Williston to Tioga Transmission Line Project

Environmental Assessment for

Pre-approval Review

DOE/EA - 1635

Western
AREA POWER
ADMINISTRATION

March 2010

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Acronyms and Abbreviations

°C	degrees Celsius
AAQS	Ambient Air Quality Standards
AIRFA	American Indian Religious Freedom Act of 1978
amsl	above mean sea level
APLIC	Avian Power Line Interaction Committee
BEPC	Basin Electric Power Cooperative
BFE	Base Flood Elevation
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
CFR	Code of Federal Regulations
CO_2	carbon dioxide
Council	Advisory Council on Historic Preservation
CRP	Conservation Reserve Program
CWA	Clean Water Act
DOE	Department of Energy
DOT	Department of Transportation
EA	Environmental Assessment
EFH	essential fish habitat
EIS	Environmental Impact Statement
EMF	electric and magnetic fields
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
GLO	General Land Office
HPTP	Historic Properties Treatment Plan
kV	kilovolt
MBTA	Migratory Bird Treaty Act
Metcalf	Metcalf Archaeological Consultants, Inc.
MLRA	Major Land Resource Area

MW	megawatt
NAGPRA	Native American Graves Protection and Repatriation Act
NDCC	North Dakota Century Code
NDGFD	North Dakota Game and Fish Department
NDNHI	North Dakota Natural Heritage Inventory
NDPSC	North Dakota Public Service Commission
NEPA	National Environmental Policy Act of 1969
NESC	National Electrical Safety Code
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OPGW	optical groundwire
Project	Williston to Tioga Transmission Line Project
ROW	right-of-way
SFHA	Special Flood Hazard Area
SHPO	State Historic Preservation Officer
SPCC Plan	Spill Prevention, Control, and Countermeasures Plan
SSURGO	Soil Survey Geographic database
SWPPP	Storm Water Pollution Prevention Plan
TCPs	traditional cultural properties
U.S.	United States
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
Western	Western Area Power Administration

Executive Summary

Basin Electric Power Cooperative (BEPC) proposes to construct and operate a new 230-kilovolt (kV) transmission line to meet existing and future electric power requirements in northwestern North Dakota, and to interconnect this new transmission line to the Western Area Power Administration's (Western) transmission system. BEPC's proposed new Williston to Tioga Transmission Line Project (hereafter referred to as BEPC's Proposed Project) would transfer power from Western's transmission system at Williston, North Dakota, to the Montana-Dakota Utilities Tioga Substation, near Tioga, North Dakota, in Williams and Mountrail counties.

Western is mandated to respond to requests for interconnection and is required to identify and evaluate potential environmental impacts of its Federal action and the potential impacts of the applicant's Proposed Project in compliance with the National Environmental Policy Act (NEPA). Western has determined that, if the interconnection request is granted, Western would need to make modifications within its existing Williston Substation. The environmental impacts of the substation modification were analyzed in the Wolf Point to Williston Transmission Line Rebuild Environmental Assessment (EA) (prepared August 2003) and are considered part of Western's Federal action for this Project. Western's Federal action is limited to making a determination to approve or deny BEPC's interconnection request, and to make any necessary system modifications to accommodate the interconnection of BEPC's Proposed Project. It does not include the Williston to Tioga Transmission Line Project, although this EA analyzes and discloses the potential environmental impacts of BEPC's Proposed Project.

BEPC is required to obtain a permit from the North Dakota Public Service Commission (NDPSC) for construction and operation of the proposed transmission line. Permitting requirements include avoidance of residential structures, parks, and important ecological resources. BEPC's NDPSC environmental and Western's NEPA requirements are integrated into this EA.

Western's Federal Action

Western's Open Access Transmission Service Tariff (Tariff) provides open access to its transmission system. Open access is provided through an interconnection, if transmission system capacity is available. BEPC has applied to interconnect to Western's power transmission system at the Williston Substation. Western must make a determination that the requested interconnection can be made. In order to make that determination, the potential environmental effects need to be determined and evaluated through the preparation of this EA.

Western must consider BEPC's request for interconnection at Williston Substation and, if the action alternative is adopted, make modifications to the substation necessary to accommodate the interconnection. If Western adopts the No Action Alternative, Western would not approve the interconnection request, and no modification of the Williston Substation would take place. In response to the Need for Agency Action, Western must adhere to the following:

- Provide Transmission Service. Under Western's Tariff, the agency offers capacity on its transmission system to deliver electrical power when such capacity is available. The Tariff complies with the Federal Energy Regulatory Commission's Final Order Numbers 888, 888A, 888B, and 888C, which are intended to ensure non-discriminatory transmission system access.
- Protect Transmission System Reliability and Service to Existing Customers. Western needs to ensure that existing transmission system reliability and service would not be degraded. Western conducts transmission and system studies to ensure that system reliability and service to existing customers are not adversely affected by proposed new interconnection.
- Consider the Applicant's Objectives. Since the statement of Purpose and Need affects the extent to which alternatives are considered reasonable, it is important to understand both Western's Purpose and Need and that of the applicant.

The expansion of Williston Substation was evaluated for potential environmental impacts in this analysis and in the Wolf Point to Williston Transmission Line Rebuild EA (prepared August 2003). If Western approves the interconnection request, the Williston to Tioga Transmission Line Project would interconnect to substation equipment within this expansion.

BEPC's Proposed Project Location and Description

BEPC's Proposed Project would be located in northwestern North Dakota, almost entirely in Williams County. Williston Substation is located west of the City of Williston, in Williams County; Tioga Substation is located northeast of the City of Tioga, less than two miles into western Mountrail County. The Project location is shown on **figure ES-1**.

BEPC proposes to construct, own, operate, and maintain a 230-kV, single-circuit transmission line using steel single-pole self-supporting structures within a 125-foot-wide right-of-way (ROW). If an interconnection is approved, Western would be responsible for modifying the 230-kV bay at Williston Substation to accommodate interconnection of the new transmission line. Modifications at the Williston Substation also were addressed as part of Wolf Point to Williston Transmission Line Rebuild EA (prepared August 2003).

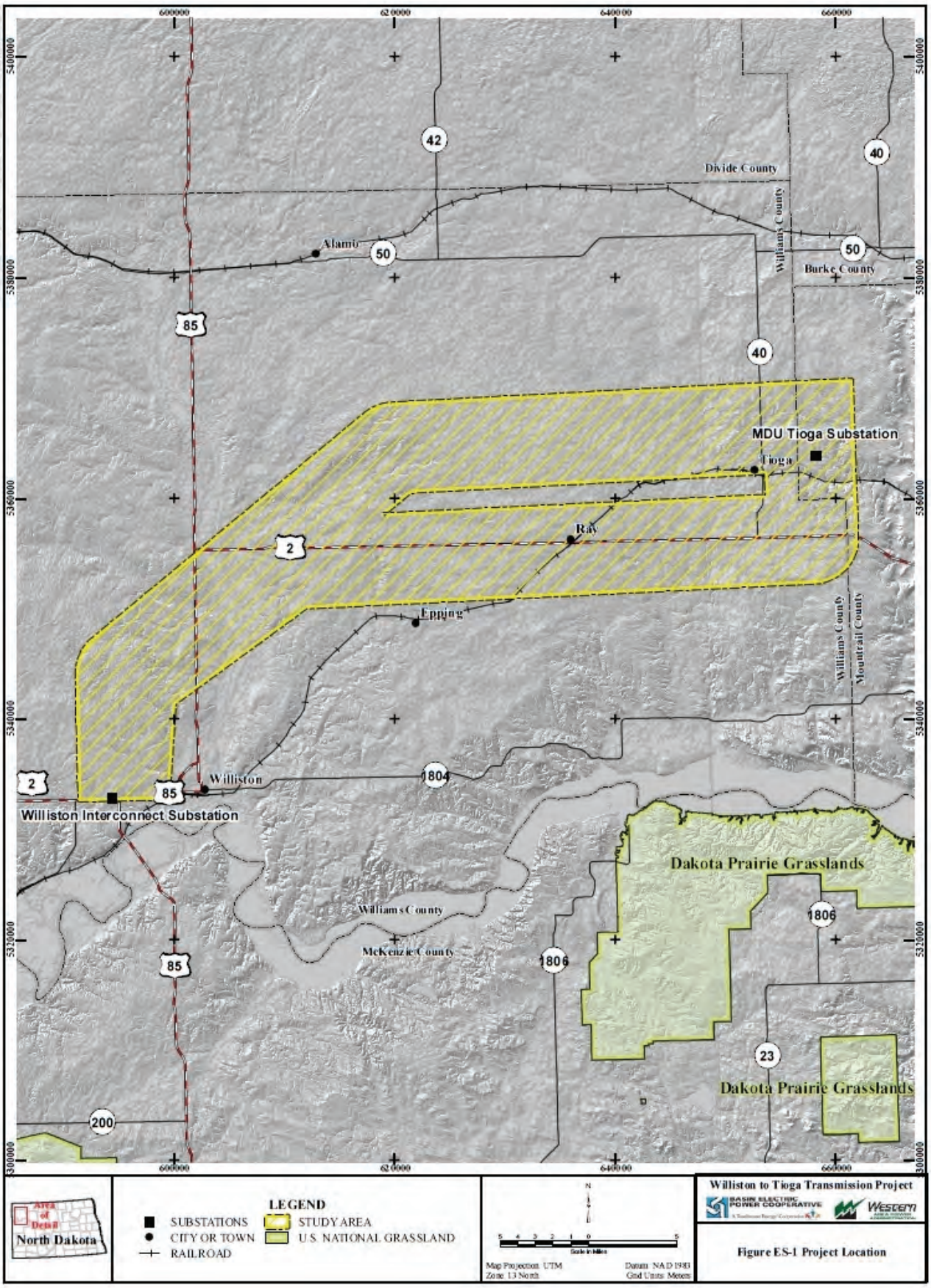
The single-pole transmission line structures would range in height from approximately 95 to 120 feet and average 110 feet, depending on span distances between structures and area topography. The span between structures would range from 700 feet to 950 feet and average approximately 800 feet, depending on topography; taller structures could be used for crossing existing distribution and transmission lines or where unusual terrain exists. The single-pole structures would be designed to support three conductors and an overhead optical groundwire (OPGW). The OPGW would provide lightning suppression and fiber optic communications between the Williston and Tioga substations for systems control. Tangent structures would be free-standing and directly imbedded into the soil. Angle structures (used where the transmission line changes direction) and dead-end structures (used to provide longitudinal stability along the length of the line) would be steel with concrete foundations. Guy wires and anchors would not be used.

BEPC's transmission line design and construction would meet the requirements of the National Electrical Safety Code for the Heavy Loading District, BEPC design criteria, and other applicable local or national building codes. The Heavy Loading District refers to those areas (including North Dakota) that are subject to severe ice and wind loading.

Project Scoping

Scoping meetings were held at two locations, Williston and Tioga, North Dakota, to provide Project information and to receive comments from the public and agencies. Meeting announcements were sent to potentially affected landowners, governmental officials, tribes, and the media. Paid meeting announcements were advertised through radio and newspapers. Additional meetings were held with local community commissioners and county planning and zoning boards. Flyers were posted in storefronts and other community gathering places in the towns of Williston, Tioga, Epping, Springbrook, Ross, Stanley, and Ray.

The "owner's preferred route" presented during the scoping period was revised in response to public comments. As a result of the changes, landowners that could be affected by the new Preferred Route were identified. Advertisements notifying the public of the proposed changes were placed in the newspaper. Additionally, BEPC representatives visited with every landowner along the new route to discuss the Proposed Project and obtain survey permission.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Williston Interconnect Substation
Dakota Prairie Grasslands
McKenzie County
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CITY OR TOWN
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Map Projection: UTM
Zone 13 North
Datum: NAD 1983
Grid Units: Meters
Williston to Tioga Transmission Project
BASIN ELECTRIC POWER COOPERATIVE
Western
Figure ES-1 Project Location

Corridor Identification

A six-mile-wide corridor was initially identified from the Williston Substation to the Tioga Substation in accordance with NDPSC requirements. Sensitive environmental resources were identified within the corridor in accordance with NDPSC exclusion and avoidance criteria. Potential optional transmission line routes were then identified within the corridor.

Routing Analysis

BEPC identified preliminary transmission line routes within the previously referenced corridor and presented them to the public during the scoping meetings. Input from the public resulted in the selection of a Preferred Route and two Route Options for further consideration, referred to as Route Options A, B, and C. BEPC engineers, lands specialists, and environmental specialists worked with landowners intensively to identify and refine a Preferred Route in response to landowner concerns. The selected route avoided residential structures, most cropland, and environmentally sensitive areas such as wetlands and cultural resources.

The Preferred Route, or Route Option C, would be approximately 61.1 miles in length and would permanently affect less than 0.2 acre. Construction of the Proposed Project along the Preferred Route would result in temporary impacts to approximately 273 acres, needed for structure pads (work sites), a 12-foot-wide access trail between structure sites, pulling and tensioning sites, and splicing sites. Temporary use areas would be needed for three material staging areas. Project-specific mitigation measures were identified and would be followed by BEPC to minimize environmental impacts.

Impacts of Western's Federal Action

Operation of the Williston – Tioga Transmission Line would require an interconnection at Western's Williston Substation. Expansion of the substation was evaluated for potential environmental impacts as part of this EA and in the Wolf Point to Williston Transmission Line Rebuild EA (prepared August 2003). The 230-kV bay within Williston Substation would be modified to accommodate the interconnection and all modifications would be within the existing substation footprint.

Impacts of BEPC's Proposed Project

Jurisdictions, Land Use and Agricultural Practices

Temporary construction impacts of BEPC's Proposed Project were determined based on the need for access trails, pulling and tensioning sites, splicing sites, and structure work sites. Construction of Route Option C (Preferred Route) would temporarily affect 273 acres. A total of 0.2 acre would be permanently impacted by structure bases. Temporary impacts to prime and unique farmlands are expected to total 3.0 acres.

Actual impacts to agricultural practices would be similar among the three Route Options. Use of single-pole structures would minimize impacts to agricultural activities and allow cultivation to take place immediately adjacent to each structure footprint. The final alignment would avoid sensitive resources.

Although croplands and planted herbaceous perennials were avoided to the extent practicable, more of these areas would be temporarily affected by construction of Route C (175 acres) than by construction of Route Options A or B (147 or 132 acres). Construction of the Preferred Route also would affect more scrubland and barren land than would be affected by construction of either Route Option A or B. Wetlands and riverine areas would be avoided or spanned, regardless of route. The Preferred Route is longer than Route Options A or B, largely due to minor route adjustments that were made to accommodate landowner wishes. The Preferred Route would impact more cropland and herbaceous perennial lands as a result of its longer length, and because greater portions of Route Options A and B would cross pastureland and rangeland diagonally. Route Option C would mostly parallel road and property lines within cultivated lands.

Physiology, Geology, Soils, and Minerals

Previous mining activities have created localized subsidence that could affect structure placement. The potential for soil compaction and erosion is relatively low; impacts to soils would be reduced by BEPC scheduling construction activities to avoid wet conditions. The Proposed Project is not expected to impact area mineral resources, including active oil and/or natural gas wells.

Hydrology and Drainage

Impacts to floodprone areas and drainages are not anticipated because they would be avoided or spanned.

Vegetation and Wetland Resources

Construction of Route Option C would temporarily affect 153 acres of cropland. However, cultivation would return croplands to their pre-construction condition. Wetlands would not be impacted because they would be avoided or spanned.

Wildlife and Fisheries

Construction of BEPC's Proposed Project would result in the temporary displacement of highly mobile game and non-game species. Direct impacts to low-mobility species could result in some loss of individuals, primarily due to crushing. BEPC would carry out pre-construction surveys to identify the presence of migratory species; active nests would be avoided during construction. Structure design, conductor-to-conductor spacing, and conductor-to-ground spacing exceed the wingspan of avian species and would be sufficient to preclude electrocution of raptors that could use the area for nesting and/or foraging.

Fisheries resources are minimally present in the Project area; those that are present would be spanned. Therefore, impacts to such resources are not expected.

Special Status Species

Impacts to federally listed species (whooping crane [*Grus americana*] and piping plover [*Charadrius melodus*]) are expected to be minimal due to project location and lack of habitat. The Project site is located within the western edge of the whooping crane flyway and habitat that would support the species is considered marginal. Western and BEPC will comply with mitigation measures required by the U.S. Fish and Wildlife Service for their respective actions. Habitat that would support piping plover also is marginal along the preferred transmission line route. Most ponds are of marginal quality and not suitable for the species. The Dakota skipper is not found in western Mountrail County or Williams County; therefore, the species would not be impacted.

Archaeological Resources

A total of 55 archaeological and historic sites and nine isolated finds were recorded during Class III pedestrian surveys of Route Option C (Preferred Option). All nine isolated finds were recommended as not eligible for the NRHP and no further work is recommended for the sites. The NRHP-eligibility of the 55 archaeological and historic sites is currently unknown; however, the sites would be either spanned or otherwise avoided during line construction.

Changes in the original route necessitated an additional Class III cultural resource survey that was carried out during the spring 2009. The additional survey covered approximately 22.08 miles of transmission line right-of-way, totaling approximately 535.26 acres. Twelve new cultural resource sites were recorded and three previously known sites were relocated and the site forms were updated. Thirteen of the 15 sites were considered to be potentially eligible for the National Register of Historic Places. The remaining two sites consisted of remnants of a school house and an historic dwelling, which were determined not to be eligible. The proposed transmission line would avoid all sites that were identified during the fall 2008 and spring 2009 field surveys. Therefore, no adverse effects to archaeological or historic resources are expected to occur as a result of BEPC's Proposed Project. The North Dakota State Historic Preservation Officer reviewed the Class III

report and recommended that "no historic properties (would be) affected" and that "no significant sites (would be) affected" by construction and operation of the proposed transmission line.

Native American Setting

Western initiated Native American consultation with letters to ten tribes on August 1, 2008. The Rosebud Sioux tribe, the only tribe to respond to the letters, indicated that they had no objection to the Project.

Paleontological Resources

Although paleontological resources may be present within the area, the preferred transmission line route is predominantly located on surface glacial deposits where there is low potential for finding important fossils.

Transportation

BEPC's Preferred Route is located near two public airports and a private landing strip. Analyses of proposed alignments indicate that the Preferred Route would not penetrate airspace of any of the three airports. The proposed transmission line would parallel and cross area highways and the Burlington Northern – Santa Fe Railroad. BEPC would utilize temporary H-frame structures to elevate the conductors at highway and railroad crossings during construction. The H-frame structures would be removed following construction and each site would be returned to preconstruction conditions.

Socioeconomics

Potential socioeconomic impacts would be minimal, primarily due to BEPC's use of single-pole structures, avoidance of cultivated fields to the extent practicable, and scheduling construction activities to avoid periods of relatively high precipitation. BEPC's Proposed Project would provide short-term beneficial impacts to the local economy. Direct impacts to individuals would be limited to approximately 96 landowners.

Environmental Justice, Visual Impacts, and Noise

BEPC's Proposed Project would not impact a disproportionate number of minority individuals. Therefore, environmental justice issues are not anticipated. Visual impacts would be limited to rural areas with relatively low population numbers. Potential visual and noise impacts are expected to be temporary and minimal and only present in scattered locations.

Cumulative Impacts

NEPA requires the identification and consideration of incremental impacts that are related to the Proposed Action when added to other past, present, and reasonably foreseeable actions (40 CFR 1508.7). Reasonably foreseeable future actions that could contribute to cumulative impacts include the proposed Belfield to Rhame Transmission Line Project, MDU T1 – T2 Reconductoring Project, Williston to Watford Rebuild Project, Watford to Charlie Creek Rebuild Project, the T2 230/115-kV Transmission Line Replacement Project, and ongoing development of oil and gas fields.

BEPC's construction, reconductoring, and rebuilding of these transmission lines in the area would result in some impacts that are similar to those identified for the proposed Project. The proposed Belfield to Rhame Project would have a greater contribution to cumulative impacts than reconductoring, rebuilding, or replacement projects because it would require new ROW, structures, and conductor. Reconductoring, rebuilding, and replacement projects generally are limited to the use of existing ROWs and may use existing structures.

Impacts that would be considered to contribute to cumulative effects of the Belfield to Rhame Transmission Line Project and the Williston to Tioga Transmission Line Project include the combined temporary impacts to approximately 570 acres within the two project areas. In combination, the two projects also would result in temporary impacts to nearly 300 acres of cropland and 231 acres of rangeland/grassland. Long-term impacts associated with the Williston to Tioga Transmission Line Project would contribute minimally (less than 0.2 acre) to land use impacts.

BEPC's Proposed Project would not contribute to global warming because fossil fuel combustion would be limited to construction and maintenance activities. Opportunities for intentional acts of destruction would be increased within the region as a result of a new transmission line.

None of the expected environmental impacts of BEPC's Williston to Tioga Transmission Line Project were found to be significant, and it also is not anticipated that the cumulative effects, when considered with the development discussed above, would be significant.

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1.0 Introduction

Basin Electric Power Cooperative (BEPC) proposes to construct and operate a new 230-kilovolt (kV) transmission line to meet existing and future electric power requirements in northwestern North Dakota, and to interconnect this new transmission line to the Western Area Power Administration's (Western) transmission system. BEPC's proposed new Williston to Tioga Transmission Line Project (hereafter referred to as BEPC's Proposed Project) would transfer power from Western's transmission system at Williston, North Dakota, to the Montana-Dakota Utilities Tioga Substation, near Tioga, North Dakota, in Williams and Mountrail counties.

1.1.1 Western Area Power Administration

Western is the Lead Federal Agency for this Environmental Assessment (EA). Western is a Federal power-marketing agency within the U. S. Department of Energy (DOE) that markets and delivers Federal electric power to municipalities, public utilities, Federal and State agencies, and Native American tribes in 15 western and central States. As a Federal agency, Western is required to comply with the National Environmental Policy Act (NEPA, 42 United States Code [USC] 4321 *et seq*.) and regulations set forth under Council on Environmental Quality (CEQ, 40 CFR parts 1500 – 1508) and DOE regulations 10 CFR parts 1021 and 1022. BEPC is the Project applicant (also referred to as Project sponsor or Project proponent) and would be responsible for construction, operation, maintenance, and decommissioning of the proposed Project. BEPC is one of the largest electric generation and transmission cooperatives in the U.S. and provides power to 121 member rural electric systems in nine states. Western's service area and BEPC's northern service area are shown on **figures 1-2** and **1-3**, respectively.

NEPA requires Federal agencies to evaluate their proposed Federal actions for expected impacts on environmental resources that could result from the proposed action and reasonable alternatives. Potential direct, indirect, and cumulative environmental impacts must be identified and assessed. If impacts cannot be fully avoided, mitigation measures must be implemented to reduce the severity of impacts. Based on DOE's NEPA implementation policies, an EA is required to address Western's Federal action and BEPC's Proposed Project to determine if these actions could potentially cause significant environmental impacts.

Letters were mailed to potentially affected landowners, Federal and State agencies, Native American tribes, special interest groups, and elected governmental officials during March 2008. BEPC opened a field office in Williston, North Dakota, during the spring of 2008 to facilitate interaction with landowners and the public, and public scoping meetings were held in Williston and Tioga on March 17 and 18, 2008, respectively. Feedback from the public was used to refine transmission line alignments and to identify potential impacts and mitigation measures. BEPC engineers and right-of-way (ROW) specialists met with individual landowners during the detailed routing process. Additional information about public involvement is provided in Section 1.5, Public Involvement.

1.1.2 Western's Purpose and Need

Western's Open Access Transmission Service Tariff provides open access to its transmission system. Open access is provided through an interconnection, if transmission system capacity is available. BEPC has applied to interconnect to Western's power transmission system at the Williston Substation. Western must make a determination that the requested interconnection can be made. In order to make that determination, the potential system and environmental effects need to be determined and evaluated, and are presented in this EA.

Western must consider BEPC's request for interconnection at Williston Substation and, if the Action Alternative is adopted, make modifications to the substation necessary to accommodate the interconnection. If Western adopts the No Action Alternative, Western would not approve the interconnection request, and no modification of the Williston Substation will take place. In response to the Need for Agency Action, Western must adhere to the following:

- Provide Transmission Service. Under Western's tariff, the agency offers capacity on its transmission system to deliver electrical power when such capacity is available. The Tariff complies with the Federal Energy Regulatory Commission's Final Order Numbers 888, 888A, 888B, and 888C, which are intended to ensure non-discriminatory transmission system access.
- Protect Transmission System Reliability and Service to Existing Customers. Western needs to ensure that existing transmission system reliability and service is not degraded. Western conducts transmission and system studies to ensure that system reliability and service to existing customers are not adversely affected by proposed new interconnections.
- Consider the Applicant's Objectives. Since the statement of Purpose and Need affects the extent to which alternatives are considered reasonable, it is important to understand both Western's Purpose and Need and that of the applicant.

The expansion of the Williston Substation was evaluated for potential environmental impacts in this analysis and in the Wolf Point to Williston Transmission Line Rebuild EA (prepared August 2003). If Western approves the interconnection request, the Williston to Tioga Transmission Line Project would interconnect to substation equipment within this expansion.

1.1.3 BEPC's Project Purpose and Need

BEPC's Transmission Services Division completed a comprehensive transmission system study in September 2008 that addressed load forecasts in portions of northwestern North Dakota and northeastern Montana. The study analyzed impacts of the latest load forecast for the region that has been affected by rapid increases in oil and gas extraction and delivery. The load forecast for this area is shown on **figure 1-1**.

The study showed that the existing system will have insufficient capacity to accommodate projected loads by 2011. Furthermore, Western's Williston to Charlie Creek 115-kV transmission line is in poor physical condition and is currently being rebuilt to provide 230-kV service.

The existing Tioga 230/115-kV transformer limits the power imports from Saskatchewan to 165 megawatts (MW). The increased 115-kV network load has increased loading on the Tioga 230/115-kV transformer to the extent the 165-MW Saskatchewan import can no longer be accommodated. Also, the loss of the Tioga 230/115-kV transformer causes low voltage on the 115-kV system. Therefore, a parallel transformer is needed to mitigate the existing overload and provide a backup for the existing transformer. This project also is underway.

The proposed Williston to Tioga 230-kV transmission line project would complete the 230-kV loop from Tioga to Charlie Creek and to meet the projected loads. Without the facility, the existing Williston to Tioga 115-kV line would be subject to overload, resulting in noncompliance with utility practice and requirements, reduced substation equipment service life, or failure outage to end users.

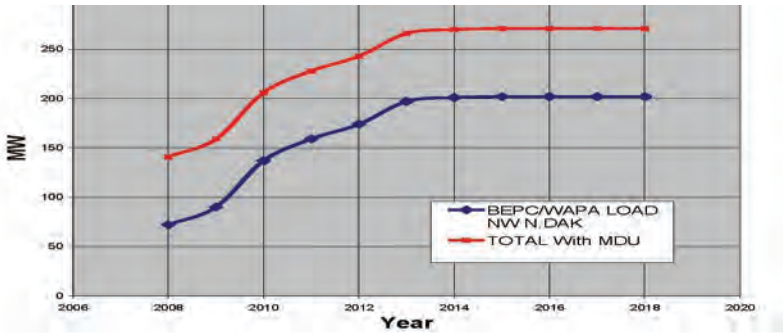

Figure 1-1 Northwest North Dakota Load Forecast – 2007 Forecast

1.2 Assessment Process

BEPC's Proposed Project is being analyzed in this EA, and requires a permit issued by the North Dakota Public Service Commission (NDPSC). NEPA and NDPSC requirements are integrated into a single Environmental Assessment (EA) supporting selection of a preferred alternative. A corridor level assessment that is required by the NDPSC is provided in **Appendix A**, The Proposed Project that follows a Preferred Route. Two other transmission line Route Options and the No Action Alternative, are evaluated as part of this EA. The No Action Alternative is applicable to the proposed interconnection at Western's Williston Substation. Selection of a No Action Alternative would preclude an interconnection at Western's Williston Substation and indirectly preclude construction of the proposed transmission line. Detailed transmission line routing was carried out by BEPC to maximize the use of existing linear features, avoid sensitive areas and receptors, minimize environmental impacts, and comply with landowner requests, and to comply with NDPSC requirements. Aerial photography, field reconnaissance, and available published data were used to identify potential routes that would accomplish these objectives. Cultivated fields were avoided, to the extent practicable, to minimize impacts to agricultural activities. BEPC transmission line engineers and right-of-way (ROW) specialists met with landowners during detailed routing to refine potential routes to accommodate specific landowner wishes. Based on public comments from a previous project with similar environmental issues, BEPC elected to use single-pole transmission line structures during the planning stages of the Williston to Tioga Transmission Project. Use of single-pole structures would greatly reduce land requirements, conflicts with agricultural activities, and the introduction and spread of noxious weeds.

1.3 Project Location

The proposed Project would be located in northwestern North Dakota, almost entirely in Williams County. Williston Substation is located west of the City of Williston, in Williams County; Tioga Substation is located northeast of the City of Tioga, less than two miles into western Mountrail County. The Project location is shown on **figure 1-2**.

1.4 Project Conformance with Policies, Plans, and Programs

Interconnection to the Western transmission system requires approval from Western, and construction and operation of a new transmission line requires a permit from the NDPSC.

Under NEPA and CEQ regulations an EA must be prepared on Western's Federal action and BEPC's Proposed Project. This EA process analyzes the environmental impacts of both actions. The EA process could result in a Finding of No Significant Impact or a decision to prepare an Environmental Impact Statement (EIS). If significant impacts are identified that cannot be avoided or mitigated to less-than-significant, an EIS would be required.

A transmission line routing study was carried out in compliance with the NDPSC guidelines for Energy Conversion and Transmission Siting, as defined in title 49 of the North Dakota Century Code (NDCC). State approval of the project is granted by a decision from the NDPSC.

1.4.1 North Dakota Public Service Commission

The NDPSC has regulatory authority over the siting and permitting of BEPC's Proposed Project. It is the policy of the NDPSC "… to route transmission facilities in an orderly manner compatible with environmental preservation and the efficient use of resources. In accordance with this policy, sites and routes shall be chosen which minimize adverse human and environmental impacts while ensuring continuing system reliability and integrity and ensuring that energy needs are met and fulfilled in an orderly and timely fashion." (Chapter 49-22 of the North Dakota Energy Conversion and Transmission Facility Siting Act.)

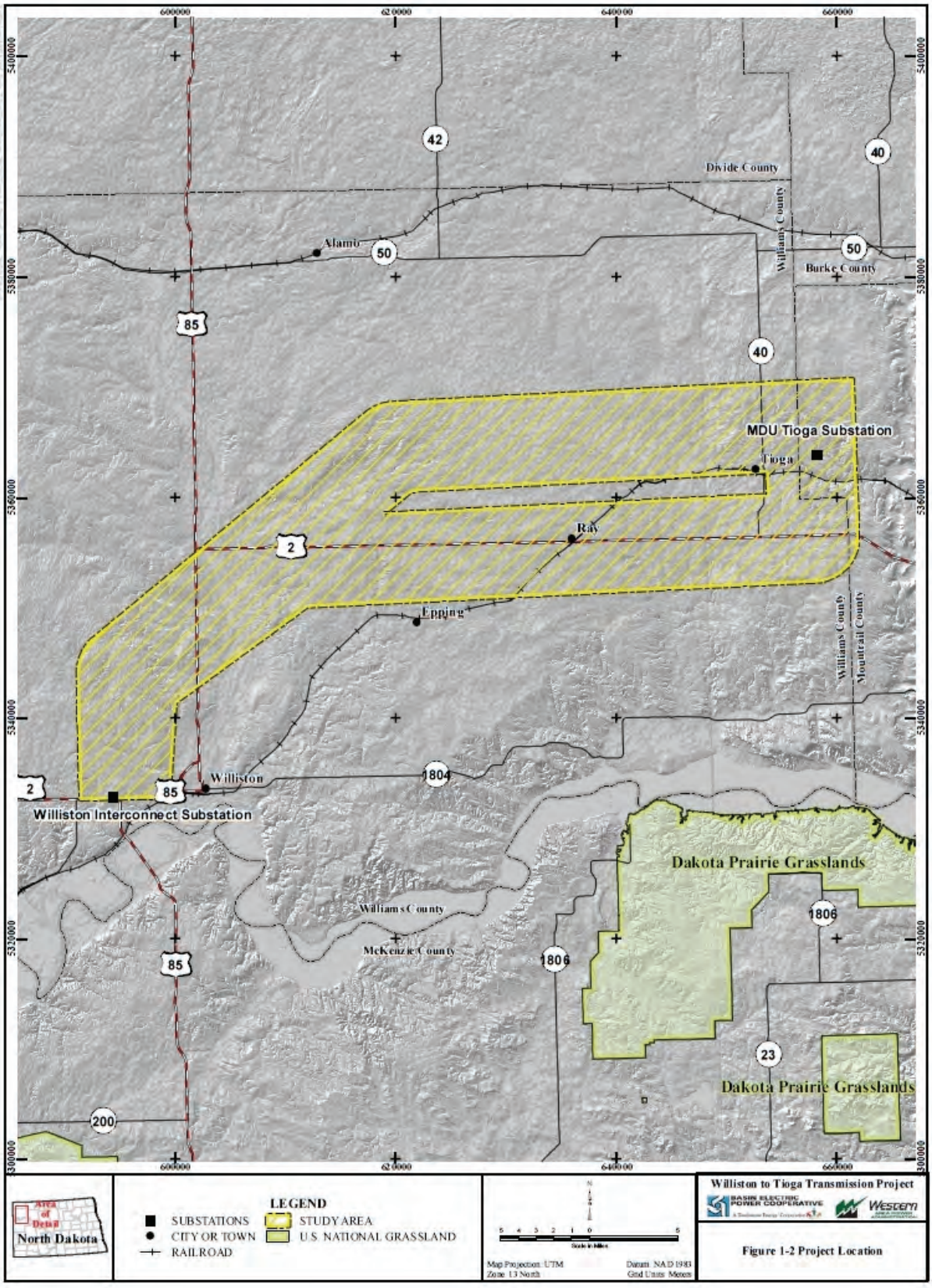

Figure 1-2 Project Location

State requirements include the identification and evaluation of a proposed transmission line corridor or corridors. Corridor widths are to be 10 percent of the length, but no more than 6 miles wide. Potential transmission line alignments are then routed within the identified corridor, or corridors. Although corridor and alignment routing are two-step processes, BEPC requested, and was granted, a combined approach for the Williston to Tioga Transmission Line Project.

Section 49-22-05.1 (Exclusion and Avoidance Areas – Criteria) of the North Dakota Energy Conversion and Transmission Facility Siting Act states that "… areas within five hundred feet (152.4 meters) of an inhabited rural residence must be designated as avoidance areas." The section also indicates that the "… five hundred foot (152.4 meters) avoidance area criteria for inhabited rural residence may be waived by the owner of the inhabited rural residence …"

The State also identifies additional exclusion areas that include National and State parks, landmarks, historic districts, wilderness areas, archaeological sites, Federal and State designated grasslands, game refuges, game management areas and threatened and endangered species habitat. The State does not distinguish critical habitat, as defined in the Federal Endangered Species Act (ESA).

Avoidance areas are identified in section 69-06-08-02 as historical resources that are not designated as exclusion areas, areas within city limits, areas within 100-year event floodplains, geologically unstable areas, woodlands and wetlands, and areas of recreational significance that are not designated as exclusion areas.

Route selection criteria designated in section 69-06-08-02(3) require that the applicant (i.e., BEPC) demonstrate that "… adverse effects resulting from the location, construction, and operation of the facility … (must) be at an acceptable minimum, or that those effects will be managed and maintained at an acceptable minimum." Selection criteria include minimizing impacts to: agriculture; community resources and infrastructure; and human, plant, and animal resources.

State routing criteria that are applicable to the proposed Williston to Tioga Transmission Line are addressed in full in Section 3.1, NDPSC Routing Criteria.

1.4.2 Permits, Authorizations, and Consultation Required

Permitting and agency authorization and Consultations would be required from various Federal, State, and county agencies. Permitting and coordination requirements include:

- Western – System Interconnection Authorization, compliance with NEPA, National Historic Preservation Act (NHPA), and other applicable Federal laws, regulations, and executive orders.
- U.S. Army Corps of Engineers – Compliance with the Clean Water Act.
- U.S. Fish and Wildlife Service (USFWS) – Compliance with the ESA (section 7 consultation), compliance with the Migratory Bird Treaty Act (MBTA).
- North Dakota Department of Transportation – Permit to construct and operate a transmission line across or within highway ROW.
- North Dakota Public Service Commission – Certificate of Corridor Compatibility and Route Permit.
- State of North Dakota Historic Preservation Office – Compliance with the National Historic Preservation Act (NHPA) (section 106 consultation).
- North Dakota Game and Fish Department (NDGFD) – Consultation to identify any State-listed species of concern that could potentially be affected by the Proposed Project.
- Williams County – Planning and Zoning Board indicated that a Conditional Use Permit would be required for the Proposed Project.

- Zoning permits are likely to be required by some townships.
- Burlington Northern – Santa Fe Railroad – Authorization to construct and operate a transmission line across railroad ROW.

Western's and BEPC's service areas are shown on **figures 1-3** and **1-4**, respectively.

1.5 Public Involvement

The primary public involvement goal for the Williston to Tioga Transmission Project is to share Project information and to obtain relevant input from participants about the Proposed Project. The following discussion describes the scoping process for the Williston to Tioga Transmission Project.

1.5.1 Notification

Western initiated the EA notification process by mailing letters to potential affected landowners, interested individuals, non-governmental organizations, interest groups, and agencies on March 5, 2008. The notification letters announced the public scoping meetings scheduled for March 17 and 18, 2008, as well as the intent to prepare an EA. Notification letters also were sent to Native American tribes that traditionally used the area.

In addition to the notification letters, advertisements were placed in two local newspapers: the *Williston Herald* and *Tioga Tribune*. Advertisements in the *Williston Herald* were published on Wednesday, March 9, 2008, and Sunday, March 12, 2008; advertisements were published in the *Tioga Tribune* on Wednesday, March 5, 2008, and Wednesday, March 12, 2008. Radio advertisements announcing the public meetings were broadcast on one local radio station (KTGO-AM), five times a day, on Monday and Tuesday, from 6:00 a.m. to 7:00 p.m. and three additional times a day on Tuesday from 6:00 a.m. to 12 noon during the week of March 11 through March 18, 2008. Flyers were posted in storefronts and other community gathering places in the towns of Williston, Tioga, Epping, Springbrook, Ross, Stanley, and Ray.

The "owner's preferred route" presented during the scoping period was revised in response to public comments. As a result of the changes, landowners that could be affected by the new Preferred Route were identified. Advertisements notifying the public of the proposed changes were placed in the *Williston Herald* on May 25, 2008, and June 1, 2008. Additionally, BEPC representatives visited every landowner along the new route to discuss the Preferred Route and obtain survey permission.

1.5.2 Scoping Meetings

Two scoping meetings were held to provide the public an opportunity learn more about the Proposed Project and to discuss their concerns. The dates, locations, and number of attendees at the scoping meetings are provided in **table 1-1**.

Table 1-1 Public Scoping Meetings

Meeting Location	Meeting Date	Number of Attendees that Signed In
El Rancho Motor Hotel Williston, North Dakota	March 17, 2008	58
Jungle Restaurant Tioga, North Dakota	March 18, 2008	25

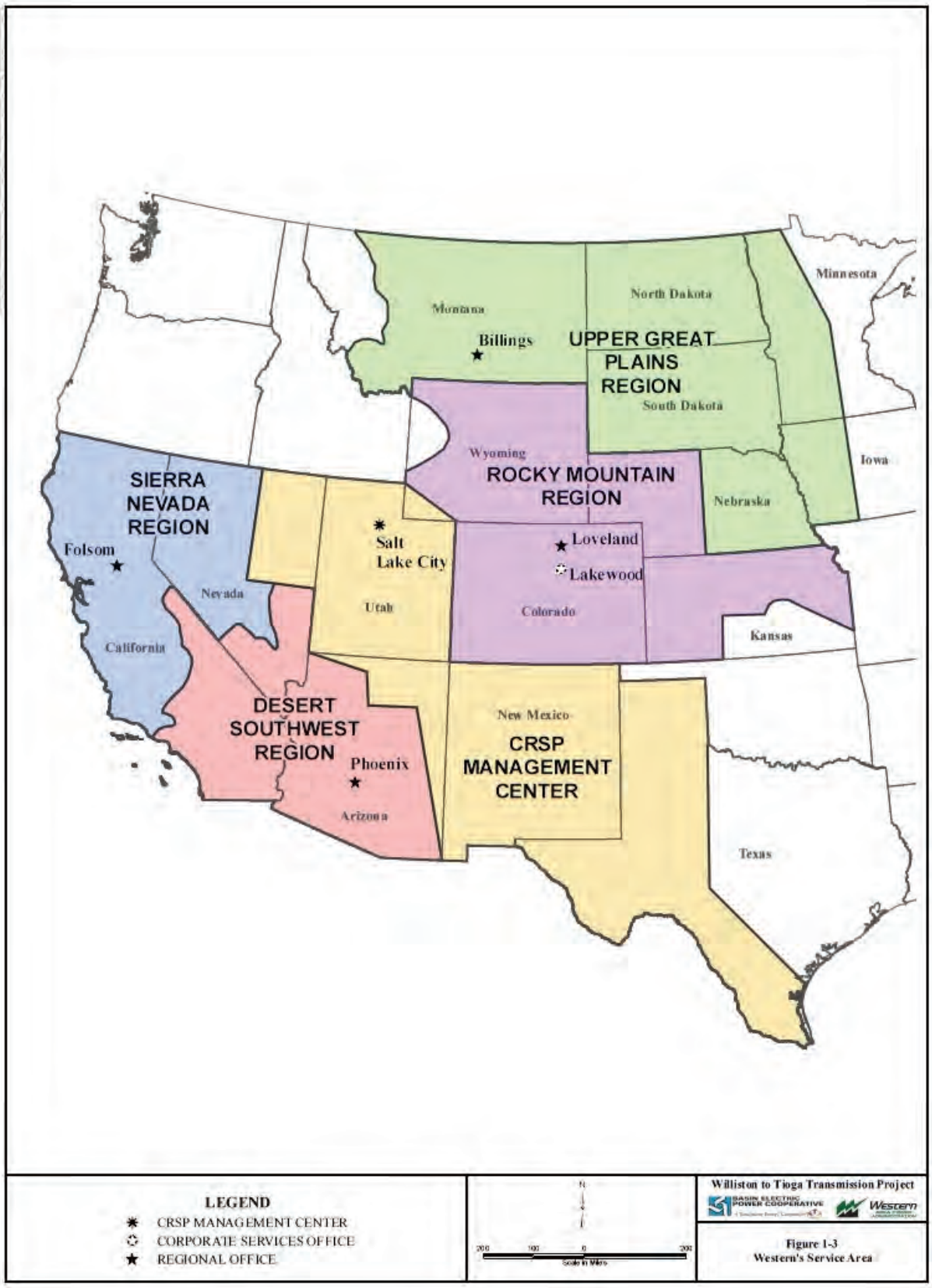

Figure 1-3 Western's Service Area

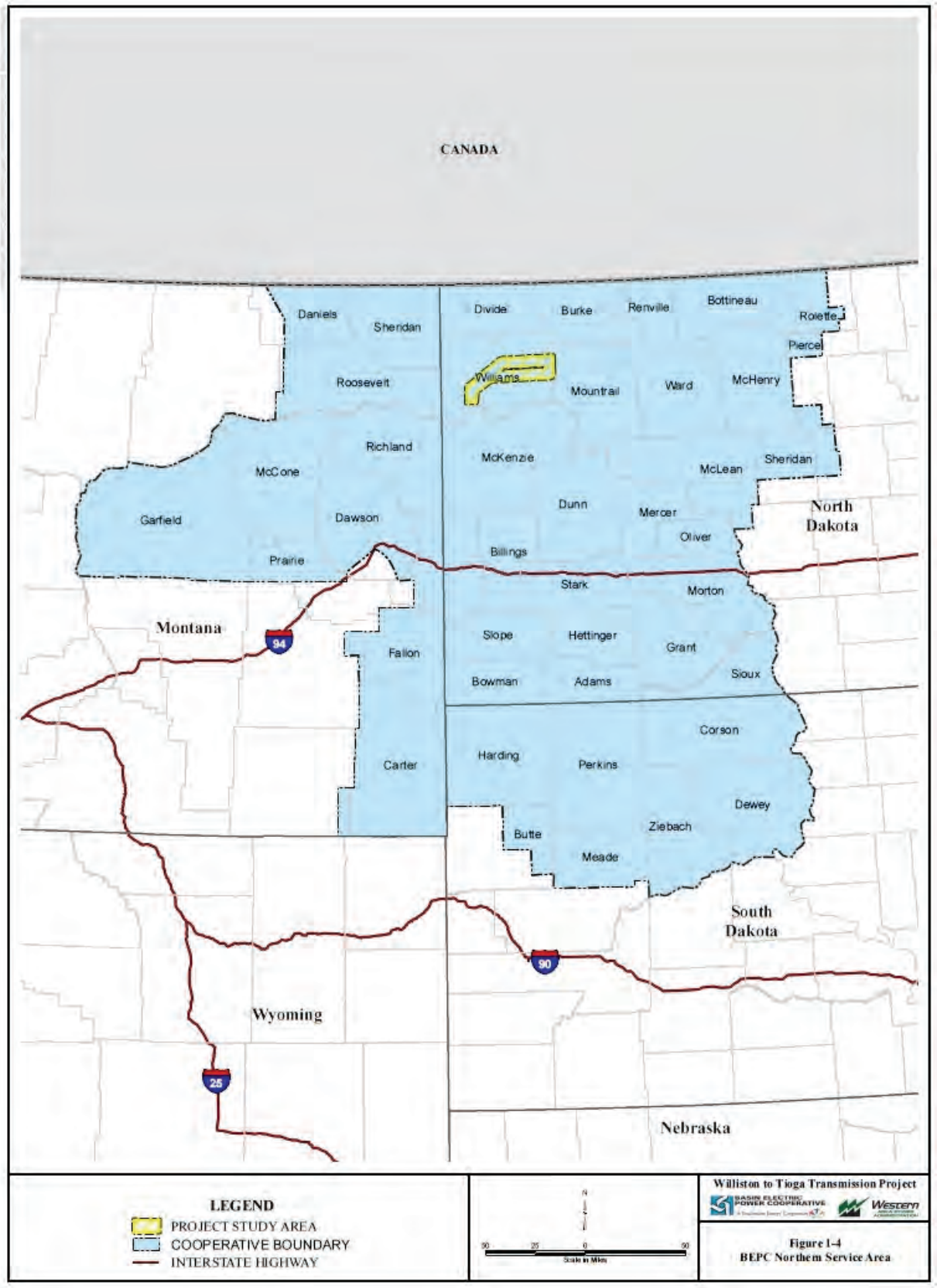

Figure 1-4 BEPC Northern Service Area

The meetings were held in an open house format to promote information exchange about the Proposed Project and to gather public input. Poster boards and aerial photographs showing the Proposed Project and the environmental review process were available to facilitate discussion between meeting attendees and Western and BEPC representatives. Project maps were provided for meeting attendees to note their suggestions and comments. Also, comment forms were available for meeting attendees to complete and submit at the meeting or mail to Western at a later date.

Ray City Commissioners' Meeting

BEPC representatives met with the City of Ray's commissioners on May 12, 2008. A map of the revised Preferred Route was presented to the city and a request to survey city lands was submitted, which was approved by the Commissioners.

Williams County Planning and Zoning Board

BEPC representatives presented the scope of the proposed Project to the Williams County Planning and Zoning Board on September 2, 2008. Additional meetings are planned to acquire county permits for the Proposed Project.

Additional Meetings and Outreach

The revised Preferred Route would parallel 28 miles of U.S. Highway 2. Accordingly, BEPC met with the North Dakota DOT about routing the line adjacent to the highway ROW. BEPC representatives also met with the area's crop sprayers and the City of Ray grain elevator manager to discuss the potential of the revised Preferred Route interfering with crop spraying. Additionally, the North Dakota State Land office was contacted to get their input on routing options where the revised Preferred Route would cross State lands.

Consultation and Coordination with Federal, State, and Local Governments

Specific regulations require Western to coordinate and consult with Federal, State, and local agencies about the potential of the Preferred Route and Route Options that could affect sensitive resources. The coordination and consultation must occur in a timely manner and these activities are required before any final decisions are made. Issues related to agency consultation may include biological resources, cultural resources, socioeconomics, land and water management. Biological resource consultation included section 7 consultation with the USFWS, as prescribed in the ESA, and consultation with State resource agencies. Cultural resource consultations apply to potential impacts to important cultural or archaeological sites, including section 106 consultation with the State Historic Preservation Officer (SHPO), as prescribed in the NHPA. The Federal, State, and local agencies that Western contacted are provided in **Appendix B**, Notification and Public Comments.

Native American Consultation

In compliance with the NHPA, Western initiated government-to-government consultation for BEPC's Proposed Project by sending letters and Project maps on August 1, 2008, to the following tribal groups: Eastern Shoshone Tribe, Northern Arapaho Tribe, Northern Cheyenne Tribe, Oglala Lakota Nation, Rosebud Sioux Tribe, Cheyenne River Sioux Tribe, Standing Rock Sioux, Crow Tribe, Fort Peck Tribes, and Three Affiliated Tribes. The letters were sent to inform the tribal groups of the proposed undertaking and to solicit comments concerning traditional cultural properties (TCPs) or places of cultural and religious importance. The Rosebud Sioux tribe, the only tribe to respond to the letters, indicated that they had no objection to the Proposed Project. At this time, no TCPs or places of cultural and religious importance have been identified within the Project area either through inventory or by the contacted tribal groups.

1.5.3 Summary of Scoping Comments

Western received a total of 34 comment submittals (e.g., letters, comment forms) containing 53 individual comments, and numerous verbal comments during the public scoping period. Most of the comments were from landowners; comments from agencies included the North Dakota DOT and the NDGFD.

Following the close of the public scoping period, comments were compiled and analyzed to identify issues and concerns. Each comment was reviewed and entered into an electronic database. As each comment was entered, the mailing list was updated to ensure that all interested parties would receive information throughout the process. Reports were generated categorizing the issues by topic and/or resources; reports were then reviewed to identify data entry errors and to eliminate duplication.

1.5.4 Identification of Issues

Information gained during scoping assists Western in identifying the potential environmental issues, Route Options, and mitigation measures associated with development of the Proposed Project. Transmission line segments that were presented during public meetings are shown on **figures 1-5** through **1-7**.

Most of the comments were related to potential impacts to landowner property. As a result of the landowner comments during the scoping period, transmission line routes that were presented in the scoping meetings were revised. The revised routes were published in the *Williston Herald* on May 25, 2008. Additionally, BEPC personally responded, either by email or mail, to approximately 30 individual landowners who requested additional information and/or maps of the routes.

In addition to impacts to landowner property, there were concerns about potential impacts from the Proposed transmission line route northwest of the Sloulin Field International Airport, where a runway expansion is planned. The proposed routes would avoid potential impacts to airport operations. The NDGFD expressed concern about potential disturbance of native prairie, riparian corridors, and wetlands areas related to construction of H-frame structures. However, during the planning phase of the Project, BEPC determined the single-pole structures would be used.

Additional comments and requests received during detailed routing were used by BEPC engineers and lands specialists to refine the routing process. BEPC engineers and lands specialists worked one-on-one with landowners to address each individual concern. Route alignments were adjusted in most instances to accommodate landowner concerns where it was practical and did not result in greater impact to other landowners and natural resources. Comments received during the scoping process have been summarized and are included in **appendix B**. Routing adjustments that were made as a result of collaborative discussions with landowners are described in **appendix C**.

