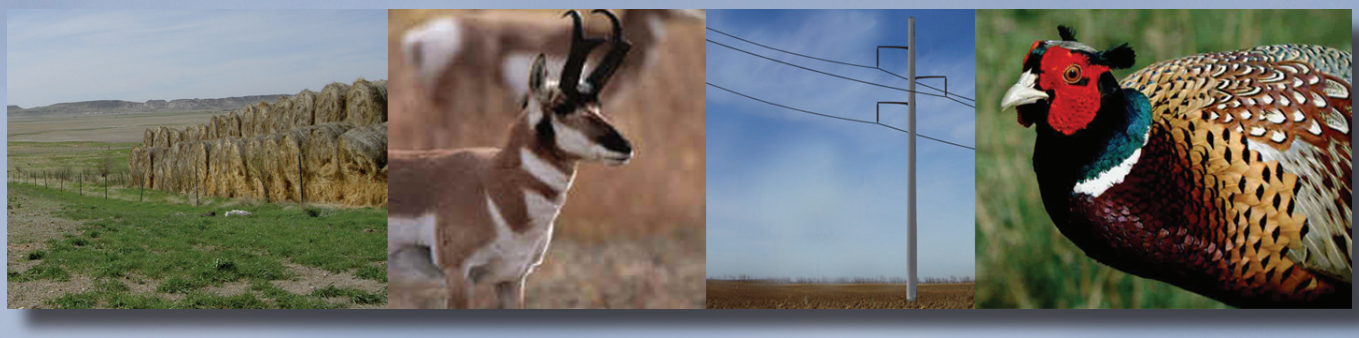


Belfield to Rhame Transmission Line Project

Environmental Assessment for Pre-approval Review

DOE/EA-1596

Western
AREA POWER
ADMINISTRATION

September 2008

Department of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800

SEP 16 2008

Dear Interested Party:

Western Area Power Administration (Western) is pleased to provide you with a copy of the Belfield – Rhame Transmission Line Project Environmental Assessment for Pre-Approval Review (EA).

Western is interested in receiving your comments on the EA. The comment period ends on October 24, 2008. Comments on the EA must be received before the end of the comment period. Written comments can be submitted to Western at the following address:

Dirk Shulund
Western Area Power Administration
P.O. Box 35800
Billings, MT 59107-5800

You may also submit comments to Dirk Shulund by email at shulund@wapa.gov. When submitting comments, please include your full name and address. Anonymous comments will not be accepted.

If you have any questions concerning the EA, please contact Dirk Shulund at (406) 247-7402 or the information listed above. We look forward to receiving your comments.

Sincerely,

for - Nicholas J. Stas
Environmental Manager

DOE/EA-1596

Belfield to Rhame Transmission Line Project Environmental Assessment for Pre-approval Review

September 2008

Executive Summary

Basin Electric Power Cooperative (BEPC) proposes to construct and operate a new single-circuit 230-kilovolt (kV) Belfield to Rhame transmission line and substation (proposed Project) to meet existing and future electric power requirements in southwestern North Dakota. The new transmission line would transfer power from the Western Area Power Administration (Western) grid at Belfield Substation, North Dakota, to a new substation that would be constructed near Rhame that would be owned and operated by BEPC. The proposed improvements would support BEPC's obligation to provide reliable power to end users.

The proposed Project would comply with requirements of the National Environmental Policy Act of 1969 (NEPA) and 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. The EA evaluates and compares three potential transmission line routes, sites for the proposed Rhame Substation, a microwave relay facility, and a No Action Alternative.

Western is mandated to respond to requests for interconnection and is required to identify and evaluate potential environmental impacts of the Proposed Action in compliance with NEPA.

Project Location

The proposed Project would be located in Stark, Slope, and Bowman counties in southwestern North Dakota. Belfield Substation is in Stark County, southeast of the City of Belfield. The proposed Rhame Substation would be located in Bowman County, south of the City of Rhame. A new microwave relay facility would be installed on East Rainy Butte, in Slope County. Six-mile-wide study corridors (shown on **figure ES-1**) were identified from the Belfield Substation to the proposed Rhame Substation site in accordance with NDPSC requirements.

Project Description

The proposed single-circuit 230-kV transmission line would be constructed using steel single-pole structures within a 125-foot-wide right-of-way (ROW). The proposed Project also includes construction of a new substation near Rhame, North Dakota. Modifications to the existing Belfield Substation would be minor and would take place entirely within the existing substation fence.

Transmission line structure heights would range from 95 to 120 feet; span distances between structures would range from 700 to 950 feet depending on topography. Actual structure heights and span distances would vary, depending on land features, line crossings, and terrain. The single-pole structures would be designed to support three conductors and an optical groundwire that would be used for lightning suppression and communications purposes. 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 required.

Project 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.

Rhame Substation would be a new facility that would be owned and operated by BEPC. The substation would occupy approximately 12.5 acres within an 80-acre tract that has been purchased by BEPC. The selected substation site was one of four under consideration. Site selection was based on its suitability to meet Project

interconnection objectives and a willingness of the landowner to sell the property. Microwave communications equipment would be installed adjacent to Rhame Substation and on East Rainy Butte.

Project Scoping

Scoping meetings were held at two locations to provide Project information and to receive comments from the public and agencies. Meeting announcements were sent to potentially affected land owners, governmental officials, tribes, and the media. Paid meeting announcements were advertised through radio and newspapers. Additional meetings were held with county commissioners, agencies, and individual landowners.

Corridor Identification

A six-mile-wide corridor was initially identified from the Belfield Substation to the area proposed for the Rhame Substation site. Two additional corridors were later identified to enable access to the Rhame Substation site from the south. Resources within the corridors were compiled and mapped to identify routing opportunities (e.g., linear features) and constraints (e.g., NDPSC exclusion and avoidance areas). The three corridors occupy approximately 440,000 acres.

Routing Analyses

Alternative transmission line routes and substation sites were identified and presented to the public during the scoping meetings. Input from the public resulted in the selection of a preferred route and two alternative routes to be carried forward for further consideration. BEPC engineers, lands (ROW) specialists, and environmental specialists worked with landowners intensively over a five-month period to identify and refine a proposed route and substation site in response to landowner concerns. The selected route and substation site would avoid residential structures, most cropland, and environmentally sensitive areas, and would minimize impacts to agricultural activities. The selected route and alternatives are similar in length, ranging from 72.55 to 77.54 miles.

The preferred route alternative, shown on **figure ES-2**, would be approximately 73.51 miles long and would permanently affect less than 0.2 acre. Installation would result in temporary impacts to 297 acres, needed for structure pads (work sites), a 12-foot-wide access road between structures, pulling and tensioning sites, and splicing sites. Additional temporary use areas would be needed for material staging at Belfield and Rhame substations and sites within the central Project area. Project-specific mitigation measures were identified and would be followed to minimize environmental impacts.

Project Impacts

Lands that would be permanently affected by the transmission line would total less than 0.2 acre; an additional 12.5 acres would be permanently impacted by the proposed Rhame Substation. Transmission line construction would temporarily affect 116 acres of cropland, 9 acres of Prime and Unique Farmland, and 146 acres of Farmland of Statewide Importance. Local mining (primarily gravel and scoria), wetlands, and drainages would be spanned, thus eliminating or greatly reducing impacts. The proposed route would temporarily impact less cropland, more herbaceous and prairie habitat, and more shrubland habitat than the other alternatives. Minimization of impacts to cropland is largely a factor of detailed routing performed by BEPC engineers and ROW agents, and BEPC's decision to use single-pole structures.

Several mammalian and avian special-status species are present, or may be present within the proposed Project area, including: hispid pocket mouse (*Chaetodipus hispidus*), American advocet (*Recurvirostra americana*), Baird's sparrow (*Ammodramus bairdii*), bobolink (*Dolichonyx oryzivorus*), dickcissel (*Spiza americana*), golden eagle (*Aquila chrysaetos*), grasshopper sparrow (*Ammodramus savannarum*), ferruginous

hawk (*Buteo regalis*), lark bunting (*Calamospiza melanocorys*), loggerhead shrike (*Lanius ludovicianus*), northern harrier (*Circus cyaneus*), northern pintail (*Anas acuta*), red-headed woodpecker (*Melanerpes erythrocephalus*), sharp-tailed grouse (*Tympanuchus phasianellus*), short-eared owl (*Asio flammeus*), Swainson's hawk (*Buteo swainsoni*), and upland sandpiper (*Bartramia longicauda*). There are no special-status fish or plant species likely to be present within the Project area.

Impacts to animal and plant species are expected to be low and largely limited to temporary loss or displacement during construction. Impacts to migratory birds would be mitigated if construction were to avoid the nesting season. The proposed transmission line was re-routed during the routing process to avoid two golden eagle nests; however, the realignment is in proximity to an abandoned nest that may once been used by golden eagles.

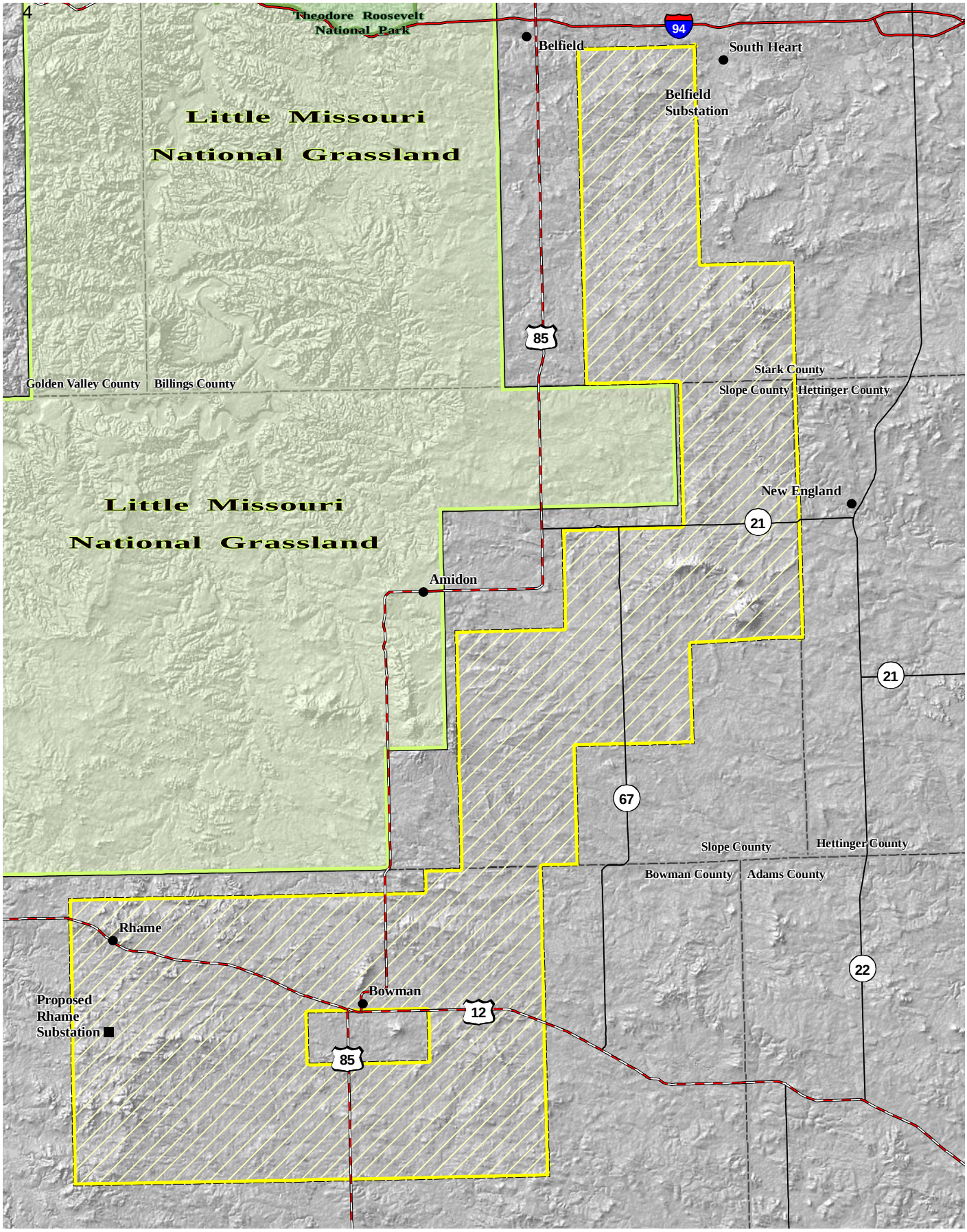
Results of Class I and Class III cultural resources investigations indicate that important archaeological or historic resources would not be affected by construction or operation of the proposed transmission line or Rhame Substation. Consultation with tribes did not identify any Native American concerns.

Socioeconomic impacts associated with the proposed Project are expected to be minimal. The proactive approach to transmission line routing taken by BEPC staff resulted in avoiding cropland to the extent practicable and routing within areas that would be least objectionable by landowners. Impacts to farming also were mitigated by BEPC's decision to use self-supporting single-pole structures, rather than H-frame or guyed structures.

Cumulative Impacts

South Heart Lignite Mine and Coal gasification Power Plant and a new airport in Bowman County were identified as reasonably foreseeable future projects that could contribute to cumulative impacts in the Project area. The South Heart Lignite Mine and Power Plant would impact several square miles of agricultural land in the northern portion of the Project area. Although a site for the proposed new Bowman County Airport has not been identified, the facility would likely impact at least one square mile of agricultural land. The South Heart Project and the Bowman County Airport Project are shown on **figure ES-3**.

Both projects would result in long-term impacts that would affect biological resources and the socioeconomic composition of the area. Long-term impacts associated with airport development and mining include minor loss of existing habitat and loss and displacement of species. Cumulative impacts associated with these and the proposed Project are expected to minimally impact area environmental resources.



North Dakota
Area of Detail

LEGEND

- SUBSTATION
- CITY OR TOWN
- PROJECT STUDY AREA
- U.S. NATIONAL GRASSLAND
- NATIONAL PARK

N

5 4 3 2 1 0 5
Scale in Miles

Map Projection: UTM
Zone: 13 North

Datum: NAD 1983
Grid Units: Meters

Belfield to Rhame Transmission Project

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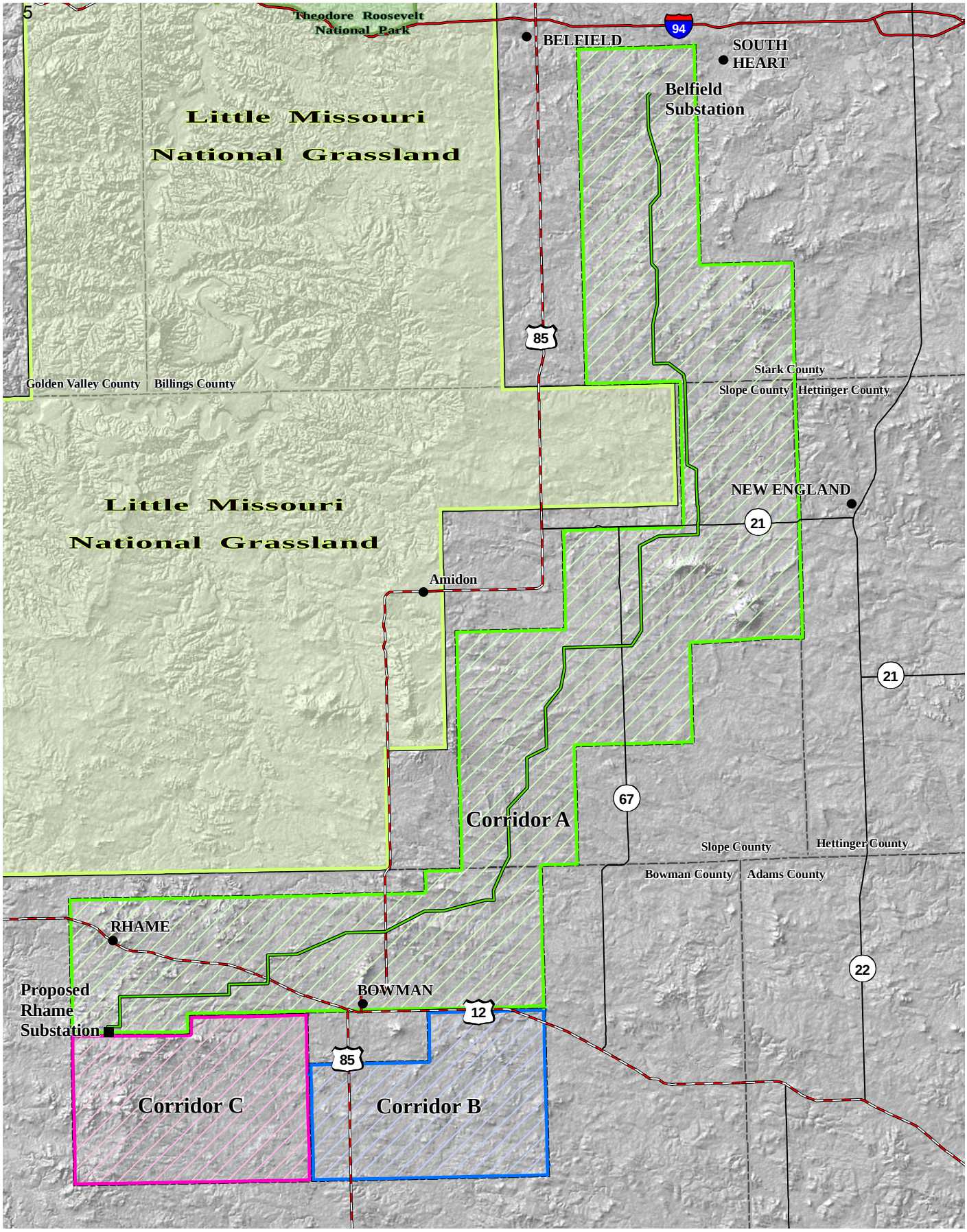
Figure ES-1
Project Location



North Dakota
Area of Detail

LEGEND

- SUBSTATION
- CITY OR TOWN
- TRANSMISSION LINE ROUTE ALTERNATIVE 'C' (PROPOSED)
- CORRIDOR 'A'
- CORRIDOR 'B'
- CORRIDOR 'C'
- U.S. NATIONAL GRASSLAND
- NATIONAL PARK

N

5 4 3 2 1 0 5
Scale in Miles

Map Projection: UTM
Zone: 13 North
Datum: NAD 1983
Grid Units: Meters

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
Western Area Power Administration

Figure ES-2
Transmission Line Route
Alternative 'C' (Proposed)

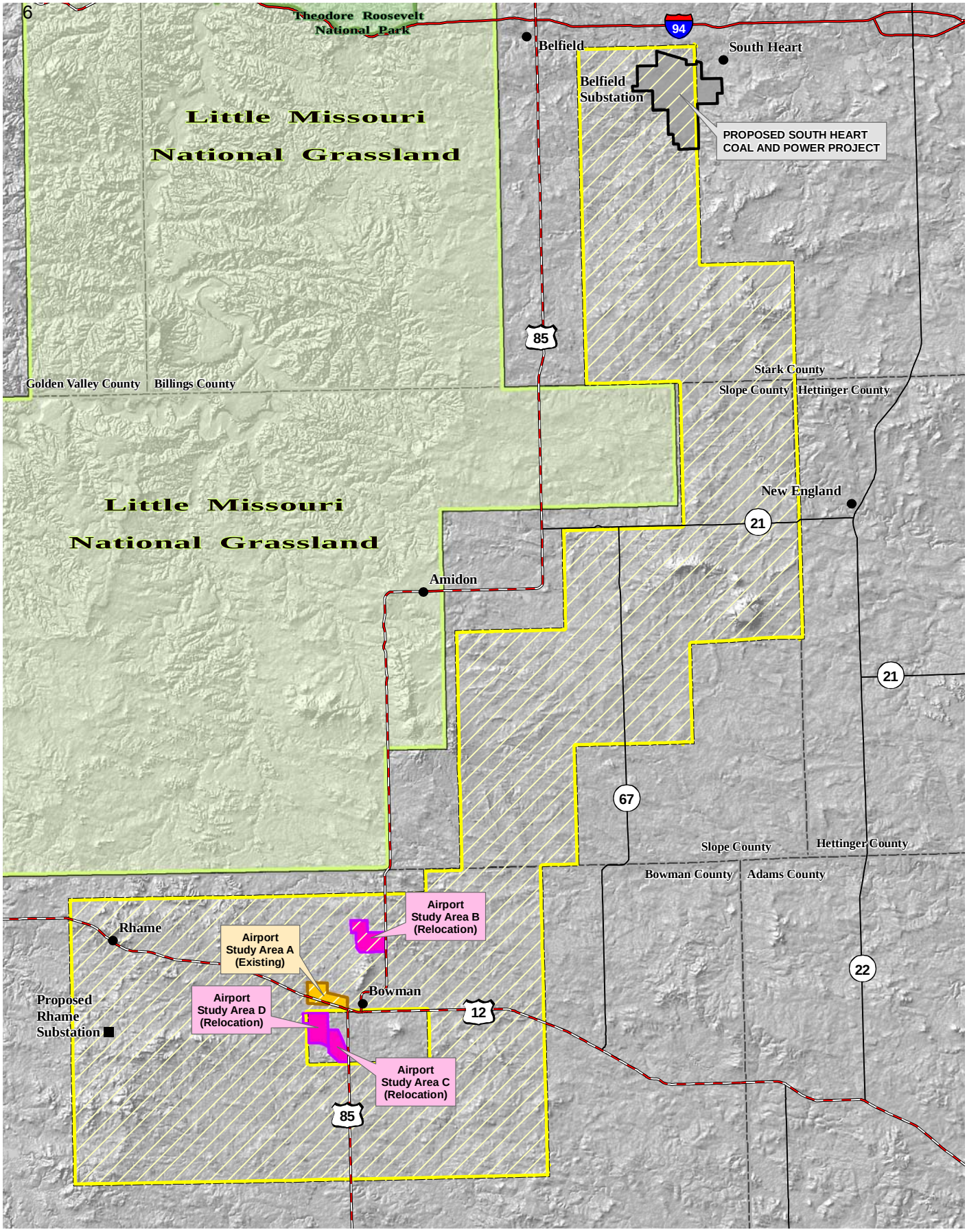


Figure ES-3
Projects Considered in Cumulative Impacts Analysis

Acronyms and Abbreviations

AAQS	Ambient Air Quality Standards
AIRFA	American Indian Religious Freedom Act
amsl	above mean sea level
APLIC	Avian Power Line Interaction Committee
ATV	all terrain vehicles
BEPC	Basin Electric Power Cooperative
BFE	Base Flood Elevations
BMP	Best Management Practices
cm	centimeter
CFR	Code of Federal Regulations
CMC	County Major Collector
CMS	Cultural Material Scatter
CRP	Conservation Reserve Program
CWA	Clean Water Act
EA	Environmental Assessment
EFH	essential fish habitat
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FR	Federal Register
ft^2	square feet
HPTP	Historic Properties Treatment Plan
kV	kilovolt
m	meter

MBTA	Migratory Bird Treaty Act
MDU	Montana-Dakota Utilities Company
MW	megawatt
NAGPRA	Native American Graves Protection and Repatriation Act
NDCC	North Dakota Century Code
NDCWCS	North Dakota Comprehensive Wildlife Conservation Strategy
NDGFD	North Dakota Game and Fish Division
NDNHI	North Dakota Natural Heritage Inventory
NDPSC	North Dakota Public Service Commission
NEPA	National Environmental Policy Act
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
NWR	National Wildlife Refuge
OPGW	optical groundwire
PLOTS	Private Land Open to Sportsmen
PSC	Public Service Commission
ROW	right-of-way
SCADA	Supervisory Control and Data Acquisition
SFHA	Special Flood Hazard Area
SHPO	State Historic Preservation Officer
SPCC Plan	Spill Prevention, Control, and Countermeasures Plan
SR	State Route
SWPPP	Storm Water Pollution Prevention Plan
TCP	traditional cultural property

U.S.	United States
USC	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
Western	Western Area Power Administration

Contents

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1.0 Introduction

Electrical power transmission improvements are needed in southwestern North Dakota to meet increasing load demands. If constructed, the Belfield to Rhame 230-kilovolt (kV) single-circuit Transmission Line Project (hereafter referred to as the proposed Project) would provide approximately 55 megawatts (MW) of additional power capacity to southwestern North Dakota. The additional power would be transferred from the Western Area Power Administration (Western) grid at Belfield Substation, North Dakota, to a new substation that would be constructed near Rhame, North Dakota. The transmission line and the new Rhame Substation would be owned and operated by Basin Electric Power Cooperative (BEPC). In addition, the proposed facilities would substantially increase the reliability of the transmission grid in the region.

1.1 Assessment Process

Permitting for the proposed Project includes requirements of the National Environmental Policy Act of 1969 (NEPA) and 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.

Corridor-level analyses were carried out to identify exclusion and avoidance areas, as defined by the NDPSC and described in chapter 3.0 of this EA. Exclusion and avoidance areas, described in detail in chapter 3.0 include, but are not limited to: designated or registered National, State, county, and local government parks; monuments; wildlife management areas; historic resource sites; residences and residential areas; irrigated land; and areas of ecological importance.

Detailed transmission line routing was carried out within identified corridors to maximize the use of existing linear features, avoid sensitive areas and receptors, minimize environmental impacts, and comply with landowner requests. Aerial photography, field reconnaissance, and available published data were used to identify potential routes that would accomplish these objectives. Cultivated fields also 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.

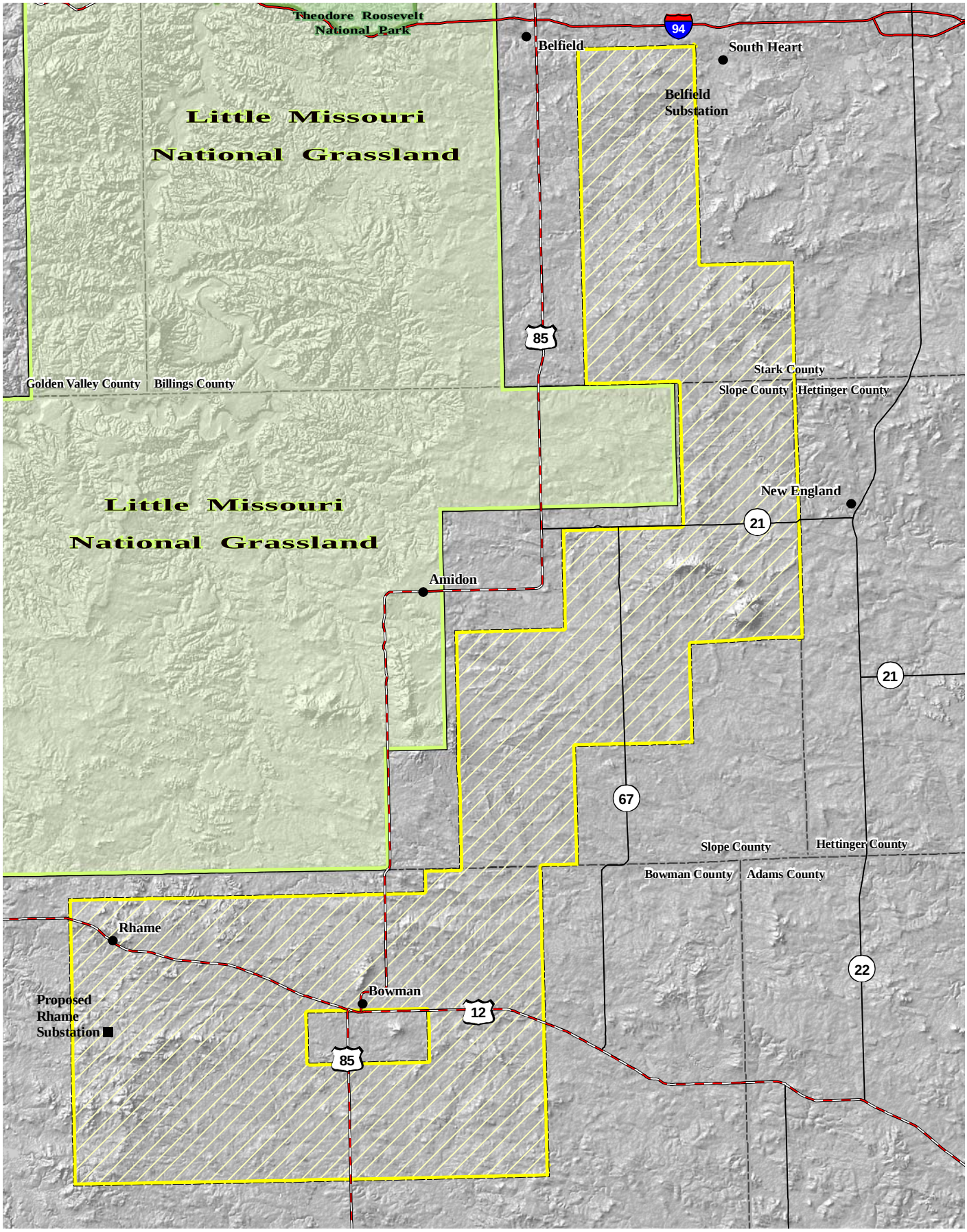
Analyses also were carried out to identify and evaluate potential alternative substation locations and select a substation site that met Project interconnection objectives, minimized environmental impacts, and was acceptable to local landowners and BEPC. Four sites were initially identified as potentially suitable for development. Based on discussions with landowners, BEPC eliminated three sites from further consideration. The remaining site was determined to be acceptable from engineering, environmental, and public acceptance perspectives.

1.2 Project Location

The proposed Project would be located in Stark, Slope, and Bowman counties in southwestern North Dakota. Belfield Substation is in Stark County, southeast of the City of Belfield. The proposed Rhame Substation would be located in Bowman County, south of the City of Rhame. A new microwave relay facility would be installed on East Rainy Butte, in Slope County. Six-mile-wide study corridors were identified from the Belfield Substation to the proposed Rhame Substation site in accordance with NDPSC requirements, as shown on **figure 1-1.**

1.3 Project Conformance with Policies, Plans, and Programs

Interconnection to the Western grid and construction and operation of a new transmission line requires authorization from Western and the NDPSC. An EA process, involving a transmission line routing study was carried out in compliance with NEPA and NDPSC guidelines for Energy Conversion and Transmission Siting as defined in title 49 of the North Dakota Century Code (NDCC).



North Dakota
Area of Detail

LEGEND

- SUBSTATION
- CITY OR TOWN
- PROJECT STUDY AREA
- U.S. NATIONAL GRASSLAND
- NATIONAL PARK

N

5 4 3 2 1 0 5

Scale in Miles

Map Projection: UTM
Zone: 13 North

Datum: NAD 1983
Grid Units: Meters

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
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Western Area Power Administration

Figure 1-1
Project Location

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 cannot be avoided or mitigated to less-than-significant, an EIS would be required. Approval through the NDPSC would be granted through a decision from the commission. Transmission line routing and analyses, public scoping, and environmental analyses were carried out to meet Federal and State permitting requirements.

1.3.1 Western Area Power Administration

Western is the Federal Lead Agency for the EA and a Federal power-marketing agency within the United States (U.S.) Department of Energy that 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 NEPA (42 United States Code [USC] 4321 *et seq*.) and guidelines set forth under Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] 1500 – 1508).

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 service area are shown on **figures 1-2** and **1-3**, respectively.

NEPA requires Federal agencies to evaluate expected impacts on environmental resources that could result from the proposed Project and a reasonable range of Project alternatives. Potential direct, indirect, and cumulative environmental impacts must be identified and assessed. If impacts cannot be fully avoided, mitigation measures must be recommended to reduce the severity of impacts.

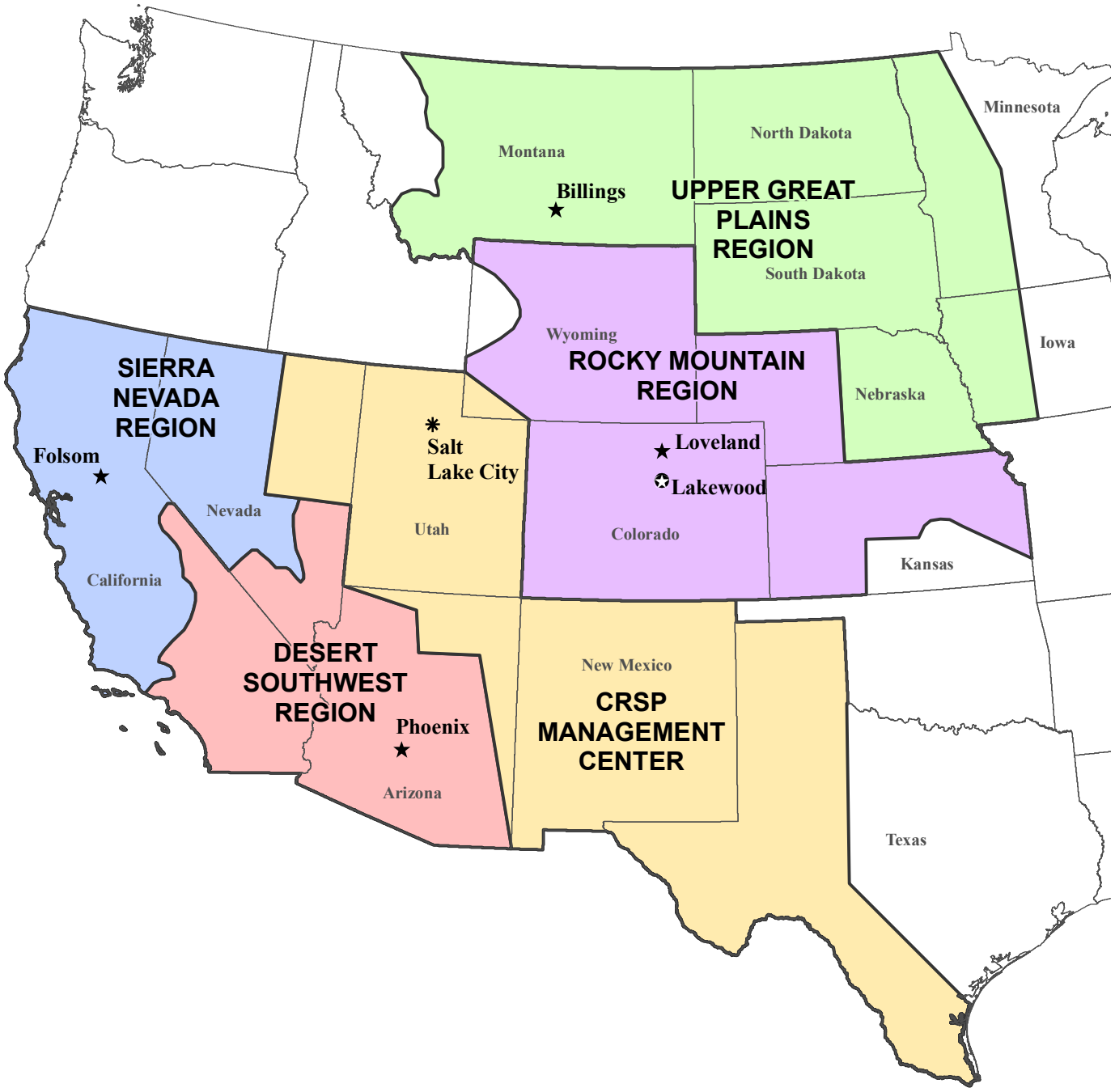
Western issued a determination that an EA would be required for the proposed Project on March 21, 2007. Letters were mailed to potentially affected land-owners, Federal and State agencies, Native American tribes, special interest groups, and elected governmental officials during July 2007. BEPC opened a field office in Dickinson, North Dakota, during July 2007 to facilitate interaction with the public and public scoping meetings were held in Belfield and Bowman on July 23 and 24, 2007, respectively. Feed-back from the public was used to refine transmission line alignments and to identify potential impacts and mitigation measures. BEPC engineers and ROW specialists met with individual landowners during the detailed routing process. Additional information about public involvement is provided in Section 1.5, Public Involvement.

