy Regulatory Commission’s (FERC) comments on WBI Energy’s draft resource reports, WBI Energy revised a segment of its previously proposed route between MPs 50.71 and 51.49 in Richland County at the Antelope Creek and the Wild Rice River. Prior to this change, WBI Energy had evaluated two route variations to cross Antelope Creek and the Wild Rice River. Both of these earlier variations utilized two short guided bores to cross Antelope Creek and the Wild Rice River. The proposed Project alignment and design now will utilize one longer guided bore to cross both waterbodies.

The first variation was described in WBI Energy’s draft resource report as the Antelope Creek/Wild Rice River Variation. This variation is referred to in this analysis as Variation A. The second variation was WBI Energy’s previously proposed route prior to the adoption of the current single guided bore design. This second variation is referred to in this analysis as Variation B. As shown on figure 10.6-10 in appendix 10A, the variations separate from the proposed route in Richland County just west of 175th Avenue SE. From there, Variation A proceeds east and crosses Antelope Creek. After crossing the creek, it continues east for about 0.4 mile, crossing a power line corridor and then the Wild Rice River at a bend just south of the proposed crossing location. After crossing the river, the variation continues east for another 830 feet and then rejoins the proposed route at MP 51.49. Variation B begins at the same point as Variation A but follows the same alignment as the proposed route east for approximately 0.24 mile. It separates from the proposed route after crossing Antelope Creek (about 480 feet east of the creek). It first proceeds east, southeast for about 0.18 mile and then goes east, northeast for about 0.26 mile until it rejoins the proposed route about 610 feet east of (and after crossing) the river. From there, it follows the same alignment as the proposed route east to MP 51.49, where it ends.

An environmental comparison of the Antelope Creek/Wild Rice River Route Variation to the corresponding segment of the proposed route is included in table 10.6-11.

TABLE 10.6-11

**Wahpeton Expansion Project
Comparison of Antelope Creek / Wild Rice River Route Variations to the Corresponding Segments of Proposed Route**

Criteria	Variation A	Variation B	Proposed Route
Antelope Creek/Wild Rice River Route Variations^a			
Length (miles)	0.74	0.78	0.73
Land affected by construction (acres) ^b	8.7	8.6	12.0
Land within permanent right-of-way (acres)	4.5	4.7	4.4
Length collocated/uncollocated (miles)	0.0/0.74	0.0/0.78	0.00/0.73
Percent collocated	0	0	0
NHD waterbody crossings (number)	2	2	3 ^c
Major (>100 feet) waterbody crossings (number)	0	0	0
NWI wetlands affected (acres)	0.0	0.0	0.0
Forestland affected (acres) ^d	1.7	2.2	1.9
Agricultural land affected (acres) ^e	8.7	7.9	12.0
Steep slopes (>15%) crossed (feet) ^f	0	0	0
Road/railroad crossings (number)	0	0	0
Residences within 50 feet of the centerline (number)	0	0	0
Federal/state/municipal land crossed (acres)	0	0	0
Landowners affected (number)	3	4	3
Cultural sites crossed/within 50 feet ^g (number)	0 ^h	0	0 ^h
<p>Source: U.S. Fish and Wildlife Service, 2016; U.S. Geological Survey, National Hydrography, n.d; NDGISHUB-DOT, 2009; NDGISHUB-DOT, 2018.</p> <p>^a Numbers assume use of guided bores to cross Antelope Creek and the Wild Rice River.</p> <p>^b Acreage is based on potential workspace, including additional temporary workspace, for the guided bores.</p> <p>^c In addition to crossing Antelope Creek, the proposed guided bore will cross under the Wild Rice River at a bend in the river. Because of this bend in the river, the bore alignment crosses under the Wild Rice River twice.</p> <p>^d Forestland acreage includes forestland located between the guided bore entry and exit locations.</p> <p>^e Agricultural land acreage includes estimated additional temporary workspace associated with estimated guided bore staging and pull back areas.</p> <p>^f Variation B crosses approximately 25 feet of slope greater than 15 percent. However, this slope would not be disturbed because it is in an area that would be crossed by guided bore.</p> <p>^g Cultural resource sites include previously mapped sites identified by the Class I literature search and sites identified within 50 feet of potential workspace during WBI Energy's Class III field surveys that cannot be determined ineligible for listing on the National Register of Historic Places without further evaluation.</p> <p>^h A portion of this alignment was not surveyed during WBI Energy's Class III field surveys and one landowner has indicated that there is an area containing unevaluated cultural resources on their property. There is potential that the Variation A and/or proposed route are/is within 50 feet of a cultural site.</p>			

As shown in the table, both routes cross the Antelope Creek, the Wild Rice River, and an overhead power line. None of the routes are collocated with another corridor or cross any roads or railroads and all three routes cross mostly flat to gently sloping terrain and are located primarily in agricultural land. The proposed route and Variation A cross three landowner properties whereas Variation B crosses four (two of which are also crossed by the proposed route). The primary difference between the routes is that the proposed route involves a single guided bore to

cross both Antelope Creek and the Wild Rice River whereas both variations will cross the waterbodies using two shorter guided bores. Another difference is that the proposed route is slightly shorter (about 0.1 mile shorter than Variation A and 0.5 mile shorter than Variation B) but because of additional temporary workspace (ATWS) for the guided bore, the proposed route would impact more agricultural land. However, it is the only route that will avoid the need for trenching between Antelope Creek and the Wild Rice River. For these reasons, WBI Energy determined that the proposed route is preferable to the variations.

10.6.2.7 Wild Rice River Route Variation/MP 57

In response to FERC’s comments on the draft resource reports, WBI Energy evaluated a route variation to the currently proposed route between MPs 56.78 and 57.79 in Richland County to avoid two crossings of the Wild Rice River. As shown on figure 10.6-11 in appendix 10A, the variation separates from the proposed route in Richland County in an agricultural field south of 73rd Street SE. From there, it proceeds across agricultural land southeast for approximately 0.14 mile (765 feet) and then south for 0.6 mile until it rejoins the proposed route on the south side of 74th Street SE at MP 57.79.

An environmental comparison of the Wild Rice River Route Variation/MP 57 to the corresponding segment of the proposed route is included in table 10.6-12.

TABLE 10.6-12		
Wahpeton Expansion Project Comparison of Wild Rice River Route Variation/MP 57 to the Corresponding Segments of Proposed Route		
Criteria	Variation	Proposed Route
Wild Rice River Route Variation^a		
Length (miles)	0.74	1.00
Land affected by construction (acres)	7.7	14.9
Land within permanent right of way (acres)	4.5	6.1
Length collocated/uncollocated (miles)	0.06/0.68	0.33/0.67
Percent collocated	8	33
NHD waterbody crossings (number)	0	3
Major (>100 feet) waterbody crossings (number)	0	0
NWI wetlands affected (acres)	0.0	0.0
Forestland affected (acres) ^b	0.0	0.4
Agricultural land affected (acres)	6.6	7.9
Steep slopes (>15%) crossed (feet)	0	0
Road/railroad crossings (number)	1	2
Residences within 50 feet of the centerline (number)	0	0
Federal/state/municipal land crossed (acres)	0	0
Landowners affected (number)	4	4
Cultural sites crossed/within 50 feet ^c (number)	unknown ^c	0

TABLE 10.6-12

Wahpeton Expansion Project		
Comparison of Wild Rice River Route Variation/MP 57 to the Corresponding Segments of Proposed Route		
Criteria	Variation	Proposed Route
<p>Source: U.S. Fish and Wildlife Service, 2016; U.S. Geological Survey, National Hydrography, n.d; NDGISHUB, 2009; NDGISHUB-DOT, 2018.</p> <p>^a Analysis is based on a the construction right-of-way and ATWS required for the pipeline including road crossings and the guided bore crossings of the Wild Rice River (proposed route only). A 50-foot-wide corridor was used to calculate the acreages of any permanent impacts. Actual acreage for the proposed route would increase at the guided bore entry and exit locations but decrease between the guided bore entry and exit locations.</p> <p>^b Forestland acreage includes forestland located between the guided bore entry and exit locations.</p> <p>^c Cultural resource sites include previously mapped sites identified by the Class I literature search and sites identified within 50 feet of potential workspace during WBI Energy’s Class III field surveys that cannot be determined ineligible for listing on the National Register of Historic Places without further evaluation.</p>		

As shown in the table, the Wild Rice River Route Variation/MP 57 is shorter than the proposed route by about 0.26 mile and would create about the same amount of new uncollocated corridor. Neither route crosses any mapped NWI wetlands or is near any residences. Additionally, both routes cross flat to gently sloping terrain and are located mostly in agricultural land. The primary difference between the two routes is that the proposed route crosses the Wild Rice River twice and another NHD mapped intermittent stream, all of which are avoided by the variation. The proposed route also crosses a small amount of forestland (0.4 acre) adjacent to the Wild Rice River crossings. However, WBI Energy’s proposed design—which will use the guided bore method to cross the Wild Rice River and all of the adjacent forestland—will avoid trenching of the bed and banks of the river and minimize tree clearing to what may be needed to lay electric-grid guide wires and potentially access the river for hydrostatic test water, which will largely negate these differences between the routes (see section 1.3.2.2 for additional detail). Another issue with the variation is that approximately 68 percent of the variation crosses a landowner who denied WBI Energy survey access and is likely to oppose having the pipeline on their land. Conversely, all four landowners along the proposed route granted survey access and seem amenable to the route. For these reasons, WBI Energy determined that the proposed route is preferable to the variation.