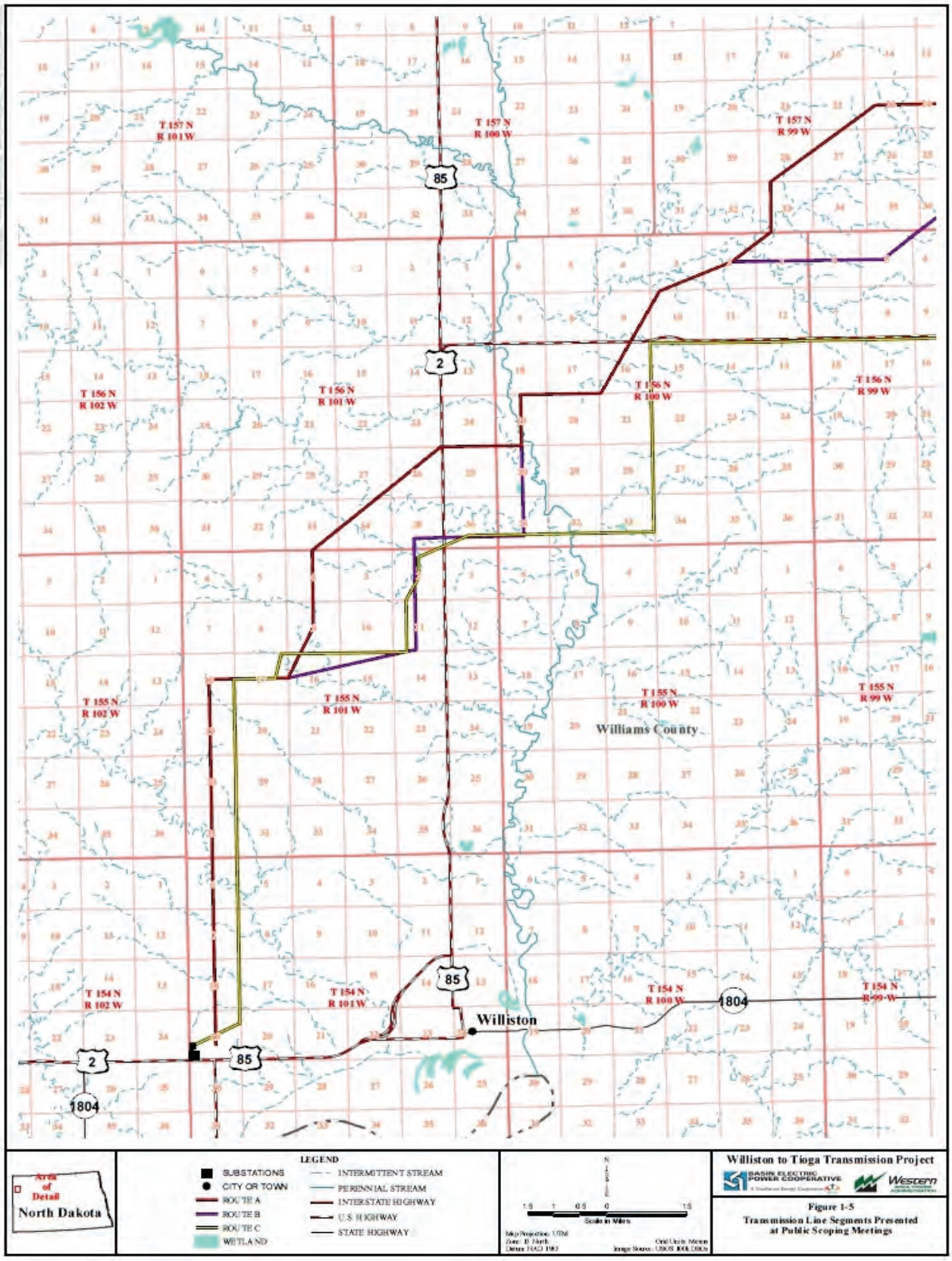

Figure 1-5 Transmission Line Segments Presented at Public Scoping Meetings

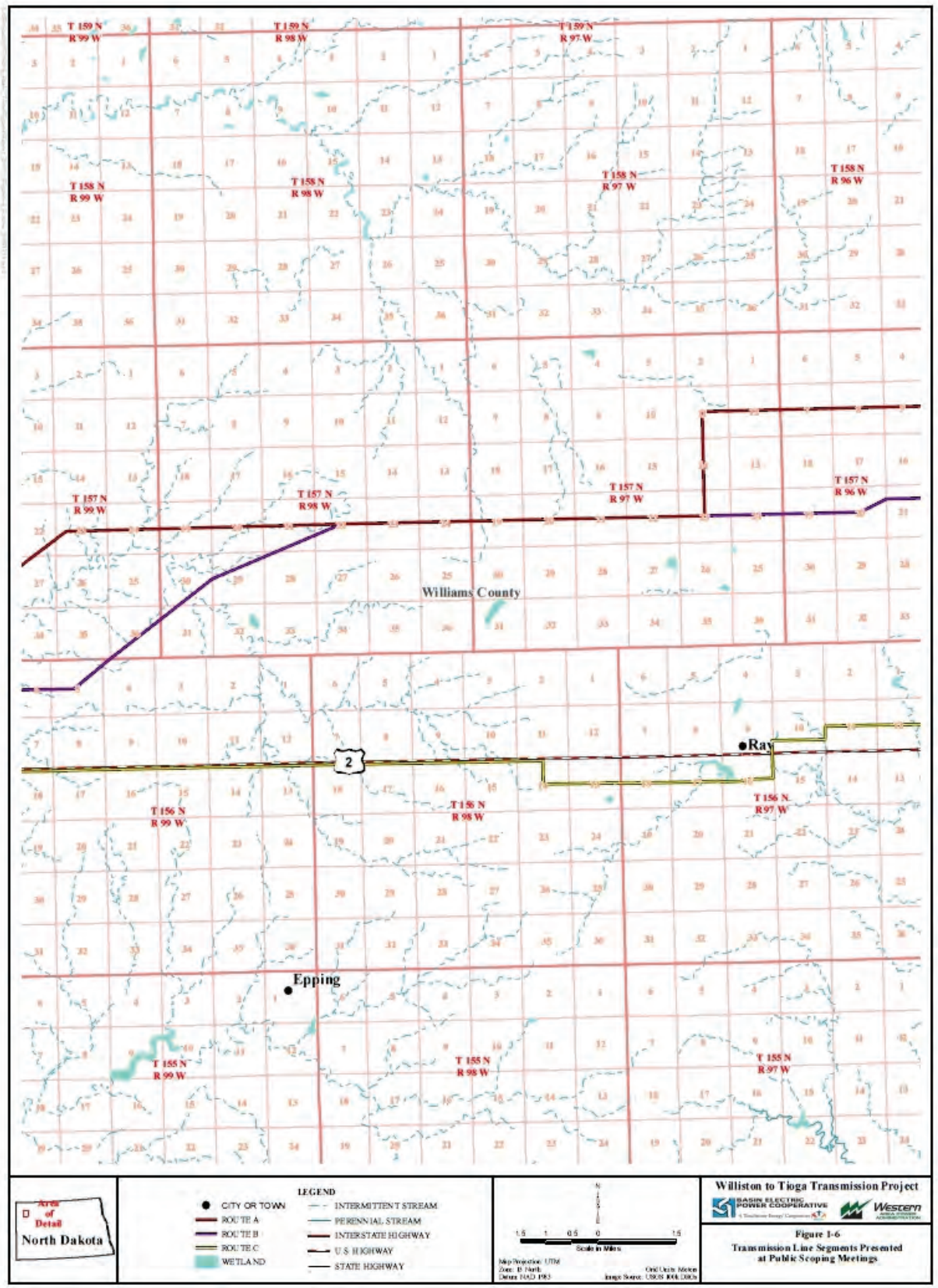

Figure 1-6 Transmission Line Segments Presented at Public Scoping Meetings

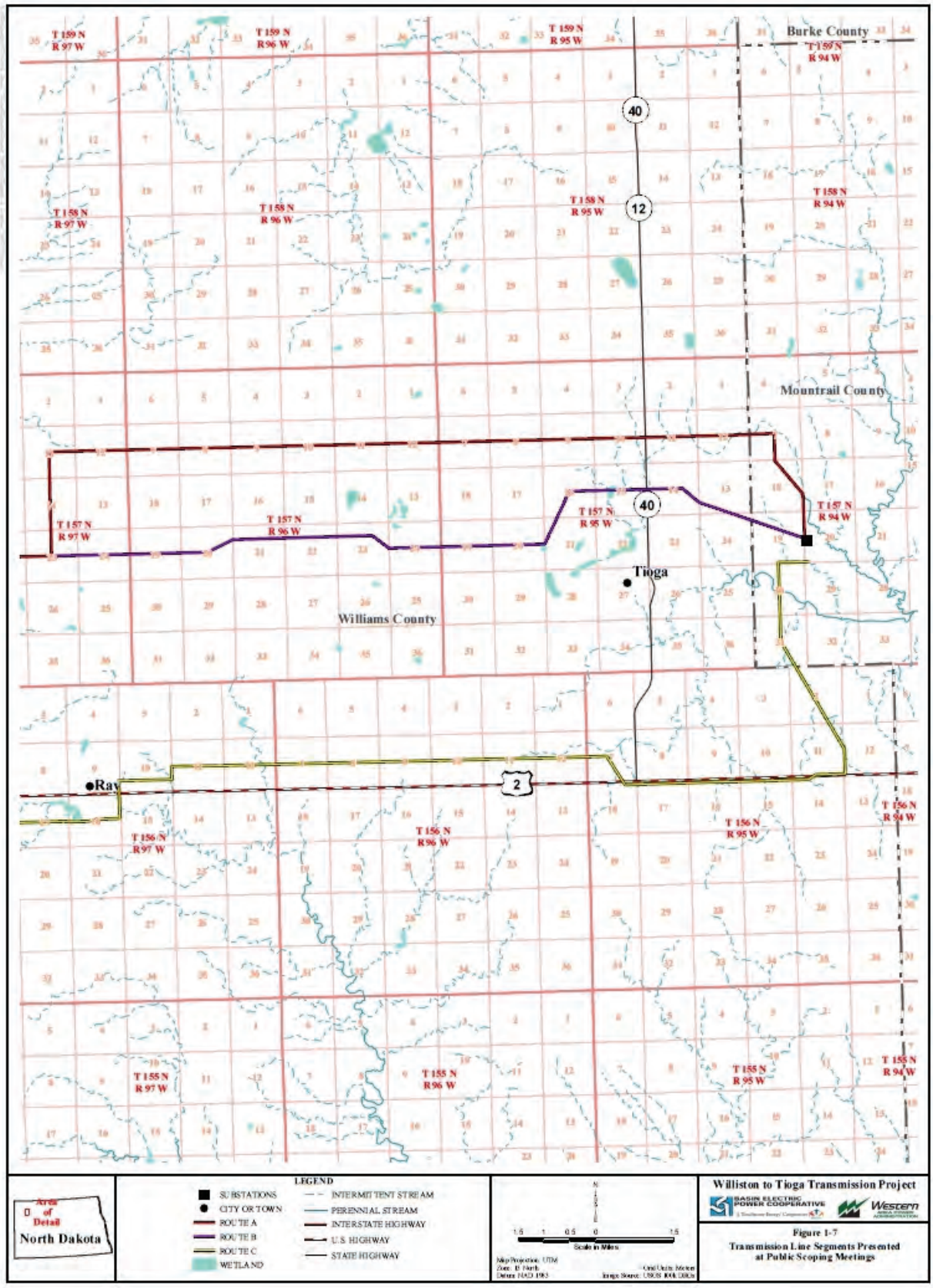

Figure 1-7 Transmission Line Segments Presented at Public Scoping Meetings

2.0 Project Design and Construction Details

BEPC developed a detailed list of steps that would be taken from project design through decommissioning. Project-specific mitigation measures were compiled by applying best management practices (BMPs) that are typical for constructing a high-voltage transmission line. Project-specific mitigation measures are provided in **appendix D**.

2.1 Western's Substation Modifications

Western would be responsible for modifying the 230-kV bay at Williston Substation to accommodate interconnection of the new transmission line. Modifications at the Williston Substation were specifically addressed as part of the Wolf Point to Williston Transmission Line Rebuild EA (prepared August 2003).

2.2 Transmission Line Design Parameters

BEPC's proposed 230-kV, single-circuit transmission line would be constructed using steel single-pole self-supporting structures within a 125-foot-wide ROW. The single-pole transmission line structures would range in height from approximately 95 to 120 feet and average 110 feet, depending on span distances between structures and area topography. The span between structures would range from 700 feet to 950 feet and average approximately 800 feet, depending on topography; taller structures could be used for crossing existing distribution and transmission lines or where unusual terrain exists. The single-pole structures would be designed to support three conductors and an overhead optical groundwire (OPGW). The OPGW would provide lightning suppression and fiber optic communications between the Williston and Tioga substations for systems control. Tangent structures would be free-standing and directly imbedded into the soil. Angle structures (used where the transmission line changes direction) and dead-end structures (used to provide longitudinal stability along the length of the line) would be steel with concrete foundations. Guy wires and anchors would not be used.

BEPC's Project construction and design would meet the requirements of the National Electrical Safety Code (NESC) for the Heavy Loading District, BEPC design criteria, and other applicable local or national building codes. The Heavy Loading District refers to those areas (including North Dakota) that are subject to severe ice and wind loading. **Table 2-1** describes the typical physical design characteristics for the proposed transmission line, and a typical single-pole structure is shown on **figure 2-1**.

Minimum conductor clearance is measured at the point of greatest conductor sag and closest proximity to the ground. The Williston to Tioga Transmission Line would be constructed with clearances that exceed standards set by the NESC. Minimum conductor height would be 26 feet over agricultural land, 28 feet over rural roads, and 31 feet over paved highways.

2.3 Transmission Line Construction Activities

BEPC would likely commence construction of the transmission line in mid-2010 and extend throughout the North Dakota construction season, usually beginning in March or April and ending in November or December of each year. Construction would be temporarily delayed if soils become excessively saturated due to heavy precipitation. Private contractors retained by BEPC would construct the transmission line and haul away construction wastes associated with the proposed Project. BEPC's contractors also would be responsible for complying with mitigation measures and agency requirements.

2.3.1 Pre-construction Surveying and Geotechnical Analyses

BEPC must complete various studies and obtain permits acquired before construction begins, including completion of the EA process, Western approval of the interconnection request, NDPSC permitting of the transmission line, cultural resources (section 106 NHPA) clearance, section 7 ESA biological surveys and

biological assessment, transmission line engineering and design, ROW procurement, and final transmission structure siting.

Table 2-1 Transmission Line Characteristics

Design Component	Values
Voltage (kV)	230
Conductor Size (diameter in inches)	1.345
ROW width (feet)	125
Maximum and minimum span distances between structures (feet)	700 - 950
Average span (feet)	800
Maximum and minimum structure height (feet)	95 - 120
Average height of structures (feet)	110
Average number of structures (per mile)	6.6
Temporary work area disturbance per structure (square feet) (approximately 125-foot x 100-foot area)	12,500
Permanent disturbance per structure (acre) (approximately three-foot diameter)	<0.0002
Minimum conductor ground clearance to agricultural land at 100 degrees Celsius (°C) (feet)	26
Minimum conductor-ground clearance to rural roads at 100°C (feet)	28
Minimum conductor-ground clearance to paved highways at 100°C (feet)	31
Circuit configuration	Vertical

BEPC and/or its contractors would perform initial line survey work, consisting of survey control, route centerline location, profile surveys, and access surveys prior to construction. These surveys would likely be conducted concurrently with other pre-construction tasks.

Geotechnical analyses were conducted at transmission line angle points and other locations to determine engineering requirements for structures. A truck-mounted auger was transported to each site to drill small-diameter boreholes. Cuttings from each borehole were evaluated to determine soil characteristics. Geotechnical analyses was conducted to minimize impacts to agricultural activities; land disturbances were confined to a relatively small area needed for site access and equipment operations. Geotechnical drilling locations required an area totaling approximately 400 square feet for equipment setup and operations in addition to an access trail.

ROW Access and Construction Preparation

Crews would gain access from public roads and section line trails as well as within the transmission line ROW for constructing and maintaining the line. Access for line construction would be by truck travel within the ROW; structure sites located along section lines would be accessed directly from section line roads and trails, where possible. New graded surface access roads are not anticipated. Existing roads and trails would be left in comparable or better condition than what existed before construction. Gates would be installed where fences cross the ROW and locks would be installed at the landowner's request. Gates not in use would be closed but not locked, unless otherwise requested by the landowner.

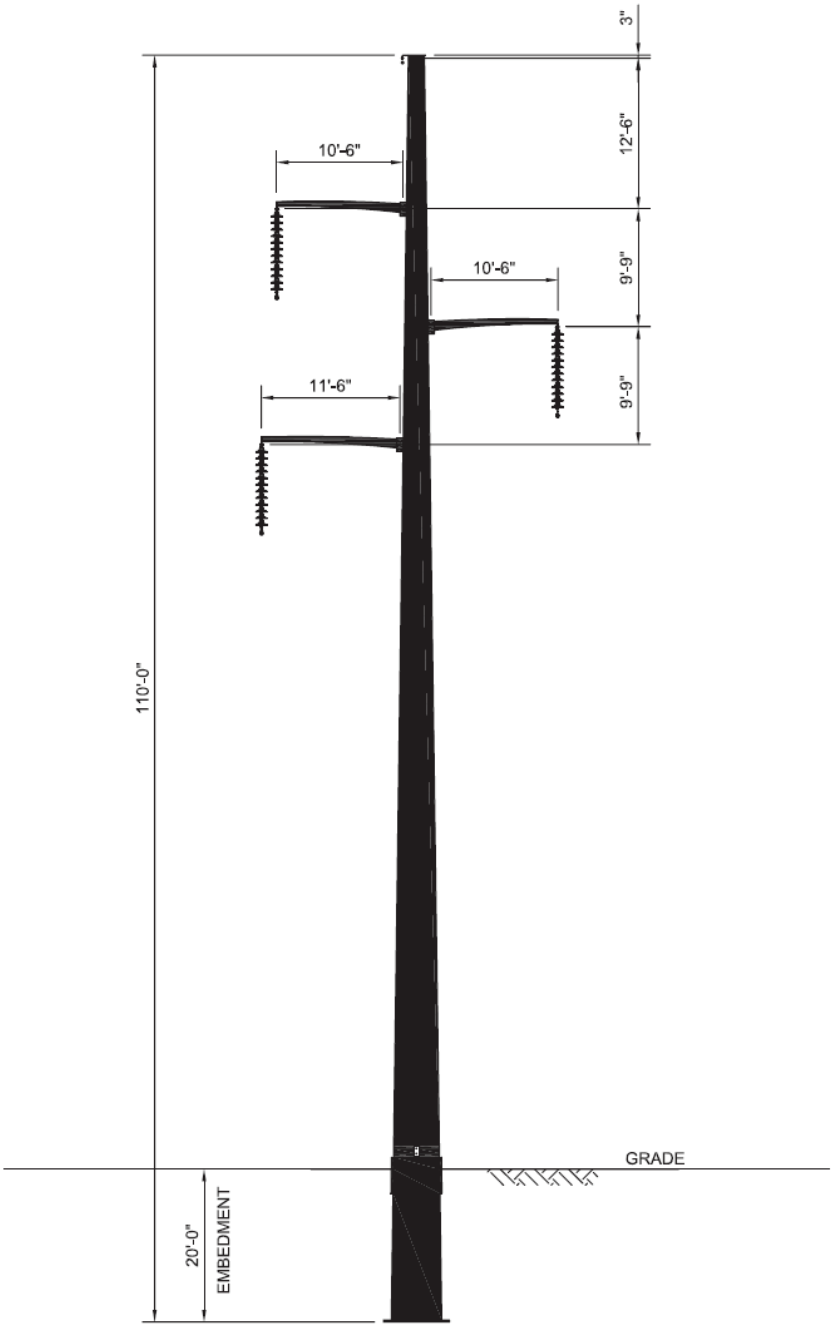

Figure 2-1 Typical Single-pole Structure

During construction, BEPC anticipates that three temporary material staging and equipment laydown areas, each averaging approximately 15 acres, would be used. If additional areas were needed, BEPC would conduct appropriate biological and cultural resource surveys before disturbance. Material staging site Number 1 would be located in the SW ¼, SW ¼, Section 14, T155N, R101W, approximately one mile south and west of the proposed transmission line. Material staging site Number 2 would be located in the NW ¼ of NW ¼, Section 15, T156N, R100W, adjacent to the proposed transmission line and US Route 2. Material staging site Number 3 would be located in the NE ¼, NW ¼, Section 17, T156N, R97W, approximately 0.5 mile from the proposed transmission line. All three sites have been previously disturbed by agricultural activities. BEPC would be responsible for returning staging areas to their previous condition when work is completed.

Tree and brush removal in the ROW would be minimal because the Project area consists largely of cultivated cropland and rangeland, and because woodlands and shelterbelts were avoided during the routing process. The ROW would only be cleared if trees and/or shrubs that are present would interfere with construction activities or the safe, reliable operation of the transmission line. Trees would be cut at ground level to provide access within the ROW and to allow vehicle access. Stumps and roots would remain in the ROW unless the landowner requests otherwise. Disposal of cut trees and brush would be consistent with the landowner's wishes and applicable State waste management rules. BEPC would replace trees removed at a 2:1 ratio, in accordance with NDPSC requirements.

2.3.2 Transmission Structure Site Preparation

Transmission structure site clearing would be minimal. The Project area and locations along all of the proposed transmission line routes are relatively flat; the need for structure site leveling is also expected to be minimal. It is anticipated that at some structure locations, BEPC may need to blade small areas (up to 40 feet by 40 feet for crane and manlift landings) to level the ground surface to allow the safe operation of the equipment. Blading would be confined to the ROW and accomplished using bulldozers or front-end loaders. Soil removed during leveling would be stockpiled and replaced following construction; special emphasis would be placed on salvaging topsoil to be used for reclamation. The ground would be re-graded to the approximate original contour and revegetated (rangeland) or tilled (cropland) when the work is completed. Approximately 12,500 square feet would be temporarily disturbed at each structure site for borehole excavation, structure laydown, structure assembly, and structure erection. Temporary disturbance to soils would be mitigated by returning the sites to grazing and farming.

2.3.3 Borehole Excavation

BEPC's contractor crews would use a truck-mounted auger or tracked vehicle equipped with a power auger to drill holes for the structures at appropriate locations along the ROW. Total disturbance at each structure location would vary depending on terrain and equipment; however, all disturbance would be confined to the ROW.

Borings for the pole holes would have an average diameter of five feet and an average depth of 20 feet. The single-pole structure would be lowered by crane into boreholes and the annulus around the structure would be backfilled with excavated material. Surplus material (expected to total approximately 15 cubic yards at each tangent structure site) would be spread around the base of structures or hauled to an offsite location (i.e., area landfills) for disposal, in accordance with landowner wishes.

Approximately 32 structures would require reinforced concrete foundations consisting of a six-foot-diameter boring to an average depth of 20 feet. Approximately 20 cubic yards of surplus material would be either spread in the vicinity of the structure or disposed of in accordance with landowner wishes. Large volumes of excess soil would be disposed of at local landfills. Landfills typically need additional fill as cover for waste material. BEPC would ensure that disposal of waste material, including concrete spoil, would be in compliance with applicable regulations and would not include placement in wetlands or aquatic sites. Site-specific borehole diameters, depth, and the use of reinforced concrete foundations would be determined during geotechnical and engineering evaluations.

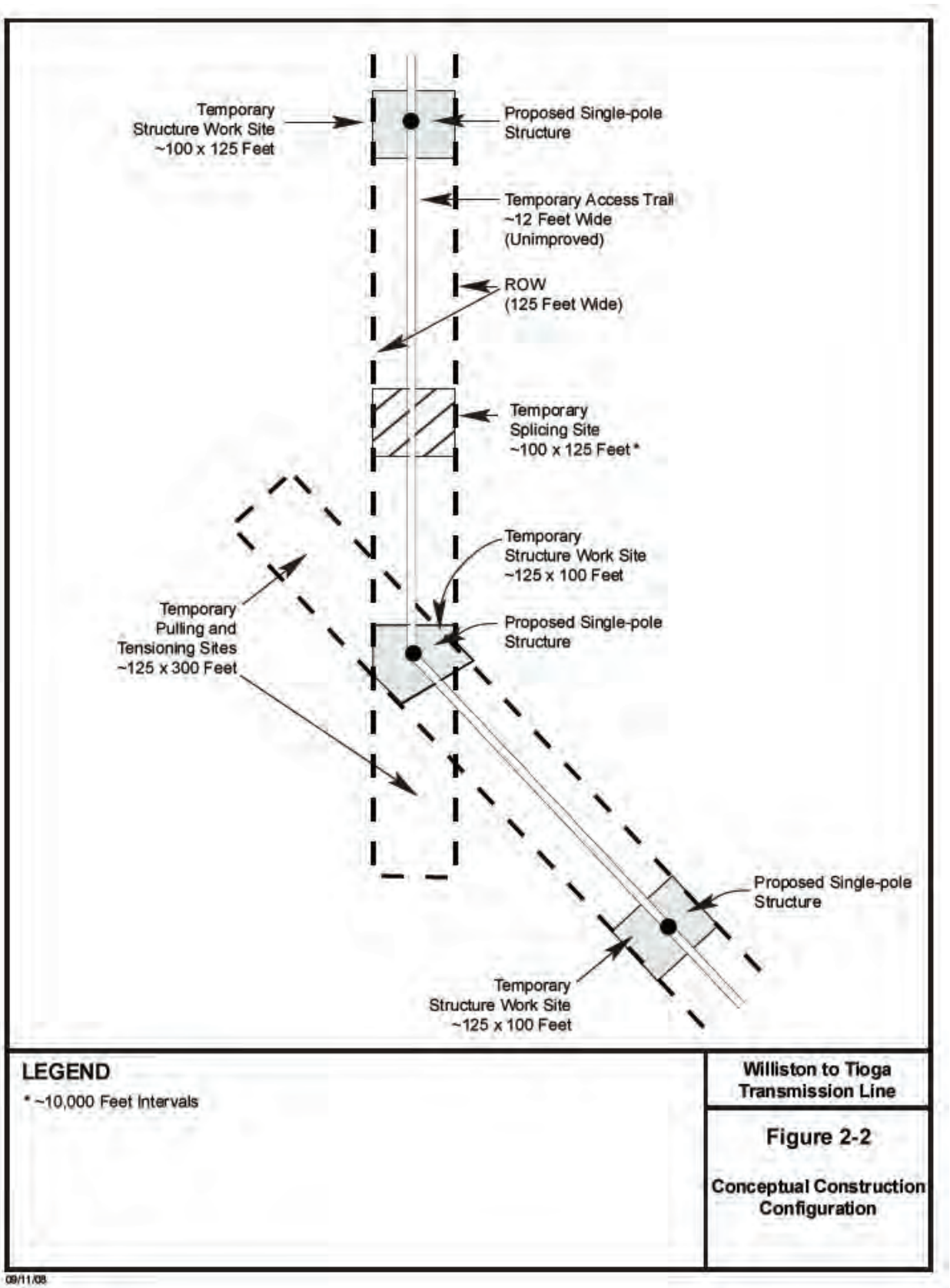

Figure 2-2 Conceptual Construction Configuration

2.3.4 Structure Assembly and Erection

Structure components (structure segments, davit arms, hardware, insulators, and related materials) would be trucked to structure work site locations and assembled. Davit arms, insulators, and other appurtenances would be attached to the poles while on the ground at each structure location, within the 125-foot-wide ROW. Erection crews would place the lower portion of the structure in the borehole (directly imbedded) or on reinforced foundations (i.e., self-supporting angle point and deadend structures) using cranes or large boom trucks. The structures would then be plumbed and the hole backfilled, as previously described. The upper portion of the structure would be lifted by crane and inserted onto the lower section. Both sections would then be bolted together.

2.3.5 Conductor Stringing and Tensioning

Following structure construction, crews would install the conductors and OPGW using conductor stringing sheave blocks and line pulling and tensioning equipment. The conductor and OPGW would be kept under tension during the stringing process to keep the conductor clear of the ground and obstacles that could damage the conductor and/or OPGW surfaces. Keeping tension on the conductors and OPGW also would prevent impacts to crops or environmental resources in the ROW between structures.

Pulling and tensioning sites are typically located at 10,000-foot intervals and at angle point structures. Sites along tangent structures are maintained within the ROW, those at angle points typically are partially outside of the normal 125-foot-wide ROW. Each site typically requires two 37,500-square-foot (0.9-acre) temporary use areas. Stringing equipment generally consists of wire pullers, tensioners, conductor reels, OPGW wire reels, and sheave blocks. About 10,000 feet of conductor and OPGW would be installed for each pull. After the conductor/ground wire is pulled for a section of line, it is tightened or sagged to the required design tension in compliance with the NESC. The process would be repeated until all of the conductor and OPGW is pulled through all sheaves. Conductor stringing also would require access to each structure for securing the conductor to the insulators or OPGW to each structure, once final line sag is established. A typical pulling and tensioning site, splicing site, and access road are shown schematically on **figure 2-2**.

For public safety and property protection, BEPC would install temporary wooden guard structures to provide support when stringing conductor and OPGW across existing power lines, roads, highways, railroads, and other linear obstacles. The structures would be removed when stringing is complete; the pole borings would be backfilled and the temporary support structure sites would be reclaimed. All temporary wooden guard structures would be installed within the transmission line ROW.

2.4 Structure Site Access and Traffic

Access would involve the use of existing roads where available, and temporary overland access trails where necessary. No new access roads would be constructed for the Proposed Project. The use of temporary overland access trails between structure sites would not require new construction, but would result in temporary disturbance. Occasional access from section line trails could result in temporary disturbance along the ROW; however, such disturbance would be limited to a 12-foot-wide track (approximately) and only long enough to provide vehicle access directly to structure locations. Some additional access disturbance could occur if truck or vehicle turnarounds are needed; however, BEPC would encourage the use of structure work sites for turnarounds.

Existing access roads (typically paved or maintained with a gravel or aggregate base) would be used in their original condition to the extent possible, or with minor road blading or other improvements as agreed upon by the county or township. BEPC would be responsible for repairing any damage caused by construction equipment movement and would return existing roads to original or better condition following construction. BEPC would not be responsible for maintaining roads following construction. BEPC would not be responsible for maintaining fences and gates following construction and restoration; however, access gates that would be installed during construction would be left in place following construction for maintenance access and landowner use.

Line segments that are parallel to section lines that do not have established roadways would utilize the 66-foot-wide public ROW to the extent practicable. A 33-foot-long, 12-foot-wide temporary access point to each structure site would temporarily disturb 0.009 acre. If blading or other minor improvements are needed (in localized areas) to ensure the safe movement of heavy equipment, such improvements would remain in place following construction and such areas would be restored to their original contour.

BEPC would restore disturbed areas to pre-construction conditions, to the extent practicable, but would not be responsible for the long-term maintenance of such section line trails. Any fences, gates, or similar features that would be removed during construction would be replaced or rebuilt. Gates and fences that would be installed during construction would be left in place for future use.

2.5 Temporary Overland Access

BEPC would use temporary overland access in areas without existing roads. Access through cultivated fields would be, to the extent practicable, during the non-growing season. BEPC would compensate landowners for loss of crops caused by construction activities. Any locations identified as having sensitive resources would be avoided by overland access routes. Permanent access roads to ROW or structures would not be maintained.

Temporary access routes would result in a 12-foot-wide swath of temporary disturbance and compaction of vegetation and soils. Natural vegetation along these temporary access routes would recover quickly, primarily because grading would be limited to very small, localized areas. BEPC would survey temporary overland access routes for cultural resource and vegetation surveys the same as the other ROWs. BEPC would compensate landowners for access route ROW where public access does not exist.

2.6 Reclamation

Following construction, BEPC would grade and/or re-slope disturbed areas to their approximate original contours where needed to minimize erosion and visual alteration. If grading is needed to ensure the safe movement and operation of heavy equipment, such areas would be restored following construction. In grassland or pasture areas, disturbed areas would be reseeded with native species. Cultivated land would be tilled and returned to production. Fences and gates damaged as a result of the Proposed Project would be repaired.

Rangeland from which vegetation has been removed, destroyed, or damaged would be reclaimed by BEPC and revegetated. Reclamation activities, weather permitting, would be ongoing throughout construction and would be undertaken as soon as construction activities are completed in a particular area. Drainage structures and similar improvements would be removed from areas to be reclaimed, where appropriate, and the area would be revegetated using a native seed mixture, as recommended by the County Agricultural Extension Service or the Natural Resources Conservation Service (NRCS).

BEPC would level ruts and scars from overland travel to break up compacted soils and aid in returning areas to approximate original contours. Cultivated areas disturbed by overland travel would be leveled and tilled to break up compacted soils (if necessary) and returned to production.

The optimal timing for revegetation success would be spring or fall to coincide with seasonal rains. BEPC may need to employ mulching or netting to protect seeded areas from erosion. Other erosion control measures would be applied, where needed. BEPC would conduct follow-up inspections during the next growing season. Areas that did not become revegetated would be reseeded again, as necessary. The reclamation procedures described above would be applied to disturbed areas including temporary access trails, and other areas disturbed by Proposed Project activities.

2.7 Construction Waste Management

Typical waste materials generated from construction activities include miscellaneous lumber and shipping materials used to protect equipment during transportation, paper products, soda cans, food-related materials, and sanitary waste. Waste from construction materials and rubbish from all construction areas would be

collected, hauled away, and disposed of in an approved landfill. BEPC would arrange for sanitary waste disposal through agreements with local municipal sanitary waste treatment facilities. Hazardous waste would not be stored or located near the ROW or in proximity to waterways or drainages at any time before, during, or after construction.

Material staging areas and vehicle maintenance and refueling areas would not be located near waterways. If any of the material staging areas include vehicle and equipment refueling, or storage of petroleum products in excess of 1,320 gallons, BEPC would develop a Spill Prevention, Control, and Countermeasures (SPCC) Plan. The SPCC Plan would address: 1) operating procedures to prevent spills; 2) control measures to prevent a spill from reaching navigable waters; and 3) countermeasures to contain, clean up, and mitigate the effects of a spill that reaches navigable waters. Additionally, spill containment and clean up materials (e.g., absorbent material, shovels) would be available at every work site. The materials would be used to contain and clean up oil and hydraulic spills that may result from equipment leaks. Workers would be trained in procedures to follow to contain and clean up released hazardous materials.

2.8 Construction Schedule, Work Force, and Equipment

Transmission line construction would take place over a one-year period and would generally follow a sequential set of activities performed by crews proceeding along the length of the line. BEPC would schedule activities that would impact nesting migratory bird species to avoid the nesting period (typically April 15 through July 31) to the extent practicable. However, some activities would coincide with the nesting period. In those cases, BEPC would carry out surveys during the nesting period to determine if species are present. If species are found to be present, activities would be rescheduled to avoid disturbance to nesting birds. **Table 2-2** lists construction activities. The proposed transmission line would take an estimated seven months to construct. Construction activities associated with the Project are estimated to begin during mid-2010. It is anticipated that the transmission line would be in service by late-2011. The sequential nature of construction would minimize activities at any given work site.

Table 2-2 Conventional Personnel, Equipment, and Time Requirements for Construction

Task	Number of Personnel	Equipment	Length of Time
Structure Site Clearing and Vegetation Management	4–6	Pickups, ATVs	1 month
Gate Installation	3	Flatbed and pickup trucks	1 month
Structure Assembly	6–8	Pickups, cranes, material trucks, rubber-tired crane, 4x4 pickups	4 months
Hole Excavation	2–3	Rotary drilling rigs, backhoes, pickups, rubber-tired digging equipment, ATVs, portable compressors	4 months
Structure Erection	6–8	Rubber-tired cranes, boom trucks, 4x4 pickups	5 months
Ground Wire and Conductor Stringing	16–20	Pickups, manlifts/boom trucks, hydraulic tensioning machines, reel trailers	3 months
Cleanup	4	Pickups, dump trucks, flatbed trucks	Duration of Project
Concrete Foundations	10	Excavators, concrete trucks, skid steer	1–2 months
Equipment Installation	10	Cranes and trucks	3–4 months

2.9 Operation, Maintenance, and Abandonment

BEPC would perform the following operation and maintenance activities throughout the life of the Proposed Project.

- BEPC's preventive maintenance program for the transmission line includes aerial and ground inspections. Aerial inspections would be conducted at least two times each year. Ground patrols would be conducted annually for the first three or four years, and less frequently thereafter. Climbing inspections of structures would be conducted on a five-year cycle with every fifth structure inspected each year. Inspections and patrols would involve the use of vehicles in areas where there is suitable vehicle access.
- Maintenance activities would include repairing damaged conductors, inspecting and repairing structures, replacing damaged and broken insulators, and tightening hardware.
- BEPC would maintain any gates it installs or uses for access.
- BEPC would trim trees that pose a clearance or safety problem to the operation of the transmission line. Specific requirements of the National Electric Reliability Council would be followed. This activity would be completed in accordance with the landowner easement.

If BEPC were to abandon or rebuild the transmission line in the future, decommissioning and removal of structures, conductor, and ancillary equipment would be in accordance with applicable regulations in place at the time.

Treatment of vegetation within the ROW would include the selective removal or trimming of trees to prevent their contact with the transmission line conductors. Some trees would have to be removed if they are classified as "danger trees" (trees that are 20 feet in height or taller which upon falling would come within 10 feet of the structure or conductors). Disposal of cut trees and brush would be in a manner acceptable to the landowner and in accordance with applicable State waste management rules. The need for tree removal is expected to be minimal as areas with trees were intentionally avoided by BEPC during detailed routing.

2.10 Project-specific Mitigation Measures

BEPC developed project-specific mitigation measures to avoid or reduce the severity of environmental impacts. The measures are applicable to Project construction and operation. Proposed mitigation measures are provided in **Appendix D**, Project-specific Mitigation Measures.

2.11 Worker Safety and Health Protocol

BEPC would carry out all construction and maintenance activities in compliance with applicable Federal worker safety regulations, such as defined under the Occupation Safety and Health Administration Act of 1979. Worker safety and health is administered by BEPC's Transmission Systems Maintenance Division, which is a member of the National Safety Council.

3.0 Structure and Route Options

BEPC evaluated structure design and transmission line alignment options to identify those most appropriate for the Proposed Project and those that would minimize environmental impacts. The reader should note that while these BEPC-developed alignment options are described and evaluated in this EA, they do not constitute "alternatives" as defined by NEPA as they are not alternatives to Western's defined Federal action. They are discussed to demonstrate BEPC's reasoned process to develop their Proposed Project with full consideration of environmental resources and landowner preferences, in order to minimize impacts on both.

3.1 Structure Options

BEPC applied engineering, cost, and environmental analyses to evaluate various transmission line structure designs and materials. Structure design options included single-pole, H-frame, and lattice. Materials considered included steel (galvanized and self-weathering), wood (wood pole), and laminated wood. Factors considered included durability, cost of installation, cost and frequency of periodic maintenance, and potential environmental impacts.

BEPC selected single-pole structures based on comments from landowners. Single-pole structures were considered preferable over H-frame structures because they would greatly reduce potential conflicts with agricultural machinery operations, allow placing structures near property lines (thereby reducing impacts to any one property owner), and reduce the amount of land needed for any one structure. Non-tillable land between H-frame structure legs (approximately 60 square feet) also was eliminated through the use of single-pole structures.

3.2 Route Options

Land use and land ownership patterns within the Proposed Project area are defined by the Public Land Survey System, which resulted in Townships and Ranges comprised of one-mile square sections. In North Dakota, section lines have designated 66-foot-wide ROW centered on the section lines. Approximately 420 linear miles of public ROW within the Project area provided BEPC with considerable opportunities to access adjacent properties for transmission line construction. Potential routing constraints, such as residential structures, farmsteads, irrigated lands, wildlife management areas, recreational areas are relatively few and of low density. State-listed exclusion areas, such as designated local, State, and Federal historic and land use resources were avoided in their entirety. Other routing opportunities and constraints are largely contingent upon balancing individual landowner concerns and optimizing alignments from engineering and cost perspectives. Achieving a balance between landowner concerns and those related to engineering and cost fell largely on BEPC engineering and ROW acquisition staff and negotiations with local landowners. Routing adjustments made during negotiations with landowners included off-setting structures from fencelines to allow movement of crop sprayers and similar equipment. Off-setting structures from fencelines allows access around structures. Additional routing opportunities and constraints that are unique to the Project area, including sensitive environmental resources, are addressed in **table 3-1**.

BEPC's route selection criteria, the selection process, and land requirements for the Preferred Route and two transmission line Route Options, are described in the following sections. The remaining text provides the rationale for permanent and temporary land requirements for transmission line construction. Detailed affected environment information and impacts analyses are provided in chapter 4.0.

3.2.1 Routing Selection Criteria

BEPC assembled a multidisciplinary Project team including specialists in NEPA compliance, transmission line routing, PSC permitting, transmission line and systems engineering, ROW acquisition, and public involvement. Routing analyses were carried out to meet requirements of NEPA and the NDPSC. Major elements in BEPC's routing process include the identification and analysis of routing opportunities and constraints as described in the following subsections.

Table 3-1 Project-specific Routing Criteria

Routing Opportunities	Comments
Maximize use of existing linear features, such as roads, section lines, and mid-section lines.	Use of linear features generally reduces the amount of new disturbance needed for transmission line construction and maintenance. Routing near roads and trails can reduce the need for new access road construction. Routing along section lines generally avoids land severance. Use of mid-section lines can reduce visual impacts and impacts to agriculture.
Maximize co-location with existing or planned facilities.	Overall minimization of potential impacts. Minimize land use requirements. Maximize use of existing access roads and trails, when such actions would result in a reduction of impacts.
Maximize use of routes along (unoccupied) section line trails.	Use of existing trails along section lines (rather than developed roads along section lines) should minimize visual impacts to sensitive receptors and should facilitate access for construction and maintenance and minimize the need for new access roads.
With consent of landowners, route lines through remote rangeland areas.	Use of rangeland can provide opportunities to place the transmission line in relatively remote locations, which could provide opportunities to route cross-country with minimal impacts to agriculture and potentially minimal visual impacts to sensitive receptors. However, routing within rangeland could result in a higher potential for impacts to biological, cultural, and water resources. Such routing would be considered on a case-by-case basis and with the consent of landowners and consideration of potential environmental consequences.
Routing Constraints	**Comments**
Avoid population centers.	Overall avoidance/minimization of visual, land use, and construction/maintenance impacts.
Avoid proximity to airports and landing strips.	Apply Federal Aviation Administration airspace criteria when routing transmission lines to determine structure height vs. aircraft takeoff and approach requirements.
Avoid disruption to agricultural activities (crossing of cultivated fields, structure type selection).	To the extent possible, avoid crossing cultivated lands and splitting of parcels. Avoid proximity to irrigation systems. Route along existing section lines, to the extent practicable.
Minimize impacts to prime or unique farmland.	Apply reasonable methods to minimize direct or indirect use of prime or unique farmland.

Table 3-1 Project-specific Routing Criteria

Routing Constraints	Comments
Avoid land severance, when practicable.	Avoid splitting parcels that are under single ownership, unless an opportunity exists where such routing would be acceptable by the landowner and beneficial to the Project.
Avoid extreme topographic areas (i.e., buttes and badlands).	Avoid steep slopes and highly erodible soils. Construction on steep slopes can result in erosion problems, engineering and construction difficulties, and visual impacts.
Avoid designated or registered national: parks, memorial parks, historic sites and landmarks; monuments; and wilderness areas.	These are exclusion areas, as mandated by the NDPSC.
Avoid designated or registered State: parks, historic sites; monuments; historical markers; archaeological sites; and nature preserves.	These are exclusion areas, as mandated by the NDPSC.
Avoid county parks and recreational areas; municipal parks; and parks owned or administered by other governmental subdivisions.	These are exclusion areas, as mandated by the NDPSC.
Avoid areas that are critical to the life stages of threatened or endangered animal or plant species.	These are exclusion areas, as mandated by the NDPSC.
Avoid areas where animal or plant species that are unique or rare to the State would be irreversibly damaged.	These are exclusion areas, as mandated by the NDPSC.
Avoid designated or registered national: historic districts; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands.	These are avoidance areas, as mandated by the NDPSC.
Avoid designated or registered State: wild, scenic, or recreational rivers; game refuges; game management areas; management areas; forests; forest management lands; and grasslands.	These are avoidance areas, as mandated by the NDPSC.
Avoid historic resources that are not specifically designated as exclusion or avoidance areas.	These are avoidance areas, as mandated by the NDPSC.
Avoid areas that are geologically unstable.	These are avoidance areas, as mandated by the NDPSC.
Avoid locations closer than 500 feet from houses, community centers, schools, daycare facilities, and healthcare facilities. Avoid farmsteads (minimum of 500 feet from inhabited rural structures).	These are avoidance areas, as mandated by the NDPSC. Overall avoidance or reduction of visual, land use, and construction/maintenance impacts.
Avoid reservoirs and municipal water supplies.	These are avoidance areas, as mandated by the NDPSC.
Avoid water sources for organized rural water districts.	These are avoidance areas, as mandated by the NDPSC.

Table 3-1 Project-specific Routing Criteria

Routing Constraints	Comments
Avoid irrigated land.	These are avoidance areas, as mandated by the NDPSC. Avoid induced current potential within linear facilities.
Avoid areas of recreational significance that are not designated as exclusion areas.	These are avoidance areas, as mandated by the NDPSC.
Avoid areas that have been designated as "critical habitat" under the ESA.	Minimize impacts on listed species.
Maximize structure set-backs at road crossings, to the extent practicable.	Minimize visual impacts.
Maintain uniformity of structure types (design and materials), to the extent practicable.	Minimize visual impacts.
Avoid and/or span wetlands, streams, drainages, and rivers.	Avoid and/or reduce impacts to biological and hydrological resources from line and access road construction.
Avoid flood prone areas.	Avoid impacting floodplain function. Also, avoid flood damage to power transmission facilities from flooding.
Perpendicular crossings of rivers, streams, and drainages.	Avoid and/or reduce impacts to biological and hydrological resources from line and access road construction.
Use temporary culverts to allow access, when necessary.	Reduce potential impacts to drainage patterns.
Other Considerations	**Comments**
Consider local and regional land use plans.	Minimize or avoid conflict with land use plans, goals, and objectives.
Minimize overall transmission line lengths.	Cost and maintenance considerations.
Minimize number of angle structures.	Cost and maintenance considerations.
Minimize number of transmission line crossings.	Cost, maintenance, and reliability considerations.
Avoid paralleling major transmission lines closer than 2,000 feet.	Reliability consideration. Western's criteria, designed to reduce the potential for single event catastrophic power outages.

3.2.1.1 Routing Opportunities

Routing opportunities were identified within Project area. Linear features provide opportunities that can be paralleled, such as roads, trails, and section lines. The use of linear features typically minimizes temporary and permanent impacts associated with access needed for construction and periodic maintenance. Using local roads and trails reduces the need for new road or trail construction and, therefore, minimizes potential impacts to currently undisturbed land. Although paralleling existing transmission lines provides routing opportunities, they were avoided due to North American Electric Reliability Council requirements for system reliability. For example, adverse weather conditions (i.e., tornado, high winds) that could affect an existing transmission line also could affect a parallel line, resulting in the loss of two major electrical supply lines at one or more locations during a single event.

BEPC considered existing trails (rather than improved roads) along section lines to be features that were preferable for paralleling. Section line centerlines are within a 66-foot-wide (33 feet from each edge) public ROW. Single-pole structures could be placed along private property lines and at the edge of the public ROW by using short spur temporary access extending from the trail to the structure site. Benefits of single-pole structures (over H-frame structures) are identified in section 2.1. If spur roads were to be used to gain access to structure locations, each spur road would temporarily occupy 0.009 acre, mostly within the public ROW. BEPC also considered paralleling section line trails to be preferable over paralleling local improved roads and highways because residential structures are generally located along well-defined (all weather) local roads and highways. Visual impacts to local motorists and landowners also would be minimized by locating transmission lines adjacent to trails (unimproved roads) because these areas are infrequently visited by area residents and even less frequently by non residents.

Mid-section lines also were considered to be a possible routing opportunity by BEPC because they often differentiate property ownership, particularly within areas where properties are sold in 160-acre (quarter-section) tracts. Difficulties associated with the use of mid-section lines include relatively high potential for interference with agricultural activities (i.e., cropland cultivation) and separation of property parcels. Construction along mid-section lines could result in separation of parcels within large tracts (e.g., 640 acres) that are under single ownership. However, in some cases mid-section alignments were preferable as they tend to avoid farmsteads and residences that are largely located on section line roads.

3.2.1.2 Routing Constraints

The NDPSC specifies routing exclusion and avoidance areas that directly relate to routing constraints. BEPC also routinely identifies and implements Project-specific mitigation measures to avoid and/or minimize environmental impacts, mitigate impacts that cannot be fully avoided, minimize construction costs, and benefit system reliability.

Project-specific routing criteria that BEPC applied to the Williston to Tioga Transmission Line Project are summarized in **table 3-1** (section 3.2).

3.2.2 Route Selection Process

BEPC initially identified approximately 23 transmission line segments within the area between Williston Substation and Tioga Substation and presented them at the public scoping meetings in Williston and Tioga. Two transmission line alignment options (designated as Route Options A and B) were selected by BEPC from combinations of the 23 line segments that were presented during public scoping. A 60.7-mile-long alignment was subsequently identified by BEPC engineers and lands specialists that responded to comments received during public scoping. The 61.1-mile-long alignment was designated as Route Option C and is BEPC's preferred alignment.

All three Route Options are similar in length and extend northeast from Williston Substation approximately 24 miles before turning to the east. Route Options A and B extend north and east along local roads before reaching Tioga Substation. Route Option C (Preferred Option) parallels U.S. Highway 2 and turns to the north, near Tioga Substation. Transmission line Route Options A, B, and C are shown on **figures 3-1, 3-2**, and **3-3**, respectively. Detailed routing performed by BEPC's engineers and ROW agents is provided in **appendix C**.

Permanent land requirements for each Route Option are nominal and contingent upon structure numbers. Temporary land requirements are contingent upon structure work site numbers, access road requirements, pulling and tensioning site numbers, and splicing site requirements. Temporary and permanent land requirements for each Route Option are shown in **table 3-2**.

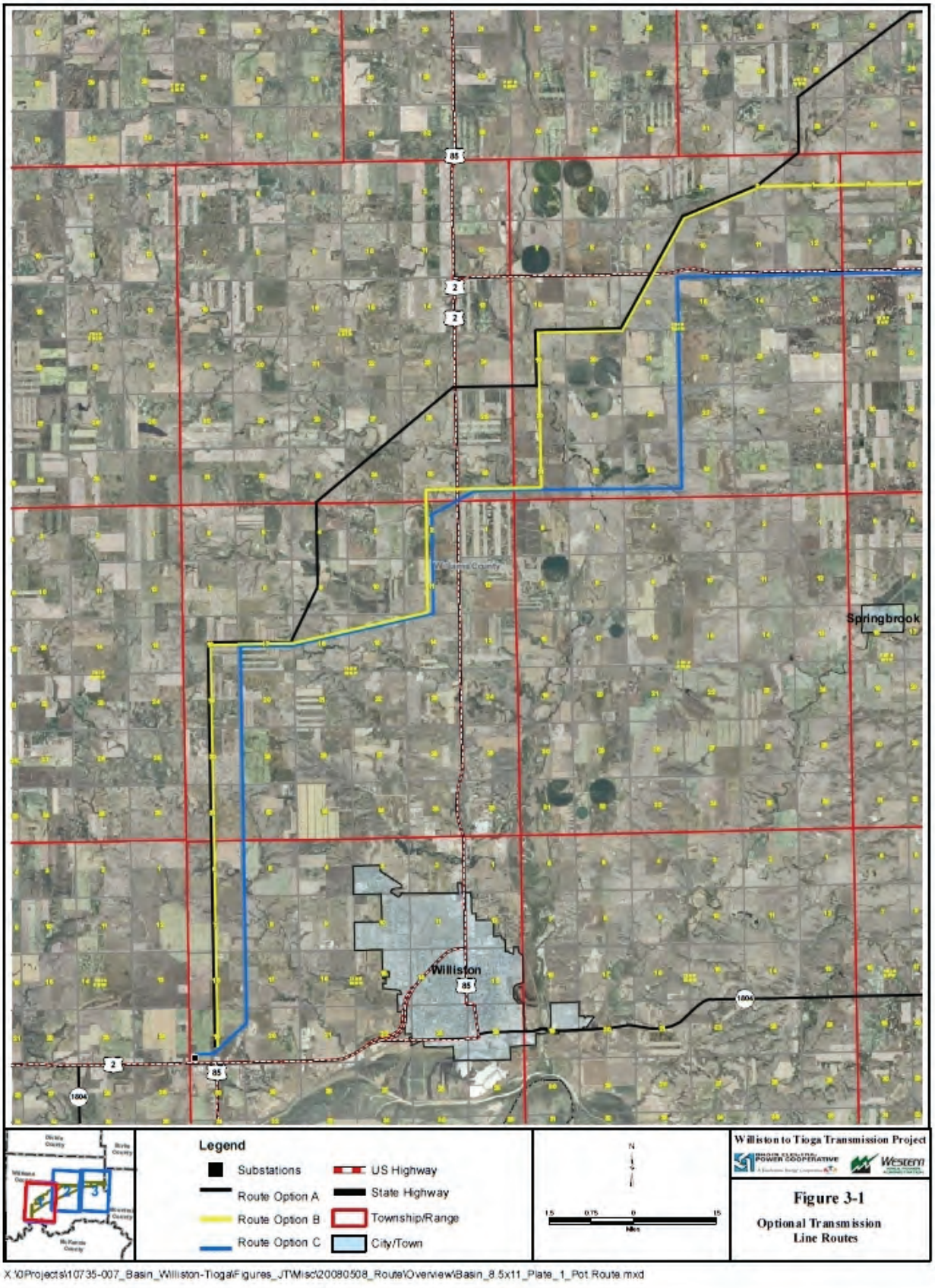

Figure 3-1 Optical Transmission Line Routes

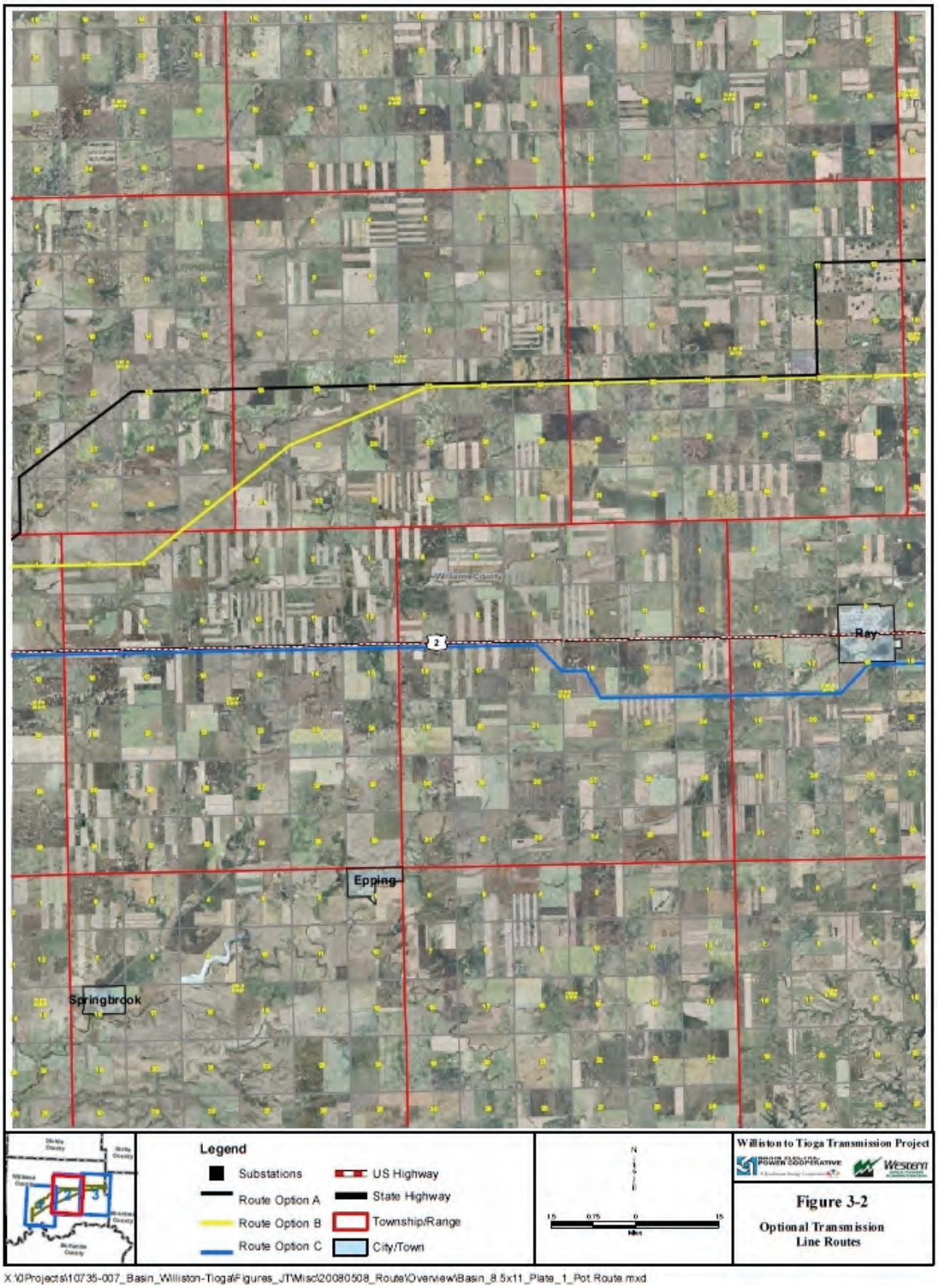

Figure 3-2 Optical Transmission Line Routes

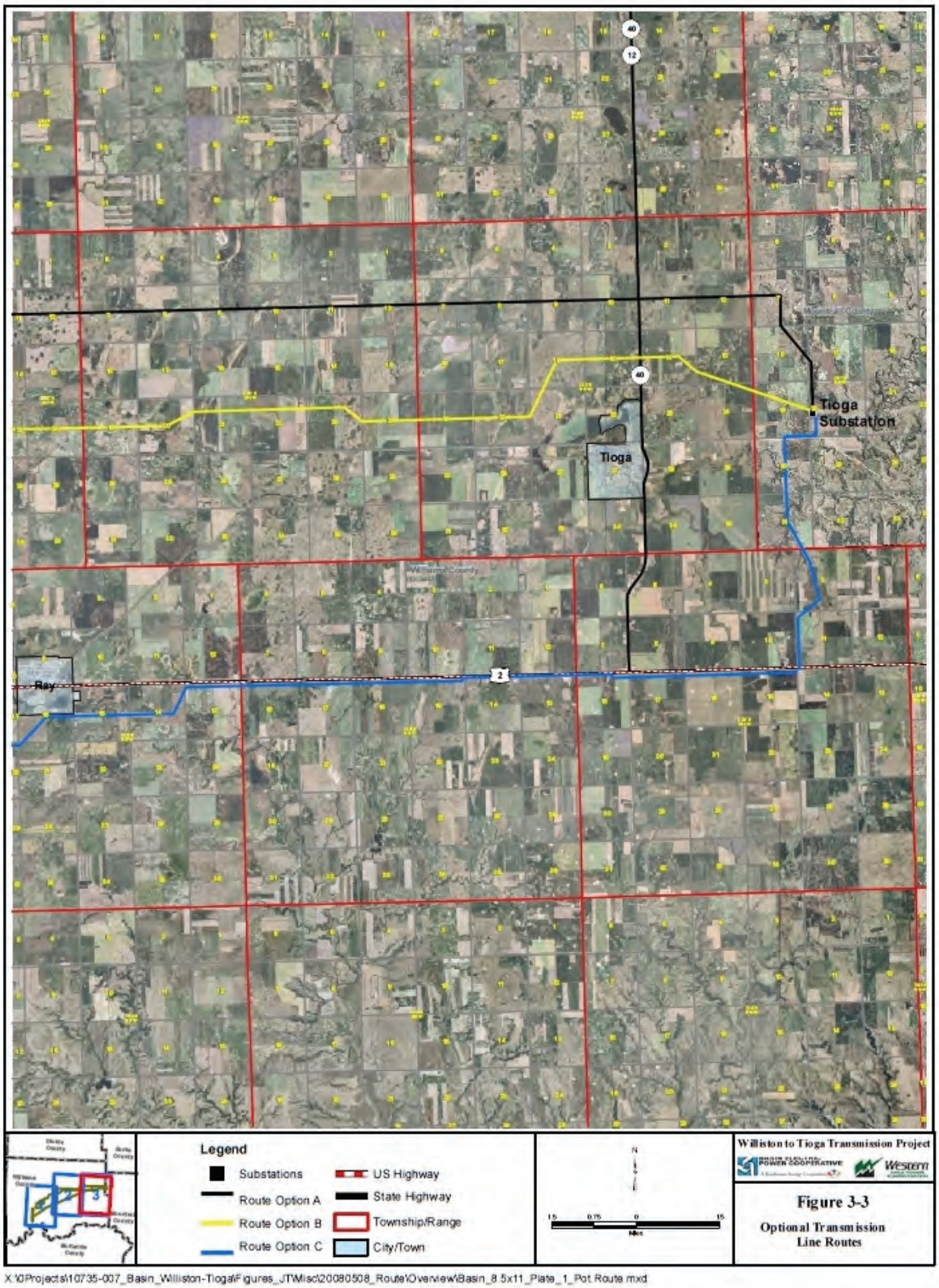

Figure 3-3 Optical Transmission Line Routes

3.2.3 Permanent Transmission Line Land Requirements

Permanent land disturbance has been estimated for self-supporting tangent structures, self-supporting dead-end structures, and self-supporting turning structures. Each tangent structure would require directly imbedding one 3-foot-diameter pole at each structure location, thus occupying a total of 7.1 square feet per structure. Turning structures and dead-end structures would be larger, with a 5-foot-diameter, thus each occupying approximately 19.6 square feet. Approximately 50 turning and dead-end structures would be required for the transmission line. Tangent, dead-end, and angle structures would be self-supporting, and would not require guy wires. Permanent transmission line land requirement is calculated to be less than 0.2 acre.