1.3.2 North Dakota Public Service Commission

It is the policy of North Dakota "… 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.)

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 Belfield to Rhame 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 meter) avoidance area criteria for inhabited rural residence may be waived by the owner of the inhabited rural residence …"



LEGEND

- ✱ CRSP MANAGEMENT CENTER
- ✪ CORPORATE SERVICES OFFICE
- ★ REGIONAL OFFICE

N

200 100 0 200

Scale in Miles

Belfield to Rhame Transmission Project

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Western Area Power Administration

Figure 1-2
Western's Service Area

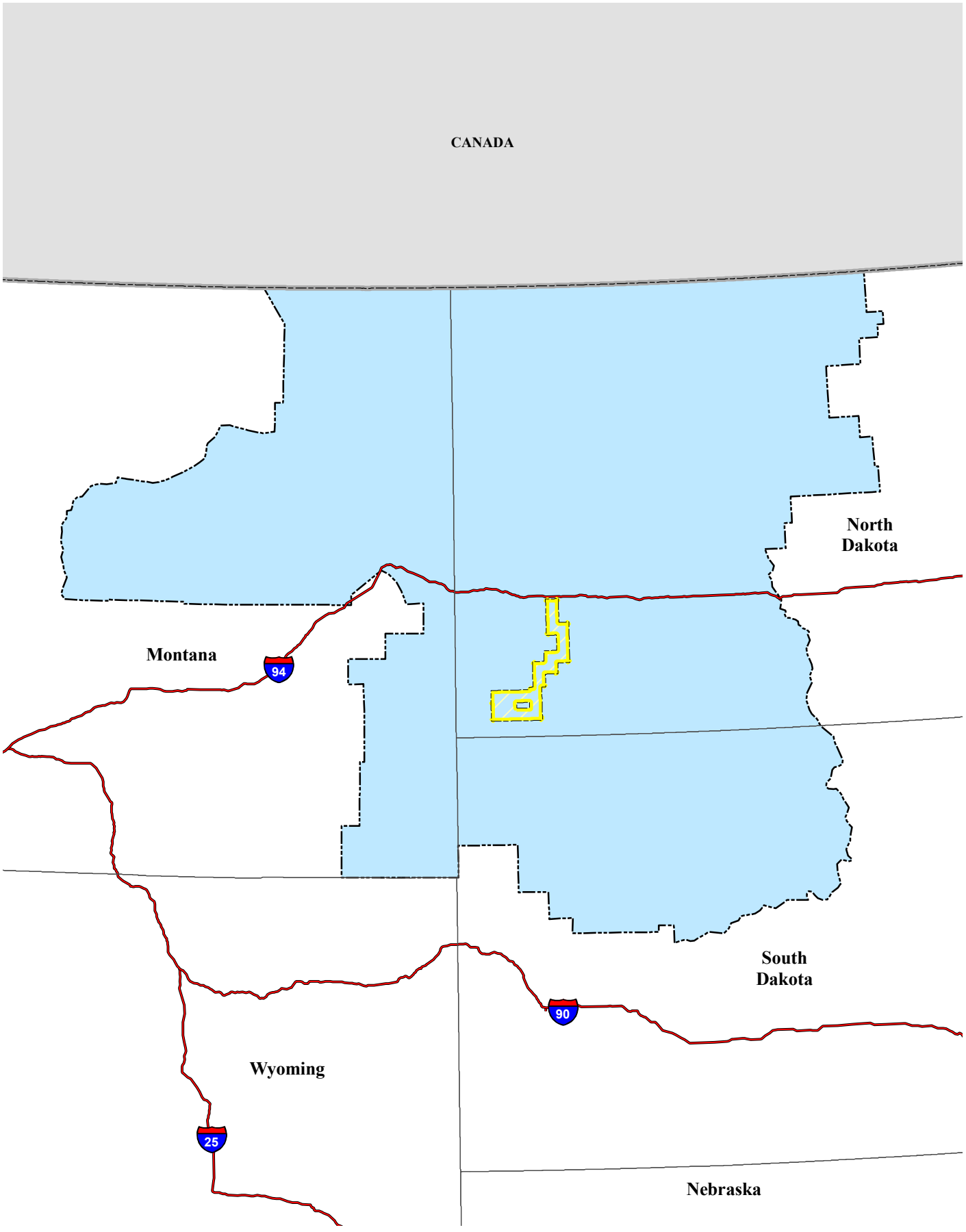


Figure 1-3
BEPC Service Area

The State also identifies additional exclusion areas that include National and State parks, landmarks, historic districts, wilderness areas, archaeological sites, 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 Belfield to Rhame Transmission Line are addressed in full in Section 3.1, NDPSC Routing Criteria.

1.3.3 Permits and Consultation Required

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

- Western Area Power Administration – System Interconnection Authorization, compliance with the National Environmental Policy Act, Native American Consultation.
- U.S. Fish and Wildlife Service – Compliance with the Endangered Species Act (section 7 consultation), compliance with the Migratory Bird Treaty Act.
- Federal Highway Administration – Permit to construct and operate a transmission line across or within Federal 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 (section 106 consultation).
- North Dakota Department of Transportation – Permit to construct and operate a transmission line across or within State highway ROW.
- North Dakota Game and Fish – Consultation to identify any State-listed species of concern that could potentially be affected by the proposed Project.
- North Dakota Department of Health – Acquire Stormwater Pollution Prevention Permit, if required, for new construction of the Rhame Substation.
- Bowman County – Acquire a Building Permit for the proposed Rhame Substation.
- Burlington Northern – Santa Fe Railroad – Authorization to construct and operate a transmission line across railroad ROW.

1.4 Purpose and Need

Purpose and need statements have been developed to address power supply requirements and requirements that Western prepare documentation authorizing the proposed Project.

1.4.1 Western's Purpose and Need

Western is mandated to respond to BEPC's request for interconnection at Belfield Substation and, if approved, make modifications to the substation necessary to accommodate the interconnection. Western's Open Access

Transmission Service Tariff provides open access to its transmission system by publicly owned utilities. 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 Belfield Substation. Western must make a determination that the requested interconnections 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 may determine the project results in a Finding of No Significant Impact or that the preparation of an EIS is necessary.

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 is 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.

1.4.2 Project Purpose and Need

The proposed transmission line and the proposed Rhame Substation are needed to meet load forecasts of BEPC customers in southwestern North Dakota. Oil and gas development activity in southwestern North Dakota is causing accelerated growth in requirements for available power from current 85-MW levels to expected 2016 levels of 140 MW. BEPC is legally mandated to meet baseload load growth and, as a utility, is required to respond to increased demand, including construction and operation of projects like the proposed Belfield to Rhame Transmission Line and Rhame Substation. Baseload growth was estimated through a study sponsored by BEPC and the North Dakota Energy Council. The study included interviews of all major energy developers in the region and did not include any energy sales to other utilities outside Basin Electric's member systems.

Western and BEPC evaluated power requirements through systems studies that included evaluations of existing substation and transmission line resources in the area, effects of various interconnection scenarios, and consequences of the addition of new facilities (BEPC 2007). Electric load in the region is served by an existing Montana-Dakota Utilities Company (MDU) 230-kV line from Baker, Montana, to Hettinger, North Dakota. The substations at Baker and Hettinger are connected to the integrated transmission system. This line has a finite capacity and the load in this region is nearing capacity. A new transmission line is needed to bring additional power to the region. The existing Belfield Substation is the closest source of this power. The Belfield Substation is connected to the power stations in central North Dakota by the 345-kV transmission grid. Also, the proposed Project improves the transmission system reliability by providing a separate power source if the Baker to Hettinger line is lost to storm damage.

The need for a new substation near Rhame results from load limitations at the Little Missouri Substation (located near Baker, Montana) that currently serves southwestern North Dakota and surrounding areas. Although capacitor additions at Little Missouri and Dawson substations have increased the load limit from 65 MW to 85 MW, voltage load curtailing at the Little Missouri Substation could occur. Additional modifications to Little Missouri Substation cannot be made because the existing 230-kV yard is a tap configuration and a new 230-kV fully developed breaker system cannot be added without the extensive addition of new equipment.

Construction and operation of the proposed Rhame Substation represents the most expedient and cost-effective solution to ensuring an adequate power supply to the region into the foreseeable future. Development of the new substation also offers an opportunity to provide increased reliability to a 115-kV distribution system between Little Missouri Substation and the proposed Rhame Substation. The Little Missouri Substation, proposed Rhame Substation, the MDU 230-kV transmission line, and the proposed Belfield to Rhame Transmission Line are shown schematically on **figure 1-4**. Current and future power demands on the Little Missouri Substation are shown on **figure 1-5**.

1.5 Public Involvement

The primary public involvement goal for the Belfield to Rhame 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 Belfield to Rhame 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 July 6, 2007. The notification letters announced the public scoping meetings scheduled for July 23 and 24, 2007, as well as the intent to prepare an EA.

In addition to the notification letters, display advertisements were placed in three local newspapers: the *Dickinson Press, Bowman Pioneer*, and *New England Herald*. Radio advertisements announcing the public meetings were broadcast on four local radio stations (KCAD-FM, KZRX-FM, KLTC-AM, and KOPK-AM), six times a day from July 12 through July 20, 2007. Flyers were posted in storefronts and other community gathering places in the towns of Dickinson, New England, Scranton, Bowman, Belfield, Amidon, and Rhame, North Dakota.

1.5.2 Scoping Meetings

Two scoping meetings were held to provide the public an opportunity to learn more about the 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
Belfield City Hall Belfield, North Dakota	July 23, 2007	27
Bowman City Hall Bowman, North Dakota	July 24, 2007	50

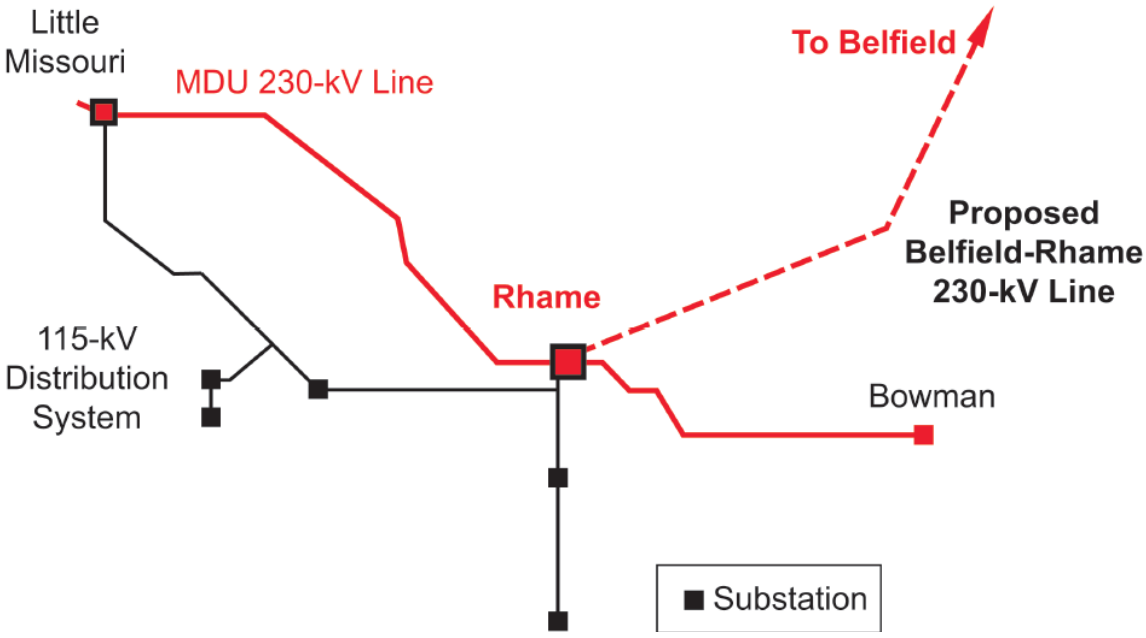


Figure 1-4 Proposed Rhame and Existing Little Missouri Substation Interconnection

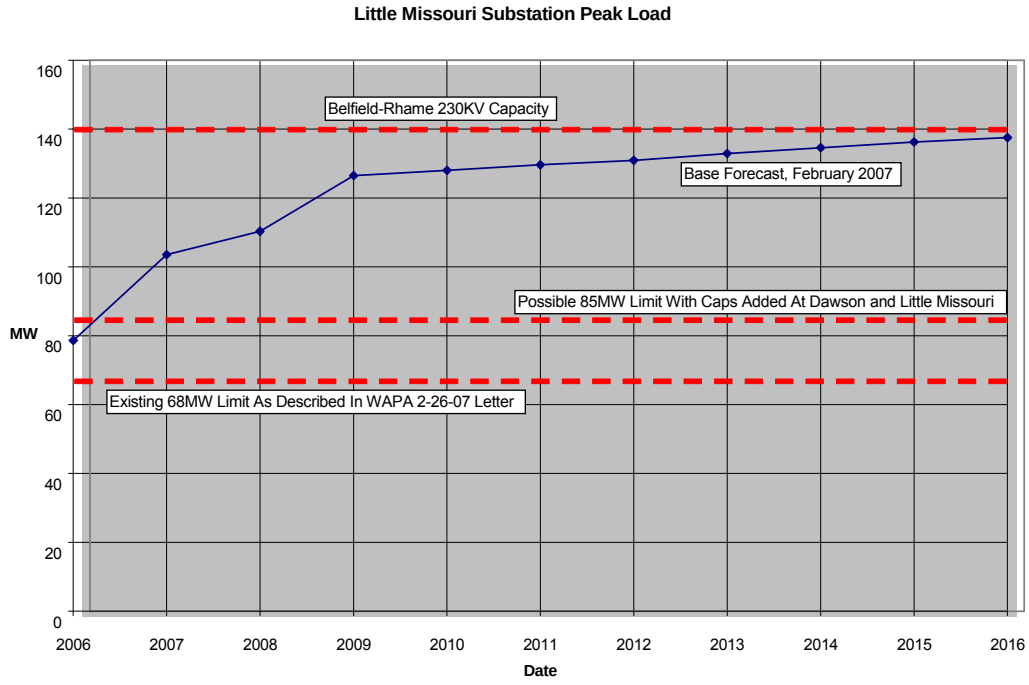


Figure 1-5 Little Missouri Substation Existing and Future Power Requirements

The meetings were held in an open house format to promote information exchange about the proposed Project and to gather public input. Displays 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.

In addition to the public scoping meetings, BEPC representatives augmented the NEPA process by meeting with the County Commissioners of the three counties during July to provide a Project overview and to receive their comments and concerns. A PowerPoint® slide show about the Project was presented and included information about Western's involvement in the proposed Project. The dates and locations of the County Commissioners' meetings are provided in **table 1-2**.

BEPC continues to engage in communication with area residences and communities. On November 14, 2007, representatives from BEPC attended the Dickinson Roundtable held in Dickinson, North Dakota. Roundtable members represent businesses and manufacturers in the Dickinson community. BEPC gave a presentation describing the Belfield to Rhame Transmission Project, the need for the Project, and the process to complete the Project. Roundtable members expressed their support for the Project and felt it would make a needed contribution to area growth and stability.

Table 1-2 County Commissioners' Meetings

Date/Time	Location
July 3, 2007 10:30 a.m.	Stark County 51 3rd Street East Dickinson, North Dakota
July 3, 2007 2:00 p.m.	Slope County 206 South Main Amidon, North Dakota
July 10, 2007 11:00 a.m.	Bowman County 104 5th Street NW Bowman, North Dakota

1.5.3 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 proposed Project and alternatives to 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 U.S. Fish and Wildlife Service (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 National Historic Preservation Act (NHPA). The Federal, State, and local agencies that Western contacted are provided in **Appendix A**, Notification.

1.5.4 Native American Consultation

In compliance with the NHPA, as amended, Western initiated government-to-government consultation for Basin Electric's proposed Project by sending letters and Project maps on July 9, 2007, to the following tribal groups: Eastern Shoshone Tribe, Northern Arapahoe 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 Project area either through inventory or by the contacted tribal groups.

1.5.5 Summary of Scoping Comments

Western received a total of 30 comment submittals (e.g., letters, comment forms) containing 74 individual comments, and numerous verbal comments during the public scoping period. Most of the comments were from landowners; comments from agencies and tribes included the USFWS, the U.S. Army Corps of Engineers, U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), North Dakota Department of Health, the Federal Aviation Administration (FAA), the Rosebud Sioux Tribe, and the Northern Cheyenne Tribe Tribal Historic Preservation Office.

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 resource; then reviewed to identify data entry errors and to eliminate duplication. A summary list of public comments, organized by resource/topic is provided in **Appendix B**, Public Comments.

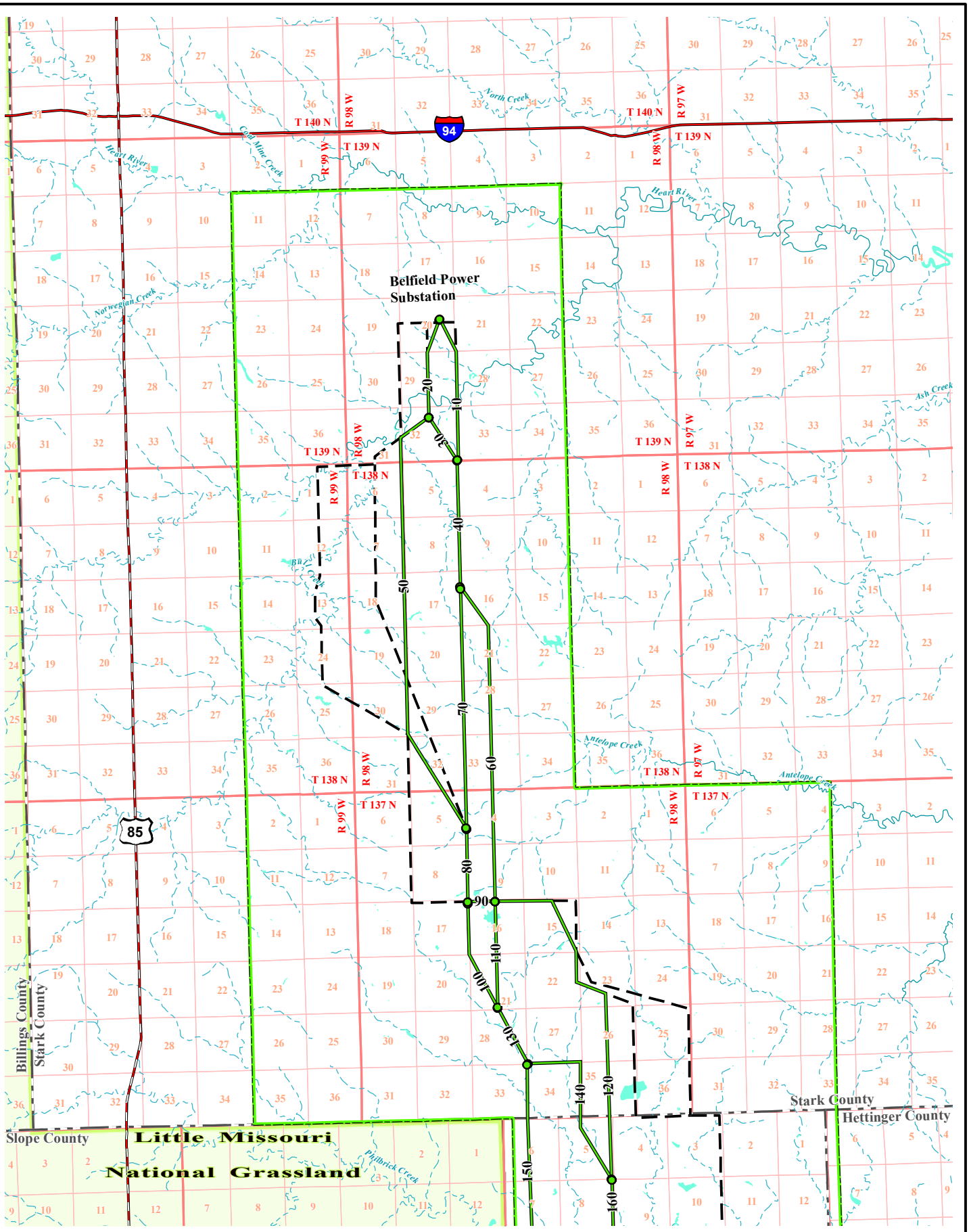
BEPC representatives worked with landowners to further refine the preferred route and alternative routes throughout the transmission line routing process.

1.5.6 Identification of Issues

Information gained during scoping assists Western in identifying the potential environmental issues, alternatives, and mitigation measures associated with development of the proposed Project. Transmission line segments that were presented during public meetings are shown on **figures 1-6** through **1-9**.

Public and agency comments received during the Project scoping process included landowner concerns regarding potential impacts to crop and livestock production, specific routing requests, and avoidance of sensitive biological and cultural resources. Additional comments and requests were received during detailed routing that were used by BEPC engineers and lands specialists to refine the routes. BEPC engineers and lands specialists worked one-on-one with landowners to address each individual concern. Route alignments were adjusted 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**.

While most of the comments received were related to landowner concerns and possible impacts to agricultural activities, Western received comments from Federal and State agencies that identified concerns about the possible impacts to the whooping crane, migratory birds, and other biological resources; construction practices; as well as Project impacts to water resources (e.g., crossing of streams and wetlands). These concerns have been addressed as part of the Project-specific mitigation measures and also were considered in the route refinement process. Additional concerns were expressed about the possible impacts of the Project to the proposed Bowman Municipal Airport; however, since development of the airport is still in the conceptual stage and a site has not been determined, impacts to the proposed airport were addressed in the cumulative analysis.



LEGEND

- POWER SUBSTATION
- CONSIDERED TRANSMISSION LINE SEGMENTS
- ELIMINATED TRANSMISSION LINE SEGMENTS
- CORRIDOR A
- WETLAND
- INTERMITTENT STREAM
- PERENNIAL STREAM
- INTERSTATE HIGHWAY
- U.S. HIGHWAY
- STATE HIGHWAY
- 120 LINE SEGMENT NUMBER

North Dakota
Area of Detail

N

1.5 1 0.5 0 1.5
Scale in Miles

Map Projection: UTM
Zone: 13 North
Datum: NAD 1983

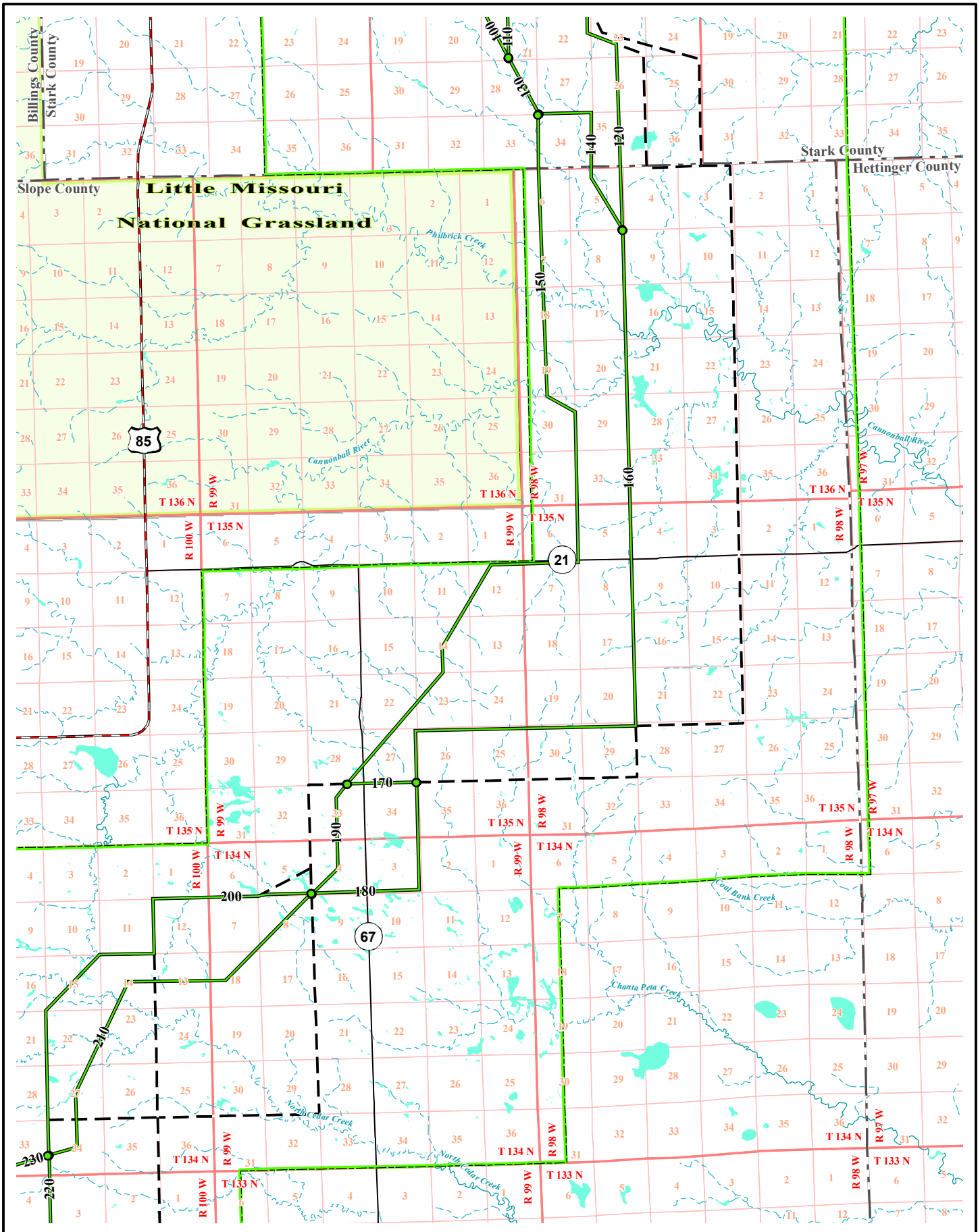
Grid Units: Meters
Image Source: USGS 100k DRGs

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Western Area Power Administration

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



North Dakota
Area of Detail

LEGEND

- POWER SUBSTATION
- CONSIDERED TRANSMISSION LINE SEGMENTS
- ELIMINATED TRANSMISSION LINE SEGMENTS
- CORRIDOR A
- WETLAND
- INTERMITTENT STREAM
- PERENNIAL STREAM
- U.S. HIGHWAY
- STATE HIGHWAY
- 120 LINE SEGMENT NUMBER

N

1.5 1 0.5 0 1.5
Scale in Miles

Map Projection: UTM
Zone: 13 North
Datum: NAD 1983

Grid Units: Meters
Image Source: USGS 100k DRGs

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
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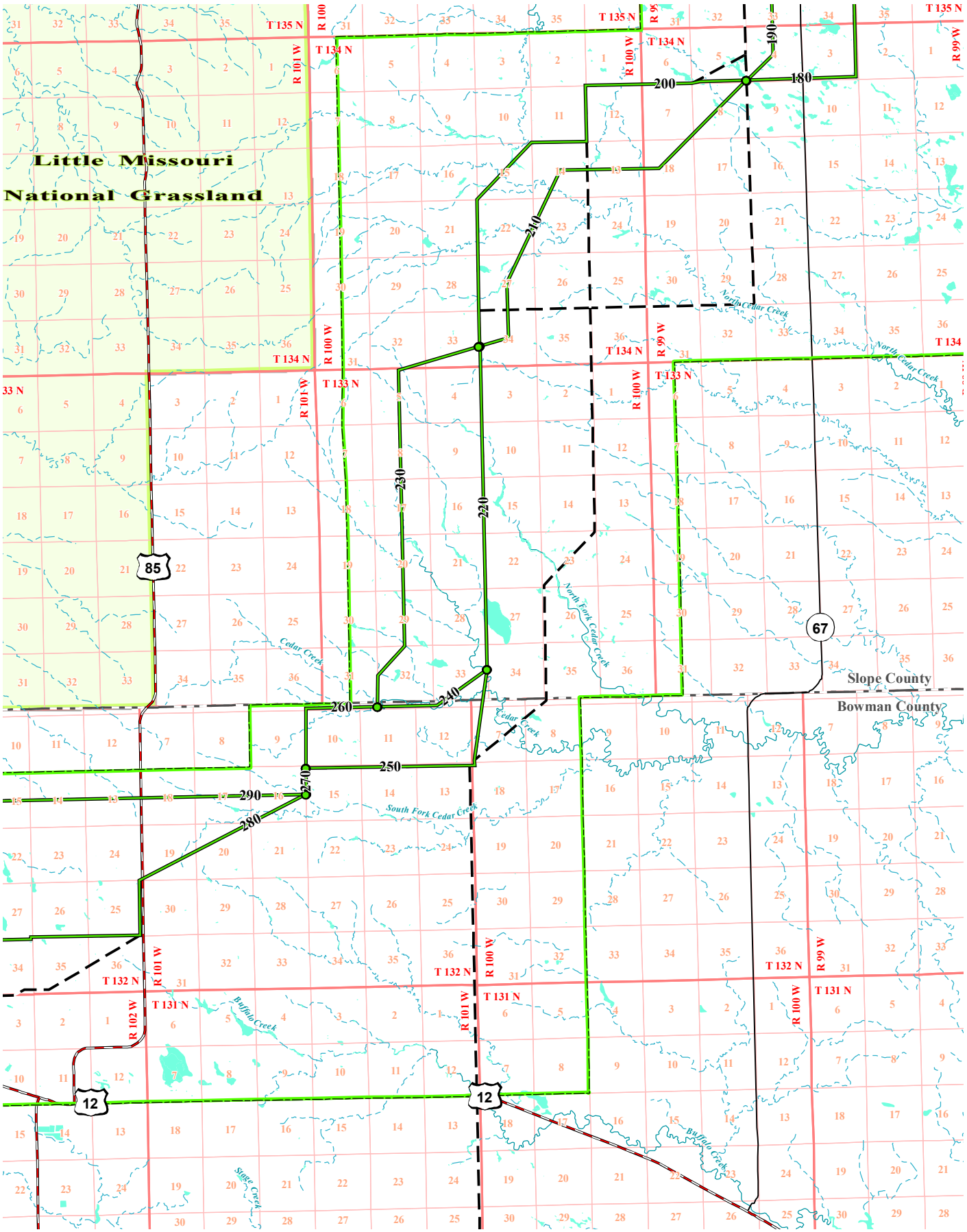
Western Area Power Administration

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



North Dakota
Area of Detail

LEGEND

- POWER SUBSTATION
- CONSIDERED TRANSMISSION LINE SEGMENTS
- ELIMINATED TRANSMISSION LINE SEGMENTS
- CORRIDOR A
- WETLAND
- INTERMITTENT STREAM
- PERENNIAL STREAM
- U.S. HIGHWAY
- STATE HIGHWAY
- 120 LINE SEGMENT NUMBER

N

1.5 1 0.5 0 1.5
Scale in Miles

Map Projection: UTM
Zone: 13 North
Datum: NAD 1983

Grid Units: Meters
Image Source: USGS 100k DRGs

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
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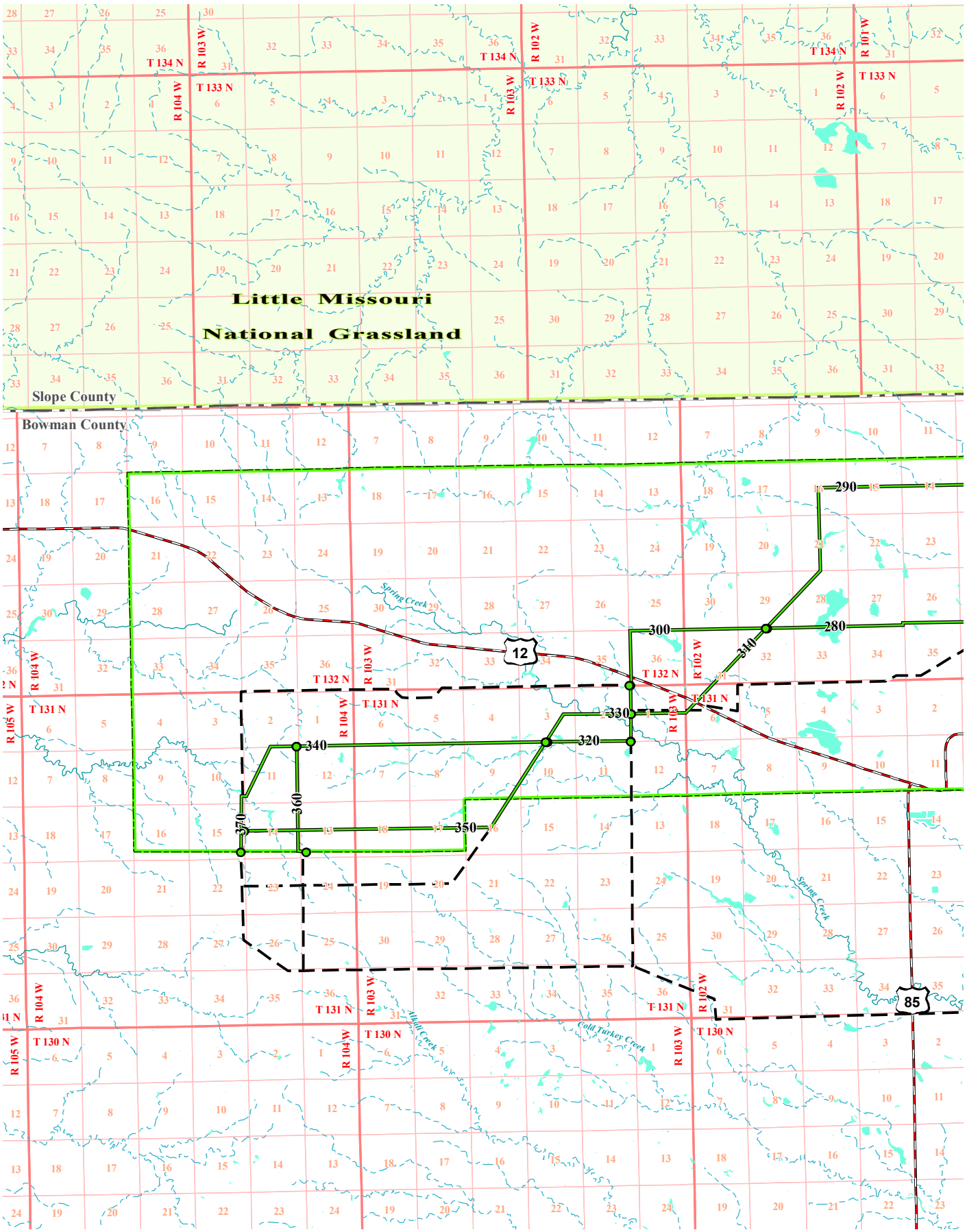
Figure 1-8
Transmission Line Segments Presented at Public Scoping Meetings



North Dakota
Area of Detail

LEGEND

- POWER SUBSTATION
- CONSIDERED TRANSMISSION LINE SEGMENTS
- ELIMINATED TRANSMISSION LINE SEGMENTS
- CORRIDOR A
- WETLAND
- INTERMITTENT STREAM
- PERENNIAL STREAM
- U.S. HIGHWAY
- 120 LINE SEGMENT NUMBER

N

1.5 1 0.5 0 1.5
Scale in Miles

Map Projection: UTM
Zone: 13 North
Datum: NAD 1983

Grid Units: Meters
Image Source: USGS 100k DRGs

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
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Figure 1-9
Transmission Line Segments Presented at Public Scoping Meetings

2.0 Project Design and Construction Details

A detailed list of steps that would be taken for construction through decommissioning of the proposed Project was developed. Project-specific mitigation measures were compiled by applying best management practices (BMPs) that are typical for constructing a high-voltage transmission line and associated facilities. Project-specific mitigation measures are provided in **appendix D**.