10.7 ABOVEGROUND FACILITY ALTERNATIVES

WBI Energy evaluated alternative site locations for the MDU—Kindred and MDU—Wahpeton Border Stations (see analyses for these alternatives below). There were no siting concerns associated with the other aboveground facilities. Therefore, WBI Energy did not identify or evaluate alternative sites for the existing Mapleton Compressor Station modifications, block valves, or pig launcher/receiver settings.

10.7.1 MDU—Kindred Border Station and Pipeline Route Alternatives

WBI Energy is in ongoing discussions to meet the needs of MDU and affected landowners to determine the best location for the MDU—Kindred Border Station. The proposed MDU—Kindred Border Station site is on agricultural land approximately 0.5 mile east of the intersection of 166th Avenue SE and 53rd Street SE at MP 23.35 in Cass County. WBI Energy identified two alternative station locations (see figure 10.7-1 in appendix 10A). The first of these, which is referred to in this analysis as MDU—Kindred Border Station Alternative A, was discussed in the Preliminary Draft of Resource Report 10 as the MDU—Kindred Border Station Alternative. This

alternative site is located on the south side of 53rd Street SE, approximately 1,000 feet west of the currently proposed site. The second alternative, which is referred to in this analysis as MDU—Kindred Border Station Alternative B, was discussed in Preliminary Draft of Resource Report 10 as WBI Energy’s preferred site. This alternative site is located southeast of the intersection of 166th Avenue SE and 53rd Street SE, approximately 2,325 feet west of the proposed site. MDU—Kindred Border Station Alternative A and Alternative B Sites are located on the same landowner’s property and the currently proposed site is located on a separate landowner’s property.

An environmental comparison of the two MDU—Kindred Border Station alternatives to the proposed site is included in table 10.7-1. All three sites are located on private land and would each only impact a single landowner. All three sites are on agricultural land and are at least 3,000 feet from the nearest residence. The primary differences between the sites include how much of the site is located on prime farmland, whether or not the site would impact mapped wetlands, the distance of each site from the Kindred/Davenport Regional Public Airport (also known as the Robert Odegaard Field Airport), and the route of the pipeline.

Alternative Sites A and B are located on soils classified as prime farmland if drained. In contrast, only about half of the proposed site is located on these types of soils (the rest of the proposed site is on soils that are not classified as prime farmland). Alternative Site A is also the only site that would impact wetlands and is the closest site to the Kindred/Davenport Regional Airport.

The Kindred/Davenport Regional Airport currently has a single 3,300-foot-long, 60-foot-wide concrete runway with a northwest to southeast orientation. According to 2020 Federal Aviation Administration (FAA) data, 30 aircrafts are based at the airport. These include 24 single engine airplanes, three multi-engine airplanes, and three military aircrafts. Air traffic averages around 115 aircrafts per week and consists primarily of local general aviation (approximately 57 percent) and transient general aviation (approximately 42 percent). The remainder (<1 percent each) consist of military and air taxi traffic. WBI Energy has had preliminary discussions with the FAA regarding the potential hazards of siting a border station facility near the airport. From these discussions, WBI Energy learned that there are two proposed runway expansion projects at the airport. One would extend the current runway further to the southeast across 166th Avenue SE. The second would involve construction of a new, shorter runway perpendicular to the existing runway west of 166th Avenue SE. The proposed site is further east from the existing airport runway and planned runway extension than the alternative sites. It would also be far enough east to be beyond the future runway protect zone. WBI Energy submitted a request to the FAA for an aeronautical study of the proposed site. The FAA responded to this request on January 20, 2022 and concluded that the proposed border station does not exceed obstruction standards and would not be a hazard to air navigation. In the spring of 2022, WBI Energy plans to submit a request for a similar analysis of the temporary crane that will be used to install the border station equipment.

Since the preliminary draft of this resource report, WBI Energy adopted a pipeline route to its proposed MDU—Kindred Border Station. As shown in figure 10.7-1 in appendix 10A, the alternative pipeline route would deviate from the proposed route at MP 21.84 and proceed south following the east side of 166th Avenue SE until it crosses 53rd Street SE (where it could intersect with Alternative Site A). The route would then turn and proceed east along the south side of the street (where it could intersect with Alternative Site B). The route would continue along the south side of the street until it rejoins the proposed route at MP 23.35.

As indicated in table 10.7-1, the alternative pipeline route is the same length as the proposed pipeline route but it is more collocated with other rights-of-way, thereby reducing the amount of new greenfield corridor created by the Project. In many other respects, the pipeline routes to the proposed site and alternative sites are similar. Both routes cross predominantly agricultural land and one road. Additionally, neither route crosses forestland, NHD-mapped waterbodies, or passes within 50 feet of a residence—although there is one residence approximately 350 feet from the proposed route. The alternative route would increase the number of affected landowners by one and would impact 870 feet of NWI-mapped wetlands that would be completely avoided by the proposed route. Additionally, the FAA has expressed concern that the alternative route crosses an area that has been designated for the runway extension. The FAA is concerned that this would complicate construction of the extension and potentially impact future runway operations and maintenance, similar to the MDU—Kindred Border Station alternative sites. WBI Energy’s proposed route would address these concerns by avoiding the proposed runway extension.

Criteria	Alternative A Site/Route ^a	Alternative B Site/Route ^a	Proposed Site/Route
MDU—Kindred Border Station Site			
Site Size (acres)	1.6	1.6	1.6
Ownership/Number of Landowners	Private/1	Private/1	Private/1
Existing Land Use (cover type)	Agriculture	Agriculture	Agriculture
NHD waterbody crossing (number)	0	0	0
NWI Wetlands Affected (acres)	0.1	0.0	0.0
Forestland affected (acres)	0.0	0.0	0.0
Prime Farmland	Yes, if drained	Yes, if drained	About 50 % of site is prime farmland if drained
Topography	0-1% slope	0-1% slope	0-1% slope
Approximate distance to nearest residence (miles)	3,000	4,200	3,000
Distance to existing airport runways (feet)	890	890	3,600
Distance to planned runway expansion (feet)	0	0	1,700
MDU—Kindred Border Station Pipeline			
Length (miles)	1.51	1.51	1.51
Land affected by construction (acres) ^b	13.7	13.7	13.7
Land within permanent right of way (acres) ^b	9.2	9.2	9.2
Length collocated/uncollocated (miles)	1.51/0.0	1.51/0.0	0.5/1.01
Percent collocated	100	100	33
NHD waterbody crossings (number)	0	0	0
Major (>100 feet) waterbody crossings (number)	0	0	0
NWI wetlands affected (acres)	2.0	2.0	0.0
Forestland affected (acres)	0.0	0.0	0.0
Agricultural land affected (acres)	13.1	13.1	13.5
Steep slopes (>15%) crossed (feet)	0	0	0
Road/railroad crossings (number)	1/0	1/0	1/0

TABLE 10.7-1

Wahpeton Expansion Project			
Comparison of MDU—Kindred Border Station Alternatives to the Corresponding Segments of Proposed Site/Route			
Criteria	Alternative A Site/Route ^a	Alternative B Site/Route ^a	Proposed Site/Route
Residences within 50 feet of the centerline (number)	0	0	0
Federal/state/municipal land crossed (acres)	0	0	0
Landowners affected (number)	4	4	3
Cultural sites crossed/within 50 feet ^c (number)	0	0	unknown
<p>Source: U.S. Fish and Wildlife Service, 2016; U.S. Geological Survey, National Hydrography, n.d; NDGISHUB-DOT, 2009; NDGISHUB-DOT, 2018.</p> <p>^a The pipeline for both the MDU—Kindred Border Station Alternative A and Alternative B would be the same.</p> <p>^b A standard 75-foot-wide corridor for the variation and proposed route was used to calculate the acreages of any construction impacts; and a 50-foot-wide corridor was used to calculate the acreages of any permanent impacts.</p> <p>^c Cultural resource sites include previously mapped sites identified by the Class I literature search and sites identified within 50 feet of potential workspace during WBI Energy’s Class III field surveys that cannot be determined ineligible for listing on the National Register of Historic Places without further evaluation. WBI Energy field surveyed the alternatives but has not yet surveyed the proposed route.</p>			

Because the proposed site increases the distance of the MDU—Kindred Border Station from the airport runway and future runway extension construction and minimizes the potential for impacts on existing and future airport operations, WBI Energy determined the proposed site and pipeline route are environmentally preferable to the alternative sites and routes for the MDU—Kindred Border Station.

10.7.2 MDU—Wahpeton Border Station and Pipeline Route Alternatives

WBI Energy is continuing discussions with MDU and affected landowners to determine the best location for the MDU—Wahpeton Border Station that meets MDU’s and the landowners’ needs. The current proposed MDU—Wahpeton Border Station site is in Richland County and located on agricultural land just northeast of the intersection of 180th Avenue SE and 75th Street SE. WBI Energy identified two alternative station locations as shown on figure 10.7-2 in appendix 10A. The first of these, which is referred to in this analysis as MDU—Wahpeton Border Station Alternative A, was discussed in the Preliminary Draft of Resource Report 10 as the MDU—Wahpeton Border Station Alternative. This alternative is located about 1.4 miles southwest of the proposed site, just northeast of the intersection of 179th Avenue SE and 76th Street SE. The second alternative, which is referred to in this analysis as MDU—Wahpeton Border Station Alternative B, was discussed in Preliminary Draft of Resource Report 10 as WBI Energy’s preferred site. This alternative is located approximately 1.0 mile west of the proposed site, just northeast of the intersection of 179th Avenue SE and 75th Street SE.