3.2.4 Temporary Transmission Line Land Requirements

A 100-foot x 125-foot (12,500 square feet) temporary work site would be located at each structure location and within the ROW. The area would be graded, if required, to ensure safe movement and operation of heavy equipment. Route Options A, B, and C would require approximately 104 to 115 acres for structure installation, as shown in **table 3-2**. Although access to structure work sites that are adjacent to section lines can be accessed (in many cases) by spur roads, BEPC made an assumption that a 12-foot-wide trail would be used between structure work site locations within the ROW. Assuming that the trail would extend approximately 750 feet between structures, it would temporarily impact approximately 75 to 83 acres, as shown in **table 3-2**.

Pulling and tensioning sites and splicing sites would result in temporary disturbance to lands within and outside of the ROW. Pulling and tensioning areas would temporarily disturb a total of 75,000 square feet (1.7 acres) at each angle structure location. Approximately 26 to 32 pulling and tensioning sites would be needed at angle structure locations, totaling approximately 45 to 55 acres. The pulling and tensioning sites would partially extend beyond the designated ROW. The landowner would be compensated for disturbance of land outside the ROW. Additional areas would be needed along long straight-line expanses of tangent structures. Approximately 10 to 16 pulling and tensioning sites would be required along stretches of tangent structures. In this case each pulling and tensioning site would occupy approximately 37,500 square feet entirely within the ROW. Pulling and tensioning in areas of tangent structures would result in temporary impacts to approximately 9.5 to 14 acres within the designated ROW.

Splicing sites, measuring approximately 12,500 square feet (0.3 acre), also would be required at approximately 10,000-foot-increments within the transmission line ROW. Approximately 29 to 32 splicing sites would be required for construction, resulting in temporary impacts to eight to nine ROW acres; however, many pulling and tensioning sites also are likely to serve as splicing sites. The conceptual configuration of temporary work sites, 12-foot-wide access trail, structure locations, pulling and tensioning sites, and splicing sites is shown on **figure 3-4**. BEPC would site temporary laydown areas at three locations of approximately 15 acres each on previously disturbed land. Site locations are within one mile of the Proposed Project, as described in section 2.3.2.

BEPC required approximately 40 borings for geotechnical analyses. Each boring temporarily affected as much as 400 square feet within the proposed ROW and at designated structure sites. The geotechnical surveys were conducted during low precipitation conditions during the late fall through early spring, which minimized impacts to the soils and crops. An Interim Action Determination was approved by Western on June 8, 2009, for geotechnical boring

Estimated temporary and permanent land requirements identified in **table 3-2** were used as the basis for calculating temporary and permanent acreage impacts to land uses, prime and unique farmland and farmland of statewide importance, vegetation types, and wetlands. Linear distance data developed through routing were converted to estimate acreage impacts. As noted in **table 3-2**, temporary impacts associated with Route Option A would affect approximately 253.8 acres. Temporary impacts associated with Route Options B and C would affect approximately 242.6 and 272.7 acres, respectively. Permanent impacts would be similar among the three Route Options essentially limited to areas occupied by the single-pole structure bases.

Table 3-2 Temporary and Permanent Land Requirements for Route Options A, B, and C

	Transmission Line Optional Routes		
	A	**B**	**C (Preferred)**
Total Length (miles)	57.2	55.0	61.1
Total Number of single-pole Structures[1]	378	363	403
Temporary Land Requirements			
Structure Pads (acres)[2]	108.5	104.2	115.6
Access Road within ROW (acres)[3]	78.1	75.0	83.3
Pulling & Tensioning Sites at Angle Structures (number)[4]	26	27	32
Pulling & Tensioning Sites at Angle Structures (acres)[5]	44.8	46.5	55.1
Pulling & Tensioning Sites along Tangent Locations (number)[6]	16	10	11
Pulling & Tensioning Sites along Tangent Locations (acres)[7]	13.8	8.6	9.5
Splicing Site Locations (number)[8]	30	29	32
Splicing Sites (acres)[9]	8.6	8.3	9.2
Total Temporary Disturbed Area (acres)	253.8	242.6	272.7
Permanent Land Requirements			
Permanent Land Requirements for Structures (acres)[10]	<0.2	<0.2	<0.2
Additional Temporary Land Requirements			
Three material staging sites	approximately 15 acres each		
40 geotechnical boring sites (within ROW)	approximately 400 square feet each[11]		

1 Approximate number, based on an average 800-foot spacing.

2 Number of structures x 100 x 125 feet (12,500 square feet).

3 750 linear feet between structure sites, number of structures, 12-foot-wide access trail.

4 Estimated number, based on number of angle structures.

5 Angle point locations x 125 feet x 300 feet (37,500 square feet) x two directions (75,000 square feet).

6 Estimated number along areas with tangent structures.

7 Tangent structure locations x 125 feet x 300 feet (37,500 square feet).

8 10,000-foot spacing between splicing sites.

9 Splicing site locations x 125 feet x 100 feet (12,500 square feet).

10 Number of structures, three-foot-diameter single-pole structure.

11 Temporary disturbance areas previously accounted for in temporary disturbance for angle structures.

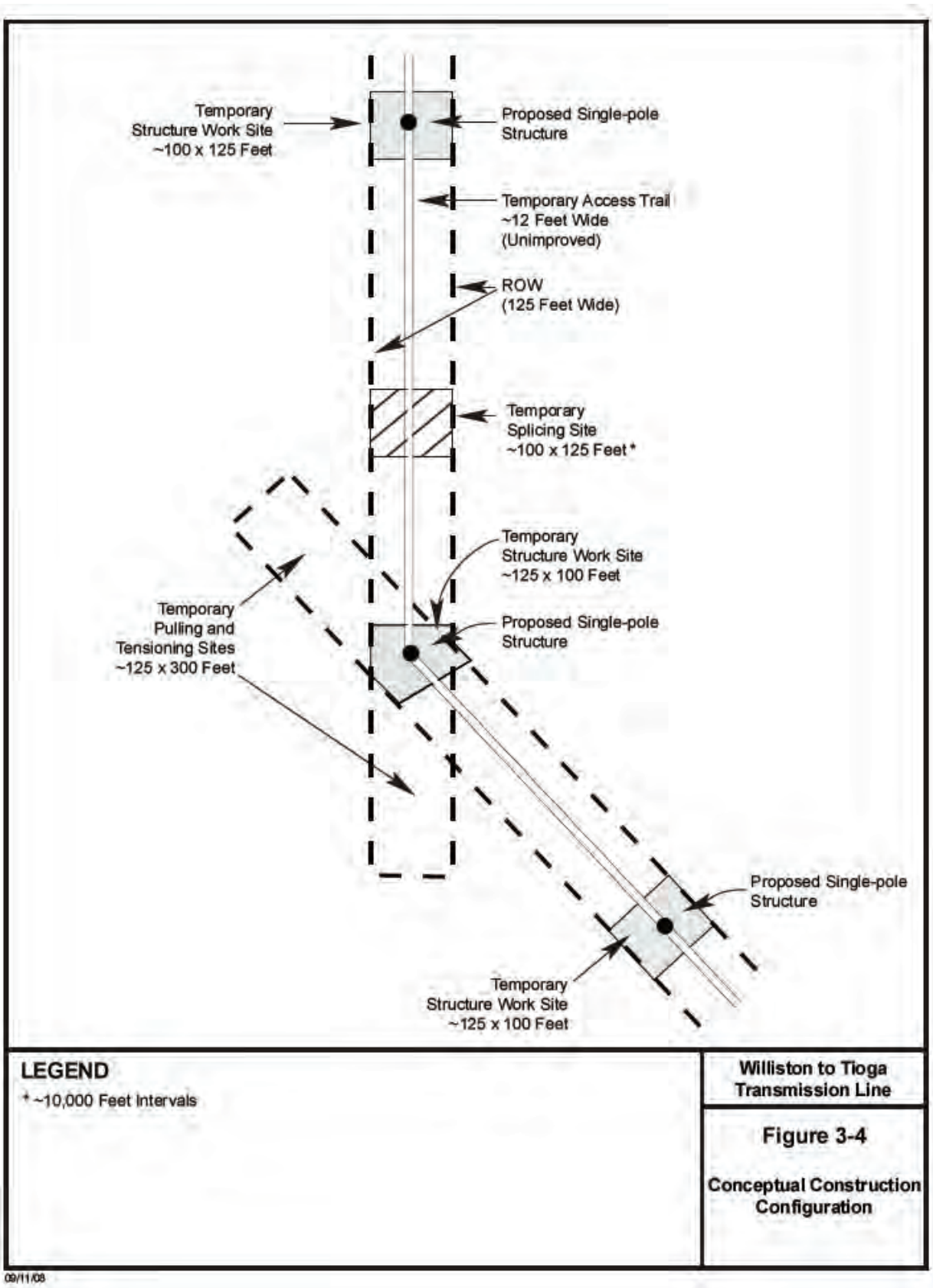

Figure 3-4 Conceptual Construction Configuration

4.0 Affected Environment and Environmental Consequences

Resources addressed in this chapter are specifically those that could be directly affected by construction, operation, maintenance, or decommissioning of BEPC's proposed Williston to Tioga Transmission Line. Significance criteria were compiled from NDPSC Routing Criteria (NDCC Title 49) (refer to section 3.1); mitigation measures have been developed from best management practices and mitigation measures provided by Western and BEPC. Mitigation measures also reflected comments received from Federal and State resource management agencies during the scoping process. Analyses address the preferred transmission line route (Route Option C), two optional transmission line routes (Route Options A and B), and the No Action Alternative. Applicable mitigation measures are listed in **Appendix D**, Project-specific Mitigation Measures.

The proposed Williston – Tioga Transmission Line would interconnect at Western's Williston Substation. Modifications to the substation would be made as were addressed in the Wolf Point to Williston Transmission Line Rebuild EA (prepared August 2003) and would consist of modifications to the 230-kV bay. Substation modifications would be entirely within the existing footprint. Western's alternatives are to permit the Williston Substation interconnection, or selection of the No Action Alternative, which would preclude the interconnection. Selection of the No Action Alternative would require BEPC to modify its Proposed Project, or consider meeting its needs in some other manner. BEPC's transmission line routing included consideration of the preferred route and two optional routes. Transmission line routing is regulated by the NDPSC for this BEPC project, and is not a Federal action.

4.1 Jurisdictions, Land Use, and Agricultural Practices

The Project area is rural and sparsely populated. Route Options A, B, and C originate in the vicinity of Williston and terminate near Tioga. Alternative C (Preferred Route Option) lies relatively close to Ray, North Dakota. All of the Route Options are in Williams County except for the extreme eastern ends, which enter western Mountrail County.

4.1.1 Affected Environment

As shown in **table 4-1**, all of the proposed Route Options would primarily cross cropland and pasture/rangeland. Construction of Route Options A and B would result in temporary impacts to approximately 132 and 115 acres of croplands, respectively. Construction of Route Options C (Preferred Route Option) would result in temporary impacts to approximately 154 acres of cropland. Croplands crossed are scattered throughout the Project area and consist of wheat, lentils, barley, oats, dry edible beans and peas, and sugar beets. Developed lands along Alternative C (Preferred Route Option) are limited to lands that are within the city limits of Ray, North Dakota. Those lands are occupied by the municipal wastewater treatment facility.

4.1.2 Environmental Consequences

Construction and operation of the Williston – Tioga Transmission Line would result in temporary and permanent impacts to land uses that would affect agricultural production in the area.

Significance Criteria

- Significant impacts would result from non-compliance with local zoning regulations.
- A significant impact would result from routing a proposed transmission line through a state-designated exclusion area.

Table 4-1 Temporary Impacts to Land Uses (acres)

	Route Option A	Route Option B	Route Option C (Preferred)
Planted herbaceous perennials	15.3	17.0	21.9
Cropland	131.9	114.6	154.2
Pasture/Rangeland	91.2	98.0	81.8
Shrubland and Barren Land	4.3	4.2	8.0
Woodland	1.7	0.5	0.6
Wetland and Riverine*	9.4	8.3	3.5
Commercial/Industrial/Developed	- 0 -	- 0 -	1.8
Total Acres (refer to table 3-2)	**253.8**	**242.6**	**271.8**

*Wetlands and riverine resources would be spanned, direct impacts to wetlands and riverine resources are not anticipated.

4.1.2.1 Proposed Transmission Line and Route Options

Construction of the proposed transmission line would result in temporary impacts to lands during and immediately following construction. Tangent structures and angle structures would be single-pole self supporting and would not require guy wires and anchors. Although self-supporting angle structures would require reinforced concrete and steel foundations and would be more expensive to install, additional lands that would be required for guy wires would not be needed. Since guy wires are not needed, cultivation can take place adjacent to the base of each structure; therefore, the amount of non-tillable lands would be limited to the footprint of each structure base. The absence of guy wires also would reduce potential interference with farm equipment operations near the structures and reduce maintenance requirements.

Transmission line construction would temporarily impact approximately four acres (Route Options B) to eight acres (Route Option C) of deciduous shrubland and barren land. Wetlands and riverine resources that are located along the alternative routes would be either avoided or spanned. Furthermore, most wetlands are of marginal quality due to disturbance from livestock grazing and are classified as seasonal and semipermanent palustrine. Woodlands have been avoided to the extent practicable; however construction would temporarily affect 0.5 to 1.7 acres of woodland habitat. Woodlands that would be affected by Project construction are limited to isolated pockets that are frequently associated with property boundaries, fence lines, and drainages. Shelter belts have been avoided to the extent practicable. Construction of the proposed Project would result in temporary impacts to two acres of developed lands within Route Option C; developed lands are not present within Route Options A or B.

Temporary and permanent impacts to land uses have been tabulated using analyses presented in chapter 3.0 and summarized in **table 3-2**. As shown in **table 3-2**, construction of Route Options A, B, and C would result in temporary impacts to 243 to 273 acres required for access trails between structures, structure pads (work sites), pulling and tensioning sites for conductor stringing, and conductor splicing sites.

Temporary impacts to cropland would total approximately 115 to 154 acres; temporary impacts to pastureland/rangeland would total 82 to 98 acres. Where practical, construction activities will be scheduled during periods when agricultural activities would be minimally affected, such as post-harvest periods. Therefore, impacts to croplands would be limited to soil compaction, which would be minimized by cultivation. Construction within pasturelands also could result in soil compaction, which is expected to recover over time. Wetlands and riverine areas would be either avoided or spanned during construction. Impacts to wetlands are not anticipated.

Construction of Route Option C would result in temporary impacts to approximately 1.8 acres of lands that were classified as commercial/industrial/developed. Those lands are located near the Ray, North Dakota wastewater treatment facility.

Permanent impacts would affect a total of less than 0.2 acre of various land uses, primarily cropland and pasture/rangeland, regardless of route option alternative. Overall temporary and permanent impacts would be minimized by BEPC's decision to use single-pole, self-supporting structures, rather than guyed structures or H-frame structures.

A Conditional Use Permit has been obtained from Williams County. Permits are not required from Mountrail County. The Project would be in compliance with county zoning requirements and state-designated siting criteria.

4.1.2.2 No Action Alternative

Selection of the No Action Alternative would result in a failure to meet the Project purpose and need; there would be no temporary or permanent land use impacts. If the Williston to Tioga line were not constructed, BEPC would be required to transfer needed power from a different source, as BEPC has electrical load growth responsibility under law as a regulated utility. Transferring power from a different source might necessitate construction of other transmission lines that would be longer and/or result in greater environmental impacts than those expected for the proposed Project.

4.2 Physiography, Geology, Soils, and Minerals

BEPC's construction activities could result in temporarily increased erosion potential that could affect receiving waters. Long-term impacts would result from a lack of opportunity to extract minerals from local sources, if the proposed Project were to reduce or inhibit access to mineral resource areas.

4.2.1 Affected Environment

The Project area is gently rolling terrain that is crossed by well-defined streams and drainages. Project area elevation ranges from 1,877 feet amsl in the vicinity of Williston to 2,244 feet amsl near Tioga. Central Project area lands are largely drained by the Little Muddy Creek and its tributaries, which flow in a southerly direction to the Missouri River and Lake Sakakawea.

4.2.1.1 Physiography

The proposed Project is located in the Great Plains physiographic province (Fenneman 1928). In western North Dakota, the Great Plains is divided into two major sections, the Glaciated Missouri Plateau and the Unglaciated Missouri Plateau. The Missouri Plateau is essentially a dissected plateau characterized by badlands, buttes and mesas, and exhumed mountain ranges such as the Black Hills. The proposed route is in the Glaciated Missouri Plateau. The glaciated area is generally of low relief compared to the unglaciated area which has more variety of landforms (Trimble 1980). The Glaciated Missouri Plateau is covered by glacial deposits, but the boundary between the glaciated and non-glaciated sections is not distinct because the glacial deposits thin gradually.

4.2.1.2 Geology

Surficial deposits are primarily composed of Quaternary alluvium and colluvium and glacial till (Freers 1970). The alluvium occurs in the Muddy Creek alluvial valley. Glacial material consists of a variety of moraine deposits including ground moraines, dead ice moraines, and lake deposits. The surficial material is largely composed of sand, gravel, and clay.

The bedrock geology consists of Tertiary Bullion Creek and Sentinel Butte Formations of the Fort Union Group (Bluemle 1988). These formations are largely composed of claystone, siltstone, sandstone, and lignite. There are very few exposures of bedrock in the Project area, it being mostly covered by glacially derived surficial deposits (Freers 1970). The bedrock is mainly exposed along the Missouri River south of the Project area.

The Project area is located in the Williston Basin, a major structural basin that covers northeastern Montana, most of North Dakota, and northwestern South Dakota (Peterson and MacCary 1987). The Williston Basin also extends north into Saskatchewan and Manitoba in southern Canada. The basin contains about 15,000 feet of Paleozoic through Tertiary sedimentary rock. The center of the basin is located south of the Project area in McKenzie County and the rocks dip gently to the south. The major structural feature in the Project area is the Nessen Anticline, a north-south trending structure located in eastern Williams County, extending for 75 miles south from the Canadian border to eastern McKenzie County (Gerhard et al. 1987). North-south trending fault zones paralleling the Nessen Anticline have been mapped in the deeper bedrock in Williams County, but do not extend up to the surface.

4.2.1.3 Soils

BEPC's proposed Williston to Tioga Transmission Line is within the Central and Northern Dark Brown Glaciated Plains Major Land Resource Areas (MLRA's) (Soils Survey Geographic database [SSURGO] 2008). The Central and Northern Dark Brown Glaciated Plains consists of nearly level to rolling till plains that are interrupted by more strongly rolling slopes adjacent to kettle holes, kames, moraines, and small glacial lakes. Deep, clayey to loamy soils dominate the landscape; these typically have thick, dark, and organically enriched topsoil layers. Mollisols and Inceptisols are the dominant soil orders in the MLRAs. Soils in the study area primarily support grazing and dryland crops.

Data have been compiled from the NRCS to indicate those soils that are prone to compaction, are classified as hydric, have low revegetation potential, and those that are classified as subject to severe wind and water erosion.

The NRCS defines a hydric soil as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. These soils are commonly associated with floodplains, lake plains, basin plains, and with riparian areas, wetlands, springs, and seeps.

Soils in the area have a high revegetation potential and only a few soils in the area are subject to severe wind or water erosion potential. Soil erosion would be accelerated if disturbed. Disturbance is characterized as removing the protective litter, or vegetative cover. None of the soils crossed are shallow to lithic (hard) bedrock.

Prime Farmland

Prime farmland is characterized as the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops available for these uses. The land could be cropland, pastureland, rangeland, forest land, or other land, but not urban or built-up land or water areas. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner when treated and managed, including water management, according to acceptable farming methods. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable levels of acidity or alkalinity, an acceptable content of salt and sodium, and few or no rocks. They have soils that are permeable to water and air. Prime farmland is neither excessively erodible nor saturated with water for a long period of time, and it either does not flood frequently, or is protected from flooding (NRCS 2007).

Specific technical criteria were established by Congress to identify prime farmland soils. In general, criteria reflect adequate natural moisture content; specific soil temperature range; pH between 4.5 and 8.4 in the rooting zone; low susceptibility to flooding; low risk to wind and water erosion; minimum permeability rates; and low rock fragment content (NRCS 2007).

Unique Farmland

Unique farmland is defined by the NRCS as land other than prime farmland that is used for the production of specific high-value food and fiber crops. It has the special combination of soil qualities, location, growing

season, and moisture supply needed for the economic production of sustained high yields of a specific high-value crop when treated and managed by acceptable farming methods (NRCS 2007).

Farmland of Statewide Importance

Farmland of Statewide Importance is determined by North Dakota State agencies. Some areas other than areas of prime and unique farmland are of statewide importance in the production of food, feed, fiber, forage, and oilseed crops. The criteria used in defining and delineating these areas are determined by the appropriate State agency or agencies. Generally, additional farmland of statewide importance includes areas that nearly meet the criteria for prime farmland and that economically produce high yields of crops when treated and managed by acceptable farming methods. Some areas can produce as high a yield as prime farmland if conditions are favorable. Additional farmland of statewide importance may include tracts of land that have been designated for agriculture by State law (NRCS 2007).

4.2.1.4 Mineral Resources

The major energy mineral resources in the Project area are oil, natural gas, and lignite (Freers 1970). Important non-fuel mineral resources are sand and gravel, clay, salt (halite), and scoria. The Williston Basin is a major oil and gas producing basin. In the U.S.-portion of the basin, total production from 1951 to the end of 2007 was approximately 2.5 billion barrels of oil and 470 billion cubic feet of gas (Burke 2006; Montana Board of Oil and Gas 2007; North Dakota Industrial Commission 2007; South Dakota Oil and Gas Section 2008). The first commercial oil well in North Dakota was drilled in Williams County on the Nessen Anticline in 1951, about seven miles south of Tioga (Freers 1970). Oil production decline in the 1990s has been offset in recent years by technological advances that have resulted in increased production from the Bakken Formation which has an estimated mean technically recoverable resource of 3.7 billion barrels of oil and 1.9 trillion cubic feet of gas (USGS 2008a). **Table 4-2** lists abandoned lignite mines that are within 1,320 feet of the Preferred Optional Route. There are no active mines within 1,320 feet of the Preferred Optional Route C.

Table 4-2 Abandoned Lignite Mines in Project Area[1]

Mine Name	Location	Dates of Operation
Eby	T154N, R101W, SW ¼ 5	Not known
Peterson	T154N, R101W, SW ¼ 5	1921-1926
Head	T154N, R101W, SE ¼ 7	1910-1916(?)
Union	T154N, R101W, SW ¼ 8	1920s
Nichols	T154N, R101W, SW ¼ NE ¼ 8	1920s

Source: North Dakota Abandoned Mined Lands Division (2006).

The Project area is located in the Fort Union Coal region (Averitt 1972). Coal in the Fort Union Formation is generally lignite in the Project area. The Fort Union Group in Williams County contains at least six important lignite beds that have been mined (Freers 1970). Lignite has been mined in Williams County for many years. Before modern surface mining methods were employed (stripping off the overburden, backfilling, and reclamation), lignite was mined by room-and-pillar underground methods. Because the overburden was thin (often less than 50 feet), underground voids would collapse to the surface creating sinkhole-type subsidence, fissures, and unstable ground conditions. Several abandoned lignite mines are present in the study area and an active underground mine remediation is underway west of Williston, North Dakota (North Dakota Abandoned Mined Lands Division 2006) (Dodd 2008a). The abandoned lignite mine sites of record are listed on **table 4-2** and are adjacent or under the Route Options A and C.

The mines listed were all operated and abandoned over 70 years ago. The abandoned mine database (North Dakota Mined Land Reclamation Division 2006) indicates that the exact locations and extent of abandoned

mine workings were not determined with certainty, but are approximate locations based on the best historical information available.

Sinkholes have developed in areas located in Sections 5 and 7, Township 154 North (T154N), Range 101 West (R101W) and the North Dakota Mined Land Reclamation Division (Dodd 2008b) has documented the precise locations and, in some cases, dimensions of the sinkholes. The information is provided in **table 4-3**.

Table 4-3 Sinkhole Data

Section, Township, Range	Latitude/Longitude	Length (feet)	Width (feet)	Diameter (feet)	Depth (feet)
5, T154N, R101W	48.18342/103.71127	25	18	ND	8
	near previous coordinates	ND	ND	6	3
	48.18453/103.71169	ND	ND	30	6
	near previous coordinates	ND	ND	15	4
7, T154N, R101W	48.17616/103.71737	20	15	ND	6
	48.17629/103.71711	12	4	ND	4
	48.17573/103.7177	ND	ND	12	4
	48.17584 103.71559	ND	ND	6	3

ND = No Data Available.

Source: Dodd (2008b).

Aggregate (sand and gravel) production is from localized deposits in floodplains or glacial deposits (Freers 1970). No gravel pits are located close to the Preferred Route or Route Options.

Clay deposits suitable for ceramic production are present in the Fort Union Group formations, but none is being mined currently. Another commodity is “scoria” or “clinker” that occurs when lignite beds burn and bake the shale and claystone strata next to the coal. Scoria is used for road surfacing and oil well location surfacing material (Freers 1970). No scoria pits are located near the Proposed Project.

4.2.1.5 Seismicity

There are three major phenomena associated with seismic hazards: Faults, seismicity, and ground motion. The following describes the potential for seismic hazard occurrence in the Project area.

Faults are dislocations whereby blocks of earth material on opposite sides of the faults have moved in relation to one another. Rapid slippage of blocks of earth past each other can cause energy to be released, resulting in an earthquake. There is evidence of fault offset in older strata underlying the surficial cover, but no evidence exists for movement on the faults in the last 10,000 years. No active faults have been identified in the Project area (Crone and Wheeler 2000). An active fault is one in which movement can be demonstrated to have taken place within the last 10,000 years (USGS 2008b).

Seismicity concerns the intensity, frequency, and location of earthquakes in a given area. Western North Dakota has historically little earthquake activity (USGS 2008c). From 1990 to 2006, almost no seismic events were recorded North Dakota.

Ground motion hazards result when the energy from an earthquake is propagated through the ground. The USGS ground motion hazard mapping indicates that potential ground motion hazard in the proposed Project area is low. The hazard map used estimates peak ground acceleration of 4 to 6 percent of gravity with a two percent probability of exceedence in 50 years (Frankel et al. 1997; Peterson et al. 2008).

Active faults, seismic activity, and ground motion are uncommon within the Project area. Therefore, effects on transmission line structures from such phenomena are unlikely. If unstable soil conditions are encountered during construction, BEPC would modify structure locations accordingly.

4.2.1.6 Landslides

Landslide is a term used for various processes involving the movement of earth material down slopes (USGS 2004). Landslides can occur in a number of different ways in different geological settings. Large masses of earth can become unstable and by gravity begin to move downhill. The instability can be caused by a combination of steep slopes, periods of high precipitation, undermining of support by natural processes (stream erosion), or unintentional undercutting or undermining the strength of unstable materials in the construction of roads and structures.

Landslides are present in the Project area and are mainly found in the badlands next to Lake Sakakawea and in areas adjacent to drainages. Landslides occur when headward erosion creates instability where unconsolidated glacial deposits overlie the Fort Union Group formations. Landslides are not present in the upland areas dominated by thick layers of glacial deposits. In the Project area landslides have been identified where the Preferred Route and Route Option A cross Sand Creek and its tributaries in section 6, T154N, R101W (Stanley 2004a). Landslides also have been identified on slopes north of the Preferred Route and Route Option B along Camp Creek in section 36, T156N, R101W. Another landslide area is about 0.25 mile south of Route Option B in section 16, T155N, R101W. Landslides are classified as Project Avoidance Areas. Refer to **appendix F**.

4.2.1.7 Subsidence

As described in section 4.2.1.4, there are potential subsidence hazards as a result of underground mining of lignite. Both landslides and subsidence could damage a transmission line that crosses these unstable areas.

4.2.2 Environmental Consequences

Construction and/or operation of BEPC's Williston to Tioga Transmission Line would not affect gravel and aggregate extraction and oil and gas production and the gravel and aggregate sites would be avoided or spanned during detailed transmission line routing. BEPC would avoid active oil and gas wells through detailed transmission line routing.

Significance Criteria

- Project construction and operation would result in temporary and permanent impacts to prime and unique farmland and farmland of State-wide importance. Those impacts would be significant if they were to result in the inability of individual landowners to remain economically viable.
- Loss of access to aggregate or other minerals that would reduce the economic viability of the local communities would represent a significant impact.
- Permanent impacts due to rutting and compacting.

4.2.2.1 Preferred Transmission Line Route and Route Options

Boring of each 5-foot-diameter single-pole tangent structure to an average depth of 20 feet would displace approximately 15 cubic yards (393 cubic feet) of soil. Installation of turning structures (those that alter the direction of the line) would require a 6-foot-diameter, 20-foot-deep borehole for foundation construction. Soil displacement for each turning structure would total approximately 21 cubic yards (565 cubic feet). Excess soils after backfilling around the structure would be spread around each structure or disposed of off-site at an approved landfill.

Additional mitigation measures include limiting the amount of ground disturbance to the extent practicable, and the use of silt and flow barriers. BEPC's construction contractor would be responsible for a Storm Water

Pollution Prevention Plan (SWPPP); BEPC engineers and lands specialists would oversee construction to ensure compliance with SWPPP requirements and compliance with landowner requests.

Disturbance by construction practices resulting in the loss of the protective vegetative soil cover could result in accelerated wind and water erosion. Compaction may occur where construction vehicles travel along the ROW, especially if the soil is moist or wet. Temporary impacts to soils could increase erosion by wind and water. The Proposed Project would affect 8.1 to 9.8 acres of soils prone to water erosion. Route Options A and B would each affect 0.4 acre of soils prone to severe wind erosion. Soils prone to wind erosion are not found along the preferred Route Option C, so wind erosion would not be expected. Project mitigation measures and BMP's would be applied to reduce water erosion and the potential for resultant sedimentation to nearby waterways.

Displacement of soil by boring holes for structures would result in a loss of the A horizon and a reduction in long-term productivity until soil horizons form and recover, which might take decades or centuries. The mixing of soil horizons by spreading subsoil on the soil surface, would lower soil productivity of agricultural and rangeland by diluting the physical, biological, and chemical properties of the topsoil. This is especially a concern in areas of prime farmland. As previously discussed, BEPC will remove excess excavated soil to an appropriate landfill for structures located in sensitive agricultural areas to mitigate these impacts.

Rutting affects the surface hydrology of a site as well as the rooting environment, and may mix soil horizons if deep enough. The process of rutting physically severs roots and reduces the aeration and infiltration potential of the soil, thereby degrading the rooting environment. Rutting also disrupts natural surface water hydrology by damming surface water flows, creating increased soil saturation upgradient from ruts, or by diverting and concentrating water flows creating accelerated erosion.

Soil compaction and rutting would result from the movement of heavy construction vehicles along the construction ROW, on access roads, and from overland access. The degree of compaction would depend on the moisture content and texture of the soil at the time of construction. Only 2.4 acres of compaction-prone soils occur along Route Option C, while 4.3 and 8.6 acres occur along Route Options A and B, respectively. Compaction would be most severe where heavy equipment operates on moist to wet soils with high clay contents. Wet areas such as wetlands and streams can be avoided or spanned by the line to minimize impacts. Detrimental compaction also can occur on soils of various textures and moisture contents if multiple passes are made on the same area by high ground-weight equipment. If soils are moist or wet, topsoil may also adhere to tires and/or tracked vehicles and be carried away. BEPC would schedule routine maintenance of the line during periods of minimum precipitation to minimize impacts such as rutting and compaction.

When weather and ground conditions permit, all deep ruts that are hazardous to farming operations and to movement of equipment would be eliminated or compensation will be provided if the landowner desires. BEPC would level, fill, and grade, or otherwise eliminate such ruts in an approved manner. Ruts, scars, and compacted soils from construction activities in cropland or rangeland would be loosened and leveled by scarifying, harrowing, discing, or other appropriate method. Damage to ditches, terraces, roads, and other features of the land would be corrected. The land and other features will be restored by BEPC as nearly as practicable to their original conditions.

Table 4-4 indicates the soil limitations within rights-of-way by the Optional Routes. The soil assessment for the proposed Project is based on the Soil Survey Geographic (SSURGO) database (NRCS 2010) review and analyses. Field mapping methods using national standards are used to construct the soil maps in the SSURGO database. SSURGO is the most detailed level of soil mapping completed by the NRCS. SSURGO digitizing duplicates the original soil survey maps.

Table 4-4 Soil Limitations within Right-of-Way, by Route Option (acres)

	Route Option		
	A	**B**	**C (Preferred)**
Compaction Prone[1]	4.3	8.6	2.4
Hydric[2]	63.1	58.5	63.4
Low Revegetation Potential	0.0	0.0	0.0
Severe Wind Erosion	0.4	0.4	0.0
Severe Water Erosion	8.7	9.8	8.1
Shallow Depth to Restrictive Layer[3]	8.7	9.6	7.2

[1] Includes soils with greater than 28 percent clay in the top 20 inches.

[2] Soils characterized as hydric or partially hydric.

[3] Paralithic bedrock.

Source: NRCS 2010.

Prime and Unique Farmlands and Farmlands of Statewide Importance

Data indicate that 3.0 to 4.8 acres of Prime and Unique Farmland and 100.5 to 126.5 acres of Farmlands of Statewide Importance would be temporarily impacted by transmission line construction. Temporary impacts to prime and unique farmland and farmlands of statewide importance are shown on **table 4-5** for the three transmission line Route Options.

Table 4-5 Temporary Impacts to Prime and Unique Farmlands and Farmlands of Statewide Importance by Route Option (acres)

	Route Option		
	A	**B**	**C (Preferred)**
Temporary Impacts to Prime and Unique Farmlands (acres)	4.8	4.1	3.0
Temporary Impacts to Farmlands of Statewide Importance (acres)	119.4	100.5	126.5
Other Lands	129.6	138.0	143.2
Total Acres Impacted (refer to table 3-2)	**253.8**	**242.6**	**272.7**

Impacts to Prime and Unique Farmland and Farmland of Statewide Importance would be temporary and short term during, and immediately following, construction. Construction equipment would likely result in soil compaction and/or rutting, particularly along the 12-foot-wide temporary access trail between structures and at structure work site locations where boring equipment, cranes, and trucks would be operating. Although not totally effective in all cases, most compaction and rutting would be mitigated by cultivation. Temporary impacts also could be minimized if construction were to take place during periods of low precipitation. Long-term or permanent loss of important farmlands would be limited to the small area that is expected to be occupied by transmission line structures. Installation of 363 to 401 structures would physically occupy less than 0.2 acre of land. Permanent loss of Prime and Unique Farmland and Farmland of Statewide Importance would be considerably less. Such negligible losses would not result in loss of economic viability to area farmers. The

use of self-supporting single-pole structures (rather than guyed structures or H-frame structures) would further reduce impacts to croplands by allowing cultivation to take place immediately adjacent to each structure base.

4.2.2.2 Mineral Resources

BEPC's Proposed Project would not affect minerals production within the area. Scattered aggregate excavation sites would be either avoided or spanned during detailed engineering. Oil and gas wells, primarily in the vicinity of Tioga, would be similarly avoided. Potential impacts to oil and gas production sites have been further minimized by BEPC's routing of the proposed Project along section and mid-section lines, rather than through tracts of land where such facilities are typically located.

4.3 Hydrology and Drainage

Although BEPC has avoided surface waters to the extent practicable, secondary impacts could result from sediment loading to receiving streams. Direct impacts to drainages and waterways would be avoided because they would be either avoided or spanned, and because erosion and sedimentation control structures such as bales or silt barriers would be employed where appropriate.

4.3.1 Affected Environment

The U.S. Congress passed the National Flood Insurance Act of 1968 in response to increasing losses from flood hazards nationwide, which resulted in establishing the National Flood Insurance Program (NFIP). The Act was subsequently expanded by the Flood Disaster Protection Act of 1973 in which floodplain areas and flood risk zones within the U.S. were identified as part of the Act.

The NFIP identified floodplain areas through flood insurance studies, consisting of hydrologic and hydraulic studies of flood risks which are administered by the Federal Emergency Management Agency (FEMA). FEMA prepares Flood Insurance Rate Maps that depict the spatial extent of flood hazard areas within Special Flood Hazard Areas (SFHAs). Flood hazard areas within the Project area are largely associated with the Little Muddy River and its tributaries, north of Williston. Although SFHAs have been designated to describe the potential for flooding events, those applicable to the Williston to Tioga Transmission Line Project area are limited those within the ROW and described in **table 4-6**.

Table 4-6 Special Flood Hazard Zones Applicable to the Project Area

Zone Name	Zone	Description
Zone X (500-year)	X500	An area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than one-foot or with drainage areas less than one-square-mile; or an area protected by levees from 100-year-flooding.
Zone AE	AE	An area inundated by 100-year flooding, for which Base Flood Elevations (BFEs) have been determined.
Zone A	A	An area inundated by 100-year flooding, for which no BFEs have been determined.

4.3.2 Environmental Consequences

Significance Criteria

- Significant impacts would result from reduced conveyance capacity of floodwaters resulting in property or crop loss (violation of Executive Order [EO] 11988) or uncontrolled contamination of surface water from erosion or storm water runoff (violation of the Clean Water Act [CWA], as amended, 33 USC 1251, et seq.

4.3.2.1 Preferred Transmission Line Route and Route Options

Waters within the Project area include scattered stock ponds and ephemeral streams. Many stock ponds and ephemeral streams have been degraded by livestock and are of limited wildlife value. Transmission line routing avoided wetlands and water features, to the extent practicable. Those that could not be fully avoided would be spanned. Areas crossed by the three transmission line route options are identified in **table 4-7**.

Table 4-7 Flood Prone Areas Crossed by Route Options (acres)

	Route Option		
	A	**B**	**C (Preferred)**
Zone X (500-year)	0.0	0.0	4.5
Zone AE	0.0	0.0	0.0
Zone A	0.0	0.0	1.0
Total Acres	**0.0**	**0.0**	**5.5**

Route Options A and B would not cross flood prone areas. Although Route Option C would temporarily impact approximately 5.5 acres of flood prone lands, BEPC would not place structures within flood prone areas or within streams or channels. Flood prone areas, streams, and channels would be avoided or spanned on a case-by-case basis. Access to structure locations would avoid crossing streams and channels. If streams or channels cannot be avoided, crossings would generally be perpendicular to such features. If culverts are needed, they would be installed temporarily and removed following construction activities. Silt barriers would be constructed to mitigate the potential for sediment loading from disturbed soils, as necessary. BEPC would revegetate disturbed soils promptly to mitigate sediment transport.

BEPC's construction contractor would develop a SWPPP specifically for the Proposed Project, which would reduce the potential for off-site transport of soils and contaminants during construction. The plan would identify circumstances in which silt barriers and other containment methods would be used and steps that would be taken to restore disturbed areas.

4.4 Vegetation Resources

The Project area is primarily comprised of planted herbaceous perennials, croplands, pasture/rangeland, shrublands and barren lands, woodlands, and wetlands. The North Dakota Natural Heritage Inventory lists three Sensitive Ecological Communities that are known to be present near the preferred transmission line alignment.

4.4.1 Affected Environment

Vegetation within each Route Option was characterized from a literature review of the NDGFD Comprehensive Wildlife Conservation Strategy (Hagen et al. 2005) and augmented through field investigations completed during September 2008 and June 2009. The Proposed Project is located within the Missouri Slope region of North Dakota, which is dominated by mixed-grass prairie with shortgrass prairie in relatively high elevations. The landscape includes level to rolling plains topography. Pasture/rangelands, croplands, and planted herbaceous perennials dominate the Project area; shrublands and woodlands are in scattered locations within the proposed ROW.

4.4.1.1 Planted Herbaceous Perennials

Herbaceous perennials grow for several seasons, after which the crop is typically plowed down to provide nutrients, especially nitrogen, to the soil. Planted herbaceous perennials (primarily alfalfa) are in scattered locations within the Project area. These locations will change as local farmers plow down alfalfa fields and return them to cultivated agriculture, and rotate other cultivated fields into herbaceous perennials to "rest" the land.

4.4.1.2 Cropland/Cultivated

Croplands are one of the largest resource categories within the project area. Crop production includes peas, lentils, sunflowers, dry edible beans, sugar beets, and other commodities. These are annual crops, with the residual plant material plowed down after harvest to allow planting of the next year's crop.

4.4.1.3 Pasture/Rangeland

Agricultural activities within the Project area have largely eliminated the presence of mixed-grass prairie and shortgrass prairie communities. Grasslands that are present are predominantly those that have been planted and are maintained for grazing. Grasslands within the Project area are described in the following text.

- Mixed-Grass Prairie Community: The mixed-grass prairie of North Dakota is a combination of the tallgrass species of eastern North Dakota and the shortgrass species found to the west. It is comprised of warm and cool season grasses and sedges. Common grasses include prairie junegrass (*Koeleria macrantha*), western wheatgrass (*Elymus smithii*), green needlegrass (*Nassella viridula*), needle-and-thread (*Hesperostipa comata*), blue grama (*Bouteloua gracilis*), little bluestem (*Schizachyrium scoparium*), and needleleaf sedge (*Carex duriuscula*) (Hagen et al. 2005). Other grass species include Canada wild-rye (*Elymus canadensis*), spike oats (*Helictotrichon hookeri*), mat muhly (*Muhlenburgia richardsonis*), spikemoss (*Selaginella* spp.), plains reedgrass (*Calamagrostis montanensis*), and buffalo grass (*Buchloe dactyloides*) (Hagen et al. 2005). Forbs included in the mixed-grass prairie community include pasque flower (*Pulsatilla* spp.), western wallflower (*Erysimum asperum*), prairie smoke (*Geum triflorum*), Missouri milkvetch (*Astragalis missouriensis*), lead plant (*Amorpha canescens*), Indian breadroot (*Pediomelum* spp.), purple prairie clover (*Dalea purpurea*), gaura (*Guara* spp.), harebell (*Asyneuma* spp.), fringed sage (*Artemesia frigida*), purple coneflower (*Echinacea* spp.), yarrow (*Achillea* spp.), and several species of goldenrods (*Solidago* spp.) (Hagen et al. 2005). Shortgrass prairie is included in the mixed-grass community. Common species include: spikemoss, blue grama, needleleaf sedge, threadleaf sedge (*Carex filifolia*), buffalo grass, and needle-and-thread. These species mature at 6 to 12 inches in height. Forbs include white wild onion (*Allium textile*), death camas (*Zigadenus* spp.), buffalo-bean (*Thermopsis* spp.), purple loco (*Oxytropis lambertii*), silverleaf (*Astragalus* spp.), prickly pear (*Optunia polyacantha*), moss phlox (*Phlox subulata*), white beardtongue (*Penstemon* spp.), and fringed sage (Hagen et al. 2005).
- Planted Grassland: Planted grassland is prairie that has been converted to cropland and then re-planted to hayland or native grasses. Conservation Reserve Program (CRP) land is a major component of this landscape. Predominant vegetation in this community includes smooth brome (*Bromus inermis*), crested wheatgrass (*Agropyron cristatum*), intermediate wheatgrass (*Thinopyrum intermedium*), tall wheatgrass (*Thinopyrum ponticum*), big bluestem (*Andropogon gerardii*), alfalfa (*Medicago sativa*), and sweet clover (*Melilotus* spp.) (Hagen et al. 2005).

4.4.1.4 Shrubland and Barren Lands

Shrublands and barren lands are characterized by a general absence of agriculture and human occupancy. Big sagebrush (*Artemisia tridentata*) is the dominant vegetation. Road surfaces also are classified as barren lands.

4.4.1.5 Woodlands

Woodland habitats are found in only a few locations in North Dakota, and they do not cover large contiguous areas (Hagen et al. 2005). Woodlands that are present within the state are often restricted to planted

windbreaks, shelter belts, and drainages. This characterization is true of the Project area. Dominant woody vegetation typically includes boxelder (*Acer negundo*), green ash (*Fraxinus pennsylvanica*), chokecherry (*Prunus virginiana*), and Siberian elm (*Ulmus pumila*).

- Upland Deciduous/Green Ash Forest: The dominant natural vegetation of these forests includes bur oak (*Quercus marocarpa*), green ash, quaking aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*), box elder, and paper birch (*Betula papyrifera*). Shrubs associated with these forests include beaked hazel (*Corylus cornuta*), highbush cranberry (*Viburnum opulus* var. *americanum*), Juneberry (*Amelanchier alnifolia*), red raspberry (*Rhubus idaeus*), and choke cherry (Hagen et al. 2005).

4.4.1.6 Wetland and Riverine

Wetland and riverine habitats are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of wetland vegetation typically adapted for life in saturated soil conditions (Environmental Laboratory 1987). Wetlands are classified depending on how long water and vegetation are present. These range from temporary wetlands that typically hold water for only a few weeks, to permanent wetlands that hold water year round. Wetland types crossed by the Proposed Project include palustrine and riverine wetlands. Dominant vegetation of wetland areas includes fine textured grasses, sedges, and rushes (Hagen et al. 2005). Riparian areas, or wooded wetlands, are not crossed by BEPC's Proposed Project.

- Palustrine Wetlands: Palustrine wetlands include all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens. They can be grouped into vegetated wetlands traditionally called by such names as marsh, swamp, bog, fen, and prairie, which are found throughout the U.S. It also includes the small, shallow, permanent or intermittent water bodies often called ponds (Cowardin et al. 1979).

  Palustrine wetlands in the vicinity of the Proposed Project include seasonal, semi-permanent, and permanent subcategories. Seasonal wetlands are described as having surface water present for extended periods in spring and early summer, but usually disappear as early as midsummer (Hagen et al. 2005). Semi-permanent wetlands have water present year-round in most years but during dry years, water may disappear as early as midsummer (Hagen et al. 2005). Finally, permanent wetlands will contain water throughout the years, in all years (Hagen et al. 2005).

- Riverine Wetlands: Riverine wetlands include wetlands contained within a channel, with two exceptions: 1) wetland dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens; and 2) habitats with water containing ocean-derived salts. Water is usually, but not always, flowing in the riverine system. Upland islands or palustrine wetlands may occur in the channel but they are not included in the riverine system. The lower perennial subsystem includes waterbodies where some water flows throughout the year and the gradient is low and water velocity is slow. Substrates consist mainly of sand and mud. The intermittent subsystem includes channels where the water flows for only part of the year (Cowardin et al. 1979).

Wetland delineation surveys were conducted in September 2008. Twenty-nine wetlands and 61 waterbodies were identified along the Preferred Route. All wetlands were determined to be palustrine, as defined above. Wetland determination was based on the presence of hydrophytic vegetation, hydric soils, and wetland hydrology in accordance with the U.S. Army Corps of Engineers 3-parameter methodology.

4.4.1.7 Developed Lands

Lands that are classified as developed include areas within metropolitan jurisdictional limits and road or highway surfaces. Route Option C crosses developed lands that are associated with the Ray wastewater treatment facility.

4.4.1.8 Sensitive Ecological Communities

Sensitive ecological communities within proximity to the Preferred Route and Route Options were identified by the North Dakota Natural Heritage Inventory (NDNHI) 2008. These terrestrial communities consist of interrelated assemblages of plants, animals, other living organisms, geological substrates, and soils that are shaped by natural processes. These communities are either rare/endangered, ecologically significant, or unique to the area. Several sensitive ecological communities were identified by the NDNHI as present in the vicinity of the Preferred Route and Route Options, but not within the proposed transmission line ROW. Those communities are:

- Western Three-square Meadow;
- Needle-and-thread Mixed Grass Prairie; and
- Green Ash Upland Woodland.

The nearest sensitive ecological community is approximately 5.5 miles from the proposed transmission line.

4.4.1.9 Noxious Weeds

Several noxious weed species are known to be a problem in North Dakota. If not controlled, noxious weeds can infest areas, resulting in the loss of native grasses and forbs. Noxious weeds identified by the NRCS are listed in **table 4-8**. The list includes State and county prohibited or restricted noxious weeds that are managed and controlled by the State of North Dakota. Although a noxious weed survey was not performed within the Project area, USDA data (2009) indicate that absinth wormwood, musk thistle, spotted knapweed, field bindweed, and broomleaf toadflax are most likely to occur within the Project area.

Table 4-8 Noxious and Invasive Weeds Known to Occur in North Dakota

Common Name	Scientific Name
Russian knapweed	*Acroptilon repens*
Absinth wormwood	*Artemisia absinthium*
Musk thistle	*Carduus nutans*
Canada thistle	*Cirsium arvense*
Diffuse knapweed	*Centaurea diffusa*
Spotted knapweed	*Centaurea stoebe*
Yellow starthistle	*Centaurea solstitialis*
Field bindweed	*Convolvulus arvensis*
Leafy spurge	*Euphorbia esula*
Broomleaf toadflax	*Linaria genistifolia*
Purple loosestrife	*Lythrum salicaria, L. virgatum*
Saltcedar	*Tamarix chinensis, T. ramosissima*

Source: NRCS 2008.

4.4.2 Environmental Consequences

Impact analyses focused on plant communities within the Project area that may be affected by constructing and operating the Proposed Project. Methods included reviewing published literature, North Dakota Natural Heritage database information, internet websites, agency correspondence, and results of baseline biological surveys conducted during April and September 2008.

Significance Criteria

- Vegetation Resources: Habitat alteration, soil compaction, and surface disturbance resulting in the loss or decline in native plant species or their associated habitat would represent a significant impact.
- Loss of any plant population that would result in a species being listed or proposed for listing as threatened or endangered would represent a significant impact.
- Sensitive Ecological Communities: Loss of native communities identified by a State or Federal agency would represent a significant impact.
- Noxious Weeds: Significant impacts would result from the introduction of, and lack of control of noxious weeds.

Vegetation types that would be temporarily disturbed, reduced, and removed as a result of BEPC's construction and installation of the transmission line (i.e., structure work areas, access trails, splicing sites, pulling and tensioning areas, laydown areas) are provided in **table 4-9**. Estimated acreages of temporary impacts to vegetation communities have been calculated using total acreage disturbances by Route Option as presented in **table 3-2**.

Table 4-9 Temporary Impacts to Vegetation Resources by Route Option (acres)

Vegetation Community	Vegetation Sub-community	Route Option		
		A	B	C (Preferred)
Planted Herbaceous Perennials	Planted Herbaceous Perennials	15.3	17.0	21.4
Cultivated	Cropland	131.9	114.6	153.2
Pasture/Rangeland	Mixed Bluestem, Needlegrass, & Wheatgrass	86.5	86.0	70.4
	Planted Grasses	4.7	12.0	13.9
	Total Pasture/Rangeland	91.2	98.0	84.3
Shrubland & Barren Lands	Total Shrubland & Barren Land	4.3	4.2	8.3
Woodlands	Total Woodlands	1.7	0.5	0.9
Wetlands and Riverine	Total Wetlands	9.4	8.3	2.8
Developed Lands	Total Developed Lands	0.0	0.0	1.8
Total Acres Impacted (refer to table 3-2)		**253.8**	**242.6**	**272.7**

BEPC's construction of the Proposed Project would likely result in vegetation losses due to crushing by heavy equipment. Upon completion of construction, BEPC would revegetate disturbed areas in compliance with Project mitigation measures (**appendix D**), including re-seeding of disturbed areas using native vegetation, or a seed mixture that would be determined by the landowner. In addition, BEPC's mitigation measures for vegetation and noxious weeds state that they will use standard construction practices to minimize potential soil compaction, erosion, and sedimentation associated with construction of the transmission line. Timely stabilization of areas disturbed by construction and reseeding with an appropriate seed mix would minimize the magnitude and duration of vegetation disturbance.

- Planted Herbaceous Perennials: Construction of the Proposed Project during the growing season would directly impact herbaceous perennials due to equipment movement for structure installation, conductor pulling and tensioning, and splicing. Construction would not take place during extremely wet conditions to reduce the possibility of soil compaction and rutting. Construction of the Project would temporarily impact 15 to 21 acres of herbaceous perennial cropland.
- Cultivated Cropland: Cropland would typically regenerate quickly following construction. Project mitigation measures (**appendix D**) indicate that in order to reduce impacts to agriculture, the transmission line would be routed along the edges of irrigated fields, or would span fields to the extent feasible. Possible impacts to croplands also were minimized by increased opportunities to use public roads, section lines, and existing trails. BEPC's decision to use single-pole structures (rather than H-frame structures) would result in reduced long-term impacts by eliminating areas between H-frame structure legs that cannot be cultivated and by allowing lines to be constructed adjacent to property and section lines.
- Pasture/Rangeland: Long-term impacts may occur to grassland and rangeland communities. Recovery of these habitats may take a minimum of five to seven years due to poor soil and low moisture conditions. Planted grasslands would typically regenerate quickly after cleanup and reseeding of the construction ROW, typically within two years. Due to low moisture content, recovery of pasture/rangeland vegetation could take several years. Project construction would affect 84 to 98 acres of pasture/rangeland.
- Shrubland and Barren Lands: A minimal amount of shrubland and barren land would be temporarily affected by Project construction. Construction of Route Options A or B would affect approximately four acres; construction of Route Option C would affect approximately eight acres. The community is sparsely vegetated and soil disturbance is likely to result in increased soil erosion from wind and water. Due to low moisture content, recovery of shrubland vegetation could take several years. Soil erosion impacts could be reduced by prompt revegetation of disturbed areas.
- Woodlands: Woodlands were avoided during detailed routing, to the extent practicable. Clearing of woodland vegetation within the construction ROW would result in long-term and permanent environmental change. In this region, it is anticipated that re-growth of woodlands to mature conditions could take between 50 to 100 years, depending on the species (long-term impact); however, BEPC would carry out ROW maintenance to remove tall woody species. Trees removed during construction would be replaced by BEPC at a 2:1 ratio and planted at locations amenable to landowners.
- Wetland/Riverine: Impacts to wetlands are not anticipated. Wetlands (including palustrine and riparian areas) would be avoided or spanned. Project mitigation measures (**appendix D**) have been developed to ensure that impacts to wetlands would be avoided or minimized. These measures include:
  - A buffer zone around wetlands when feasible to prevent impacts to those ecosystems;
  - Spanning of wetland and riverine communities;
  - Re-seeding disturbed areas using native vegetation; application of BMPs to minimize potential soil compaction, erosion, and sedimentation, and use of sediment control and erosion control devices.
  - Developing a SPCC Plan prior to the start of construction to prevent the potential for spills of hazardous substances to streams. The plan would include a procedure for storage of hazardous materials and refueling of construction equipment outside of riparian zones, spill containment and recovery plan, and notification and activation protocols;
  - Refueling and staging areas located away from waterbodies to prevent contamination;
  - Herbicides used to control noxious weeds would be applied in accordance with label instructions by a certified applicator; and
  - Establishing erosion and sediment controls prior to construction that are maintained throughout restoration.

- Developed Lands: Construction or operation of Route Options A or B would not affect developed lands. Construction of Route Option C would temporarily affect 1.8 acres of developed lands. Lands that would be affected are adjacent to the Ray wastewater treatment facility.

Construction would avoid periods of extreme soil saturation, thus rutting would be minimized to the extent practicable and soil compaction within cultivated lands would be mitigated through normal cultivation. There are no sensitive plant species within areas that would be affected by Project construction and Federally listed or State-listed threatened or endangered species would not be affected.

4.4.2.1 Sensitive Ecological Communities

Impacts to sensitive ecological communities identified as possible within the Proposed Project Route Options could include loss of individuals or local populations as a result of crushing from construction vehicles and equipment, and clearing and construction of transmission line components. Invasion of suitable habitat by noxious weeds also could result from construction activities. Although several sensitive ecological communities were identified by the NDNHI as present in the vicinity of the Preferred Route and Route Options, none are within the preferred transmission line ROW and the communities would not be affected by BEPC's Proposed Project.

4.4.2.2 Noxious Weeds

Noxious weeds, if not controlled, can displace native plant species, rendering infested areas unproductive. They could be introduced to the Project area as a result of bringing in weed-contaminated equipment from off site, using straw (for surface water control) that is not weed free, and using seed mixtures that are not weed free.

Project-specific mitigation measures (**appendix D**) to reduce the introduction of noxious weeds would include BEPC implementing a weed management plan prior to construction. The plan would include construction and restoration procedures that detail:

- Coordinating with the appropriate Federal, State, and local agencies to: 1) obtain written recommendations from local soil conservation authorities or land management agencies regarding permanent erosion control and revegetation specifications and 2) develop specific procedures in coordination with the appropriate agency to prevent the introduction or spread of noxious weeds resulting from construction and restoration activities;
- Application of approved herbicides by trained personnel and according to label directions;
- Ensure that soil that is imported for agricultural or residential use has been certified as weed-free, unless otherwise approved by the landowner;
- Ensure that the contractor will use only weed-free straw or hay for sediment control devices or mulch applications;
- Cleaning all equipment and vehicles prior to the beginning of construction; and
- Monitoring restoration for three years following construction.

There are no sensitive ecological communities within the Preferred Project route and such resources would not be affected by the proposed Project. Although several species of noxious or invasive weeds are potentially present within the Project area, the spread of such species would be controlled through best management practices, including washing of vehicles that would be used for construction and the use of weed-free materials. Long-range monitoring and control of noxious weeds also would prove to be beneficial in areas where such monitoring and controls are not in effect.