The proposed 230-kV, single-circuit transmission line would be constructed using steel single-pole self-supporting structures within a 125-foot-wide ROW. The Project also includes construction of a new substation near Rhame (Bowman County), North Dakota, and installation of a new microwave facility on East Rainy Butte in Slope County. Modifications to the existing Belfield Substation would be minor and would take place entirely within the existing substation fence. BEPC would own and would be responsible for constructing, operating, and maintaining the proposed Rhame Substation, the East Rainy Butte microwave facility, and the Belfield to Rhame Transmission Line. Western would be responsible for modifying the 230-kV bay at Belfield Substation to accommodate interconnection of the new transmission line.

BEPC engineers and lands specialists received comments on several proposed transmission line alignments during scoping. A preferred route and two alternative routes were subsequently identified for further analysis. The routing process is explained in detail in section 5.2, Route Selection Process.

2.1 Substation and Microwave Communications Facilities

The proposed substation near Rhame would be a new facility. BEPC has purchased approximately 80 acres of land for the substation site; all construction activities would be within 12.5 acres of the 80-acre parcel. Concrete foundations, support structures, and electrical equipment would be installed within a 12.5-acre fenced area of the proposed substation that would include a 2,000-square-foot control building. A free-standing microwave tower would be installed adjacent to, and outside of, the fenced area and an access road would be constructed from County Major Collector (CMC) 619, along the eastern margin of the site, to the substation enclosure.

A 180-foot-tall microwave tower would be installed on East Rainy Butte to relay signals between the Belfield Substation and the Rhame Substation. The tower and ancillary equipment would be located on a one-acre parcel, adjacent to an existing Western microwave tower. Although not determined at the present time, the Western facility could be dismantled and components could be installed on the new BEPC tower. A decision to dismantle the Western facility and install components on the BEPC tower would be made at a future date.

2.2 Transmission Line Design Parameters

The single-pole transmission line structures would range in height from approximately 95 to 120 feet and average110 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 overhead optical groundwire (OPGW). The OPGW would provide lightning suppression and fiber optic communications to Rhame Substation and Belfield Substation for systems control.

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. 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 required. **Table 2-1** describes the typical physical design characteristics for the proposed transmission line, and a typical single-pole structure is shown in **figure 2-1**.

Table 2-1 Transmission Line Characteristics

Design Component	Values
Voltage (kilovolt)	230
Conductor Size (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 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°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

Minimum conductor clearance is measured at the point of greatest conductor sag and closest proximity to the ground. The Belfield to Rhame 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

Construction of the transmission line and substation would likely begin in late 2008 or early 2009 and extend throughout the North Dakota construction season, usually beginning in March or April and ending in November or December of each year. Private contractors would construct the transmission line and haul away construction wastes associated with the Project. The contractors also would be responsible for complying with mitigation measures and agency requirements.

2.3.1 Pre-construction Surveying and Geotechnical Analyses

Various studies must be completed and permits acquired before construction begins, including completion of the NEPA process, Western authorization, NDPSC permitting, cultural resources (section 106 NHPA) clearance, section 7 ESA biological surveys, transmission line and substation engineering and design, ROW procurement, and final transmission structure siting. All further work, as described below, will be consistent with all permits and authorizations, including any applicable mitigation.

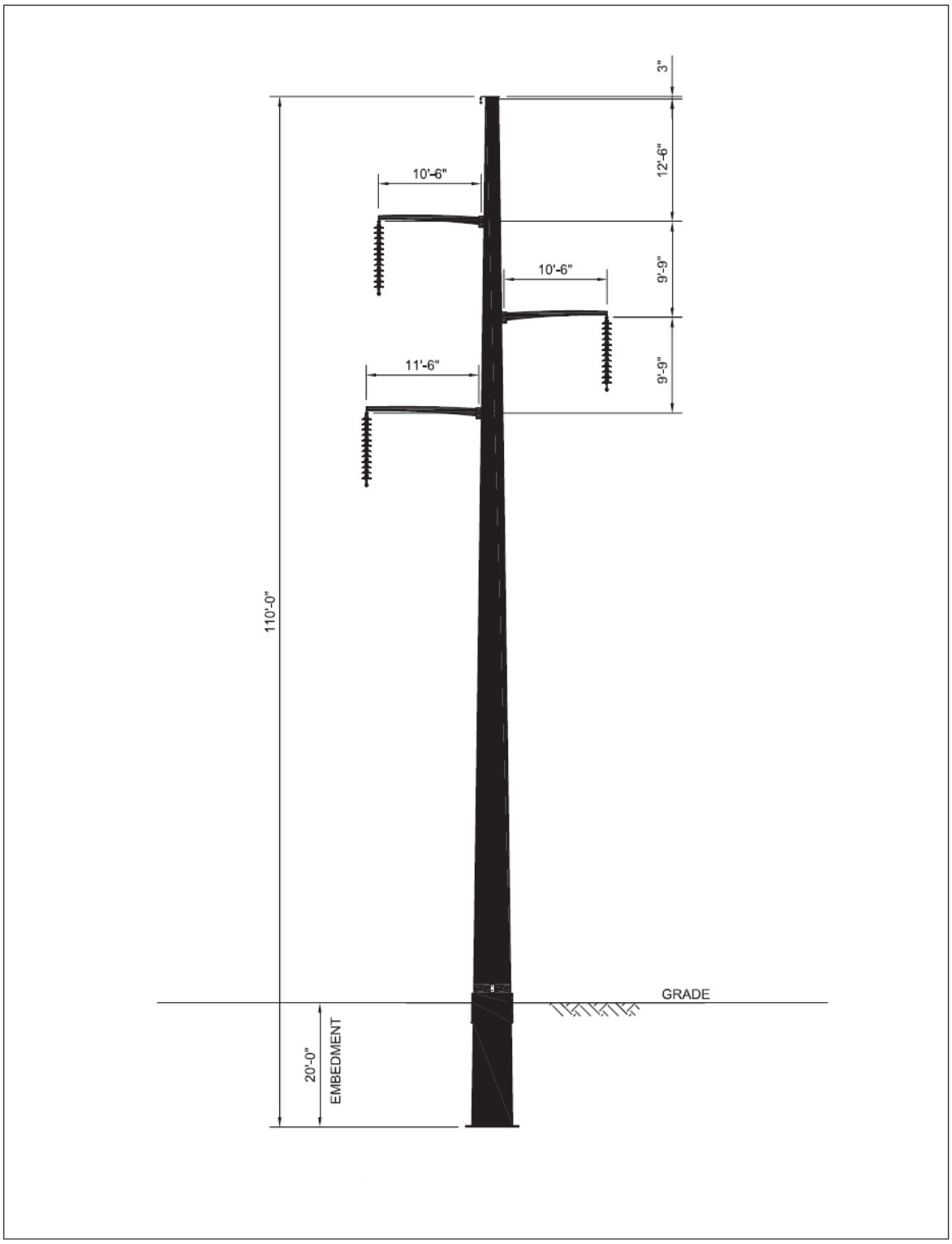


Figure 2-1 Typical Single-pole Structure

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 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 during the winter to minimize impacts to 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 for equipment setup and operations in addition to an access trail.

2.3.2 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, operating, 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.

During construction, it is anticipated that five temporary material staging and equipment laydown areas, each averaging approximately five acres, would be used. Available lands at the Belfield Substation and the proposed Rhame Substation site would be used. Three additional sites were identified in the central portion of the Project area. One site was previously used as a lay-down area for a water pipeline, one site is within a hay field, and one site was formerly used as a railroad siding. If additional areas are needed, appropriate biological and cultural resource surveys would be conducted before disturbance. Staging areas would be re-graded and revegetated when work in the area is complete and the staging area is no longer needed.

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 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.

2.3.3 Transmission Structure Site Preparation

Transmission structure site clearing would be minimal. The Project area and locations along the proposed transmission line route are relatively flat; 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 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 is completed. Temporary disturbance to soils would be mitigated by returning the sites to grazing and farming. Permanently impacted areas would be limited to structure locations across the Little Badlands, which have limited topsoil.

2.3.4 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. 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 three feet and an average depth of 12 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 three cubic yards at each tangent structure site) would be spread around the area at a depth of approximately two to four inches or disposed of (most likely in the case of cropland) in accordance with landowner wishes. The thin layer of surplus material would likely result in a temporary reduction in productivity before grazing and farming activities return the area to pre-construction conditions.

Approximately 50 structures would require reinforced concrete foundations consisting of a six-foot-diameter boring to an average depth of 20 feet. Approximately seven and one-half cubic yards of surplus material would be either spread in the vicinity of the structure or disposed of in accordance with landowner wishes. 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.

2.3.5 Structure Assembly and Erection

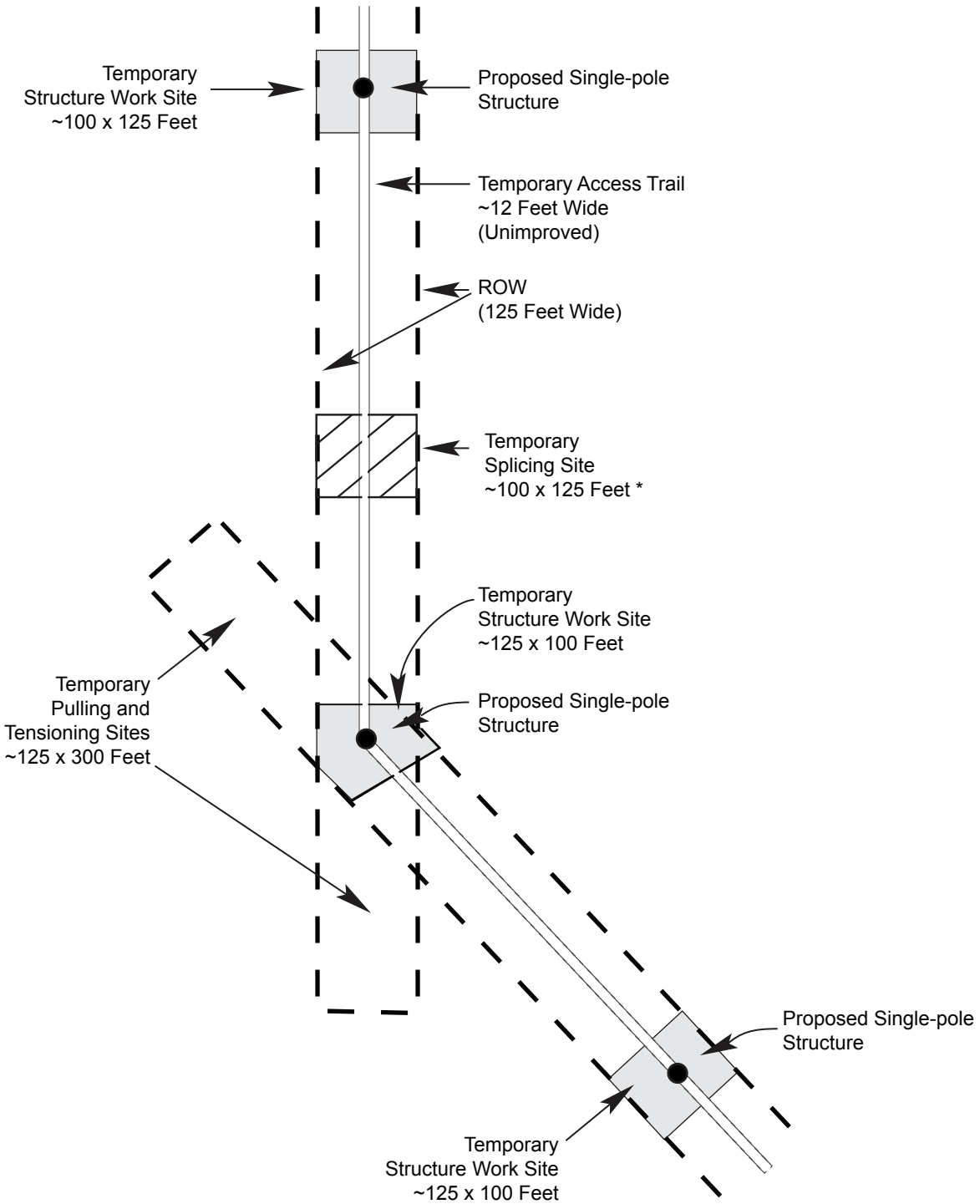
Structure components (structure segments, davit arms, hardware, insulators, and related materials) would be trucked to structure work site locations and assembled. Davit arms, insulators, and other appurtenances would be attached to the poles while on the ground at each structure location, within the 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 into the lower section. Both sections would then be bolted together.

2.3.6 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.

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 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, temporary wooden guard structures would be used to provide temporary 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.



LEGEND

* ~10,000 Feet Intervals

Belfield - Rhame Transmission Line

Figure 2-2

Conceptual Construction Configuration

06/10/08

2.4 Substation and Microwave Construction

The 12.5-acre Rhame Substation site would be cleared and leveled in a manner similar to that proposed for the transmission structures. Aggregate would be spread throughout the fenced substation site. Soil erosion would be controlled during construction using mitigation measures, described in **appendix D**. Substation components would be trucked to the site on local highways and roads and off-loaded using cranes and similar equipment. Concrete and aggregate would be trucked in from local sources.

A Supervisory Control and Data Acquisition (SCADA) system would interconnect the Belfield and Rhame substations. 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.

A microwave tower and dish would be constructed at Rhame Substation and on East Rainy Butte. The microwave tower and dish at Rhame Substation would be approximately the same height as other structures at the facility and located on a knoll, west of the substation fenceline. A new 180-foot-tall tower and two microwave dishes would be installed on East Rainy Butte. Removal of the existing Western microwave facility on East Rainy Butte and relocation of components to the proposed BEPC facility is currently under consideration. A dish would be added to the existing microwave tower at Belfield Substation.

2.5 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 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. Specific access locations and areas of temporary disturbance cannot be determined without detailed engineering showing locations where such access locations might be appropriate and distances that would be crossed. A 33-foot-long, 12-foot-wide temporary access point would temporarily disturb 0.009 acre. If blading or other minor improvements are needed to ensure the safe movement of heavy equipment, such improvements would remain in place following construction.

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 would be used when appropriate during the construction period. Gates and fences would be left in place for future use.

2.5.1 Temporary Overland Access

Temporary overland access would be used in areas without existing roads. Overland access through rangeland would avoid areas of sensitive vegetation, to the extent practicable. 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.

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 large-scale 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.

2.5.2 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 NRCS.

Ruts and scars from overland travel would be tilled to break up compacted soils and aid in returning areas to approximate original contours. Cultivated areas disturbed by overland travel would be 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. Other erosion control devices, such as water bars, or terracing, or water diversion structures would be constructed where needed. 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.

2.5.3 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 and oil and hydraulic spills that may result from equipment leaks. Workers would be trained in procedures to follow to contain and clean up any released hazardous materials.

2.6 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. Activities that would impact nesting migratory bird species would be scheduled to avoid the nesting period (typically April 15 through July 31), 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 2-2** lists construction activities. The proposed transmission line and substation would take an estimated seven months to construct. Construction activities associated with the Project are estimated to begin during late 2008 or early 2009. It is anticipated that the transmission line and substation would be in-service by April 2010. The sequential nature of construction would minimize activities at given work site.

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

Task	Number of Personnel	Equipment	Length of Time
Substation Construction			
Substation Grading	6	Dozers, scrapers, motor graders, and water trucks	1–2 months
Substation and Construction Yard and Material Staging	3–4	Pickup trucks, flatbed trucks with cranes, pole delivery trucks, rubber-tire digging equipment, all terrain vehicles (ATVs), portable compressors	Continuous during construction period
Landscape Rehabilitation	4	Pickups, flatbed trucks, backhoe, tractor, seeding equipment, hand-seeding equipment	3 months
Transmission Line Construction			
Structure Site Clearing and Vegetation Management	4–6	Pickups, mower, 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

2.7 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 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 are roads and foot patrols in areas where roads either do not exist or are not permitted.
- 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 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" (that is, 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.

2.8 Project-specific Mitigation Measures

Project-specific mitigation measures have been developed by BEPC 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.

2.9 Worker Safety and Health Protocol

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

3.0 Corridor Identification and Route Selection

In addition to the alternatives analyses required by NEPA, the NDPSC requires a two-step process consisting of identifying and selecting corridors, and routes within corridors. BEPC applied for a waiver to combine corridor and routing processes into a single document. NDPSC routing requirements are applicable to identifying appropriate corridors as well as specific transmission line routes and were incorporated into routing opportunities and constraints used in the NEPA process to provide a comprehensive approach to routing and permitting.

3.1 NDPSC Corridor and Routing Criteria

NDPSC requires initial analyses of alternative transmission line 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 NDPSC guidelines for Energy Conversion and Transmission Siting (NDCC 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.

NDPSC classifies routing constraints as exclusion areas, avoidance areas, selection criteria, and policy criteria. The criteria are summarized in the following text. Figures showing exclusion and avoidance areas for the Belfield to Rhame Transmission Project are provided in **exhibits A-1** through **A-4** and **B-1** through **B-4**.

Exclusion Areas. Exclusion areas are defined by the NDPSC 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. Areas excluded are:

- Designated or registered national: parks, memorial parks; historic sites and landmarks; natural landmarks; monuments; and wilderness areas.
- Designated or registered State: parks, historic sites; monuments; historical markers; archaeological sites; and nature preserves.
- County parks and recreational areas; municipal parks; and parks owned or administered by other governmental subdivisions.
- Areas that are critical to the life stages of threatened or endangered animal or plant species.
- Areas where animal or plant species that are unique or rare to the State would be irreversibly damaged.

Avoidance Areas. Avoidance areas are defined by the NDPSC 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 applicant 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. Avoidance areas are:

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

- Designated or registered State: wild, scenic, or recreational rivers; game refuges; game management areas; management areas; forests; forest management lands; and grasslands.
- Historic resources that are not specifically designated as exclusion or avoidance areas.
- Areas that are geologically unstable.
- Areas within 500 feet of a residence, school, or place of business (also to include community centers, healthcare facilities, and daycare facilities).
- Reservoirs and municipal water supplies.
- Water sources for organized rural water districts.
- Irrigated land.
- Areas of recreational significance that are not designated as exclusion areas.

Selection Criteria. A corridor or route shall be designated only when it is demonstrated to the NDPSC 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 criteria will be at an acceptable minimum, or that those effects would be managed and maintained at an acceptable minimum.

- Impacts to Agriculture
  - Agricultural production.
  - Family farms and ranches.
  - 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.
  - Surface drainage patterns and groundwater flow patterns.
- Impacts to:
  - Noise-sensitive land uses.
  - The visual effect on the adjacent area.
  - Extractive and storage resources.
  - Wetlands, woodlands, and wooded areas.
  - Radio and television reception, and other communication or electronic control facilities.
  - Human health and safety.
  - Animal health and safety.
  - Plant life.

Policy Criteria. The NDPSC may give preference to an applicant that will 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 NDPSC also may give preference to an applicant that will maximize interstate benefits.

- Location and design.
- Training and utilization of available labor in North Dakota for the general and specialized skills required.
- Economies of construction and operation.
- Use of citizen coordinating committees.

- A commitment of a portion of the transmitted product for use in North Dakota.
- Labor relations.
- The coordination of facilities.
- Monitoring of impacts.
- Utilization of existing and proposed ROWs and corridors.
- Other existing or proposed transmission facilities.

3.2 Project-specific Routing Criteria

Land use and land ownership patterns within the 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 that are centered on the section lines. Approximately 420 linear miles of public ROW within the Project area provide considerable opportunities to access adjacent properties for transmission line construction. Potential routing constraints, such as residential structures, farmsteads, irrigated lands, wildlife management areas, and recreational areas are relatively few and of low density. 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 falls largely on BEPC engineering and ROW acquisition staff and negotiations with local landowners.

Additional routing opportunities and constraints that are somewhat unique to the Project area are addressed in **table 3-1**.

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.

Table 3-1 Project-specific Routing Criteria

Routing Opportunities	Comments
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 FAA 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.
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.

Table 3-1 Project-specific Routing Criteria

Routing Constraints	Comments
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.
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 then 2,000 feet.	Reliability consideration. Western's criteria, designed to reduce the potential for single event catastrophic power outages.

Routing corridors are described in chapter 4.0; routes are described in chapter 5.0.

4.0 Corridor Description

Due to geographic constraints, a single six-mile-wide corridor (Corridor A) was routed from the Belfield area to the Rhame area. Corridor A extends within an area bordered on the west by Little Missouri National Grassland and on the east by the City of New England. Corridors B and C were added to provide an opportunity to enter the proposed Rhame Substation from the south. Corridors A, B, and C are shown on **figure 4-1**. Corridor land uses; prime and unique farmlands, and farmlands of statewide importance; flood hazard areas; vegetation types; wetlands and riparian areas; and other resources have been compiled from available data. Acreages and relative percentages are provided, to the extent practicable. Those resources are further evaluated as part of routing analyses described in chapter 6.0 of this EA.

4.1 Jurisdictions, Land Use, and Agricultural Practices

The three corridors are located in Stark, Slope, and Bowman counties in southwestern North Dakota and oriented to avoid exclusion and avoidance areas, including population centers of Belfield, South Heart, and New England. Designated wildlife and grasslands such as the Little Missouri National Grassland, White Lake National Wildlife Refuge (NWR), Cedar Lake Wildlife Refuge, and Stewart Lake NWR also were avoided by the corridor. Resources that could not be fully avoided in the corridors included urbanized (developed) areas within Rhame and portions of Bowman, rural residences, and water resources.

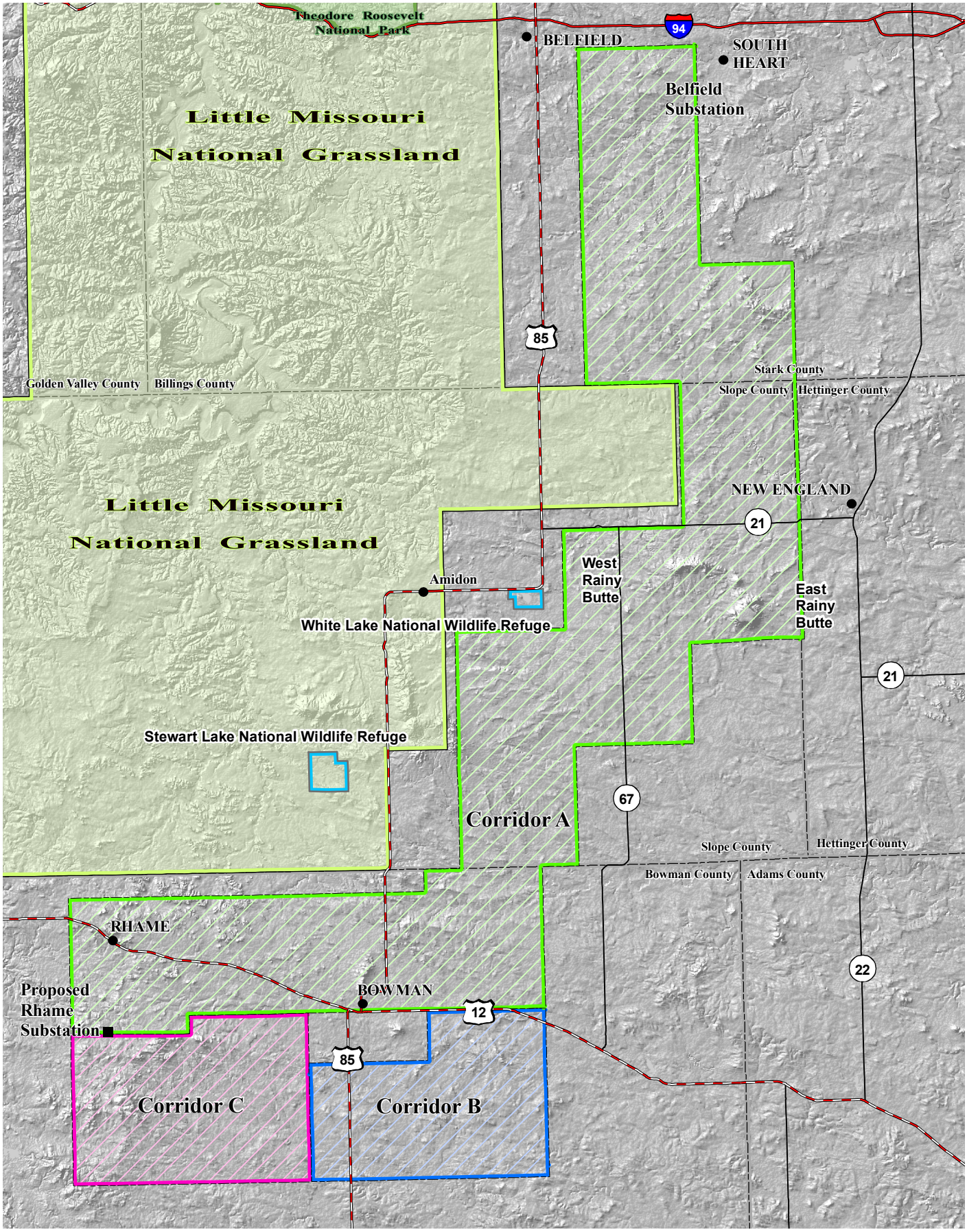
Agriculture and livestock production dominates approximately 95 percent of land uses within the corridors. Land uses within the three corridors were classified from State of North Dakota data as open water, developed, barren land (badlands), forested, rangeland, grassland (primarily maintained pasture), cropland, riparian, and emergent wetlands.

Corridor A totals 323,515 acres, of which 92 percent are classified as cropland and grassland. Corridors B and C total 55,483 and 61,681 acres, respectively, and are similar to those of Corridor A with 91 to 94 percent of the land occupied by cropland and grassland. Developed land occupies approximately 14,000 acres (4.3 percent) of Corridor A, which includes the northern portion of the City of Bowman and the entirety of the City of Rhame. The area was identified to be avoided during detailed routing (chapter 6.0) due to the relatively high density of residential and community infrastructure features. The land use composition of the three corridors is provided in **table 4-1**.

4.2 Physiology, Geology, Soils, and Minerals

The Belfield to Rhame Transmission Line Project lies within the Missouri Slope Upland Physiographic Region (Bluemle and Biek, not dated), which is part of the Great Plains Province. The Missouri Slope Upland Region is one of six physiographic regions within the State and is characterized by broad valleys, hills, and buttes that are largely the result of erosion of siltstone, claystone, and lignite that were deposited 65 to 55 million years ago. Erosion has taken place over the past 10 to 15 million years.

Dominant features within the 440,679-acre corridors include the Little Badlands that are relatively confined to the north central portion of Corridor A. Numerous buttes that are in scattered localities near Belfield and Rhame. East and West Rainy Buttes are in the vicinity of New England and are the most prominent landforms in the corridors.



North Dakota
Area of Detail

LEGEND

- SUBSTATION
- CITY OR TOWN
- NATIONAL WILDLIFE REFUGE
- U.S. NATIONAL GRASSLAND
- NATIONAL PARK
- CORRIDOR 'A'
- CORRIDOR 'B'
- CORRIDOR 'C'

N

5 4 3 2 1 0 5
Scale in Miles

Map Projection: UTM
Zone: 13 North
Datum: NAD 1983
Grid Units: Meters

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative
Western Area Power Administration

Figure 4-1
Belfield - Rhame
Transmission Corridors

Table 4-1 Land Uses within Corridors A, B, and C

	Corridor A		Corridor B		Corridor C	
	Acres	**Percent**	**Acres**	**Percent**	**Acres**	**Percent**
Open Water	724	0.2	173	0.3	182	0.3
Developed	13,924	4.3	2,265	4.1	2,217	3.6
Barren Land/Badlands	913	0.2	27	0.0	10	0.0
Deciduous Forest	684	0.2	2	0.0	63	0.1
Rangeland (scrub/shrub)	5,148	2.0	944	1.7	3,056	5.0
Grassland (maintained pasture)	92,067	28.4	25,170	45.5	34,406	55.8
Cropland (cultivated)	207,593	64.1	26,767	48.2	21,658	35.1
Riparian	2,299	0.6	127	0.2	77	0.1
Emergent Wetlands	163	0.0	8	0.0	12	0.0
Total[1]	**323,515**	**100.0**	**55,483**	**100.0**	**61,681**	**100.0**

[1]Totals for Land uses and totals for Prime and Unique Farmlands and Farmlands of Statewide Importance (**table 4-2**) differ due to the use of differing databases.

Soils

The six-mile-wide corridors are comprised of 31 soil types. Thirteen soil types are found within alluvial fans, terraces, and similar landforms and 13 are associated with upland plains, swales, and similar landforms. Four soil types are associated with hills, slopes, and ridges. Only one soil type is associated with bottomlands and low lying areas (USDA/NRCS 2007a).

Prime and Unique Farmland and Farmland of Statewide Importance

Prime and Unique Farmland and Farmland of Statewide Importance were compiled from Soil Survey Geographic databases. Data indicate that prime farmland soils occupy approximately four percent of Corridor A. Prime farmland soils within Corridors B and C occupy approximately four and three percent, respectively. Farmlands of Statewide Importance comprise approximately 46 percent of Corridor A, 53 percent of Corridor B, and 37 percent of Corridor C. Prime and Unique Farmland and Farmland of Statewide Importance are included in **table 4-2**.

Table 4-2 Prime and Unique Farmland and Farmland of Statewide Importance Within Corridors A, B, and C

	Corridor A		Corridor B		Corridor C	
	Acres	**Percent**	**Acres**	**Percent**	**Acres**	**Percent**
Prime and Unique Farmland	14,020	4.3	2,217	4.0	1,795	2.9
Farmland of Statewide Importance	149,387	46.2	29,101	52.5	22,847	37.1
Other Lands	160,108	49.5	24,165	43.5	37,039	60.0
Total[1]	**323,515**	**100.0**	**55,483**	**100.0**	**61,681**	**100.0**

[1]Totals for Land uses (**table 4-1**) and totals for Prime and Unique Farmlands and Farmlands of Statewide Importance differ due to differing databases.

4.3 Hydrology and Drainage

Drainages within the three corridor areas are largely intermittent or ephemeral. Named streams and rivers in the vicinity of Belfield Substation flow in a northeasterly direction and include: South Branch Heart River, Bull Creek, and Antelope Creek. Philbrick Creek, Cannonball Creek, Chanta Creek, and Cedar Creek are in the central portion of the three-corridor area. Spring Creek and Coyote Creek are in the vicinity of Bowman and Rhame.

Floodplains

Flood hazard areas, designated by the Federal Emergency Management Agency (FEMA), include three flood hazard zones within the three-county Project corridor described in **table 4-3**.

Table 4-3 Project Corridor Flood Hazard Areas (flood zones)

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.

Flood hazard areas (Zones X500, AE, and A) within the three corridor area total 8,800 acres. Flood hazard areas are scattered throughout the three corridor areas and are not discretely mapped.

4.4 Vegetation Resources

Project area corridors are heavily dominated by grasslands and agricultural (cultivated) vegetation. Grasslands comprise approximately 151,640 acres; agricultural cover comprise approximately 256,000 acres. Corridor-level vegetation resources data were used to minimize routing the proposed Belfield to Rhame Transmission Line through areas that were classified as agriculture (i.e., cultivated fields), forested, and wetlands (refer to chapter 6.0). Vegetation cover types within the corridors are shown in **table 4-4**.

Table 4-4 Vegetation Types within Project Area Corridors

Vegetation Community	Corridor A		Corridor B		Corridor C	
	Acres	Percent	Acres	Percent	Acres	Percent
Grasslands	92,067	28.5	25,170	45.4	34,406	55.8
Range (Shrub-scrub)	5,148	1.6	944	1.7	3,056	4.9
Agriculture	207,593	64.2	26,767	48.2	21,658	35.2
Forested	684	0.2	2	0.0	63	0.1
Riparian[1]	2,298	0.7	127	0.2	77	0.1
Wetlands[1]	163	0.0	8	0.0	12	0.0
Badlands	913	0.3	27	0.1	10	0.0
Other Lands	14,649	4.5	2,438	4.4	2,399	3.9
Total	**323,515**	**100.0**	**55,483**	**100.0**	**61,681**	**100.0**

[1]Wetland acreages differ from those in **table 4-5** due to differing databases. **Table 4-4** lists vegetation types; **table 4-5** lists wetland types.

Source: National Land Cover Data 2007.

4.5 Wetland Resources

National Wetland Inventory data indicate a total of 4,491 acres are classified as wetlands within the three corridors. Freshwater emergent wetlands comprise the largest acreage of wetlands in the three corridors (approximately 3,650 acres). Lakes and freshwater ponds occupy approximately 716 acres. Large wetland areas that could be difficult to span would be avoided. Small wetlands would be avoided or spanned. Wetland data are shown for each corridor in **table 4-5**.