An environmental comparison of the two MDU—Wahpeton Border Station alternatives (and their associated pipelines) to the proposed site (and proposed pipeline) is included in table 10.7-2. All three sites are located on private land with a single landowner. All three sites also are on flat terrain that is either prime farmland or prime farmland when drained. WBI Energy’s customer indicated a preference for the Alternative A Site over the others. However, this site is located in a forested area (approximately 1.44 acres of the site are forested). Additionally, unlike the other sites, Alternative A is within 80 feet of a residence to the south and about 165 feet from

a residence to the north. Further, while neither the proposed site or Alternative B would directly impact wetlands or waterbodies, the northern portion of the Alternative A Site would impact a NHD mapped stream (which would be within the boundary of the site) and require the filling of approximately 0.16 acre NWI-mapped wetland.

TABLE 10.7-2

Wahpeton Expansion Project			
Comparison of MDU—Wahpeton Border Station Alternatives to the Corresponding Segments of Proposed Site/Route			
Criteria	Alternative A Site/Route	Alternative B Site/Route	Proposed Site/Route
MDU—Wahpeton Border Station Site			
Site Size (acres)	1.6	1.6	1.6
Ownership/Number of Landowners	Private/1	Private/1	Private/1
Existing Land Use (cover type)	Forest	Agriculture	Agriculture
NHD waterbody crossing (number)	1	0	0
NWI Wetlands Affected (acres)	0.16	0.0	0.0
Forestland affected (acres)	1.44	0.0	0.0
Prime Farmland	Prime farmland if drained	Prime farmland	Prime farmland
Topography	0–1% slope	0-2% slope	0–2% slope
Approximate distance to nearest residence (feet)	80	1,340	1,600
MDU—Wahpeton Border Station Pipeline^a			
Length (miles)	1.85	0.96	1.90
Land affected by construction (acres)	16.8	8.7	17.3
Land within permanent right-of-way (acres)	11.2	5.8	11.5
Length collocated/uncollocated (miles)	1.85/0.0	0.96/0.0	1.90/0.0
Percent collocated	100	100	100
NHD waterbody crossings (number)	2	1	0
Major (>100 feet) waterbody crossings (number)	0	0	0
NWI wetlands affected (acres)	<0.1	0.0	0.0
Forestland affected (acres)	<0.1	0.0	0.0
Agricultural land affected (acres)	14.6	8.6	16.0
Steep slopes (>15%) crossed (feet)	0	0	0
Road/railroad crossings (number)	3/0	0/0	1/1
Residences within 50 feet of the centerline (number) ^b	0	0	0
Federal/state/municipal land crossed (acres)	0	0	0
Landowners affected (number)	10	2	4
Cultural sites crossed/within 50 feet ^c (number)	unknown	unknown	unknown
Source: U.S. Fish and Wildlife Service, 2016; U.S. Geological Survey, National Hydrography, n.d; NDGISHUB-DOT, 2009; NDGISHUB-DOT, 2018.			
^a A standard 75-foot-wide corridor for the variation and proposed route was used to calculate the acreages of any construction impacts; and a 50-foot-wide corridor was used to calculate the acreages of any permanent impacts			
^b Pipeline centerline of Alternative A is within approximately 66 feet of one residence.			
^c Cultural resource sites include previously mapped sites identified by the Class I literature search and sites identified within 50 feet of potential workspace during WBI Energy's Class III field surveys that cannot be determined ineligible			

TABLE 10.7-2			
Wahpeton Expansion Project			
Comparison of MDU—Wahpeton Border Station Alternatives to the Corresponding Segments of Proposed Site/Route			
Criteria	Alternative A Site/Route	Alternative B Site/Route	Proposed Site/Route
for listing on the National Register of Historic Places without further evaluation. WBI Energy has not completed fieldsurveys for the alternatives or the proposed route.			

In contrast, Alternative B and the proposed site are very similar from an environmental perspective. Both sites are located in agricultural fields adjacent to 75th Street SE, which are 1,300 feet or more from any residence. The proposed site and Alternative B are also far from any mapped stream or wetlands. The primary difference is that the landowner of the Alternative B site has told WBI Energy that they are opposed to having a border station on their property, which is not the case with the proposed site.

Another difference between the three sites is the pipeline route necessary to connect each site to the rest of the Project. The pipeline route to both alternative sites would deviate from the proposed route at MP 58.67. From there, it would proceed south following the east side of 179th Avenue SE for approximately 0.96 mile to Alternative B. To reach Alternative A, it would continue south on the east side of 179th Avenue SE for another 0.9 mile. As indicated in table 10.7-2, Alternative B would require approximately 1 mile less pipeline than either the proposed site or Alternative A. The pipeline route to Alternative B would also affect less agricultural land and fewer landowners than that of the other sites (two fewer than the proposed route and eight fewer than the Alternative A route). However, both the Alternative B and Alternative A routes would cross NHD-mapped streams (one in the case of Alternative B and two in the case of Alternative A), which are avoided by the proposed route. Additionally, both the Alternative A and Alternative B routes cross properties whose owners denied survey access and, thus, would likely oppose the pipeline on their properties.

For these reasons, WBI Energy determined the proposed site and pipeline route is environmentally preferable to the alternative sites and routes for the MDU—Wahpeton Border Station.

10.8 GUIDED BORE EVALUATIONS

FERC’s comments on the draft resource reports requested that WBI Energy evaluate whether the planned guided bores could be extended at MPs 13.7, 33.4, and 51.0 to avoid some forest and wetland impacts. Evaluation of modifications at these three locations is provided below.

10.8.1 Guided Bore at MP 13.7

There is no forestland in the vicinity of the guided bore across 44th Street SE and 166th Avenue SE at MP 13.7. The ends of the road bore will be outside of the wetlands and no trenching will occur within the wetlands bordering the roads at this location. WBI Energy has adjusted the ATWS associated with the road bore to keep it out of the wetlands. However, WBI Energy still requires workspace within the wetlands on the construction right-of-way to move its equipment across the 44th Street SE/166 Avenue SE intersection. This need cannot be addressed by extending the bore.

10.8.2 Guided Bore at MP 33.4

There are no forestlands in the vicinity of the guided bore for County Road 2 at MP 33.4. Workspace, including two ATWS, is needed south of the county road for staging and spoil storage associated with the road bore. This workspace is located in an agricultural hay field and partially overlaps emergent wetland wrib007e. This wetland begins about 95 feet south of the road between MPs 33.4 and 33.5 and extends south from there for approximately 550 feet. To avoid having workspace in this wetland, the road bore, which is about 185 feet long, would need to be extended another 590 feet further south. This would nearly quadruple the length of the bore. This option is not practicable or warranted given that only 0.9 acre of the emergent wetland will be affected by the workspace (construction right-of-way and ATWS) for the bore and the wetland consists mostly (90 percent cover) of foxtail barley and lesser amounts of other mostly fast growing and/or weedy species including yellow foxtail and reed canary grass.