4.5 Wildlife and Fisheries

4.5.1 Affected Environment

Wildlife use within the proposed Project area was characterized from a literature review including NDGFD's Comprehensive Wildlife Conservation Strategy (Hagen et al. 2005), as well as both 2008 spring and fall field investigations. Additionally, agency correspondence and species information was collected from the USFWS, NDGFD, and the NDNHI (USFWS 2008b; NDGFD 2008; NDNHI 2008). The literature review included a broad corridor along the three Route Options as well as field investigations along the Preferred Route (Route Option C) that included pulling and tensioning sites that were outside of the designated ROW.

Terrestrial Wildlife

The predominant wildlife habitats along the proposed Project consist of cropland and pasture/rangeland, which provide habitat to support a diversity of wildlife species.

Big Game

Big game species within the Proposed Project area include white-tailed deer (*Odocoileus virginianus*), with possible occurrence of mule deer (*Odocoileus hemionus*), and pronghorn (*Antilocapra americana*). No seasonal big game ranges were identified by the NDGFD (NDGFD 2008).

Small Game

Small game species that occur within the Proposed Project area include native and non-native furbearers, upland game birds, and waterfowl. Common furbearers within the Project area include red fox (*Vulpes vulpes*), raccoon (*Pyrocyon lotor*), badger (*Taxidea taxus*), striped skunk (*Mephitis mephitis*), and coyote (*Canis latrans*).

Common upland game birds in the Proposed Project area include ring-necked pheasant (*Phasianus colchicus,* an introduced species), sharp-tailed grouse (*Tympanuchus phasianellus*), gray partridge (*Perdix perdix,*an introduced species), and wild turkey (*Meleagris gallopavo*). Representative waterfowl species include mallard (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), northern shoveler (*Anas clypeata*), and gadwall (*Anas strepera*).

Nongame Species

A diverse number of nongame species (e.g., small mammals, raptors, passerines, amphibians, and reptiles) occupy a variety of trophic levels and habitat types along the Preferred Route. Common wildlife species include small mammals such as bats, voles, squirrels, gophers, and mice. These small mammals provide a substantial prey base for predators in the area including larger mammals (coyote and badger), raptors (eagles, buteos, accipiters, owls), and reptiles.

Migratory birds are protected by the MBTA (16 USC 703-711) and EO 13186 (66 FR 3853), which makes it unlawful to take, kill, or possess migratory birds. EO 13186 was enacted to, among other things, ensure that environmental analyses of Federal actions evaluate impacts of actions and agency plans on migratory birds. Federally listed and other sensitive bird species are discussed in section 4.6.

Migratory birds are considered integral to natural communities and act as environmental indicators based on their sensitivity to environmental changes caused by human activities. Examples of migratory bird species that occur along the Preferred Route include the mourning dove (*Zenaida macroura*), killdeer (*Charadrius vociferus*), common nighthawk (*Chordeiles minor*), western kingbird (*Tyrannus verticalis*), eastern kingbird (*Tyrannus tyrannus*), horned lark (*Eremophila alpestris*), eastern bluebird (*Sialia sialis*), mountain bluebird (*Sialia currucoides*), common yellowthroat (*Geothlypis trichas*), clay-colored sparrow (*Spizella pallida*), vesper sparrow (*Pooecetes gramineus*), lark sparrow (*Chondestes grammacus*), savannah sparrow (*Passerculus sandwichensis*), western meadowlark (*Sturnella neglecta*), Baird's sparrow (*Ammodramus bairdii*), black-billed cuckoo (*Coccyzus erythropthalmus*), bobolink (*Dolichonyx oryzivorus*), chestnut-collared longspur (*Calcarius ornatus*), dickcissel (*Spiza americana*), grasshopper sparrow (*Ammodramus savannarum*), lark bunting

(*Calamospiza melanocorys*), LeConte's sparrow (*Ammodramus leconteii*), loggerhead shrike (*Lanius ludovicianus*), marbled godwit (*Limosa fedoa*), Sprague's pipit (*Anthus spragueii*), and upland sandpiper (*Bartramia longicauda*) are migratory bird species that may occur within the proposed Project area.

Raptor species that occupy habitats within northwestern North Dakota are those associated with tall- and mixed-grass prairie, shrubland, woodlands, wetlands, and cropland. Those species include bald eagles (*Haliaeetus leucocephalus*), golden eagles (*Aquila chrysaeotos*), red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk (*Buteo regalis*), American kestrel (*Falco sparverius*), prairie falcon (*Falco mexicanus*), burrowing owl (*Athene cunicularia*), great horned owl (*Bubo virginianus*), short-eared owl (*Asio flammeus*), northern harrier (*Circus cyaneus*), and other birds of prey including the turkey vulture (*Cathartes aura*) (Peterson 1990). Protected raptor species that have been identified for the proposed Project area include bald eagle, ferruginous hawk, northern harrier, Swainson's hawk (*Buteo swainsoni*), short-eared owl, and burrowing owl (**Appendix E**, Special Status Species). These species all are designated as North Dakota Species of Conservation Priority. Woodlands within the area are limited, but would provide nesting and perching opportunities for many raptor species; prairie and rangeland would provide nesting opportunities for the burrowing owl and foraging opportunities for other raptor species.

Fisheries Resources

The Project area includes several occasional intermittent and ephemeral streams. One perennial stream, the Little Muddy River, is crossed in Williams County. Federal and State wildlife agencies have not expressed concerns for fish species or sensitive aquatic habitat within any of the waterbodies within the proposed Project area. In addition, no waterbodies within the proposed Project area contain species managed by the National Marine Fisheries Service, or support essential fish habitat (EFH) as defined under the Magnuson-Stevens Fishery Conservation and Management Act. Therefore, the proposed Project would not affect EFH.

4.5.2 Environmental Consequences

Impact analysis focused on wildlife species and associated habitats that may be affected by construction and/or operation of the proposed Project. Methods for establishing a baseline of status, occurrence and associated habitat of wildlife that may occur within the proposed Project area include reviewing published literature, natural heritage database information, internet websites, agency correspondence, and field surveys. Biologists with the USFWS, NDGFD, and NDNHI were contacted for information about the status of wildlife species, habitat, special wildlife features and habitats in the proposed Project area (USFWS 2008b; NDGFD 2008; NDNHI 2008). Initial baseline biological surveys were conducted in April 2008; with more extensive field surveys conducted in September 2008 and June 2009.

Project areas that would be temporarily impacted include a 12-foot-wide access trail between structure locations, structure pads (work sites), pulling and tensioning sites, and splicing sites as described in section 3.2.4 and presented in **table 3-2**. As noted in **table 3-2**, temporary impacts associated with construction of Route Options A, B, and C would total 254, 243, and 273 acres, respectively. Three 15-acre laydown areas also would be temporarily impacted. Acres of suitable habitat that could be affected have been estimated based on vegetation community acreages, presented in **table 4-8**. The fact that the disturbed area would be linear and narrow in most areas helps reduce the potential level of impact on wildlife species.

Significance Criteria

Wildlife Resources

- Declining populations or local extinctions of wildlife populations, migratory species and resident avian species from loss of associated habitat would represent a significant impact. Significant impacts also would result from permanent habitat fragmentation causing displacement of wildlife, vehicle and equipment operation causing loss of eggs, nests, or young beyond one season.
- Significant impacts also would result from violation of MBTA, or substantial losses of bird species (i.e., raptors and waterfowl) from electrocution or collision with transmission lines.

4.5.2.1 Preferred Transmission Line Route and Route Options

Game Species

Impacts to big game and small game species would include an incremental short-term reduction of forage habitat. However, these incremental losses of vegetation would represent only a small percentage of the overall available habitat within the broader Project region. The loss of native vegetation would be long-term (greater than 5 years and, in some habitats, more than 20 years). In the interim, herbaceous species may become established within 3 to 5 years, depending on future weather conditions and grazing management practices that would affect reclamation success in the Project area. In most instances, suitable habitat adjacent to the disturbed areas would be available for wildlife species until vegetation reestablished within the disturbance areas. In addition, BEPC would replant disturbed areas with native species or non-native species as directed by the appropriate agency/landowner (see **appendix D**) and the ROW would be monitored to control establishment of woody vegetation.

Indirect impacts would result from increased human activity and noise levels during transmission line construction. Big game species as well as small game species would likely decrease their use within and adjacent to surface disturbing activities due to increased noise levels. This displacement of both big game and small game species would be temporary and short-term and animals would return to the disturbance area following construction activities.

Nongame Species

Direct impacts to nongame species (e.g., mammals, birds, reptiles, nests) from surface disturbance activities would result in incremental short-term loss of habitat. The impacts would continue until construction activities stopped and vegetation became reestablished. Impacts include mortalities of less mobile or burrowing nongame species (e.g., small mammals, birds, reptiles, amphibians, invertebrates) caused by operating vehicles and equipment. Although some species would be temporarily displaced during construction, habitat fragmentation effects would be short-term.

Indirect impacts would include short-term displacement of highly mobile species (e.g., larger mammals, adult birds) caused by increased noise levels and human activities during construction. Displacement of nongame species from disturbance areas would be temporary and animals would be expected to return to the disturbance areas following construction activities. Effects of habitat fragmentation would be short-term and temporary.

The MBTA makes it unlawful to take, kill, or possess migratory birds. Habitat alteration, human disturbance, and power line collisions or electrocutions could result in direct impacts to migratory species including loss of individuals, abandonment of nests or young, and the loss of nests, eggs, or young. However, these impacts would be reduced by following mitigation measures from Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (Avian Power Line Interaction Committee [APLIC] 2006) and Mitigating Bird Collisions with Power Lines: The State of the Art in 1994 (APLIC 1994). Prior to construction, BEPC would contact the USFWS for guidance regarding mitigation measures that may be necessary to protect migratory birds.

BEPC does currently plan some transmission line construction activities during the nesting period (typically March through July) for migratory birds. As part of the Project-specific mitigation measures (**appendix D**), BEPC would conduct pre-construction surveys to locate active bird nests for species protected under the MBTA and establish buffers (if necessary) until the nesting season is complete. BEPC would contact the USFWS and Western before surveys are conducted to acquire approval for survey methods and monitoring requirements.

Electrocution and collision with power lines is a major cause of mortality for raptors, waterfowl, and whooping cranes. Additionally, collision potential depends on transmission line design, the location of the transmission line relative to high-use habitat areas (e.g., nesting, foraging, and roosting), and bird flight patterns and movement corridors. Following the mitigation measures from Suggested Practices (APLIC 2006) and Mitigating Bird Collisions, mentioned above, (APLIC 1994), collision impacts for raptors and other foraging bird

species would be minimized. Conductor-to-ground and conductor-to-conductor distances that are proposed for the transmission line are approximately 10 feet and 20 feet, respectively (refer to **figure 2-1**), which is sufficient to preclude electrocution of avian species. Contact electrocution is primarily a distribution line issue.

Construction-related impacts on fisheries would be limited to land disturbing activities that would directly affect receiving streams and could include the movement of heavy equipment, riparian, and the use of herbicides. Since such activities would be avoided, related impacts to fisheries resources are not anticipated. Mitigation measures have been developed (see **appendix D**) to reduce impacts to waterbodies crossed by the proposed Project. Those measures include:

- Avoiding or spanning all streams and drainages;
- Developing a SPCC Plan prior to the start of construction to prevent the potential for spills of hazardous substances to streams. The plan would include a procedure for storage of hazardous materials and refueling of construction equipment outside of riparian zones, spill containment and recovery plan, and notification and activation protocols;
- Refueling and staging areas located away from waterbodies to prevent contamination;
- Herbicides used to control noxious weeds would be applied in accordance with label instructions by a certified applicator; and
- Establishing erosion and sediment controls prior to construction that are maintained throughout restoration.

4.6 Special Status Species

Special status species are those in which State and/or Federal agencies provide protection by law, regulation or policy. Federally listed and federally proposed for listing species and designated critical habitat are protected under the ESA. For this analysis, special status species also include those species that have been designated as species of conservation priority by NDGFD that could be affected by Project construction and/or operation.

The State of North Dakota categorizes wildlife species into three levels of conservation priority (Hagen et al. 2005). The following categories were developed to describe the conservation needs for North Dakota species of conservation priority:

- Level I: species with a high level of priority due to the declining status here or across the range or high rate of occurrence in North Dakota, constituting the core of the species breeding range but are at-risk range wide.
- Level II: species with a moderate level of priority or species with a high level of priority but a substantial level of non-State wildlife grants funding.
- Level III: species with a moderate level of priority but are believed to be peripheral or non-breeding in North Dakota.

Special status species analysis focused on wildlife and plant species and habitats that may be affected by BEPC's construction and operation of the Proposed Project. The analysis considered Federal laws and State statutes. The ESA is administered by the USFWS and provides broad national protection for fish, wildlife, and plants that are listed as endangered or threatened. The ESA outlines procedures for Federal agencies to follow when a listed species or designated habitat may be affected by an action they authorize, fund, or permit. The State of North Dakota does not have an endangered species law. The MBTA also is administered by the USFWS. The MBTA is a Federal law enabling the U.S. to fulfill its international, bilateral conventions for conserving migratory bird populations and their habitats. Additionally, the Bald and Golden Eagle Protection Act (BGEPA), also administered by the USFWS, provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession and commerce of such

birds. Revised regulations providing mechanism to authorize take under BGEPA went into effect June 19, 2008.

Methods for establishing a baseline of status, occurrence, and associated habitat of wildlife that may occur within the proposed Project area include reviewing published literature, natural heritage database information, internet websites, agency correspondence, and field surveys. Biologists with the USFWS, NDGFD, and NDNHI were contacted for information about the status of wildlife species, habitat, special wildlife features, and habitats in the proposed Project area (USFWS 2008b; NDGFD 2008; NDNHI 2008). Baseline biological surveys of the Project area were conducted in September 2008.

4.6.1 Affected Environment

The analysis for special-status species focused on those species that could occur within the Project area. Special status species originally considered for the Proposed Project area presented in **Appendix E**, Special Status Species. The evaluation determined that some of these species would not occur in the Project area or would otherwise not be affected by the Proposed Project. Comments are provided on these species in **appendix E**.

4.6.1.1 Special Status Wildlife Species

A total of 64 special status wildlife species were identified by the USFWS, the State of North Dakota, and the NDNHI as occurring within the Project vicinity (USFWS 2008b; Hagen et al. 2005; NDNHI 2008). These species, their habitat associations, and their occurrence within the study area are summarized in **Appendix E**, Special Status Species. Occurrence for each species was based on habitat requirements and known distribution. Based on these evaluations, 24 species have been eliminated from detailed analysis, of which, two of these species are federally listed species (threatened and endangered) and two species are candidates for listing as threatened or endangered. The federally listed species that have been eliminated from consideration are the gray wolf (*Canis lupus*), interior least tern (*Sterna antillarum*), pallid sturgeon (*Scaphirynchus albus*), and Dakota skipper (*Hesperia dacotae*). The gray wolf was eliminated because it is highly unlikely to be within the project area and would only be present as a migratory occurrence. Interior least tern was eliminated because nesting habitat is not present. Pallid sturgeon was eliminated because the species requires large fast-flowing rivers, which are not present within the Project area. The Dakota skipper is a Federal candidate species that is not found in western Mountrail County or Williams County.

Non-listed species eliminated from detailed analysis include arctic shrew (*Sorex arcticus*), greater prairie chicken (*Tympanuchus cupido*), long-eared myotis (*Myotis evotis*), long-legged myotis (*Myotis volans*), peregrine falcon (*Falco peregrinus*), pygmy shrew (*Sorex hoyi*), horned grebe (podiceps auritus), red-headed woodpecker (*Melanerpes erythrocephalus*), Richardson's ground squirrel (*Spermophilus richardsonii*), sagebrush vole (*Lemmiscus curtatus*), swift fox (*Vulpes velox*), western small-footed myotis (*Myotis ciliolabrum*), and eight species of fish. Of the remaining 40 species retained for analysis, two are listed species; whooping crane (*Grus americana*) and piping plover (*Charadrius melodus*). Special status wildlife species that have been retained for analysis are discussed below and in **appendix E**. No designated critical habitat for any species is located within BEPC's Proposed Project.

Federally Listed Wildlife Species

Whooping Crane

The whooping crane is a federally endangered species and a North Dakota Level III species of conservation priority. Collision with power lines is the greatest source of non-natural mortality for fledged whooping cranes that migrate between nesting and wintering habitat (USFWS 2006). Designated critical habitat, nesting habitat, and breeding rookeries are not present in the vicinity of the Proposed Project. However, the proposed Project area is located within the yearly migratory route for the Aransas – Wood Buffalo population. Species records show migration routes through Williams and Mountrail counties (USFWS 2006). Whooping cranes may migrate through the Project area in the spring (April to mid-May) and in the fall (mid-September to October). Suitable stop-over habitat for migrating whooping cranes includes wetlands and ponds for roosting and/or feeding. Individual cranes typically spend only a few days at a given site during migration before moving on.

Piping Plover

The piping plover is federally threatened species and a North Dakota Level II species of conservation priority. The piping plover is generally characterized as using exposed, sparsely vegetated shores, and islands of shallow, alkali lakes and impoundments for breeding (Hagen et al. 2005). Salt-encrusted, alkali, or subsaline semipermanent lakes, ponds, and rivers with wide shorelines of gravel, sand, or pebbles are preferred (Hagen et al. 2005). Piping plovers forage on fly larvae, beetles, crustaceans, mollusks, and other small animals near the shoreline or sometimes by the nest. It is expected that the piping plover would only use the Proposed Project area for migration and forage purposes; breeding and nesting would most likely be associated with riverine areas associated with Lake Sakakawea and the Missouri River.

North Dakota Wildlife Species of Conservation Priority

Grassland Associated Species

Baird's sparrow (*Ammodramus bairdii*), black-billed cuckoo (*Coccyzus erythropthalmus*), bobolink (*Dolichonyx oryzivous*), chestnut-collared longspur (*Calcarius ornatus*), dickcissel (*Spiza americana*) grasshopper sparrow (*Ammodramus leconteii*), lark bunting (*Calamospiza melanocorys*), LeConte's sparrow (*Ammodramus leconteii*), loggerhead shrike (*Lanius ludovicianus*), marbled godwit (*Limosa fedoa*), Sprague's pipit (*Anthus spragueii*), and upland sandpiper (*Bartramia longicauda*), are migratory bird species that may occur within the Proposed Project area. These migratory bird species are associated with grassland habitats.

Perching Species

Red-tailed hawk (Buteo jamaicansis), Ferruginous hawk (*Buteo regalis*), northern harrier (*Circus cyaneus*), short-eared owl (*Asio flammeus*), and Swainson's hawk (*Buteo swainsoni*) also are migratory birds and raptor species that may occur within the proposed Project area and are associated with grassland habitats. Several raptor species were observed foraging in close proximity to the Preferred Route during September 2008 field surveys of the Project area including Swainson's hawk, northern harrier, and red-tailed hawk.

Lekking Species

Sharp-tailed grouse are found in mixed-grasslands with patches of small trees or shrubs. During the breeding season male sharp-tailed grouse congregate on specific areas known as leks in the early morning to impress nearby females. Leks are usually located within wet meadows, ridges, and knolls, or recently burned areas. No lek sites for sharp-tallied grouse have been identified by the NDGFD or the NDNHI in the vicinity of the Proposed Project area. However, during the September 2008 survey of the Project area, numerous sharp-tailed grouse were observed.

Less Mobile and Burrowing Species

Plains spadefoot (*Spea bombifrons*), smooth green snake (*Liochlorophis vernalis*), short horned lizard (*Phrynosoma douglassi*) and western hognose snake (*Heterodon nasicus*) inhabit dry, open grasslands with sandy or loose soils and, occasionally rock crevices. Other habitat factors include proximity to water and small mammal burrows (Hagen et al. 2005). These species all utilize burrows during portions of their life history. Smooth green snake also may utilize hibernacula and have been documented hibernating within ant mounds. These species were not observed during September 2008 surveys.

Burrowing owl (*Athene cunicularia*), is a ground nesting owl which nests in abandoned mammal burrows, which they enlarge and excavate (Hagen et al. 2005). One burrowing owl was observed along the Preferred Route (see **appendix F, exhibit F-1**).

Wetland, and Riparian Associated Species

American advocet (*Recurvirostra americana*), American bittern (*Botaurus lentiginosus*), black tern (*Chlidonias niger*), canvasback (*Aythya valisineria*), Franklin's gull (*Larus pipixcan*), Nelson's sharp-tailed sparrow (*Ammodramus nelsoni*), northern pintail (*Anus acuta*), redhead (*Aythya americana*), sedge wren (*Cistothorus platensis*), willet (*Catoptrophorus semipalmatus*), Wilson's phalarope (*Phalaropus tricolor*), and yellow rail (*Corurnicops noveboracensis*) are migratory bird species that may occur within the Proposed Project area and

are associated with wetlands, wetland complexes, and waterbody habitats. The Canadian toad (*Bufo hemiophrys*) and common snapping turtle (*Chelydra serpentina*) are associated with permanent lakes, ponds, rivers, and wetlands (Hagen et al. 2005). Although routing data indicate 2.8 to 9.4 acres of wetland habitat could be temporarily impacted by Project construction, all wetlands would be avoided or spanned during construction.

The September 2008 and June 2009 field surveys found habitat that would support these species including one perennial stream, the Little Muddy River, and a limited number of ponds or wetlands with permanent water. Additionally, occasional intermittent and ephemeral streams also were noted.

4.6.1.2 Special Status Fish Species

A total of nine special status fish species were identified by the USFWS, the State of North Dakota, and the NDNHI as occurring within the Project vicinity (USFWS 2008b; Hagen et al. 2005; NDNHI 2008). These species, their habitat associations, and their occurrence within the study area are summarized in **Appendix E**, Special Status Species. Based on evaluations, in **appendix E**, all nine fish species have been eliminated from detailed analysis.

The September 2008 and June 2009 field surveys did not identify habitat that would support these species. Only one perennial stream, the Little Muddy River, will be spanned by the proposed Project. These species are not known to occur in the Little Muddy River.

4.6.1.3 Special Status Plant Species

A total of three special status plant species were identified by the USFWS, the State of North Dakota, and the NDNHI as occurring within the Project vicinity (USFWS 2008b; Hagen et al. 2005; NDNHI 2008). These species, their habitat associations, and their occurrence within the Proposed Project area are summarized in **Appendix E**, Special Status Species. Based on evaluations found in **appendix E**, all three plant species have been eliminated from detailed analysis, none of which are federally listed species. The non-listed species eliminated from detailed analysis include Dakota buckwheat (*Eriogonum visheri*), heart-leaved buttercup (*Ranunculus cardiophyllus*), and jointed-spike sedge (*Carex athrostachya*). Species specific surveys for these plant species were not required by the NDGFD (NDGFD 2007b).

All three species may occur within the Project area, but were eliminated from detailed analysis as the habitat characteristics necessary to support these species were not found during September 2008 survey efforts.

4.6.2 Environmental Consequences

Impact analysis focused on special status species that may be affected by construction and/or operation of BEPC's Proposed Project. Methods for establishing a baseline of status, occurrence and associated habitat of wildlife that may occur within the Proposed Project area include reviewing published literature, natural heritage database information, internet websites, agency correspondence, and field surveys. Biologists with the USFWS, NDGFD, and NDNHI were contacted for information about the status of wildlife species, habitat, special wildlife features, and habitats in the Proposed Project area (USFWS 2008b; NDGFD 2008; NDNHI 2008). Initial baseline biological surveys were conducted in April 2008; with more extensive field surveys conducted in September 2008 and June 2009.

The USFWS recommends the following mitigation measures (USFWS 2008a) in order to minimize disturbances to fish and wildlife resources possibly occurring within the Project area:

- Time construction to avoid activities from April 1 through July 15 to minimize disruption to waterfowl or other wildlife during the nesting season, and to avoid high water conditions;
- Make no stream channel alterations or changes in drainage patterns;
- Replace trees/shrubs at a ratio of two planted for each one removed;

- Install and maintain appropriate erosion control measures to reduce sediment transport off-site; and
- Reseed disturbed areas with a mixture of native grass and forb species.

BPEC would implement the USFWS recommendations. For the first recommendation, if BEPC schedules construction during the nesting season, pre-construction surveys would be conducted to locate any active nests. Active nests would be avoided, and the USFWS consulted concerning buffer areas.

Further consultation with the NDGFD indicated that the State is concerned about construction disturbance to native prairie or wetland/riparian habitats. The NDGFD recommends avoiding work in these areas, not placing aboveground appurtenances in wetlands areas, and reclaiming disturbed areas to pre-Project conditions (NDGFD 2008).

Project area acres that would be temporarily impacted include a 12-foot-wide access trail between structure locations, structure pads (work sites), pulling and tensioning sites, and splicing sites as described in section 3.2.4 and presented in **table 3-2**. As noted in **table 3-2**, temporary impacts associated with construction of Routes Options A, B, and C would total 254, 243, and 271 acres, respectively. Acres of suitable habitat that could be affected have been estimated based on vegetation community acreages, presented in **table 4-8**.

Significance Criteria

- Significant impacts would result from jeopardizing the continued existence of a federally listed species, loss of individuals of a population of species that would result in a change in species status, violation of the MBTA, the ESA, or section 404 of the CWA (33 USC 1251, et seq., EO 11990).
- Electrocution or collision of bird species (i.e., whooping crane and raptors) with transmission lines that would jeopardize the population as a whole or result in a measurable reduction in species numbers would result in a significant impact.

4.6.2.1 Special Status Wildlife Species

Special status species include those listed by the USFWS as threatened, endangered, and candidates or proposed for listing as either threatened or endangered, as well as those designated by the State as a species of conservation priority.

Possible impacts to special status wildlife species would be similar to those discussed for general wildlife. Direct impacts include mortalities caused by construction activities (e.g., crushing from vehicles and equipment) and permanent structures (e.g., collision with power lines); habitat loss, manipulation or fragmentation; and animal displacement. Indirect impacts to wildlife may include increased noise occurrence, increased human activity, increased presence of noxious and invasive weeds, and increased dust from unpaved roads. Indirect impacts also would include short-term displacement of mobile species (e.g., larger mammals, adult birds) caused by increased noise levels and human activities during construction. Impact levels would depend upon timing and type of construction, sensitivity of the impacted species, and seasonal use patterns.

In order to minimize impacts to special status wildlife species, BEPC would coordinate with the USFWS and the NDGFD and comply with the terms and conditions of any mitigation plan for special status species that would be developed and approved by those agencies prior to construction. Consultations with these agencies would be conducted to determine appropriate and feasible buffers for the Proposed Project. Monitoring would be conducted in accordance with any mitigation plan that may be necessary as a result of impact analyses.

Federally Listed Species

Whooping Crane

The Proposed Project would not affect whooping crane nesting habitat or breeding rookeries. BEPC's construction and operation of the Proposed Project would occur within the whooping crane migratory route, and may result in an increase in collision risk. Collision with power lines, although primarily of distribution voltage, is the largest source of non-natural mortality for migrating whooping cranes. Collision potential depends on the location of the transmission line relative to high-use habitat areas (e.g., nesting, foraging, and roosting), bird flight patterns, and movement corridors. Specifically for whooping cranes, collision potential increases when power lines are constructed between suitable wetland roosting and foraging habitat while at a stop-over site. Cranes tend to fly at low altitudes between these two sites, increasing the chances for collision.

The September 2008 and June 2009 field surveys identified several locations crossed by the Project or adjacent to the Project area that could be considered suitable stop-over habitat. The Proposed Project area occurs within the western portion of the whooping crane migration corridor. Based on the number of whooping crane sightings that have been recorded by the USFWS through 2009, the potential occurrence of whooping crane is high. Recent whooping crane sightings are identified on **figure 4-1**.

BEPC's has committed to implementing the suggested minimization measures from Suggested Practices (APLIC 2006) and Mitigating Bird Collisions (APLIC 1994) outlined in **appendix D** to limit collisions. BEPC is coordinating with the USFWS regarding additional minimization measures.

Piping Plover

Direct impacts to piping plover from BEPC's construction of the Proposed Project may include disturbance of piping plover stop-over habitat. The Proposed Project could cause displacement, injury, or direct mortality of individuals. These impacts are highly unlikely as the transmission line would span and structures would be placed outside the limited habitat for this species. Construction activities and associated noise occurring in the vicinity of stop-over habitat could temporarily disrupt and displace individuals if they are present. The September 2008 and June 2009 field surveys identified one location crossed by the Project or adjacent to the Project area that could be considered suitable stop-over habitat. This location, which is a small ponded area (approximately one acre) with marginal alkali habitat could provide migration or foraging habitat for the piping plover. However, it does not contain suitable characteristics to provide nesting or breeding habitat for the species. Therefore, BEPC's Proposed Project is not expected to impact the species.

Informal consultation with the USFWS is ongoing regarding impacts and minimization measures to protect the whooping crane and piping plover. Concepts under consideration include line marking to reduce collisions with static wires. BEPC will comply with the provisions in the Project biological assessment; these provisions would ensure compliance with the ESA and would minimize impacts to the whooping crane and piping plover.

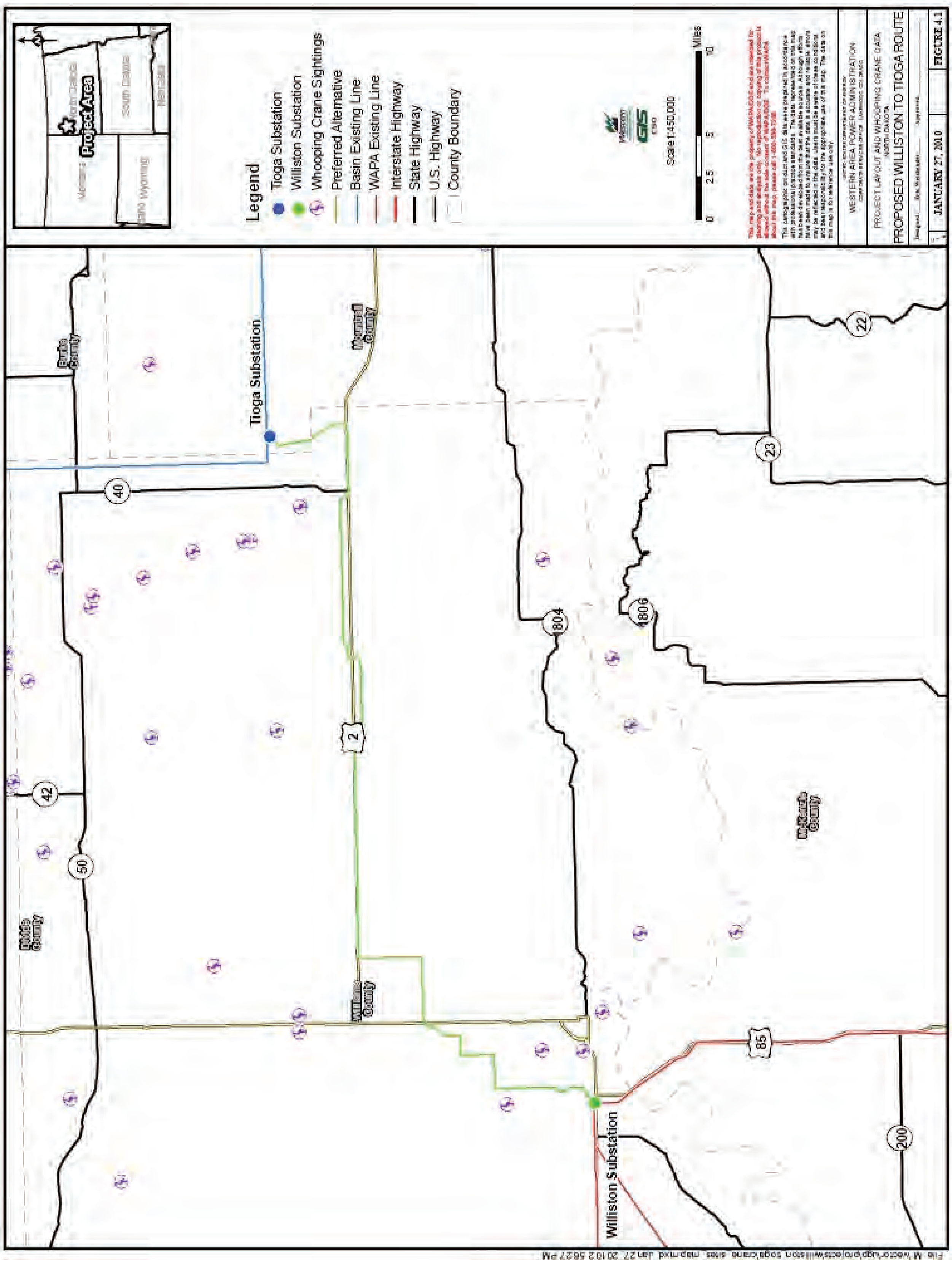

Figure 4-1 Whooping Crane Sightings

North Dakota Species of Conservation Priority

Grassland Associated Species

Temporary impacts to Baird's sparrow, burrowing owl, black-billed cuckoo, bobolink, chestnut-collared longspur, dickcissel, ferruginous hawk, grasshopper sparrow, lark bunting, Leconte's sparrow, loggerhead shrike, marbled godwit, northern harrier, plains spadefoot, sharp-tailed grouse, short-eared owl, short-horned lizard, smooth green snake, Sprague's pipit, Swainson's hawk, upland sandpiper, and western hognose snake would be limited to temporary disturbance during construction. Although temporary displacement could occur during construction, actual loss of individuals would be unlikely. Impacts to nesting species could be avoided by BEPC scheduling initial ground disturbing activities to avoid the nesting season to the extent practicable. Field surveys would be carried out during nesting periods to determine the presence of such species if construction activities are scheduled during the nesting period.

Indirect impacts may include the incremental reduction and degradation of habitat by the construction of the proposed transmission line and infrastructure. Construction of the Proposed Project would also provide additional hunting perches for raptors. With the exception of raptor species, this could cause indirect impacts through the facilitation of depredation. BEPC's Project-specific standard mitigation measures (**appendix D**) also indicate that BEPC plans conduct pre-construction surveys to located active bird nests for species protected under the MBTA and establish buffers (if necessary) until the nesting season is complete.

Perching Species

In addition to the temporary and indirect impacts indicated above, additional temporary impacts to ferruginous hawk, northern harrier, short-eared owl, and Swainson's hawk may occur due to human activities. Impacts associated with collision with conductor or OPGW would be similar among Route Options and would be mitigated by line marking devices. Electrocution impacts associated with any of BEPC's three Route Options are not expected due to line and structure spacing. Distances between conductors and between conductors and structures exceed the wingspan of avian species that frequent the area. According to BEPC's mitigation measures (**appendix D**), if construction is to occur during the breeding season for raptors (February 1 through August 15), prior to construction activities, raptor breeding surveys would be conducted by a qualified biologist through areas of suitable nesting habitat to identify any active nest sites within 0.5 mile from the Project area. If applicable, appropriate protection measures, including seasonal constraints and establishment of buffer areas would be implemented at active nest sites until the young have fledged and have dispersed from the nest area. These measures would be implemented on a site-specific and species-specific basis, in coordination with USFWS.

Lekking Species

Direct impacts of construction to sharp-tailed grouse may include the loss of lekking grounds and other habitat. Depending on the timing of construction, the proposed Project could impact sharp-tailed grouse during lekking activities or brood rearing, and could cause displacement, injury, or direct mortality of individuals. These species are particularly sensitive to disturbances while they gather on lekking grounds each morning and evening from March to June. Construction activities and associated noise occurring in early morning and late evening in the vicinity of lekking grounds could disrupt and displace individuals that have gathered for breeding activities. Lekking grounds were not observed during field investigations; therefore it is not expected that the species would be impacted by the Proposed Project.

Less Mobile and Burrowing Species

Direct impacts to burrowing owl, plains spadefoot, short-horned lizard, smooth green snake, and western hognose snake could result from surface disturbing activities (e.g., crushing by vehicles and equipment) and result in mortalities of these less mobile or burrowing species. Additional direct impacts may include the destruction of burrows and hibernacula, which could result in the displacement of burrowing species into less suitable habitats, increasing susceptibility to predation, reducing cover or forage habitat, or reducing reproductive success. Preconstruction surveys would be performed to determine the presence or absence of burrowing owls within the construction area.

Wetland, and Riparian Associated Species

Impacts to the American advocet, American bittern, black tern, canvasback, Canadian toad, common snapping turtle, Franklin's gull, horned grebe, Nelson's sharp-tailed sparrow, northern pintail, redhead, sedge wren, willet, Wilson's phalarope, and yellow rail would be minimal because the Preferred Route (or Route Options) avoids open water, wetlands, and a 100-foot buffer would be maintained around riparian habitats. Collision impacts would be mitigated by installation of line marking devices per USFWS recommendations. Temporary impacts to the above-referenced species would be limited to temporary disturbance during construction. Although temporary displacement could occur during construction, actual loss of individuals would be unlikely. Impacts to nesting species could be avoided by the avoidance of these areas and BEPC's scheduling of initial ground disturbing activities to avoid the nesting season to the extent practicable. Field surveys would be carried out during nesting periods to determine the presence of such species if construction activities occur during the nesting season.

It is unlikely that the Canadian toad or common snapping turtle would be affected by Project construction as such activities would take place outside of a 100-foot buffer from the waterbody. A 100-foot buffer for wetlands, riparian areas, and aquatic habitats would be provided. Preconstruction survey and buffer protocol would be coordinated with USFWS.

4.6.2.2 Special Status Fish Species

Impacts to special status fish species would not occur as the Project area does not contain suitable habitat for these species, and they are not present.

4.6.2.3 Special Status Plants Species

Impacts to special status plant species would not occur as the Project area does not contain suitable habitat for these species, and they are not present.

4.7 Archaeological and Historic Resources

Archaeological and historic resources are protected by a series of Federal laws enacted to protect these resources from damage or loss due to Federal undertakings, or private undertakings operating under Federal license, Federal funding, or on federally managed lands. The public's recognition that these non-renewable resources are important and should be protected began in the 20th Century and continues to the present. Three of the most important laws are the NHPA of 1966, as amended; the American Indian Religious Freedom Act (AIRFA) of 1978; and the Archaeological Resource Protection Act of 1979. EO 11593 also provides necessary guidance on protection and enhancement of archaeological and historic resources. New legislation and emphases that have come to the forefront over the past 20 years include the Native American Graves Protection and Repatriation Act (NAGPRA); EO 13007, the consideration of historic and traditional landscapes; and the increased awareness of and consultation for traditional cultural properties.

4.7.1 Affected Environment

From February 27 to June 20, 2008, Metcalf Archaeological Consultants, Inc. (Metcalf) conducted a Class I records and files search through the State Historical Society of North Dakota to identify previously conducted cultural resources inventories and previously documented cultural resources within the study area. The study area measured six miles wide centered on Corridors A and B. Additionally, Metcalf reviewed historic General Land Office (GLO) records to determine if remains of trails, transportation routes, homesteads, or other historic resources may be present in the study area. The locations of all previously recorded cultural resource sites and previously conducted surveys that had accompanying maps were digitized. Once digitized, the sites and surveys were displayed on maps to show their locations relative to the corridor boundaries and proposed transmission line routes (i.e., Route Option A, Route Option B, and Route Option C). Ultimately, the focus of the analysis was narrowed down to those sites located within 75 and 500 feet of the centerlines of Route Options A, B, and C (Preferred Route) (**table 4-10**). The distances were used to identify sites that could be within (or very close to) the Preferred Route ROW and those that could be impacted by transmission line construction. The results of the analysis are presented below in text and associated table.

Route Option A. A total of 14 previously recorded sites were identified within 500 feet of the Route Option A centerline; eight of the sites also were identified within 75 feet of the centerline (**table 4-10**). The eight sites within 75 feet of the centerline include three prehistoric stone circles, three prehistoric stone circles/cairns, one prehistoric stone circle and alignment, and a historic farmstead. All of the prehistoric sites are unevaluated and would require testing or additional archival research to determine their eligibility for the National Register of Historic Places (NRHP). The historic farmstead is documented as not eligible for the NRHP. The remaining six sites within 500 feet of the centerline include two prehistoric stone circles, two prehistoric stone circles/cairns, one historic bridge, and one site with prehistoric rock features. All five of the prehistoric sites are unevaluated and would require testing or additional archival research to determine their eligibility for the NRHP. The historic bridge is documented as eligible for the NRHP.

Route Option B. As a result of the files search, a total of 10 previously recorded sites were located within 500 feet of the Route Option B centerline; seven of the sites also are located within 75 feet of the centerline (**table 4-10**). The seven sites within 75 feet of the centerline include a prehistoric stone circle and alignment, two prehistoric stone circles, three prehistoric stone circles/cairns, and a historic trail. All of the prehistoric sites are unevaluated and would require testing or additional archival research to determine their eligibility for the NRHP. The historic trail was located during the GLO search and is not a recorded site; therefore, the eligibility is unknown at this time. The remaining three sites previously recorded within 500 feet of the centerline include a prehistoric stone circle/cairn, prehistoric cairn with flake, and historic cultural material scatter and depression. Both of the prehistoric sites are unevaluated and would require testing or additional archival research to determine their eligibility for the NRHP. The historic cultural material scatter and depression is documented as not eligible for the NRHP.

Route Option C (Preferred Route). A total of 26 previously recorded sites were located within 500 feet of the Preferred Route centerline; nine of the 26 sites also are located within 75 feet of the centerline (**table 4-10**). The nine sites within 75 feet of the centerline include an architectural site with various features, three prehistoric sites (stone circle/cairn, lithic isolated find, and chipped stone site lead), four historic sites (granary/windmill, cultural material scatter and depression, railroad crossing, and farmstead), and a modern residence. All of the prehistoric sites are unevaluated and would require testing or additional archival research to determine their eligibility for the NRHP. Sites not eligible for the NRHP include the modern residence, historic granary/windmill, and historic cultural material scatter and depression. The historic farmstead is documented as eligible for the NRHP. NRHP-eligibility of the architectural site with various features and historic railroad is unknown at this time.

The remaining seventeen sites within 500 feet of the Preferred Route centerline include five prehistoric sites (stone circle, stone circle with flake, stone cairn, and two stone circles/cairns), 11 historic sites (shed, granary, building/foundation, structure, two cultural material scatters and depressions, and five farmsteads), and a modern residence. All of the prehistoric sites and one of the two historic cultural material scatters and depressions are unevaluated and would require testing or additional archival research to determine their eligibility for the NRHP. The remaining historic sites are documented as not eligible for the NRHP.

Table 4-10 Previously Recorded Archaeological and Historic Resources Identified Through the Class I (Files Search) Inventory

Site Number	Site Type	Description	NRHP Evaluation	Route Option					
				A		B		C (Preferred Route)	
				Within 500 feet	Within 75 feet	Within 500 feet	Within 75 feet	Within 500 feet	Within 75 feet
32WI55	Architectural	Various features	Unknown					X	X
32WI162	Prehistoric	Circles	Unevaluated					X	
32WI166	Prehistoric	Circle/Cairn	Unevaluated	X					
32WI167	Prehistoric	Circles	Unevaluated	X					
32WI168	Prehistoric	Circles	Unevaluated	X	X				
32WI169	Prehistoric	Circles	Unevaluated	X					
32WI171	Prehistoric	Circles	Unevaluated	X	X				
32WI178	Prehistoric	Circles/Cairns	Unevaluated					X	X
32WI195	Prehistoric	Circles/Cairns	Unevaluated	X	X	X	X		
32WI214	Prehistoric	Circles/Cairns	Unevaluated	X	X	X	X		
32WI222	Prehistoric	Circle	Unevaluated	X	X	X	X		
32WI223	Prehistoric	Circles/Alignment	Unevaluated	X	X	X	X		
32WI234	Historic	Farmstead	Not Eligible	X	X				
32WI242	Architectural	Building/Foundation/CMS	Not Eligible					X	
32WI255	Historic	CMS/Depression	Not Eligible					X	
32WI261	Prehistoric	Circles/Cairns	Unevaluated	X		X			
32WI266	Prehistoric	Circle/Cairn	Unevaluated	X	X	X	X		
32WI401	Prehistoric	Circles	Unevaluated			X	X		
32WI409	Prehistoric	Cairn	Unevaluated					X	
32WI412	Prehistoric	Circle/Cairn	Unevaluated					X	

Table 4-10 Previously Recorded Archaeological and Historic Resources Identified Through the Class I (Files Search) Inventory

Site Number	Site Type	Description	NRHP Evaluation	Route Option					
				A		B		C (Preferred Route)	
				Within 500 feet	Within 75 feet	Within 500 feet	Within 75 feet	Within 500 feet	Within 75 feet
32WI418	Architectural	Shed	Not Eligible					X	
32WI419	Architectural	Residence	Not Eligible					X	X
32WI427	Architectural	Residence	Not Eligible					X	
32WI438	Architectural	Granary/Windmill	Not Eligible					X	X
32WI440	Architectural	Granary	Not Eligible					X	
32WI454	Historic	CMS/Depression	Unevaluated					X	
32WI458	Architectural	Nylander Farmstead	Not Eligible					X	
32WI461	Architectural	Foss Farmstead	Not Eligible					X	
32WI473	Architectural	Burlington-Daniel Farmstead	Not Eligible Feature 8 (granary) individual nomination					X	
32WI475	Architectural	Town Hall/R&W Fertilizer	Not Eligible Feature 1 (town hall/school) individual nomination					X	
32WI476	Architectural	Leverenz-Skogen Farmstead	Not Eligible					X	
32WI477	Architectural	Stevens Farmstead	Eligible					X	X
32WI478	Architectural	Vang-Erickson Farmstead	Not Eligible					X	
32WI910	Architectural	Bridge	Eligible	X					

Table 4-10 Previously Recorded Archaeological and Historic Resources Identified Through the Class I (Files Search) Inventory

Site Number	Site Type	Description	NRHP Evaluation	Route Option					
				A		B		C (Preferred Route)	
				Within 500 feet	Within 75 feet	Within 500 feet	Within 75 feet	Within 500 feet	Within 75 feet
32WI943	Prehistoric	Circles/Flake	Unevaluated			X		X	
32WI960	Prehistoric	Circles/Cairns	Unevaluated					X	
32WI969	Historic	CMS/Depression	Not Eligible			X		X	X
32WIx354	Prehistoric IF	Chipped Stone	Unevaluated					X	X
32WIx359	Prehistoric SL	Rock Features	Unevaluated	X					
32WIx401	Prehistoric SL	Circle	Unevaluated					X	X
T155N/ R101W Section 18	Center of the East Half of the East Half	Historic trail found during the GLO search; crosses the line	Not Recorded			X	X		
Railroad Crossings	Historic	Railroads-all crossings will need to be recorded	Not Recorded					X	X

CMS = Cultural Material Scatter.

IF = Isolated Find.

SL = Site Lead.

Source: Metcalf 2008a.

Results of the Class III Pedestrian Inventory

Metcalf conducted a Class III pedestrian inventory of the Preferred Route on August 18 through 22, 2008, and September 16 through 23, 2008 (Metcalf 2008b). A follow-up pedestrian survey was conducted during the spring 2009 to investigate resources that could be impacted along various transmission line reroutes. The survey areas consisted of a 200-foot-wide corridor centered on the Preferred Route transmission line centerline. The 200-foot-wide corridor was sufficiently broad to include an area of potential effects. With the exception of approximately 0.5 mile where access was denied by the landowner and 0.5 mile where access was not possible due to an impassable road, the entire preferred Route was surveyed for archaeological and historic resources. Pulling and tensioning sites that would be outside of the Preferred Route ROW (primarily at transmission line turning points) also were investigated.

A total of 64 archaeological and historic resources were identified during the 2008 Class III inventory (**table 4-11**). Nine of these resources are prehistoric lithic isolates. The remaining 55 resources include six prehistoric cairn sites, 35 prehistoric stone circle or stone circle and cairn sites, two prehistoric lithic scatters, eight historic sites, two railroads, one architectural site, and one multi-component site containing historic depressions, historic cultural material, and prehistoric stone circles. All of the isolated finds are recommended by the field archaeologist as not eligible for listing on the NRHP. Additional investigation of these resources is not planned.

Table 4-11 Archaeological and Historic Resources Located During the 2008 Class III Inventory

Smithsonian Number	Temporary Field Number	Site Type	NRHP Evaluation	Recommendations/ Comments
	MAC-WTT-1	Cairn	Unevaluated	Avoidance
	MAC-WTT-2	Stone Circle and Cairns	Unevaluated	Avoidance
	MAC-WTT-3	Historic Occupation	Unevaluated	Avoidance
	MAC-WTT-4	Railroad	Unevaluated	Avoidance
	MAC-WTT-5	Stone Circle	Unevaluated	Avoidance
	MAC-WTT-6	Historic Road Bed	Unevaluated	Avoidance
	MAC-WTT-7	Stone Circles	Unevaluated	Avoidance
	MAC-WTT-8	Stone Circle	Unevaluated	Avoidance
	MAC-WTT-9	Stone Circles	Unevaluated	Avoidance
32WI454		Historic Graves	Unevaluated	Avoidance
	MAC-WTT-10	Railroad	Unevaluated	Avoidance
	MAC-WTT-11	Dump and Small Bridge	Unevaluated	Avoidance
	MAC-WTT-12	Lithic Scatter	Unevaluated	Avoidance
	MAC-WTT-13	Stone Circles	Unevaluated	Avoidance
	MAC-WTT-14	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-15	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-16	Stone Circles	Unevaluated	Avoidance
	MAC-WTT-17	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-18	Historic Artifact Scatter	Unevaluated	Avoidance

Table 4-11 Archaeological and Historic Resources Located During the 2008 Class III Inventory

Smithsonian Number	Temporary Field Number	Site Type	NRHP Evaluation	Recommendations/ Comments
	MAC-WTT-19	Stone Circles	Unevaluated	Avoidance
	MAC-WTT-20	Stone Circles	Unevaluated	Avoidance
	MAC-WTT-21	Historic Cemetery	Unevaluated	Avoidance
	MAC-WTT-22	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-23	Stone Circles	Unevaluated	Avoidance
	MAC-WTT-24	Stone Circle	Unevaluated	Avoidance
	MAC-WTT-25	Cairns	Unevaluated	Avoidance
	MAC-WTT-26	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-27	Stone Circle	Unevaluated	Avoidance
	MAC-WTT-28	Stone Circles	Unevaluated	Avoidance
	MAC-WTT-29	Stone Circles	Unevaluated	Avoidance
	MAC-WTT-30	Stone Circle and Cairns	Unevaluated	Avoidance
	MAC-WTT-31	Lithic Scatter	Unevaluated	Avoidance
	MAC-WTT-32	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-33	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-34	Stone Circle	Unevaluated	Avoidance
	MAC-WTT-35	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-36	Historic School	Unevaluated	Avoidance
	MAC-WTT-37	Cairn	Unevaluated	Avoidance
	MAC-WTT-38	Cairn	Unevaluated	Avoidance
	MAC-WTT-39	Stone Circles	Unevaluated	Avoidance
32WI969	MAC-WTT-40	Historic Occupation	Unevaluated	Avoidance
	MAC-WTT-41	Stone Circle	Unevaluated	Avoidance
	MAC-WTT-42	Stone Circle	Unevaluated	Avoidance
	MAC-WTT-43	Multi-Component (Prehistoric Stone Circles and Historic Depression and Scatter)	Unevaluated	Avoidance
	MAC-WTT-44	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-45	Stone Circle	Unevaluated	Avoidance
	MAC-WTT-46	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-47	Historic Mine	Unevaluated	Avoidance
	MAC-WTT-48	Stone Circles	Unevaluated	Avoidance

Table 4-11 Archaeological and Historic Resources Located During the 2008 Class III Inventory

Smithsonian Number	Temporary Field Number	Site Type	NRHP Evaluation	Recommendations/ Comments
	MAC-WTT-49	Stone Circles and Cairn	Unevaluated	Avoidance
	MAC-WTT-50	Stone Circles and Cairns	Unevaluated	Avoidance
	MAC-WTT-51	Stone Circles and Cairn	Unevaluated	Avoidance
	MAC-WTT-52	Stone Circles and Cairn	Unevaluated	Avoidance
	MAC-WTT-53	Cairns	Unevaluated	Avoidance
	MAC-WTT-54	Cairns	Unevaluated	Avoidance
	MAC-WTT-x1	Isolate-non-diagnostic lithic	Not Eligible	No Further Work
	MAC-WTT-x2	Isolate- non-diagnostic lithics	Not Eligible	No Further Work
	MAC-WTT-x3	Isolate- non-diagnostic lithic	Not Eligible	No Further Work
	MAC-WTT-x4	Isolate- non-diagnostic lithic	Not Eligible	No Further Work
	MAC-WTT-x5	Isolate- non-diagnostic lithic	Not Eligible	No Further Work
	MAC-WTT-x6	Isolate- non-diagnostic lithics	Not Eligible	No Further Work
	MAC-WTT-x7	Isolate- non-diagnostic lithic	Not Eligible	No Further Work
	MAC-WTT-x8	Isolate- non-diagnostic lithic	Not Eligible	No Further Work
	MAC-WTT-x9	Isolate- non-diagnostic lithic	Not Eligible	No Further Work

Source: Metcalf 2008b.

The 55 archaeological and historic sites were unevaluated and would require evaluative testing to determine their eligibility for listing on the NRHP. BEPC plans to avoid the unevaluated sites by rerouting the proposed transmission line or by spanning the proposed transmission line over the sites. The results of the inventories conducted in August and September 2008, as well as reroute surveys, were documented in a technical report and submitted to Western, the North Dakota SHPO, and interested tribes. Two sites (32WI1454 and 32WI1969) were previously recorded as being within 75 to 500 feet from the Preferred Route centerline. Both sites, and all other sites would be avoided during construction, or would not require further analysis to determine NRHP eligibility.

Rerouting of the Preferred Route was undertaken to minimize impacts to affected landowners. The rerouted segments totaled 22.08 miles, comprising 535.26 acres within a 200-foot-wide corridor. Results of the Class III survey within rerouted segments are provided in **table 4-12**.

Table 4-12 Archaeological and Historic Resources Located during the 2009 Class III Inventory (rerouted segments)

Temporary Field Number	Site Type	NRHP Eligibility and Management Recommendations
32MN803	Stone circle/cairns	Undetermined/avoidance
32MN804	Stone circle/cairns	Undetermined/avoidance
32MN805	Stone circle	Undetermined/avoidance
32W11057	Stone circle	Undetermined/avoidance
32W11058	Historic occupation	Not eligible
32W11059	Stone circle	Undetermined/avoidance
32W11060	Stone circle	Undetermined/avoidance
32W11061	Stone circle/cairn	Undetermined/avoidance
32W11062	Stone circle	Undetermined/avoidance
32W11063	Stone circle	Undetermined/avoidance
32W11064	School house remnant	Not eligible
32W11065	Stone circle	Undetermined/avoidance
32W11006 update	1 more circle	Undetermined/avoidance
32W11042 update	Historic camp area added	Undetermined/avoidance
32W11044 update	12 more circles	Undetermined/avoidance

A total of 12 sites were recorded and another three sites that per previously recorded were updated. Thirteen sites were classified as undetermined NRHP eligibility; two of the 15 sites were determined to be not eligible under NRHP criteria. All 15 sites would be avoided by either locating structures to areas that would not affect sites or by spanning.

4.7.2 Environmental Consequences

Significance Criteria

- Adverse effects to one or more archaeological or historic sites either listed on or eligible for listing on the NRHP would represent a significant impact; however, adverse effects to these resources could be mitigated through avoidance or appropriate mitigation measures.
- Visual impacts to historic resources could affect the historic context of National Register sites, resulting in a significant impact.

4.7.2.1 Preferred Transmission Line Route and Route Options

Section 106 of the NHPA requires that Federal agencies take into account the effect of an undertaking on historic properties and provide the Advisory Council on Historic Preservation (Council) an opportunity to comment. Historic property, as defined by the regulations implementing section 106, means “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP maintained by the NPS.” The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization that meet the National Register criteria. Potential impacts to historic properties are assessed using the “criteria of adverse effect” (36 CFR 800.5[a][1]), as defined in the implementing

regulations for the NHPA. “An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association.” Adverse effects include not only the physical disturbance of a historic property, but also may include the introduction, removal, or alteration of various visual or auditory elements, which could alter the traditional setting or ambience of the property. The analysis of impacts using the criteria is limited to those resources that are listed in the NRHP or have been recommended as eligible.

A total of 55 archaeological and historic sites and nine isolated finds were recorded during the Class III inventory conducted during 2008 along the original Preferred Route Option. Fifteen additional sites were found or updated along the modified Preferred Route. All of the isolated finds are recommended as not eligible for the NRHP. No further work is recommended for these resources. The NRHP-eligibility of the 55 sites originally identified and 15 sites along the reroute segments, currently is unknown. BEPC would avoid these unevaluated sites by spanning the transmission line over the sites or by rerouting the proposed transmission line. Since the sites would not be affected by BEPC’s Proposed Project, further evaluation to determine eligibility is not required. Therefore, no adverse effects to archaeological or historic resources are expected to occur as a result of BEPC’s Proposed Project. The North Dakota State Historic Preservation Officer reviewed the Class III report and recommended that “no historic properties (would be) affected” and that “no significant sites (would be) affected” by construction and operation of the proposed transmission line (Paaverud 2009). No historic structures were identified that would be visually impacted by the proposed transmission line, regardless of Route Option selected.