Table 4-5 Wetland Types Within Corridors A, B, and C

Wetland Types and Number by Corridor						
	Corridor A		**Corridor B**		**Corridor C**	
	Acres	**Number**	**Acres**	**Number**	**Acres**	**Number**
Lake	33	3	46	2	52	7
Freshwater Pond	384	620	112	115	89	159
Freshwater Emergent Wetland	3,150	1,537	334	246	166	219
Freshwater Forested/Shrub Wetland	18	18	0	0	<1	1
Other	65	100	18	16	23	16
Riverine	1	5	0	0	0	0
Total[1]	**3,651**	**2,283**	**510**	**379**	**330**	**402**

[1]Wetland acreages differ from those in **table 4-4** due to differing databases. **Table 4-4** lists vegetation types; **table 4-5** lists wetland types.

Source: National Wetland Inventory.

4.6 Sensitive Ecological Communities

Sensitive ecological communities were identified by the North Dakota Natural Heritage Inventory (NDNHI). These terrestrial natural communities consisting of interrelated assemblages of plants, animals, and other living organisms incorporated into their physical surroundings including geologic substrate, soils, topography, and aspect that are shaped by climate and other natural processes. These high quality communities are ones that provide diverse assemblages of native species and represent the least distressed examples of ecosystems that existed in North Dakota prior to European settlement (Hagen et al. 2005). Sensitive ecological communities identified by the NDNHI present within the three Project corridors are described below.

Needle-and-thread Mixed Grass Prairie. Needle-and-thread Mixed Grass Prairie is associated with flat to rolling topography with deep (40- to 100-centimeter [cm]), sandy loam to loam, coarser-textured soils. Although typically associated with uplands within the corridors, this community may also occur lower in the landscape, such as coulee and draw bottoms, if soils are sufficiently coarse (usually sandstone-derived). Elevation ranges are typically from 610 to 1,680 meters (m) (2,000 to 5,500 feet) and the average annual precipitation ranges from slightly less than 25 cm to over 50 cm (10 to 20 inches). The dominant vegetation consists of moderate to moderately dense medium-tall grasses (NatureServe 2007). Needle-and-thread mixed grass prairie communities are likely to represent less than six percent of corridor lands.

Western Wheatgrass Saline Seep. Western Wheatgrass Saline Seep community is found in depressions and on ephemeral stream terraces on deep, moderately saline soils, sometimes with a clay subsoil. These soils are present within the corridors and are wet for part of the year and may flood periodically. The vegetation is dominated by graminoids (wheatgrass), which may be as tall as one m, but typically are less than 0.6 m. The dominants are western wheatgrass (*Pascopyrum smithii)* and saltgrass (*Distichlis spicata)*. Heavy grazing and lack of fire throughout its range may cause some stands to have an increased proportion of exotics (NatureServe 2007). Western wheatgrass saline seeps would occupy a small proportion of the prairie wheatgrass vegetation community.

Green Ash Upland Woodland. The Green Ash Upland Woodland community occurs in upland ravines, broad valleys, moderately steep slopes, and along small permanent or ephemeral streams, including deep mesic ravines and canyon bottoms that are not flooded or saturated. On these sites, soil and topography permit greater than normal moisture. The soils are clay loams, sandy clay loam, and sandy loam, dry to moist, and moderately well-drained within limited areas of the corridors. The parent material is typically colluvium or alluvium. The dominant vegetation of this community is green ash (*Fraxinus pennsylvanica)* (NatureServe 2007). Green ash upland woodlands are likely to occupy less than 0.3 percent of corridor lands.

Horizontal Juniper-Little Bluestem Shrubland. This creeping juniper community type occurs on moderate to steep slopes, usually on upper slopes within limited areas of corridors. Soils are silty loam, sandy loam, or clay loam and it occurs on north- and, rarely, west-facing slopes. Parent materials are sandstone, siltstone, claystone, and sandy glacial till. The community is dominated by short shrubs and graminoids (NatureServe 2007) and occupies less than 0.1 percent of corridor lands.

Badlands Slope. The Badlands Slope ecological system is within northern portions of Corridor A and is typified by extremely dry and easily eroded, consolidated clay soils with bands of sandstone or isolated consolidates and little to no cover of vegetation (usually less than 10 percent but can be as high as 20 percent). Vegetated patches within the badlands system may have cover higher than 20 percent. In those areas with vegetation, species can include scattered individuals of many dryland shrubs or herbaceous taxa, including curly-top gumweed (*Grindelia squarrosa*), broom snakeweed (*Gutierrezia sarothrae*) (especially with overuse and grazing), greasewood (*Sarcobatus vermiculatus*), Gardner's saltbush (*Atriplex gardneri*), birdfoot sagebrush (*Artemisia pedatifida*), buckwheat (*Eriogonum* spp.), plains muhly (*Muhlenbergia cuspidate*), bluebunch wheatgrass (*Pseudoroegneria spicata*), and Hooker's sandwort (*Arenaria hookeri*). Patches of *Artemisia* spp. also can occur. This system can occur where the land lies well above its local base level or below and is created by several factors, including elevation, rainfall, carving action of streams, and parent material (NatureServe 2007). Badlands slope is limited to 0.5 percent of the three corridors.

Sandreed Prairie. Prairie sandreed (*Calamovilfa longifolia*) grassland is found on gentle slopes but also can be found on flat land or moderate to steep slopes within the corridors. Soils consist of thin sands, sandy loams, and loamy sands, in places derived from sandstone. Most stands of this community are not very large. The vegetation is dominated by graminoids, with two strata, one of mid- to tall-grasses, the other of dense short sedges (NatureServe 2007). Sandreed prairie would represent approximately one percent of the three corridors.

Western Wheatgrass Prairie. Western wheatgrass prairie community occurs on flat or gently sloping terrain including floodplains, gentle valley slopes, and uplands within the three Corridors. The soils are clay loam, silt loam, or loam and usually deep and fertile. This community is dominated by medium and short graminoids (NatureServe 2007). Western wheatgrass prairie would represent less than six percent of the three corridors.

Western Floodplain Forest. Western Floodplain Forest is an ash - elm woody draw community type that occurs on upland sites along steep north-facing slopes and, occasionally, along intermittent drainages or near the bases of north-facing slopes of upland sites. Soils are typically moist and poorly drained, and usually silty clay or clay. This is a moderately to densely vegetated forest with an open to dense shrub understory (NatureServe 2007). Western floodplain community would represent less than 0.5 percent of the three corridors.

Silver Sage-Western Wheatgrass Scrub. Silver or coaltown sagebrush (*Artemisia cana*) shrubland occurs on flat alluvial deposits on floodplains, terraces or benches, or alluvial fans. The soils are moderately deep to deep and either silt loam, clay loam, or sandy loam. This community is dominated by a combination of shrubs and graminoids. The total vegetation cover is moderate with the tallest and most conspicuous stratum in this community consisting of a shrub layer that is usually 0.6 to 1.2 m (2 to 4 feet) (NatureServe 2007). Silver sage-western scrub would represent less than 0.5 percent of the three corridors.

Buckbrush Shrubland. Buckbrush Shrubland within the three corridors, is dominated by western snowberry (*Elaeagnus commutata*) and occurs in mesic depressions and swales, typically surrounded by upland grassland communities. The soils are silts and loams. This type has three distinct vegetation layers, a shrub layer (approximately 80 cm [31 inches] tall), a graminoid-dominated layer (approximately 30 cm [12 inches] tall), and a forb-dominated layer (<20 cm [<8 inches] tall) (NatureServe 2007). Buckbrush shrubland is estimated to occupy less than one percent of the three corridors.

4.7 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. The potential occurrence and control of noxious weeds is addressed in section 6.3.3.8.

Noxious weeds identified by the NRCS as present in Stark, Slope, and Bowman counties are listed in **table 4-6**. The list includes State and County prohibited or restricted noxious weeds that are managed and controlled by the State of North Dakota.

4.8 Wildlife and Fisheries

Corridor lands provide habitat for a broad range of wildlife species. Dominant big game species include mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginanus*), elk (*Cervus elaphus*), and pronghorn (*Antilocapra americana*). Small game includes red fox (*Vulupes vulupes*), raccoon (*Pyrocyon lotor*), badger (*Taxidea taxus*), and striped skunk (*Mephitis mephitis*). Upland game and waterfowl species include ringed-necked pheasant (*Phasianus colchicus*, a non-native species), gray partridge (*Perdix perdix*), wild turkey (*Meleagrus gallopavo*), mallard (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), northern shoveler (*Anas clypeata*), and gadwall (*Anas strepera*). A wide variety of small game species, migratory birds, reptilian, and aquatic species also inhabit the area.

4.9 Special-status Species

A total of 54 special-status species were identified by the USFWS, the State of North Dakota, and the NDNHI as potentially occurring within the Project area (USFWS 2007; Hagen et al. 2005; NDNHI 2007). Federally listed species that may be present are the whooping crane (*Grus americana*), gray wolf (*Canis lupus*), and black-footed ferret (*Mustela nigripes*). Special-status species data were applied to routing considerations and are addressed in detail in section 6.6. No federally listed plant species are known to be present within the three-county Project area corridors.

4.10 Archaeological and Historic Resources

Corridor A

There are 165 previously documented cultural resources sites in Corridor A. Eighty-nine of the documented sites are architectural sites, including 38 recorded structures in the City of Rhame. Many of the architectural sites are farmsteads, homesteads, or ranches; however, they also include other types of structures, such as bridges, schoolhouses, churches, and cemeteries. Twenty-one of the sites are historic archaeological sites, which include cultural material scatters, dumps, depressions and foundations, and mines. The remaining 55 sites are prehistoric. Of these, 39 are lithic scatters, 12 are open camps, 3 are quarry sites, and 1 is an unidentified rock feature.

Table 4-6 Noxious Weeds Known to Occur Within the Three-County Project Area

Common Name	Scientific Name	Counties		
		Stark	Slope	Bowman
Russian knapweed	*Acroptilon repens*	X	X	X
Absinth Wormwood	*Artemisia absinthium*	X	X	X
Musk thistle	*Carduus nutans*	X	X	X
Canada thistle	*Cirsium arvense*	X	X	X
Diffuse knapweed	*Centaurea diffusa*	X	X	X
Spotted knapweed	*Centaurea maculate*	X	X	X
Yellow starthistle	*Centaurea solstitialis*	X	X	X
Field Bindweed	*Convolvulus arvensis*	X	X	X
Leafy spurge	*Euphorbia esula*	X	X	X
Dalmation toadflax	*Linaria genistifolia*	X	X	X
Purple loosestrife	*Lythrum salicaria*	X	X	X
Hoarycress*	*Cardaria draba*	X		
Yellow Toadflax*	*Linaria vulgaris*	X		
Black Herbane*	*Hyoscyamus niger*	X		
Baby's Breath*	*Gypsophila paniculata*			X
Hound's Tongue*	*Cynoglossum* spp.		X	
St. Johnswort*	*Hypericum* spp.		X	

*Noxious weeds identified by county in addition to the North Dakota State List.

Source: USDA/NRCS 2005; NRCS 2007b,c,e.

Corridor B

Twenty-six cultural resources sites are previously documented in Corridor B. Fourteen of the sites are architectural, including five farmsteads, five houses, five bridges, a schoolhouse, and a church/cemetery. Only two historic archaeological sites were previously recorded in Corridor B; both are cultural material scatters. The remaining 10 sites include 6 prehistoric lithic scatters and 4 prehistoric open camps.

Corridor C

There are 26 cultural resources sites previously documented in Corridor C. Fourteen of the documented sites are architectural sites, including eight farmsteads, three houses, two schoolhouses, and one church/cemetery. Historic archaeological sites include one cairn and three cultural material scatters. Prehistoric sites in the corridor include 2 lithic scatters, 1 quarry, and 5 stone circle sites.

Archaeological resource data compiled within the three corridors were used to identify areas to be avoided during detailed routing (refer to chapter 6.0). The proposed Project route was further evaluated through a Class III (pedestrian survey) as part of final routing.

4.11 Native American Setting

Southwestern 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, WY

Northern Arapaho Tribe
Fort Washakie, WY

Northern Cheyenne Tribe
Lame Deer, MT

Oglala Lakota Nation
Pine Ridge, SD

Rosebud Sioux Tribe
Rosebud, SD

Cheyenne River Sioux Tribe
Eagle Butte, SD

Standing Rock Sioux
Fort Yates, ND

Crow Tribe
Crow Agency, MT

Fort Peck Tribes
Poplar, MN

Three Affiliated Tribes
New Town, ND

Native American consultation was initiated by Western and is addressed in section 6.8.

4.12 Paleontological Resources

Southwestern North Dakota is well-known for paleontological resources. Fossils found in Stark, Slope, and Bowman counties have been found in the White River Group, Golden Valley Formation, Sentinel Butte Formation, and Bullion Creek Formation (Bluemle 1988, 1977). Data from the North Dakota Geological Survey (2007) list eight mammalian and three reptilian species.

4.13 Transportation Network

Major surface transportation routes in the Project area consist of Interstate 94 (I-94), U.S. 85, U.S. 12, and State Routes (SR) 22, 21, and 67. I-94 provides access across southern North Dakota and interconnects cities throughout the upper Midwest and western States. U.S. 12 interconnects Rhame, Bowman, and cities to the east and west. Major north-south routes include U.S. 85 from Belfield to Bowman and SR 22 from Dickinson to New England. SR 21 and SR 67 serve the central portion of the Project area.

Local highways include CMC Route 619, which extends south of Rhame and adjacent to the proposed Rhame Substation site. Local roads are oriented on a north-south/east-west grid along section lines. Local roads consist of primitive (unimproved) trails through improved roads with gravel, grading, and drainage. Local roads along section lines are typically within a 66-foot-wide ROW.

AirNav data (2007a,b) indicate that commercial airports are located in Bowman and Dickinson. The public-owned Bowman Municipal Airport has a single asphalt/aggregate surface runway measuring 4,800 feet long and 75 feet wide. The Dickinson – Theodore Roosevelt Regional Airport main runway is asphalt grooved, 6,400 feet long and 100 feet wide; the cross-wind runway is asphalt grooved, 4,700 feet long and 75 feet wide. Several private landing strips are scattered throughout the Project area.

4.14 Socioeconomics

The proposed six-mile-wide corridor includes Stark, Slope, and Bowman counties in rural, southwestern North Dakota. Stark County is approximately 1,340 square miles with a population of 22,167 residents (U.S. Census Bureau 2006). The Project area extends south through Slope County, which is approximately 1,219 square miles, and the least populated of the three counties, with 713 residents. The southern portion of the proposed Project and the Rhame Substation is located in Bowman County. The U.S. Census Bureau 2006 estimate reports a county population of 2,991 residents.

Median household income for communities within the six-mile-wide corridor ranges from $20,375 in Rhame, located in the southern portion of the corridor in Bowman County to $35,750 in South Heart, located in the northern portion of the corridor in Stark County (Census 2000, Income 1999). Racial composition of residents within all three counties within the corridor is predominantly white; 97.9 percent in Stark County, 99.9 percent in Slope County, and 99.5 percent in Bowman (U.S. Census Bureau 2000).

Agriculture is the primary industry, with spring wheat as the most common crop produced, followed by durum wheat, winter wheat, and hay. Livestock production is the second largest industry, primarily producing beef cattle, dairy cattle, and hogs. Service industries and retail trade support residents in the area towns. During the hunting season, the tourism industry provides recreational activities such as big and small game hunting.

4.15 Environmental Justice

Environmental Justice is evaluated in Chapter 6.0, Affected Environment and Consequences.

4.16 Visual Resources

Visual resources within the three-county corridor Project area largely consist of broad expanses of cultivated fields, rangeland, and grasslands. Areas that are not used for crop or livestock production are limited to urbanized centers associated with cities and towns. Sensitive receptors within the area include rural residents living in scattered housing on farmsteads.

4.17 Noise

Ambient noise levels within the Project corridor have not been measured; however, given the rural setting, they are likely to be low. Levels near developed areas and along area roads and highways are likely to be higher due to vehicle movement and other human activities. Wind is frequently a major contributor to ambient noise levels within the area. Agricultural machinery noise is a contributor to noise levels, when operated near residences and other sensitive receptors. Sensitive receptors within the area are limited to residents in scattered rural locations and those urban areas.

4.18 Meteorology and Air Quality

Average maximum and minimum annual temperatures in the Project area range from 55.1 degrees Fahrenheit (°F) to 30.3°F and average below freezing temperatures occur during October through April. Precipitation ranges from a low monthly average of 0.38 inch during February to a high monthly average of 3.44 inches in June. Annual precipitation totals 15.28 inches (High Plains Regional Climate Center 2008).

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.

5.0 Transmission Line Routing, Structure Design, and Substation Selection

Corridor data were evaluated to identify exclusion and avoidance areas, as defined by the NDPSC to identify resources that were considered to be routing opportunities. Route selection criteria, the selection process, and land requirements for the preferred route and two alternative routes and the selection process for the proposed Rhame Substation site 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 6.0.

5.1 Routing Selection Criteria

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

5.1.1 Routing Opportunities

Routing opportunities were identified within the six-mile-wide corridors. Linear features provide opportunities that can be paralleled. Paralleling of linear features, such as roads, trails, and section lines typically minimize 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 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 supply lines at one or more locations during a single event.

Existing trails (rather than improved roads) along section lines were considered 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 spur roads extending from the trail to the structure site. Benefits of single-pole structures (over H-frame structures) are identified in section 2.2. If spur roads were to be used to gain access to structure locations, each spur road would temporarily occupy 0.009 acre. Paralleling section line trails also was considered 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 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 property 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.

5.1.2 Routing Constraints

NDPSC specifies routing exclusion and avoidance areas that directly relate to routing constraints. Additional constraints associated with Project-specific mitigation measurs are routinely followed 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 applied to the Belfield to Rhame Transmission Line Project are summarized in **table 3-1** (section 3.2).

5.2 Route Selection Process

Constraints and opportunities analyses were used to identify several potential transmission line routes within the identified corridors. Several site visits were conducted to prepare the corridor evaluation; additional site visits were made to identify features and land uses that were relevant to the identification of alternative transmission line routes. Information acquired during the scoping process provided insight to landowner concerns that influenced routing decisions; BEPC engineers and ROW specialists further modified proposed routes as a result of meetings with individual landowners.

Routing opportunities are numerous throughout the corridors, primarily consisting of section lines that are oriented in a north-south/east-west configuration. Section lines are centered within a 66-foot-wide public ROW. Existing roads are typically centered within the ROW, equal distance from adjacent property lines. Unimproved trails are frequently located along section lines where improved roads have not been established.

Approximately 60 alternative transmission line segments, totaling approximately 231 miles, were initially identified within the six-mile-wide corridor from the existing Belfield Substation to the proposed Rhame Substation site. An additional 70-mile-long alternative alignment was plotted by BEPC engineers using fixed-wing aircraft, resulting in a total of approximately 300 segment miles. Discussions among members of the multi-disciplinary team consisting of engineers, ROW specialists, and environmental professionals resulted in the elimination of 23 segments from further consideration. Approximately 37 segments (representing a total of 164 miles) remained for further consideration. Numerical identifiers were then assigned to each line segment and potential routes were compiled.

The 37 line segments, shown on **figures 1-6** through **1-9**, were presented at public scoping meetings in Belfield and Bowman on July 23 and July 24, respectively. Additional information pertaining to public involvement is provided in section 1.6.

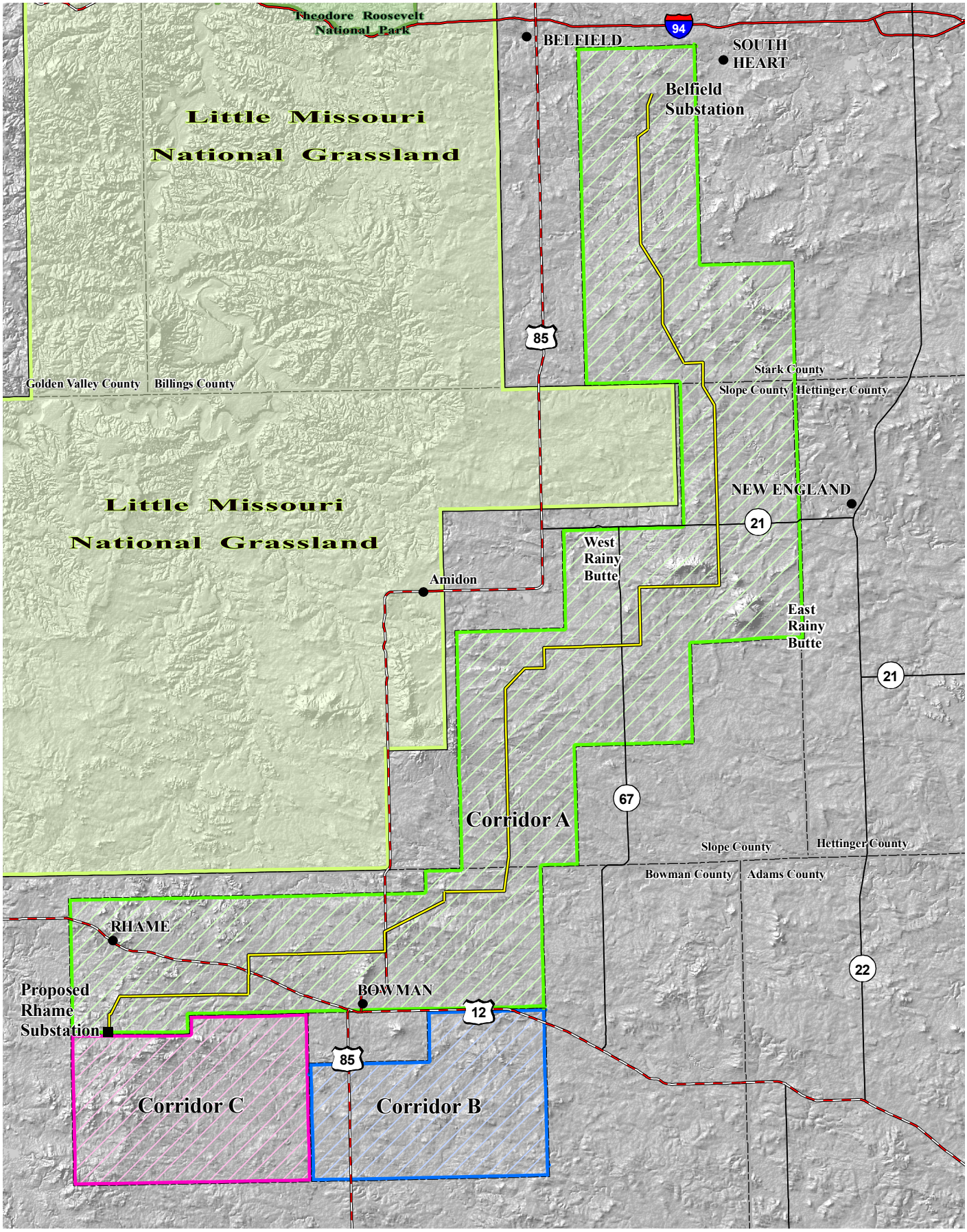
Comments received during public meetings were used to identify a proposed route and two alternative routes that were retained for further analyses. Alternative A largely consists of segments that follow section lines parallel to existing trails and roads. Alternative B is comprised of transmission line segments extending through mid-sections. Alternative C (Preferred Alternative) was developed as a result of public and agency input and through one-on-one discussions with area landowners. Transmission line Alternatives A, B, and C are shown on **figures 5-1**, **5-2**, and **5-3**, respectively. Detailed routing performed by BEPC engineers and ROW agents is provided in **appendix C**.

5.3 Substation Selection Process

Potential Rhame Substation sites were identified during field reconnaissance. Criteria applied to the identification process included proximity to Montana-Dakota Utilities Company's (MDUs) 230-kV transmission line, access availability, and land availability. Four potential sites were initially selected.

All four sites are in proximity to the MDU's 230-kV Transmission Line, a 57-kV Transmission Line, and the existing Rhame Substation. All four sites are relatively level and well-drained. Two sites abut CMC 619, a major north-south paved highway extending south from Rhame. Two sites lie approximately one mile west of the highway, on an all-weather gravel county road.

Two landowners did not want to sell their properties and would not negotiate to do so. One landowner indicated that he would sell the property, if BEPC had no better options, but did not want to sign an Option to Sell Agreement. Negotiations with the fourth landowner were successful with an agreement to sell a rectangular 80-acre parcel. Since three of the four sites could not be obtained and the remaining site met Project objectives, comparative analyses of the four sites were not carried forward. All four potential substation sites are shown on **figure 5-4**.



North Dakota
Area of Detail

LEGEND

- SUBSTATION
- CITY OR TOWN
- TRANSMISSION LINE ROUTE ALTERNATIVE 'A'
- CORRIDOR 'A'
- CORRIDOR 'B'
- CORRIDOR 'C'
- U.S. NATIONAL GRASSLAND
- NATIONAL PARK

N

5 4 3 2 1 0 5
Scale in Miles

Map Projection: UTM
Zone: 13 North

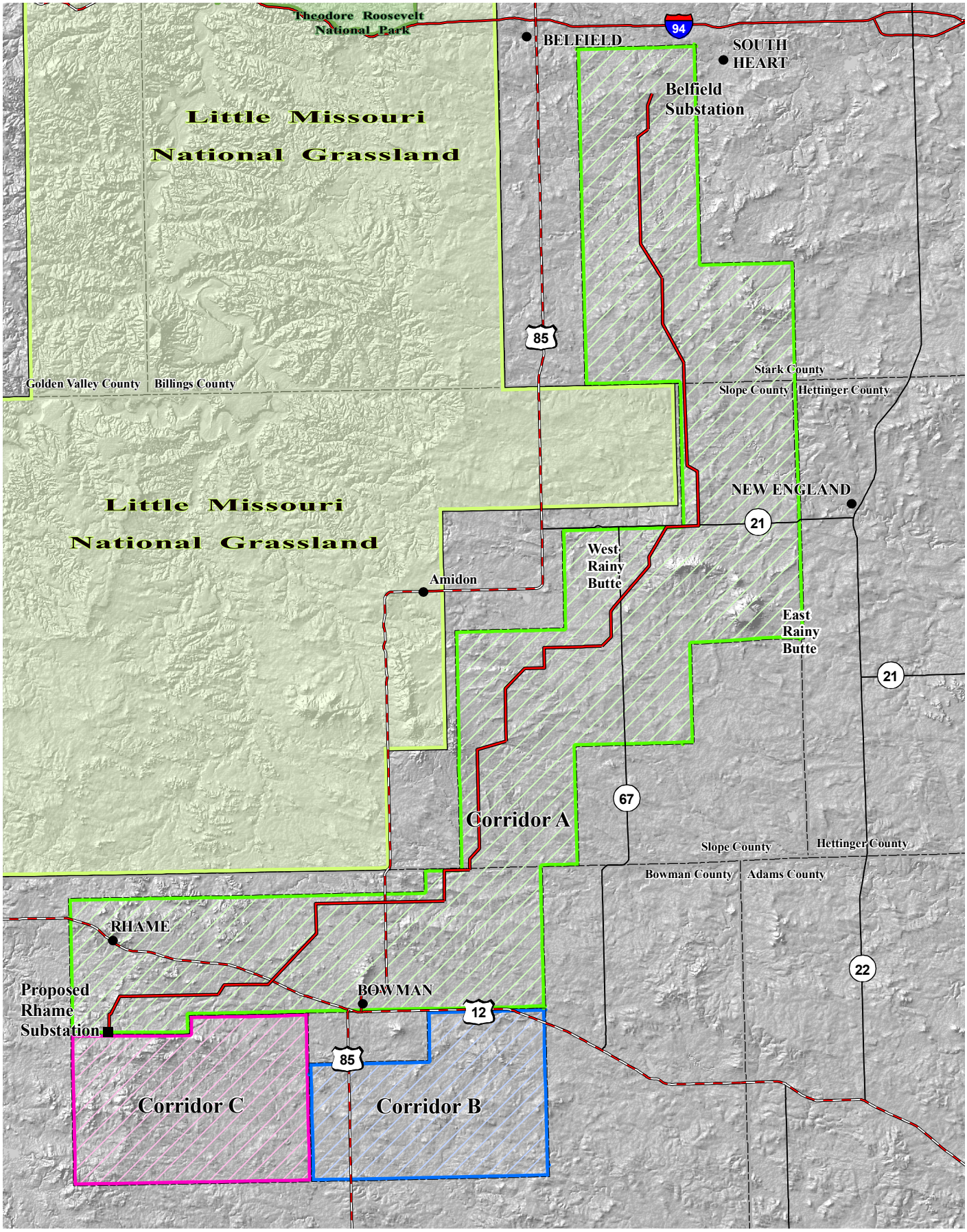
Datum: NAD 1983
Grid Units: Meters

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Western Area Power Administration

Figure 5-1
Transmission Line Route
Alternative 'A'



North Dakota
Area of Detail

LEGEND

- SUBSTATION
- CITY OR TOWN
- TRANSMISSION LINE ROUTE ALTERNATIVE 'B'
- CORRIDOR 'A'
- CORRIDOR 'B'
- CORRIDOR 'C'
- U.S. NATIONAL GRASSLAND
- NATIONAL PARK

N

5 4 3 2 1 0 5
Scale in Miles

Map Projection: UTM
Zone: 13 North
Datum: NAD 1983
Grid Units: Meters

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative
Western Area Power Administration

Figure 5-2
Transmission Line Route
Alternative 'B'

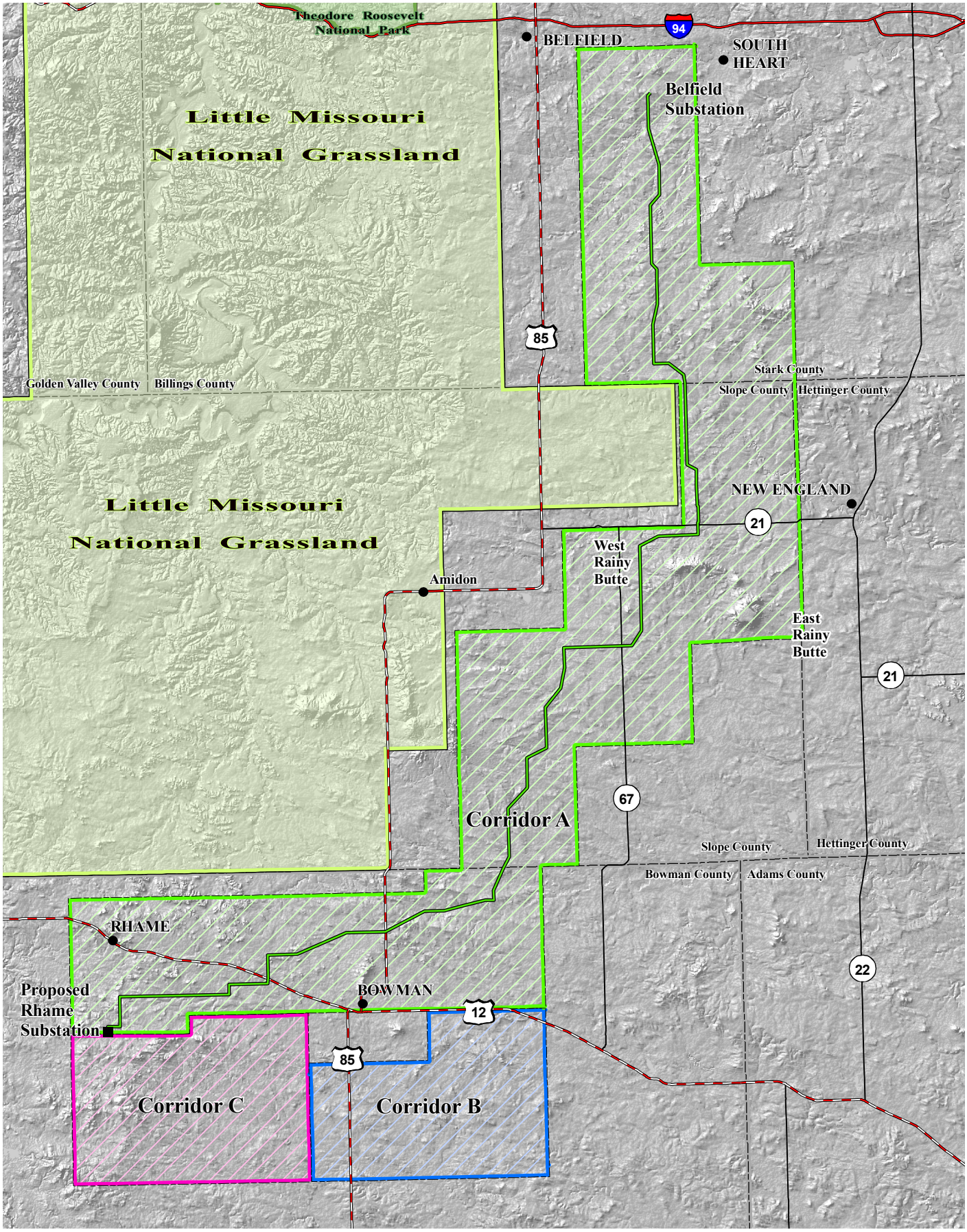


Figure 5-3
Transmission Line Route
Alternative 'C' (Proposed)

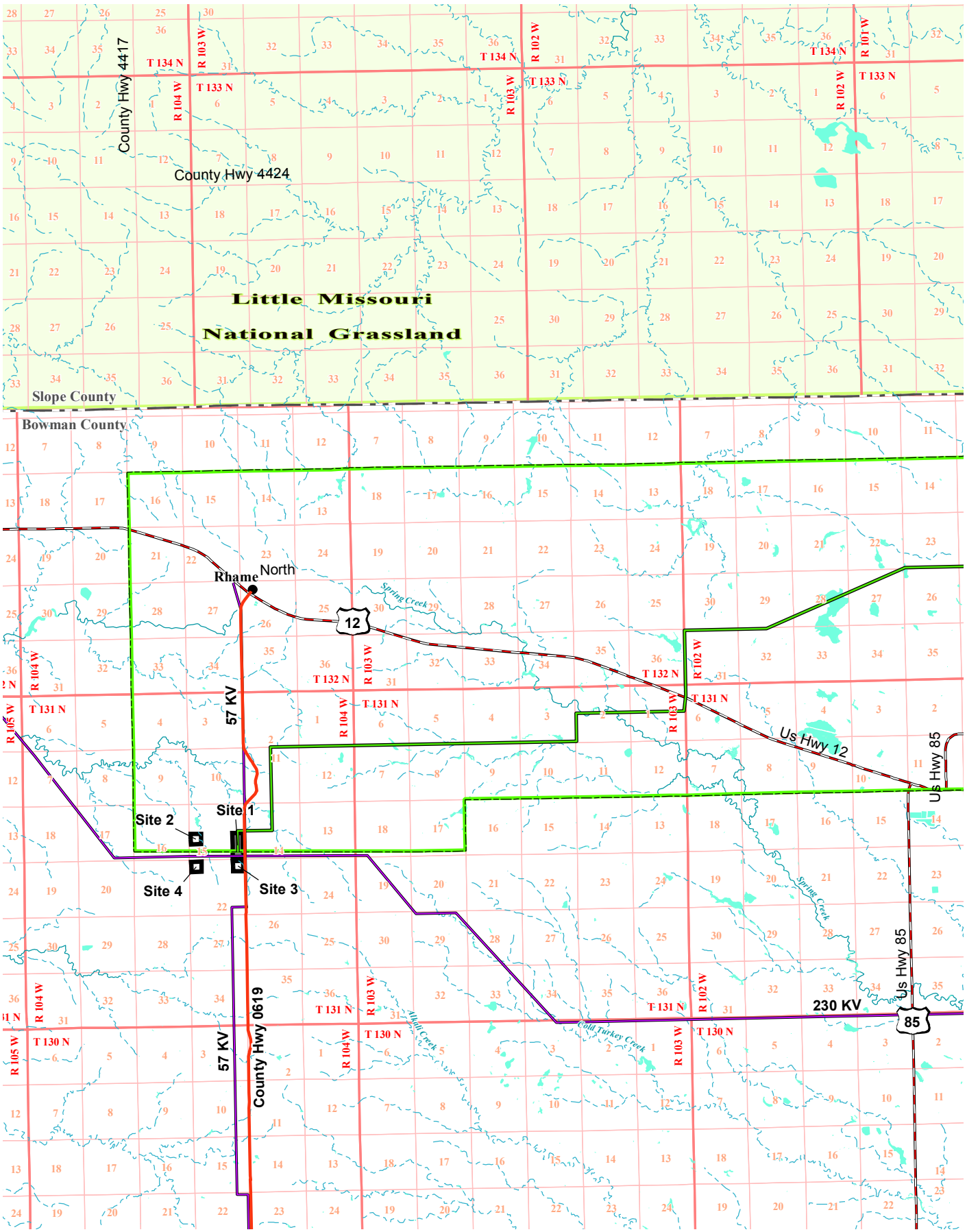


Figure 5-4
Preferred and Alternative Rhame Substation Sites

The new substation would be within a fenced 700- by 750-foot (12.5-acre) area on an 80-acre parcel. The facility would have a 230-kV portion, a 115-kV portion, and a 57-kV portion. A gravel road would be constructed from the highway (CMC 619) to the fenced 12.5-acre substation site and would occupy approximately 0.1 acre. A microwave tower would be installed west of the substation perimeter fence. The microwave facility would occupy less than 0.1 acre.