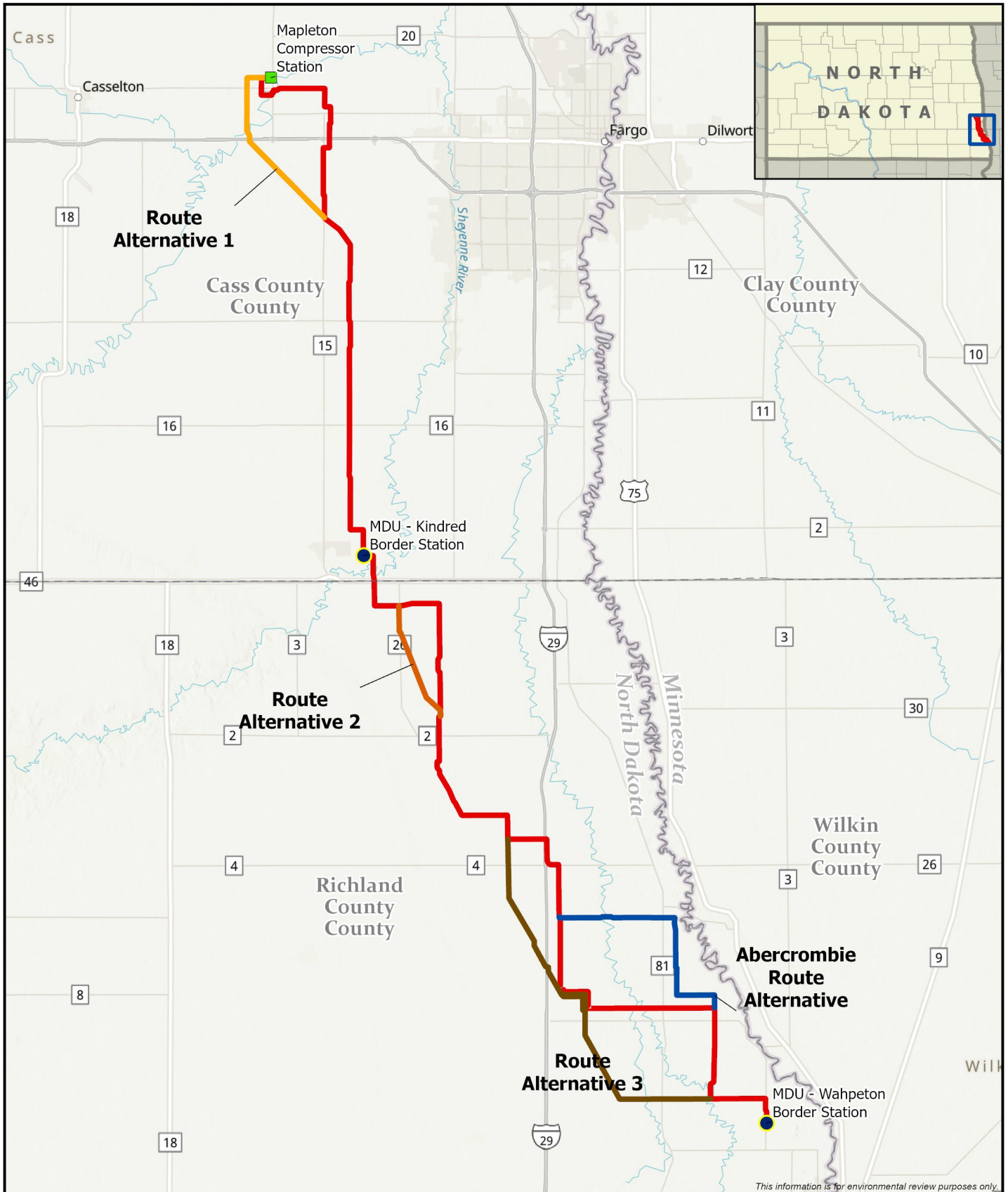
10.8.3 Guided Bore at MP 51.0

There are no wetlands bordering the first crossing of the Wild Rice River near MP 51.0. However, upland forest borders the river. Following the submittal of the draft resources reports, WBI Energy extended and realigned the guided bore across the Wild Rice River. The new bore, which combines both the Antelope Creek and Wild Rice River crossings, begins in an open field on the west side of Antelope Creek and extends to an open field on the east side of the Wild Rice River. The workspace for this new guided bore will avoid the need for trenching between Antelope Creek and the Wild Rice River and will minimize tree clearing to what may be needed to lay electric-grid guide wires and potentially access the river for hydrostatic test water. A comparison of the current design to other previously considered route variations is included in section 10.6.2.7 above.

10.9 REFERENCES

- Energy Information Administration(EIA). 2021. *Annual Energy Outlook 2021 with Projections into 2050*. U.S. Department of Energy. Available online: <https://www.eia.gov/outlooks/aeo/>. Accessed: October 2021.
- North Dakota Geographic Information Systems (NDGISHUB-DOT). 2009. *NDGISHUB Railroads*. June 18, 2009 (Updated February 11, 2022). Available online: <https://gishubdata-ndgov.hub.arcgis.com/datasets/NDGOV::ndgishub-railroads/about>.
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- U.S. Geological Survey, National Hydrography. N.d. *National Hydrography Dataset*. Available online: <https://www.usgs.gov/national-hydrography/national-hydrography-dataset>.

APPENDIX 10A ALTERNATIVES FIGURES

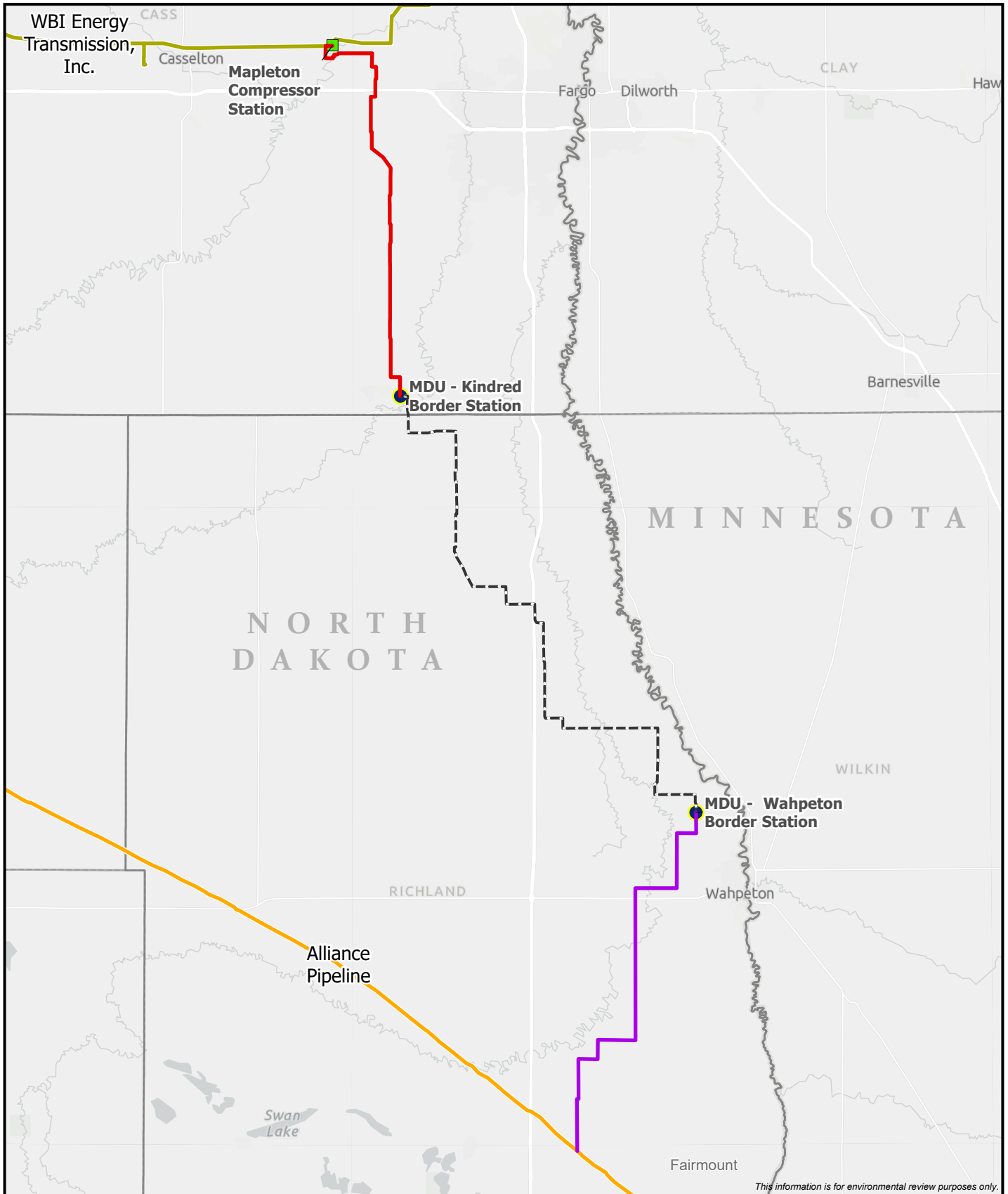


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Figure 10.4-1
Route Alternatives
Wahpeton Expansion Project
 WBI Energy Transmission, Inc.
 Cass and Richland County, North Dakota





This information is for environmental review purposes only.

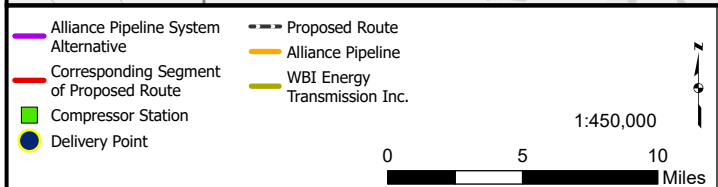
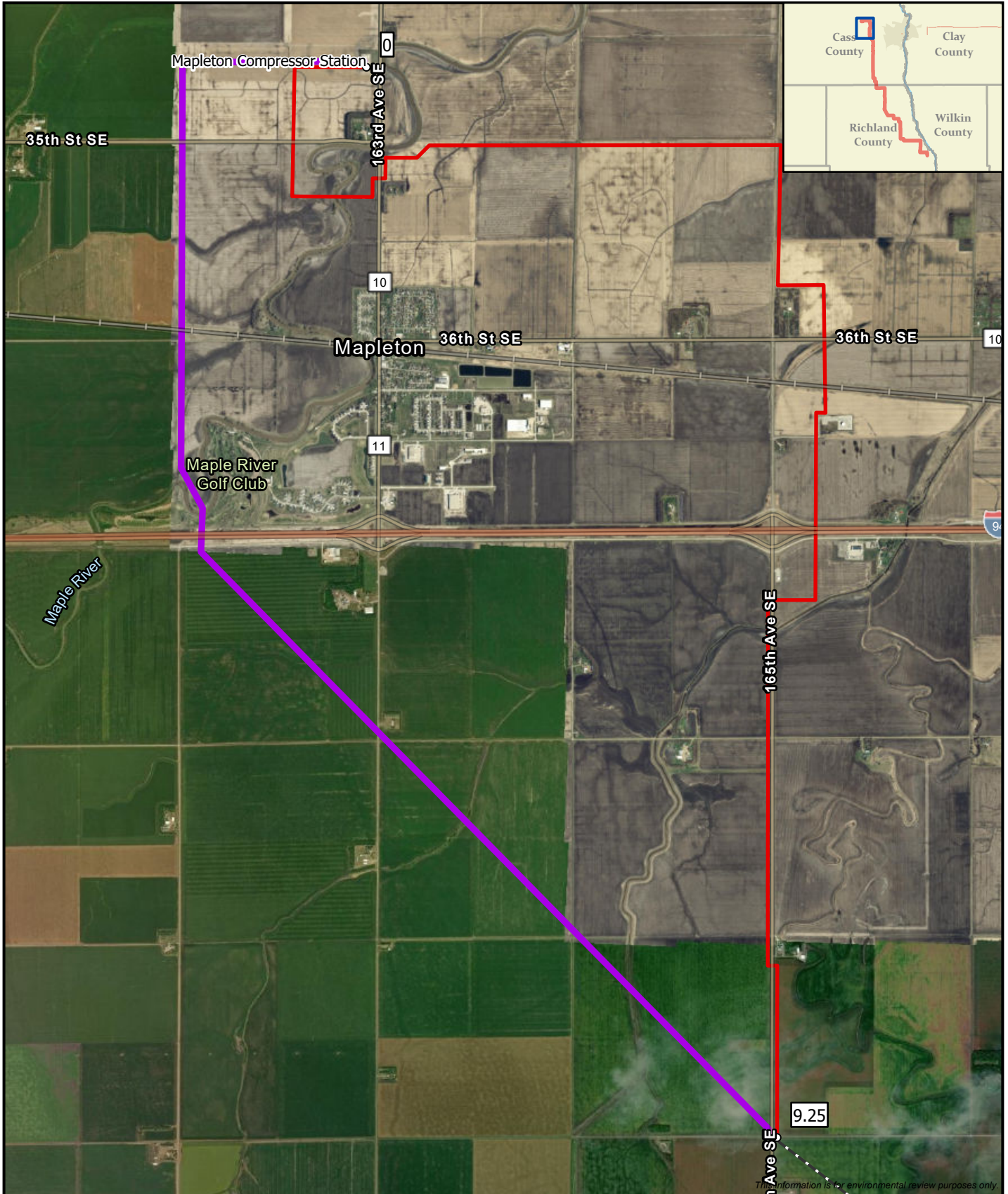