4.7.2.2 Previously Undiscovered Resources

Activities associated with constructing BEPC’s Proposed Project could adversely affect previously undiscovered archaeological and historic resources. Class III cultural resource inventories may not locate all sites. Buried sites may be missed in the course of field investigations, or ground cover may conceal evidence of a site. If a previously unknown archaeological or historic resource is encountered during construction of the Proposed Project, BEPC would cease all work within 200 feet of the discovery that might adversely affect the resource and would consult with the appropriate parties to evaluate the discovery. SHPO would be notified immediately (within 24 hours) and would have a qualified archaeologist or a tribal monitor with the proper expertise for the suspected resource type on-site as soon as possible. Construction would not proceed until authorized by SHPO. All archaeological and historic resources would be evaluated using the criteria of eligibility for the National Register of Historic Places established at 36 CFR Part 60.4. Consultation with the appropriate parties (i.e., North Dakota SHPO, interested tribes) would be initiated prior to making the determination. Western would then make a Determination of Eligibility, as required by section 106 of the NHPA and consult with the appropriate parties to determine any mitigation efforts necessary to eliminate or reduce adverse effects. If the site is eligible and further avoidance of the resource is not possible, Western would prepare a Historic Properties Treatment Plan (HPTP) following the guidance provided by the Council in *Treatment of Archaeological Properties* (1980), other standards of the Secretary of the Interior, National Park Service bulletins, and other appropriate Federal guidelines. The HPTP would include a summary of the physical and cultural context, a research design, and treatment measures specifically designed for the resource in question.

The draft HPTP would be submitted to the North Dakota SHPO and interested Tribes for review and comment. All reviewers would respond to the draft HPTP within 21 calendar days of receipt, unless all reviewers agree upon a different time period. Comments received would be incorporated into a revised document. Should any reviewer fail to respond within 21 days, it would be assumed that the reviewer concurs with the HPTP as written.

If construction or other Project personnel identify what they believe to be human remains, they would immediately halt construction at that location and notify the construction or environmental inspector and Western’s Federal Preservation Officer of the discovery. The inspector would notify the archaeological field director or archaeological monitor of the discovery as soon as possible, and then would proceed to ensure that further construction does not occur within 200 feet in any direction of the discovery until further instruction is

received from Western. The inspector also would secure the area of the apparent human remains to ensure no further disturbance or removal of those remains and associated material occurs. The inspector also would ensure that vehicular traffic across the area is restricted to a location removed from the discovery. After arrival at the site, the archaeological field director or archaeological monitor would evaluate the discovery.

Under the provisions of North Dakota law (Century Code § 23-06-27), the discovery of human remains on State or private lands would be reported promptly by Western to the county coroner, the county sheriff, and the North Dakota State Archaeologist. The remains would not be disturbed or removed until reviewed by the State Archaeologist, the State Office of History, Western, and tribes.

4.8 Native American Setting

Specific statutes, regulations, and EOs guide consultation with Native Americans to identify archaeological and historic resources important to tribes and to address tribal concerns about potential impacts to these resources. These include the NEPA, NHPA, AIRFA, NAGPRA of 1990, and EOs 13007, Indian Sacred Sites, and 13175, Consultation and Coordination with Indian Tribal Governments. These statutes and regulations direct Federal agencies to consult with Native American tribal leaders and others knowledgeable about resources that are important to them and their way of life. Consultation is conducted for Federal actions, and can be conducted for applicant actions such as the Proposed Project, that have the potential to affect locations of traditional concern, areas where religious ceremonies are conducted, areas of traditional cultural uses, archaeological sites, and other modern and ancestral tribal resources.

4.8.1 Affected Environment

Northwestern North Dakota and surrounding areas have been traditionally used by Native Americans since pre-recorded time. Ten present-day tribes have ties to the Project area: Eastern Shoshone Tribe, Cheyenne River Sioux Tribe, Northern Arapaho Tribe, Standing Rock Sioux, Northern Cheyenne Tribe, Crow Tribe, Oglala Lakota Nation, Fort Peck Tribes, Rosebud Sioux Tribe, and Three Affiliated Tribes. Nation-to-Nation consultation was initiated by Western.

4.8.2 Environmental Consequences

Western initiated Nation-to-Nation consultation by sending letters to the ten tribes listed above on August 1, 2008. The letter described the Proposed Project and provided the tribes with the opportunity to comment on the Project and identify sites or places that might be of religious or cultural significance to the tribes. The Rosebud Sioux Tribe responded to the letter and has no concerns with the Proposed Project; however, they requested copies of the Class I and Class III inventory reports.

Significance Criteria

- Significant impacts would result from physical damage to cultural, traditional use, religious, or sacred sites or impacts that would reduce the aesthetic quality of Native American resource sites (EO 13007). Loss of access to Native American resource sites or infringement on religious practices of Native Americans (EO 13084) also would result in a significant impact.

4.8.2.1 Preferred Transmission Line Route and Route Options

The Class I cultural resources inventory indicates that previously recorded archaeological and historic resources are located within 75 feet of all three transmission line Route Options. Eight sites are within 75 feet of Route Option A, seven sites are within 75 feet of Route Option B, and nine sites are within 75 feet of Route Option C (Preferred Route). Additionally, several sites were noted to be within 500 feet of Route Options A and B; 26 sites were noted to be within 500 feet of Route Option C (refer to **table 4-10**). Results of the Class III pedestrian inventory indicated that construction or operation of the Preferred Route would not adversely impact known or observed archaeological or historic resources. Furthermore, none of the optional transmission line routes appear to have greater Native American importance than other Route Options. Consequently, construction and operation of BEPC's Proposed Project would not affect resources that are important to Native Americans.

If archaeological or historic resources are discovered during BEPC's construction of the transmission line, work would cease within 200 feet of the discovery and Western would be contacted. The process discussed in section 4.7.2.2 would ensure any discovered archaeological or historic resource or human remains would be properly treated under applicable law.

4.9 Paleontological Resources

Paleontological resources that are located on State lands are protected under North Dakota's Paleontological Resource Protection Act (NDCC 54-17.3) which gives the North Dakota Industrial Commission, acting through the office of the State Geologist, the responsibility to protect paleontological resources that are located on land owned by the State, or its political subdivisions (North Dakota Geological Survey 2007). Resources on private land are not protected under this Act, and are considered property of the landowner.

4.9.1 Affected Environment

Paleontological resources are potentially present in the bedrock in the Project area. The rocks of the Fort Union Group have a high potential for fossils including plants, invertebrates, and vertebrates (mammals and reptiles) (Bureau of Land Management 2006). However, the Preferred Route and Route Options are all predominantly located on surficial deposits, especially glacial deposits, where there is low potential for finding important fossils since glacial processes are not conducive to the preservation of fossils.

4.9.2 Environmental Consequences

Significance Criteria

- Loss of paleontological resources of State-wide importance would represent a significant impact to the resource.

4.9.2.1 Preferred Transmission Line Route and Optional Routes

It is unlikely that paleontological resources would be affected by transmission line construction since there is little bedrock present along the Preferred transmission line route or the Route Options. If paleontological resources are discovered during construction, BEPC would halt work in the area and would notify the North Dakota Geological Survey. Construction of the Proposed Project could result in the discovery of paleontological resources that otherwise would not have been found. Such a discovery could prove beneficial to the scientific community.

4.10 Transportation

Regional transportation facilities, largely consisting of highways and rural roads, would be used to transport construction and maintenance workers, equipment, and materials to transmission line sites. Established roads would be used to the greatest extent practicable. Construction equipment and materials would be transported on overland trails that would be within the ROW to structure sites. Overland trails would generally not be graded.

4.10.1 Affected Environment

BEPC's construction of the Williston to Tioga Transmission Line would require crossing numerous local roads and highways. Route Options A, B, and C would cross the Burlington Northern-Santa Fe Railroad and approximately the same number of local roads and highways.

All three Route Options would be located west of Williston – Sloulin Field International Airport. Sloulin Field provides international service to commercial carriers and general aviation. The main runway is 6,650 feet long and 100 feet wide. Route Option C is east of Tioga Municipal Airport and a private landing strip that is located north of Williston. Tioga Municipal Airport handles commercial and general aviation.

Major highways in the Project area include U.S. Highway 2/U.S. Highway 85 that extends north from Williston; U.S. Highway 2 that extends east-west through Ray, North Dakota; and North Dakota State Highway 40 that is oriented north-south from U.S. Highway 2 to Tioga. Other roads and highways in the Project area are oriented in a north-south, east-west grid along section lines.

4.10.2 Environmental Consequences

Significance Criteria

- Long-term (more than two weeks) disruption of the local transportation network during transmission line construction would represent a significant impact.

4.10.2.1 Preferred Transmission Line Route and Route Options

All three transmission line alignments cross approximately the same number of major local roads and highways. Disruption to local traffic is expected to be minimal, short-term, and temporary and related to the movement of heavy equipment. Construction activities would be carried out over several months; therefore, the intensity of impacts at any one site would be infrequent and short term.

Single-pole transmission line structures, conductor, ground wire, OPGW, and hardware would be trucked to staging areas and/or to structure site locations. Flat-bed trucks would be used to transport structure sections (typically two sections per structure), insulators, hardware, conductor, and OPGW. Truck trips would be spread out to various locations along the transmission line corridor and among the three laydown areas over several months. Equipment would be required for site clearing, structure assembly, hole excavation, conductor and OPGW stringing, and foundation construction, as identified in **table 2-2**. Personal vehicles would transport approximately 70 construction workers to scattered work sites over a six- to eight-month period. Areas where worker activity is most intense are likely to experience localized temporary traffic that could be an annoyance to rural residents. Overall traffic increases also could lead to a small increase in the risk of traffic accidents. Actual impacts associated with each Route Options are similar, due to similarities in the alignments and the road system.

Steps would be taken to reduce potential impacts to traffic during construction. The movement of heavy equipment would comply with applicable U.S. DOT and North Dakota DOT regulations. Local roads and highways that are damaged by construction equipment would be repaired in a timely manner and to county specifications.

Route Options A, B, and C are approximately one mile west of Williston – Sloulin Field International Airport. Engineering analyses indicate that the maximum structure height of the proposed transmission line cannot exceed 130 feet. Design height for the line ranges from 95 to 120 feet (approximately 10 feet below the maximum allowable height). Route Option C would within one-mile east of Tioga Municipal Airport. Engineering analyses indicate maximum structure height of the proposed transmission line cannot exceed 141 feet. The proposed transmission line (Route Option C) was rerouted to avoid a private landing strip north of Williston. The revised route would be approximately one mile west of the landing strip.

4.11 Socioeconomics

Socioeconomic analyses address potential for impacts to population, housing, and economic viability, particularly to agriculture, as a result of transmission line construction within the Project area. The analyses also include potential impacts associated with the temporary employment of construction workers. BEPC would not require additional permanent personnel for transmission line operations.

4.11.1 Affected Environment

4.11.1.1 Population and Demography

The proposed Williston to Tioga Transmission Project would be located in Williams and Mountrail counties in rural northwestern North Dakota. All but the extreme eastern portion of the Project would be located in

Williams County. According to the U.S. Census Bureau 2000, Williams County has a population of 19,761 residents. The eastern portion of the Project, which includes the Tioga Substation and a small portion of the transmission line route extend east into Mountrail County with a population of 6,631 residents (U.S. Census Bureau 2000).

Racial composition of residents within the two counties is predominantly white; approximately 93 percent in Williams County, and 66 percent in Mountrail County. **Table 4-13** provides demographic information for the towns located in proximity to the proposed Project.

Table 4-13 Local Demographics

Town	County	Population*	Median Household Income**	% Below Poverty Level	
				Families	Individuals
Williston	Williams	12,512	29,962	11.3	13.4
Ray	Williams	534	31,563	2.6	3.7
Tioga	Williams	1,125	29,740	3.5	7.0

* U.S. Census Bureau, American Fact Finder 2000.

** U.S. Census Bureau, American Fact Finder, Census 2000, Income 1999.

4.11.1.2 Economy and Employment

Agriculture is the primary industry, with wheat being the most common crop produced, followed by lentils, barley, oats, dry edible beans and peas, and sugar beets (USDA 2008). Livestock production is the second largest industry, primarily producing beef cattle, and hogs. Service industries and retail trade support residents in the area towns.

The oil and gas industry has been a major economic contributor to the region since the discovery of oil in the Williston Basin in 1951 (Williston 2008). While oil and gas production is concentrated in western North Dakota, the secondary effects (refining and transporting) affects and significantly benefits the entire State's economy (Bangsten & Leistritz 2007).

During the hunting season, the hunting industry provides numerous recreational activities. Recreation in the area includes big game and small game hunting on private and North Dakota Game lands. Big game hunting includes whitetail deer and antelope; small game hunting includes pheasant, and sharptail grouse (Williston Convention and Visitors Bureau 2008).

Additional recreational activities include fishing, bird watching, and canoeing (Williston Convention and Visitors Bureau 2008). Fishing in nearby Lake Sakakawea for walleye and northern pike attract many visitors to the area. Bird watching enthusiasts come to the area for the 365 bird species in the region. Canoeing is a popular recreational activity on the Yellowstone River, Missouri River, and Lake Sakakawea.

4.11.2 Environmental Consequences

Significance Criteria

- Impacts include losses that would jeopardize the economic viability of local agricultural or livestock producers.

4.11.2.1 Preferred Transmission Line Route and Route Options

Construction of the Williston to Tioga Transmission Line would directly affect approximately 96 landowners, regardless of Route Option selected. The proposed Project would not be located within 500 feet of any inhabited rural residences.

Structures that are located within cultivated field would require avoidance by machinery that would result in additional fuel usage and time commitments. The presence of the structures also could result in accidental damage to farm machinery. However, using single-pole structures greatly reduces potential conflicts with farming practices, reduces lands that would be rendered inaccessible by farm machinery, and reduces the effects on farming efficiency.

Mitigation measures available to reduce temporary impacts would include timing construction to avoid the growing season and prompt re-planting of crops. Although cultivated lands would be compacted by machinery operations, temporary impacts would be limited to approximately 2.4 to 8.6 acres within compaction prone soils (refer to **table 4-4**). Additional mitigation measures would include off-setting structures from property lines to allow equipment movement in close proximity to structures. Off-setting would be at the discretion of landowners and through negotiation with BEPC. All structures would be free-standing (self-supporting); guy wires and anchors would not be used. Socioeconomic impacts would be minimized due to the relative absence of long-term impacts to agricultural activities and avoidance of residential structures.

Construction of the proposed transmission line would be completed by BEPC's construction contractors. A total of approximately 70 workers would be needed during the seven-month construction period (**table 2-2**). Workers traveling from outside of the area would require lodging and meals. The communities of Williston and Tioga could see a minimal, short-term beneficial economic impact during construction. Some materials and services would be purchased locally, such as concrete, seed, aggregate, food, fuel, and machinery repair. Impact to housing, population, or community services are not expected as a result of the proposed Project. No long-term beneficial or adverse economic impacts are anticipated from operation of the proposed transmission line project.

4.12 Public Health and Safety

Public health and safety issues range from construction of the proposed transmission line through Project operations.

4.12.1 Affected Environment

Construction, operation, and maintenance of BEPC's proposed Williston to Tioga Transmission Line could result in short- and long-term impacts to public health and safety. Potential health and safety concerns associated with construction include highway and roadway safety associated with the transport of structures, structure hardware, conductor, and personnel and solid waste management. Those associated with operations include electric shock, electric and magnetic fields, stray voltage, and induced voltage. Worker safety issues are associated with Project construction, operation, and maintenance activities. Potential health and safety issues are similar among the three Project Route Options.

4.12.2 Environmental Consequences

BEPC's construction and operation of the proposed Project could affect public health and safety. Transport of heavy equipment and materials would create temporary traffic congestion in some areas, which could potentially affect highway safety. BEPC would be required to remove construction-related materials from construction sites. Long-term health and safety concerns could include electric shock, electric and magnetic fields (EMF), stray voltage, induced voltage, and lightning hazard.

Significance Criteria

- Adverse health impacts from EMF, stray voltage, and induced voltage associated with the operation of transmission lines.

- Serious risk of injuries to workers and the public at large.
- The proposed Project would pose a serious risk of injuries to workers or the public at-large that would be above that of industry standards.

4.12.2.1 Preferred Transmission Line Route and Route Options

BEPC's construction of the proposed transmission line would require the transport of heavy equipment and materials along the length of the proposed Project. Impacts from vehicle movement would be relatively short-term and concentrated within specific areas at structure sites. Construction would take place over a seven-month period. Materials delivery would be carried out during the 7-month construction period. Approximately 70 truck loads would be required for structures and 20 truck loads would be required for insulator and hardware delivery. Large pieces of equipment, such as structure segments, would be delivered directly to work sites along the proposed transmission line corridor. Conductor, groundwire, and OPGW transport would require at least one flat-bed truck for each 10,000 feet of transmission line, totaling 38 to 41 truckloads. Additional truck traffic would be needed to transport materials from staging sites to work sites. Potential impacts to traffic safety would be mitigated by use of pilot cars to accompany oversized loads and slow-moving vehicles. Roads that are damaged due to heavy equipment movement would be repaired by BEPC. The movement of heavy equipment would comply with applicable USDOT and North Dakota DOT regulations. Electric shock is not expected to represent a health and safety issue as conductor heights would be sufficient to allow movement of construction and farm equipment and personnel below the proposed transmission line. Should severe weather damage the transmission line, substation equipment would automatically de-energize the line.

Cause and effect relationships associated between EMF exposure and adverse health effects have not been determined. Some studies have indicated possible connections between exposure and health effects, while other studies have not. Those indicating some sort of linkage have often, if not always, shown no correlation when replicated. EMF levels diminish substantially with increased distance from the conductors, typically reaching background levels within 300 feet of the nearest conductor. Furthermore, occasional exposure to such fields would be short-term and infrequent in this sparsely populated region. Exposures would be far less than those experienced in the home or workplace. Furthermore, the proposed transmission line would be greater than 500 feet from residential or public-use structures.

Stray voltage and induced current occurs on metal objects and along linear features, such as fences that parallel conductors. Neither stray voltage nor induced current are health risks to area residents, since they result in nuisance shocks and both would be completely mitigated by proper grounding.

Potential adverse health effects associated with lightning strikes are minimized by the presence of the combined overhead ground wire and OPGW, which shields the conductors. The current from a lightning stroke is diverted to the ground at the adjacent structure. When the current is discharged from the structure base to the surrounding ground, a step potential voltage can momentarily exist on the ground near the structure, presenting an electrocution hazard. Therefore, people should avoid being near structures during a lightning storm.

Radio reception can be affected by corona affects due to transmission line operations. The severity of such effects are largely a factor of the presence of voltage arcing and distance from the line to the receiver. Corona would be minimized by avoiding damage to conductor during stringing (thus reducing the presence of corona) and by ensuring that hardware is properly installed and connections are tight. Interference with radio reception within the project area is not expected to be a problem because houses and other inhabited buildings would be more than 500 feet from the proposed transmission line.

BEPC would construct and maintain the transmission line in compliance with worker health and safety regulations as prescribed by the U.S. Department of Labor, Occupational Safety & Health Administration, industry standards, and the NESC. Solid and human waste management would be handled by local waste removal firms. All wastes would be transported to approved disposal sites.

4.13 Environmental Justice

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was signed on February 11, 1994. EO 12898 directs Federal agencies to review proposals and identify, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations to the greatest extent practicable and permitted by law. As such, the proposed Williston to Tioga Transmission Project has been evaluated in terms of adverse effects that:

a) Are predominately borne by a minority population and/or low-income population; or

b) Would be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low income population.

4.13.1 Affected Environment

Racial composition of residents within the two counties that constitute the Project area is predominantly white; 93 percent in Williams County and 66 percent in Mountrail County. Approximately 30 percent of residences in Mountrail County are Native Americans who live on the Fort Berthold Reservation, which covers the southern portion of the county. The nearest community to the proposed Project in Mountrail County is Tioga, where the racial composition is 97 percent Caucasian.

4.13.2 Environmental Consequences

Significance Criteria

- Significant impacts would result from a disproportionate impact (or impacts) to minority (including low income) populations (EO 12898).

An analysis of BEPC's Proposed Project impact on minority and/or low-income populations from development of the site is based on census data and land use of the Project site.

4.13.2.1 Preferred Transmission Line Route and Route Options

Racial composition of the residents within both counties is predominantly white and the Fort Berthold Reservation is located well to the south of the proposed Project. Since there are essentially no minority populations that would be impacted, environmental justice is not an issue. While the communities of Williston and Tioga report a higher percentage of individuals below the poverty level (approximately 19 percent) as compared to the North Dakota's State average of 11.4 percent below poverty, BEPC's Proposed Project does not directly affect these communities or those populations. As a result, no adverse impacts to low-income populations would occur as a result of Project development. Construction and operation of the proposed transmission line would not result in proportionately greater impacts to minority populations and/or low-income populations than those to the population as a whole. The Proposed Project passes through sparsely populated areas and has been carefully located to avoid all residential areas.

4.14 Visual Resources Setting

The following discussion describes existing visual resources within the Proposed Project area. Many individuals would describe the visual resources within the Project area as aesthetically pleasing. Scenic quality is based on evaluating the overall character and diversity of landform, vegetation, water, color, and cultural features of a landscape. Additionally, visual resources are evaluated based on viewer sensitivity, which is described as the degree of concern for change in the landscape's visual character. Sensitive viewers include residents and viewers from churches, parks, recreational areas, and roadways. The level of viewer sensitivity is associated with the duration of the view. For example, residents' views of a landscape would be long-term and characterized as those of a highly sensitive viewer; whereas, a motorist's view of the landscape would be short-term in duration and characterized as those of a low- to moderately sensitive viewer.

4.14.1 Affected Environment

The Proposed Project lies within the Missouri Slope Upland Physiographic Region (Bluemle and Biek, not dated), which is part of the Great Plains Province. Elevations range from approximately 2,590 feet amsl to 2,950 feet amsl.

Visual resources in the area include large expanses of cropland and pastureland, interspersed with homesteads, often bordered by shelter belts. Much of the landscape has been modified and used for agriculture.

Colors range from varying shades of greens, soft yellows and browns, depending on the time of year. The broad horizons create a broad spectrum of colors from bright to deep blue's during daylight hours and golds, oranges, and reds at dusk to the west, and dawn to the east.

Two blacktop, two-lane roads mark the landscape from north to south and east to west. U.S. 85/U.S. 2 divides the Project area from the north to the south and is a moderately traveled highway connecting population centers on the north to population centers to the south. The roadway is a primary transportation corridor for rural residents to population centers.

4.14.2 Environmental Consequences

Significance Criteria

- Significant visual impacts to area residents could result from placing the proposed transmission line within 500 feet from inhabited rural residences.

4.14.2.1 Preferred Transmission Line Route and Route Options

Visual resources within the Project area are typically expansive and largely uncluttered by transmission lines, distribution lines, and telephone lines. Installation of a major transmission line would affect the viewshed of many areas. Visual impacts would be most apparent in areas that are frequented by local residents (i.e., near residences, along highways and local roads), and locations where the transmission line would be elevated over surrounding lands. BEPC engineers and ROW specialists made adjustments to the final routing alignment to avoid or reduce visual and other impacts to local landowners. BEPC's decision to use single-pole structures, rather than H-frame structures, further reduces potential visual impacts within the area. Reduced visual impacts are largely related to reduced mass of the single-pole structures.

Construction along roadways would introduce a linear feature that would be obtrusive to some viewers, regardless of the route option. The proposed transmission line would be visible for long distances, due to the relatively flat terrain. However, visibility of the transmission line would decrease with distance. The transmission line structures would be a light gray. Light colored structures tend to become less visible with distance as they fade in with the horizon. Construction would create temporary visual impacts that would remain until vegetation becomes reestablished.

Long-term visual impacts would be reduced by placing structures as far from residential structures as practicable. Placing structures behind shelter belts would further reduce impacts to residential views. Impacts along roadways would be reduced by placing structures along mid-section lines, or off-set into agricultural properties. Placing structures away from intersecting roads and highways would reduce visual impacts to motorists crossing perpendicular to the lines.

Although the transmission line (regardless of option) would be viewed by numerous residents and travelers throughout the area, those from residential structures would be greater than 500 linear feet, thus resulting in minimal impacts. Views along roads and highways also were considered to result in minimal impacts as the Preferred Route is located along the highway ROW and the landscape has been previously altered.

4.15 Noise

Project-related noise would be temporary and limited to that related to construction activities. Operation of the proposed transmission line would not generate appreciable noise levels.

4.15.1 Affected Environment

Ambient noise levels within the Project area are minimal, broken only by the sound of wind and occasional vehicle traffic and farm machinery. Sensitive receptors within the area are largely limited to scattered area residents.

4.15.2 Environmental Consequences

Significance Criteria

- Significant Noise level impacts are those that would create long-term annoyance to area residents.

4.15.2.1 Preferred Transmission Line Route and Optional Routes

Temporary noise impacts would result from BEPC's construction activities, most likely consisting of annoyances such as equipment back-up warning devices and diesel engine operations. Temporary construction noise would be limited to no more than a few days at any particular location and could be mitigated by scheduling work to daytime hours, particularly near sensitive receptors. BEPC's use of single-pole structures, rather than H-frame structures, would reduce construction time needed for boring structure legs by approximately 50 percent. Reduced boring time would decrease the duration of associated equipment noise. The Project would not result in long-term noise annoyances to area residents.

4.16 Air Quality

Air quality parameters typically include consideration of criteria pollutants and prevention of significant deterioration impact levels of nitrogen dioxide, particulate matter, carbon monoxide, and sulfur dioxide.

4.16.1 Affected Environment

The North Dakota Department of Health, Division of Air Quality has determined that the concentrations of the criteria pollutants in the Project area are currently lower than the allowable limits established by the National and State Ambient Air Quality Standards (AAQS). Thus, the area is considered to be in attainment of the AAQS for all pollutants.

4.16.2 Environmental Consequences

Emissions from heavy equipment would result in temporary and localized air quality impacts during construction. Diesel and gasoline engine exhaust would emit hydrocarbons. Moving equipment would increase particulate matter. Operating construction equipment would emit carbon dioxide (CO_2), a greenhouse gas, which has been identified as contributing to global warming. The amount of CO_2 that would be attributable to Project construction would be similar to that being emitted as part of local agricultural activities.

Significance Criteria

- Violation of Federal or State air quality standards would constitute a significant impact.

4.16.2.1 Preferred Transmission Line Route and Route Options

With the exception of trace amounts of ozone, the Proposed Project would not emit air emissions during operations. Air emissions generated by construction equipment (trucks, cranes, auger equipment, etc.) would be temporary and short-term. Therefore, significant impacts to air quality would not occur. Federal and State air quality standards would not be violated as a result of BEPC's Proposed Project.

4.17 Intentional Destructive Acts

Transmission line projects may be the subject of intentional destructive acts ranging from random vandalism and theft to sabotage and acts of terrorism intended to disable the facility. Acts of vandalism and theft are more likely to occur than acts of sabotage and terrorism and most likely to occur in remote areas and at substations. Theft frequently involves equipment and salvageable metal at substations and switchyards. Vandalism often includes shooting out insulators. Sabotage and terrorism would most likely include destruction of key transmission line components with the intent of interrupting the electrical grid.

Intentional destructive acts can result in financial and environmental impacts and impacts to consumers and businesses that rely on power. Financial impacts are ultimately passed on to rate payers. Environmental impacts related to intention destructive acts could range from electrocution of perpetrators, line crews, or the public; wildfire ignition from downed lines; and oil contamination from damaged equipment. Impacts to consumers and business would range from minor annoyance to economic hardship.

Vandalism and theft within substations would be minimized as equipment would be protected by fencing. Little or no preventive measures are available to protect the transmission line from vandalism or sabotage. However, separation of lines would reduce the potential for affecting two or more lines as a result of a single act of sabotage.

4.18 Global Warming

The proposed Project would not measurably contribute to global warming. Fossil fuels would only be consumed for BEPC's initial construction and periodic maintenance purposes. Effects on global warming that would be attributable to the Proposed Project cannot be quantified due to the negligible amount of emissions and the lack of scientific data.

5.0 Summary of Impacts

Three transmission line Route Options (**figures 1-5, 1-6**, and **1-7**) were identified by BEPC as a result of comments received during project scoping, consideration of resources to be avoided or excluded, and availability of linear features that could be paralleled. BEPC engineers and lands specialists met with landowners during the routing process to make the final route selection and adjustments in compliance with landowner preferences. Adjustments made in the final alignment (Route Option C) included minor changes to route the line around specific parcels and land use features at the request of landowners, which resulted in a slightly longer alignment than would be the case if route adjustments had not been made. Additional route lengths resulted in corresponding increased acreages of effects for some resources, although these are offset by accommodating landowners and lessening the perceived impacts to them. Construction and operations impacts identified for the Route Options are summarized in the following text.

Jurisdictions, Land Use, and Agricultural Practices

Temporary construction impacts were determined based on the need for access trails, pulling and tensioning sites, splicing sites, and structure work sites. Construction of Route Options A and B would temporarily impact 254 and 243 acres, respectively. Construction of Route Option C (Preferred Route) would temporarily affect 273 acres. A total of 0.2 acre would be permanently impacted by structure bases, regardless of route.

Impacts to agricultural practices would be similar among the three Route Options. Use of single-pole structures would minimize impacts to agricultural activities and allow cultivation to take place immediately adjacent to each structure footprint. The final alignment would avoid sensitive resources.

Although croplands and planted herbaceous perennials were avoided to the extent practicable, more would be temporarily affected by construction of Route Option C (175 acres) than by construction of Route Options A or B (147 or 132 acres). Higher acreages of temporary disturbance along Route Option C (than along the other Route Options) is largely due to longer line length (55 to 57 miles long versus 61 miles long). Higher acreages of Route Option C temporary disturbance to cropland and planted herbaceous perennials is largely because Route Options A and B were routed diagonally through pasture/rangeland, rather than along fencelines and roads paralleling croplands and planted herbaceous resources. Construction of Route Option C also would affect more scrubland and barren land than would be affected by construction of either Route Option A or B. Although calculations indicate wetlands and riverine land uses to be within the three Route Options, they would be spanned or otherwise avoided.

Physiology, Geology, Soils, and Minerals

Potential impacts to physiographic, geologic, and soil resources are similar among the three Route Options. All three routes cross an area north of Williston that was used for underground coal mining. Previous mining activities have created localized subsidence that could affect structure placement. The potential for soil compaction and erosion is slightly greater along Route Options A and B than along Route Option C. Impacts to soils would be reduced by scheduling construction activities to avoid wet conditions. Temporary impacts to prime and unique farmlands are expected to range from 3.0 acres (Route Option C) to 4.8 acres (Route Option A). The Project is not expected to impact area mineral resources, including active oil and/or natural gas wells.

Hydrology and Drainage

Impacts to flood-prone areas and drainages are not anticipated because they would be avoided or spanned.

Vegetation and Wetland Resources

Construction of Route Option C would temporarily affect 153 acres of cropland. Construction of Route Options A or B would affect 132 and 115 acres, respectively. Wetlands would not be impacted because they would be avoided or spanned.

Wildlife and Fisheries

Construction of BEPC's Proposed Project would result in the temporary displacement of highly mobile game and non-game species. Direct impacts to low-mobility species could result in some loss of individuals, primarily due to crushing. Pre-construction surveys would be carried out to identify the presence of migratory bird species; active nests would be avoided during construction. Structure design, conductor-to-conductor spacing, and conductor-to-ground spacing exceed the wingspan of avian species and would be sufficient to preclude electrocution of raptors that could use the area for nesting and/or foraging.

Fisheries resources within the Project area are minimal and adverse impacts are not anticipated. Fisheries habitat crossed by the proposed Project is negligible and that which is present would be spanned during construction.

Special Status Species

The whooping crane and piping plover are the only federally listed species that could be impacted by the Proposed Project. The Project site is located within the extreme western edge of the whooping crane flyway, and available habitat that would support the species in the Project area is considered marginal. BEPC will comply with mitigation measures described in the biological assessment to minimize risk to the whooping crane. The proposed Project crosses a small amount of marginally suitable foraging habitat for the piping plover. Nesting habitat is not available in proximity to the Preferred Route.

Archaeological Resources

A total of 55 archaeological and historic sites and nine isolated finds were recorded during Class III pedestrian surveys of Route Option C. All nine isolated finds were recommended as not eligible for the NRHP and no further work is recommended for the sites. The NRHP eligibility of the 55 archaeological and historic sites is currently unknown; however, the sites would be either spanned or otherwise avoided during line construction. Therefore, there is no requirement to assess eligibility, and no adverse effects to archaeological or historic resources are expected to occur as a result of constructing BEPC's Proposed Project.

Native American Setting

Western initiated Native American consultation with letters to 10 tribes on August 1, 2008. The Rosebud Sioux Tribe, the only tribe to respond to the letters, indicated that they had no objection to BEPC's Proposed Project.

Paleontological Resources

Although paleontological resources may be present within the area, the preferred transmission line route is predominantly located on surface glacial deposits where there is very low potential for finding important fossils.

Transportation

The Preferred Route is located near two public airports and a private landing strip. Analyses of proposed alignments indicate that the Preferred Route would not penetrate airspace of any of the three airports. The proposed transmission line would parallel and cross area highways and the Burlington Northern – Santa Fe Railroad. Conductor height at road, highway, and railroad crossings would comply with Federal, State, and industry clearance standards. BEPC would utilize temporary H-frame structures at highway and road crossings to elevate the conductor during construction. The temporary H-frame structures would be removed following construction and each site would be returned to preconstruction conditions.

Socioeconomics

Potential socioeconomic impacts would be minimal, primarily due to the use of single-pole structures to minimize interference with farming operations, avoidance of cultivated fields to the extent possible, and scheduling construction activities to avoid periods of relatively high precipitation. The Proposed Project would provide short-term beneficial impacts to the local economy. Direct impacts to individuals would be limited to approximately 96 landowners.

Environmental Justice, Visual Impacts, and Noise

Impacts to a disproportionate number of minority or low-income individuals would not occur; therefore, there would be no environmental justice issues. Visual impacts would be limited to rural areas with relatively low population numbers. Potential visual and noise impacts are expected to be minimal and only present in scattered locations.

Global Warming

The proposed Project would not contribute to global warming. Combustion of fossil fuel would only take place during construction and during periodic maintenance.

Intentional Acts of Destruction

Opportunities for intentional acts of destruction would be slightly increased within the region as a result of a new transmission line.

6.0 Cumulative Impacts

NEPA requires the identification and consideration of incremental impacts that are related to the Proposed Action when added to other past, present, and reasonably foreseeable actions (40 CFR 1508.7). Consideration of such impacts is necessarily broad and includes on-site and off-site public and private actions that would be directly or indirectly related to the Proposed Action. Reasonably foreseeable future actions that could contribute to cumulative impacts include: the approved Belfield to Rhame Transmission Line Project, MDU T1 – T2 Reconductoring Project, Williston to Watford Rebuild Project, Watford to Charlie Creek Rebuild Project, the T2 230/115 Transmission Line Replacement Project, and ongoing oil and gas field development.

Construction, reconductoring, and rebuilding of lines in the area would result in some impacts that are similar to those identified for the Proposed Project. The Belfield to Rhame Project would have a greater contribution to cumulative impacts than reconductoring, rebuilding, or replacement projects because it would require new ROW, structures, and conductor. Reconductoring, rebuilding, and replacement projects generally are limited to the use of existing ROWs and possibly existing structures. Oil and gas field development also would require additional lands for well sites, access roads, and gathering lines.

Impacts that would be considered to contribute to cumulative effects of the Belfield to Rhame Transmission Line Project and the Williston to Tioga Transmission Line Project include the combined temporary impacts to approximately 570 acres within the two project areas. In combination, the two projects also would result in temporary impacts to nearly 300 acres of cropland and 231 acres of rangeland/grassland. Permanent cumulative impacts associated with the two projects would represent less than 0.4 acre of project area lands.

Construction and operation of the Williston to Tioga Transmission Line would contribute to the temporary and permanent loss of soils and minerals resources within western North Dakota. Although such impacts are relatively small, when added to other projects, such as oil and gas development, the installation of pipelines, development of wind energy projects, and construction of the Belfield to Rhame Transmission Line, they represent an overall loss of resources within the region.

Development and operation of the proposed Williston to Tioga Transmission Line Project, the Belfield to Rhame Transmission Line Project, and continued development of oil and gas production facilities would contribute to temporary and long-term impacts to terrestrial and avian species. In combination, habitat losses associated with such projects would more than double those of each individual project. However, such impacts, including the loss of habitat, would be negligible when compared to the amount available for use. Terrestrial species would be impacted as a result of loss of habitat and displacement and/or loss of species. Aboveground facilities such as conductor, static wires, transmission line structures, and oil and gas production equipment could contribute cumulative impacts to avian species as a result of collision. Aboveground facilities also would provide nesting and perching sites that could be used by raptors, thus increasing predation of prey species. Increased aboveground equipment also would contribute to cumulative visual impacts within some areas.

BEPC's Proposed Project would not result in impacts to hydrology, drainages, wetlands, mineral resources, cultural, Native American, paleontological, transportation, environmental justice, global warming, or socioeconomic resources. Therefore, it would not contribute to cumulative impacts to these resources associated with ongoing or reasonably foreseeable projects.

None of the expected environmental impacts of BEPC's Williston to Tioga Transmission Line Project were found to be significant, and it also is not anticipated that the cumulative effects, when considered with the development discussed above, would be significant.

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Appendix A

Corridor Level Assessment

WAIVER OF PROCEDURES AND TIME SCHEDULES

AND

APPLICATION TO

NORTH DAKOTA PUBLIC SERVICE COMMISSION

FOR

CERTIFICATE OF CORRIDOR COMPATIBILITY

FOR THE WILLISTON TO TIOGA TRANSMISSION PROJECT

(CASE NUMBER PU-07-671)

by

BASIN ELECTRIC POWER COOPERATIVE

July 2009

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A. Project Description

A.1 Type

Electrical power transmission improvements are needed in northwestern North Dakota to meet increasing load demands. A systems study concluded that the transmission of additional power to the Tioga, North Dakota area was the most effective way of meeting future demands. As a result, Basin Electric Power Cooperative (BEPC) proposes to construct and operate a new 230-kilovolt (kV) transmission line to meet existing and future electric power requirements in northwestern North Dakota. The new transmission line would transfer power from the Western Area Power Administration (Western) Williston Interconnect Substation, near Williston, North Dakota, to a substation near Tioga, which is owned and operated by Montana-Dakota Utilities (MDU). The proposed transmission line, in addition to other system improvements in northwestern North Dakota, would allow for an additional 130 megawatts (MW) of load in northwestern North Dakota.

The proposed Project would be located in Williams and Mountrail counties in northwestern North Dakota. The Williston Interconnect Substation is located in Williams County, approximately 3.6 miles southwest of the City of Williston. The Tioga Substation also is located in Mountrail County, approximately 2 miles northeast of the City of Tioga. A 6-mile-wide corridor was identified from the Williston Interconnect Substation to the Tioga Substation in accordance with North Dakota Public Service Commission (PSC) requirements, as illustrated in **Exhibit A-1**.

The proposed 61.1-mile-long transmission line would be constructed using steel single-pole structures within a 125-foot-wide right-of-way (ROW). Minor modifications would be made to the existing Williston Interconnect Substation and Tioga Substation. Changes to the Williston Substation are part of an existing substation expansion being done by Western.

A.2 Product

Electricity would be transmitted via the proposed transmission line between the existing Williston and Tioga Substations.

A.3 Size and Design

Section A.3.4, Transmission Line Specifications, and Section A.3.5, Other Facilities, provide general information regarding the size and design of the proposed transmission line. Proposed construction procedures also are described in the following sections.

The proposed 230-kV, single-circuit transmission line would be constructed using steel single-pole self supporting structures within a 125-foot-wide ROW. Western would be responsible for modifying the 230-kV bay at Williston Interconnect Substation to accommodate interconnection of the new transmission line.

A.3.1 ROW and Construction Procedures

A.3.1.1 Permits, Pre-construction Surveys, and Geotechnical Analyses

Various studies must be completed and permits acquired before construction begins, including completion of the EA process, Western authorization, cultural resource (section 106 National Historic Preservation Act [NHPA]) clearance and biological surveys.

BEPC and/or its contractors would perform initial transmission line survey work, consisting of survey control, route centerline location, profile surveys, and access surveys prior to construction. These surveys would likely be conducted concurrently with other pre-construction tasks.

Geotechnical analyses would be conducted at transmission line angle points and other locations to determine engineering requirements for structures. A truck-mounted auger would be transported to each site to drill a small-diameter borehole. Cuttings from each borehole would be evaluated to determine soil characteristics. Geotechnical analyses would be conducted after harvest to minimize impacts to local agricultural activities. Land disturbance would be confined to a relatively small area needed for site access and equipment operations. Geotechnical locations would require an area totaling approximately 400 square feet (ft^2) in addition to an access trail.

A.3.1.2 ROW Access and Construction Preparation

Crews would gain access from public roads and section line trails as well as within the transmission line ROW for constructing and maintaining the line. Access for line construction would be by truck travel within the ROW; structure sites located along section lines would be accessed directly from section line roads and trails, where possible. New graded surface access roads are not anticipated. Existing roads and trails would be left in comparable or better condition than what existed before construction. Gates would be installed where fences cross the ROW and locks would be installed at the landowner's request. Gates not in use would be closed but not locked, unless requested by the landowner.

Three temporary material staging and equipment laydown areas, each averaging approximately 4 acres, would be used. If additional areas are needed, appropriate biological and cultural resource surveys would be conducted before disturbance. Staging areas would be returned to their previous condition when work is completed.

Tree and brush removal in the ROW is anticipated to be minimal because the Project area consists largely of cultivated cropland and rangeland, and because woodlands and shelterbelts were avoided during the routing process. The ROW would only be cleared if the trees and/or shrubs present interfere with construction activities or the safe, reliable operation of the transmission line. Trees would be cut at ground level to provide access within the ROW and to allow vehicle access. Stumps and roots would remain in the ROW unless the landowner requests otherwise. Disposal of cut trees and brush would be consistent with the landowner's wishes and applicable State waste management rules. Trees would be replaced at a 2:1 ratio.

A.3.1.3 Transmission Structure Site Preparation

Transmission structure site clearing would be minimal. The Project area and locations along the proposed route are relatively flat and the need for structure site leveling is expected to be minimal. It is anticipated that at some structure locations, blading of small areas (up to 40 feet by 40 feet for crane and manlift landings) may be required to level the ground surface to allow the safe operation of the equipment. Blading would be confined to the ROW and accomplished using bulldozers or front-end loaders. Soil removed during leveling would be stockpiled and replaced following construction; special emphasis would be placed on salvaging topsoil to be used for reclamation. The ground would be re-graded to the approximate original contour and revegetated (rangeland) or tilled (cropland) when the work has been completed. Temporary disturbance to soils would be mitigated by returning the sites to grazing and farming.

A.3.1.4 Borehole Excavation

Crews would use a truck-mounted auger or tracked vehicle equipped with a power auger to drill holes for the structures at appropriate locations along the ROW. The total disturbance at each structure location would vary depending on terrain and equipment; however, all disturbances would be confined to the ROW.

Borings for the pole holes would have an average diameter of 5 feet and an average depth of 20 feet. The single-pole structure would be lowered by crane into boreholes and the annulus around the pole would be backfilled with crushed rock. Surplus material (expected to total approximately 15 cubic yards at each tangent structure site) would be spread around the bases of structures or hauled to an off-site location (i.e., area landfills) for disposal, in accordance with landowner wishes.

Approximately 32 structures would require reinforced concrete foundations; these require a 6-foot-diameter boring to an average depth of 20 feet. Large volumes of soil would be disposed of at local landfills. Landfills typically need additional fill as cover for waste material. Disposal of waste material, including concrete spoil, would be in compliance with applicable regulations and would not include placement in wetlands or aquatic sites. Site-specific borehole diameters, depth, and the use of reinforced concrete foundations would be determined during geotechnical engineering evaluations.

A.3.1.5 Structure Assembly and Erection

Structure components (i.e., structure segments, davit arms, hardware, insulators, and related materials) would be trucked to the structure work site locations and assembled. Davit arms, insulators, and other appurtenances would be attached to the poles while on the ground at each structure location, within the 125-foot-wide ROW. Erection crews would place the lower portion of the structure in the boreholes (directly imbedded) or on reinforced foundations (i.e., self-supporting angle point and dead-end structures) using cranes or large boom trucks. The structure would then be plumbed and the holes backfilled, as previously described. Both sections would then be bolted together. Approximately 12,500 square feet would be temporarily disturbed at each structure site due to borehole excavation, structure laydown, and assembly.

A.3.1.6 Conductor Stringing and Tensioning

Following structure construction, crews would install the conductors and an optical groundwire (OPGW) using conductor stringing sheave blocks and line pulling and tensioning equipment. The conductor and OPGW are kept under tension during the stringing process to keep the conductor clear of energized circuits, the ground, and obstacles that could damage the conductor and OPGW surfaces.

Pulling and tensioning sites are typically located at 10,000-foot intervals and at angle point structures. Sites along tangent structures are located within the construction ROW; those at angle points typically are located partially outside of the normal 125-foot-wide ROW. Each site typically requires two 37,500-ft^2 (0.9 acre) temporary use areas. Stringing equipment generally consists of wire pullers, tensioners, conductor reels, OPGW reels, and sheave blocks. About 10,000 feet of conductors and OPGW could be installed for each pull. After the conductors and OPGW are pulled for a section of line, they are tightened or sagged to the required design tension in compliance with the National Electrical Safety Code (NESC). The process would be repeated until the OPGW and conductors are pulled through all sheaves. Conductor stringing also would require access to each structure for securing the conductor to the insulators or OPGW to each structure, once final line sag is established.

For public safety and property protection, temporary wooden guard structures would be used to provide temporary support when stringing conductors and OPGW across existing power lines, roads, highways, railroads, and other linear obstacles. The structures would be removed when stringing is complete; the pole borings would be backfilled and the temporary support structure sites would be reclaimed. All temporary wooden guard structures would be installed within the transmission line ROW.

A.3.1.7 Structure Site Access and Traffic

Access would involve the use of existing roads where available, and temporary overland access trails, where necessary. No new access roads would be constructed for the Project. The use of temporary overland access trails between structure sites would not require new construction, but would result in temporary disturbance. Occasional access from section line trails could result in temporary disturbance along the ROW; however, such disturbance would be limited to a 12-foot-wide track (approximately) and only long enough to provide vehicle access directly to structure locations. Some additional access disturbance could occur if truck or vehicle turnarounds are needed; however, the use of structure work sites would be encouraged.

Existing access roads (typically paved or maintained with a gravel or aggregate base) would be used in their original condition to the extent possible, or with minor road blading or other improvements as agreed upon by the county or township. BEPC would be responsible for repairing any damage caused by construction equipment movement and would return existing roads to original or better condition following construction.

BEPC would not be responsible for maintaining roads following construction. BEPC would not be responsible for maintaining fences and gates, following construction and restoration; however, access gates that would be installed during construction would be left in place following construction.

Line segments that are parallel to section lines that do not have established roadways would utilize the 66-foot-wide public ROW to the extent practicable. A 33-foot-long, 12-foot-wide temporary access point would temporarily disturb 0.009 acre. If blading or other minor improvements are needed (in localized areas) to ensure the safe movement of heavy equipment, such improvements would remain in place following construction and such areas would be restored to their original contour.

BEPC would restore disturbed areas to pre-construction conditions, to the extent practicable, and would not be responsible for the long-term maintenance of such section line trails. Any fences, gates, or similar features that would be removed during construction would be replaced or rebuilt. Gates and fences that would be installed during construction would be left in place for future use.

A.3.1.8 Temporary Overland Access

Temporary overland access would be used in areas without existing roads. Access through cultivated fields would be, to the extent practicable, during the non-growing season. Landowners would be compensated for loss of crops caused by construction activities. Gates may be installed to facilitate access to some structures and the ROW. The gates would be left in place, following construction activities. Permanent access roads to the ROW or structures would not be maintained.

Temporary access routes would result in a 12-foot-wide temporary disturbance and compaction of vegetation and soils. Natural vegetation along these temporary access routes would recover quickly, primarily because grading would not be required. Temporary overland access routes would be subject to the same cultural resource and vegetation surveys as the other ROWs. Landowners would be compensated for access routes where public access does not exist.

A.3.2 Reclamation

Following construction, disturbed areas would be graded and/or re-sloped to their approximate original contours to minimize erosion and visual alteration. In grassland or pasture areas, disturbed areas would be reseeded with native species. Cultivated land would be tilled and returned to production. Fences and gates damaged as a result of the Project would be repaired.

Rangeland from which vegetation has been removed, destroyed, or damaged would be reclaimed and revegetated. Reclamation activities, weather permitting, would be ongoing throughout construction and would be undertaken as soon as construction activities are completed in a particular area. Drainage structures and similar improvements would be removed from areas to be reclaimed, where appropriate, and the area would be revegetated using a native seed mixture, as recommended by the County Agricultural Extension Service or the Natural Resources Conservation Service (NRCS).

Ruts and scars from overland travel would be leveled to break up compacted soils and aid in returning areas to approximate original contours. Cultivated areas disturbed by overland travel would be leveled and tilled to break up compacted soils (if necessary) and returned to production.

The optimal timing for revegetation success would be spring or fall to coincide with seasonal rains. Mulching or netting may be required to protect seeded areas from erosion. Follow-up inspections would be carried out during the next growing season. Areas that did not become revegetated would be reseeded again, as necessary.

The reclamation procedures described above would be applied to disturbed areas including temporary access, staging areas, the transmission line ROW, and other areas disturbed by Project activities.

A.3.3 Construction Waste Management

Typical waste materials generated from construction activities include miscellaneous lumber and shipping materials used to protect equipment during transportation, paper products, soda cans, food-related materials, and sanitary waste. Waste from construction materials and rubbish from all construction areas would be collected, hauled away, and disposed of in an approved landfill. Sanitary waste would be disposed of through arrangements with local municipal sanitary waste treatment facilities. Hazardous waste would not be stored or located near the ROW or in proximity to waterways or drainages at any time before, during, or after construction.

Material staging areas and vehicle maintenance and refueling areas would not be located near waterways. If any of the material staging areas include vehicle and equipment refueling, or storage of petroleum products in excess of 1,320 gallons, a Spill Prevention, Control, and Countermeasures (SPCC) Plan would be developed. The SPCC Plan would address: 1) operating procedures to prevent spills; 2) control measures to prevent a spill from reaching navigable waters; and 3) countermeasures to contain, clean up, and mitigate the effects of a spill that reaches navigable waters. Additionally, spill containment and clean up materials (e.g., absorbent material, shovels) would be available at every work site. The materials would be used to contain and clean up oil and hydraulic spills that may result from equipment leaks. Workers would be trained in procedures to follow to contain and clean up released materials.

A.3.4 Transmission Line Specifications

The single-pole transmission line structures would range in height from approximately 95 to 120 feet and average 110 feet, depending on span distances between structures and area topography. The span between structures would range from 700 feet to 950 feet and average approximately 800 feet, depending on topography; taller structures could be used for crossing existing distribution and transmission lines or where unusual terrain exists. The single-pole frame structures would be designed to support three conductors and an OPGW. The OPGW would provide lightning suppression and fiber optic communications between the Williston and Tioga Substations for systems control. Tangent structures would be free-standing and directly imbedded into the soil. Angle structures (used where the transmission line changes direction) and dead-end structures (used to provide longitudinal stability along the length of the line) would be steel with concrete foundations. Guy wires would not be used.

Project construction and design would meet the requirements of the NESC for the Heavy Loading District, BEPC design criteria, and other applicable local or national building codes. The Heavy Loading District refers to those areas (including North Dakota) that are subject to severe ice and wind loading. **Table A-1** describes the typical physical design characteristics for the proposed transmission line, and a typical single-pole structure is illustrated in **Exhibit A-2**.

Minimum conductor clearance is measured at the point of greatest conductor sag and closest proximity to the ground. The proposed transmission line would be constructed with clearances that exceed standards set by the NESC. Minimum conductor height would be 26 feet over agricultural land, 28 feet over rural roads, and 31 feet over paved highways.

Table A-1 Transmission Line Characteristics

Design Component	Value
Voltage (kV)	230
Conductor diameter (inches)	1.345
ROW width (feet)	125
Typical span distances between structures (feet)	700-950
Average span (feet)	800
Maximum and minimum structure height (feet)	95-120
Average height of structures (feet)	110
Average number of structures (per mile)	6.6
Temporary disturbance per structure (square feet) (approximately 125-foot x 100-foot area)	12,500
Permanent disturbance per structure (acre) (approximately 3-foot diameter per structure leg)	<0.0002
Minimum conductor ground clearance to agricultural land at 100°C (feet)	26
Minimum conductor-ground clearance to rural roads at 100°C (feet)	28
Minimum conductor-ground clearance to paved highways at 100°C (feet)	31
Circuit configuration	Vertical

A.3.5 Other Facilities

A Supervisory Control and Data Acquisition (SCADA) system would interconnect the Williston Interconnect Substation and the Tioga Substation. Hard-wire system communications would utilize fiber optics within the OPGW between the two substations and microwave communications equipment would be installed for SCADA redundancy and to facilitate voice and data communications by field personnel. Thus, minimal modifications at the substations would be required.

A.3.6 Operation, Maintenance, and Abandonment

The following operation and maintenance activities would be performed throughout the life of the Project.

- BEPC's preventive maintenance program for the transmission line includes aerial and ground inspections. Aerial inspections would be conducted at least two times each year. Ground patrols would be conducted annually for the first 3 or 4 years, and less frequently thereafter. Climbing inspections of structures would be conducted on a 5-year cycle with every fifth structure inspected each year. Inspections and patrols would involve the use of vehicles in areas where there is suitable vehicle access.
- Maintenance activities would include repairing damaged conductors, inspecting and repairing structures, replacing damaged and broken insulators, and tightening hardware.
- BEPC would maintain any gates it installs or uses for access.

- BEPC would trim trees that pose a clearance or safety problem to the operation of the transmission line. Specific requirements of the National Electric Reliability Council would be followed. This activity would be completed in accordance with the landowner easement.

If the transmission line were to be abandoned or rebuilt, decommissioning and removal of structures, conductor, and ancillary equipment would be in accordance with applicable regulations in place at the time.

Treatment of vegetation within the ROW would include the selective removal or trimming of trees to prevent their contact with the transmission line conductors. Some trees would have to be removed if they are classified as "danger trees" (trees that are 20 feet in height or taller, which upon falling, would come within 10 feet of the structure or conductors). Disposal of cut trees and brush would be in a manner acceptable to the landowner and in accordance with applicable State waste management rules. The need for tree removal is expected to be minimal as areas with trees were intentionally avoided during detailed routing.

A.3.7 Time Schedule

Exhibit A-3 illustrates the time schedule for important permitting and construction phases of the proposed Project. Transmission line construction would take place over a 1-year period and would generally follow a sequential set of activities performed by crews proceeding along the length of the line. Activities that would impact nesting migratory bird species would be scheduled to avoid the nesting period (typically April 15 through July 15) to the extent practicable. However, some activities would coincide with the nesting period. Surveys would be carried out during the nesting period to determine if species are present. If species are found to be present, activities would be rescheduled to avoid disturbance to nesting birds.

Table A-2 lists construction activities. The proposed transmission line would take an estimated 7 months to construct. Construction activities associated with the Project are estimated to begin early 2010. It is anticipated that the transmission line would be in service by late 2010. The sequential nature of construction would minimize activities at any given work site.

Table A-2 Conventional Personnel, Equipment, and Time Requirements for Construction

Task	Number of Personnel	Equipment	Length of Time
Transmission Line Construction			
Structure site clearing and vegetation management	4–6	Pickups, all-terrain vehicles (ATVs)	1 month
Gate installation	3	Flatbed and pickup trucks	1 month
Structure assembly	6–8	Pickups, cranes, material trucks, rubber-tired crane, 4x4 pickups	4 months
Hole excavation	2–3	Rotary drilling rigs, backhoes, pickups, rubber-tired digging equipment, ATVs, portable compressors	4 months
Structure erection	6–8	Rubber-tired cranes, boom trucks, 4x4 pickups	5 months
Ground wire and conductor stringing	16–20	Pickups, manlifts/boom trucks, hydraulic tensioning machines, reel trailers	3 months
Cleanup	4	Pickups, dump trucks, flatbed trucks	Duration of Project
Concrete foundations	10	Excavators, concrete trucks, skid steer	1–2 months
Equipment installation	10	Cranes and trucks	3–4 months

B. Studies

B.1 Environmental Reports/Application

Western is the federal lead agency for an EA that is being completed for the proposed Project and a federal power-marketing agency within the United States (U.S.) Department of Energy (DOE). Western sells and delivers federal electric power to municipalities, public utilities, federal and state agencies, and Native American tribes in 15 western and central states. As a federal agency, Western is required to comply with the National Environmental Policy Act (NEPA) (42 United States Code [USC] 4321 et seq.), and regulations set forth under Council on Environmental Quality (40 Code of Federal Regulations [CFR] 1500 – 1508) and DOE regulations 10 CFR Part 1021–1022.