5.4 Structure Alternatives

Engineering and cost analyses were applied 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 originally selected steel H-frame structures for the Project because the materials and installation are relatively inexpensive, they can withstand heavy ice and wind loading, and spans between structures can be longer than wood. Use of steel H-frame structures also would largely eliminate the use of guy wires. Based on comments received during public scoping, BEPC reconsidered the use of single-pole structures, rather than H-frame structures. Single-pole structures 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.

Span distances would be less for single-pole structures (averaging 800 feet) than that of H-frame structures (1,000 feet). Therefore, more structures would be required per mile of line and for the Project. Shorter span distances are, in part, due to differing conductor configurations. H-frame structures would have a horizontal conductor configuration with all three phases an equal height above ground level. Single-pole structures would have a vertical conductor configuration.

5.5 Transmission Alternatives

Several structural and non-structural alternative power supply methods were considered, but eliminated from further analyses. Operation of a power generating facility in the Rhame area could reduce or eliminate the need for a new transmission line from Belfield to Rhame; however, construction and operation of a new fossil-fueled generating station (e.g., gas-fired simple- or combined-cycle facility) would be cost prohibitive and could result in greater environmental impacts than would result from a new transmission line. The development of local wind power facilities would fail to provide reliable baseload power that is needed.

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

Construction of a new transmission line from Belfield Substsation and construction of a new substation at Rhame were determined to be the most expedient means of meeting future load growths in the region.

5.6 Description of Alternative Transmission Line Routes

Alternatives A and C generally parallel existing section lines and roads/trails throughout their lengths. Alternative B extends along mid-section lines throughout much of its length. All three alternatives are similar near Belfield and Rhame substation sites and take advantage of crossing rangeland to reduce overall alignment lengths. Distinct differences among the three alignments are apparent throughout the central portion of the Project area.

Alternative A would be approximately 77.54 miles long. Alternatives B and C would total approximately 72.55 and 73.51 miles long, respectively. Assuming an average structure-to-structure span of 800 feet,

approximately 512, 479, and 485 structures would be required for Alternatives A, B, and C, respectively. Permanent land requirements for each alternative 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 alternative are shown in **table 5-1**.

Table 5-1 Temporary and Permanent Land Requirements for Alternatives A, B, and C

	Transmission Line Alternative		
	A	**B**	**C**
Total Length (miles)	77.54	72.55	73.51
Total Number of single-pole Structures[1]	512	479	485
Temporary Land Requirements			
Structure Pads (acres)[2]	146.9	137.5	139.2
Access Road within ROW (acres)[3]	98.7	92.4	93.5
Pulling & Tensioning Sites (number)[4]	25	30	31
Pulling & Tensioning Sites (acres)[5]	43.0	51.6	53.4
Splicing Sites (number)[6]	41	38	39
Splicing Sites (acres)[7]	11.8	10.9	11.2
Total Temporary Disturbed Area (acres)	300.4	292.4	297.3
Permanent Land Requirements			
Permanent Land Requirements for Structures (acres)[8]	<0.2	<0.2	<0.2
Additional Temporary Land Requirements			
Five laydown areas	approximately 5 acres each		
52 geotechnical boring sites (within ROW)	approximately 100 square feet each		

[1]Approximate Number, Based on an average 800-foot spacing.

[2]Number of structures x 100 x 125 feet (12,500 ft^2).

[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 x 300 feet (37,500 ft^2) x two directions (75,000 ft^2).

[6]10,000-foot spacing.

[7]125 x 100 feet (12,500 ft^2).

[8]Number of structures, three-foot-diameter structure legs, two legs per structure.

5.6.1 Permanent Transmission Line Land Requirements

Permanent land disturbance has been estimated for self-supporting tangent structures. Each structure would require directly imbedding one three-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 five-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, thus guy wires would not be required.

5.6.2 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. Temporary disturbance needed for structure work areas would total 110 to 117 acres, as shown in **table 5-1**. Although access to structure work sites that are adjacent to section lines can be accessed (in many cases) by spur roads, an assumption was made 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 92 to 99 acres, as shown in **table 5-1**.

Pulling and tensioning areas and splicing sites would result in temporary disturbance to some lands. Pulling and tensioning areas would temporarily disturb a total of 75,000 square feet (1.7 acres) at each angle structure location. Additional areas likely would be needed along long expanses of tangent structures. Those needed at angle structures would likely require lands outside the ROW; those along tangent structures would be within the ROW. The landowner would be compensated for disturbance of land outside the 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. Pulling and tensioning locations would total 43 to 53 acres; splicing sites would occupy 11 to 12 acres. 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 5-5**.

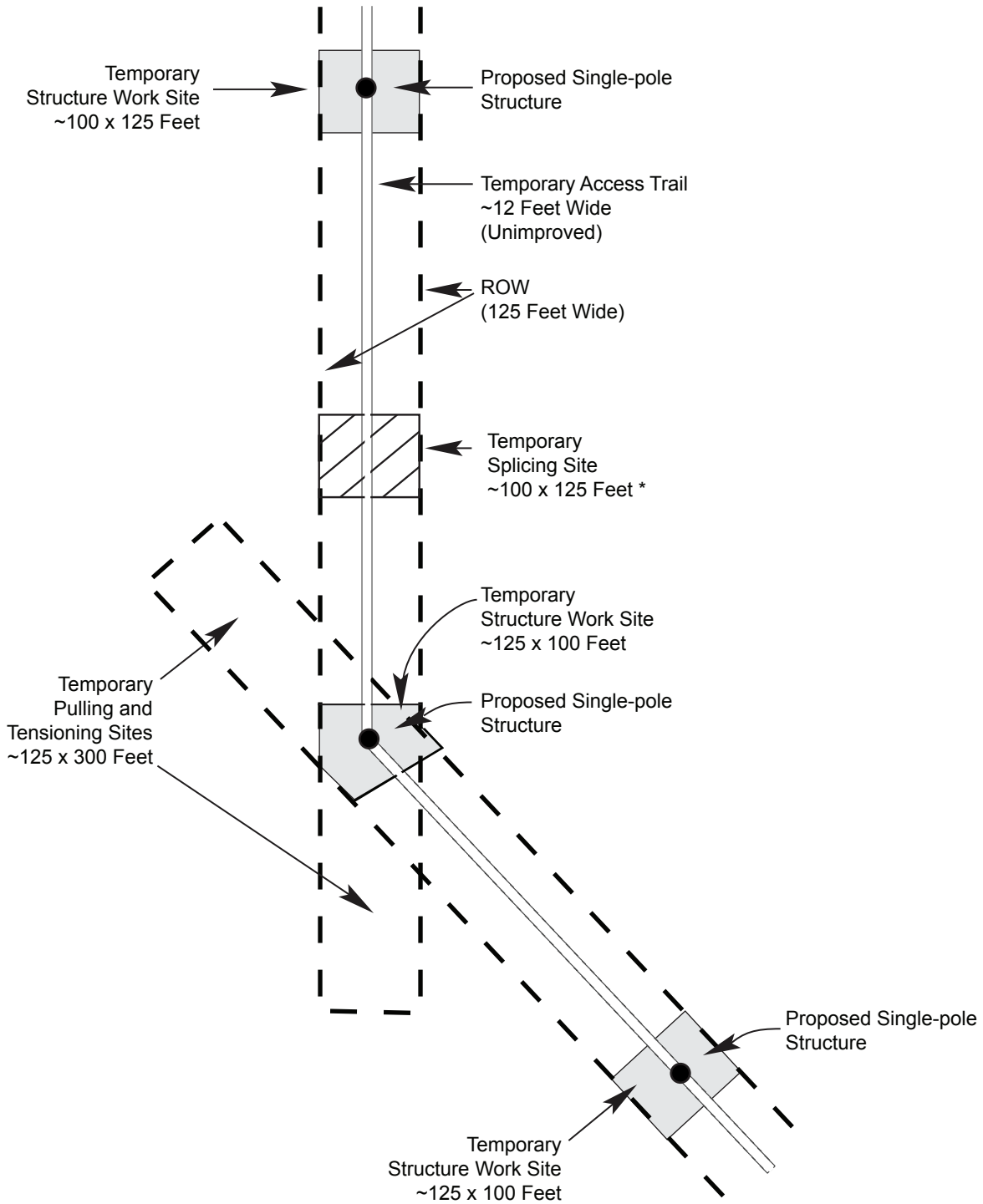
Temporary laydown areas would be located at the existing Belfield Substation and the proposed 80-acre Rhame Substation parcel. Three additional areas were identified within previously disturbed central Project lands. Each site would total approximately five acres as described in section 2.3.2.

Approximately 52 borings were required for geotechnical analyses. Although each boring site temporarily affected approximately 100 square feet, the locations are 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 reduced impacts to the soils and crops.

A new 180-foot-tall microwave tower and dishes would be installed on East Rainy Butte to serve as a communications link between Belfield and Rhame substations and to serve as a communications link for company personnel working in the field. The facility would be installed on a one-acre parcel adjacent to an existing Western microwave facility. Consideration is ongoing to move the existing Western microwave facility and install the equipment on the new BEPC facility. The new microwave facility would not be located near three other existing microwave communication facilities on East Rainy Butte. The proposed microwave facility is shown on **figure 5-6**.

Estimated temporary and permanent land requirements identified in **table 5-1** 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 5-1**, temporary impacts associated with Alternative A would affect 300 acres. Temporary impacts associated with Alternatives B and C would affect 292 and 297 acres, respectively. Permanent impacts would be similar among the three alternatives and largely related to construction of the Rhame Substation and areas occupied by the single-pole structure bases.



LEGEND

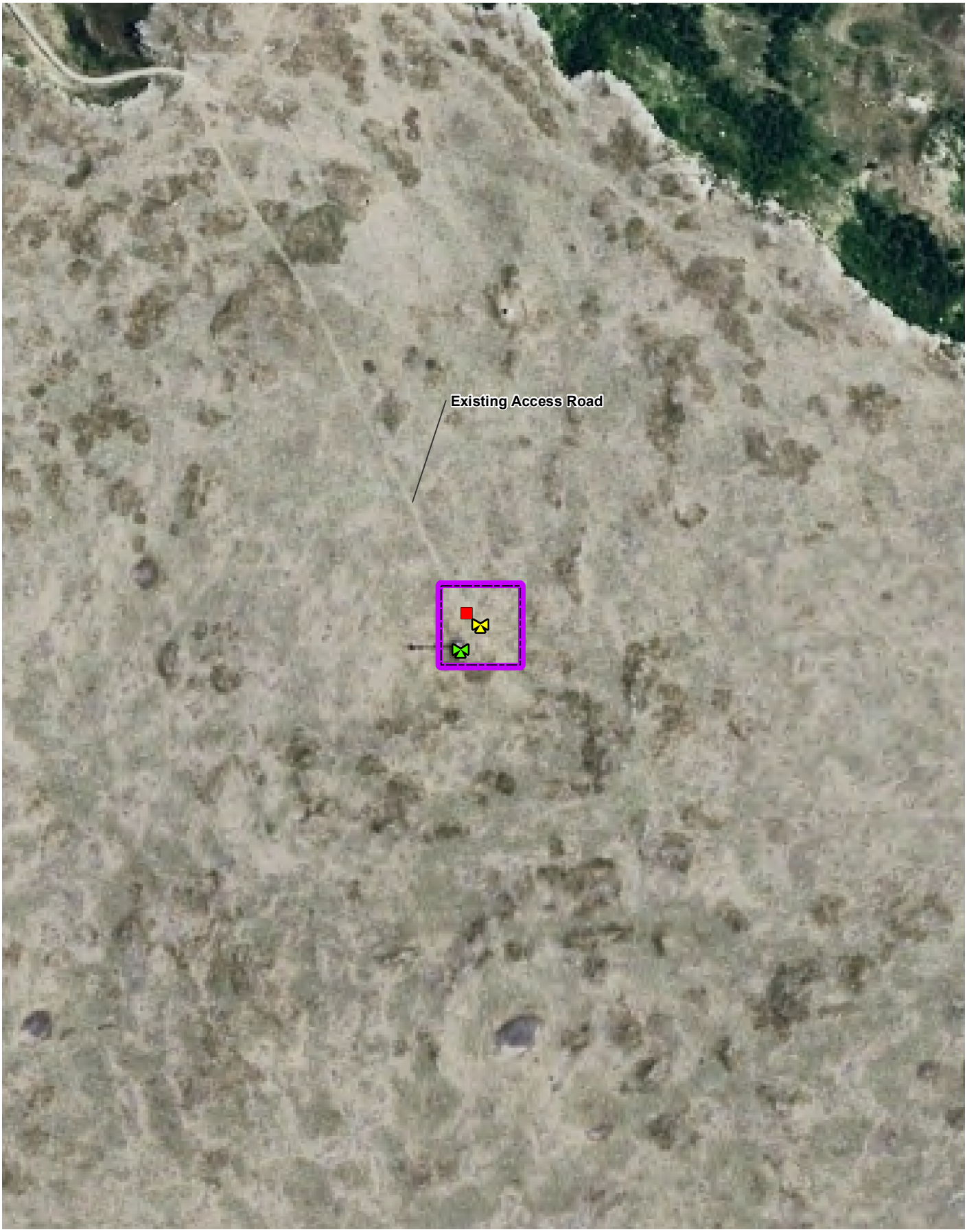
* ~10,000 Feet Intervals

Belfield - Rhame Transmission Line

Figure 5-5

Conceptual Construction Configuration

06/10/08



North Dakota
Area of Detail

Existing Western Microwave Tower
Proposed Electrical Building
Proposed East Rainy Butte Microwave Tower
Proposed East Rainy Butte Microwave Tower Site

0 200 400
Feet

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative
Western Area Power Administration

Figure 5-6
Proposed East Rainy Butte Microwave Tower Site

6.0 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 the proposed Belfield to Rhame Transmission Line and the proposed Rhame Substation. 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 (Alternative C), two alternative transmission line routes (Alternatives A and B), the proposed Rhame Substation, and a new microwave tower to be constructed on East Rainy Butte. The No Action Alternative also was evaluated, as required under NEPA. Applicable mitigation measures are listed in **Appendix C**, Project-specific Mitigation Measures.

6.1 Jurisdictions, Land Use, and Agricultural Practices

Construction of the proposed transmission line would result in temporary impacts to lands during and immediately following construction. Long-term impacts that would result from lands between H-frame structure legs that would be inaccessible by farm machinery would not occur using single-pole structures. Angle structures would be single-pole self-supporting and would not require guy wires. 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. The absence of guy wires would reduce potential conflicts with agricultural operations near the structures and reduce maintenance requirements.

6.1.1 Affected Environment

The Belfield to Rhame Transmission Line Project would require the construction of 73 to 78 miles of transmission line in a 125-foot-wide ROW in Slope, Stark, and Bowman counties, North Dakota. As shown in **table 6-1**, the proposed Project or Project alternatives would primarily cross open water, developed land, barren lands/badlands, deciduous forest, rangeland, grassland, cropland, and emergent wetlands. Open waters crossed by alternative transmission line alignments consist of relatively small stock ponds, which would be avoided or spanned during construction. Developed lands crossed are associated with public rights-of-way along highways, section lines, and railroads. Barren lands/badlands are limited to the Little Badlands in Stark County. Deciduous forest is largely limited to scattered woodlands that were encountered during detailed routing. Shelterbelt woodlands were not crossed by the proposed Project. Rangeland (shrub steppe) is largely limited to isolated lands of marginal quality that is used for livestock grazing. Grasslands typically include areas that are maintained for livestock production and cropland represents areas that are planted and cultivated as row crops. Emergent wetlands consist of relatively small depressions that support emergent hydrophyllic vegetation. Emergent wetlands are typically of low habitat value due to grazing.

Avoidance of croplands and minimization of potential impacts to farming machinery operations were major concerns expressed by landowners during scoping. Comparative analyses of lands crossed by alternatives and lands within Corridor A (refer to **table 4-1**) indicate that routing avoided croplands during detailed routing to the extent practicable. Corridor A is comprised of approximately 64 percent cropland; approximately 39 to 47 percent of Transmission Line Alternatives A, B, and C would cross cropland (refer to **table 6-1**). All three alternatives would impact a greater percentage of rangeland and grassland land uses than that represented as present within Corridor A, as a whole. Transmission Line Alternative C (Preferred Alternative) would cross more grassland and less cropland than would be crossed by Alternatives A or B.

North Dakota Game and Fish Division (NDGFD) sponsors a program to facilitate public access and hunting to private lands through the Private Land Open to Sportsmen (PLOTS) program. The program is a collaborative effort between private landowners, Game and Fish staff, hunters, the North Dakota Legislature, and the Governor that is funded solely from State license purchases by residents and nonresidents. Under the

program, land is set aside for hunting between September 1 and April 1. No development restrictions are associated with the PLOTS program.

The Farm Service Agency administers and the NRCS provides technical support for the Conservation Reserve Program (CRP), which provides technical and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their land in an environmentally beneficial and cost-effective manner. The CRP reduces soil erosion and protects the Nation's ability to produce food and fiber.

Table 6-1 Temporary Impacts to Land Uses (acres)

	Alternative A	Alternative B	Alternative C
Open Water	0.3	0.2	0.3
Developed	49.3	28.1	27.0
Barren Land/Badlands	0.1	0.1	0.6
Deciduous Forest	0.2	0.1	0.0
Rangeland (Shrub steppe)	3.9	5.4	4.3
Grassland (maintained pasture)	120.2	118.8	146.4
Cropland (Cultivated)	124.3	137.4	116.2
Riparian	0.0	0.0	0.0
Emergent Wetlands	2.1	2.3	2.5
Total Acres (refer to section 5.6.2 and table 5-1)	**300.4**	**292.4**	**297.3**

6.1.2 Environmental Consequences

6.1.2.1 Significance Criteria

- Significant impacts would result from non-compliance with local zoning regulations.

6.1.2.2 Proposed Transmission Line and Alternatives

Temporary and permanent impacts to land uses have been tabulated using analyses presented in chapter 5.0 and summarized in **table 5-1**. As shown in **table 5-1**, construction of Alternatives A, B, and C would result in temporary impacts to 300.4, 292.44, and 297.3 acres, respectively. Estimated temporary acres of impacts were calculated based on distances of line crossings for each land use and temporary areas of disturbance for each alternative. Acreages of temporary disturbance (refer to **table 5-1**) include temporary structure pads, temporary access roads, temporary pulling and tensioning sites, and temporary splicing sites, as described in section 5.6.2.

Construction of transmission line Alternative A or Alternative B would temporarily impact approximately 119 to 120 acres of grassland. Construction of Alternative C (Preferred Alternative) would temporarily affect approximately 146 acres of grassland. Temporary impacts to croplands crossed by Alternative C (Preferred Alternative) would be less (116 acres) than those of Alternatives A or B. Permanent impacts to lands would be limited to lands needed for structure legs and would be similar among the three alternatives.

Estimated acreage impacts for various other land uses are shown by alternative in **table 6-1**. Actual temporary impacts to open water and emergent wetlands would be less than those stated in the table because such resources would be spanned during construction.

Placing lands in the CRP reduces sedimentation in streams and lakes, improves water quality, establishes wildlife habitat, and enhances forest and wetland resources. It encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, filter strips, or riparian buffers. Farmers receive an annual rental payment for the term of the multi-year contract (NRCS 2007a). Several CRP lands are within the overall Project area; however, specific CRP lands locations are not available due to confidentiality concerns. However, the presence of CRP lands does not preclude routing and construction across such lands.

Construction through PLOTS and CRP lands would adversely affect hunting and conservation resources during, and immediately following construction. Lands disturbed would be restored and revegetated to their pre-construction condition to the extent practicable; however, it is likely that hunting on lands that have been designated for public hunting use (PLOTS) would be adversely affected for at least one hunting season.

Bowman County will require a building permit for the substation. No zoning permits would be required for the transmission line, microwave facility, or substation.

6.1.2.3 Proposed Rhame Substation and East Rainy Butte Microwave Facility

Construction of the Rhame Substation would permanently remove 12.5 acres from agricultural use. An additional 67 acres of the 80-acre parcel would be temporarily removed from agricultural use during construction. Installation of a microwave facility on East Rainy Butte would change the land use from undeveloped to industrial. However, a change in zoning would not be required.

6.1.2.4 No Action Alternative

Selection of the No Action Alternative would result in a failure to meet the Project purpose and need and continued use of the transmission line ROW and Rhame Substation lands for agricultural purposes. If the Belfield-Rhame Transmission line was not to be constructed, BEPC would be required to transfer needed power from a different source. Transferring of power from a different source might necessitate construction of transmission lines that would be longer and/or result in greater environmental impacts than those expected for the proposed Project. The proposed East Rainy Butte microwave facility would not be constructed and a potential option to co-locate the existing Western microwave facility could not be implemented.

6.2 Physiology, Geology, Soils, and Minerals

Construction activities could result in temporarily increased erosion potential that could affect receiving waters. Long-term impacts could result from lack of opportunity to extract minerals from local sources.

6.2.1 Affected Environment

The Project area is gently rolling with scattered buttes ranging from 100 to more than 400 feet above the surrounding surface. Although most buttes are relatively small, some occupy several hundred acres. East Rainy Butte and West Rainy Butte are in the central portion of the Project area in Slope County at elevations 3,310 and 3,340 feet above mean sea level (amsl), respectively. Rangeland and cropland in the northern area is about 2,590 feet amsl. Lands in southern areas are approximately 2,950 feet amsl.

The Little Badlands are located in the northern portion of the Project area, approximately 11 miles southeast of Belfield. The Badlands are similar to those of the Little Missouri National Grassland, but limited to an area covering approximately six square miles. The Little Badlands are characterized as rugged topography with relatively little vegetation. The remainder of the area consists of relatively flat farm and rangelands with interspersed buttes.

Bluemle (not dated) indicates that North Dakota is located in an area of low earthquake probability and that infrequent, small earthquakes may occur near or within the State. Geologic structures that are in proximity to the Project area and may contribute to earthquakes are deeply buried and relatively inactive. Two deep faults, the Thompson Boundary Fault and the Tabbernor Fault/Fold Zone extend north-south through the Western

Dakota Mobile Belt in western North Dakota. The U.S. Geological Survey (2007) ranks North Dakota among States having the lowest potential for earthquakes.

6.2.1.1 Soils

The proposed transmission line would largely cross relatively level terrain with deep loamy soils. Topsoil along the proposed alignment across the Little Badlands is absent and soils are comprised of aggregate that is highly erodible.

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 2007a).

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 2007a).

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. Examples of such crops are citrus, cranberries, olives, tree nuts, and vegetables (NRCS 2007a).

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 2007a).

6.2.1.2 Mineral Resources

The single largest deposit of lignite coal in the world is in western North Dakota (Murphy, not dated). Harmon and Hansen lignite beds extend over 5,500 square miles in Bowman, Adams, Slope, and Golden Valley counties of southwestern North Dakota. Mining in eastern Bowman County has been ongoing since 1925. South Heart Coal, LLC, is planning to begin lignite mining at a site south of South Heart and east of Belfield Substation. Proposed mining operations are addressed in Section 7.4, Cumulative Impacts.

Ancient volcanic ash beds in western and central North Dakota are mined for road base construction, concrete admixtures and aggregates, abrasives, cleansers, polishing compounds, slow release fertilizers, ceramics, and

other purposes (Murphy, not dated). Marmarth Ash beds in Slope County are approximately six feet thick and extend over 600 acres.

Sand and gravel is abundant throughout much of the State which is dominated by glacial sediments (Murphy, not dated). Clinker, commonly referred to as scoria, consists of clay, silt, and sandstone baked or fused by heat generated from the burning of underlying lignite. Scoria is mined at several locations and is commonly used for road construction. Oil production from the Project area is limited to scattered areas of northwestern Stark County and southern Bowman County.

6.2.2 Environmental Consequences

6.2.2.1 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 aggregate or other minerals that would reduce the economic viability of the local communities would represent a significant impact.

6.2.2.2 Proposed Transmission Line and Alternatives

All three transmission line alternatives cross the Little Badlands along similar alignments. The area crossed is approximately one to one and one-half miles and characterized as steep barren hills. Although construction through the Little Badlands is technically feasible, steep slopes and erodible soils could result in construction difficulties and localized erosion could be exacerbated by soil disturbance resulting from heavy equipment movement. Accelerated erosion potential and excess borehole materials could contribute to degradation of surface waters during a storm water runoff event. Approximately eight structures would be required to cross the area. Excavation of a four-foot-diameter, 20-foot-deep borehole, for a three-foot-diameter single-pole structure, would result in approximately 140 cubic feet of soil displacement. Topsoil would be separated and stockpiled from underlying soils during boring operations. Excess soils that would be spread around each structure site would be susceptible to transport during a runoff event. However, soil transport and potential discharge to receiving streams could be reduced by placing excess soils on lowlands that are not in proximity to existing streams and drainages. Disposal of soils away from structure locations would require landowner consent, particularly since they may be of minimal agricultural value. Additional mitigation measures include limiting the amount of ground disturbance, to the extent practicable, the use of silt and flow barriers, and separation of the topsoil horizon. The 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.

Prime and Unique Farmlands and Farmlands of Statewide Importance

Data indicate that 2.2 to 3.5 miles of Prime and Unique Farmland and 35.1 to 38.5 miles of Farmlands of Statewide Importance would be crossed by the three transmission line alternatives. Assuming that actual temporary impacts to lands would range from 292 acres (Alternative B) to 300 acres (Alternative A), as estimated on **table 5-1**, Temporary impacts to Prime and Unique Farmland would range from 8.9 acres (Alternative C, Preferred Alternative) to 13.6 acres (Alternative A). Temporary impacts to Farmland of Statewide Importance would range from 141.6 (Alternative B) to 149.0 acres (Alternative A). Temporary impacts to both resources are estimated on **table 6-2**.

Impacts to Prime and Unique Farmland and Farmland of Statewide Importance would be temporary and short-term. 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, compaction and rutting would be mitigated by cultivation and reseeding. Long-term or permanent loss of important farmlands would be limited to the area that is expected to be occupied by transmission line structures. Installation of 479 to 512 structures would physically occupy less than 0.2 acre of land. Actual loss of Prime and Unique Farmland and

Farmland of Statewide Importance would be considerably less. Such losses would not result in loss of economic viability to area farmers.

Table 6-2 Temporary Impacts to Prime and Unique Farmlands and Farmlands of Statewide Importance (acres)

	Alternative A	Alternative B	Alternative C (Preferred)
Temporary Impacts to Prime and Unique Farmlands (acres)	13.6	11.2	8.9
Temporary Impacts to Farmlands of Statewide Importance (acres)	149.0	141.6	146.1
Other Lands	137.8	139.6	142.3
Total Acres Impacted (refer to section 5.6.2 and table 5-1)	**300.4**	**292.4**	**297.3**

Minerals

Information received during public scoping indicates that coal mining operations (South Heart Coal, LLC) could impact lands within Section 28, Township 139 North, Range 98 West. Conflicts with mining operations were avoided by selecting a preferred alignment through Section 29. If constructed, the proposed transmission line through Section 29 would be approximately one-half mile west of proposed mining operations. Potential impacts associated with South Heart Coal, LLC, operations are addressed in Section 7.2, Cumulative Impacts. Ongoing coal mining operations near Scranton (Bowman County) are several miles east of the Project area and would not conflict with construction of Alternatives A, B, or C, and would not contribute to cumulative impacts within the Project area.

Marmarth Ash beds are located west of Rhame and other ancient volcanic beds, sand and gravel, clay, silt, sandstone and scoria extraction sites are of limited size (generally less than one acre each) and in scattered locations. Although future localized mineral extraction sites could be impacted by transmission line construction/operation, mining sites would be avoided by making minor adjustments to the selected transmission line alignment.

Oil production is limited to an area southwest of Rhame and is not expected to be affected by the proposed Project. The nearest oil and gas production facility is several miles to the southwest of the proposed Rhame Substation site and potential transmission line alignments.

Since mineral resources would be avoided or spanned, economic impacts associated with minerals production are not anticipated to affect the economic viability of the region.

6.2.2.3 Proposed Rhame Substation and East Rainy Butte Microwave Facility

The proposed Rhame Substation site is currently used for crop production. Approximately 50 percent of the 80-acre tract is classified by the NRCS as Farmland of Statewide Importance. Prime farmland soils are not present on the tract. Substation construction would occupy approximately 12.5 acres, a portion of which would likely include Farmland of Statewide Importance.

There is no ongoing mineral extraction on the 80-acre substation tract. Construction of the substation would preclude development of surface mineral extraction from the 12.5-acre substation. If oil reserves were to be discovered under the 80-acre substation tract (and/or the 12.5-acre substation site), production could be achieved by directional drilling.

The East Rainy Butte microwave site is not used for agricultural or mineral production purposes. Use of the site would not impact important physiographic, geological, soils, or mineral resources.

6.2.3 No Action Alternative

Potential impacts to farmlands and the agricultural community would not occur if the Project were not constructed. Local landowners would not be required to modify existing farming activities to avoid single-pole structures. Temporary impacts associated with construction and maintenance would not occur.

6.3 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 would be avoided by spanning drainages and waterways.

6.3.1 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 to by the Flood Disaster Protection Act of 1973. 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 FEMA. FEMA prepares Flood Insurance Rate Maps that depict the spatial extent of flood hazard areas within Special Flood Hazard Areas (SFHAs). Although SFHAs have been designated to describe the potential for flooding events, those applicable to the Belfield to Rhame Project area are limited those described in **table 6-3**.

Table 6-3 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 BFEs have been determined.
Zone A	A	An area inundated by 100-year flooding, for which no BFEs have been determined.

6.3.2 Routing Environmental Consequences

6.3.2.1 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*.)

6.3.2.2 Proposed Transmission Line and Alternatives

Data indicate that none of the alternative transmission line routes would cross an extensive amount of flood prone areas. Areas crossed by the three transmission line routes are addressed in **table 6-4**.

Alternatives A, B, and C would cross minimal flood prone areas. Potential impacts to transmission line crossings would be ameliorated by placing structures outside of Zones A, AE, or X500.

Table 6-4 Temporary Impacts to Floodprone Areas (acres)

	Alternative A	Alternative B	Alternative C
Zone X500	0.2	0.4	0.5
Zone AE	0.4	1.8	1.8
Zone A	4.0	2.9	7.3
Total Acres **(refer to section 5.6.2 and table 5-1)**	4.6	5.1	9.6

Structures would not be placed within flood prone areas or within streams or channels, regardless of alignment alternative. Flood prone areas, streams, and channels would be avoided or spanned on a case-by-case basis. Access roads would avoid crossing streams and channels. If streams or channels cannot be avoided, crossings would 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. Disturbed soils would be revegetated promptly to mitigate sediment transport.

A SWPPP would be developed specifically for the 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.

6.3.2.3 Proposed Rhame Substation and East Rainy Butte Microwave Facility

The proposed Rhame Substation site is not within a flood prone area and there are no drainages through the site. A SWPPP would be developed to address steps that would be taken to reduce off-site transport of soils disturbed during construction and off-site transport of contaminants following construction. A SPCC Plan would be developed to reduce the potential for off-site release of contaminants during substation operations. The SPCC Plan is particularly important when storing or handling hazardous materials. Containment and clean-up materials would be maintained at work site locations for use if an incidental spill were to occur. Therefore, development of the site is not expected to impact hydrology or local drainage within the area.

The East Rainy Butte microwave facility site is not in a floodprone area and development of the site would not affect hydrology and drainage in the area. If constructed, a SWPPP would be required to reduce sediment transport during a storm water runoff event.

6.3.3 No Action Alternative

Application of the No Action Alternative would preclude the potential for impacting drainages or flood hazard areas along the transmission line ROW.

6.4 Vegetation and Wetland Resources

The Project area is comprised of grassland, badlands, and scrub/shrub, wetland, and woodland vegetation resources. Wetlands are comprised of freshwater ponds and freshwater emergent communities. Riparian (wooded wetlands) vegetation types are not crossed by any of the alternative transmission line routes.