Figure 10.4-2
System Alternatives
Wahpeton Expansion Project
 WBI Energy Transmission, Inc.
 Cass and Richland County, North Dakota



<ul style="list-style-type: none"> — Alternative/Variation — Corresponding Segment of Proposed Route ○ Milepost --- Proposed Route 	<p>1:43,000</p> <p>0 0.15 0.3 0.6 Miles</p>		<p>Figure 10.6-1 Route Alternative 1 Wahpeton Expansion Project WBI Energy Transmission, Inc. Cass County, North Dakota</p> 
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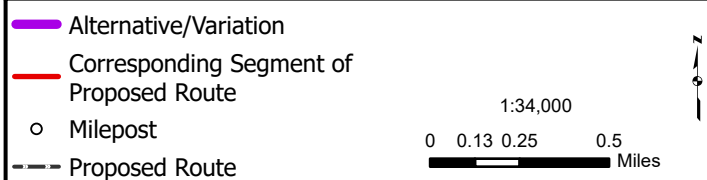
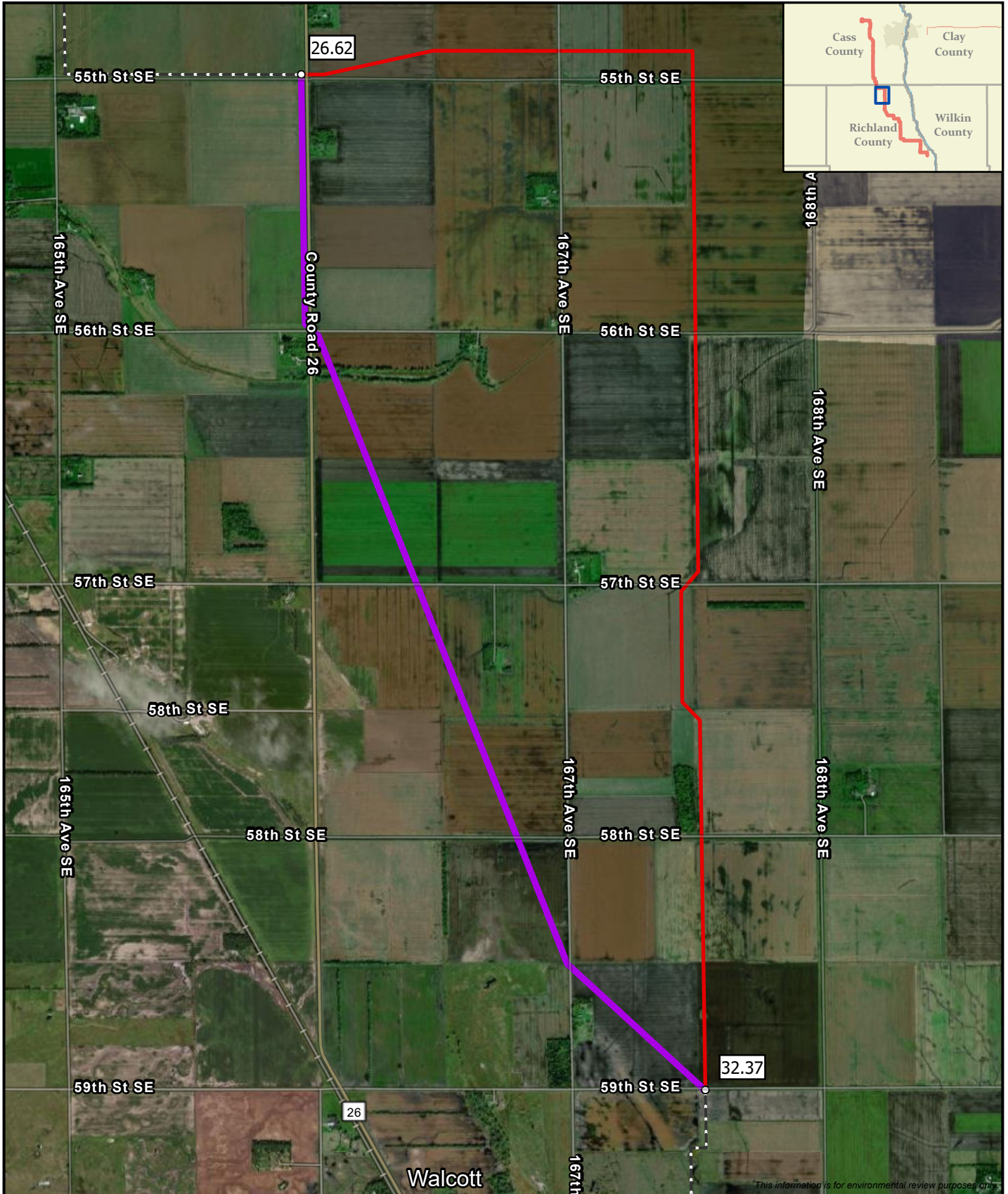



Figure 10.6-2
Route Alternative 2
Wahpeton Expansion Project
 WBI Energy Transmission, Inc.
 Richland County, North Dakota