BEPC is the Project applicant (also referred to as Project sponsor or Project proponent) and would be responsible for construction, operation, maintenance, and decommissioning of the proposed Project. BEPC is one of the largest electric generation and transmission cooperatives in the U.S. and provides power to more than 120-member rural electric systems in nine states. BEPC's northern service area within North Dakota, South Dakota, and Montana is illustrated in **Exhibit B-1**.

The NEPA requires federal agencies to make a series of evaluations and decisions that anticipate adverse effects on environmental resources and that a reasonable range of Project alternatives identify potential direct, indirect, and cumulative environmental impacts. If impacts cannot be fully avoided, mitigation measures are to be recommended to reduce the severity of impacts.

Based on Western's NEPA implementation policies, an EA would be required for the proposed Williston to Tioga Transmission Project to determine if the proposed Project could potentially cause significant environmental impacts. Letters were mailed to potentially affected landowners, Native American tribes, interested individuals, non-governmental organizations, interest groups, and agencies on March 5, 2008. Public scoping meetings were held in Williston and Tioga on March 17 and 18, 2008, respectively. Public input was used to refine transmission line alignments and to identify potential impacts and mitigation measures.

Specific regulations require Western to coordinate and consult with federal, state, and local agencies about the potential of the proposed Project and alternatives to affect sensitive resources. The coordination and consultation must occur in a timely manner and are required before any final decisions are made. Issues related to agency consultation may include biological resources, cultural resources, socioeconomics, land, and water management. Biological resource consultations are completed to address potential impacts to sensitive species or habitats, as required by Section 7 of the Endangered Species Act (ESA). Cultural resource consultations are completed to address potential impacts to important cultural or archaeological sites, as required under Section 106 of the NHPA. The federal, state, and local agencies that Western contacted are provided in **Appendix A**, Notification. **Appendix B**, Agency Correspondence, is a compilation of correspondence letters in response to the notification letters submitted by Western.

In compliance with NEPA, as amended, Western initiated government-to-government consultation for BEPC's proposed Project by sending letters and Project maps on March 8, 2008, to the following tribal groups: Eastern Shoshone Tribe, Northern Arapaho Tribe, Northern Cheyenne Tribe, Oglala Lakota Nation, Rosebud Sioux Tribe, Cheyenne River Sioux Tribe, Standing Rock Sioux, Crow Tribe, Fort Peck Tribes, and Three Affiliated Tribes. The letters were sent to inform the tribal groups of the proposed undertaking and to solicit comments concerning traditional cultural properties (TCPs) or places of cultural and religious importance. At this time, no TCPs or places of cultural and religious importance have been identified within the proposed corridor by the contacted tribal groups.

B.2 Affected Environment

B.2.1 Jurisdictions, Land Use, and Agricultural Practices

The proposed corridor is located in Williams and Mountrail counties in northwestern North Dakota and oriented to avoid exclusion and avoidance areas to the extent practicable, including population centers of Williston, Ray, and Tioga. Lands operated by the U.S. Fish and Wildlife Service (USFWS) Wetland Management Districts (WMD), including Lostwood WMD and Crosby WMD, were avoided. Resources that could not be fully avoided in the proposed corridor included rural residences and water resources.

Agriculture and livestock production dominates approximately 91 percent of land uses within the proposed corridor. Land uses within the proposed corridor were classified from U.S. Geological Services (USGS)-State of North Dakota data as open water, cropland and planted herbaceous perennials, pasture/rangeland, shrubland and barren land, wetland and riverine, woodlands, and developed lands (USGS 2004).

The proposed corridor includes 199,468.5 acres of land, of which 90.8 percent are classified as cropland, pasture, and planted herbaceous perennials. The land use composition of the proposed corridor is provided in **Table B-1**.

Table B-1 Land Use Categories within the Proposed Corridor

Land Use Category	Acres	Percent
Cultivated crops	127,794.3	64.1
Pasture/hay	719.1	0.4
Grassland/herbaceous	52,398.3	26.3
Shrub/scrub	3,131.9	1.6
Woodlands	442.2	0.2
Wetlands/riverine	3,524.8	1.8
Open water	543.7	0.3
Developed	10,832.0	5.4
Barren land	82.2	0.0
Total	**199,468.5**	**100.0**

B.2.2 Physiography, Topography, Soils, Geology, and Minerals

The proposed corridor includes gently rolling terrain that is crossed by well-defined streams and drainages. Elevation within the proposed corridor ranges from 1,877 feet above mean sea level (amsl) in the vicinity of Williston to 2,244 feet amsl near Tioga. Land within the central portion of the proposed corridor is largely drained by the Little Muddy Creek and its tributaries, which flow in a southerly direction to the Missouri River and Lake Sakakawea.

B.2.2.1 Physiography

The proposed transmission line is located in the Great Plains physiographic province (Fenneman 1928). In western North Dakota, the Great Plains is divided into two major sections, the Glaciated Missouri Plateau and the Unglaciated Missouri Plateau. The Missouri Plateau is essentially a dissected plateau characterized by badlands, buttes and mesas, and exhumed mountain ranges such as the Black Hills. The proposed corridor is in the Glaciated Missouri Plateau. The glaciated area is generally of low relief compared to the unglaciated area, which has more variety of landforms (Trimble 1980). The Glaciated Missouri Plateau is covered by

glacial deposits, but the boundary between the glaciated and non-glaciated sections is not distinct because the glacial deposits thin gradually.

B.2.2.2 Topography

The western part of the study area is located in bottomlands of the Missouri River, while much of the area is located on fairly level uplands. In the eastern part of the study area near Tioga, North Dakota, the topography consists of undulating hills (Freers 1970). Project area elevation ranges from 1,877 feet amsl in the Williston area to 2,244 feet amsl near Tioga.

B.2.2.3 Geology

The surficial deposits are primarily composed of Quaternary alluvium and colluvium and glacial till (Freers 1970). The alluvium occurs in the Muddy Creek alluvial valley. Glacial material consists of a variety of moraine deposits including ground moraines, dead ice moraines, and lake deposits. The surficial material is largely composed of sand, gravel, and clay.

The bedrock geology consists of Tertiary Bullion Creek and Sentinel Butte Formations of the Fort Union Group (Bluemle 1988). These formations are largely composed of claystone, siltstone, sandstone, and lignite. There are very few exposures of bedrock in the proposed corridor, it being mostly covered by glacially derived surficial deposits (Freers 1970). The bedrock is mainly exposed along the Missouri River south of the proposed corridor.

The proposed corridor is located in the Williston Basin, a major structural basin that covers northeastern Montana, most of North Dakota, and northwestern South Dakota (Peterson and McCary 1987). The Williston Basin also extends north into Saskatchewan and Manitoba in southern Canada. The basin contains about 15,000 feet of Paleozoic through Tertiary sedimentary rock. The center of the basin is located south of the proposed corridor in McKenzie County and the rocks dip gently to the south. The major structural feature in the proposed corridor is the Nessen Anticline, a north-south trending structure located in eastern Williams County, but actually extends for 75 miles south from the Canadian border to eastern McKenzie County (Gerhard et al. 1987). North-south trending fault zones paralleling the Nessen Anticline have been mapped in the deeper bedrock in Williams County, but do not extend up to the surface.

B.2.2.4 Mineral Resources

The major energy mineral resources in the proposed corridor are oil, natural gas, and lignite (Freers 1970). Important non-fuel mineral resources are sand and gravel, clay, salt (halite), and scoria. The Williston Basin is a major oil and gas producing basin. The first commercial oil well in North Dakota was drilled in Williams County on the Nessen Anticline in 1951, about 7 miles south of Tioga (Freers 1970). In the U.S. portion of the basin, total production since 1951 to the end of 2007 was approximately 2.5 billion barrels of oil and 470 billion cubic feet of gas (Burke 2006; Montana Board of Oil and Gas 2007; North Dakota Industrial Commission 2007; South Dakota Oil and Gas Section 2008). Oil production decline in the 1990s has been offset in recent years by technological advances that have resulted in increased production from the Bakken Formation, which has an estimated mean technically recoverable resource of 3.7 billion barrels of oil and 1.9 trillion cubic feet of gas (USGS 2008a). **Table B-2** lists the well fields and number of wells that are within and immediately adjacent to the proposed corridor.

The proposed Project is located in the Fort Union Coal region (Averitt 1972). Coal in the Fort Union Formation is generally lignite in the proposed corridor. The Fort Union Group in Williams County contains at least six important lignite beds that have been mined (Freers 1970). Lignite was mined in Williams County before modern surface mining methods were employed; lignite was mined by room-and-pillar underground methods. Because the overburden was thin (often less than 50 feet), underground voids would collapse to the surface creating sinkhole-type subsidence, fissures, and unstable ground conditions. Several abandoned lignite mines are present in the study area and an active underground mine reclamation is underway west of Williston, North Dakota (North Dakota Abandoned Mine Lands Reclamation Division 2006; Dodd 2008a). The abandoned lignite mine sites of record are listed on **Table B-3** and are located within the proposed corridor.

Table B-2 Oil and Gas Well Summary[1,2]

Field Name	Number of Wells	Well Type	Status
Beaver Lodge	21	Oil and Gas, Salt Water Disposal, Water Injection	Active, Plugged and Abandoned, Inactive, and Permit now Canceled
Cow Creek	2	Oil and Gas	Active
East Fork	1	Oil and Gas	Plugged and Abandoned
Pleasant Valley	3	Oil and Gas	Dry Hole, Plugged and Abandoned, and Inactive
Ray	1	Gas Condensate	Active
Tioga	1	Oil and Gas	Plugged and Abandoned
Wildcat	7	Oil and Gas	Dry Hole, Permit now Canceled

[1] Source: North Dakota Industrial Commission, Oil and Gas Division (2008).

[2] Due to the large number of wells within the proposed corridor, only wells within 0.25 mile of the proposed route were included in this table.

Table B-3 Abandoned Lignite Mines within the Proposed Corridor[1]

Name	Location	Dates of Operation
Eby	T154N, R101W, SW ¼ 5	Not known
Peterson	T154N, R101W, SW ¼ 5	1921-1926
Head	T154N, R101W, SE ¼ 7	1910-1916(?)
Union	T154N, R101W, SW ¼ 8	1920s
Nichols	T154N, R101W, SW ¼ NE ¼ 8	1920s

[1] Source: North Dakota Abandoned Mine Lands Reclamation Division (2006).

The mines listed were all operated and abandoned over 70 years ago. The abandoned mine database (North Dakota Abandoned Mine Lands Reclamation Division 2006) indicates that the exact locations and extent of abandoned mine workings were not determined with certainty, but are approximate locations based on the best historical information available. Sinkholes have developed in areas located in Sections 5 and 7, Township 154 North (T154N), Range 101 West (R101W), and the North Dakota Mined Land Reclamation Division (Dodd 2008b) has documented the precise locations and, in some cases, dimensions of the sinkholes. The information is provided in **Table B-4**.

Aggregate (i.e., sand and gravel) production is from localized deposits in floodplains or glacial deposits. Approximately 59 gravel pits are located within the proposed corridor (Freers 1970; National Atlas 2008).

Table B-4 Sinkhole Data

Section, Township, Range	Latitude/Longitude	Length (feet)	Width (feet)	Diameter (feet)	Depth (feet)
5, T154N, R101W	48.18342/103.71127	25	18	ND	8
	near previous coordinates	ND	ND	6	3
	48.18453/103.71169	ND	ND	30	6
	near previous coordinates	ND	ND	15	4
7, T154N, R101W	48.17616/103.71737	20	15	ND	6
	48.17629/103.71711	12	4	ND	4
	48.17573/103.7177	ND	ND	12	4
	48.17584 103.71559	ND	ND	6	3

ND = No Data Available.

Source: Dodd (2008b).

Clay deposits suitable for ceramic production are present in the Fort Union Group formations, but none are being mined currently. Another commodity is “scoria” or “clinker” that occurs when lignite beds burn and bake the shale and claystone strata next to the coal. Scoria is used for road surfacing and oil well location surfacing material (Freers 1970). No scoria pits are located in the proposed corridor.

B.2.2.5 Seismicity

There are three major phenomena associated with seismic hazards: faults, seismicity, and ground motion. The following describes the potential for seismic hazard occurrence in the proposed corridor.

Faults are dislocations whereby blocks of earth material on opposite sides of the faults have moved in relation to one another. Rapid slippage of blocks of earth past each other can cause energy to be released, resulting in an earthquake. As described in section B.2.2.3, there is evidence of fault offset in older strata underlying the surficial cover, but no evidence that would lead to a conclusion of movement on the faults in the last 10,000 years. No active faults have been identified in the proposed corridor (Crone and Wheeler 2000). An active fault is one in which movement can be demonstrated to have taken place within the last 10,000 years (USGS 2008b).

Seismicity concerns the intensity, frequency, and location of earthquakes in a given area. Northwestern North Dakota has historically little earthquake activity (USGS 2008c). From 1990 to 2006, almost no seismic events were recorded North Dakota.

Ground motion hazards result when the energy from an earthquake is propagated through the ground. The USGS ground motion hazard mapping indicates that potential ground motion hazard in the proposed corridor is low. The hazard map used estimates peak ground acceleration of 4 to 6 percent of gravity with a 2 percent probability of exceedance in 50 years (Frankel et al. 1997; Peterson et al. 2008).

B.2.2.6 Landslides

Landslide is a term used for various processes involving the movement of earth material down slopes (USGS 2004). Landslides can occur in a number of different ways in different geological settings. Large masses of earth can become unstable and by gravity begin to move downhill. The instability can be caused by a combination of steep slopes, periods of high precipitation, undermining of support by natural processes

(stream erosion), or unintentional undercutting or undermining the strength of unstable materials in the construction of roads and structures.

Landslides are present in the proposed corridor and are mainly found in badlands next to Lake Sakakawea and in areas adjacent to drainages (Murphy 2004a,b). Landslides occur when headward erosion creates instability where unconsolidated glacial deposits overlie the Fort Union Group formations. Landslides are not present in the upland areas dominated by thick layers of glacial deposits. Landslides have been identified in the proposed corridor near Sand Creek and its tributaries in Section 6, Township 154 North (T154N), Range 101 West (R101W) (Murphy 2004a). In addition, landslides have been identified on slopes along Camp Creek in Section 36, T156N, R101W, and in areas of Section 16, T155N, R101W.

B.2.2.7 Subsidence

As described in section B.2.2.4, there are potential subsidence hazards as a result of underground mining of lignite.

B.2.2.8 Paleontological Resources

Paleontological resources are potentially present in the bedrock in the proposed corridor. The Rocks of the Fort Union Group have a high potential for fossils including plants, invertebrates, and vertebrates (mammals and reptiles) (Bureau of Land Management 2006). However, the proposed corridor is situated on surficial deposits where there is low potential for finding important fossils, especially the glacial deposits, since glacial processes often are not conducive to the preservation of fossils.

B.2.2.9 Soils

Prime and unique farmland and farmland of statewide importance occur within the proposed corridor. Prime farmland is characterized as the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops available for these uses (the land could be cropland, pastureland, rangeland, forest land, or other land, but not urban or built-up land or water areas). It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner when treated and managed, including water management, according to acceptable farming methods. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable levels of acidity or alkalinity, an acceptable content of salt and sodium, and few or no rocks. They have soils that are permeable to water and air. Prime farmland is neither excessively erodible nor saturated with water for a long period of time, and it either does not flood frequently, or is protected from flooding (NRCS 2007).

Specific technical criteria were established by Congress to identify prime farmland soils. In general, criteria reflect adequate natural moisture content; specific soil temperature range; pH between 4.5 and 8.4 in the rooting zone; low susceptibility to flooding; low risk to wind and water erosion; minimum permeability rates; and low rock fragment content (NRCS 2007).

Unique farmland is defined by the NRCS as land other than prime farmland that is used for the production of specific high-value food and fiber crops. It has the special combination of soil qualities, location, growing season, and moisture supply needed for the economic production of sustained high yields of a specific high-quality crop when treated and managed by acceptable farming methods.

Unique farmland is used for a specific high-value food or fiber crop; has an adequate supply of available moisture for the specific crop because of stored moisture, precipitation, or irrigation; and has a combination of soil qualities, growing season, temperature, humidity, air drainage, elevation, aspect, and other factors, such as nearness to markets, that favors the production of a specific food or fiber crop (NRCS 2007).

Farmland of statewide importance is determined by the state agencies. Some areas other than areas of prime and unique farmland are of statewide importance in the production of food, feed, fiber, forage, and oilseed crops. The criteria used in defining and delineating these areas are determined by the appropriate state

agency or agencies. Generally, additional farmland of statewide importance includes areas that nearly meet the criteria for prime farmland and that economically produce high yields of crops when treated and managed by acceptable farming methods. Some areas can produce as high a yield as prime farmland if conditions are favorable. In some states, additional farmland of statewide importance may include tracts of land that have been designated for agriculture by state law (NRCS 2007).

Prime and unique farmland and farmland of statewide importance were compiled from Soil Survey Geographic databases. Data indicate that prime farmland soils occupy approximately 8.2 percent of the proposed corridor and farmlands of statewide importance comprise approximately 52.7 percent of the proposed corridor. Prime and unique farmland and farmland of statewide importance are included in **Table B-5**.

Table B-5 Important Soils within the Proposed Corridor

Soil Types	Acres	Percent
Prime and unique farmland	16,392	8.2
Farmland of statewide importance	105,124	52.7
Other lands	77,953	39.1
Total	**199,469**	**100.0**

B.2.3 Hydrology and Drainage

Although surface waters would be avoided to the extent practicable, secondary impacts could result from sediment loading to receiving streams. Direct impacts to drainages and waterways would be avoided because they would be either avoided or spanned during detailed engineering.

The U.S. Congress passed the National Flood Insurance Act of 1968 in response to increasing losses from flood hazards nationwide, which resulted in establishing the National Flood Insurance Program (NFIP). The Act was subsequently expanded by the Flood Disaster Protection Act of 1973, in which floodplain areas and flood risk zones within the U.S. were identified as part of the Act.

The NFIP identified floodplain areas through flood insurance studies, consisting of hydrologic and hydraulic studies of flood risks, which are administered by the Federal Emergency Management Agency (FEMA). FEMA prepares Flood Insurance Rate Maps that depict the spatial extent of flood hazard areas within Special Flood Hazard Areas (SFHAs). Flood hazard areas within the proposed corridor are illustrated in **Exhibits D-7** through **D-9** and largely associated with the Little Muddy River and its tributaries, north of Williston. Although SFHAs have been designated to describe the potential for flooding events, those applicable to the proposed corridor are limited to those described in **Table B-6**.

Table B-6 Special Flood Hazard Zones Applicable to the Proposed Corridor

Zone Name	Zone	Description
Zone X (500-year)	X500	An area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than 1 foot or with drainage areas less than 1-square-mile; or an area protected by levees from 100-year-flooding.
Zone AE	AE	An area inundated by 100-year flooding, for which Base Flood Elevations (BFEs) have been determined.
Zone A	A	An area inundated by 100-year flooding, for which no BFEs have been determined.

B.2.4 Vegetation Resources

Vegetation within the proposed corridor was characterized from a literature review of the North Dakota Game and Fish Department (NDGFD) Comprehensive Wildlife Conservation Strategy (Hagen et al. 2005) and by Geographic Information System (GIS) analysis of land use and land cover. The proposed Project is located within the Missouri Coteau Mixed-grass Prairie region and the Missouri River System/Breaks region of North Dakota. The Missouri Coteau region was historically dominated by mixed-grass prairie and the Missouri River Breaks with woody draws and shortgrass prairie uplands. The topography of the area is rolling hills becoming steeper breaks and draws towards the Missouri River (Hagen et al. 2005). Based on field surveys completed in September 2008, cropland and native prairie dominate the proposed corridor; planted grasslands, deciduous shrublands, wetlands, and other vegetation types are scattered throughout the proposed corridor. Open water and waterbodies, developed land, and areas with barren lands do not support vegetation. Barren and developed lands consist of areas that are devoid of vegetation due to construction-related disturbances and urban development. Vegetation cover types that occur within the proposed corridor are listed in **Table B-7**.

Table B-7 Vegetation Cover Types within the Proposed Corridor

Vegetation Types	Acres	Percent
Cultivated cropland	127,794.3	64.1
Pasture/hay	719.1	0.4
Grassland/herbaceous perennials	52,398.3	26.3
Shrubland	3,131.9	1.6
Woodlands	442.2	0.2
Wetlands	4,068.5	2.0
Other lands	10,914.2	5.5
Total	**199,468.5**	**100.0**

Source: Strong 2004 (North Dakota GAP Analysis Land Cover Database).

B.2.4.1 Grassland and Planted Herbaceous Perennials

Pasture/Rangeland

Agricultural activities within the proposed corridor have largely eliminated the presence of native prairie communities. The remnants of native prairie are mostly utilized for cattle grazing. Grasslands within the proposed corridor include:

- Mixed-Grass Prairie Community: The mixed-grass prairie of North Dakota is a combination of the tallgrass species of eastern North Dakota and the shortgrass species found to the west. It is comprised of warm- and cool-season grasses and sedges. Common grasses include prairie junegrass (*Koeleria macrantha*), western wheatgrass (*Elymus smithii*), green needlegrass (*Nassella viridula*), needleandthread (*Hesperostipa comata*), blue grama (*Bouteloua gracilis*), little bluestem (*Schizachyrium scoparium*), and needleleaf sedge (*Carex duriuscula*) (Hagen et al. 2005). Other grass species include Canada wild-rye (*Elymus canadensis*), spike oats (*Helictotrichon hookeri*), mat muhly (*Muhlenburgia richardsonis*), spikemoss (*Selaginella* spp.), plains reedgrass (*Calamagrostis montanensis*), and buffalograss (*Buchloe dactyloides*). Forbs included in the mixed-grass prairie community include purple coneflower (*Echinacea* spp.), field sagewort (*Artemisia campestris*), snowberry (*Symphoricarpos albus*), yarrow (*Achillea* spp.), goldenrod (*Solidago* spp.), wavyleaf thistle (*Cirsium undulatum*), Missouri milkvetch (*Astragalis missouriensis*), Indian breadroot (*Pediomelum* spp.), purple prairie clover (*Dalea purpurea*), prairie sagewort (*Artemesia frigida*), pasque flower

(*Pulsatilla* spp.), western wallflower (*Erysimum asperum*), prairie smoke (*Geum triflorum*), gaura (*Guara* spp.), and harebell (*Asyneuma* spp.) (Hagen et al. 2005).

- Shortgrass Prairie Community: The shortgrass prairie is mostly found on the uplands of the Missouri Breaks region within the proposed corridor. It is comprised of warm-season species that can survive the low average rainfalls of southwestern North Dakota. Common grass species include blue grama, buffalograss, needleandthread, needleleaf sedge, and threadleaf sedge (*Carex filifolia*). These species mature at six to 12 inches in height. Forbs include white wild onion (*Allium textile*), death camas (*Zigadenus* spp.), buffalo-bean (*Thermopsis* spp.), purple loco (*Oxytropis lambertii*), silverleaf (*Astragalus* spp.), field sagewort, snowberry, prickly pear (*Optunia polyacantha*), moss phlox (*Phlox subulata*), white beardtongue (*Penstemon* spp.), and fringed sage (Hagen et al. 2005).

- Planted Grassland (i.e., herbaceous perennials): These areas are croplands that have been replanted to perennial grasses and/or legumes. This class also includes native grasslands that have been invaded by smooth brome (*Bromus inermis*) or leafy spurge (*Euphorbia esula*). Commonly planted species include smooth brome, crested wheatgrass (*Agropyron cristatum*), intermediate wheatgrass (*Thinopyrum intermedium*), tall wheatgrass (*Thinopyrum ponticum*), big bluestem (*Andropogon gerardii*), alfalfa (*Medicago sativa*), and sweet clover (*Melilotus* spp.). These lands are generally used for hay or forage production. Planted grasslands also can be enrolled in the Conservation Reserve Program (CRP) that restricts their use for hay/forage (Hagen et al. 2005).

B.2.4.2 Shrubland

Deciduous shrublands are a small component of the proposed corridor and usually confined to breaks and draws. The dominant shrub species include silver buffaloberry (*Shepherdia argentea*) and chokecherry (*Prunus virginiana*).

B.2.4.3 Cultivated Cropland

This community is comprised mostly of wheat production, although sunflowers, lentils, dry edible beans, and peas are raised in the proposed corridor.

B.2.4.4 Woodlands

Woodland habitats are found in only a few locations in North Dakota, and they do not cover large contiguous areas (Hagen et al. 2005). Isolated areas of woodland habitat occur within the proposed corridor. Dominant species in woodlands include green ash (*Fraxinus pennsylvanica*), chokecherry, roses (*Rosa* sp.), and snowberry. The proposed corridor also includes windbreaks (i.e., shelterbelts) adjacent to cropland and farmsteads. The dominant species in these wind breaks is Siberian elm (*Ulmus pumila*).

B.2.4.5 Wetland and Riverine

Wetland and riverine habitats are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of wetland vegetation typically adapted for life in saturated soil conditions (Environmental Laboratory 1987). Wetlands are classified depending on how long water and vegetation are present. These range from temporary wetlands that typically hold water for only a few weeks, to permanent wetlands that hold water year round. Wetland types within the proposed corridor include palustrine and riverine wetlands. Dominant vegetation of wetland areas includes fine-textured grasses, sedges, and rushes (Hagen et al. 2005).

- Palustrine Wetlands: Palustrine wetlands include all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens. They can be grouped into vegetated wetlands traditionally called by such names as marsh, swamp, bog, fen, and prairie, which are found throughout the U.S. It also includes the small, shallow, permanent or intermittent water bodies often called ponds (Cowardin et al. 1979). Palustrine wetlands are classified as either seasonal, semi-permanent, or permanent subcategories. Seasonal wetlands are described as having surface water present for extended periods in spring and early summer, but usually disappear as early as midsummer

(Hagen et al. 2005). Semi-permanent wetlands have water present year-round in most years; permanent wetlands will contain water throughout the year, in all years (Hagen et al. 2005).

- Riverine Wetlands: Riverine wetlands include wetlands contained within a channel, with two exceptions: 1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens; and 2) habitats with water containing ocean-derived salts. Water is usually, but not always, flowing in the riverine system. Upland islands or palustrine wetlands may occur in the channel but they are not included in the riverine system. The lower perennial subsystem includes waterbodies where some water flows throughout the year and the gradient is low and water velocity is slow. The intermittent subsystem includes channels where the water flows for only part of the year (Cowardin et al. 1979). Wetland types that occur within the proposed corridor are listed in **Table B-8**.

Table B-8 Wetland Types within the Proposed Corridor

Wetland Types	Acres	Number
Freshwater pond	266.1	268
Freshwater emergent wetland	2,361.0	3,039
Freshwater forested/shrub wetland	2.1	7
Lake	65.0	3
Riverine	86.2	18
Other	1.7	5
Total	**2,782.1**	**3,340**

[1] Wetland acreage differs from acreages provided in **Table B-1** and **Table B-7** due to different data sources.

Source: NWI maps.

B.2.4.6 Sensitive Ecological Communities

Sensitive ecological communities for the study area were identified by the North Dakota Natural Heritage Inventory (NDNHI) 2008. These terrestrial communities consist of interrelated assemblages of plants, animals, other living organisms, geological substrates, and soils that are shaped by natural processes. These communities are either rare/endangered, ecologically significant, or unique to the area. These communities are not protected by state statutes. Several sensitive ecological communities were identified by the NDNHI as present in the vicinity but not within the proposed corridor. However, biological surveys conducted in September 2008 identified three of these communities to be within the proposed corridor. These communities are summarized below.

Western Three-square Meadow

The community is found along perennial streams, marshes, ponds, and overflows with permanently saturated soils. Dominant species of the community include common threesquare (*Schoenoplectus pungens* var. *longispicatus*), broadleaf cattail (*Typha latifolia*), arctic rush (*Juncus arcticus*), cordgrass (*Spartina* spp.), common rush (*Juncus effusus*), and spotted water hemlock (*Cicuta maculata*) (Jones et al. 2006). The community is globally secure (G5 Rank) but is critically imperiled within North Dakota (S1 Rank) (Jones et al. 2006; Duttenhefner 2008).

Needleandthread Mixed Grass Prairie

The community is found on level to rolling uplands with loam to sandy loam soils across the northern Great Plains. Dominant species of the community include needleandthread (*Hesperostipa comata*), blue grama

(*Bouteloua gracilis*), threadleaf sedge (*Carex filifolia*), prairie junegrass (*Koeleria macrantha*), western wheatgrass (*Pascopyrum smithii*), prairie sagewort (*Artemisia frigida*), broom snakeweed (*Gutierrezia sarothrae*), prairie rose (*Rosa arkansana*), spiny phlox (*Phlox hoodii*), hairy false goldenaster (*Heterotheca villosa*), scarlet beeblossom (*Gaura coccinea*), and dotted blazing star (*Liatris punctata*) (Drake 2006). The community is globally secure (G5 Rank) but is imperiled within North Dakota (S2 Rank) (Drake 2006; Duttenhefner 2008).

Green Ash Upland Woodland

This community occurs on slopes of ravines, open valleys, and along streams. The dominant species of this community include green ash (*Fraxinus pennsylvanica*), boxelder (*Acer negundo*), chokecherry (*Prunus virginiana*), western snowberry (*Symphoricarpos occidentalis*), currant (*Ribes* sp.), rose (*Rosa* sp.), smooth brome (*Bromus inermis*) (Faber-Langendoen 2001). This community is globally imperiled/vulnerable (G2G3 Rank) and it is vulnerable within North Dakota (S3 Rank) (Duttenhefner 2008; Faber-Langendoen 2001).

B.2.4.7 Noxious Weeds

Several noxious weed species are known to cause ecological and commercial damage in North Dakota. If not controlled, noxious weeds can infest areas, resulting in the loss of native vegetation and crops. The state- and county-prohibited or restricted noxious weeds are listed in **Table B-9**. Canada thistle, field bindweed, leafy spurge, and yellow toadflax were observed within the Proposed Corridor during field surveys conducted in September 2008.

Table B-9 Noxious Weeds Known to Occur in North Dakota

Common Name	Scientific Name
Russian knapweed	*Acroptilon repens*
Absinth wormwood	*Artemisia absinthium*
Musk thistle	*Carduus nutans*
Yellow starthistle	*Centaurea solstitialis*
Spotted knapweed	*Centaurea stoebe* ssp. *micranthos*
Canada thistle	*Cirsium arvense*
Field bindweed	*Convolvulus arvensis*
Leafy spurge	*Euphorbia esula*
Dalmatian toadflax	*Linaria dalmatica* ssp. *dalmatica*
Purple loosestrife	*Lythrum salicaria*
Saltcedar	*Tamarix ramosissima*
Yellow toadflax	*Linaria vulgaris*
Dodder	*Cuscuta* sp.
Broomrape	*Orobanche* sp.

Source: North Dakota Department of Agriculture 2008.

B.2.5 Wildlife and Fisheries

Wildlife use within the proposed corridor was characterized from a literature review of the North Dakota Game and Fish Department's (NDGFD's) Comprehensive Wildlife Conservation Strategy (Hagen et al. 2005), as well

as both 2008 spring and fall field investigations. Additionally, agency correspondence and species information was collected from the USFWS, NDGFD, and the NDNHI (USFWS 2008a,b; NDGFD 2008; NDNHI 2008).

The predominant wildlife habitats along the proposed corridor consist of agricultural land, grasslands (tall and mixed-grass prairie), shrublands, woodlands (mixed conifer and deciduous), and wetlands (woody and emergent herbaceous). These vegetation types support a diversity of wildlife species and are discussed in section B.2.4, Vegetation Resources. This section focuses on species of high economic and/or recreational importance and those that are considered sensitive to human disturbance.

B.2.5.1 Big Game

Big game species within the proposed corridor include white-tailed deer (*Odocoileus virginianus*), with possible occurrences of mule deer (*Odocoileus hemionus*), and pronghorn (*Antilocapra americana*). No seasonal big game ranges were identified by the NDGFD (NDGFD 2008).

B.2.5.2 Small Game

Small game species that occur within the proposed corridor include native and non-native furbearers, upland game birds, and waterfowl. Common furbearers within the proposed corridor include red fox (*Vulpes vulpes*), raccoon (*Pyrocyon lotor*), badger (*Taxidea taxus*), striped skunk (*Mephitis mephitis*), and coyote (*Canis latrans*).

Representative upland game birds in the proposed corridor include ring-necked pheasant (*Phasianus colchicus*) (an introduced species), sharp-tailed grouse (*Tympanuchus phasianellus*), gray partridge (*Perdix perdix*), and wild turkey (*Meleagris gallopavo*). Representative waterfowl species include mallard (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), northern shoveler (*Anas clypeata*), and gadwall (*Anas strepera*).

B.2.5.3 Nongame Species

A diverse number of nongame species (e.g., small mammals, raptors, passerines, amphibians, and reptiles) occupy a variety of trophic levels and habitat types within the proposed corridor. Common wildlife species include small mammals such as bats, voles, squirrels, gophers, and mice. These small mammals provide a substantial prey base for predators in the area including, larger mammals (coyote and badger), raptors (eagles, buteos, accipiters, owls), and reptiles.

Migratory birds are protected by the Migratory Bird Treaty Act (MBTA) (16 USC 703-711) and Executive Order (EO) 13186 (66 Federal Register 3853), which makes it unlawful to take, kill, or possess migratory birds. EO 13186 was enacted to, among other things, ensure that environmental analyses of Federal actions evaluate impacts of actions and agency plans on migratory birds. Federally listed and other sensitive bird species are discussed in section B.2.6.

Migratory birds are considered integral to natural communities and act as environmental indicators based on their sensitivity to environmental changes caused by human activities. Examples of migratory bird species that occur within the proposed corridor include the mourning dove (*Zenaida macroura*), killdeer (*Charadrius vociferus*), common nighthawk (*Chordeiles minor*), western kingbird (*Tyrannus verticalis*), eastern kingbird (*Tyrannus tyrannus*), horned lark (*Eremophila alpestris*), eastern bluebird (*Sialia sialis*), mountain bluebird (*Sialia currucoides*), common yellowthroat (*Geothlypis trichas*), clay-colored sparrow (*Spizella pallida*), vesper sparrow (*Pooecetes gramineus*), lark sparrow (*Chondestes grammacus*), savannah sparrow (*Passerculus sandwichensis*), western meadowlark (*Sturnella neglecta*), and brown-headed cowbird (*Molothrus ater*).

Raptor species that occupy habitats within the proposed corridor are those associated with tall- and mixed-grass prairie, shrubland, woodlands, wetlands, and cropland. Those species include eagles (bald and golden eagles), buteos (e.g., red-tailed and ferruginous hawks), falcons (American kestrel and prairie falcon), owls (burrowing owl, great horned owl, and short-eared owl), northern harrier, and other birds of prey including the turkey vulture (Peterson 1990). Protected raptor species that have been identified for the proposed corridor

include bald eagle, ferruginous hawk, northern harrier, Swainson's hawk, short-eared owl, and burrowing owl (**Appendix C**, Special Status Species). These species all are designated as North Dakota Species of Conservation Priority.

B.2.5.4 Fisheries Resources

The proposed corridor includes several occasional intermittent and ephemeral streams. One perennial water, the Little Muddy River, is crossed in Williams County. Federal and state wildlife agencies have not expressed concerns for any fish species or sensitive aquatic habitat within any of the waterbodies within the proposed corridor. In addition, no waterbodies within the proposed corridor contain species managed by the National Marine Fisheries Service, or support essential fish habitat (EFH) as defined under the Magnuson-Stevens Fishery Conservation and Management Act.

B.2.6 Special Status Species

Special status species are those in which state and/or federal agencies provide protection by law, regulation, or policy. Federally listed and federally proposed for listing species with designated critical habitat are protected under the ESA. For this analysis, special status species also include those species that have been designated as species of conservation priority by the NDGFD.

The State of North Dakota categorizes wildlife species into three levels of conservation priority (Hagen et al. 2005). The following categories were developed to describe the conservation needs for North Dakota species of conservation priority:

- Level I: species with a high level of priority due to the declining status here or across the range or high rate of occurrence in North Dakota, constituting the core of the species breeding range but are at-risk range-wide.
- Level II: species with a moderate level of priority or species with a high level of priority but a substantial level of non-state wildlife grants funding.
- Level III: species with a moderate level of priority but are believed to be peripheral or non-breeding in North Dakota.

Special status species analysis focused on wildlife and plant species and habitats that may occur within the proposed corridor. The process considered federal laws and state statutes. The ESA is administered by the USFWS and provides broad national protection for fish, wildlife, and plants that are listed as endangered, threatened, or proposed for listing. The ESA outlines procedures for federal agencies to follow when a listed species or designated habitat may be affected by an action they authorize, fund, or permit. Species considered North Dakota species of conservation priority also receive some protection. The MBTA also is administered by the USFWS. The MBTA is a federal law enabling the U.S. to fulfill its international, bilateral conventions for conserving migratory bird populations and their habitats. The MBTA makes it unlawful to take, kill, or possess migratory birds, nests, eggs, or parts of birds without a permit. Additionally, the Bald and Golden Eagle Protection Act (BGEPA), also administered by the USFWS, provides for the protection of the bald eagle (the national emblem) and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession and commerce of such birds. Revised regulations providing mechanism to authorize take under the BGEPA went into effect June 19, 2008.

Methods for establishing a baseline of status, occurrence and associated habitat of wildlife that may occur within the proposed corridor include reviewing published literature, natural heritage database information, internet websites, agency correspondence, and field surveys. Biologists with the USFWS, NDGFD, and NDNHI were contacted for information about the status of wildlife species, habitat, special wildlife features, and habitats in the proposed corridor (USFWS 2008a,b; NDGFD 2008; NDNHI 2008). Baseline biological surveys within the proposed corridor were conducted in September 2008.

The analysis for special status species focused on those species that could occur within the proposed corridor. Special status species originally considered for the proposed corridor are presented in **Appendix C**, Special Status Species. The evaluation determined that some of these species would not occur in the proposed corridor. Comments on these species are provided in **Appendix C** and are not discussed further.

A total of 64 special status wildlife species were identified by the USFWS, the State of North Dakota, and the NDNHI as occurring within the 6-mile-wide corridor (USFWS 2008a,b; Hagen et al. 2005; NDNHI 2008). These species, their habitat associations, and their occurrence within the proposed corridor are summarized in **Appendix C**, Special Status Species. Occurrence for each species was based on habitat requirements and known distribution. Based on these evaluations, 24 species have been eliminated from detailed analysis, of which 3 of these species are federally listed species (threatened and endangered). The federally listed species that were eliminated from detailed analysis include the gray wolf (*Canis lupus*), interior least tern (*Sterna antillarum*), and pallid sturgeon (*Scaphirynchus albus*). The gray wolf was eliminated because it is highly unlikely to be within the proposed corridor and would only be present as a migratory occurrence. Interior least tern was eliminated because nesting habitat is not present. Pallid sturgeon was eliminated because the species requires large fast-flowing rivers, which are not present within the proposed corridor. The Dakota skipper (*Hesperia dacadae*), a federal candidate species, was also eliminated from detailed analysis. The non-listed species eliminated from detailed analysis include American white pelican (*Pelecanus erythrorhynchos*), arctic shrew (*Sorex arcticus*), bald eagle (*Haliaeetus leucocephalus*), Franklin's gull (*Larus pipixcan*), greater prairie chicken (*Tympanuchus cupido*), long-eared myotis (*Myotis evotis*), long-legged myotis (*Myotis volans*), peregrine falcon (*Falco peregrinus*), pygmy shrew (*Sorex hoyi*), horned grebe (*Podiceps auritus*), red-headed woodpecker (*Melanerpes erythrocephalus*), Richardson's ground squirrel (*Spermophilus richardsonii*), sagebrush vole (*Lemmiscus curtatus*), swift fox (*Vulpes velox*), and western small-footed myotis (*Myotis ciliolabrum*), and eight species of fish. Of the remaining 40 species retained for analysis, two are listed species; whooping crane (*Grus americana*), and piping plover (*Charadrius melodus*). Special status wildlife species that have not been eliminated from analysis are discussed below and in **Appendix C**. No designated critical habitat is located within the proposed corridor.

B.2.6.1 Federally Listed Species

Whooping Crane

The whooping crane is a federally endangered species and a North Dakota Level III species of conservation priority. Collision with power lines is the greatest source of mortality for fledged whooping cranes that migrate between nesting and wintering habitat (USFWS 2006). Designated critical habitat, nesting habitat, and breeding rookeries are not present in the vicinity of the proposed corridor. However, the proposed corridor is located within the yearly migratory route for the Aransas-Wood Buffalo Breeding Population (AWBP). Species records show migration routes through Williams and Mountrail counties (USFWS 2008a,b). Whooping cranes may migrate through the proposed corridor in the spring (April to mid-May) and in the fall (mid-September to October). Suitable stop-over habitat for migrating whooping cranes includes wetlands and cropland ponds for roosting and/or feeding. Individual cranes typically spend only a few days at most at a given site during migration before moving on.

Piping Plover

The piping plover is a federally threatened species and a North Dakota Level II species of conservation priority. The piping plover is generally characterized as using exposed, sparsely vegetated shores and islands of shallow, alkali lakes and impoundments for breeding (Hagen et al. 2005). Salt-encrusted, alkali, or subsaline semipermanent lakes, ponds, and rivers with wide shorelines of gravel, sand, or pebbles are preferred (Hagen et al. 2005). Piping plovers forage on fly larvae, beetles, crustaceans, mollusks, and other small animals near the shoreline or sometimes by the nest. It is expected that the piping plover would only use the proposed corridor for migration and foraging purposes, and are not likely to breed and nest within the small and limited waterbodies located in the vicinity of this Project.

B.2.6.2 North Dakota Species of Conservation Priority

Grassland Associated Species

Baird's sparrow (*Ammodramus bairdii*), black-billed cuckoo (*Coccyzus erythropthalmus*), bobolink (*Dolichonyx oryzivorus*), chestnut-collared longspur (*Calcarius ornatus*), dickcissel (*Spiza americana*), grasshopper sparrow (*Ammodramus savannarum*), lark bunting (*Calamospiza melanocorys*), LeConte's sparrow (*Ammodramus leconteii*), loggerhead shrike (*Lanius ludovicianus*), marbled godwit (*Limosa fedoa*), Sprague's pipit (*Anthus spragueii*), and upland sandpiper (*Bartramia longicauda*) are migratory bird species that are listed as North Dakota species of conservation priority and may occur within the proposed corridor. These migratory bird species are associated with grassland habitats.

Perching Species

Red-tailed hawk (*Buteo jamaicensis*), Ferruginous hawk (*Buteo regalis*), northern harrier (*Circus cyaneus*), short-eared owl (*Asio flammeus*), and Swainson's hawk (*Buteo swainsoni*) are migratory birds and raptor species that are also North Dakota species of conservation priority that may occur within the proposed corridor and are associated with grassland habitats. Several raptor species were observed foraging within the proposed corridor during September 2008 field surveys, including Swainson's hawk, northern harrier, and red-tailed hawk.

Lekking Species

Sharp-tailed grouse are found in mixed-grasslands with patches of small trees or shrubs. During the breeding season male sharp-tailed grouse congregate on specific areas known as leks in the early morning to impress nearby females. Leks are usually located within wet meadows, ridges, and knolls, or recently burned areas. No lek sites for sharp-tailed grouse have been identified by the NDGFD or the NDNHI in the vicinity of the proposed corridor. During the September 2008 surveys, numerous sharp-tailed grouse were observed.

Less Mobile and Burrowing Species

Plains spadefoot (*Spea bombifrons*), smooth green snake (*Liochlorophis vernalis*), short horned lizard (*Phrynosoma douglassi*) and western hognose snake (*Heterodon nasicus*) are also North Dakota species of conservation priority which inhabit dry, open grasslands with sandy or loose soils and, occasionally rock crevices. Other habitat factors include proximity to water and small mammal burrows (Hagen et al. 2005). Plains spadefoot, short horned lizard, and western hognose snake utilize burrows during portions of their life history. Smooth green snake utilize may utilize hibernacula and have been documented hibernating within ant mounds. These species were not detected during September 2008 surveys.

Burrowing owl (*Athene cunicularia*), is a ground nesting owl which nests in abandoned mammal burrows which they enlarge and excavate (Hagen et al. 2005). One burrowing owl was also observed during September 2008 surveys (see **Exhibit D-1**).

Wetland and Riparian Associated Species

American avocet (*Recurvirostra americana*), American bittern (*Botaurus lentiginosus*), black tern (*Chlidonias niger*), canvasback (*Aythya valisineria*), Franklin's gull (*Larus pipixcan*), Nelson's sharp-tailed sparrow (*Ammodramus nelsoni*), northern pintail (*Anus acuta*), redhead (*Aythya americana*), sedge wren (*Cistothorus platensis*), willet (*Catoptrophorus semipalmatus*), Wilson's phalarope (*Phalaropus tricolor*), and yellow rail (*Corurnicops noveboracensis*) are migratory bird species that are North Dakota species of conservation priority and may occur within the proposed corridor. These migratory bird species are associated with wetlands, wetland complexes, and waterbody habitats.

The Canadian toad (*Bufo hemiophrys*) and common snapping turtle (*Chelydra serpentina*) also are a North Dakota species of conservation priority. These species prefer permanent lakes, ponds, rivers, and wetlands (Hagen et al. 2005).

The September 2008 and June 2009 field surveys found a limited amount of habitat that would support these species including one perennial water, the Little Muddy River, and a limited number of ponds or wetlands with permanent water. Additionally, occasional intermittent and ephemeral streams were also observed.

B.2.6.3 Special Status Fish

A total of nine special status fish species were identified by the USFWS, the State of North Dakota, and the NDNHI as occurring within the proposed corridor (USFWS 2008a,b; Hagen et al. 2005; NDNHI 2008). These species, their habitat associations, and their occurrence within the proposed corridor are summarized in **Appendix C**, Special Status Species. Based on evaluations in **Appendix C**, all nine fish species have been eliminated from detailed analysis, of which one is a federally listed endangered species, the pallid sturgeon (*Scaphirhynchus albus*). The non-listed species eliminated from further analysis include blue sucker (*Cycleptus elongates*), finescale dace (*Phoxinus meogaeus*), flathead catfish (*Pylodictis olivaris*), flathead chub (Platygobio gracilis), northern redbelly dace (*Phoxinus eos*), paddlefish (*Polyodon spathula*), sicklefin chub (*Macrhybopis meeki*), and sturgeon chub (*Macrhybopsis gelida*).

The September 2008 and June 2009 field surveys did not detect habitat that would support these species. Only one perennial water, the Little Muddy River, occurs within the proposed corridor. These species are not known to occur in this river.

B.2.6.4 Special Status Plants

A total of three special status plant species were identified by the USFWS, the State of North Dakota, and the NDNHI as occurring within the proposed corridor (USFWS 2008a,b; Hagen et al. 2005; NDNHI 2008). These species, their habitat associations, and their occurrence within the proposed corridor are summarized in **Appendix C**, Special Status Species. Based on evaluations, in **Appendix C**, all three plant species have been eliminated from detailed analysis, none of which is a federally listed species. The non-listed species eliminated from further analysis include Dakota buckwheat (*Eriogonum visheri*), heart-leaved buttercup (*Ranunculus cardiophyllus*), and jointed-spike sedge (*Carex athrostachya*). Species-specific surveys for these plant species were not required by the NDGFD (NDGFD 2008).

All three species were identified as having potential to occur within the proposed corridor but were eliminated from detailed analysis as the habitat characteristics necessary to support these species were not detected during September 2008 survey.

B.2.7 Archaeological and Historic Resources

Cultural resources are protected by a series of federal laws enacted to protect these resources from damage or loss due to federal undertakings, or private undertakings operating under federal license, federal funding, or on federally managed lands. The public's recognition that these non-renewable resources are important and should be protected began in the 20th Century and continues to the present. Three of the most important laws are the NHPA of 1966, as amended; the American Indian Religious Freedom Act of 1978; and the Archaeological Resource Protection Act of 1979. EO 11593 also provides necessary guidance on protection and enhancement of cultural resources. New legislation and emphases that have come to the forefront over the past 20 years include the Native American Graves Protection and Repatriation Act; EO 13007, the consideration of historic and traditional landscapes; and the increased awareness of and consultation for traditional cultural properties (Parker and King 1989).

Class I Cultural Resources Survey Results

From February 27 to June 20, 2008, Metcalf Archaeological Consultants, Inc. (Metcalf) conducted a Class I records and files search through the State Historical Society of North Dakota to identify previously conducted cultural resources inventories and previously documented cultural resources within the study area. Additionally, Metcalf reviewed historic General Land Office (GLO) records to determine if remains of trails, transportation routes, homesteads, or other historic resources may be present in the study area.

The files search revealed 148 sites in the proposed corridor (Metcalf 2008). Sixty-seven of these sites are prehistoric, including 62 sites with stone circles and/or cairns, one site recorded as a mound, and four low-density material scatters. A small number of the stone circle/cairn sites also have associated material scatters. Thirteen of the 148 sites are historic, including seven material scatters with depressions indicative of foundation remains and six with structural foundation remnants and/or small depressions. One multi-component site containing stone circles and a historic material scatter also was identified in the proposed corridor. The remaining 67 sites are architectural sites. These include farmsteads, houses, bridges, churches, municipal buildings, a utility line, and a number of agricultural outbuildings. Most of the architectural sites are in or near the Town of Ray.

Summary of General Land Office Review for the Proposed Corridor

On April 7, 2008, Metcalf reviewed GLO maps of the proposed corridor. The townships, ranges, and sections that lie within the proposed corridor were entered into the GLO database and the results were examined for any evidence of trails, transportation routes, homesteads, or other historic resources. The Great Northern Railroad, trails, several buildings, and modern highways, pipelines, and road systems were identified within the proposed corridor. Most of the identified trails subsequently have been modified or removed as a result of modern highway construction or other forms of infrastructure.

B.2.8 Native American Setting

Northwestern North Dakota and surrounding areas traditionally have been used by Native Americans since pre-recorded time. Present-day tribes with ties to the area include:

- Eastern Shoshone Tribe – Fort Washakie, Wyoming;
- Northern Arapaho Tribe – Fort Washakie, Wyoming;
- Northern Cheyenne Tribe – Lame Deer, Montana;
- Oglala Lakota Nation – Pine Ridge, South Dakota;
- Rosebud Sioux Tribe – Rosebud, South Dakota;
- Cheyenne River Sioux Tribe – Eagle Butte, South Dakota;
- Standing Rock Sioux – Fort Yates, North Dakota;
- Crow Tribe – Crow Agency, Montana;
- Fort Peck Tribes – Poplar, Minnesota; and
- Three Affiliated Tribes – New Town, North Dakota.

Western sent Nation-to-Nation consultation letters to these 10 tribes on August 1, 2008. The letter described the proposed Project and provided the tribes with the opportunity to comment on the Project and identify sites or places that might be of religious or cultural significance to the tribes. To date, only the Rosebud Sioux Tribe has responded to the letter. The Tribe has no concerns with the Project; however, they requested copies of the Class I and Class III cultural resources reports.

B.2.9 Paleontological Resources

Paleontological resources that are located on state lands are protected under North Dakota's Paleontological Resource Protection Act (North Dakota Century Code [NDCC] 54-17.3), which gives the North Dakota Industrial Commission, acting through the Office of the State Geologist, the responsibility to protect paleontological resources that are located on land owned by the state, or its political subdivisions (North Dakota Geological Survey 2007). Resources on private land are not protected under this Act, and are considered property of the landowner.

B.2.10 Transportation

Regional transportation facilities, largely consisting of highways and rural roads, would be used to transport construction and maintenance workers, equipment, and materials to transmission line sites. Construction of the proposed Project would require crossing numerous local roads, highways and the Burlington Northern-Santa Fe Railroad.

The proposed corridor would be located west of the Williston - Sloulin Field International Airport. Sloulin Field provides international service to commercial carriers and general aviation. The main runway is 6,650 feet long and 100 feet wide. Currently, the proposed corridor contains the Tioga Municipal Airport. This airport serves general aviation and has a 4,501-foot-long, 75-foot-wide main runway.

Major highways in the proposed corridor include U.S. Highway 2/U.S. Highway 85 that extends north from Williston; U.S. Highway 2 that extends east-west through Ray, North Dakota; and ND Highway 40 that is oriented north-south from U.S. Highway 2 to Tioga. Other roads and highways in the proposed corridor are oriented in a north-south, east-west grid along section lines.

B.2.11 Socioeconomics

Socioeconomic analyses address population, demography, economy, and employment.

Population and Demography

The proposed Project is located in Williams and Mountrail counties in rural northwestern North Dakota. Williams County is approximately 2,148 square miles with a population of 19,761 residents (U.S. Census Bureau 2000). The eastern portion of the proposed corridor, which includes the Tioga Substation and a small portion of the proposed route, extend east into Mountrail County within an area of approximately 1,941 square miles and a population 6,631 residents (U.S. Census Bureau 2000).

Racial composition of residents within the two counties is predominantly white; approximately 93 percent in Williams County and 66 percent in Mountrail County. **Table B-10** provides demographic information for the towns located within the proposed corridor.

Table B-10 Population and Demography within the Proposed Corridor

Town	County	Population[1]	Median Household Income[2]	% Below Poverty Level	
				Families	Individuals
Williston	Williams	12,512	29,962	11.3	13.4
Ray	Williams	534	31,563	2.6	3.7
Tioga	Williams	1,125	29,740	3.5	7.0

[1] U.S. Census Bureau, American Fact Finder 2000.

[2] U.S. Census Bureau, American Fact Finder, Census 2000, Income 1999.

Economy and Employment

Agriculture is the primary industry, with wheat being the most common crop produced, followed by lentils, barley, oats, dry edible beans and peas, and sugar beets (U.S. Department of Agriculture 2008). Livestock production is the second largest industry, primarily producing beef cattle, and hogs. Service industries and retail trade support residents in the area towns.

The oil and gas industry is a major economic contributor to the region since the discovery of oil in the Williston Basin in 1951 (Williston 2008). Since 1951, total production from the Williston Basin has exceeded 2.5 billion barrels (Williston 2008). While oil and gas production is concentrated in western North Dakota, the secondary effects (refining and transporting) affects and significantly benefits the entire state's economy.

During the hunting season, the hunting industry provides numerous recreational activities. Recreation in the area includes big game and small game hunting on private and state owned and managed lands. Big game hunting includes whitetail deer and antelope; small game hunting includes pheasant, Hungarian partridge, and sharptail grouse (Williston Convention and Visitors Bureau 2008).

Additional recreational activities include fishing, bird watching, and canoeing (Williston Convention and Visitors Bureau 2008). Fishing in nearby Lake Sakakawea for walleye and northern pike attract many visitors to the area. Bird watching enthusiasts come to the area for the 365 bird species in the region. Canoeing is a popular recreational activity on the Yellowstone River, Missouri River, and Lake Sakakawea.

B.2.12 Public Health and Safety

Construction, operation, and maintenance of the proposed Project could result in short- and long-term impacts to public health and safety. Potential health and safety concerns associated with construction include highway and roadway safety associated with the transport of structures, structure hardware, conductor, and personnel and solid waste management. Those associated with operations include electric shock, electric and magnetic fields, stray voltage, and induced voltage. Worker safety issues are associated with Project construction, operation, and maintenance activities.

B.2.13 Environmental Justice

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was signed on February 11, 1994. EO 12898 directs federal agencies to review proposals and identify, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations to the greatest extent practicable and permitted by law. As such, the proposed Project must be evaluated in terms of an adverse effect that:

- Is predominantly borne by a minority population and/or low-income population; or
- Will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low income population.

Racial composition of residents within the two counties that constitute the Project area is predominantly white; 93 percent in Williams County and 66 percent in Mountrail County. Approximately 30 percent of residents in Mountrail County are Native Americans who live on the Fort Berthold Reservation, which covers the southern portion of the county. The nearest community to the proposed Project in Mountrail County is Tioga, where the racial composition is 97 percent Caucasian.

B.2.14 Visual Resources

Visual resources within the proposed corridor are what many individuals would describe as aesthetically pleasing. Scenic quality is based on evaluating the overall character and diversity of landform, vegetation, water, color, and cultural features of a landscape. Additionally, visual resources are evaluated based on viewer sensitivity, which is described as the degree of concern for change in the landscape's visual character. Sensitive viewers include residents and viewers from churches, parks, recreational areas, and roadways. The level of viewer sensitivity is associated with the duration of the view. For example, residents' views of a landscape would be long-term and characterized as a highly sensitive viewer; whereas, a motorist's view of the landscape would be short-term in duration and characterized as a low- to moderate-sensitive viewer.