6.4.1 Affected Environment

Vegetation within each Alternative route was characterized from a literature review of the NDGFD Comprehensive Wildlife Conservation Strategy (Hagen et al. 2005). 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 with isolated sandstone

buttes and badland formations and minimal wetland basins. Scrub/shrub communities and forested areas are also are scattered throughout the area. Open water and waterbodies, developed land, and areas with barren lands do not display vegetation characteristics and are discussed in section 6.1.1.1.

6.4.1.1 Grasslands

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 figida*), purple coneflower (*Echinacea* spp.), yarrow (*Achillea* spp.), and several species of goldenrods (*Solidago* spp.) (Hagen et al. 2005).
- Shortgrass Prairie Community: The shortgrass prairie is mostly found within elevated portions of the Missouri Slope region of North Dakota. It is comprised of warm season species that can survive the low average rainfalls of southwestern North Dakota. Common grass species include spikemoss, blue grama, needleleaf sedge, threadleaf sedge, buffalo grass, and needle-and-thread. 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.), prickly pear (*Optunia polyacantha*), moss phlox (*Phlox subulata*), white beardtongue (*Penstemon* spp.), and fringed sage (Hagen et al. 2005).
- Planted Grassland: Planted grassland is described as prairie that has been converted to cropland and then re-planted to hayland or native grasses. 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).

6.4.1.2 Range (Shrub/Steppe)

Shrub Steppe consists of eroded buttes, scoria mounds, and salt pans making it similar to the badlands. Shrub steppe is characterized by a general absence of agriculture and human occupancy. Big sagebrush (*Artemisia tridentata*) is the dominant vegetation.

6.4.1.3 Agriculture

Agricultural land crossed by the proposed Project is considered cropland. This community is comprised mostly of wheat production, although sunflowers and other commodities also are raised.

6.4.1.4 Forested

Forested habitats are found in only a few locations in North Dakota, and they do not cover large contiguous areas (Hagen et al. 2005).

- Upland Deciduous/Green Ash Forest: The dominant natural vegetation of these forests includes bur oak (*Quercus marocarpa*), green ash (*Fraxinus pennsylvanica*), quaking aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*), box elder (*Acer negundo*), 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 (*Prunus virginiana*) (Hagen et al. 2005).
- Conifer/Juniper Forests: Ponderosa pine (*Pinus ponderosa*) and Rocky Mountain juniper (*Juniperus scopulorum*) are the most common species within this forested area. These forests are dispersed through the southern half of North Dakota's badlands (Hagen et al. 2005).

6.4.1.5 Wetlands

Wetlands 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 the 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 crossed by 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).

6.4.1.6 Badlands

Dominant vegetation within the badlands is comprised of spiny saltbush (*Atriplex* spp.), greasewood (*Sarcobatus* spp.), prickly pear, rabbitbrush (*Chysothamnus nauseosus*), silver sage (*Artemesia cana*), prairie sandreed (*Calamovilfa longifolia*), yucca (*Yucca* spp.), winter fat (*Krascheninnikovia lanata*), butte primrose (*Oenothera caespitosa*), standing milkvetch (*Astragalus laxmannii*), and penstemon (*Penstemon* spp.) (Hagen et al. 2005).

Sensitive Ecological Communities

The sensitive ecological communities that could occur within each alternative route are the same as those that could occur within the six-mile corridor of the proposed Project and are discussed previously in section 4.6.

Noxious Weeds

The noxious weeds that could occur within each alternative route are the same as those that could occur within the six-mile corridor of the proposed Project and are discussed in section 4.7.

6.4.2 Environmental Consequences

Impact analysis 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 baseline biological surveys conducted in September 2007 and April 2008.

6.4.2.1 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. A significant impact also would result from the introduction and spread of noxious and invasive plant species and the subsequent displacement of native habitat as a result of implementation of the proposed Project. 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.
- Significant Ecological Communities: Loss of one or more native communities identified by a Federal or State agency would represent a significant impact.
- Wetlands: A net loss of wetlands would constitute a significant impact.
- Noxious Weeds: Significant impacts would result from the introduction of, and lack of control of, noxious weeds (NDCC 63-01.1, *et seq*.; EO 13112).]

6.4.2.2 Proposed Transmission Line and Alternatives

Vegetation types that would be disturbed, reduced, and removed as a result of construction and installation of alternative transmission lines and associated ancillary facilities (i.e., work areas, pole pads, access and spur roads, splicing sites, pulling and tensioning areas, and laydown areas) are provided in **table 6-5**.

Table 6-5 Temporary Impacts to Vegetation Communities

Vegetation Community	Alternative A	Alternative B	Alternative C
Grasslands	137.2	141.5	159.6
Range (Shrub/Steppe)	6.5	7.2	9.3
Agriculture (Cropland)	147.8	133.0	112.5
Forested	1.1	1.9	2.0
Riparian and Wetlands	6.3	7.5	10.6
Badlands (sparse vegetation)	1.5	1.8	3.3
Total Acres Impacted (refer to section 5.6.2 and table 5-1)	300.4	292.4	297.3

Acreages of potential temporary impacts to vegetation and wetland communities have been estimated using total acreage disturbances by alternative listed on **table 5-1**. Data from **table 6-5** indicate that approximately 113 to 148 acres of cropland and 80 to 90 acres of planted herbaceous perennials would be impacted by transmission line construction. Prairie communities (planted herbaceous perennials, native prairie grasses,

and shrub steppe) that would be impacted by construction would total 144 to 169 acres. Although data indicate that approximately six to 10 acres of wetland communities would be temporarily impacted, all wetlands would be either avoided or spanned. Trees and shrubs would be replaced two for every one removed. Detailed routing by BEPC engineers and lands specialists maximized opportunities to cross grasslands, prairie, and shrub steppe and minimized crossing cropland. Alternatives A and B would temporarily impact 144 to 149 acres of grasslands, prairie, and shrub steppe; temporary impacts resulting from construction of Alternative C (Preferred Alternative) would total 169 acres. Conversely, Alternatives A and B would temporarily impact 133 to 148 acres of cropland, whereas those associated with construction of Alternative C (Preferred Alternative) would total 113 acres. Permanent impacts to grasslands, prairie, rangeland (shrub/steppe), and croplands would be proportionately similar and would not exceed the 0.2 acre that would be occupied by transmission line structures, regardless of alternative.

Potential impacts to grasslands and shrub steppe communities would include direct disturbance, reduction or removal of vegetation, soil compaction, soil contamination, and increased soil erosion. Disturbance to the soil can reduce soil stability, seedbed generation, and nutrient availability in scattered areas. Although similar impacts would result from construction within croplands, cultivation and crop production would largely mitigate such effects.

Direct impacts to vegetation would be the cutting, clearing, and/or removal of existing vegetation within the construction work area. Construction within agricultural fields would be avoided during extremely wet conditions to avoid excessive rutting and compaction. If necessary, BEPC would temporarily shift construction activities to avoid excessively wet areas. Upon completion of construction, disturbed areas would be revegetated in compliance with Project-specific mitigation measures (**appendix D**), including re-seeding of disturbed areas using native vegetation, or a weed-free seed mixture that would be determined through consultation with the NRCS and/or the County Extension Agent. 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 the construction ROW and reseeding with an appropriate seed mix would minimize the duration of vegetation disturbance.

- Grasslands: Temporary impacts would affect the grassland community. Planted grasslands would typically regenerate quickly following construction as a result of reseeding of the construction ROW; typically within two years. Construction of Alternative C (Preferred Alternative) would temporarily affect approximately 146 acres of grassland community.
- Rangeland (Shrub/steppe): Approximately 9 acres of rangeland (shrub/steppe) community would be impacted by construction of Alternative C. Due to poor soil conditions, revegetation of the nine acres of rangeland (shrub/steppe) could take as long as 20 to 30 years. The loss of nine acres of rangeland over an extend time period would not affect the overall productivity of agricultural-use lands within the Project area.
- Agriculture: Cropland would be restored to baseline conditions quickly following construction due to cultivation and replanting. Project specific mitigation measures (**appendix D**) indicate that in order to reduce impacts to agriculture, the transmission line would be routed along the edges of fields, or would span fields to the extent feasible. Potential 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. Construction of Alternative C would temporarily affect approximately 113 acres; construction of Alternatives A or B would temporarily affect 148 and 133 acres.
- Forested: Forested lands within the Project area consist of scattered stands of trees that could not be avoided during detailed transmission line routing. Although they were avoided, to the extent practicable, a total of approximately two acres could be affected by construction of Alternative C. Clearing of woodland vegetation within the construction ROW would result in long-term and

permanent change as large trees would not be allowed to grow under the transmission line. Trees removed during construction would be replaced at a 2:1 ratio, as directed by the NDPSC.

- Wetland/Riparian: Impacts to wetlands are not anticipated. Wetlands (including riparian areas) would be avoided or spanned and would not be directly impacted by Project construction or operation. Project specific mitigation measures (**appendix D**) have been developed to avoid or reduce impacts to wetlands. These measures include:
  - Avoiding wetlands during routing to the extent practicable;
  - A 100-foot buffer zone around wetlands when feasible to prevent impacts to those ecosystems;
  - Spanning of wetland and riparian communities that cannot be entirely avoided; and
  - Development of storm water pollution prevention plans and spill response plans, as needed.

  Consultation with the USFWS and the NDGFD identified concerns about impacts to wetland communities (USFWS 2007; NDGFD 2007a). No structures would be placed in wetlands and no construction equipment would traverse wetland and riparian areas. Therefore, construction or operation of the proposed Project would not result in direct impacts to wetlands.

- Badlands: Long-term impacts may occur on badland vegetation. Recovery of these habitats may take several years, due to poor soil and low moisture conditions. Increased erosion would likely occur prior to revegetation.

Sensitive Ecological Communities

Impacts to sensitive ecological communities identified as occurring within the proposed Project alternative routes could include loss of individuals or local populations as a result of crushing from construction vehicles and equipment, and clearing for and construction of transmission line components. Invasion of suitable habitat by noxious weeds could occur from construction activities.

The USFWS (2007) and NDGFD (2007a) identified concerns about impacts to native prairie communities. However, native prairie communities were avoided by detailed routing. Therefore, impacts to native prairie are not anticipated.

Noxious Weeds

Noxious weeds, if not controlled, can displace native plant species, rendering infested areas unproductive. They can 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.

The selection of single-pole structures would reduce the opportunity for noxious weeds to colonize areas near structures, as compared with the space between H-frame poles which cannot be cultivated, and may serve as a base for noxious weed invasion. Project-specific mitigation measures (**appendix D**) to reduce the introduction of noxious weeds would include 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;
- Ensure that any soil that is imported for Project use has been certified as weed-free, unless otherwise approved by the landowner. It is not expected that importation of soil will be required for the Project;

- Ensure that the contractor will use only weed-free straw or hay for sediment control devices or mulch applications; and
- Cleaning all equipment and vehicles prior to the beginning of construction.

Long-term impacts to vegetation resources would affect approximately 0.2 acre along the proposed transmission line route, regardless of alternative selected. Construction of the proposed substation and microwave facility would affect an additional 12.5 acres, in areas that are not known to support sensitive plant or animal species. Therefore, overall impacts of the Project are not expected to result in reduced viability of sensitive species numbers. Ecologically important resources within the Project area are shown on **exhibits A-1** through **A-4**.

The potential introduction of noxious weeds would be minimized by adherence to appropriate mitigation measures that would minimize the spread of noxious weeds. BEPC would monitor for the presence of noxious weeds following line construction. If noxious weed species are present, steps would be taken to eradicate such species. Therefore, the proposed Project should not result in the spread of noxious weeds.

6.4.2.3 Proposed Rhame Substation and East Rainy Butte Microwave Facility

Potential crop production would be lost within approximately 12.5 acres of the 80-acre substation tract, due to substation construction. Remaining areas (approximately 68 acres) would be temporarily used for materials and equipment storage during construction, but would be available for crop production or grazing after construction. Temporary impacts due to materials and equipment storage would be mitigated by reseeding with a native grasses.

The SWPPP and the SPCC Plan would reduce the potential for the transport of soils and contaminants during and after construction of the substation. The plans would provide long-term protection of adjoining lands and receiving waters during the life of the Project.

The East Rainy Butte microwave site is not used for agricultural purposes. Less than 0.23 acre would be disturbed during construction and less than 0.01 acre would be permanently occupied by the facility. Use of the site would have no appreciable (measurable) affect on vegetation and wetland resources in the area.

6.4.2.4 No Action Alternative

Potential impacts to farmlands and the agricultural community would not occur if the Project were not constructed. Local landowners would not be required to modify existing farming activities to avoid single-pole structures. Temporary impacts associated with construction and maintenance would not occur.

6.5 Wildlife and Fisheries

6.5.1 Affected Environment

Wildlife use within the proposed Project area was characterized from a literature review of the NDGFD's Comprehensive Wildlife Conservation Strategy (Hagen et al. 2005) and from fall and spring field investigations. Additionally, agency correspondence and species information was collected from the USFWS, NDGFD, and the North Dakota Natural Heritage Program (USFWS 2007b; NDNHI 2007).

6.5.1.1 Terrestrial Wildlife

The predominant wildlife habitats along the proposed Project consist of agricultural land, planted grasslands, mixed-grass prairie, and shortgrass prairie, which support a diversity of wildlife species. The following focuses on species of high economic and/or recreational importance and those that are considered sensitive to human disturbance.

Big Game

Big game species within the Project area include mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginanus*), elk (*Cervus elaphus*), pronghorn (*Antilocapra americana*), mountain lion (*Felis concolor*), and bobcat (*Lynx rufus*). Seasonal big game ranges were not identified by the NDGFD.

Small Game

Small game species that occur within the Project area include furbearers, upland game birds, and waterfowl. Common furbearers within the Project area include red fox (*Vulupes vulupes*), raccoon (*Pyrocyon lotor*), badger (*Taxidea taxus*), and striped skunk (*Mephitis mephitis*). Upland game birds in the Project area include ring-necked pheasant (*Phasianus colchicus*, an introduced species), gray partridge (*Perdix perdix,* an introduced species), and wild turkey (*Meleagris gallopavo*). Waterfowl species include mallard (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), northern shoveler (*Anas clypeata*), and gadwall (*Anas strepera*).

Nongame Species

The Western mixed-grass/short grass community has a diversity of nongame species (e.g., mammals, reptiles and birds). The North Dakota Comprehensive Wildlife Conservation Strategy (NDCWCS) identified a variety of species within the Project area. Common mammalian species include the thirteen-lined ground squirrel (*Spermophilus lateralis*), northern pocket gopher (*Thomomys talpoides*), prairie dog (*Cynomys* spp.), olive-backed pocket mouse (*Perognathus fasciatus*), Ord's kangaroo rat (*Dipodomys ordii*), western harvest mouse (*Reithrodontomys megalotis*), deer mouse (*Peromyscus maniculatus*), prairie vole (*Microtus ochrogaster*), meadow vole (*Microtus pennsylvanicus*), meadow jumping mouse (*Zapus hudsonius*), western small-footed myotis (*Myotis ciliolabrum*), and coyote (*Canis latrans*).

Reptilian species possibly inhabiting the Project area include the Woodhouse's toad (*Bufo woodhousei*), Great Plains toad (*Bufo cognatus*), northern leopard frog (*Rana pipiens*), western chorus frog (*Pseudacris triseiata*), tiger salamander (*Ambystoma tigrinum*), common garter snake (*Thamnophis sirtalis*), yellowbelly racer (*Coluber constrictor*), bullsnake (*Pituophis melanoleucus*), and prairie rattlesnake (*Crotalus* viridis).

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 Project area include the mourning dove (*Zenaida macroura*), killdeer (*Charadrius vociferous*), 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*).

Migratory birds are protected by the Migratory Bird Treaty Act (MBTA) (16 USC 703-711) and EO 13186 (66 Federal Register [FR] 3853), which makes it unlawful to take, kill, or possess migratory birds. EO 13186 was issued to, among other things, ensure that environmental analyses of Federal actions evaluate impacts of actions and agency plans on migratory birds. Other elements of EO 13186 State that the Federal agency should restore and enhance the habitat for migratory birds and abate the detrimental alteration of the environment from pollution. Most avian species are protected by the MBTA with the exception of a few species, typically those that are non-native, such as the European starling (*Sturnus vulgaris*). The NDCWCS lists 33 Federal migratory species that may be impacted by the proposed Project. Further evaluation finds that all 33 species may occur within the Project area (**appendix E**, Biological Resources). Species protected by the MBTA are determined at the discretion of the authorizing agency. These species are discussed in detail in Section 6.6, Special-status Species.

Raptor species that occupy habitats along the transmission line alignment are those associated with tall- and mixed-grass prairie, shrubland, woodlands, badlands, and cropland. Those species include bald eagles (*Haliaeetus leucocephalus*), golden eagles (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk (*Buteo regalis*), American kestrel (*Falco sparverius*), prairie falcon(*Falco mexicanus*), western burrowing owl (*Athene cunicularia*), great horned owl (*Bubo virginianus*), and 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 Project area include bald eagle, golden eagle, peregrine falcon (*Falco peregrinus*), prairie falcon, ferruginous hawk, northern harrier, Swainson's hawk (*Buteo swainsoni*), short-eared owl, and western burrowing owl (**Appendix E**, Biological Resources). These species all are designated as North Dakota Species of Conservation Priority. Two golden eagle nests were identified along the Project route during the surveys on September 2007 (**figure 6-1**). The proposed route was shifted one-half mile to avoid these nests. However, field investigations during April 2008 found an inactive golden eagle nest in proximity to the new alignment. In addition, raptor species observed in flight during the September 2007 and April 2008 surveys include the ferruginous hawk, short-eared owl, Swainson's hawk, Northern harrier, red-tailed hawk, great horned owl, American kestrel, and golden eagle.

6.5.1.2 Fisheries Resources

The majority of the proposed transmission line route crosses occasional intermittent and ephemeral streams. One perennial stream, the South Branch Heart River, is crossed in Stark County. The Heart River supports a warm water fishery and representative game fish species include walleye, catfish, and pike (NDGFD 2007c). Special-status fish within the Project area are discussed in Section 4.6, Special-status Species and Noxious Weeds.

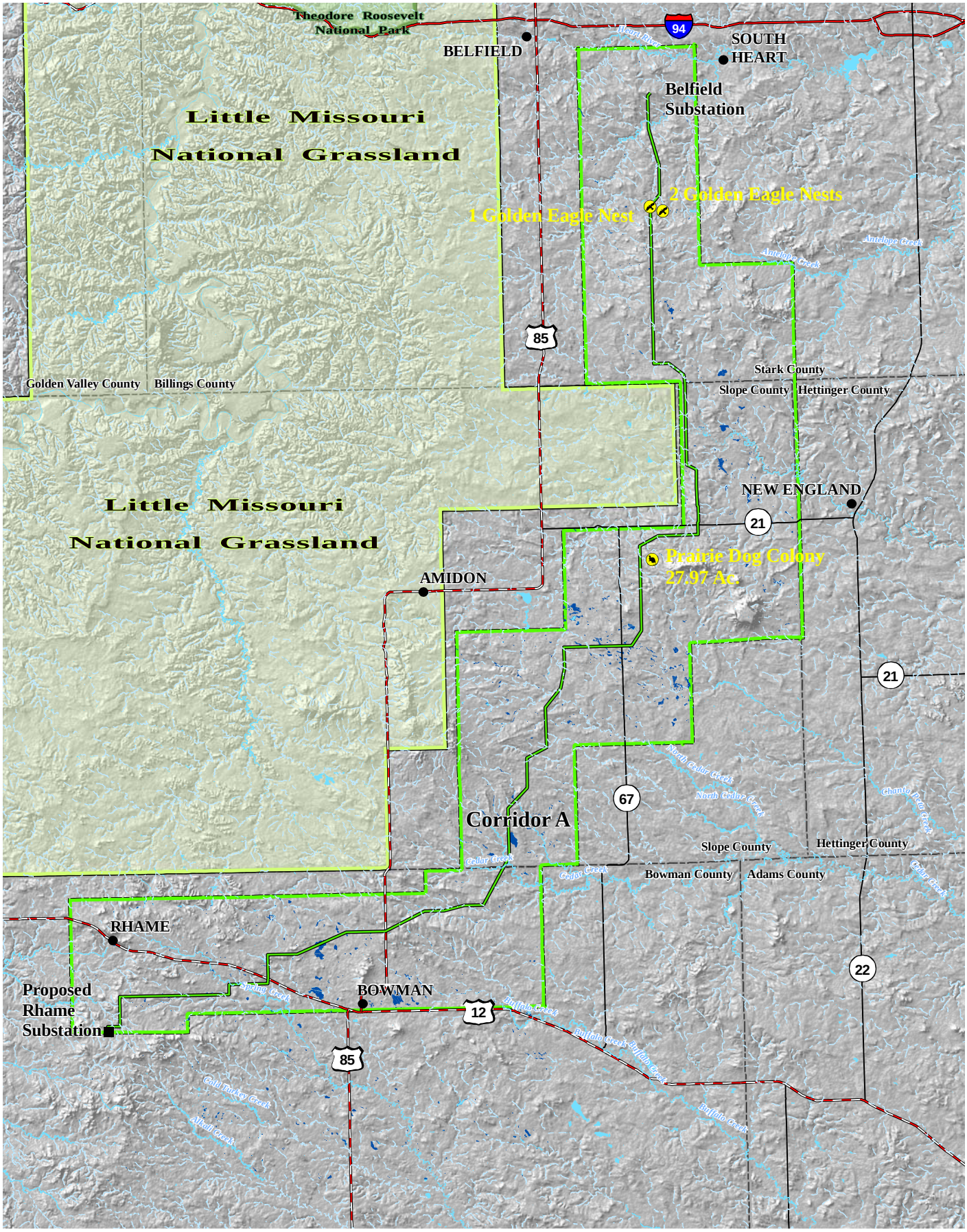
Federal and State wildlife agencies have not expressed concerns for any fish species or sensitive aquatic habitat within any of the waterbodies crossed by the Project. In addition, no waterbodies affected by the Project contain species managed by the National Marine Fisheries Service, nor do they support essential fish habitat (EFH) as defined under the Magnuson-Stevens Fishery Conservation and Management Act. Therefore, the proposed Project would not affect EFH.

6.5.2 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 2007b; NDNHI 2007). Fall baseline biological surveys were conducted in September 2007; spring surveys were conducted in April 2008.

BEPC would comply with USFWS recommendations regarding the following mitigation measures (USFWS 2007) in order to minimize disturbances to fish and wildlife resources possibly occurring within the Project area:

- 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.



North Dakota
Area of Detail

LEGEND

- GOLDEN EAGLE NESTS
- SUBSTATION
- CITY OR TOWN
- PRAIRIE DOG COLONY
- INTERMITTENT STREAM
- PERENNIAL RIVER OR CREEK
- PREFERRED TRANSMISSION ROUTE
- WETLAND
- LAKE OR RESERVOIR
- CORRIDOR 'A'
- U.S. NATIONAL GRASSLAND
- NATIONAL PARK

N

5 4 3 2 1 0 5
Scale in Miles

Map Projection: UTM
Zone: 13 North

Datum: NAD 1983
Grid Units: Meters

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Western Area Power Administration

Figure 6-1
Golden Eagle, Prairie Dogs and Wetlands

6.5.2.1 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 habitat fragmentation causing displacement of wildlife, vehicle and equipment operation causing loss of eggs, nests, or young.
- Significant impacts also would result from violation of the MBTA (16 USC 703 – 711, EO January 1, 2001), or electrocution or collision of Federally protected bird species (i.e., raptors and waterfowl) that would result in a measurable decrease in population numbers.

6.5.2.2 Proposed Transmission Line and Alternatives

Game Species

Impacts to big game and small game species would include an incremental short-term reduction of forage habitat and short-term habitat fragmentation within the proposed surface disturbance areas during construction. However, these incremental losses of vegetation would represent only a small percentage of the overall available habitat within the broader Project region. In most instances, suitable habitat adjacent to the disturbed areas would be available for wildlife species until grasses and woody vegetation were 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 [**appendix D**]). Additionally, holes or excavation pits that would be unattended overnight would be secured with temporary fencing and/or covered with plywood to reduce the possibility of wildlife entrapment.

Indirect impacts would result from increased human activity and noise levels during transmission line construction. Big game species likely would 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 short-term and animals would return to the disturbance area following construction activities.

Operation activities occurring from permanent aboveground facilities would result in no permanent loss of big game habitat. The 12.5-acre substation is within agricultural land.

Nongame Species

Direct impacts to nongame species (e.g., mammals, birds, reptiles) from surface disturbance activities would result in incremental short-term loss of habitat. Habitat fragmentation 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.

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 short-term and animals would be expected to return to the disturbance areas following construction activities.

The MBTA makes it unlawful to take, kill, or possess migratory birds. Habitat alteration and human disturbance 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 avoided by restricting construction within specific areas where migrating species are present to outside the breeding season (typically from mid-February to mid-August, although the period may be adjusted on site-specific factors) and by following applicable 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 2006 (APLIC 2006). Prior to construction, Western would contact the USFWS for guidance regarding mitigation measures that may be necessary to protect migratory birds.

BEPC currently plans to construct the transmission line during the nesting period (typically April 15 through July 31) for migratory birds. Project-specific mitigation measures (**appendix D**) indicates that BEPC plans 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. A qualified biologist would survey potentially suitable habitat for nesting activity and other evidence of nesting (e.g., mated pairs, territorial defense, birds carrying nest materials, 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 would be implemented on a site-specific and species-specific basis, in coordination with Western.

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 applicable mitigation measures from Suggested Practices for Avian Protection on Power Lines: The State of the Art in 1996 (APLIC 1996) and Mitigating Bird Collisions with Power Lines: The State of the Art in 1994 (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 (refer to **figure 2-1**), which is sufficient to preclude wingspan electrocution of these avian species.

Project-specific mitigation measures that have been developed for the Project (**appendix D**) include the use of line markers to prevent collision with conductors in proximity to wetlands that support large numbers of avian species. Perch deterrents could be installed on structures near active raptor nests and areas with heavy raptor concentrations. Perch deterrents would be installed near aquatic, wetland, and forested riparian habitats to minimize perching opportunities and raptor predation on waterfowl and other avian species. Perch deterrents also could prevent nest construction in areas where they could lead to electrocution or a fire hazard.

Fisheries

Construction-related impacts on fisheries would include clearing and grading of vegetation along stream banks that could increase turbidity levels in the waterbodies, and could result in localized increases in water temperature and light penetration that could affect aquatic habitat. In addition, pollutants from hazardous substance spills and herbicide use could contaminate fisheries crossed by the Project.

Mitigation measures have been developed to reduce impacts to waterbodies crossed by the proposed Project. Those measures include:

- Avoiding all waterbodies during routing to the extent practicable;
- Spanning all streams and drainages;
- Providing a 100-foot-wide buffer for adequate habitats, to the extent practicable;
- Developing a SPCC Plan prior to the start of construction to prevent the potential for spills of hazardous materials (i.e., petrochemicals and coolant) to streams. The SPCC 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;
- Locating refueling and staging areas away from waterbodies to prevent contamination;
- Applying herbicides used to control noxious weeds in accordance with label instructions (**appendix D**); and
- Establishing erosion and sediment controls prior to construction that are maintained throughout restoration.

6.5.2.2 Proposed Rhame Substation and East Rainy Butte Microwave Facility

Construction and operation of the 12.5-acre proposed Rhame Substation site would eliminate wildlife habitat within the area that is currently in cultivation. Wildlife that currently use surrounding areas within the 80-acre

tract that would be disturbed during substation construction would be temporarily displaced. Fisheries habitat is not available on, or in proximity to, the 80-acre tract. Therefore, impacts to fisheries resources are not expected.

The East Rainy Butte microwave site provides limited habitat for wildlife. Temporary disturbance to approximately 0.23 acre during construction and the permanent loss of less than 0.01 acre following construction would have no appreciable affect on wildlife. Although the 180-foot-tall tower could increase the occurrence of avian collisions, if the Western microwave tower were to be removed, the increased possibility of avian collision in the area would be nullified.

6.5.2.3 No Action Alternative

Wildlife and fisheries resources would not be impacted if the No Action Alternative were to be selected.

6.6 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 EA, special-status species also include those species that have been designated as species of conservation priority by 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 be affected by construction and operation of the proposed Project. 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.

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 2007b; NDNHI 2007). Baseline biological surveys were conducted in September 2007 prior to route finalization and during April 2008 after the preferred route was established.

6.6.1 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 are presented in **Appendix E**, Biological

Resources. 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** and are not discussed further.

A total of 53 special-status terrestrial and aquatic wildlife species were identified by the USFWS, the State of North Dakota, and the NDNHI as occurring within the Project vicinity (USFWS 2007; Hagen et al. 2005; NDNHI 2007). Species, their habitat associations, and their occurrence within the study area are summarized in **Appendix E**, Biological Resources. Occurrence for each species was based on habitat requirements and known distribution. Based on these evaluations, two species have been eliminated from detailed analysis (the blue sucker and the pink papershell). Of the remaining species analyzed, three are federally listed (i.e., whooping crane, gray wolf, and black-footed ferret). Special-status wildlife species that have not been eliminated from analysis are discussed below. No designated critical habitat is located within the Project area.

Federally Listed Species

Black-footed Ferret. The black-footed ferret (*Mustela nigripes*) is a federally listed endangered species and North Dakota Level I species of conservation priority. The black-footed ferret was once distributed throughout the high plains of the Rocky Mountains and western Great Plains regions, but is now thought to be the rarest mammal in the U.S. In general, ferrets are secretive, primarily nocturnal, and rarely observed. The black-footed ferret was considered extirpated from the U.S. until a small population was discovered in Wyoming in 1981. A captive breeding and re-introduction program, guided by the USFWS, established some experimental/nonessential populations in Wyoming, Montana, South Dakota, and Arizona.

The black-footed ferret is associated exclusively with prairie dog colonies in shrublands and grasslands. According to the USFWS's ferret search guidelines from April 1989, prairie dog colonies must be large complexes (80 acres or greater) with towns no further than three miles apart to sustain a viable population of approximately 120 ferrets (USFWS 1989). All active prairie dog towns or complexes of towns large enough to support ferrets are considered to be suitable habitat. One 28-acre black-tailed prairie dog town was identified during the September 28, 2007, field investigation. However, changes in transmission line routing since that time avoided the town. No other prairie dog towns were observed during April 2008 field investigations.

Gray Wolf. The gray wolf (*Canis lupis*) is a federally listed endangered species and North Dakota Level III species of conservation priority. The gray wolf is currently classified into several population segments. The Western Great Lakes populations of gray wolves includes all of Minnesota, Wisconsin, and Michigan; the eastern half of North Dakota and South Dakota; the northern half of Iowa; the northern portions of Illinois and Indiana; and the northwestern portion of Ohio. The USFWS removed the Western Great Lakes population from the list of Endangered and Threatened Wildlife on February 8, 2007 (73 FR 10513 [2007a]). The Rocky Mountain population of gray wolf has been delisted as either threatened or endangered.

No known breeding populations of gray wolf inhabit North Dakota. However, there have been documented occurrences of gray wolves at scattered locations since 1981 as well as unconfirmed sightings in the Turtle Mountains of north-central North Dakota (Licht and Fritts 1998).

Whooping Crane. The whooping crane (*Grus americana*) is a federally endangered species and a North Dakota Level III species of conservation priority. Collisions 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 Project. However, the proposed Project area is located on the western edge of its migratory route. Species records show migration routes through Slope, Bowman, and Stark counties (USFWS 2007). 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 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.

North Dakota Species of Conservation Priority

Black-tailed Prairie Dog. The black-tailed prairie dog (*Cynomys ludovicianus*) is a North Dakota Level I species of conservation priority and North Dakota's largest ground squirrel. The species is a year-round resident that occupies prairie landscapes with short vegetation and flat topography. It has been reduced to one percent of its historic range due to habitat loss and poisoning. Only one black-tailed prairie dog town of approximately 28 acres was identified near the proposed Project area during the September 2007 field surveys but changes to the preliminary route have occurred since that time. No other prairie dog towns were identified during the April 2008 field investigations.

Swift Fox. The swift fox (*Vulpes velox*) is a North Dakota Level II species of conservation priority. It is found within a variety of habitats but has its burrows and dens in fairly level upland grasslands, as well as roadsides. Dens are typically in sandy soils on open prairies, along fences, or in plowed fields, often in locations with expansive views of the surrounding area. Areas of vegetation that exceed the height of the fox are avoided.

Swift fox were found statewide at one time but have been extirpated from North Dakota due to indiscriminant poisoning and loss of habitat due to the conversion of agriculture and development. In addition, this species is vulnerable to competition and predation with red fox and coyote populations (Hagen et al. 2005).

Long-eared Myotis, Long-legged Myotis, Western Small-footed Myotis. Long-eared myotis (*Myotis evotis*), long-legged myotis (*Myotis volans*), and western small-footed myotis (*Myotis ciliolabrum*) are North Dakota Level III bat species of conservation priority and is found in western North Dakota's badlands. The proposed Project crosses the Little Badlands area where these species could occur. The bats utilize rugged terrain, roosting in small groups or as individuals. The species prefer rock outcrops and cliffs for roosting sites and is strongly associated with coniferous trees, but also will utilize deciduous trees and sagebrush flats for roosting caves and abandoned mines for hibernating. Ponderosa pine habitat of the badlands are key areas for the species (Hagen et al. 2005). All three species are impacted by the use of pesticides and the loss of water sources. These bat species are insectivores and the use of pesticides has can reduce their prey base near feeding grounds (Hagen et al. 2005). The use of insecticides also can contribute to bioaccumulation of insecticides within some bat species. The rate of bioaccumulation would be dependent upon insecticide type, use, and bat species.

River Otter. The river otter (*Lontra canadensis*) is a North Dakota Level II species of conservation priority. River otters occur in a variety of aquatic environments but prefer areas with high-quality river habitat that includes high numbers of wetlands and a high percentage of riparian woodland associated with the river system (Hagen et al. 2005).

The river otter historically occurred in aquatic habitats throughout North Dakota. A combination of unregulated trapping, loss of suitable habitat, and susceptibility to pollutants resulted in the near-extirpation of otters from the state (Hagen et al. 2005). Otter sightings have increased but it is not known if otters have re-colonized their former range or if a viable population exits in North Dakota (Hagen et al. 2005). Historically, otters were known to occur within the Heart River (Hagen et al. 2005). In recent years, sightings have been limited to the Red River and its tributaries, and in Lake Sakakawea on the Missouri River System (Hagen et al. 2005).

Associated habitat for the species is limited within the Project area. Direct impacts to the species are not anticipated because river otter habitat is of marginal quality due to grazing and because it would be spanned or avoided.