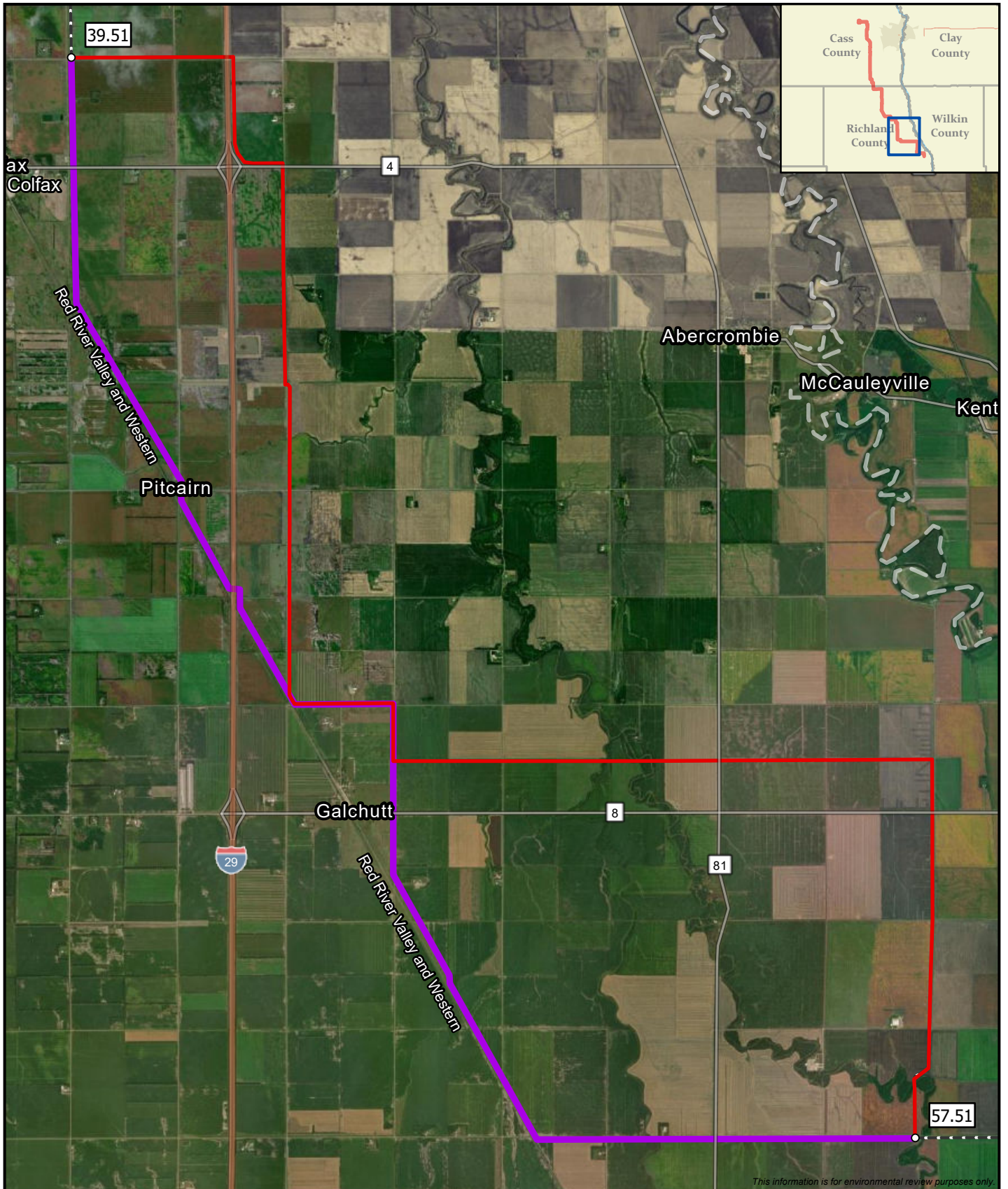


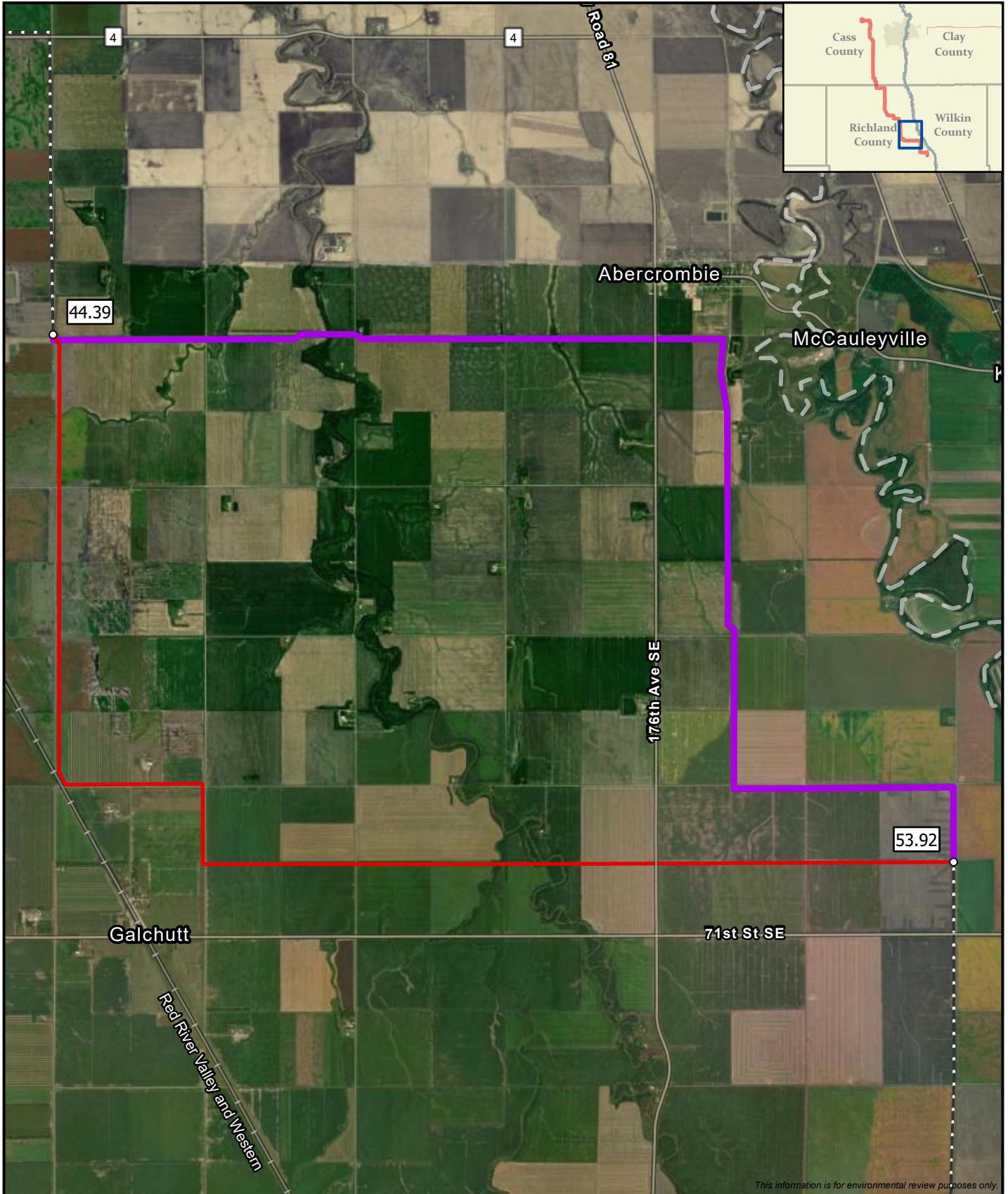
Figure 10.6-3
Route Alternative 3
Wahpeton Expansion Project
 WBI Energy Transmission, Inc.
 Richland County, North Dakota

— Alternative/Variation
 — Corresponding Segment of Proposed Route
 ○ Milepost
 - - - Proposed Route

1:79,000
 0 0.3 0.6 1.2 Miles

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ERM



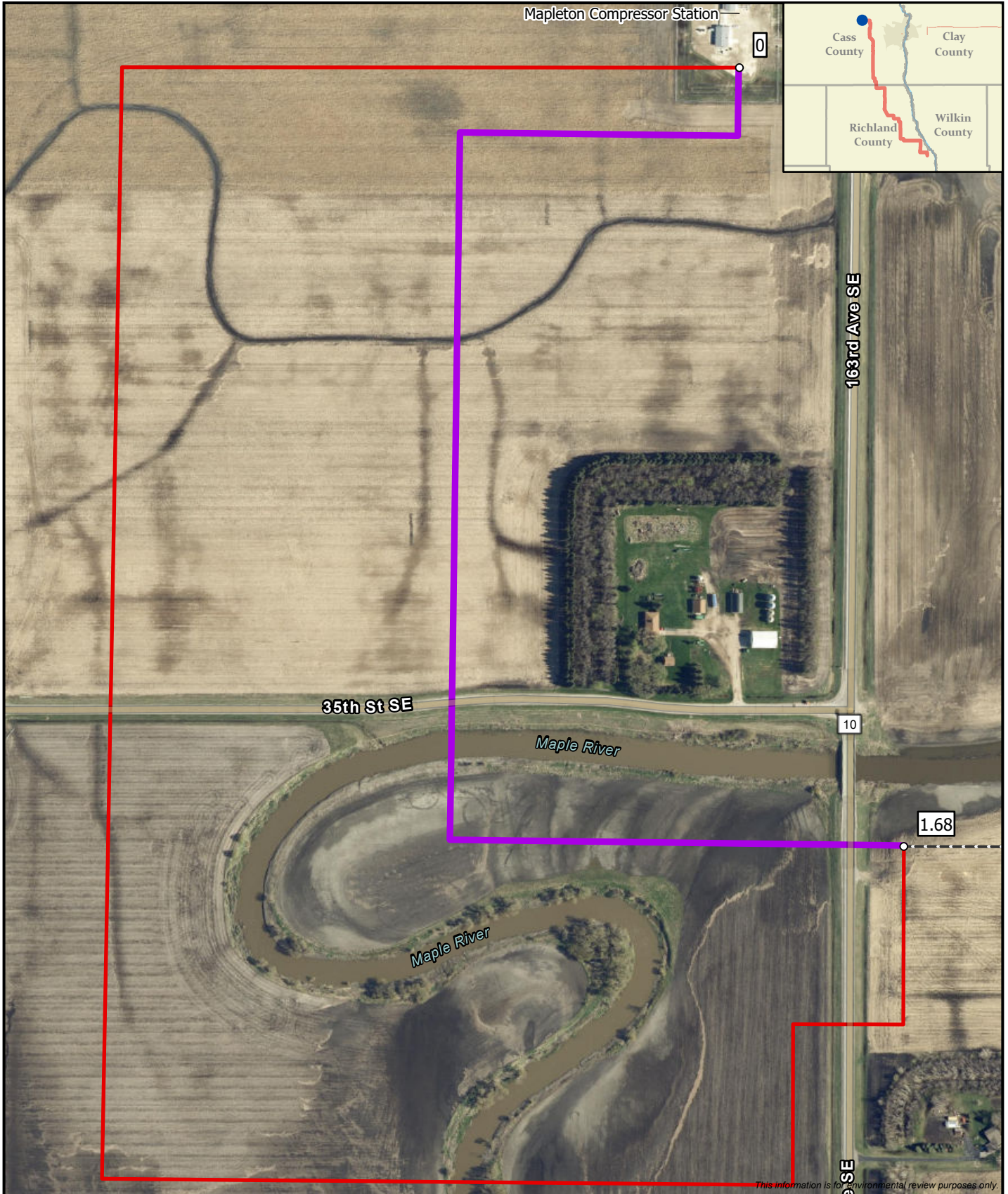
This information is for environmental review purposes only.