The western part of the study area is located in bottomlands of the Missouri River, while much of the area is located on fairly level uplands. In the eastern part of the study area near Tioga, North Dakota, the topography consists of undulating hills (Freers 1970). Elevations along the proposed corridor vary from just less than 2,000 feet amsl at the Missouri River to 2,400 feet amsl at Tioga, North Dakota. Visual resources in the area include large expanses of cropland and pastureland, interspersed with homesteads, surrounded by shelter belts. Much of the landscape has been modified and used for agriculture. Colors range from varying shades of greens, soft yellows, and browns, depending on the time of year. The broad horizons create a broad spectrum of colors from bright to deep blues during daylight hours and golds, oranges, and reds at dusk to the west, and dawn to the east.

Major highways in the proposed corridor include U.S. Highway 2/U.S. Highway 85 that extends north from Williston; U.S. Highway 2 that extends east-west through Ray, North Dakota; and ND Highway 40 that is oriented north-south from U.S. Highway 2 to Tioga. Other roads and highways in the proposed corridor are oriented in a north-south, east-west grid along section lines.

B.2.15 Noise

Ambient noise levels within the proposed corridor are minimal, broken only by the sound of wind and occasional vehicle traffic and farm machinery. Sensitive receptors within the area are largely limited to scattered area residents.

B.2.16 Air Quality

Air quality parameters typically include consideration of criteria pollutants and prevention of significant deterioration impact levels of nitrogen dioxide, particulate matter, carbon monoxide, and sulfur dioxide.

The North Dakota Department of Health, Division of Air Quality has determined that the concentrations of the criteria pollutants in the proposed corridor are currently lower than the allowable limits established by the National and State Ambient Air Quality Standards (AAQS). Thus, the area is considered to be in attainment of the AAQS for all pollutants.

C. Need for Facility

C.1 Analysis of Need

BEPC's Transmission Services Division completed a comprehensive transmission system study in September 2008 that addressed load forecasts in portions of northwestern North Dakota and northeastern Montana. The study analyzed impacts of the latest load forecast for this region that has been affected by rapid increases in oil and gas extraction and delivery. The load forecast for this area is illustrated in **Exhibit C-1**.

The study showed that the existing system will have insufficient capacity to accommodate projected loads by 2011. Furthermore, Western's Williston to Charlie Creek 115-kV line is in poor physical condition and is currently being rebuilt to 230-kV service.

The existing Tioga 230/115-kV transformer limits the power imports from Saskatchewan to 165-MW. The increased 115-kV network load has increased loading on the Tioga 230/115-kV transformer to the extent the 165-MW Saskatchewan import can no longer be accommodated. Also, the loss of the Tioga 230/115-kV transformer causes low voltage on the 115-kV system. Therefore, a parallel transformer is needed to mitigate the existing overload and provide a backup for loss of the existing transformer. This Project also is underway.

The proposed Williston to Tioga 230-kV transmission line is necessary to complete the 230-kV loop from Tioga to Charlie Creek and to meet the projected loads. Without the facility, the existing Williston-Tioga 115-kV line would be subject to overload, resulting in non-compliance with utility practice and requirements, reduced substation equipment service life, or failure outage to end users.

C.2 Alternatives

Demand side management is a non-structural method that is often called upon to aid in meeting power supply shortfalls. The North Dakota Department of Commerce is mandated to implement the State Energy Program promoting energy conservation and efficiency and reducing energy consumption growth rates. Implementation of additional demand side management energy conservation efforts would fail to meet near-term and future energy needs in southwestern North Dakota.

C.3 Deviation from Ten-Year Plan

The description of the proposed Project corresponds with information provided in the most recent Ten-Year Plan, which was submitted to the PSC by BEPC. There were no deviations between the planned Project described in the Ten-Year Plan and the proposed Project described in this application.

D. Location

D.1 Study Area

North Dakota Administrative Code, Section 69-06-04-02 1 b. requires that the width of the corridor for the proposed transmission line be at least 10 percent of its length, but not less than 1 mile and not greater than 6 miles, unless approved by the PSC. Therefore, the proposed Project is using a 6-mile-wide corridor. Due to geographic constraints, a single 6-mile-wide corridor was routed from the Williston area to the Tioga area as illustrated in **Exhibit A-1**.

Factors provided in Section 49-22-09 NDCC that are to be considered in evaluating application and designation of sites, corridors, and routes are listed below. The PSC shall be guided by, but is not limited to, the following considerations, where applicable, to aid in the evaluation and designation of sites, corridors, and routes:

1. *Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment*.

   A Class I file search of recorded cultural resource sites within the proposed corridor was completed using data from the Division of Archaeology and Historic Preservation, State Historical Society of North Dakota. The NDNHI also provided database information regarding threatened, endangered, and state sensitive plant species. In addition, an EA is currently being completed by Western for the proposed Project.

2. *The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.*

   BEPC would use self-supporting electric transmission line structures without the use of guy wires for support. Steel single-pole structures would be used instead of steel H-frame structures, which would result in less permanent disturbance. Also, there would be no need for construction of new substations as the proposed Project would utilize the existing Williston Interconnect Substation and Tioga Substation.

3. *The potential for beneficial uses of waste energy from a proposed energy conversion facility.*

   Not applicable.

4. *Adverse direct and indirect environmental effects which cannot be avoided should the proposed site or route be designated.*

   To the extent practicable, all effects from the construction and operation of a transmission line within the proposed corridor would be mitigated. No other permanent direct or indirect adverse effects are anticipated.

5. *Alternatives to the proposed site, corridor, or route which are developed during the hearing process and which minimize adverse effects.*

   No alternatives to the proposed corridor location have been identified at this time. Alternative corridors may be identified during the public hearing process.

6. *Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.*

   Minimal amounts (<0.2 acre) of land at the structure locations would be taken permanently out of production. No irreversible or irretrievable commitments of natural resources would occur from Project construction and operation. All areas of natural vegetation within the ROW would be reclaimed with agency-recommended or landowner-approved seed mixtures; wetlands and woodlands would be avoided to the extent practicable.

7. *The direct or indirect economic impacts of the proposed facility*.

   Economic impacts would be positive. Ad valorem taxes would be paid annually, which help the economy. North Dakota sales or use tax would be paid on all materials purchased. During construction, workers would increase the level of business activity in the area.

8. *Existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site, corridor, or route.*

   Several oil fields are located within the proposed corridor. However, exact locations of future oil field developments are not known at this time.

9. *The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.*

   The proposed corridor does include several historic sites, structures, and archaeological sites. Due to the geologic substrate with the proposed corridor, it is unlikely that paleontology resources would be encountered. It is anticipated that the proposed route would avoid these sites.

10. *The effect of the proposed site or route on areas which are unique because of the biological wealth or because they are habitats for rare and endangered species*.

    The proposed corridor includes wetlands and wooded areas in localized areas. A total of 64 special status wildlife species and three special status plant species potentially occur within the proposed corridor. However, impacts to these species are not anticipated to these species with the implementation of best management practices and mitigation measures.

11. *Problems raised by federal agencies, other state agencies, and local entities.*

    To date, no problems have been indentified. Federal and state agencies were contacted during the data collection phase of the proposed Project. These agencies have provided input and identified concerns that have been addressed in this document.

D.2 Proposed Corridor Location and Selection Criteria

The proposed transmission line must originate at the existing Williston Interconnect Substation and terminate at the existing Tioga Substation. No alternative corridors were selected. Alternative corridors would not be feasible based on the proposed Project's need and design.

The criteria identified and illustrated in this section and **Exhibits D-1** through **D-9** are difficult to list in order of importance in terms of relative value as they are closely interrelated. They were of equal value and importance in the corridor selection process. The exclusion, avoidance, and selection criteria are discussed in the following sections.

The PSC requires a two-step process consisting of identifying and selecting corridors and routes within corridors. Corridor widths are to be 10 percent of the total corridor length, with a maximum width not to exceed 6 miles.

Transmission line routing criteria have been developed using PSC guidelines for Energy Conversion and Transmission Siting (North Dakota Century Code, Title 49). Additional criteria have been included, when appropriate. The criteria are applicable to the identification of potential alternative corridors and potential alternative routes. Routing criteria were updated and refined to reflect issues and concerns expressed by federal, state, and local agencies, the applicant, and the public.

The PSC classifies routing constraints as exclusion areas, avoidance areas, selection criteria, and policy criteria. The criteria are summarized in the following sections.

D.2.1 Exclusion Areas

Exclusion areas are defined as geographical areas that are to be completely avoided during transmission line routing. Buffer zones of reasonable distance are to be applied to each exclusion area; natural screening may be considered in determining the extent of the buffer zone. **Exhibits D-1** through **D-3** illustrate exclusion areas that occur within and immediately adjacent to the proposed corridor. Exclusion areas include:

1. *Designated or registered national: parks, memorial parks; historic sites and landmarks; natural landmarks; monuments; and wilderness areas.*

   None are located within the proposed corridor.

2. *Designated or registered state: parks, historic sites; monuments; historical markers; archaeological sites and nature preserves.*

   Based on the review of cultural resources information obtained from the State Historical Society of North Dakota, cultural resource sites occur within the proposed corridor.

3. *County parks and recreational areas; municipal parks; and parks owned or administered by other governmental subdivisions.*

   Three parks have been identified as occurring within or near the town of Williston on the south end of the proposed corridor. Harmon Park and East Lawn Park located in Williston, and Twin Lakes Park located north of Williston and occur approximately 1 mile (or greater) east of the proposed corridor (**Exhibit D-1**). There are several golf courses (Ray Golf Course, Tioga Golf Course, Williston Municipal Golf Course, Eagle Ridge Golf Course) that also occur within and adjacent to the proposed corridor. No other parks or recreational areas occur within or adjacent to the proposed corridor.

4. *Areas that are critical to the life stages of threatened or endangered animal or plant species.*

   Although federally listed species, such as the whooping crane and piping plover may occur within the proposed corridor, critical habitat for these species does not occur within the proposed corridor.

5. *Areas where animal or plant species that are unique or rare to the state would be irreversibly damaged.*

   Although state sensitive animal and plant species occur within the proposed corridor, none of these species would be irreversibly damaged by construction activities. **Exhibits D-1** through **D-3** illustrate general locations of state sensitive species populations present within and adjacent to the proposed corridor.

D.2.2 Avoidance Areas

Avoidance areas are defined as geographical areas that are to be completely avoided during transmission line routing, unless the applicant shows that under the circumstances, there is no reasonable alternative. In determining whether an avoidance area should be designated for a facility, the PSC may consider, among

other things, the proposed management of adverse impacts; the orderly siting of facilities; system reliability and integrity; the efficient use of resources; and alternative routes. Economic considerations alone shall not justify approval of these areas. Buffer zones of a reasonable distance shall be included, unless a distance is specified in the criteria. Natural screening may be considered in determining the width of the buffer zone. **Exhibits D-4** through **D-6** illustrate the avoidance areas that occur within the proposed corridor. Avoidance areas include:

1. *Designated or registered national: historic districts; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands.*

   The proposed corridor was selected to avoid lands operated by the USFWS Wetland Management Districts (WMD) within the proposed corridor including Lostwood WMD and Crosby WMD, which maintains the Tioga Waterfowl Production Area located west of the Town of Tioga. Additionally, the proposed corridor avoids the majority of lands managed by the U.S. Army Corps of Engineers (USACE) as wildlife and grassland areas. These areas include the Williston Grassland Area, Little Muddy Wildlife Area, and the Williston Grassland Area (see **Exhibit D-4**). USACE lands that are included within the proposed corridor include a small portion of the Williston Wildlife Area located south of the Town of Williston (see **Exhibit D-4**). There are no wild, scenic, or recreational rivers within the proposed corridor.

2. *Designated or registered state: wild, scenic, or recreational rivers; game refuges; game management areas; management areas; forests; forest management lands; and grasslands.*

   The proposed corridor was selected to avoid designated or registered state wild, scenic, or recreational rivers; game refuges; game management areas (i.e., Lewis and Clark Wildlife Management Area, White Earth Wildlife Management Area); management areas; forests; forest management lands; and grasslands.

3. *Historic resources that are not specifically designated as exclusion or avoidance areas.*

   None are located within the proposed corridor.

4. *Areas that are geologically unstable.*

   No faults are known to occur within the proposed corridor. However, due to underground lignite mining, sinkhole-type subsidence, fissures, and unstable ground conditions do exist within the proposed corridor.

5. *Areas within 500 feet of a residence, school, or place of business (also to include community centers, healthcare facilities, and daycare facilities).*

   Residences, other structures, active and abandoned schools, and businesses are located within the proposed corridor. The majority of the residences and other structures are scattered throughout the proposed corridor. The highest density or residences and businesses are located in the towns of Williston, Ray, and Tioga. Several schools occur within the proposed corridor, of which the majority occur in rural portions of the proposed corridor.

6. *Reservoirs and municipal water supplies.*

   The proposed corridor includes a total of eight wells used for municipal water supplies. The majority of these wells are located near the Town of Ray.

7. *Water sources for organized rural water districts.*

   None are located within the proposed route.

8. *Irrigated land.*

   The proposed corridor includes all or parts of eight center-pivot irrigation fields.

9. *Areas of recreational significance that are not designated as exclusion areas.*

   None are present within the proposed corridor.

D.2.3 Selection Criteria

In selecting its proposed corridor, a corridor or route shall be designated only when it is demonstrated to the PSC by the applicant that any significant adverse effects that would result from the location, construction, and maintenance of the facility as they relate to the following, would be at an acceptable minimum, or that those effects would be managed and maintained at an acceptable minimum. Selection criteria within the proposed corridor are illustrated in **Exhibits D-7** through **D-9**. Selection criteria include:

1. *Agricultural production.*

   Land within the proposed corridor is predominantly used for agricultural production, which could not be avoided during the corridor identification process.

2. *Family farms and ranches.*

   Family farms and ranches could not be avoided during the corridor identification process. Rural residences and buildings would be avoided during the routing process.

3. *Land that the owner can demonstrate has soil, topography, drainage, and an available water supply that cause the land to be economically suitable for irrigation.*

   Any areas for future irrigation would be identified along the proposed route via landowner discussions and avoided to the extent practicable.

4. *Surface drainage patterns and groundwater flow patterns.*

   Section B.2.3, Hydrology and Drainage, provides a general description of the hydrology and surface drainage within the proposed corridor. Perennial, ephemeral, and intermittent creeks and wetlands occur within the proposed corridor. These areas would be identified along the proposed route and avoided to the extent practicable.

5. *Noise-sensitive land uses.*

   Section B.2.15, Noise, provides information regarding existing noise levels and potential sensitive receptors within the proposed corridor.

6. *The visual effect on the adjacent area*.

   Section B.2.14, Visual Resources, provides information regarding the visual landscape and potential sensitive receptors within the proposed corridor.

7. *Extractive and storage resources.*

   The eastern portion of the proposed corridor includes several oil and natural gas fields, along with three natural gas plants. Transmission line development is not expected to have any impact on these resources.

8. *Wetlands, woodlands, and wooded areas.*

   Wetlands, woodlands, and wooded areas, including shelterbelts, occur in localized areas within the proposed corridor. These areas would be avoided wherever feasible by the proposed route.

9. *Radio and television reception, and other communication or electronic control facilities.*

   Several radio, television, and other communication facilities occur within the proposed corridor. However, the operation of the proposed Project would not affect either communication transmission or reception.

10. *Human health and safety.*

    Not applicable to the corridor selection process. Potential impacts to human health and safety have been addressed in the Route Permit Application.

11. *Animal health and safety.*

    Not applicable to the corridor selection process. Potential impacts to animal health and safety have been addressed in the Route Permit Application.

12. *Plant life.*

    Not applicable to the corridor selection process. Potential impacts to plant life have been addressed in the Route Permit Application.

D.2.4 Policy Criteria

The PSC may give preference to an applicant that would maximize benefits that result from the adoption of the following policies and practices, and in a proper case, may require the adoption of such policies and practices. The PSC also may give preference to an applicant that would maximize interstate benefits. Policy criteria include:

1. *Location and design.*

   The proposed corridor was selected to avoid sensitive resources to the extent possible.

2. Training and utilization of available labor in North Dakota for the general and specialized skills required.

   Not applicable.

3. *Economics of construction and operation.*

   Not applicable.

4. *Use of citizen coordinating committees.*

   Not applicable.

5. *A commitment of a portion of the transmitted product for use in North Dakota.*

   Power would be purchased by Mountrail-Williams Electric Cooperative, Western, and MDU, which are local energy suppliers. The proposed transmission line would serve the increasing electrical load needed for oil and gas activity in North Dakota.

6. *Labor relations.*

   Union and non-union construction contractors would bid on the proposed Project. The construction contract would be awarded to the lowest qualified bidder. Transmission line construction would require special skills and equipment. The construction contractor would be encouraged to use local labor when possible.

7. *The coordination of facilities.*

   The existing Williston Interconnect Substation would be used to interconnect with the Tioga Substation.

8. *Monitoring of impacts.*

   Not applicable.

9. *Utilization of existing and proposed ROWs and corridors.*

   The proposed corridor was selected to maximize the potential use of existing highways, roads, and section lines.

10. *Other existing or proposed transmission facilities.*

    Not applicable.

D.2.5 Design and Construction Limitations

In order to serve the intended functions of transmitting electricity from the Williston Interconnect Substation to the northwestern North Dakota area, the proposed transmission line must originate at the Williston Interconnect Substation and terminate at the Tioga Substation. Areas of construction limitations including exclusion areas, avoidance areas, selection criteria, and policy criteria are described in sections D.2.1 through D.2.4 and illustrated in **Exhibits D-1** through **D-9**.

D.2.6 Economic Considerations

BEPC is committed to constructing the proposed transmission line as economically as possible while strictly adhering to the PSC's criteria. The anticipated construction cost for installation of the proposed transmission line towers within the proposed corridor is $24.3 million; annual operation costs are estimated at approximately $23,673 per year for the proposed transmission line.

D.3 Mitigative Measures

Construction specifications would be designed to minimize potential impacts associated with the proposed transmission line. Certain impacts may not be entirely avoidable, but could be mitigated to reduce the severity and longevity. Specific mitigation measures for the proposed Project have been provided in **Appendix D**.

D.4 List of Preparers and Qualifications

This application for a Certificate of Corridor Compatibility was prepared by AECOM Inc., dba AECOM Environment (AECOM) (formerly ENSR Corporation), BEPC, and Metcalf. The qualifications of the individuals who participated in the preparation and review of this application are provided in **Table D-1**.

Table D-1 Qualifications of Application Preparers

Company and Person	Responsibilities	Education and Experience
AECOM Environment - Fort Collins, Colorado		
Jon Alstad	Corridor Compatibility Application Manager	M.S. Range Science B.S. Animal Science A.A. Liberal Arts 20 Years Experience
George High	Project Manager	B.S. Biology 34 Years Experience
Peggy Roberts	Assistant Project Manager, Public Involvement Specialist	B.J. Journalism/PR M.S. Public Communications (in progress) 17 Years Experience
Erik Bray	Wildlife and Fisheries	B.S. Wildlife Management and Biology 10 Years Experience
Jessica Rubado	Special Status Species	B.S. Fisheries and Wildlife Science 9 Years Experience
Terra Mascarenas	Soils	B.S. Soil Science (Environmental Concentration) 11 Years Experience
Rachel Ridenour	Vegetation and Special Status Plant Species	B.S. Natural Resource Management 1 Year Experience
Kim Munson	Cultural Resources	M.A. Anthropology B.A. Anthropology 13 Years Experience
Bill Berg	Geology, Mineral Resources, and Paleontology	M.S. Geology 30 Years Experience
Billy Williams	GIS	B.S. Forestry Science 1 Year Experience
Matt Brekke	Technical Support	B.S. Wildlife Biology 2 Years Experience
Susan Coughenour	Technical Editor	Two Years General Studies 25 Years Experience
Basin Electric Power Cooperative – Bismarck, North Dakota		
Duey Marthaller	Project Manager	M.S. Civil Engineering B.S. Civil Engineering 29 Years Experience Registered Professional Engineer

Table D-1 Qualifications of Application Preparers

Company and Person	Responsibilities	Education and Experience
Kevin Solie	Environmental Analyst	M.S. Geology B.S. Geology B.S. Geological Engineering 17 Years Experience Engineer in Training
Mike Murray	Right-of-Way	A.A. Business Administration Various Courses through International ROW Association SR/WA (Senior ROW designation) 8 Years Experience
Valeree King	Right-of-Way	Interstate Business College – Legal Writing and Descriptions Various Courses through International ROW Association 16 Years Experience
Don Hellman	Right-of-Way	2 yr degree Electrical tech Associate Arts and Science degree Various courses through International ROW Association 36 Years experience working for Utility Companies with the last 16 years in ROW
Duffy Heinle	Right-of-Way	A.A. Criminal Justice A.S. Polygraph Sciences B.A. College Studies 1 Year Experience
Veda Christman	Right-of-Way	B.S. Business Administration Various courses through International ROW Association 10 Years Experience
Jason Brekke	GIS Analyst	BS Geography 7 Years Experience
Curt Pearson	Corporate Communications	B.S. Business Administration M.B.A. Cert. Cooperative Communicator 30 Years Experience
Metcalf Archaeological Consultants – Eagle, Colorado		
Patrick O'Brien	Cultural Resources	M.A. Anthropology B.A. Anthropology 17 Years Experience

D.5 Maps

Detailed maps (i.e., **Exhibits**) of the proposed corridor have been provided in the **Exhibits** section.

D.6 Permits, Licenses, Approvals, and Consultation Requirements

Permits, consultations, and approvals would be required from various federal and state agencies, which would include:

- North Dakota Public Service Commission – Certificate of Corridor Compatibility and Route Permit;
- Western – System Interconnection Authorization, compliance with the National Environmental Policy Act and Native American Consultation;
- USFWS – Compliance with the ESA (section 7 consultation), compliance with the MBTA;
- State of North Dakota Historic Preservation Office – Compliance with the NHPA (section 106 consultation);
- Federal Aviation Administration – Aeronautical study with a determination of hazards and requirements for painting and/or lighting;
- Federal Communications Commission – Agency may require registration and lighting of tower less than 200 feet tall;
- North Dakota Department of Transportation – Permit to construct and operate a transmission line across or within highway ROWs;
- Burlington Northern-Santa Fe Railroad – Authorization to construct and operate a transmission line across railroad ROWs;
- NDGFD – Consultation to identify any state-listed species of concern that could potentially be affected by the proposed Project; and
- Willliams County – Acquire Zoning Permit.

D.7 References

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Appendix B

Notification and Public Comments

Williston to Tioga Transmission Project
Notification List

FEDERAL AGENCIES

U.S. Fish and Wildlife Services
Field Supervisor for Ecological Services
3425 Miriam Avenue
Bismarck, ND 58501-7926

U.S. Army Corps of Engineers
Omaha District
Col. David Press
District Commander
106 South 15th Street
Omaha, NE 68102-1618

Federal Emergency Management Agency
Regional Environmental Officer
Department of Homeland Security
P.O. Box 25267
Denver, CO 80225-0267

Federal Aviation Administration
Great Lakes Region
O'Hare Lake Office Center
2300 East Devon Avenue
Des Plaines, IL 60018

Federal Highway Administration
1471 Interstate Loop
Bismarck, ND 58503-0567

U.S. Environmental Protection Agency
NEPA Program – 8EPR-N Mail Code
999 18th Street, Suite 300
Denver, CO 80202-2466

STATE AGENCIES

North Dakota NRCS State Office
220 East Rosser Avenue
Federal Building
Room 270
Bismarck, ND 58501

North Dakota State
Farm Service Agency
1025 28th Street S
Fargo, ND 58103-2372

North Dakota Department of Agriculture
600 E. Boulevard Ave., Dept. 602
Bismarck, ND 58505-0020

North Dakota Forest Service
Molberg Center
307 First Street East
Bottineau, ND 58318

North Dakota Game and Fish Department
100 N. Bismarck Expressway
Bismarck, ND 58505-0830

North Dakota State Historical Board
612 East Boulevard Avenue
Bismarck, ND 58505-0830

North Dakota Indian Affairs Commission
600 East Boulevard Avenue
1st Floor Judicial Wing
Room 3117
Bismarck, ND 58505

North Dakota State Land Department
1707 North 9th Street
P.O. Box 5523
Bismarck, ND 58506-5523

North Dakota Department of Commerce
Division of Community Services
Century Center
1600 East Century Avenue, Suite 2
Bismarck, ND 58503

North Dakota Department of Transportation
608 East Boulevard Avenue
Bismarck, ND 58505

North Dakota Public Service Commission
600 East Boulevard Ave., Dept. 408
Bismarck, ND 58505

North Dakota Transmission Authority
State Capitol, 14th Floor
600 E. Boulevard Ave., Dept. 405
Bismarck, ND 58505

North Dakota Department of Health
Environmental Health Section
918 East Divide Avenue
Bismarck, ND 58501

North Dakota Parks and Recreation Department
1835 Bismarck Parkway
Bismarck, ND 58504

ELECTED OFFICIALS

The Honorable Earl Pomeroy
North Dakota Congressional Delegation
Room 328
Federal Building
220 East Rosser Avenue
Bismarck, ND 58501

The Honorable Byron Dorgan
North Dakota Congressional Delegation
312 Federal Building
P.O. Box 2579
Bismarck, ND 58502

The Honorable Kent Conrad
North Dakota Congressional Delegation
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Senator John M. Andrist
North Dakota State Legislature
P.O. Box E
Crosby, ND 58730-0660

Representative Bob Skarphol
North Dakota State Legislature
P.O. Box 725
Tioga, ND 58852-0725

Representative Dorvan Solberg
North Dakota State Legislature
11395 66th Street NW
Ray, ND 58849-9473

COUNTY

Mountrail County Farm Service Agency
21 1st Street SE
Standley, ND 58784

Williams County Farm Service Agency
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Williston, ND 58801

Martin Hanson
Williams County Commissioners
P.O. Box 2047
Courthouse
205 East Broadway
Williston, ND 58802-2047

Raymond Schmidt
Williams County Commissioners
P.O. Box 2047
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Mountrail County Commissioners
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David Hynek
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Shoshone Business Council
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Arapahoe Business Council
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JoAnn White
Tribal Historic Preservation Officer
Northern Arapahoe Tribe
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P.O. Box 542
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Cecelia Firethunder
President
Oglala Sioux Tribal Council
P.O. Box H
Pine Ridge, SD 57570

Rodney Bordeaux, President
Rosebud Sioux Tribal Council
P.O. Box 430
Redbud, SD 57570

Russell Eagle Bear, THPO
Rosebud Sioux Tribe of Indians
P.O. Box 809
Rosebud, SD 57570

Herold Frazier, Chairman
Cheyenne River Sioux Tribal Council
P.O. Box 590
Eagle Butte, SD 57625

Albert Lebeau, THPO
Cheyenne River Sioux Tribe
P.O. Box 590
Eagle Butte, SD 57625

Ron His-Horse-is-Thunder
Chairman
Standing Rock Sioux Tribal Council
P.O. Box D
Fort Yates, ND 58538

Tim Mentz, THPO
Standing Rock Sioux Tribe
P.O. Box D
Fort Yates, ND 58538

Carle Venne, Chairman
Crow Tribal Council
P.O. Box 159
Crow Agency, MT 59022

Darrin Oil Coyote
Cultural Director
Crow Tribal Administration
P.O. Box 159
Crow Agency, MT 59022

John Morales, Chairman
Fort Peck Tribes
P.O. Box 836
Poplar, MT 59255

Curley Youpee, THPO
Fort Peck Tribes
P.O. Box 836
Poplar, MT 59255

Marcus D. Wells
Chairman
Three Affiliated Tribes Business Council
404 Frontage Road
New Town, ND 58763

ORGANIZATIONS

Ducks Unlimited
3502 Franklin Avenue
Bismarck, ND 58501

The Nature Conservancy
P.O. Box 1156
Bismarck, ND 58502-1156

Sierra Club, Dacotah Chapter
311 E. Thayer Ave.
Suite 113
Bismarck, ND 58501

POTENTIALLY AFFECTED LANDOWNERS

1,000+ Individuals

Summary of Key Public Comments

Agricultural Impacts

- Preference for locating the transmission line south of Springbrook, Epping, and Ray to reduce crossing cropland.
- Transmission line routing should consider interference with crop spraying.
- Concern about transmission line interference with AM-radio.

Routing Options

- Preference for the northernmost route because it is straight alignment.

Biology Resources

- Consider potential impacts to a well-established prairie dog colony on the 20-acre parcel south of NW 53rd Street in Sand Creek, west of the Williston Airport.

Cultural

- Commenter noted two stone circles on hilltops in SE1/4 Section 27 T99 R156N and the SE1/4 of Section 15 T99 R156N.
- The transmission line route should avoid tipi rings located in Section 34, T155, R101.
- Concern about the construction of the transmission line affecting Native Americans, since the Cheyenne historically and traditionally travelled and camped with the Mandan in the North Dakota region.

Public Safety

- Concerns about health and safety issues for those living near transmission lines and the potential effects to pregnant women.

Recreation

- Consideration should be considered to stray bullets from hunters hitting the transmission lines.

Land Use

- Landowner noted on Sheet Map 1 of 3 a Verizon cell tower in Section 26.
- Concern expressed about the transmission line route in the northern corridor affecting state school trust lands and impacts to potential oil drilling on trust lands, which is a large income producer for the school trust.
- Landowner expressed concern about potential impacts to future residential and wind farm development on a 20-acre parcel south of NW 53rd Street in Sand Creek and west of the airport.
- Transmission line should not be routed on Segment 20 to avoid landowner's property in order to maintain current property value.
- Landowner prefers transmission line not be routed on their property (Missouri Ridge TWP ~ 2 NWSE T155 R101, Section 34) to avoid impacts to site of future home.
- Landowner request that the transmission line be routed along the section line instead of crossing property at an angle.

- Prefers Segments 30 – 60 and that the transmission line be routed along section lines in Sections 18 and 19.
- Concern expressed about routing the transmission line through farmsteads north of Williston.
- Transmission line routing should avoid future runway expansion in Segment 14.
- Concern expressed about impacts to the airport approach zone height restrictions northwest of Williston.
- Prefers Segment 130 and 140 to Segment 40.
- Prefers the most northern route because it is straighter.
- Concern about the impact of the transmission line on oil and gas exploration; questions about distance a drilling rig and seismograph from the transmission line.
- Transmission line route should avoid the Soine/Pioneer Cemetery south/southeast of Ray, North Dakota.
- The North Dakota Department of Transportation expressed no concerns about the transmission line route; however, they requested the transmission line be located parallel to property lines and off the highway right-of-way for public safety purposes.
- Transmission line route should avoid croplands in NEWNW Sec. 11-155-01.

Vegetation

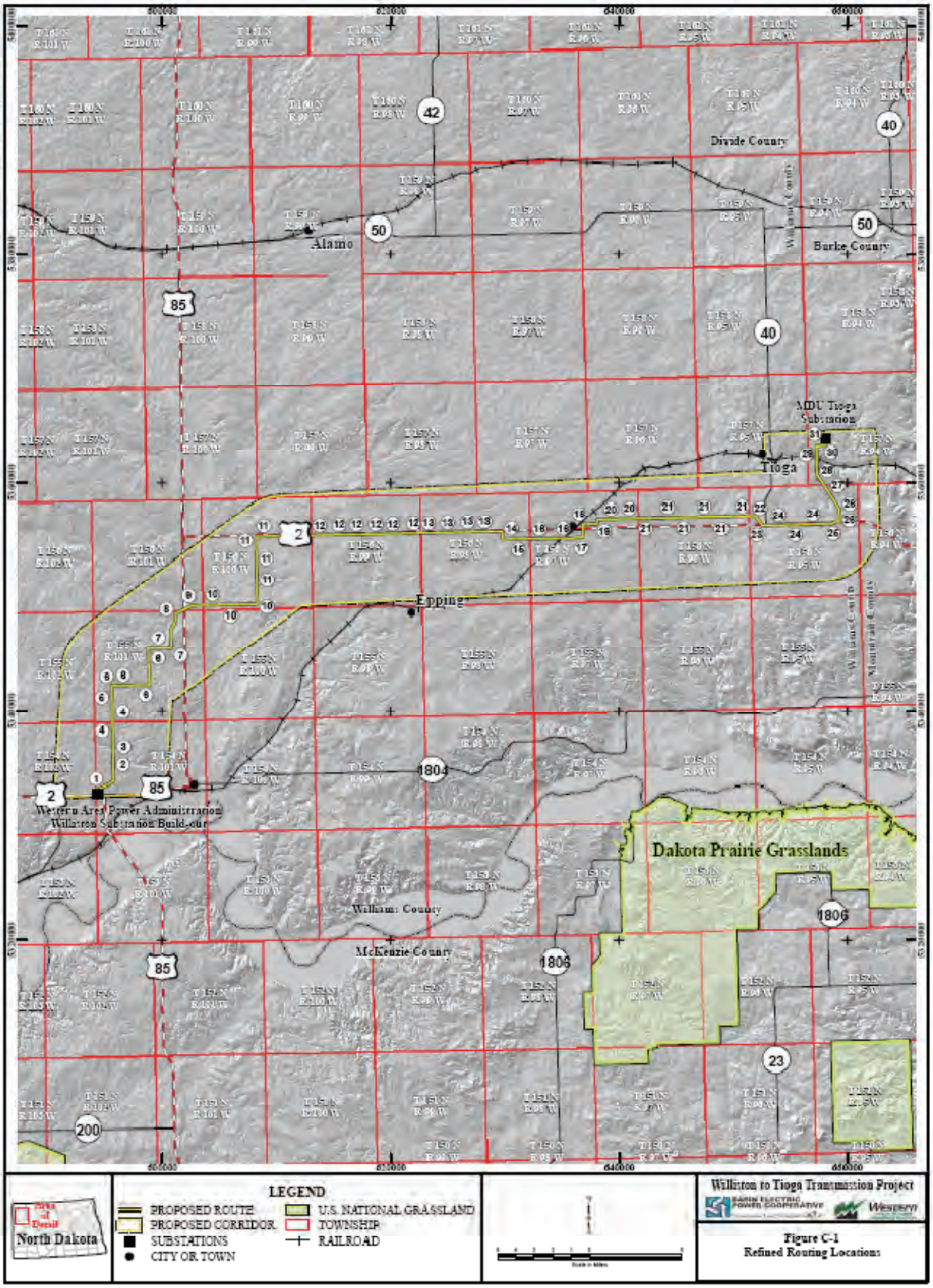
- Potential impacts to native prairie grasses on 20-acre parcel south of NW 53rd Street in Sand Creek, west of the airport in Williston.
- Concern about disturbance to native prairie, riparian corridors, and wetlands associated with the construction of H-frame transmission line structures.
- All aboveground appurtenances should avoid wetland areas.
- Following construction, disturbed areas should be reclaimed to pre-project conditions.

Visual Resources

- Segments 100 to the north and Segment 40 to the south could impact views from residence.

Appendix C

Detailed Routing


Divide County
Burke County
Alamo
Tioga
MDU Tioga Substation
Epping
Western Area Power Administration Williston Substation Build-out
Dakota Prairie Grasslands
Williams County
McKenzie County
1804
1806
42
40
50
85
2
200
23
LEGEND
PROPOSED ROUTE
PROPOSED CORRIDOR
SUBSTATIONS
CITY OR TOWN
U.S. NATIONAL GRASSLAND
TOWNSHIP
RAILROAD
North Dakota
Williston to Tioga Transmission Project
Figure C-1
Refined Routing Locations

Williston to Tioga 230-kV Transmission Line
Route Selection and Analysis Summary

Map #	Section	Township	Range	Routing Rationale/Discussion
1	19	154	101	Western is adding a new 230-kV bay on the north side of their existing substation. Existing lines and industrial development limit the space available to route the proposed new line. The Preferred Route diagonals NE to the section line before proceeding north.
2	18	154	101	The Preferred Route proceeds north along the east section line. An elk farm is avoided as well as houses east and west of the route. At the north end of the section, the line diagonals 0.25 mile west to accommodate a house and is preferred by the landowner.
3	7, 8	154	101	The Preferred Route continues north 0.50 mile before turning back to the section line in the north 1/2 of the section.
4, 4, 6	6, 31, 32	154 155	101 101	The land use is pasture and cropland as the Preferred Route proceeds north along the section line.
6	30	155	101	Land use is pasture and cropland. The Preferred Route continues along the county road. If zoning regulations allow, the route will be as close to the road right-of-way edge as possible.
8	19, 20, 21, 22, 16	155	101	Extensive field reconnaissance and landowner interviews were done to determine a route in this difficult area. Residences in Sections 13, 17, 19, and 20 make routing the line difficult. The Preferred Route follows the south edge of Sections 20 and 21 and the east edge of Sections 21 and 16. Land use is innately pasture with some cropland. Rough terrain in the middle of Sections 16 and 21 is avoided. Also, a landing strip and residence in the SW corner of Section 16 is avoided.
7	10, 11	155	101	To minimize the impact on cropland, the Preferred Route is adjacent to the south edge of Section 10. The Preferred Route turns north just under 0.25 mile into Section 11. The Preferred Route turns at this location to avoid a pipeline.
8	2	155	101	A U.S. Highway 2 crossing location near the NE corner of Section 2 was selected. A suitable crossing was difficult to find because of rough terrain, residences, and businesses. This proposed crossing has high ground on both sides and is not close to a residence or business. The Preferred Route through Section 2 minimizes impact on cropland.

Williston to Tioga 230-kV Transmission Line
Route Selection and Analysis Summary

Map #	Section	Township	Range	Routing Rationale/Discussion
8	36	156	101	The land use in this section is pasture. The line diagonals 0.25 mile north to avoid a school and two pipelines.
10	31 ,32, 33	156	100	The Preferred Route heads east, 0.25 mile north of the section line to follow a property line. An irrigation system is planned in Section 31. The line was routed around the proposed irrigation. At the east edge of Section 33, the line turns north and follows the section line.
11	28, 21, 16, 15, 14, 13	156	100	The Preferred Route continues to follow the section line. At the north end of Section 15, the line turns east and parallels U.S. Highway 2. The line would be adjacent to the edge of the highway right-of-way to minimize the impact on the adjoining fields.
12	18, 17, 16, 15, 14, 13	156	99	The Preferred Route is adjacent to the U.S. Highway 2 right-of-way. Land use is mainly pasture. No residences exist on this side of the highway. Also, the area north of U.S. Highway 2 is cropland where lentils and peas are grown. These crops require use of aerial spraying. A transmission line would interfere with crop spraying. Discussions were held with crop spraying pilots and they prefer the route along the highway and said the line would not be a problem for them.
13	18, 17, 16, 15	156	98	The Preferred Route continues along the highway right-of-way edge. The land use is cropland and pasture. See write-up for T156N, R99W, for why the line is adjacent to the highway.
21	14	156	98	The line continues along the highway right-of-way for 0.50 mile, then turns south. The Preferred Route turns south to avoid residences along the highway and the city of Ray. Land use is cropland. The Preferred Route follows the 0.25 line, which is the borderline between fields minimizing the impact on farming.
21	13	156	98	The Preferred Route continues along the 0.25 line. The line would be on field boundaries, and residences along the highway are avoided.
18	18, 17	156	97	The Preferred Route continues along the 0.25 line. The line would be on field boundaries, and residences along the highway are avoided. At the east edge of Section 17, the line angles around a wetland area and a cultural site.

Williston to Tioga 230-kV Transmission Line
Route Selection and Analysis Summary

Map #	Section	Township	Range	Routing Rationale/Discussion
18	16	156	97	As the Preferred Route approaches the south edge of the Ray golf course, the route angles to the south side of the road to avoid the golf course. Just past the golf course at about the center of the section, the proposed route angles slightly north, then parallels the 0.25 line to the east edge of the section. The line then turns north and follows the section line. The NW1/4 of Section 16 is owned by the city of Ray. The city agrees with the Preferred Route.
18	9	156	97	The Preferred Route continues into Section 9 along the east section line for 0.25 mile. Then the route would turn east along a property line.
20	10	156	97	The Preferred Route continues along a property line for 0.75 mile then turns north for 0.25 mile then turns east for 0.25 mile to the section line.
20, 21	11, 12	156	97	The route continues along the 0.25 line. Land use is cropland. The Preferred Route is mostly on the property line to minimize the impact. The line cannot run adjacent to the highway in this area because of residences and an existing water pipeline.
21	7, 8, 9, 10, 11, 12	156	96	The route continues along the 0.25 line. Land use is cropland. The Preferred Route is mostly on the property line to minimize the impact. The line cannot run adjacent to the highway in this area because of residences and an existing water pipeline.
22	7	156	95	The Preferred Route extends 0.50 mile into Section 7 before it diagonals to the south side of the highway. The route goes back to the highway to avoid residences and businesses along State Highway 40 just south of Tioga.
24	18	156	95	The Preferred Route enters Section 18 as it crosses U.S. Highway 2 and immediately turns east along the highway right-of-way. A residence and oil well are avoided.
24	17, 16, 15	156	95	The Preferred Route continues along the south side of the highway right-of-way. Residences on the north side are avoided. Land use is cropland. Impact to cropland would be minimal.
23	14	156	95	The Preferred Route continues along the south side of the highway for about 1/3 mile. It then crosses the highway to avoid a residence.

Williston to Tioga 230-kV Transmission Line
Route Selection and Analysis Summary

Map #	Section	Township	Range	Routing Rationale/Discussion
24	11, 12	156	95	The Preferred Route runs parallel to U.S. Highway 2 on the north side. In the SE corner of the section, it would pass between the highway and a group of tanks. Land use is cropland. The line would cross over into Section 12 before turning north for about 0.75 mile. Here the route would turn to the NW and go back into Section 11. The location of this turn was selected to avoid cropland in Section 1 and minimize impact to cropland in Section 11. This angle point location is preferred by the landowner.
27	2	156	95	The land use in this section is pasture. Cropland is avoided by going diagonally through the section. The elevation of the structure tops was reviewed relative to the Tioga Airport. The Preferred Route meets clearance requirements for the airport.
28	31	157	94	The Preferred Route goes diagonally to the center of the section and then proceeds north on the 0.25 line. The line also meets regulations regarding the Tioga Airport.
29	30	157	94	The Preferred Route is adjacent to the N-S 0.25 line to avoid a field. Land use is pasture and cropland. The impact on farming is minimal because the line will not be in the field. The landowner prefers this route.
30	19	157	94	The Preferred Route enters the section at the south 1/4 corner and proceeds east along a grass strip adjacent to cropland. The line would parallel an existing line within this grass strip. The angle point was selected to avoid a wetland.
31	20	157	94	The Preferred Route turns north on the west edge of the section and would proceed north to the Tioga Substation. The line would parallel an existing distribution line and enter the substation from the west.

Appndix D

Project-specific Mitigation Measures

Appendix D

Williston to Tioga 230-kV Transmission Project
Mitigation and Reclamation Measures

1. Jurisdictions, Land Use, and Agricultural Practices

Land Use

- The movement of crews and equipment will be limited to the right-of-way (ROW) and other areas that have been surveyed for cultural, historical and biological resources. The construction contractor will limit movement on the ROW so as to minimize damage to rangeland, cropland, or property.
- The preferred transmission line route will be routed 500 feet or more away from inhabited structures.

Agricultural Practices

- The proposed transmission line will span fields to the extent feasible.
- The proposed transmission line will be routed along section and mid-section lines to avoid diagonal crossings of fields, when possible.
- Where practical, construction activities will be scheduled during periods when agricultural activities would be minimally affected or the landowner will be compensated accordingly.
- Fences, gates, and similar improvements that are removed or damaged will be promptly repaired or replaced. New gates may be installed, if deemed appropriate.
- ROW will be purchased through negotiations with each landowner affected by the proposed project and payment will be made of full value for crop damages or other property damage during construction or maintenance.
- When weather and ground conditions permit, all deep ruts that are hazardous to farming operations and to movement of equipment would be eliminated or compensation will be provided if the landowner desires. Such ruts will be leveled, filled, and graded, or otherwise eliminated in an approved manner. Ruts, scars, and compacted soils from construction activities in cropland or rangeland will be loosened and leveled by scarifying, harrowing, disking, or other appropriate method. Damage to ditches, terraces, roads, and other features of the land will be corrected. The land and other features will be restored as nearly as practicable to their original conditions.

2. Physiography, Topography, Soils, Geology, and Minerals

Soils

- Excess soils will be hauled off-site to an approved landfill.
- Erosion and sediment controls will be established prior to construction, then maintained and controlled through application of storm water prevention plans.
- Sediment control measures (e.g., installation of silt fences) will be used, where appropriate, to prevent sediment from moving offsite and into water bodies.
- Maintenance operations will be scheduled during periods of minimum precipitation to minimize the potential of surface runoff and to reduce the risk of erosion, rutting, sedimentation, and soil compaction. However, emergency repairs to the proposed transmission line may occur during periods of inclement weather.

- Temporary laydown areas will be located in previously disturbed areas and areas previously surveyed for cultural and biological resources.

3. Geology

- Transmission line structures will not be sited on any potentially active faults.
- Transmission line structures will not be sited on lands known to have the potential landslides.

4. Hydrology and Drainage

- A 100-foot buffer will be established adjacent to wetlands and creeks, where practicable, to prevent or minimize impacts to those ecosystems. Construction vehicles and equipment will not traverse through wetlands and riparian areas, thereby avoiding direct impacts to these sensitive areas.
- Transmission line structures will be sited so that streams and drainages are spanned and remain undisturbed. Construction and maintenance access also will avoid these areas.
- Staging areas and refueling areas will not be located near surface water bodies.
- Areas that need to be cleared during construction will be revegetated with an approved native seed mix as soon as technically feasible to minimize soil erosion and sediment runoff.
- A Spill Prevention and Response Plan will be developed prior to the start of construction to prevent the potential for spills of hazardous substances into streams and drainages, and potential contamination of groundwater. The plan will include a procedure for storage of hazardous materials and refueling of construction equipment outside of riparian zones, spill containment and recovery plan, and notification and activation protocols.
- Refueling of construction vehicles will occur at commercial fueling facilities and at staging areas, if onsite fuel storage is needed for refueling.
- A Storm Water Pollution Prevention Plan (SWPPP) will be developed and implemented prior to initial construction activities. This plan will include an analysis of materials that will be utilized and site activities that could potentially impact storm water and the associated mitigation measures to minimize that potential. Plan implementation will include regular inspections of areas under construction, material storage and laydown areas, and structural devices for storm water management. All construction personnel will be trained on the plan and will be required to comply with its requirements and the maintenance of all mitigation measures. The SWPPP will be maintained until final stabilization of all disturbed areas is completed.

5. Vegetation Resources

- In areas where wooded areas cannot be avoided, the proposed transmission line will be placed in areas with the lowest density of trees, whenever feasible, thereby reducing the number of trees that will require removal within the construction ROW.
- Woody species (i.e., trees and shrubs) removed (i.e., cut or mowed) during construction will be replaced at a 2:1 ratio (i.e., 2 plants would be planted for every plant removed, as required by the North Dakota Public Service Commission [NDPSC]). If possible, the replacement trees would be planted in the same watershed where trees were removed. Suitable sites would be identified through cooperation with landowners and appropriate State or local agencies.
- Prior to construction, a woody (e.g., trees and shrubs) species inventory will be conducted in areas where vegetation will be removed (i.e., cut or mowed) to determine the numbers, sizes, and locations of woody species present in these areas. A Woody Species Inventory Report will be developed, which will summarize the information collected during the woody species inventory. In addition, a Woody Species Planting Plan will be developed that will provide detailed information regarding the numbers, sizes, and locations of species that will be planted and methods used to plant these species.

Numbers, sizes, locations, and species to be replanted will be determined through consultation with appropriate State, local agencies, and landowners

- All vegetative materials resulting from clearing operations will either be chipped on site, or removed and disposed in a permitted facility.
- Existing native vegetation within the construction ROW will be preserved whenever feasible.
- Surface disturbance areas will be reclaimed using native species and will be planted at the appropriate times, as recommended by agencies or landowners, to reestablish native vegetative cover and minimize the potential for invasion by non-native species.
- Wetland and riparian communities will be spanned by the proposed transmission line thereby avoiding impacts to these ecosystems.
- Erosion and sedimentation controls will be implemented to minimize indirect impacts to wetlands and riparian areas.
- The ROW would be maintained to remove woody species that could become established and become a hazard to the transmission line.

6. Wildlife and Fisheries

- Prior to surface disturbance activities during the migratory bird (not including raptors) breeding season (April 15 through July 15), a qualified biologist would survey within suitable habitat (i.e., non-cultivated land) for nesting activity and other evidence of nesting (e.g., mated pairs, territorial defense, birds carrying nest material, transporting food). If active nests are located, or other evidence of nesting is observed, appropriate protection measures, including establishment of buffer areas and constraint periods, would be implemented until the young have fledged and dispersed from the nest area. These measures will be implemented on a site-specific and species-specific basis, in coordination with Western.
- If construction is to occur during the breeding season for raptors (February 1 through August 15), prior to construction activities, raptor breeding surveys will be conducted by a qualified biologist through areas of suitable nesting habitat to identify any active nest sites within 0.5 mile (1.0 mile for bald eagles) from the project area. If applicable, appropriate protection measures, including seasonal constraints and establishment of buffer areas will be implemented at active nest sites until the young have fledged and have dispersed from the nest area. These measures will be implemented on a site-specific and species-specific basis, in coordination with Western.
- Standard measures to minimize avian collision risk with overhead transmission lines, as outlined in *Mitigating Bird Collisions with Power Lines* (Avian Power Line Interaction Committee [APLIC] 1994), will be examined and appropriate measures will be developed in coordination with the United States Fish and Wildlife Service (USFWS) and North Dakota Game and Fish Department (NDGFD).
- Adequate raptor proofing designs, as described in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006), will be implemented on the structures in coordination with the NDGFD to minimize raptor use of these structures.
- Holes that are drilled or excavated for pole placement or foundation construction and left unattended overnight will be marked and secured with temporary fencing and plywood covers to reduce the potential for livestock and wildlife entering the holes and for public safety.

7. Special Status Species and Noxious Weeds

Special Status Species

- BEPC will implement additional mitigation measures developed during section 7 consultations, as specified by the USFWS.

Noxious Weeds

- Prior to the initiation of construction activities, construction vehicles and equipment would be thoroughly cleaned to prevent the possible spread of noxious weed seeds within the project area.
- Noxious weeds present within proposed disturbance areas will be controlled prior to the initiation of construction to prevent the potential spread of noxious weeds.
- If noxious weeds are observed in the surface disturbance areas, populations will be controlled with the application of herbicides, which will be applied by a certified herbicide applicator in accordance with label instructions and State and local County Weed Board regulations. Biological control methods (i.e., use of spurge beetles, etc.) may also be considered for weed control, in consultation with appropriate agencies.
- Herbicides will not be used near surface water.
- The construction ROW and other surface disturbance areas will be monitored for noxious weeds for a three-year period following construction and reclamation.
- Landowners will be consulted regarding all noxious weed control measures and issues.
- Herbicide applications will occur in late spring or early summer to eradicate or control noxious weeds before they mature.

8. Archaeological and Historic Resources

- All cultural resources will be evaluated using the criteria of eligibility for the National Register of Historic Places established at 36 Code of Federal Regulations Part 60.4. Consultation with the appropriate parties (i.e., North Dakota State Historic Preservation Officer [SHPO], interested Native American groups) will be initiated prior to making the determination. Western will then make a Determination of Eligibility, as required by Section 106 of the National Historic Preservation Act (NHPA) and consult with the appropriate parties to determine any mitigation efforts necessary to eliminate or reduce adverse effects.
- Cultural resource surveys will be conducted within proposed surface disturbance areas prior to construction. A Class III cultural resources report will be prepared and sent to Western and the North Dakota SHPO for review and consultation.
- If any previously unknown cultural resources or human remains are discovered during project construction, all work within 200 feet of the discovery that might adversely affect the cultural resource will cease until Western, in consultation with the appropriate parties, can evaluate the discovery. Western will be notified immediately (within 24 hours) and will have a cultural resource specialist or a tribal monitor with the proper expertise for the suspected resource type on-site as soon as possible. Construction will not proceed until authorized by Western.

9. Paleontological Resources

- If paleontological resources are observed during construction, construction activities in the area will cease and Western will be contacted to discuss the importance of the paleontological resources and develop appropriate mitigation.

10. Transportation Network

- The transportation of materials and equipment will be conducted in accordance with North Dakota Department of Transportation regulations.
- All necessary provisions will be made to conform to safety requirements for maintaining the flow of public traffic. Construction operations will be conducted to offer the least possible obstruction and inconvenience to public traffic.
- Public roads, section lines and existing trails will be used, to the extent practicable, to access the proposed transmission line.

11. Socioeconomic Values

- Potential impacts to populations and housing within the project area will be minimized.

12. Hazardous Materials and Solid Waste

- The proposed project will likely be subject to the requirements associated with hazardous waste management as a small quantity generator as described in 40 CFR 262.

13. Meteorology and Air Quality

- The contractors will apply standard environmental protection measures associated with construction.
- Fugitive dust emissions generated as a result of surface disturbance activities and vehicle use of access roads will be controlled by the periodic application of water, if necessary.
- Vehicles and equipment will be properly maintained to avoid excessive emission of exhaust gases due to poor engine adjustments.
- The speed of vehicles traveling on unpaved roads will be limited, to the extent practicable, to reduce the generation of fugitive dust.
- Burning or burying waste materials within the ROW will not be permitted and all waste materials will be disposed of at permitted waste disposal areas or landfills.