Hispid Pocket Mouse. The hispid pocket mouse (*Chaetodipus hispidus*) is a North Dakota Level III species of conservation priority found predominantly in southern North Dakota west of the Missouri River. The species prefers short and mixed-grass prairie but will utilize grain fields as well. The hispid pocket mouse is a grainivore and will eat seeds from native grasses and grain fields, which are abundant in the Project area (Hagen et al. 2005). The main threat to the hispid pocket mouse is loss of habitat. The conversion of native prairie to cropland has limited foraging and suitable cover for nesting and protection (Hagen et al. 2005).

Sagebrush Vole. The sagebrush vole (*Lemmiscus curtatus*) is a North Dakota Level III species of conservation priority found in southwestern North Dakota. The sagebrush vole is found in semi-arid areas with loose soil that contain a combination of sagebrush and mixed brush (Hagen et al. 2005). The main threat to the sagebrush vole is loss of sagebrush habitat (Hagen et al. 2005), which is limited within the Project area. Due to the general absence of sagebrush, the species is unlikely to occur within the Project area.

Bald Eagle. On August 8, 2007, the bald eagle (*Haliaeetus leucocephalus*) was removed from the List of Endangered and Threatened Wildlife; however, the species remains protected under the Bald and Golden Eagle Protection Act and the MBTA. Additionally, the bald eagle is a North Dakota Level II species of conservation priority. Historically, populations of bald eagles were drastically reduced, principally due to low productivity as a result of the bioaccumulation of pesticides. Since the banning of organochlorine pesticides such as dichlor-diphenyl-trichloroethane (DDT), bald eagle numbers have been increasing.

Because the bald eagle's diet consists mostly of fish, individuals tend to be found associated with bodies of water such as lakes, rivers, and reservoirs. Eagles also may forage opportunistically, especially in winter, feeding on waterfowl, dead fish, jackrabbits, and big game carrion.

Nesting or foraging bald eagles are not present in the Project area. The Project area does not provide suitable habitat for foraging or nesting. Those eagles that may be present in the area likely would be transient.

Burrowing Owl. The burrowing owl (*Athene cunicularia*) is a North Dakota Level II species of conservation priority. The ground nesting owl inhabits fields and grazing land. Burrowing owls nest in abandoned mammal burrows (e.g., prairie dog, ground squirrel, badger, coyote, and swift fox), which they enlarge and excavate (Hagen et al. 2005). Burrowing owls are present in North Dakota from April to September and peak breeding season occurs from early May to mid-August (Hagen et al. 2005). Burrowing owls were not observed during the spring or fall field investigations and would not be impacted by Project construction or operation.

Golden Eagle, Ferruginous Hawk, Swainson's Hawk, Northern Harrier, Peregrine Falcon, Prairie Falcon, Short-eared Owl. Golden eagle (*Aquila chrysaetos*), Ferruginous hawk (*Buteo regalis*), Swainson's hawk (*Buteo swainsoni*), northern harrier (*Circus cyaneus*), peregrine falcon (*Falco peregrinus*), Prairie Falcon (*Falco mexicanus*), and short-eared owl (*Asio flammeus*) are raptor species that are North Dakota species of conservation priority that are identified as occurring within the proposed Project area in section 6.5.1.1 above.

Grasshopper Sparrow, Lark Bunting, LeConte's Sparrow, Loggerhead Shrike, Long-billed Curlew, Dickcissel, Chestnut-collared Longspur, Brewer's Sparrow, Bobolink, Black-billed Cuckoo, Marbled Godwit, Baird's Sparrow, McCown's Longspur, Red-headed Woodpecker, Sprague's Pipit, Upland Sandpiper. Grasshopper sparrow (*Ammodramus savannarum*), lark bunting (*Calamospiza melanocorys*), LeConte's sparrow (*Ammodramus leconteii*), loggerhead shrike (*Lanius ludovicianus*), long-billed curlew (*Numenius americanus*), dickcissel (*Spiza americana*), chestnut-collared longspur (*Calcarius ornatus*), Brewer's sparrow (*Spizella breweri*), bobolink (*Dolichonyx oryzivorus*), black-billed cuckoo (*Coccyzus erythropthalmus*), marbled godwit (*Limosa fedoa*), Baird's sparrow (*Ammodramus bairdii*), McCown's longspur (*Calcarius mccownii*), red-headed woodpecker (*Melanerpes erythrocephalis*), 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 are identified as occurring within the proposed Project area in section 6.5.1.1, above. These migratory bird species are associated with grassland habitats and may be found within the 169 acres of grasslands and rangelands that would be temporarily affected by construction of Alternative A. Construction of Alternatives A or B would result in slightly less temporary acreage disturbances.

American Advocet, American Bittern, Willet, Wilson's Phalarope. American advocet (*Recurvirostra americana*), American bittern (*Botaurus lentiginosus*), willet (*Catoptrophorus semipalmatus*), and Wilson's phalarope (*Phalaropus tricolor*) are migratory bird species that are North Dakota species of conservation priority and are identified as occurring within the proposed Project area in section 6.5.1.1 above. These migratory bird species are associated with wetland and waterbody habitats. Wetland and riparian habitat would not be directly impacted by Project construction, regardless of alternative.

Canvasback, Northern Pintail, Redhead. Canvasback (*Aythya valisineria*), Northern pintail (*Anus acuta*), and Redhead (*Aythya americana*) are migratory bird species that are all North Dakota species of conservation priority and are identified as occurring within the proposed Project area in section 6.5.1.1 above. These migratory bird species are considered waterfowl and are associated with large wetland complexes containing open water and emergent vegetation (e.g., cattails and bulrush). Wetland and riparian habitat would not be directly impacted by Project construction, regardless of alternative.

Greater Sage Grouse. The greater sage grouse (*Centrocercus urophasianus*) is a North Dakota Level II species of conservation priority and has been petitioned for Federal listing consideration. In April 2004, the USFWS determined that listing the sage grouse under the ESA may be warranted and initiated a status review. However, based on a 12-month finding for petitions to list the greater sage grouse as threatened or endangered, the USFWS has subsequently determined that the listing is not warranted (70 FR 2244).

This year-round resident inhabits only a small portion of the southwestern corner of North Dakota. The greater sage grouse is a sagebrush obligate, particularly big sagebrush, but will utilize riparian and upland meadows, irrigated and non-irrigated croplands, and pasturelands for brood-rearing. Lek sites consist of natural openings in sagebrush and disturbed areas such as dry stream channels and burned areas (Hagen et al. 2005). Secondary to sagebrush habitat, sage grouse require moist wetland and wet meadows to aid in brood rearing.

No known lek sites have been identified by the NDGFD or NDNHI as occurring within the Project area and none were observed during field surveys. In addition, very little sagebrush habitat was identified during the September 2007 and April 2008 surveys.

Sharp-tailed Grouse. The sharp-tailed grouse (*Tympanuchus phasianellus*) is a North Dakota Level II species of conservation priority. This species is most common in the Missouri Slope region of North Dakota. Sharp-tailed grouse are found in mixed-grass prairie with patches of small trees or shrubs. CRP land is important to the species (Hagen et al. 2005). During the breeding season from March to June, male sharp-tailed grouse congregate on specific areas known as leks in the early morning to impress nearby female grouse. Leks are usually located within wet meadows, ridges, and knolls, or recently burned areas. No lek sites have been identified by the NDGFD of the NDNHI; however, individuals were observed during the September 2007 field surveys near the Project area. Sharp-tailed grouse were not observed during spring or fall field investigations and impacts to the species would not result from Project construction or operation.

Common Snapping Turtle, Plains Spadefoot, Northern Sagebrush Lizard, Short-horned Lizard, Western Hognose Snake. The common snapping turtle (*Chelydra serpentina*) is a North Dakota Level II species of conservation priority. The species prefers warm water in permanent lakes or rivers with a muddy bottom and plenty of aquatic vegetation (Hagen et al. 2005). September 2007 and April 2008 field investigations identified four perennial streams and nine waterbodies that contain common snapping turtle habitat. Since waterbodies, riparian, and wetland habitat would be spanned, impacts to the above referenced species are not expected.

The plains spadefoot (*Spea bombifrons*) and the Western hognose snake (*Heterodon nasicus*) are North Dakota Level I species of conservation priority. The short-horned lizard (*Phrynosoma douglassi*) is a North Dakota level II species of conservation priority and the Northern sagebrush lizard (*Sceloporus gracious*) is a North Dakota level III species of conservation priority. These reptile species inhabits dry, open grasslands with sandy or loose soils and, occasionally rock crevices. Other habitat factors include a proximity to water and small mammal burrows (Hagen et al. 2005). These reptile species could occur within the Little Badlands area crossed by the proposed Project in Stark County.

Habitat degredation in the loss of associated vegetation communities and pollutants is the main reason for decline for each of these reptile species occurring within the Project area.

Northern Redbelly Dace, Flathead Chub. The Northern redbelly dace (*Phoxinus eos*) is a North Dakota Level II species of conservation priority. This species occurs in a variety of habitats ranging from streams to bog lakes but relies on cold, clear headwater streams. Populations occur in the Missouri River drainage,

specifically the Cannonball River, Antelope Creek, and the South Fork Heart River (a tributary of the Heart River) crossed by the proposed Project (Hagen et al. 2005). Cedar Creek and the Philbrick River are crossed by the proposed Project and contain suitable habitat. However, the river would be spanned, thus avoiding impacts to riverine resources.

Reasons for population declines include degradation of quality habitat. This includes the loss of riparian habitat along waterways and a decline in water quality due to poor land use practices. The addition of dams have changed flow regime and fragmented populations (Hagen et al. 2005).

The flathead chub (*Platygobio gracilis*) is a Dakota Level II species of conservation priority. This species is found mostly in large turbid rivers with sand or gravel bottoms but prefers slow turbid water present in the main channel of river systems (Hagen et al. 2005). Habitat factors preferred by this species include a turbidity of less than 250 nephelometric turbidity unit, water depths of less than one meter, and temperatures ranging from 18 to 22 degrees Celsius (Hagen et al. 2005). Populations have been documented in the Heart and Cannonball rivers that would be crossed by the proposed Project. Such crossings would be spanned by the proposed transmission line, thus impacts are not expected.

Reasons for population decline include loss of habitat though impoundments and channelization of rivers and the use of water for cattle grazing, agriculture, industrial, and municipal purposes. In addition, competition and predation has increased as a result of introduction of nonnative fish species (Hagen et al. 2005).

Special-status Plants

Appendix E, Biological Resources, summarizes the special-status plant species identified for the six-mile-wide Project corridor. The table provides the species name, status, basic habitat association, and occurrence within the corridor, and references used for evaluation for each species. Six sensitive plant species were initially identified for evaluation for the Project by the NDNHI. All six species were listed as Species of Concern and identified by the NDNHI. No Federal or State listed plant species were identified by for this Project. All six species were identified as could occur within the Project area and are summarized in the following information. Species specific surveys for these plant species were not required by the NDGFD (NDGFD 2007b).

Alkali Sacaton, Bent-flowered Milkvetch, Narrow-leaved Wirelettuce, Slim Flowered Scurfpea, Torrey's Cat's-Eye. Alkali Sacaton, Bent-flowered Milkvetch, Narrow-leaved Wirelettuce, Slim Flowered Scurfpea, and Torrey's Cat's-Eye are associated with dry to moist sites with sand or gravelly soils. The species are most often found growing on alkaline flats, prairies, and sandy plateaus, which are common along the proposed and alternative Project alignments. Due to the relatively broad range of habitat that can be occupied by the species, they would most often be associated with grasslands and rangelands.

White Point Locoweed. White point locoweed (*Oxytropis sericea*) is a perennial that occurs on open, well-drained slopes of the western plains. It is infrequent to common on prairie uplands, streambanks, valleys, and alpine sites. It occurs on sandy, gravelly, or rocky soils but grows best on sandy loams and is tolerant of moderately saline soils and low nutrient conditions, but not tolerant of water-saturated soils such as heavy clay. It is drought tolerant but is not tolerant of excessive shade. It is tolerant to freezing temperatures during the growing season and competes well on nutrient-rich, deep loam on subalpine sites. White point locoweed thrives at medium elevations (Esser 1993) and is likely to be present within areas that would be temporarily affected by Project construction.

6.6.2 Environmental Consequences

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 5.6 and presented in **table 5-1**. As noted in **table 5-1**, temporary impacts associated with construction of Alternatives A, B, and C would total 300.4, 292.4, and 297.3 acres, respectively.

6.6.2.1 Significance Criteria

Special-status Species Resources

- 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 (16 USC 703 – 711, EO January 1, 2001), the ESA (16 USC 1531 *et seq*.), 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.

6.6.2.2 Special-status Species

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

Wildlife

Impacts to special-status 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 and electrocution); 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 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.

Further consultation with the NDGFD indicates that the State is concerned about impacts to nongame species associated with native prairie or wetland/riparian habitats. No species specific surveys will be required for North Dakota Species of Conservation priority occurring within the Project area (NDGFD 2007b).

Project-specific mitigation measures (**appendix D**) have been developed to minimize impacts to special-status species includes coordination with the USFWS and the NDGFD and compliance 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 Project. Monitoring would be conducted in accordance with any mitigation plan that may be necessary as a result of impact analyses.

Federally Listed Species

Black-footed Ferret. Impacts on black-footed ferrets from the proposed Project could result from abandonment of underground nursery dens and the loss of adults and young from the compaction of prairie dog burrows during construction. Indirect impacts could occur from the increase in noise levels and other disturbances related to construction and human presence.

Relative to the Project area, a nonessential/experimental population of black-footed ferrets occurs within the Cheyenne River Sioux Reservation in Ziebach and Dewey counties, South Dakota. The location is approximately 190 miles southwest of the Project ROW in Bowman County, North Dakota. It would be highly unlikely that individual ferrets from the Cheyenne River Sioux Reservation would be present along the Project ROW. Finally, the black-footed ferret is believed to be extirpated from North Dakota (Hagen et al. 2005).

Only one prairie dog town of approximately 28 acres was identified near the proposed Project area during the September 2007 field surveys, but route changes subsequent to that time avoided the town. No additional

towns were observed during the April 2008 field investigations. Since the 28-acre prairie dog town is too small to support a ferret population, the proposed Project would not affect the black-footed ferret.

Whooping Crane. The proposed Project would not affect whooping crane nesting habitat or breeding rookeries. Currently, the construction schedule of proposed Project does overlap with the spring and fall migration periods. Collision with power lines is the largest source of mortality for whooping cranes. Collision potential depends on 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. Specifically for whooping cranes, collision potential increases when power lines are constructed between suitable wetland roosting habitat and agricultural land utilized for foraging while at a stop-over site. Cranes tend to fly at low altitudes between these two sites, increasing the chances of collisions.

The September 2007 and April 2008 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 is within the western portion of the general migration corridor for the whooping crane. However, based on the number of whooping crane sightings that have been recorded by the USFWS through 2007, approximately 85 percent of the whooping crane that were sighted were within a 120-mile-wide corridor located more than 50 miles east of the Project area. The extreme northern portion of the Project area is located within the extreme western edge of the migration corridor where an additional 10 percent of the sighting have occurred. Therefore, the potential for whooping cranes to occur within the Project area during their annual spring and fall migrations would be low.

Project-specific mitigation measures (**appendix D**) available to prevent collision with conductors include line marking and avoidance of construction in proximity to wetlands that support large numbers of avian species and to follow applicable mitigation measures from Suggested Practices for Avian Protection on Power Lines: Mitigating Bird Collisions with Power Lines: The State of the Art in 2006 (APLIC 2006). In addition, it is recommended that Western consult with the USFWS on the implementation of specific whooping crane mitigation measures to reduce the possibility of impacts.

Gray Wolf. The analysis of the presence of gray wolf in the North Dakota indicates it is likely that individual dispersing wolves from Manitoba or Minnesota may occasionally wander into the vicinity of the proposed Project area. However, the NDGFD believes the species to be extirpated from North Dakota (Hagen et al. 2005). Given the infrequency of wolf observations (10 total in North Dakota and Minnesota) from 1981 until 1998 (one in 1981, one in 1985, one in 1986, one in 1989, one in 1990, four in 1991, and one in 1992) (Licht and Fritts 1994), it is highly unlikely that a dispersing wolf would be present within the transmission line ROW during, or following construction activities. Therefore, construction and operation of the proposed Project is unlikely to have any direct or indirect effect on the gray wolf.

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Black-tailed Prairie Dog. The effects of construction through a prairie dog colony may include temporary loss of forage and shelter due to vegetation clearing, collapsing of burrows, and temporary disruption of foraging and resting activities due to disturbance associated with construction equipment. Direct mortality of prairie dogs could result if active burrows are occupied at the time of construction. If construction occurs later in the prairie dog's reproductive season (late May to early June), most prairie dogs are expected to be mobile and able to avoid construction traffic; however, some individual prairie dogs may be injured or killed during construction. In addition, there is a chance of destroying active dens with young if construction occurs during the reproductive season.

Only one town of approximately 28 acres was identified near the proposed Project area during the September 2007 field surveys; however, rerouting of the proposed alignment avoided the town and no additional prairie dog towns were identified during the April 2008 field surveys. Therefore, the proposed Project would not affect black-tailed prairie dog populations.

Swift Fox. Impacts to breeding swift fox could result from abandonment of den sites and the loss of adults and young. Indirect impacts would result from the increased noise levels and human presence related to

construction. Since the swift fox has been extirpated from North Dakota, it is highly unlikely that the proposed Project would have any impacts to the species.

Long-eared Myotis, Long-legged Myotis, Western Small-footed Myotis. No historic communal long-eared myotis, long-legged myotis, Western small-footed myotis, or other bat roost sites (e.g., hibernacula, nursery colonies, bachelor roosts) have been identified by the NDGFD (2007b) within the proposed Project area. Therefore, impacts to the species are not expected.

River Otter. No in-stream construction activities would occur during Project construction; therefore, direct impacts to the river otter are not anticipated. River otter habitat within the area has been modified by grazing and is of marginal quality. The Project may temporarily impact individual river otters due to human activity in the area. However, such impacts are not likely to cause a trend to Federal listing or loss of viability to the species.

Hispid Pocket Mouse. Impacts on the hispid pocket mouse from construction of the Project would include direct impacts that could occur during clearing if heavy equipment collapses dens and tunnels while navigating the ROW or at structure locations, splicing sites, or pulling and tensioning sites. Associated habitat for the hispid pocket mouse is abundant within and adjacent to the Project area; therefore, the Project may impact individual Hispid pocket mice but is not likely to cause a trend to Federal listing or loss of viability to this species. Approximately 169 acres of grasslands and rangelands could be temporarily impacted as a result of construction of Alternative C. The habitat offers little vegetation cover for the species and species numbers are likely to be limited. Construction of Alternatives A or B could temporarily affect 144 or 149 acres of habitat, respectively.

Sagebrush Vole. Impacts on the sagebrush vole from construction of the Project would include direct impacts that could occur during clearing if heavy equipment collapses dens and tunnels while navigating the ROW or at structure locations, splicing sites, or pulling and tensioning sites. Sagebrush habitat is limited as a result of cultivation and that which is present is poorly suited for the species. The Project may impact individual sagebrush voles but is not likely to cause a trend to Federal listing or loss of viability to the species. Temporary impacts to habitat would be similar as those identified for the hispid pocket mouse.

Bald Eagle. The September 2007 and April 2008 field surveys did not identify suitable bald eagle roosting or nesting habitat. According to **table 6-1**, all three alternatives cross less than one-half acre (approximately 0.1 percent) of open water and deciduous forests required by the species. In addition, no bald eagle nests sites were identified during the September 2007 and April 2008 field surveys. Therefore, it is unlikely that the proposed Project would have any direct or indirect effects on the bald eagle.

Burrowing Owl. Destruction of burrows could result in displacement of owls into less suitable habitats, increasing susceptibility to predation, reducing cover or forage habitat, or reducing reproductive success. Displacement, injury, or direct mortality could result if active burrows are occupied at the time of ground disturbing activities. Only one town of approximately 28 acres was identified near the proposed Project area during the September 2007 field surveys but changes to the preliminary route have occurred since that time. The current route would not lie near the previously identified prairie dog town or other prairie dog towns. The proposed Project would not impact individual burrowing owls and is not likely to cause a trend to Federal listing or loss of viability of species.

Golden Eagle, Ferruginous Hawk, Swainson's Hawk, Northern Harrier, Peregrine Falcon, Prairie Falcon, Short-eared Owl. Project construction could result in temporary impacts to golden eagle, Ferruginous hawk, Swainson's hawk, northern harrier, peregrine falcon, prairie falcon, and short-eared owl due to human activity. Such impacts are likely to affect 169 acres along Alternative C (Preferred Alternative), 144 acres along Alternative A or 149 acres along Alternative B. Electrocution impacts associated with any of the three alternatives are not expected due to line and structure spacing. Impacts associated with collision with conductor or OPGW would be similar among alternatives and would be mitigated by line marking devices, in accordance with USFWS requirements.

American Advocet, American Bittern, Willet, Wilson's Phalarope. Impacts to American advocet, American bittern, willet, and Wilson's phalarope are not expected because wetland and riverine habitat would not be affected by transmission line construction.

Canvasback, Northern Pintail, Redhead. Impacts to canvasback, northern pintail, and redhead would be minimal because the proposed Project (or alternatives) avoids open water and wetlands. Potential collision impacts would be mitigated by installation of line marking devices.

Grasshopper Sparrow, Lark Bunting, LeConte's Sparrow, Loggerhead Shrike, Long-billed Curlew, Dickcissel, Chestnut-collared Longspur, Brewer's Sparrow, Bobolink, Black-billed Cuckoo, Marbled Godwit, Baird's Sparrow, McCown's Longspur, Red-headed Woodpecker, Sprague's Pipit, Upland Sandpiper. 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 scheduling initial ground disturbing activities to avoid the nesting season to the extent practicable. Field surveys also would be carried out during nesting periods to determine the presence of such species.

Greater Sage Grouse. Direct impacts of construction on sage grouse may include the loss of lekking grounds and other sage grouse habitat. Although the Project would not result in a permanent loss of habitat along the pipeline ROW, the regeneration of sagebrush would likely be slow. Depending on the timing of construction, the proposed Project could impact sage grouse during lekking activities or brood rearing, and could cause displacement, injury, or direct mortality of individuals. Sage grouse are particularly sensitive to disturbances while they gather on lekking grounds each morning and evening from early March to early May. Construction activities and associated noise occurring in early morning and late evening in the vicinity of lekking grounds could disrupt and displace sage grouse that have gathered for breeding activities. In addition, once breeding activities have concluded, sage grouse hens create their nests on the ground underneath sagebrush plants in proximity to the lekking grounds. The proposed Project could impact nesting sage grouse by destroying nests, causing nest abandonment, or causing injury or direct mortality to the young.

Indirect impacts may include the degradation of habitat by the construction of power lines and the associated roads and infrastructure, and provides additional hunting perches for raptors (NDGFD 2007a). Perch deterrents would be installed to minimize impacts in areas where increased predation would be a concern according to BEPC's mitigation measures (**appendix D**).

Greater sage grouse habitat is largely associated with rangeland of which 6.5 to 9.3 acres could be temporarily affected by construction of Alternatives A, B, or C. However, NDGFD and the NDNHI did not identify any lek sites or suitable abitat in proximity to the proposed transmission line alignment. The NDGFD will not require greater sage grouse surveys prior to construction but does recommend avoiding sagebrush habitat to the extent possible. Because there is a lack of known lek sites, impacts to the greater sage grouse from the proposed Project are not expected.

Sharp-tailed Grouse. Direct impacts of construction on sharp-tailed grouse may include the loss of lekking grounds and other sharp-tailed grouse 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. Sharp-tailed grouse are particularly sensitive to disturbances while they gather on lekking grounds each morning and evening from early March to early May. Construction activities and associated noise occurring in early morning and late evening in the vicinity of lekking grounds could disrupt and displace sage grouse that have gathered for breeding activities. The proposed Project could impact nesting sharp-tailed grouse by destroying nests, causing nest abandonment, or causing injury or direct mortality to the young.

Individual sharp-tailed grouse were identified adjacent to the Project area during the September 2007 field investigation, proving that they do occur within the area. However, none were observed along any of the three alternative transmission lines and suitable habitat is not present within the proposed or alternative transmission line alignments. Although the proposed Project could impact individuals, it is unlikely that such impacts would cause a trend to Federal listing or loss of viability of species.

Common Snapping Turtle, Plains Spadefoot. Direct impacts to common snapping turtle, or plains spadefoot could result in mortalities of these less mobile or burrowing reptile species due to surface disturbing activities (e.g., crushing by vehicles and equipment). All wetland and riparian communities will be spanned by the transmission line and a 100-foot buffer for wetlands will be included as additional mitigation to avoid impacts to receiving streams. Therefore, impacts to individuals are not likely to occur during construction. Any loss of individuals during construction would not result in a trend to Federal loss or viability of the species.

Northern Sagebrush Lizard, Short-horned Lizard, Western Hognose Snake. Direct impacts to Northern sagebrush lizard, short-horned lizard, or Western hognose snake could result in mortalities of these less mobile or burrowing reptile species due to surface disturbing activities (e.g., crushing by vehicles and equipment). Temporary habitat loss would likely be limited to 6.5 acres of rangeland associated with Alternative A to 9.3 acres of rangeland associated with Alternative C. Indirect impacts would include the loss of associated vegetation during construction activities. The proposed Project could impact individuals but is not likely to cause a trend to Federal listing or loss of viability of species.

Northern Redbelly Dace, Flathead Chub. Clearing and grading of vegetation within the construction ROW could increase erosion along stream banks and turbidity levels in the waterbodies. Localized changes in water temperature and light penetration could affect aquatic habitat. Indirect impacts could occur if soil transport were to affect such locations and degrade habitat. However, since such resources would be spanned by all three transmission line alternatives, impacts to the species are not anticipated.

In addition, BEPC will develop a SPCC Plan prior to the start of construction to prevent the potential for spills of hazardous substances to streams. The SPCC 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. Herbicides used to control noxious weeds would be applied in accordance with label instructions. Actual impacts to northern redbellied dace and the flathead chub are expected to be negligible as their habitats would be avoided or spanned by the transmission line.

6.6.2.3 Special-status Plants

Alkali Sacaton, Bent-flowered Milkvetch, Narrow-leaved Wirelettuce, Slim Flowered Scurfpea, Torrey's Cat's-Eye, White Point Locoweed. Impacts to alkali sacaton, bent-flowered milkvetch, narrow-leaved wirelettuce, slim flowered scurfpea, Torrey's cat's-eye, and white point locoweed 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. Due to the relatively broad range of habitat that can be occupied by the species, they would most often be associated with grasslands and rangelands. Approximately 144 acres would be temporarily impacted as a result of construction of Alternative A. Construction of Alternatives B or C would result in temporary impacts to 149 acres and 169 acres, respectively. Invasion of suitable habitat by noxious weeds could occur from construction activities. The proposed Project may impact individuals but is not likely to cause a trend to Federal listing or loss of viability for these plant species.

6.6.2.4 Proposed Rhame Substation and East Rainy Butte Microwave Facility

The 80-acre Rhame Substation property is currently in cultivation. Small mammals and reptiles would likely be displaced during construction, but would return to the 67 acres that would not be developed following construction activities. Small game mammals and reptiles would be eliminated from the 12.5-acre substation site. There are no known special-status species to be present on the 80-acre substation property; therefore, use of the proposed 80-acre site would not affect special status species. Noxious weed control would be implemented as described for the transmission line.

The East Rainy Butte microwave facility site provides little or no habitat to support species of concern. Therefore, development of the site is not expected to impact such resources.

6.6.2.5 No Action Alternative

If the Project were not construction, biological resources within the area would remain in their present condition. Other activities in the Project area would continue to degrade or eliminate habitat at current rates and biological resources would continue to be stressed.

6.7 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 (AIRFA) 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 (NAGPRA); EO 13007, the consideration of historic and traditional landscapes; and the increased awareness of and consultation for traditional cultural properties (Parker and King 1989).

6.7.1 Affected Environment

Metcalf Archaeological Consultants, Inc. (Metcalf) conducted a Class I files search for the proposed Project from August 20 to September 24, 2007 (Metcalf 2007a). The work was done using site and manuscript files at the State Historical Society of North Dakota in Bismarck and North General Land Office data. Metcalf gathered and tabulated data on all previously recorded cultural resources and previous cultural resource surveys within Corridors A, B, and C. The locations of all cultural resources and surveys that had accompanying maps were digitized. Once digitized, the resources and surveys were displayed on maps to show their locations relative to corridor boundaries and to the proposed transmission line routes (i.e., Alternative A, Alternative B, and Alternative C). The file search study area measured six miles wide centered on each of the three corridors. Ultimately, the focus of the analysis was narrowed down to those sites located within 75 and 500 feet of the proposed route centerline and the centerlines of Alternatives A, B, and C. The distances were used to identify sites that could be within (or very close to) the proposed ROW and those that could be impacted by transmission line construction. The results of the analysis are presented below in text and associated table.

Alternative A. A total of 12 previously recorded sites (32SK0909, 32SK0024, 32SK0040, 32SK0059, 32SK0061, 32SK0062, 32SK0034, 32SL0032, 32BO0275, 32BO0961, 32BO0966, 32BO0270) were identified within 500 feet of the centerline; three of the sites (32SK0062, 32SK0034, 32SL0032) also are located within 75 feet of the centerline (**table 6-6**). The three sites within 75 feet of the centerline include a prehistoric cultural material scatter, a historic garage and grain bin, and a prehistoric cultural material scatter/quarry. All three of the sites are unevaluated and require testing or additional archival research to determine their eligibility for the National Register of Historic Places (NRHP). The remaining nine sites include three prehistoric cultural material scatters, two prehistoric cultural material scatters/quarries, two historic ranches, one historic cultural material scatter/foundation/depression, and one historic windmill/corral. With the exception of the historic cultural material scatter/foundation/depression, all of the nine sites within 500 feet of the centerline are unevaluated and require testing or additional archival research to determine their eligibility for the NRHP. The historic scatter/depression/foundation was recommended by the field archaeologist as not eligible for the NRHP.

Alternative B. As a result of the files search, a total of eight previously recorded sites (32SK0909, 32SK0024, 32SK0040, 32SK0059, 32SK0061, 32SK0062, 32SK0034, 32SL0345) were located within 500 feet of the Alternative B centerline; two of the sites (32SK0062, 32SK0034) also were located within 75 feet of the centerline (**table 6-6**). The two sites within 75 feet of the centerline include a prehistoric cultural material scatter and a historic garage and grain bin. Both of the sites are unevaluated and require testing or additional

Table 6-6 Previously Recorded Archaeological and Historic Resources Identified Through the Class I (Files Search) Inventory

Site Number	Site Type	Description	NRHP Evaluation[1,2]	Alternative A		Alternative B		Alternative C (Preferred Alternative)	
				Within 500 feet	Within 75 feet	Within 500 feet	Within 75 feet	Within 500 feet	Within 75 feet
32SK0909	Prehistoric	Cultural Material Scatter (CMS)	Unevaluated	Yes	No	Yes	No	No	No
32SK0024	Architectural	Windmill/Corral	Unevaluated	Yes	No	Yes	No	No	No
32SK0040	Prehistoric	CMS/Quarry	Unevaluated	Yes	No	Yes	No	No	No
32SK0059	Prehistoric	CMS	Unevaluated	Yes	No	Yes	No	No	No
32SK0061	Prehistoric	CMS/Quarry	Unevaluated	Yes	No	Yes	No	No	No
32SK0062	Prehistoric	CMS	Unevaluated	Yes	Yes	Yes	Yes	No	No
32SK0034	Architectural	Garage/Grain bin	Unevaluated	Yes	Yes	Yes	Yes	No	No
32SL0345	Prehistoric	CMS	Unevaluated	No	No	Yes	No	No	No
32SL0032	Prehistoric	CMS/Quarry	Unevaluated	Yes	Yes	No	No	No	No
32BO0978	Architectural	Pucket Farm	Unevaluated	No	No	No	No	Yes	Yes
32BO0275	Prehistoric	CMS	Unevaluated	Yes	No	No	No	No	No
32BO0961	Architectural	Heinrick Ranch	Unevaluated	Yes	No	No	No	Yes	No
32BO0966	Architectural	Burdette Ranch	Unevaluated	Yes	No	No	No	Yes	No
32BO0270	Historic	CMS/Foundation /Depression	Not eligible-field	Yes	No	No	No	Yes	No

[1] "Unevaluated" indicates that the site was not evaluated as either eligible or not eligible at the time it was recorded by the field archaeologist.

[2] "Not eligible-field" indicates that the site has been recommended as not eligible by the field archaeologist , but has not been reviewed by North Dakota SHPO.

archival research to determine their eligibility for the NRHP. The remaining six sites include three prehistoric cultural material scatters, two cultural material scatters/quarries, and one historic windmill/corral. All of the sites are unevaluated and require testing or additional archival research to determine their eligibility for the NRHP.

Refer to **table 6-6** for results of the Class I cultural resources inventory.

Alternative C (Preferred Alternative). As a result of the files search, a total of four previously recorded sites (32BO0978, 32BO0961, 32BO0966, 32BO0270) were located within 500 feet of the preferred alternative centerline; one of the four sites (32BO0978, Puckett Farm) also is located within 75 feet of the centerline (**table 6-6**). Although the Pucket Farm is located within 75 feet of the preferred alternative centerline, the farm structures are located at least 500 feet from the centerline and would be outside of the construction corridor. The remaining three sites within 500 feet of the preferred alternative centerline include two ranches and a historic cultural material scatter/depression/foundation. The two ranches are unevaluated and the historic scatter/depression/foundation was recommended by the field archaeologist as not eligible for the NRHP.

Results of the Class III Pedestrian Inventory

Metcalf conducted a Class III pedestrian inventory of the proposed preferred alternative from October 31 to November 7, 2007. The survey area consisted of a 200-foot-wide corridor centered on the proposed transmission line centerline and the footprint of two potential substation locations. With the exception of a total of approximately three linear miles where access was denied by the landowner, the entire proposed preferred alternative was surveyed for cultural resources.

A total of 11 sites and eight isolated finds were identified during the Class III inventory (**table 6-7**). The 11 sites consist of four prehistoric lithic scatters, two historic farmsteads, one historic homestead, and a historic bridge, dump, railroad, and stock pen. Bifaces and flakes are included in the isolated finds. Of the 11 sites, nine are recommended by the field archaeologist as not eligible for the NRHP and two are unevaluated at this time. The two unevaluated sites include a historic railroad and a prehistoric lithic scatter. Evaluative testing would be needed to determine the eligibility of these two sites. However, the railroad would be spanned by the transmission line, thus avoiding any impact to the site, and the prehistoric lithic scatter is located outside of the Project area and would be avoided by Project construction. Therefore, no further work (i.e., testing) is recommended for these two sites.