- Alternative/Variation
- Corresponding Segment of Proposed Route
- Milepost
- Proposed Route

1:57,000

0 0.2 0.4 0.8 Miles

Figure 10.6-4
Abercrombie Route Alternative
Wahpeton Expansion Project
 WBI Energy Transmission, Inc.
 Richland County, North Dakota



This information is for environmental review purposes only.

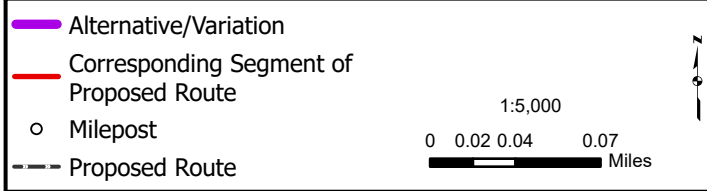

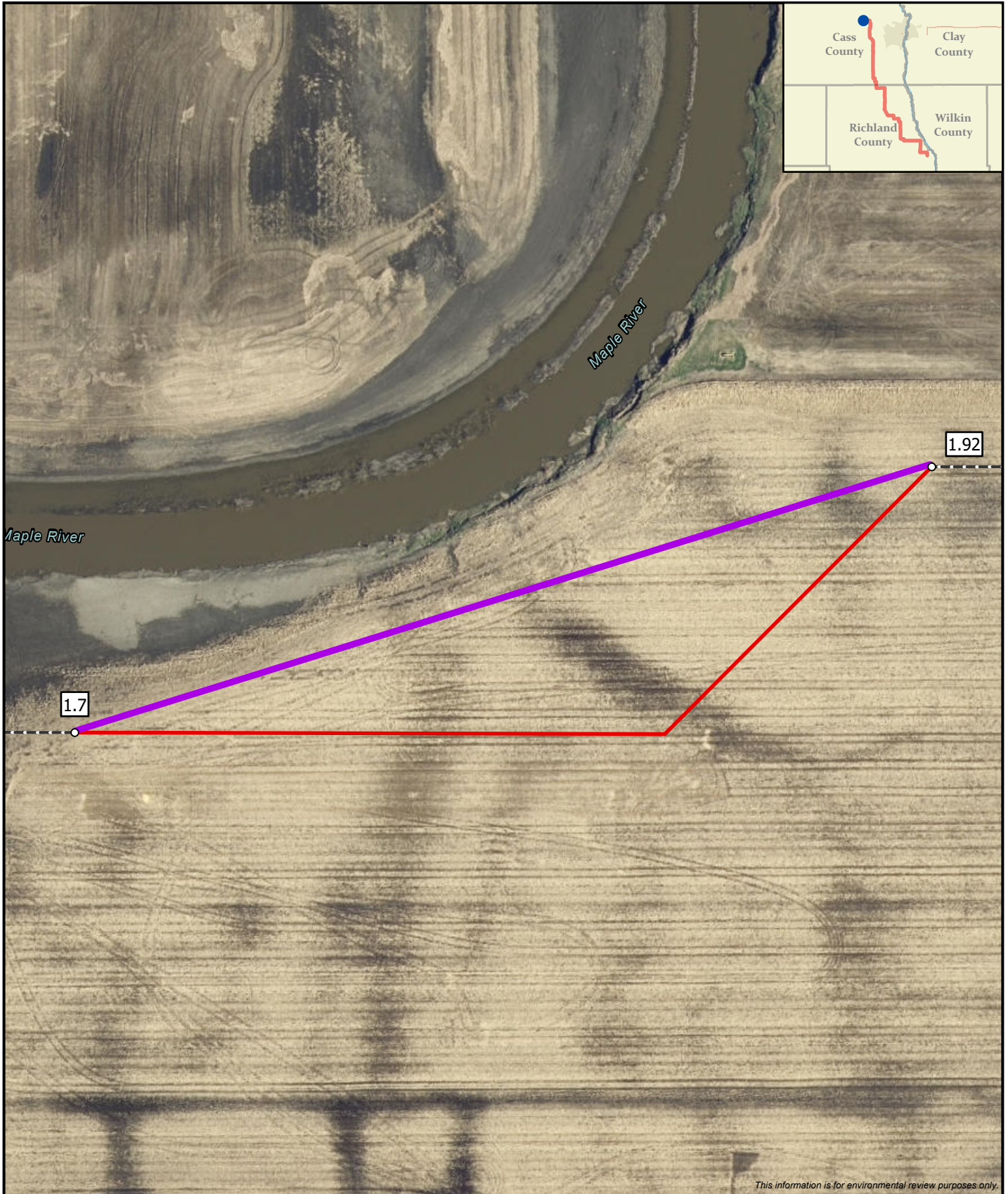


Figure 10.6-5
Maple River Route Variation
Wahpeton Expansion Project
 WBI Energy Transmission, Inc.
 Cass County, North Dakota





This information is for environmental review purposes only.

- Alternative/Variation
- Corresponding Segment of Proposed Route
- Milepost
- - - Proposed Route

1:2,000

0 0.01 0.01 0.03 Miles

Figure 10.6-6
Bishop Route Variation
Wahpeton Expansion Project
 WBI Energy Transmission, Inc.
 Cass County, North Dakota



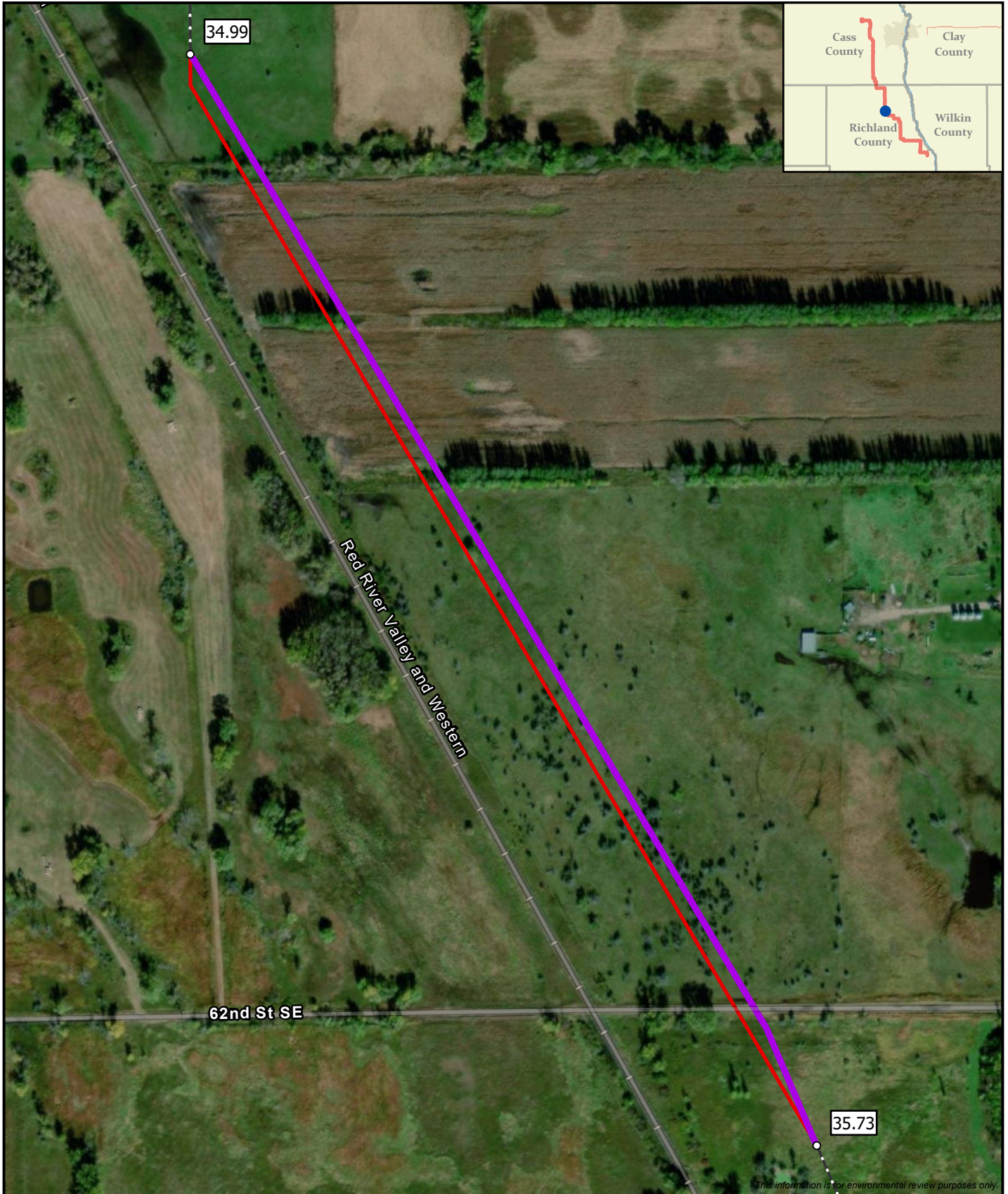
This information is for environmental review purposes only.

<ul style="list-style-type: none"> — Alternative/Variation — Corresponding Segment of Proposed Route ○ Milepost — Proposed Route 	<p>1:9,000</p> <p>0 0.04 0.07 0.14 Miles</p>		<p>Figure 10.6-7 Bartholomay Route Variation Wahpeton Expansion Project WBI Energy Transmission, Inc. Cass County, North Dakota</p>	
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This information is for environmental review purposes only.