Appendix E

Special Status Species

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
MAMMALS								
Arctic shrew	*Sorex arcticus*	ND Level III	Most commonly found in grass-sedge marshes, wet meadows, and other moist openings in and adjacent to boreal forest. Also present, in fewer numbers, in tamarack-spruce bogs and cedar swamps. Small globular nests are usually made aboveground under logs or other material.	Riparian	No	Yes. This species and its required habitat are not found within the Project area.	Mountrail	Hagen et al. 2005; NatureServe 2008
Grey wolf	*Canis lupis*	**FE**; ND Level III	This species inhabits a wide range of habitats where large ungulates are found. It utilizes mixed hardwood-coniferous forests in wilderness and sparsely settled areas, to forest and prairie landscapes dominated by agricultural and pasture lands.	Any	Yes – The occurrence of this species in the Project area would be as a migrant only.	Yes. Migratory occurrence of this species is highly unlikely and the Project would not impact this species due to the fact that it's mobile.	Mountrail Williams	Hagen et al. 2005; USFWS 2008b
Long-eared myotis	*Myotis evotis*	ND Level III	This species typically roosts in rugged terrain in small groups or alone in rock crevices and under tree bark. It is associated with coniferous trees. This species hibernates in caves and abandoned mines.	Rugged terrain and coniferous trees	Yes – The occurrence of this species would be limited to foraging activities.	Yes. Use of the Project area by this species for foraging is unlikely. In addition, foraging would occur at night. Considering that construction activities would primarily occur within the day, and this species is mobile during foraging, the Project would not impact this species and is therefore not carried forward for detailed analysis.	Mountrail Williams	Hagen et al. 2005

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Long-legged myotis	*Myotis volans*	ND Level III	This species typically roosts in rugged terrain in small groups or alone in rock crevices and under tree bark. They also are associated with coniferous trees.	Rugged terrain and coniferous trees	Yes – The occurrence of this species would be limited to foraging activities.	Yes. Use of the Project area by this species for foraging is unlikely. In addition, foraging would occur at night. Considering that construction activities would primarily occur within the day, and this species is mobile during foraging, the Project would not impact this species and is therefore not carried forward for detailed analysis.	Mountrail Williams	Hagen et al. 2005
Pygmy shrew	*Sorex hoyi*	ND Level II	This species prefers moist areas and riparian woodlands associated with mixed and tall grass prairies.	Riparian Woodlands	No	Yes. The Project area is located outside of the range of this species.	Mountrail	Hagen et al. 2005; NatureServe 2008.
Richardson's ground squirrel	*Spermophilus richardsonii*	ND Level II	This species prefers well grazed pastures of native or tame grass in areas of sandy loam or gravelly soils. They also can be found near agricultural fields which provide cereal grain as a food source.	Mixed-grass prairie	Yes	Yes. Individuals or evidence of this species was not detected in the vicinity of the Project area during 2008 survey efforts.	Mountrail Williams	Hagen et al. 2005
Sagebrush vole	*Lemmiscus curtatus*	ND Level III	This species prefers semi-arid areas with loose soil; usually a combination of grass and sagebrush.	Semi-arid lands	No	Yes. The required habitat for this species (sagebrush) is not located in the vicinity of the Project area.	Mountrail Williams	Hagen et al. 2005

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Swift fox	*Vulpes velox*	ND Level II	This species is found in short-, mid-, and mixed-grass prairies with gently rolling hills. Den sites are typically located on flat areas or along slopes or ridges that provide a good view. Dens are typically on sites dominated by blue grama or buffalo grass.	Grasslands	Yes – historic	Yes. This species is believed to be extirpated from North Dakota.	Mountrail Williams	Hagen et al. 2005
Western small-footed myotis	*Myotis ciliolabrum*	ND Level III	This species typically roosts in rugged terrain in small groups or alone in rock crevices and under tree bark. They are only found in North Dakota's badlands and also are associated with coniferous trees.	Rugged terrain and coniferous trees	Yes – The occurrence of this species would be limited to foraging activities.	Yes. Use of the Project area by this species for foraging is unlikely. In addition, foraging would occur at night. Considering that construction activities would primarily occur within the day, and this species is mobile during foraging, the Project would not impact this species and is therefore not carried forward for detailed analysis.	Williams	Hagen et al. 2005
BIRDS								
American advocet	*Recurvirostra americana*	ND Level II	This species prefers ponds or lakes with exposed, sparsely vegetated shorelines. Peak breeding season: mid-May to early July.	Ponds or Lakes	Yes	No. However, the Project crosses a limited amount of marginally suitable habitat.	Mountrail Williams	Hagen et al. 2005
American bittern	*Botaurus lentiginosus*	ND Level I	This species inhabits a variety of wetlands, particularly large wetlands with tall emergent vegetation. This migratory bird also will nest in tall, dense grassland. Breeding season: mid-June to late-July.	Wetlands and tall, dense grasslands	Yes	No. However, the Project crosses a limited amount of marginally suitable habitat.	Mountrail Williams	Hagen et al. 2005

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
American white pelican	*Pelecanus erythrorhynchos*	ND Level I	This species nests in colonies on islands or peninsulas in large lakes and sometimes on rivers. These islands consist of gravel, sand, or soil substrate and little to no vegetation. Foraging habitat is located shallow waters of lakes, marshes, and rivers.	Large lakes/ reservoirs	Yes	No. This species and its required habitat are found along the Missouri River and waterbodies throughout North Dakota.	Mountrail Williams	Hagen et al. 2005
Baird's sparrow	*Ammodramus bairdii*	ND Level I	This species prefers extensive tracts of native prairie but will utilize idle, tame grasslands, and lightly to moderately grazed pastures. Stands of grasses with narrow leaves are readily used. Breeding season: early June to late-July.	Extensive tracts of native mixed grass prairie and lightly grazed pastures	Yes	No	Mountrail Williams	Hagen et al. 2005; NatureServe 2008
Bald eagle	*Haliaeetus leucocephalus*	ND Level II	This species typically occurs near large bodies of water that support suitable roosting and foraging habitat. Nest sites typically occur in proximity to open water and generally are found in mature heterogeneous stands of multi-storied trees, but also may nest on cliffs. Winter habitat typically includes areas of open water, adequate food sources, and sufficient diurnal perches and night roosts. Breeding season: January through July. Winter roosting season: November 15 through March 15.	Large rivers and waterbodies	Yes	No. This species and its required habitat are found along the Missouri River and waterbodies throughout North Dakota.	Mountrail Williams	Hagen et al. 2005; USFWS 2008b
Black tern	*Chlidonias niger*	ND Level I	This species prefers wetlands complexes of shallow wetlands with emergent vegetation and open water surrounded by grasslands. Areas of open water are used for foraging and nests are constructed on floating mats of residual vegetation within the emergent vegetation. Breeding season: early June to mid-July.	Shallow wetlands, grassland	Yes	No. However, the Project crosses only a small amount of marginally suitable habitat.	Mountrail Williams	Hagen et al. 2005

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Black-billed cuckoo	*Coccyzus erythropthalmus*	ND Level I	This species inhabits bushy margins or openings of woodlands, and thickets of small trees or shrubs on the prairie. Also uses riparian areas, shelterbelts and wooded areas of towns and farmsteads. Breeding season: mid-June to late-July.	Wooded areas	Yes	No. However, the Project crosses only a small amount of suitable habitat.	Mountrail Williams	Hagen et al. 2005
Bobolink	*Dolichonyx oryzivorus*	ND Level II	This species uses a variety of grasslands but prefers moderate to tallgrass prairie, hayland, and retired croplands. Breeding season: early June to mid-July.	Grasslands	Yes	No	Mountrail Williams	Hagen et al. 2005
Burrowing owl	*Athene cunicularia*	ND Level II	This migratory species inhabits open grasslands with short vegetation and bare ground. Rely exclusively on burrowing mammals to create burrows for nest sites. Breeding season: early May to mid-August.	Prairie dog colonies	Yes	No. This species was detected during 2008 survey efforts in the vicinity of the Project area.	Secondary Range: Mountrail Williams	Hagen et al. 2005
Canvasback	*Aythya valisineria*	ND Level II	This species prefers deep wetlands, particularly semipermanent wetlands with emergent cover. Breeding season: mid-May to mid-August.	Open water	Yes	No. However, the Project crosses only a small amount of marginally suitable habitat.	Mountrail Williams	Hagen et al. 2005
Chestnut-collared longspur	*Calcarius ornatus*	ND Level I	This species is described as a native prairie specialist. Level to rolling, open, arid, mixed-grass and shortgrass prairie is utilized. Breeding season: early May to mid-July.	Native prairie	Yes	No	Mountrail Williams	Hagen et al. 2005
Dickcissel	*Spiza americana*	ND Level II	This species uses a variety of grassland habitats but prefers areas with alfalfa, sweet clover, and other brushy grasslands. Breeding season: early June to mid-August.	Grasslands	Yes	No	Mountrail Williams	Hagen et al. 2005

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Franklin's Gull	*Larus pipixcan*	ND Level I	This species nests in colonies in extensive prairie wetlands with emergent vegetation on floating mats of vegetation, on muskrat houses, or other debris. Foraging occurs over water or within agricultural fields. Breeding season: late-May to mid-July.	Large wetlands, Ag fields	Yes	No. The Project crosses a small amount of suitable habitat.	Mountrail Williams	Hagen et al. 2005
Ferruginous hawk	*Buteo regalis*	ND Level I	This species inhabits a variety of open country and shrublands. Usually avoids cultivated fields, heavily grazed pastures, high elevations, and forest interiors. May be associated with prairie dog towns. Breeding season: late-April to mid-July.	Open country and shrublands	Yes	No	Mountrail Williams	Hagen et al. 2005; Gomes (No Date)
Grasshopper sparrow	*Ammodramus savannarum*	ND Level I	This species inhabits grasslands of intermediate height, clumped vegetation, patches of bare ground, moderate litter depth, and sparse woody vegetation. Also uses native and tame grasslands, CRP, haylands, and croplands. Breeding season: early June to late-July.	Open country	Yes	No	Mountrail Williams	Hagen et al. 2005
Greater Prairie Chicken	*Tympanuchus cupido*	ND Level II	This species occurs within native tallgrass prairie associated with agricultural land. Leks are located in areas of short vegetation and bare ground. Nests are found close to the lek site within dense vegetation and some association to water. Breeding season: late-April to early July.	Native Tallgrass prairie/cropland	No	Yes. This species is believed to be extirpated from most of North Dakota. Current distribution is limited to eastern North Dakota.	Mountrail Williams	Hagen et al. 2005; Svedarsky et al. 2003
Horned Grebe	*Podiceps auritus*	ND Level I	This species breeds in shallow freshwater ponds and marshes with emergent vegetation and substantial amounts of open water. Breeding season: June to early August.	Ponds/wetlands	No	Yes. This species and its required habitat are not found within the Project area.	Mountrail Williams	Hagen et al. 2005

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Interior least tern	*Sterna antillarum*	**FE**; ND Level II	This species utilizes sparsely vegetated shorelines and sandbars within lakes and rivers. Nests are constructed as a hollow scrape on the ground with foraging occurring close to the nesting colony. Breeding season: early June to mid-July.	Sandbars/ shorelines	No	Yes. This species and its required habitat are not found within the Project area.	Mountrail Williams	Hagen et al. 2005; USFWS 2008b; NDNHI 2008
Lark bunting	*Calamospiza melanocorys*	ND Level I	This species inhabits mixed-grass prairies and sagebrush communities. Weedy cropland, Conservation Reserve Program (CRP), hayland, and pastures also are used. Breeding season: early June to early August.	Open country and shrubland	Yes	No	Mountrail Williams	Hagen et al. 2005
LeConte's sparrow	*Ammodramus leconteii*	ND Level II	This species prefers fens, wet meadows, and marshes of sedge grasses. Breeding season: late-May to mid-August.	Wetlands	Yes	No. The Project crosses a small amount of marginally suitable habitat.	Mountrail Williams	Hagen et al. 2005
Loggerhead shrike	*Lanius ludovicianus*	ND Level II	This species prefers open country with thickets of small trees, shrubs, and shelterbelts. Breeding season: early May to mid-July.	Open country with tree clumps	Yes	No	Mountrail Williams	Hagen et al. 2005
Marbled godwit	*Limosa fedoa*	ND Level I	This species requires large expanses of short, sparse to moderately vegetated uplands for nesting and a variety of wetlands for foraging. Requires a high percentage of grass cover and wetlands. Breeding season: early May to late-June.	Prairie adjacent to wetlands	Yes	No. The Project crosses only a small amount of marginally suitable habitat.	Mountrail Williams	Hagen et al. 2005
Nelson's sharp-tailed sparrow	*Ammodramus nelsoni*	ND Level I	This species inhabits fens, shallow-marsh and wet meadow zones of wetlands. Breeding season: mid-June to early August.	Fens, wet meadows	Yes	No. The Project crosses only a small amount of marginally suitable habitat.	Mountrail Williams	Hagen et al. 2005

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Northern harrier	*Circus cyaneus*	ND Level II	This species inhabits open grasslands and wetlands with tall, dense vegetation. This migratory bird will utilize native or tame vegetation in wet or dry grasslands, fresh to alkali wetlands, lightly grazed pastures, croplands, shrubby fields and fallow fields. Breeding season: early May to mid-July.	Grasslands, Agriculture, and wetlands	Yes	No. This species was detected during 2008 survey efforts.	Mountrail Williams	Hagen et al. 2005; Gomes (No Date)
Northern pintail	*Anas acuta*	ND Level II	This species prefers wetland complexes of open water and associated upland native prairie. Breeding season: early April to early July.	Open water	Yes	No. The Project crosses only a small amount of marginally suitable habitat.	Mountrail Williams	Hagen et al. 2005
Peregrine falcon	*Falco peregrinus*	ND Level III	This species uses open expanses of native prairie, badland complexes, rocky cliffs overlooking rivers, lakes, or other water in North Dakota. Nests on high ledges, cliffs, steep sides of buttes, and tall buildings. Only one breeding pair has been identified in Fargo, North Dakota. Breeding season: early May to late-July.	Cliffs	Yes – as a migrant only.	Yes. The only known nesting pair was located in Fargo, North Dakota, and was last observed in 1954.	Mountrail Williams	Hagen et al. 2005; Gomes (No Date)
Piping plover	*Charadrius melodus*	**FT**; ND Level II	This species uses sandy or gravelly beaches and sandbars or alkaline wetlands. Breeding season: late-May to mid-July.	Sandy/gravelly beaches	Yes	No. The Project crosses only a small amount of marginally suitable habitat.	Mountrail Williams	Hagen et al. 2005; USFWS 2008b; NatureServe 2008
Redhead	*Aythya americana*	ND Level II	This species uses a variety of wetland types but prefers semi-permanent and deep seasonal wetlands. Breeding season: early June to late-August.	Open water	Yes	No. The Project crosses only a small amount of marginally suitable habitat.	Mountrail Williams	Hagen et al. 2005

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Red-headed woodpecker	*Melanerpes erythrocephalus*	ND Level II	This species prefers natural stands of mature deciduous trees along river bottoms, shelterbelts, and wooded areas of towns. Breeding season: early June to early August.	Deciduous tree stands	No	Yes. Shelterbelts and towns would be avoided. Habitat would not be affected.	Mountrail Williams	Hagen et al. 2005
Sedge wren	*Cistothorus platensis*	ND Level II	This species prefers wet meadows of tall grasses and sedges. Breeding season: mid-June to early August.	Wet meadows	Yes	No. The Project crosses only a small amount of marginally suitable habitat.	Mountrail Williams	Hagen et al. 2005
Sharp-tailed grouse	*Tympanuchus phasianellus*	ND Level II	This species uses mixed grass prairie with patches of shrubs and small trees. CRP grasslands are important to this species. Nests in lightly grazed native prairie, haylands, CRP, and may be located close to the margin of a thicket of shrubs or small trees. Breeding season mid-May to early August.	Mixed grass prairie with patches of shrubs	Yes	No. No lek sites are known to occur near the Preferred Project location, but individuals were observed during 2008 survey efforts.	Mountrail Williams	Hagen et al. 2005
Short-eared owl	*Asio flammeus*	ND Level II	This species inhabits large expanses of open grassland and wetland areas. Uses native prairie, hayland, retired cropland, small grain stubble, shrubsteppe, and wet meadow zones of wetlands. CRP land is important for this species. Breeding season: late-April to mid-July.	Open country	Yes	No	Mountrail Williams	Hagen et al. 2005
Sprague's pipit	*Anthus spragueii*	ND Level I	This species requires large native grasslands of intermediate height and sparse to intermediate vegetation density. Breeding season: early May to mid-August.	Large native grasslands	Yes	No	Mountrail Williams	Hagen et al. 2005

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Swainson's hawk	*Buteo swainsoni*	ND Level I	This species inhabits open grasslands with scattered trees or shrubs. Also uses shortgrass, mixed-grass, tallgrass prairie, riparian areas, isolated trees, shelterbeds, pasture, hayland, cropland, and wetland borders. Breeding season: mid-May to late-July.	Open country with scattered trees and shrubs	Yes	No. This species was observed during 2008 survey efforts.	Mountrail Williams	Hagen et al. 2005; Gomes (No Date)
Upland sandpiper	*Bartramia longicauda*	ND Level I	This species inhabits native and tame grassland, wet meadows, hayland, pastures, CRP, cropland, highway and railroad ROWs. Often uses wooden fence posts for viewing. Breeding season: late-May to early July.	Open country Grasslands	Yes	No	Mountrail Williams	Hagen et al. 2005
Whooping crane	*Grus americana*	**FE**; ND Level III	Use of the Project would be limited to migration only. During migration, this species uses primarily wetlands and cropland ponds for roosting and feeding. Spring and fall migration through the Project regions generally occurs from April to mid-May and from mid-September to October.	Wetlands bordered by agricultural fields	Yes – Within primary migratory route through North Dakota	No	Mountrail Williams	Hagen et al. 2005; USFWS 2008b; NDNHI 2008;
Willet	*Cataptrophorus semipalmatus*	ND Level I	Marshes, tidal mudflats, beaches, lake margins, mangroves, tidal channels, river mouths, coastal lagoons, sandy or rocky shores, and, less frequently, open grassland. Breeding season: late-May to mid-July.	Wetlands with sparse shorlines adjacent to native shortgrass prairie	Yes	No. The Project crosses only a small amount of marginally suitable habitat.	Mountrail Williams	Hagen et al. 2005

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Wilson's phalarope	*Phalaropus tricolor*	ND Level I	This species uses wetlands with open water, emergent vegetation, and open shoreline for foraging and wet meadows, upland grasslands, and wetlands for nesting. Breeding season: late-May to early June.	Wetlands adjacent to upland grasslands	Yes	No. The Project crosses only a small amount of marginally suitable habitat.	Mountrail Williams	Hagen et al. 2005
Yellow rail	*Coturnicops noveboracensis*	ND Level I	This species uses fens or wet meadows with emergent vegetation, shallow water, and moist soil. Breeding season: early June to mid-July.	Fens, wet meadows	Yes	No. The Project crosses only a small amount of marginally suitable habitat.	Mountrail Williams	Hagen et al. 2005; NatureServe 2008
REPTILES / AMPHIBIANS								
Canadian toad	*Bufo hemiophrys*	ND Level I	This species inhabits margins of lakes, ponds, and a variety of wetlands that maintain a permanent water source. This species burrows in the soil with inactive.	Lakes, ponds and wetlands	Yes	No. The Project crosses only a small amount of suitable habitat.	Mountrail Williams	Hagen et al. 2005
Common snapping turtle	*Chelydra serpentina*	ND Level II	This species prefers warm water in permanent lakes or rivers with a muddy bottom and plenty of aquatic vegetation. This species buries itself in the mud at the margins of lakes, ponds, and rivers.	Lakes or rivers	Yes	No. The Project crosses only a small amount of marginally suitable habitat.	Mountrail Williams	Hagen et al. 2005
Plains spadefoot	*Spea bombifrons*	ND Level I	This species inhabits dry, open grasslands with sandy or loose soils. Temporary wetlands without vegetation, such as those found in agricultural fields, are easily flooded and may provide tolerable breeding habitat. This species burrows underground or occupies rodent burrows when inactive.	Open grasslands	Yes	No	Mountrail Williams	Hagen et al. 2005
Short-horned lizard	*Phrynosoma douglassi*	ND Level II	This species prefers semi-arid, shortgrass prairie in rough terrain. This species burrows in the soil or occupies rodent burrows.	Arid landscapes	Yes	No. The Project crosses only a small amount of suitable habitat.	Williams	Hagen et al. 2005

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Smooth green snake	*Liochlorophis vernalis*	ND Level I	This species prefers grazed or ungrazed grassland, particularly the uplands of hills where grass is shorter. Moist meadows, native prairies, and occasionally woodland clearings also are used. This species also utilizes burrows. It has been documented hibernating in ant mounds.	Grassland, upland hills	Yes	No	Mountrail Williams	Hagen et al. 2005
Western hognose snake	*Heterodon nasicus*	ND Level I	This species prefers dry, sandy or gravelly areas in grassland, open sand prairies, or sand dunes. Burrows into loose soil or small mammal burrows for cover.	Open sand prairies	Yes	No. The Project crosses only a small amount of suitable habitat.	Mountrail Williams	Hagen et al. 2005
FISH								
Blue sucker	*Cycleptus elongatus*	ND Level I	This species inhabits streams with swift currents and large turbid rivers. Found mostly in riffles or narrow chutes. Requires gravel bottoms free of sediment.	Large, turbid rivers with gravel bottoms free of sediment	No	Yes. No large rivers will be crossed by the proposed Project.	Mountrail Williams	Hagen et al. 2005; NatureServe 2008
Finescale dace	*Phoxinus neogaeus*	ND Level III	This species inhabits boggy water of lakes and slow moving small streams. Bottom substrate is normally silted, sand, or gravel with vegetation present.	Boggy lakes and streams	No	Yes. One historic occurrence (1974) in Williams County is recorded by NDNHI 2008; however, the species is found only in the Tongue River in northeastern North Dakota.	Williams	Hagen et al. 2005; NDNHI 2008
Flathead catfish	*Pylodictis olivaris*	ND Level III	This species occurs in pools and slow moving stretches of large rivers. Areas with debris and a hard bottom are preferred. Also found near impoundments where spawning habitat is available.	Large rivers with pools	No	Yes. No large rivers will be crossed by the proposed Project.	Mountrail Williams	Hagen et al. 2005

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Flathead chub	*Platygobio gracilis*	ND Level II	This species occurs in small creeks and the largest rivers that have turbid fluctuating water levels and unstable sand bottoms. This species relies on flood flows to spawn successfully.	Turbid rivers with sandy substrate	No	Yes. No large rivers will be crossed by the proposed Project.	Mountrail Williams	Hagen et al. 2005; NDNHI 2008; NatureServe 2008
Northern redbelly dace	*Phoxinus eos*	ND Level II	This species inhabits slower moving stretches of rivers with clear water over silt bottoms. Vegetation is usually found in close proximity. Found to a lesser extent in pools and impoundments.	Rivers and ponds	No	Yes. One historic occurrence (1975) in Williams County is recorded by NDNHI 2008; however, in the Missouri River drainage, population are only known to occur in Brush, Apple, Beaver, and Antelope creeks, and the Cannonball, Knife, Heart, and Little Missouri rivers.	Williams	Hagen et al. 2005; NDNHI 2008
Paddlefish	*Polyodon spathula*	ND Level II	This species inhabits slack water areas of rivers and areas of low flow. Areas such as behind sandbars, wing dams, or other structures are preferred.	Large Rivers	No	Yes. No large rivers will be crossed by the proposed Project.	Mountrail Williams	Hagen et al. 2005; NDNHI 2008; NatureServe 2008
Pallid sturgeon	*Scaphirhynchus albus*	**FE**; ND Level II	This species is only found in the Missouri River and parts of the Yellowstone River. Usually in fast current areas with a firm sand or gravel bottom.	Large Rivers	No	Yes. No large rivers will be crossed by the proposed Project.	Mountrail Williams	Hagen et al. 2005; NatureServe 2008
Sicklefin chub	*Macrhybopsis meeki*	ND Level I	This species inhabits large turbid rivers, usually with a sand or gravel bottom.	Large Rivers	No	Yes. No large rivers will be crossed by the proposed Project.	Williams	Hagen et al. 2005; NatureServe 2008

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Sturgeon chub	*Macrhybopsis gelida*	ND Level I	This species inhabits large slow-moving turbid rivers, usually with a sand or gravel bottom.	Large Rivers	No	Yes. No large rivers will be crossed by the proposed Project.	Williams	Hagen et al. 2005; NDNHI 2008; NatureServe 2008
INVERTEBRATES								
Dakota skipper	*Hesperia dacotae*	**FC**	The Dakota skipper is an obligate resident of native prairie habitats and resides in two types of grassland habitats. The first is flat, moist, native bluestem grass prairie where three species of wildflowers are present and in flower during the adult (flight) stage. The second habitat is upland, dry prairie that is often on ridges and hillsides. Bluestem grasses and needlegrasses dominate these drier habitats. The current distribution of this species includes the border between tall grass and mixed grass prairie in western Minnesota, Northeastern South Dakota, north-central North Dakota, and southern Manitoba, Canada (USFWS 2002).	Large tracts of native prairie	No.	Yes. Only known to be east of the Project area.	Mountrail	USFWS 2008b; NatureServe 2008; (USFWS 2002, 2003)
PLANTS								
Dakota buckwheat	*Eriogonum visheri*	ND SOC	This plant grows predominantly on barren, highly erodible, rock outcrops in badlands habitats. It also may be found on smaller erosional features in mixed grass prairie. Flowering Period: July-August. Elevation range: 1,900-3,100 feet.	Barren land	No	Yes. Habitat for this species was not detected in the vicinity of the Project area.	Mountrail	NDNHI 2008; Ladyman 2006; Locklear 2008

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Heart-leaved buttercup	*Ranunculus cardiophyllus*	ND SOC	Heart-leaved buttercup occurs in dry to moist meadows and seeps of the Rocky Mountains and western great plains. Its distribution in the Great Plains is concentrated in the Black Hills area of South Dakota. Flowering Period: June-July. Elevation Range: 1,970-11,150 feet.	Dry to moist meadows and seeps	No	Yes. Habitat for this species was not detected in the vicinity of the Project area. The Project area falls at the lower end of the elevation tolerance for this species where it has rarely been documented.	Williams	NDNHI 2008; Efloras 2008; GPFA 1986; MNHP/MFWP 2008; Van Bruggen 1976
Jointed-spike sedge	*Carex athrostachya*	ND SOC	Jointed-spike sedge is found on the margins of moist to wet meadows in the western U.S. Flowering Period: late spring-summer. Elevation Range: 1,900-8,800 feet.	Moist to wet meadows	No	Yes. Habitat for this species was not detected in the vicinity of the Project area. The Project area falls at the lower end of the elevation tolerance for this species where it has rarely been documented.	Mountrail Williams	NDNHI 2008; GPFA 1986; Klinkenberg 2008

[1] **Species Status**

FE = Federally Endangered.
FT = Federally Threatened.
FD = Federally Delisted.
FC = Federal Candidate.
ND Level I, II, III = North Dakota Level I, II, III Species of Conservation Priority.
ND SOC = North Dakota Species of Concern.

Appendix F

Exclusion and Avoidance Areas

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Springbrook

Williston

Laydown Area 1

Western Area Power Administration
Williston Substation Build-out

T 156 N R 103 W
T 156 N R 102 W
T 156 N R 101 W
T 156 N R 100 W
T 156 N R 99 W
T 155 N R 103 W
T 155 N R 102 W
T 155 N R 101 W
T 155 N R 100 W
T 155 N R 99 W
T 154 N R 103 W
T 154 N R 102 W
T 154 N R 101 W
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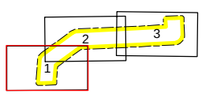
T 153 N R 101 W
T 153 N R 100 W
T 153 N R 99 W



LEGEND

- PROPOSED ROUTE
- PROPOSED CORRIDOR
- SUBSTATIONS
- MATCH LINE
- TOWNSHIP
- CITY/TOWN

EXCLUSION AREAS

- BURROWING OWL
- PARK
- GOLF COURSE

EXCLUSION AREAS (SECTION WITH NORTH DAKOTA NATURAL HERITAGE SPECIES OBSERVATION)

- RARE ECOLOGICAL COMMUNITY
- RARE ANIMAL OBSERVATION
- RARE PLANT OBSERVATION

N

1.5 0.75 0 1.5
Scale in Miles

3 1.5 0 3
Scale in Kilometers

Williston to Tioga Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Western AREA POWER ADMINISTRATION

Exhibit F-1
Proposed Route Exclusion Areas

Sources:Wildlife/Ecology- NDNHI 2008, Parks- GNIS

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Laydown Area 3

Laydown Area 2

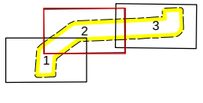
Laydown Area 1

2

Epping

Springbrook

T 157 N R 101 W
T 157 N R 100 W
T 157 N R 99 W
T 157 N R 98 W
T 157 N R 97 W
T 156 N R 101 W
T 156 N R 100 W
T 156 N R 99 W
T 156 N R 98 W
T 156 N R 97 W
T 155 N R 101 W
T 155 N R 100 W
T 155 N R 99 W
T 155 N R 98 W
T 155 N R 97 W



LEGEND

PROPOSED ROUTE
PROPOSED CORRIDOR
SUBSTATIONS
MATCH LINE
TOWNSHIP
CITY/TOWN

EXCLUSION AREAS
BURROWING OWL
PARK
GOLF COURSE

EXCLUSION AREAS (SECTION WITH NORTH DAKOTA NATURAL HERITAGE SPECIES OBSERVATION)
RARE ECOLOGICAL COMMUNITY
RARE ANIMAL OBSERVATION
RARE PLANT OBSERVATION

N

1.5 0.75 0 1.5
Scale in Miles

3 1.5 0 3
Scale in Kilometers

Williston to Tioga Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
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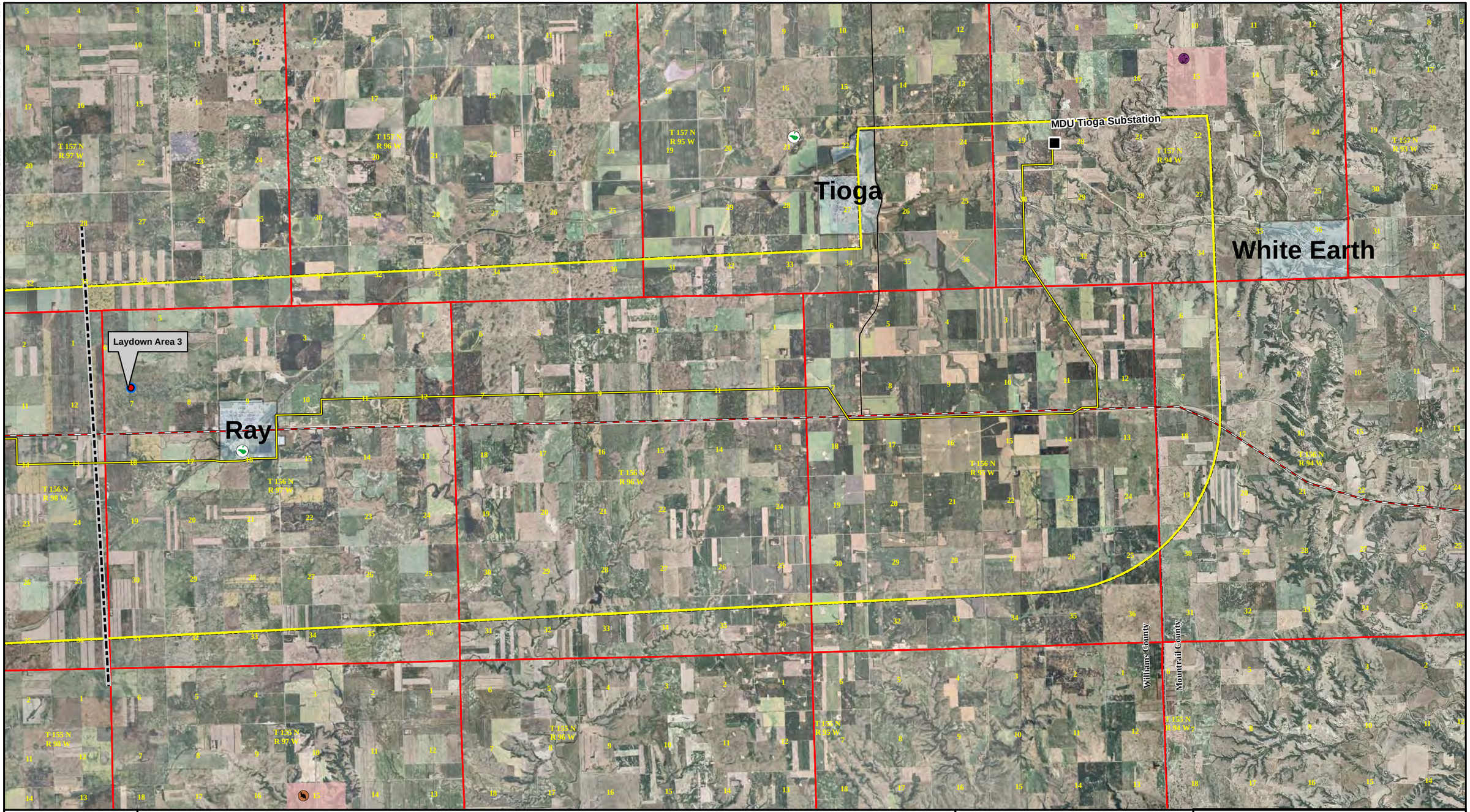
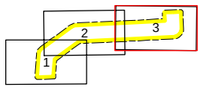
Western AREA POWER ADMINISTRATION

Exhibit F-2
Proposed Route
Exclusion Areas

Sources:Wildlife/Ecology- NDNHI 2008, Parks- GNIS





LEGEND

- PROPOSED ROUTE
- PROPOSED CORRIDOR
- SUBSTATIONS
- MATCH LINE
- TOWNSHIP
- CITY/TOWN

EXCLUSION AREAS

- BURROWING OWL
- PARK
- GOLF COURSE

EXCLUSION AREAS (SECTION WITH NORTH DAKOTA NATURAL HERITAGE SPECIES OBSERVATION)

- RARE ECOLOGICAL COMMUNITY
- RARE ANIMAL OBSERVATION
- RARE PLANT PLANT OBSERVATION

N

1.5 0.75 0 1.5
Scale in Miles

3 1.5 0 3
Scale in Kilometers

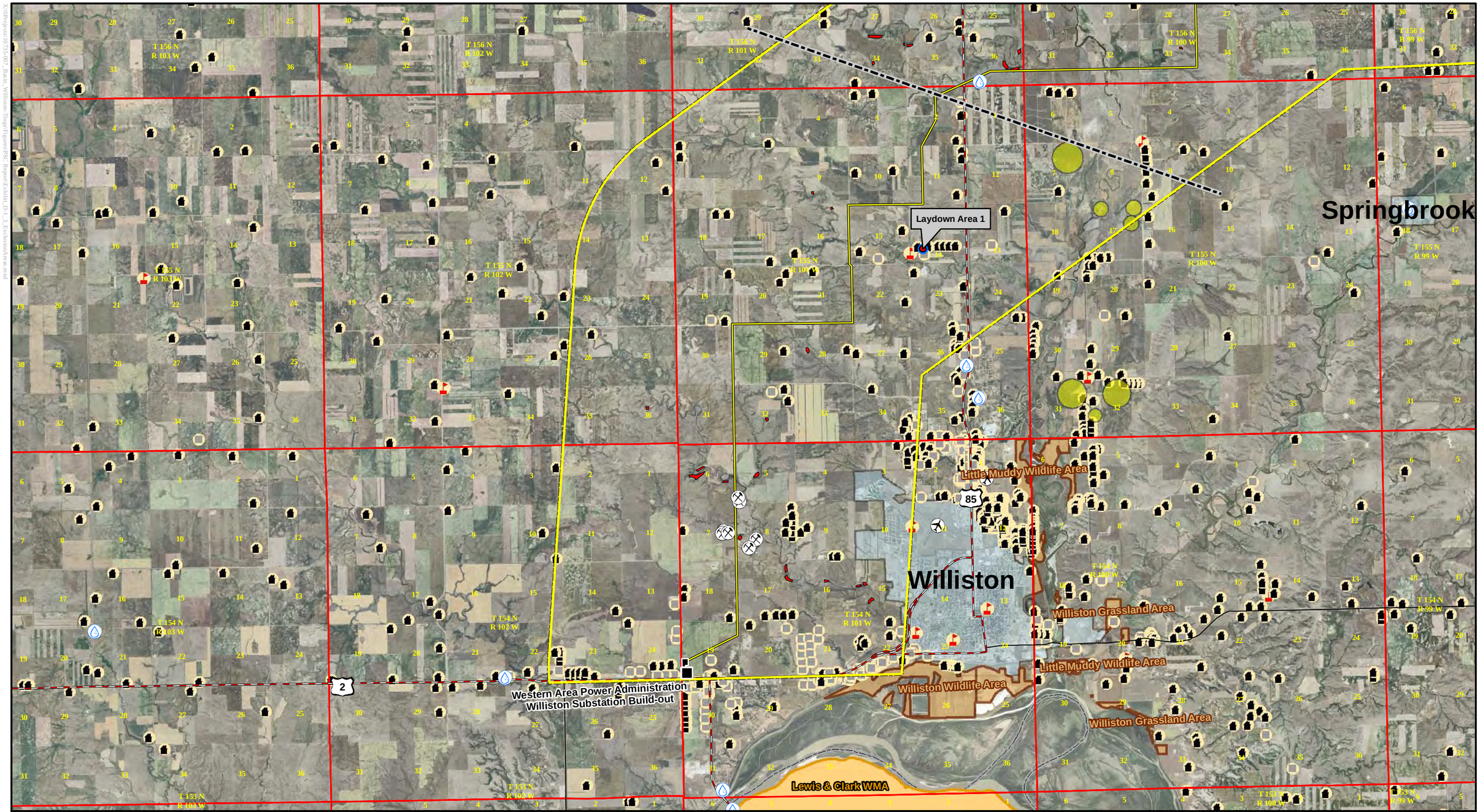
Williston to Tioga Transmission Project

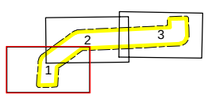
BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Western Area Power Administration

Exhibit F-3
Proposed Route Exclusion Areas

Sources:Wildlife/Ecology- NDNHI 2008, Parks- GNIS





LEGEND

- PROPOSED ROUTE
- PROPOSED CORRIDOR
- SUBSTATIONS
- MATCH LINE
- TOWNSHIP
- CITY/TOWN

AVOIDANCE FEATURES

- MUNICIPAL WATER WELLS
- ABANDONED MINES
- AIRPORT
- RESIDENCE OR OTHER STRUCTURE WITH 500 FT. BUFFER
- PLACE OF BUSINESS WITH 500 FT. BUFFER
- SCHOOL WITH 500 FT. BUFFER
- LANDSLIDE AREAS
- IRRIGATED AREAS
- USACE WILDLIFE/GRASSLAND MANAGEMENT AREAS
- STATE WILDLIFE MANAGEMENT AREAS
- USFWS WATERFOWL PRODUCTION AREAS

N

1.5 0.75 0 1.5
Scale in Miles

3 1.5 0 3
Scale in Kilometers

Williston to Tioga Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Western AREA POWER ADMINISTRATION

Exhibit F-4
Proposed Corridor
Avoidance Areas

Sources:Schools - USGS, GNIS; Residential/Business - NDDatahub; Geology - NDGS,2004; Wildlife - NDGF, NDDatahub, USFWS; Water Supply - North Dakota State Water Commission

Laydown Area 3

Laydown Area 2

Laydown Area 1

Epping

Springbrook

2

T 157 N R 101 W
T 157 N R 100 W
T 157 N R 99 W
T 157 N R 98 W
T 157 N R 97 W
T 156 N R 101 W
T 156 N R 100 W
T 156 N R 99 W
T 156 N R 98 W
T 156 N R 97 W
T 155 N R 101 W
T 155 N R 100 W
T 155 N R 99 W
T 155 N R 98 W
T 155 N R 97 W

LEGEND

- PROPOSED ROUTE
- PROPOSED CORRIDOR
- SUBSTATIONS
- MATCH LINE
- TOWNSHIP
- CITY/TOWN

AVOIDANCE FEATURES

- MUNICIPAL WATER WELLS
- ABANDONED MINES
- AIRPORT
- RESIDENCE OR OTHER STRUCTURE WITH 500 FT. BUFFER
- PLACE OF BUSINESS WITH 500 FT. BUFFER
- SCHOOL WITH 500 FT. BUFFER
- LANDSLIDE AREAS
- IRRIGATED AREAS
- USACE WILDLIFE/GRASSLAND MANAGEMENT AREAS
- STATE WILDLIFE MANAGEMENT AREAS
- USFWS WATERFOWL PRODUCTION AREAS

N

1.5 0.75 0 1.5
Scale in Miles

3 1.5 0 3
Scale in Kilometers

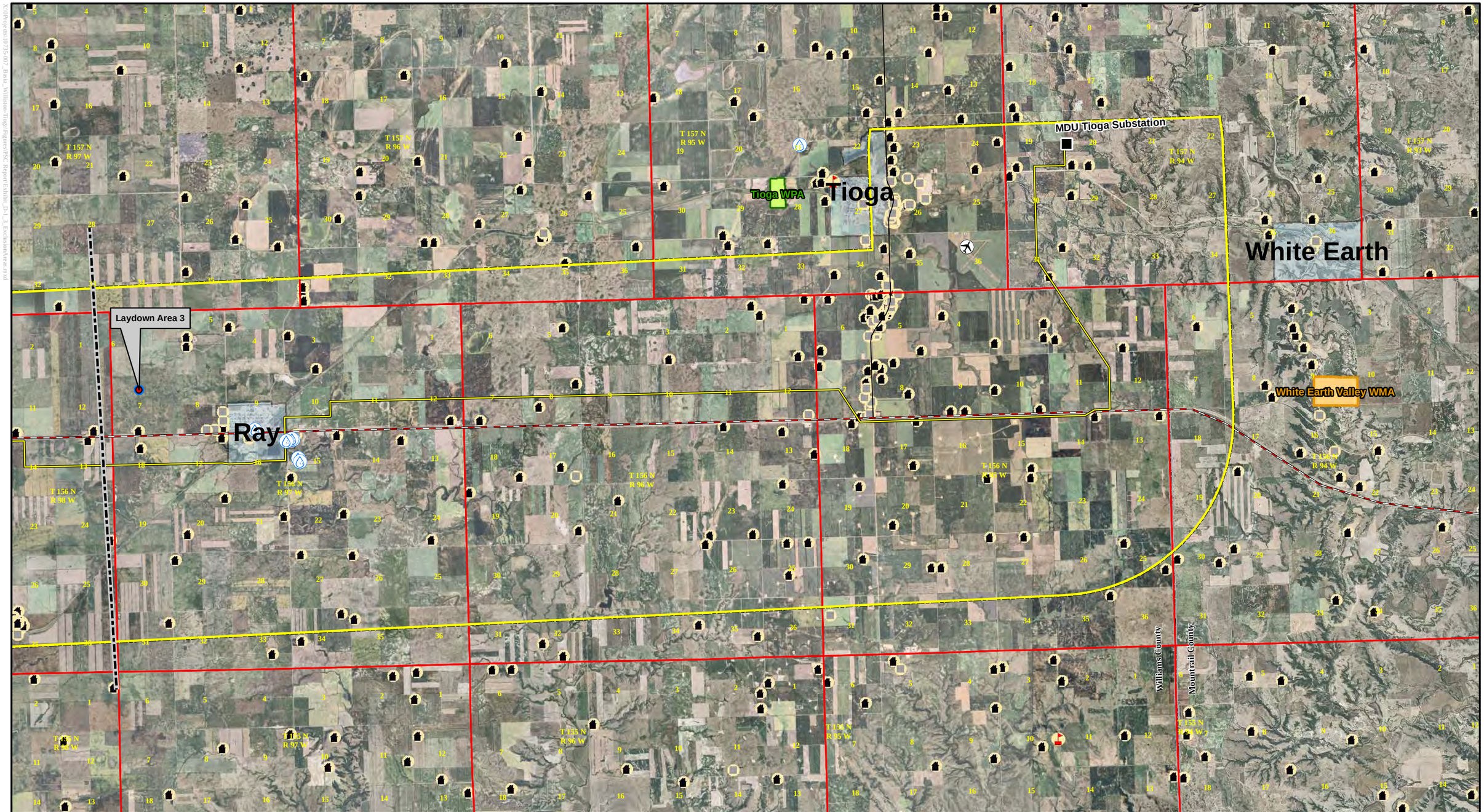
Williston to Tioga Transmission Project

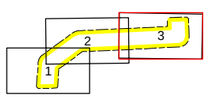
BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Western Area Power Administration

Exhibit F-5
Proposed Corridor
Avoidance Areas

Sources:Schools - USGS, GNIS; Residential/Business - NDDatahub; Geology - NDGS,2004; Wildlife - NDGF, NDDatahub, USFWS; Water Supply - North Dakota State Water Commission





LEGEND

- PROPOSED ROUTE
- PROPOSED CORRIDOR
- SUBSTATIONS
- MATCH LINE
- TOWNSHIP
- CITY/TOWN

AVOIDANCE FEATURES

- MUNICIPAL WATER WELLS
- ABANDONED MINES
- AIRPORT
- RESIDENCE OR OTHER STRUCTURE WITH 500 FT. BUFFER
- PLACE OF BUSINESS WITH 500 FT. BUFFER
- SCHOOL WITH 500 FT. BUFFER
- LANDSLIDE AREAS
- IRRIGATED AREAS
- USACE WILDLIFE/GRASSLAND MANAGEMENT AREAS
- STATE WILDLIFE MANAGEMENT AREAS
- USFWS WATERFOWL PRODUCTION AREAS

N

1.5 0.75 0 1.5
Scale in Miles

3 1.5 0 3
Scale in Kilometers

Williston to Tioga Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
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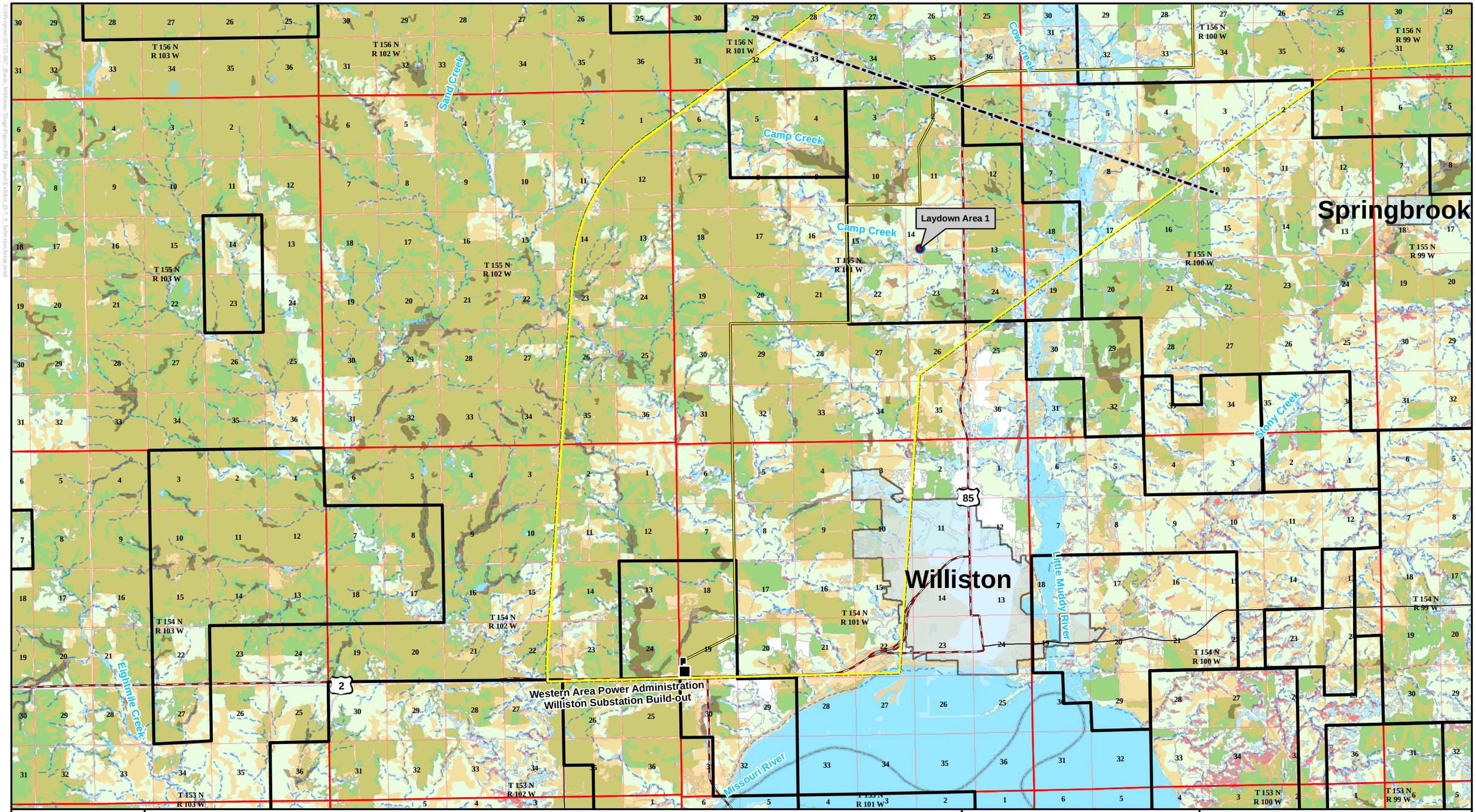
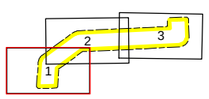
Western Area Power Administration

Exhibit F-6
Proposed Corridor
Avoidance Areas

Sources:Schools - USGS, GNIS; Residential/Business - NDDatahub; Geology - NDGS,2004; Wildlife - NDGF, NDDatahub, USFWS; Water Supply - North Dakota State Water Commission





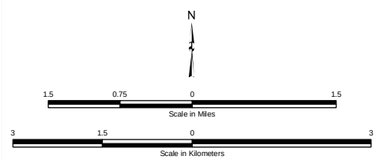
LEGEND

- PROPOSED ROUTE
- PROPOSED CORRIDOR
- SUBSTATIONS
- MATCH LINE
- TOWNSHIP
- CITY/TOWN

Selection Criteria

- PRIME FARMLAND
- FARMLAND OF STATEWIDE IMPORTANCE
- CULTIVATED CROPS
- FORESTED
- GRASSLAND/HERBACEOUS
- PASTURE/HAY
- POND, LAKE, OR WETLAND

- INTERMITTENT STREAMS
- PERENNIAL STREAMS
- GAS PLANT BOUNDARY
- OIL FIELD BOUNDARY



Williston to Tioga Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
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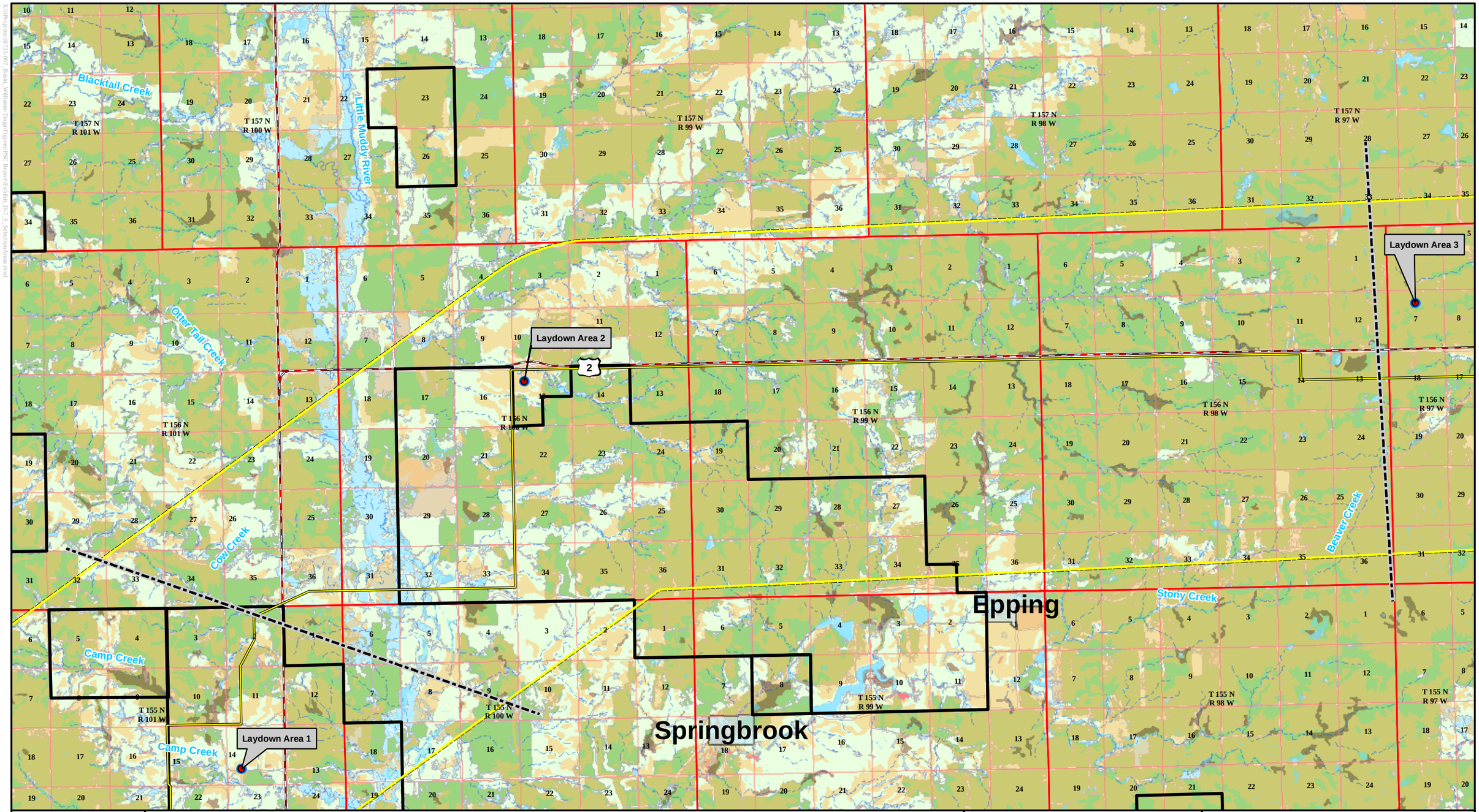
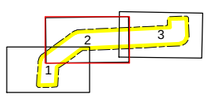
Western AREA POWER ADMINISTRATION

Exhibit F-7
Proposed Corridor
Selection Criteria

Sources: Farmland - Ssurgo; Landclass - NLCD 2001; Streams/Wetland - NWI, NHD; Oil/Gas - NDIC Oil and Gas Division 2008.





LEGEND

- PROPOSED ROUTE
- PROPOSED CORRIDOR
- SUBSTATIONS
- MATCH LINE
- TOWNSHIP
- CITY/TOWN

Selection Criteria

- PRIME FARMLAND
- FARMLAND OF STATEWIDE IMPORTANCE
- CULTIVATED CROPS
- FORESTED
- GRASSLAND/HERBACEOUS
- PASTURE/HAY
- POND, LAKE, OR WETLAND

- INTERMITTENT STREAMS
- PERENNIAL STREAMS
- GAS PLANT BOUNDARY
- OIL FIELD BOUNDARY

N

1.5 0.75 0 1.5
Scale in Miles

3 1.5 0 3
Scale in Kilometers

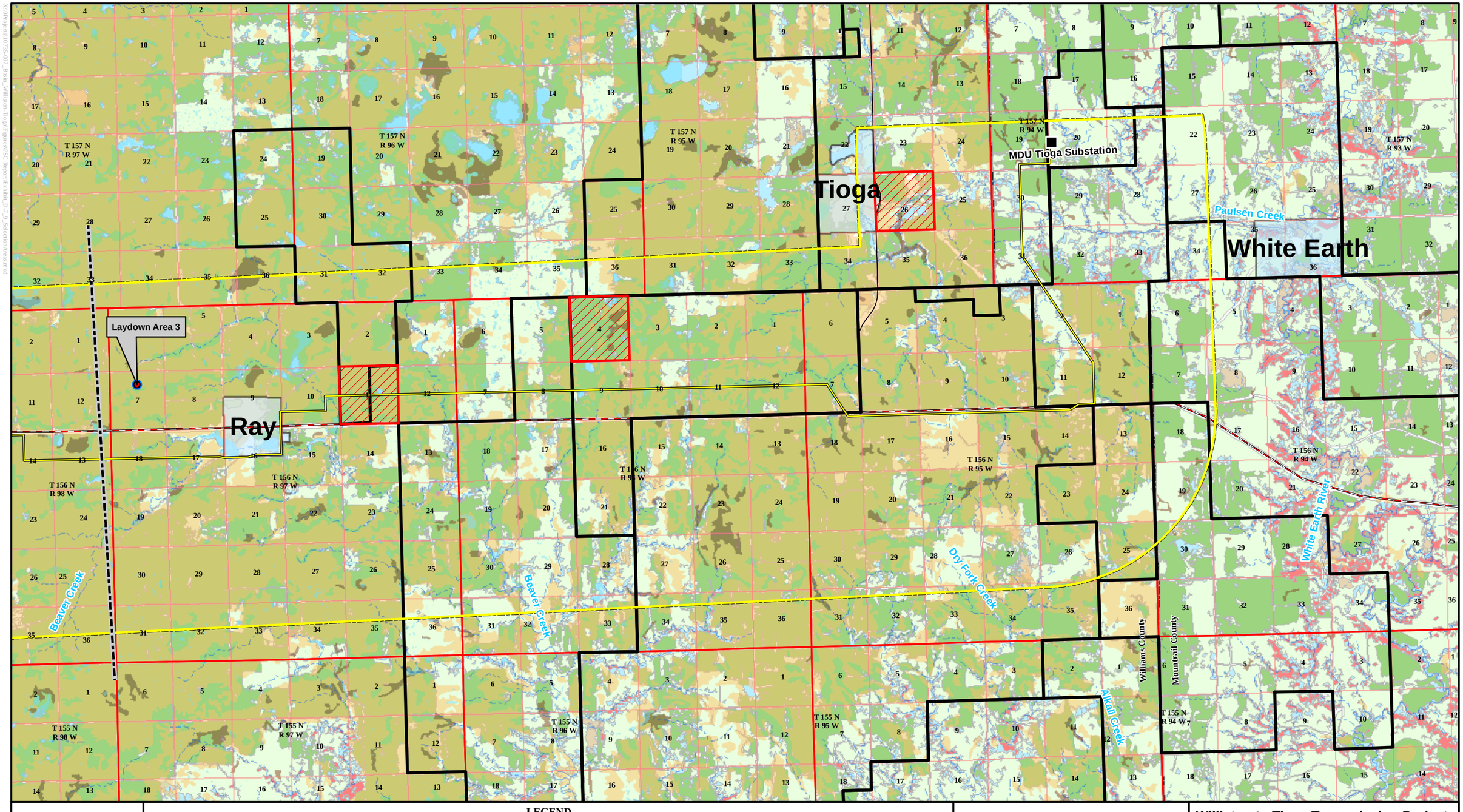
Williston to Tioga Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Western Area Power Administration

Exhibit F-8
Proposed Corridor Selection Criteria

Sources: Farmland - Ssurgo; Landclass - NLCD 2001; Streams/Wetland - NWI, NHD; Oil/Gas - NDIC Oil and Gas Division 2008.



LEGEND

- PROPOSED ROUTE
- PROPOSED CORRIDOR
- SUBSTATIONS
- MATCH LINE
- TOWNSHIP
- CITY/TOWN

Selection Criteria

- PRIME FARMLAND
- FARMLAND OF STATEWIDE IMPORTANCE
- CULTIVATED CROPS
- FORESTED
- GRASSLAND/HERBACEOUS
- PASTURE/HAY
- POND, LAKE, OR WETLAND

- INTERMITTENT STREAMS
- PERENNIAL STREAMS
- GAS PLANT BOUNDARY
- OIL FIELD BOUNDARY

N

Scale in Miles: 1.5 0.75 0 1.5

Scale in Kilometers: 3 1.5 0 3

Williston to Tioga Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
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Western Area Power Administration

Exhibit F-9
Proposed Corridor
Selection Criteria

Sources: Farmland - Ssurgo; Landclass - NLCD 2001; Streams/Wetland - NWI, NHD; Oil/Gas - NDIC Oil and Gas Division 2008.