<ul style="list-style-type: none"> — Alternative/Variation — Corresponding Segment of Proposed Route ○ Milepost --- Proposed Route 	<p>1:14,000</p> <p>0 0.05 0.1 0.2 Miles</p>	<p>Figure 10.6-8 Erickson Route Variation Wahpeton Expansion Project WBI Energy Transmission, Inc. Richland County, North Dakota</p>
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This information is for environmental review purposes only.

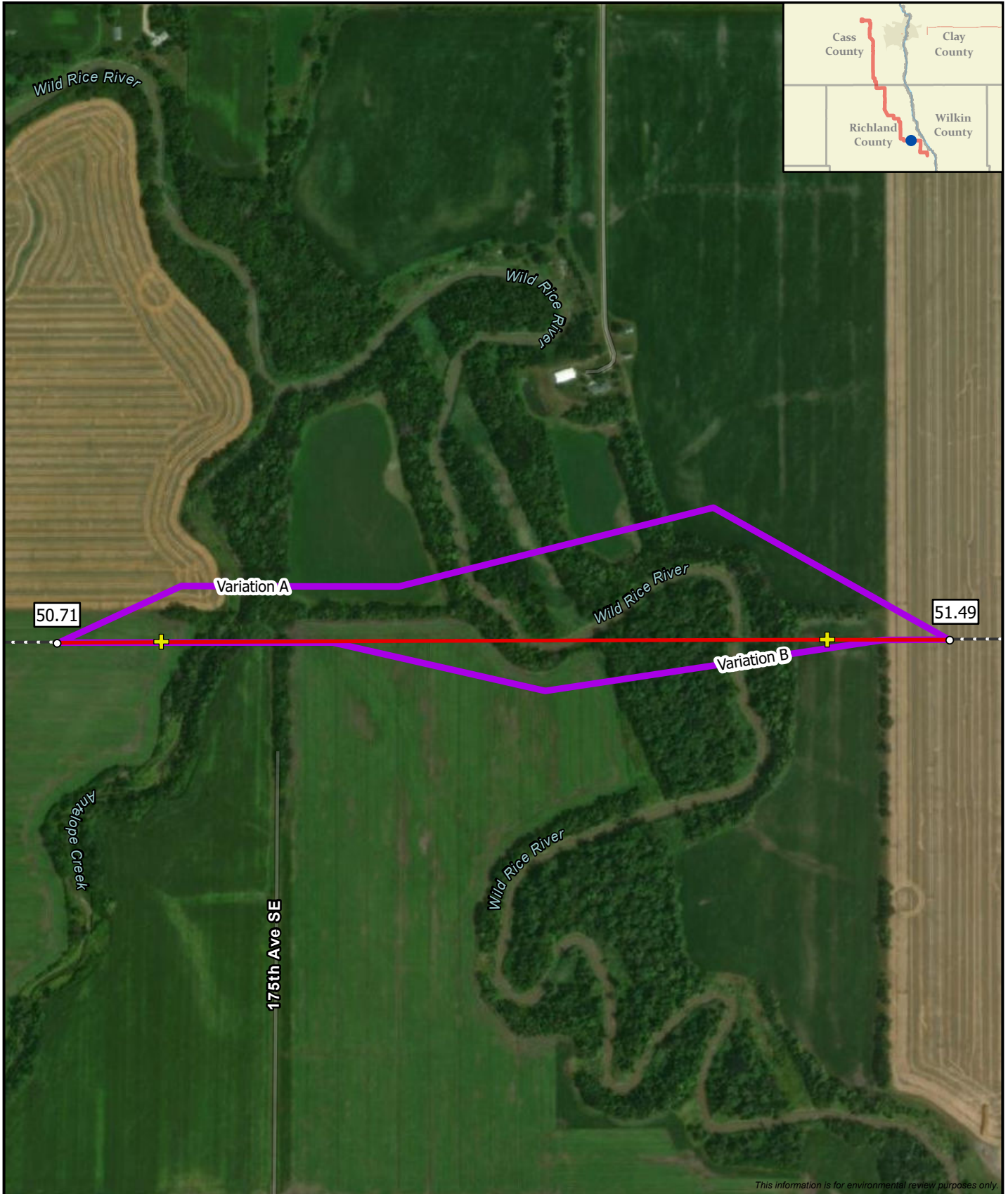
- Alternative/Variation
- Corresponding Segment of Proposed Route
- Milepost
- - - Proposed Route

1:5,000

0 0.02 0.04 0.07 Miles

Figure 10.6-9
Moe Route Variation
Wahpeton Expansion Project
 WBI Energy Transmission, Inc.
 Richland County, North Dakota





This information is for environmental review purposes only.

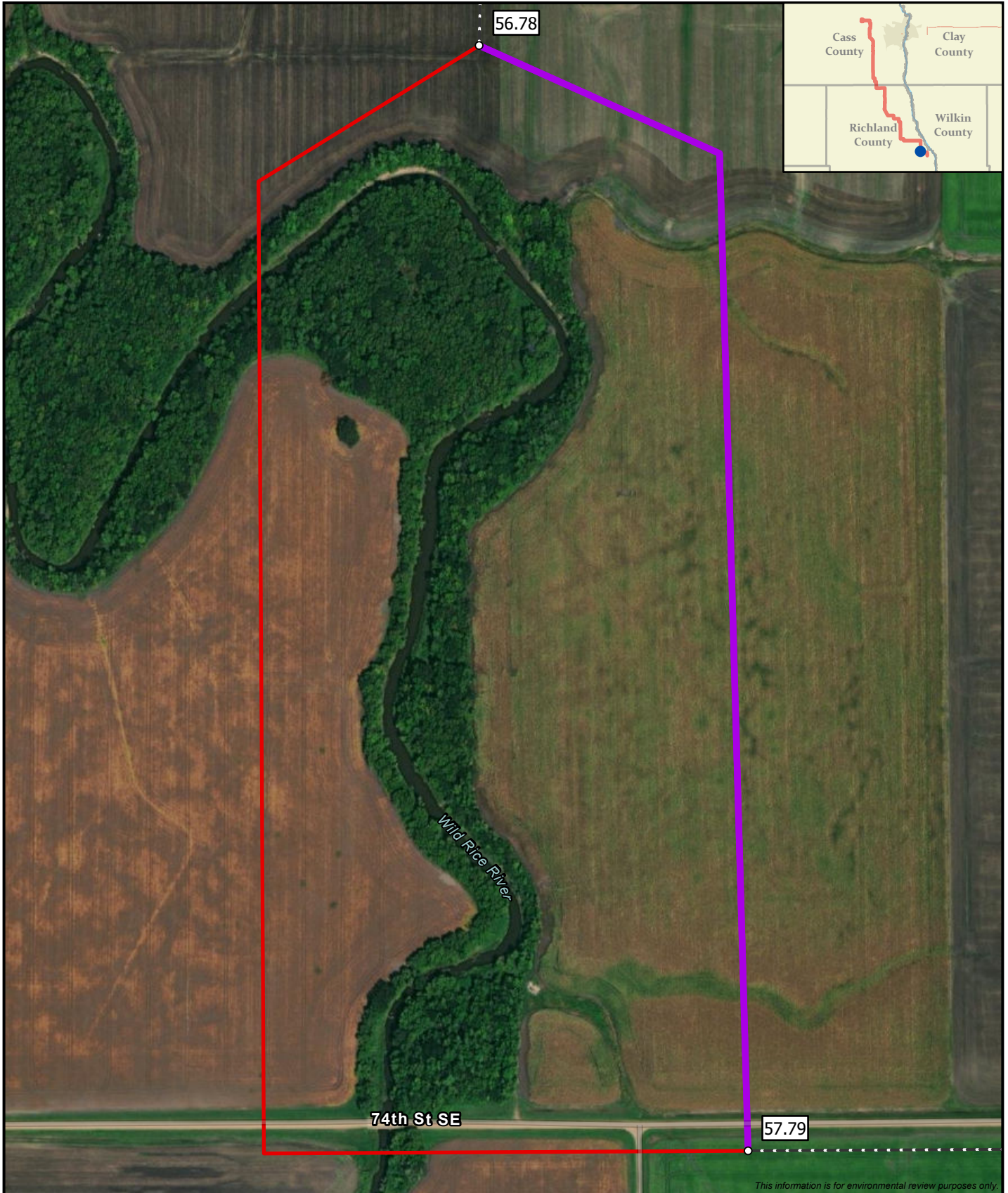
- Alternative/Variation
- Corresponding Segment of Proposed Route
- + Bore Enter/Exit
- Milepost
- Proposed Route

1:7,000

0 0.03 0.06 0.11 Miles

Figure 10.6-10
Antelope Creek/Wild Rice River Variations
Wahpeton Expansion Project
 WBI Energy Transmission, Inc.
 Richland County, North Dakota





This information is for environmental review purposes only.

- Alternative/Variation
- Corresponding Segment of Proposed Route
- Milepost
- Proposed Route

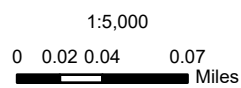


Figure 10.6-11
Wild Rice River Route Variation/MP 57
Wahpeton Expansion Project
 WBI Energy Transmission, Inc.
 Richland County, North Dakota