Table 6-7 Archaeological and Historic Resources Located During the Class III Inventory

SITS Number	Temporary Field Number	Site Type	NRHP Evaluation	Recommendations/ Comments
	0001	Prehistoric lithic scatter	Not eligible	No further work
	0002	Prehistoric lithic scatter	Not eligible	No further work
	0003	Prehistoric lithic scatter	Not eligible	No further work
	0004	Historic homestead	Not eligible	No further work
	0005	Historic bridge	Not eligible	No further work (outside of Project area)
	0006	Historic farmstead	Not eligible	No further work
	0007	Historic agricultural (stock pens)	Not eligible	No further work
	0008	Historic farmstead	Not eligible	No further work

Table 6-7 Archaeological and Historic Resources Located During the Class III Inventory

SITS Number	Temporary Field Number	Site Type	NRHP Evaluation	Recommendations/ Comments
	0009	Historic dump	Not eligible	No further work
	RR1	Historic railroad	Unevaluated	No further work (most likely would be spanned)
32SL345		Prehistoric lithic scatter	Unevaluated	No further work (outside of Project area)
	IFJMS1	Isolated finds - four flakes	Not eligible	No further work
	IFJMS2	Isolated find -biface	Not eligible	No further work
	IFJMS3	Isolated find - flake	Not eligible	No further work
	IFJMS4	Isolated finds - one biface, four flakes	Not eligible	No further work
	IFGW4	Isolated find - biface	Not eligible	No further work
	IFGW3	Isolated find - biface	Not eligible	No further work
	IFGW2	Isolated find - flake	Not eligible	No further work
	IFGW1	Isolated finds - four flakes	Not eligible	No further work

Source: Metcalf 2007b.

6.7.2 Environmental Consequences

6.7.2.1 Significance Criteria

- Adverse effects to one or more archaeological or historic sites potentially eligible or eligible for listing on the NRHP would represent a significant impact; however, adverse effects to these resources would be mitigated through avoidance or appropriate mitigation measures.

6.7.2.2 Proposed Transmission Line and Alternatives

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 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 11 sites and eight isolated finds were recorded during the Class III inventory of the proposed preferred alternative. Nine of the 11 sites and all of the isolated finds are recommended as not eligible for the NRHP. No further work is recommended for these sites. The NRHP-eligibility of the remaining two sites currently is unknown. One of the unevaluated sites, a prehistoric lithic scatter, is located outside of the Project area and would not be affected by Project construction. The remaining unevaluated site is a historic railroad that would be avoided by spanning the transmission line over the site. Therefore, no impacts to archaeological or historic resources are expected to occur as a result of the proposed Project.

Activities associated with constructing the proposed Project could adversely affect previously undiscovered prehistoric and historic sites. Class III cultural resource inventories may not locate all sites. Buried sites may be missed in the course of field investigations. If a previously unknown cultural resource is encountered during Project construction, all work within 200 feet of the discovery that might adversely affect the cultural resource would immediately cease until Western, in consultation with the appropriate parties, could 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 would not proceed until authorized by Western. Upon arriving at the site of the discovery, the cultural resource specialist will assess the resource. The assessment will include the nature of the resource, the spatial extent of the resource, and the nature of deposition and exposure. If the site is determined to be damaged, a site damage assessment report will be written by the cultural resource specialist for review and comment by Western, the North Dakota SHPO, and Tribes.

The cultural resource specialist also would complete a North Dakota Archaeological Site Form that includes basic information on how and when the discovery was made. All Archaeological Site Forms will be sent by the cultural resource specialist to Western. Western will send the forms to the North Dakota SHPO and Tribes for review and comment.

All cultural resources will 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) will be initiated prior to making the determination. Western will 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 will prepare a Historic Properties Treatment Plan (HPTP) following the guidance provided by the Advisory Council on Historic Preservation (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 will include a summary of the physical and cultural context, a research design, and treatment measures specifically designed for the cultural resource in question.

Western will submit the draft HPTP to the North Dakota SHPO and interested Tribes for review and comment. All reviewers will respond to the draft HPTP within 21 calendar days of receipt, unless all reviewers agree upon a different time period. Western will incorporate the comments into a revised document. Should any reviewer fail to respond within 21 days, Western will assume 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 a construction or environmental inspector and Western's Federal Preservation Officer of the discovery. The inspector would notify the cultural resource field director or cultural resources 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 cultural resource specialist 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. If the human remains are found on federal or tribal land, NAGPRA may apply. Western would evaluate the appropriate steps and implement internal procedures for complying with NAGPRA. NAGPRA [43 CFR §10.4(d)(iii)] requires notification within three days to affiliated Tribal members.

NAGPRA [43 CFR §10.4(c)] requires that the Federal activity that resulted in the inadvertent discovery of human remains should cease for a maximum of 30 days and the remains should be secured and protected, "including, as appropriate stabilization or covering." [43 CFR §10.4(d)(ii)]

NAGPRA [43 CFR 10.4 (d)(v)] states that, if the human remains, funerary objects, sacred objects, or objects of cultural patrimony must be excavated or removed, follow the requirements and procedures in 10.3 (b) of NAGPRA.

6.7.2.3 Proposed Rhame Substation and East Rainy Butte Microwave Facility

In early March 2008, Metcalf conducted a Class I files search at the State Historical Society of North Dakota. The search revealed one previously recorded site and an isolated find within one mile of the proposed substation location. Three previously recorded sites were identified within 0.5 mile of the proposed microwave tower location (Bluemle 2008).

On March 17-18, 2008, Metcalf conducted a Class III pedestrian inventory of the proposed substation location in Bowman County and microwave tower location in Slope County, North Dakota (Bluemle 2008). As a result of the inventory, two prehistoric isolated finds were located within the proposed microwave tower Project area; no sites were located within the proposed substation Project area. Both isolated finds are recommended as not eligible for the NRHP.

If a previously unknown cultural resource is encountered during construction of the proposed substation and microwave tower, all work within 200 feet of the discovery that might adversely affect the cultural resource would cease immediately and the procedures identified above would be followed.

6.7.2.4 No Action Alternative

Selection of the No Action Alternative by Western would ensure that potential impacts to cultural resources that could result from the proposed Project would not occur.

6.8 Native American Setting

Specific statutes, regulations, and EOs guide consultation with Native Americans to identify cultural 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 cultural resources that are important to them and their way of life. Consultation is conducted for Federal actions, such as decisions about 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.

6.8.1 Affected Environment

Southwestern 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 (refer to section 4.8 for the list of Tribes). Nation-to-Nation consultation was initiated by Western.

6.8.2 Environmental Consequences

Western initiated Nation-to-Nation consultation with ten present-day Tribes with traditional ties to the Project area. However, none of the contacted Tribes expressed interest in the Project and none provided information pertaining to the presence (or absence) of Traditional Cultural Use Areas. Therefore, potential impacts to traditional use areas and areas that are considered sacred to the tribes are unknown at this time.

6.8.2.1 Significance Criteria

- Significant impact would result from physically 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.

6.8.2.2 Proposed Transmission Line and Alternatives

The Class I cultural resources inventory indicates that previously reported archaeological and historical sites are within 75 feet of all three transmission line alternatives. Three sites are within 75 feet of Alternative A, two sites are within 75 feet of Alternative B, and one site is within 75 feet of Alternative C (Preferred Alternative). Additionally, several sites were noted to be within 500 feet of Alternatives A and B; four sites were noted to be within 500 feet of Alternative C (refer to **table 6-7**). Results of the Class III pedestrian inventory indicated that construction or operation of Alternative C (Preferred Alternative) would not adversely impact known or observed cultural resource sites. Furthermore, none of the alternative transmission lines appear to have greater Native American importance than other alternatives.

If cultural resources are discovered during construction of the transmission line, work would cease within 200 feet of the discovery and Western would be contacted. The process discussed in section 6.6.2.2 would ensure any discovered cultural resource or human remains would be properly treated under applicable law.

6.8.2.3 Proposed Rhame Substation Site and East Rainy Butte Microwave Facility

The Class I files search indicates that archaeological or historic sites have not been previously found on the proposed Rhame Substation site or the East Rainy Butte microwave site. Two isolated finds were located at the proposed microwave site during the Class III inventory; no sites were located at the proposed substation site.

If cultural resources are discovered during construction of the substation and microwave facility, work would cease within 200 feet of the discovery, and the procedures discussed in section 6.6.2.2 would be followed.

6.8.2.4 No Action Alternative

If the Project were not constructed, Native American resources, including traditional cultural properties or sacred sites, would not be affected.

6.9 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.

6.9.1 Affected Environment

The proposed Project lies within an area known for abundant paleontological resources. North Dakota Geological Survey (2007) lists eight mammalian and three reptilian species that are known from the

three-county area. Specific locations paleontological resources are not available; however, they most likely would be present within the Little Badlands, rather than on surrounding agricultural lands.

6.9.2 Environmental Consequences

6.9.2.1 Significance Criteria

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

6.9.2.2 Proposed Transmission Line and Alternatives

Construction of the proposed transmission line could result in direct impacts to paleontological resources. Specific locations of known resource locations have not been identified; however, it is likely that they would be most abundant within rocky substrate associated with buttes and exposed aggregate of the Little Badlands and outcroppings which are crossed by all three alternatives. Formations that are known to have paleontological resources that are crossed by the alternatives are the: White River Group, Golden Valley Formation, Sentinel Butte Formation, and Bullion Creek Formation (Bluemle 1988, 1977). Because there are no glacial deposits in southwestern North Dakota that would cover bedrock, the route would cross bedrock where topsoil, alluvium, or colluvium are not present. Therefore, monitoring for paleontological resources should take place during construction where bedrock is present. Although it is unlikely that construction would affect paleontological resources of State-wide importance, if such resources are discovered during construction, work in the area should be halted and the North Dakota Geological Survey should be notified.

6.9.2.3 Proposed Rhame Substation and East Rainy Butte Microwave Facility

The proposed Rhame Substation site is cultivated land and there is no exposed bedrock that would provide substrate for paleontological resources. Furthermore, the land is under private ownership; if paleontological resources are present on the site, they would not be afforded legal protection.

Paleontological resources are not known to be present on the proposed East Rainy Butte microwave site. Furthermore, the land is under private ownership; if paleontological resources are present on the site, they would not be afforded legal protection.

6.9.2.4 No Action Alternative

Impacts to paleontological resources would not occur under the No Action Alternative scenario. 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.

6.10 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.

6.10.1 Affected Environment

Construction of the Belfield to Rhame Transmission Line would require crossing numerous local roads and highways. Alternative A, B, and C would cross the Burlington Northern-Santa Fe Railroad and approximately the same number of local roads and highways.

The FAA and Bowman County are planning to construct a new commercial airport near Bowman. Ongoing planning has identified four options for development. Three options are not in proximity to the Belfield to Rhame Transmission Line alternatives; option B is bordered on two sides by Alternative C. Information from FAA (Dressler 2007; Schuck 2007) indicates that Study Area B is not considered to be the most appropriate location for the airport: however, additional analyses are ongoing.

6.10.2 Environmental Consequences

6.10.2.1 Significance Criteria

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

6.10.2.2 Proposed Transmission Line and Alternatives

All three alternative transmission line alignments cross approximately the same number of major local roads and highways roads. Disruption to local traffic is expected to be minimal, short-term, and temporary and related to the movement of heavy equipment. Temporary wooden H-frame structures would be installed within the proposed transmission line ROW to facilitate line stringing. The wooded H-frame structures would be installed by boring structure leg holes near the roadway and installing structure poles and cross-members to support conductor, and OPGW during pulling and tensioning. Actual disruption to local traffic patterns would be minimal, consisting of temporary delays. Road closures would not be required. Transmission line installation at railroad crossings would be similar to those of road crossings, but would not impact rail movement. Soils displaced while boring holes for the H-frame legs would be used to back-fill around the legs and used as fill when the structure is removed.

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, totaling approximately 90 truck loads.

Equipment would be required for site clearing, structure assembly, hole excavation, conductor and OPGW stringing, foundation construction, and construction of Rhame Substation 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 risk of traffic accidents. Actual impacts associated with each alternative are similar, due to similarities in alignments.

6.10.2.3 Proposed Rhame Substation and East Rainy Butte Microwave Facility

The Rhame Substation site is adjacent to CMC 619. Construction personnel, equipment, and materials would be transported to the site on CMC 619 and major highways. Although potential suppliers have not been identified, it is likely that much of the equipment and materials would be transported on I-94, U.S. Highway 12, and U.S. Highway 85. Potential impacts to local traffic patterns would likely be limited to occasional temporary delays. Impacts to local traffic could be mitigated by scheduling to avoid peak traffic periods and pilot cars would be used to escort oversized loads.

There are no public roads on East Rainy Butte. Therefore, installation of a microwave facility would not affect transportation resources in the area. The proposed 180-foot-tall microwave tower is below (shorter than) the 200-foot FAA requirement for aircraft obstruction lighting.

6.10.2.4 No Action Alternative

Potential impacts to local traffic patterns would not occur if the Project were not developed.

6.11 Socioeconomics

Socioeconomic analyses address compensatory rates that would be paid to landowners for ROW acquisition and estimates of crop production losses resulting from temporary disturbance of lands during construction and permanent loss of tillable lands. The analyses also address temporary employment of construction workers

during transmission line and substation construction. No additional permanent personnel would be required for transmission line or substation operations.

6.11.1 Affected Environment

6.11.1.1 Population and Demography

The proposed Belfield to Rhame Transmission Project is located in Stark, Slope, and Bowman counties in rural, southwestern North Dakota. The northern portion of the proposed Project is located in Stark County. Stark County is approximately 1,340 square miles with a population of 22,167 residents (2006 estimate) (U.S. Census Bureau 2006). South of Stark County, the Project area extends through Slope County. According to the U.S. Census Bureau 2006 estimate, Slope County, approximately 1,219 square miles, is the least populated of the three counties, with 713 residents. The southern portion of the proposed Project and the Rhame Substation is located in Bowman County. The U.S. Census Bureau 2006 estimate reports a county population of 2,991 residents.

Racial composition of residents within all three counties is predominantly white; 97.9 percent in Stark County, 99.9 percent in Slope County, and 99.5 percent in Bowman. **Table 6-8** provides demographic information for the towns located in proximity to the proposed Project.

Table 6-8 Demographics of Towns in Proximity to the Proposed Project

Town	County	Population*	Median Household Income**	% Below Poverty Level**	
				Families	Individuals
Belfield	Stark	866	$27,619	16.7	18.6
South Heart	Stark	307	$35,750	8.0	9.4
Amidon	Slope	26	$27,188	No data	No data
Bowman	Bowman	1,600	$31,645	5.4	7.5
Rhame	Bowman	189	$20,375	5.6	18.6

*U.S. Census Bureau, Census 2000.

**U.S. Census Bureau, Census 2000, Income 1999.

6.11.1.2 Economy and Employment

Agriculture is the primary industry, with spring wheat as the most common crop produced, followed by durum wheat, winter wheat, and hay (North Dakota Economy: Agriculture 2007). Livestock production is the second largest industry, primarily producing beef cattle, dairy cattle, and hogs. Service industries and retail trade support residents in the area towns. During the hunting season, the hunting industry provides recreational activities. Recreation in the area includes big and small game hunting on private and North Dakota Game and PLOT lands. Big game include deer, pronghorn, and elk; small game include pheasant, dove, turkey, and duck. Recreational activities also include hiking at White Butte, the highest elevation in North Dakota.

6.11.2 Environmental Consequences

6.11.2.1 Significance Criteria

- Impacts include losses that would jeopardize the economic viability of local agricultural or livestock producers and those resulting in adverse health effects to area residents. Those impacts would be

significant if they resulted in the loss of farming or ranching or adverse health for one or more individual.

- Placement of the proposed transmission line within 500 feet of inhabited structures (unless consented by landowners).

6.11.2.2 Proposed Transmission Line and Alternatives

Construction of the Belfield to Rhame Transmission Line would directly affect approximately 105 landowners, regardless of alternative selected.

Alternatives A and B would be within 500 feet of two to three inhabited structures, if adjustments in the alignment were not made to place the transmission line at a greater distance. Detailed routing, carried out by BEPC engineers and lands specialists, resulted in the identification of Alternative C that would avoid proximity to inhabited structures. Therefore, no inhabited structures would be within 500 feet of the Preferred Alternative (Alternative C).

Structures that are located within cultivated fields 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, BEPC's decision to use single-pole structures, rather than H-frame structures, greatly reduces potential conflicts with farming practices, reduces lands that would be rendered inaccessible by farming 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 compressed by machinery operations, temporary impacts would be limited to approximately 112 to 148 acres and tilling would offset related impacts. 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. Turning structures (points of inflection) would be free-standing (self-supporting); guy wires would not be used.

Construction of the proposed transmission line would be completed by 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 Belfield, Dickinson, and Bowman could see a minimal, short-term beneficial economic impact during construction. Some materials and services would be purchased locally, such as concrete, seed, aggregate, and machinery repair. Impacts to housing, population, or community facilities and services are not expected as a result of the proposed Project.

6.11.2.3 Proposed Rhame Substation and East Rainy Butte Microwave Facility

A maximum of 67 acres of the proposed Rhame Substation site would be temporarily disturbed during substation construction and interconnection to the MDU Transmission Line. The substation would permanently occupy approximately 12.5 acres. Lands that would be temporarily affected would be restored following construction and could be returned to agricultural productivity. The long-term loss of productivity on the 12.5-acre substation site would result in a negligible impact to the agricultural community as a whole.

No inhabited structures are within 500 feet of the proposed Rhame Substation. The nearest inhabited structures would be more than one-half mile from the site. Impacts to housing, population, or community facilities and services are not expected as a result of the proposed Project.

The proposed East Rainy Butte microwave facility site is in a remote area. Socioeconomic impacts associated with construction or operation of the facility are not anticipated.

6.11.2.4 No Action Alternative

Temporary (short-term) loss of a maximum of 67 acres of cropland and permanent (long-term) loss of 12.5 acres of cropland productivity would not occur if the Project were not constructed. Additionally, if the No Action Alternative were selected, local communities would not realize the beneficial economic impacts associated with Project construction.

6.12 Public Health and Safety

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

6.12.1 Affected Environment

Construction, operation, and maintenance of the proposed Belfield – Rhame Transmission Line, Rhame Substation, and the microwave relay station 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, corona, 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 alternatives.

6.12.2 Environmental Consequences

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

6.12.2.1 Significance Criteria

- Adverse health impacts from EMF, stray voltage, and induced voltage associated with transmission lines.
- Serious injuries to workers and the public at-large.

6.12.2.2 Proposed Transmission Line and Alternatives

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 seven 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.

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.

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 typically 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. 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.

Corona is caused by electric current arcing across two or more points along transmission line conductor. Although corona can cause television and radio reception interference, it does not represent a threat to human health and safety. Stray voltage is typically associated with rural end-users, such as farm and ranch complexes where equipment is exposed to dust and other contaminants. Induced current occurs along linear features, such as fences that parallel conductors. Neither stray voltage nor induced current are health risks to area residents and both can be mitigated by proper grounding.

Potential adverse health effects associated with lightning strikes are minimized by the presence of the overhead ground wire and optical ground wire which shield 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 structures during a lightning storm.

The transmission line would be constructed in compliance with worker health and safety regulations as prescribed by the US Department of Labor, Occupational Safety & Health Administration 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.

6.12.2.3 Proposed Rhame Substation and East Rainy Butte Microwave Facility

Electrocution hazard would be present inside the fence of the fence of the substation facility. High voltage equipment always poses a threat to any human who enters the facility. The facility would be fenced and access points secured with padlocks and marked with signs prohibiting the entry of unauthorized personnel. The design of the facility would be such that energized equipment would comply with Rule 110.A. of the NESC that requires a 14.9-foot safety clearance zone within the fence for 230-kV equipment. Exposed parts must be outside of the safety zone. Only trained personnel would be allowed to maintain the substation equipment, and they would comply with applicable Western or Basin worker safety programs, procedures, and regulations.

Public human health and safety hazards at the proposed microwave relay station are not anticipated as the facility is in a remote location. Construction and maintenance workers would have a risk of on-the-job injury, but this risk would be minimized by adherence to applicable worker safety regulations and Western or Basin work procedures.

6.12.2.4 No Action Alternative

Impacts to public health and safety would not occur if the Project were not to be constructed or operated.

6.13 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 Belfield to Rhame Transmission Project must be evaluated in terms of an adverse effect that:

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

b) 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.

6.13.1 Affected Environment

Racial composition of residents within the three counties that constitute the Project area is predominantly white; 97.9 percent in Stark County, 99.9 percent in Slope County, and 99.5 percent in Bowman. Furthermore, the economic level of area residents is above poverty level for the State of North Dakota.

Since there are no disproportionate impacts to minority and low income populations, there are no environmental justice issues associated with construction or operation of the proposed Project.

6.13.2 Environmental Justice Consequences

6.13.2.1 Significance Criteria

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

An analysis of the 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.

6.13.2.2 Proposed Transmission Lines and Alternatives

Racial composition of the residents within all three counties is predominantly white; since there are essentially no minority populations that would be impacted, environmental justice is not an issue. While the communities of Belfield and Rhame 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, the proposed Project does not directly affect these communities or those populations. As a result, no impacts to low-income populations would occur as a result of Project development. Construction and operation of the proposed transmission lines and alternatives would not result in proportionately greater impacts to minority populations and/or low-income populations than those to the population as a whole.

6.13.2.3 Proposed Rhame Substation and East Rainy Butte Microwave Facility

Minority populations are not present in proximity to the proposed Rhame Substation or the East Rainy Butte Microwave Facility. Therefore, environmental justice is not an issue.

6.13.2.4 No Action Alternative

Under the No Action Alternative, construction of the proposed Project would not take place and minority populations would remain unchanged.

6.14 Visual Resources Setting

The following discussion describes existing visual resources within the proposed Project area. Visual resources within the Project area 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.

Project Setting

The proposed Project lies within the Missouri Slope Upland Physiographic Region (Bluemle and Biek, not dated), which is part of the Great Plains Province. The Missouri Slope Upland Region is one of six physiographic regions within North Dakota and is characterized as broad valleys, hills, and buttes that are largely the result of erosion of siltstone, claystone, and lignite that were deposited 65 to 55 million years ago. Erosion has taken place over the past 10 to 15 million years. 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, lined with shelter belts. Much of the landscape has been modified and used for agriculture. Portions of the Project area are characterized as badlands having rough terrain and little vegetation.

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. Buttes provide visual focus in varying viewscapes.

Two blacktop, two-land roads mark the landscape from north to south and east to west. U.S. Highway 85 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. State Highway 21 runs west of New England.

6.14.1 Environmental Consequences

6.14.1.1 Significance Criteria

- Significant visual impacts to area residents could result from placing the proposed transmission line within direct line-of-site and closer than 660 feet from residential structures. The 660 feet represents a foreground setting where transmission line structures would likely be a dominant feature. Visual impacts to historic resources would could affect the historic context of National Register sites (16 USC 470, *et seq*.; 36 USC 3001), resulting in a significant impact.

6.14.1.2 Proposed Transmission Line and Alternatives

Visual resources within the Project area are typically expansive and largely absent of transmission 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. Construction across the Little Badlands would be most noticeable to viewers on surrounding lands. Alternatives A, B, and C cross the Little Badlands along the same alignment. 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 alternative. 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.

No historic structures were identified that would be visually impacted by the proposed transmission line, regardless of alternative selected. Although the transmission line (regardless of alternative) 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 viewer duration would be short-term, and in many cases peripheral.

6.14.1.3 Proposed Rhame Substation and East Rainy Butte Microwave Facility

Construction of a new substation along CMC 619 would result in adverse visual impacts along one of the main highways to Rhame. Although the existing Rhame Substation, located approximately two miles south of the proposed new substation site would be dismantled as a partial offset, visual impacts associated with the new facility would be greater. The new facility would occupy a larger area, require more electrical interconnections and would include a 2,000-square-foot control building. The substations would not be visible from residential structures. Therefore, visual impacts to occupants of residential structures are not expected.

The addition of a new microwave tower on East Rainy Butte would result in minimal visual impacts, due to distance and facility size. Furthermore, if the Western microwave facility were to be relocated to the new BEPC facility, potential impacts would be nullified.

6.14.1.4 No Action Alternative

Selection of the No Action Alternative would result in maintaining the visual qualities of the Project area. The Project area would remain largely unobstructed by man-made features.

6.15 Noise

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

6.15.1 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.

6.15.2 Environmental Consequences

6.15.2.1 Significance Criteria

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

6.15.2.2 Proposed Transmission Line and Alternatives

Temporary noise impacts would result from 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. The 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 reduce the duration of associated equipment noise. The Project would not result in long-term noise annoyances to area residents.

6.15.2.3 Proposed Rhame Substation and East Rainy Butte Microwave Facility

Construction of the proposed Rhame Substation would result in a temporary increase in noise levels at the site. Residents of a house located approximately one-half mile to the east and a house approximately one mile to the north would hear heavy equipment noise. Increased truck traffic along local roads also would result in temporary impacts local residents. Impacts to local residents would be temporary during Project construction.

The East Rainy Butte microwave facility is in a remote location. Construction noise would not affect area residents.

6.15.2.4 No Action Alternative

Human-induced noise levels would remain at their current levels within the Project area if the transmission line or substation were not to be constructed.

6.16 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.

6.16.1 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.

6.16.2 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. Earth moving equipment would increase particulate matter. Operating construction equipment would emit carbon dioxide (CO_2), a greenhouse gas, that has been identified as contributing to global warming. The amount of CO_2 that would be attributable to Project construction would be far less than that of power generation and would be similar to that being emitted as part of local agricultural activities. Effects on global warming that would be attributable to the Project cannot be quantified due to lack of scientific data.

6.16.2.1 Significance Criteria

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

6.16.2.2 Proposed Transmission Line and Alternatives

The proposed Project would not emit air emissions during operations. Air emissions generated by construction equipment (trucks, earthmoving equipment, etc.) would be temporary and short-term. Therefore, impacts to air quality are not anticipated. Federal and State air quality standards would not be violated as a result of the Project.

6.16.2.3 Proposed Rhame Substation and East Rainy Butte Microwave Facility

The proposed Rhame Substation or East Rainy Butte microwave facility would not emit air emissions during operations. Air emissions generated by construction equipment (trucks, earthmoving equipment, etc.) would be temporary and short-term. Federal and State air quality standards would not be violated as a result of the Project.

6.16.2.4 No Action Alternative

Implementation of the No Action Alternative would have no affect on air quality within the Project.

6.17 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 of 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 who 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.

7.0 Summary of Impacts

BEPC's decision to use single-pole structures (rather than H-frame structures) would reduce temporary and permanent impacts along the proposed transmission line corridor. Single-pole structures would require a smaller footprint and would allow cultivation to be carried out immediately adjacent to the structure. The area between H-frame structure legs typically cannot be accessed by machinery and cannot be cultivated. The likelihood for damage to farming machinery also is lower when operating round single-pole structures than operating around H-frame structures. Furthermore, single-pole structures can be located immediately adjacent to property lines, mid-section lines, and public ROWs. H-frame structure legs would be offset approximately 19 feet from such boundaries.

The proposed Rhame Substation site was selected because it met requirements to interconnect transmission and distribution lines in the desired area and because the landowner agreed to sell the property to BEPC.

The new microwave tower on East Rainy Butte would be served by a single trail that currently serves Western's microwave tower. If Western were to co-locate on the new BEPC tower, net (cumulative) impacts would remain unchanged.

Jurisdictions, Land Use and Agricultural Practices

Permanent and temporary impacts associated with transmission line construction and operation would be similar among the three alternatives. However, detailed routing performed by BEPC engineers and lands specialists minimized impacts to croplands and rangeland, to the extent practicable. Jurisdictional impacts would be the same, regardless of alternative selected. BEPC's decision to use self-supporting single-pole structures (rather than H-frame and guyed structures) would greatly reduce encumbrances associated with heavy equipment movement around structures. Idle land between H-frame structure legs also would be eliminated. The use of temporary trails (rather than a maintained ROW) between structure sites would minimize lands needed for the Project, regardless of alternative selected.

Physiology, Geology, Soils, and Minerals

All three alternative alignments cross essentially the same physiographic and geologic features. Potential impacts to Prime and Unique farmlands and farmlands of Statewide Importance would be similar, regardless of alternative selected. All three alternatives also cross (and would impact) approximately the same amount of erodible soils (1.0 to 1.5 miles) in the Little Badlands. Mineral resources would be avoided and/or spanned, regardless of alternative selected.

Hydrology and Drainage

Floodprone areas drainages would be avoided or spanned during construction of the proposed transmission line. There are no floodprone areas or drainages within the proposed Rhame Substation property or on East Rainy Butte.

Vegetation and Wetland Resources

Temporary disturbance and permanent use of various vegetation resources would be similar among the three alternatives. Alternative C (Preferred Alternative) would cross more grassland and less cultivated land than would be crossed by Alternatives A or B. Wetlands would be spanned; therefore, direct impacts related to construction are not expected.

Wildlife and Fisheries

Potential impacts to wildlife and fisheries resources would be similar, regardless of alternative constructed. Alternative C (Preferred Alternative) was modified to avoid two golden eagle nests.

Special Status Species

Habitat that could support special status species was avoided through detailed routing by BEPC engineers and lands specialists. The preferred route (Alternative C) was modified to avoid two golden eagle and a prairie dog community that potentially could support burrowing owl.

Archaeological Resources

Known cultural resources sites were avoided to the extent practicable. Fewer sites were found to be within 75 feet of Alternative C than within 75 feet of Alternatives A or B. Construction and operation of Alternative C (Preferred Alternative) would not impact National Register sites or sites that would be nominated for listing on the National Register.

Native American Setting

Western contacted several tribal organizations in an attempt to address Native American issues. The tribes did not express any interest or concern regarding the Project.

Paleontological Resources

Construction of the proposed transmission line could impact paleontological resources. Monitoring would be carried out through sensitive areas.

Transportation

Construction and operation of the proposed transmission line would not affect the transportation network. Temporary crossing structures would be installed to span roadways and the railroad.

Socioeconomics

Detailed routing carried out by BEPC engineers and lands specialists resulted in avoidance of all residential structures. Several structures are within 500 feet of Alternatives A and B; no residential structures are within 500 feet of the proposed Project alternative.

Environmental Justice, Visual Impacts, and Noise

Construction or operation would not result in environmental justice issues. Visual impacts and noise impacts would be minimal, largely due to distances from sensitive receptors.

Air Quality

Temporary air quality impacts would result from equipment operations during construction. Long-term impacts are not anticipated.

7.1 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 are the:

- Proposed South Heart Coal, LLC Mining and Coal gasification Power Plant; and
- Construction and operation of a new airport in Bowman County.

7.1.1 Proposed South Heart Lignite Mine and Coal Gasification Plant

South Heart Coal, LLC has proposed the development of lignite mining and a 500-MW coal gasification plant southeast of the Belfield Substation. If developed, the mine would likely impact several square miles of agricultural land. Associated cumulative impacts would be long-term and would likely affect biological, socioeconomic, and visual resources within the area.

Although a plan of development is not available for the proposed mine and power plant, assumptions have been made based on similar operations elsewhere. Mining operations would likely require removal and stockpiling of topsoil, excavation of lignite resources and surface restoration that would permanently change surface uses, biological resources, and water resources. Heavy equipment would be brought to the site on public roads which could create temporary transportation impacts. Coal handling would be confined to the property boundary, but would likely require transport to the plant site by truck, dedicated rail line, or conveyor system.

7.1.1.1 Biological Resources

Permanent impacts to biological resources would likely include loss of some land uses in areas that would be used for mining operations and the power plant. Mining operations would result in long-term impacts that would persist until the lands are restored. Restoration of lignite mining sites typically results in the creation of permanent impoundments to control surface drainage and permanently modified landforms that are suitable for grazing.

Although habitat would be permanently lost due to mining operations and power plant construction, post-restoration impoundments would likely increase wetland and riparian habitat in the area. Increased wetland and riparian habitat would be beneficial to migratory waterfowl and a variety of wetland and riparian species. Reduced cropland and increased rangeland and wetland/riparian habitat would result in a long-term net beneficial impact to wildlife.

Increased power lines in the area would result in a cumulative impact to avian species. Cumulative impacts would include collision with structures and conductors.

7.1.1.2 Cultural Resources

Potential impacts to cultural resources would be mitigated prior to construction.

7.1.1.3 Socioeconomics

Based on corridor analyses for the Project, approximately 50 percent of lands that would be affected for power plant construction and mining are in cultivation. Although the loss of agricultural productivity would affect a few landowners, they would be compensated as part of property sales and incremental impacts to the region as a whole would be minimal.

7.1.1.4 Visual Resources

Visual impacts associated with power plant construction and operation and surface mining could affect a wide range of viewers within the area. Cumulative impacts of the power plant, mine, and the Belfield to Rhame Transmission Line would result in additional visual impacts within the northern portion of the Project area.

7.1.2 Construction and Operation of a New Airport in Bowman County

Although a site for the proposed new Bowman County Airport has not been identified, it would be located in the vicinity of the proposed Belfield to Rhame Transmission Line. The new airport would likely occupy approximately one square mile of cropland and/or pastureland. Airport property would be fenced and would include a terminal, hangers, runway marking features, storage tanks, and other structures that would change

the visual character of the area. The facility also would contribute to the loss of wildlife habitat and the loss of agricultural lands. Future uses of the existing airport are undetermined. The existing airport could be expanded or converted to a different use.

7.1.2.1 Biological Resources

Approximately one square mile of wildlife habitat would be permanently lost as a result of airport construction and operation. Habitat loss and fragmentation associated with the airport would result in greater impacts to big game and small game species than that of the proposed transmission line and Rhame Substation. Cumulative impacts of permanent habitat loss that would be associated with both Projects would affect a relatively small portion of available habitat in the southern portion of the Project area.

Loss of approximately one square mile of agricultural productivity would result in far greater impacts to the local agribusiness community than would occur as a result of the proposed transmission line. Construction of the airport could result in the loss of more than 640 acres of agricultural land; agricultural land that would be taken out of production as a result of the proposed transmission line and substation would total approximately 12.5 acres. Therefore the proposed Belfield to Rhame Transmission Line Project would represent a minor incremental cumulative loss of agricultural activity within the region.

7.1.2.2 Cultural Resources

Potential impacts to cultural resources would be mitigated prior to construction.

7.1.2.3 Visual Resources

Construction and operation of a new airport would result in far greater visual impacts to area residents than would be associated with the proposed transmission line and substation. Construction of both Projects would cumulatively contribute to increased visual impacts within the southern portion of the Project area.

The proposed South Heart Lignite Mine and Coal-fired Power Plant and alternative Bowman County Airport sites are shown on **figure 7-1**.

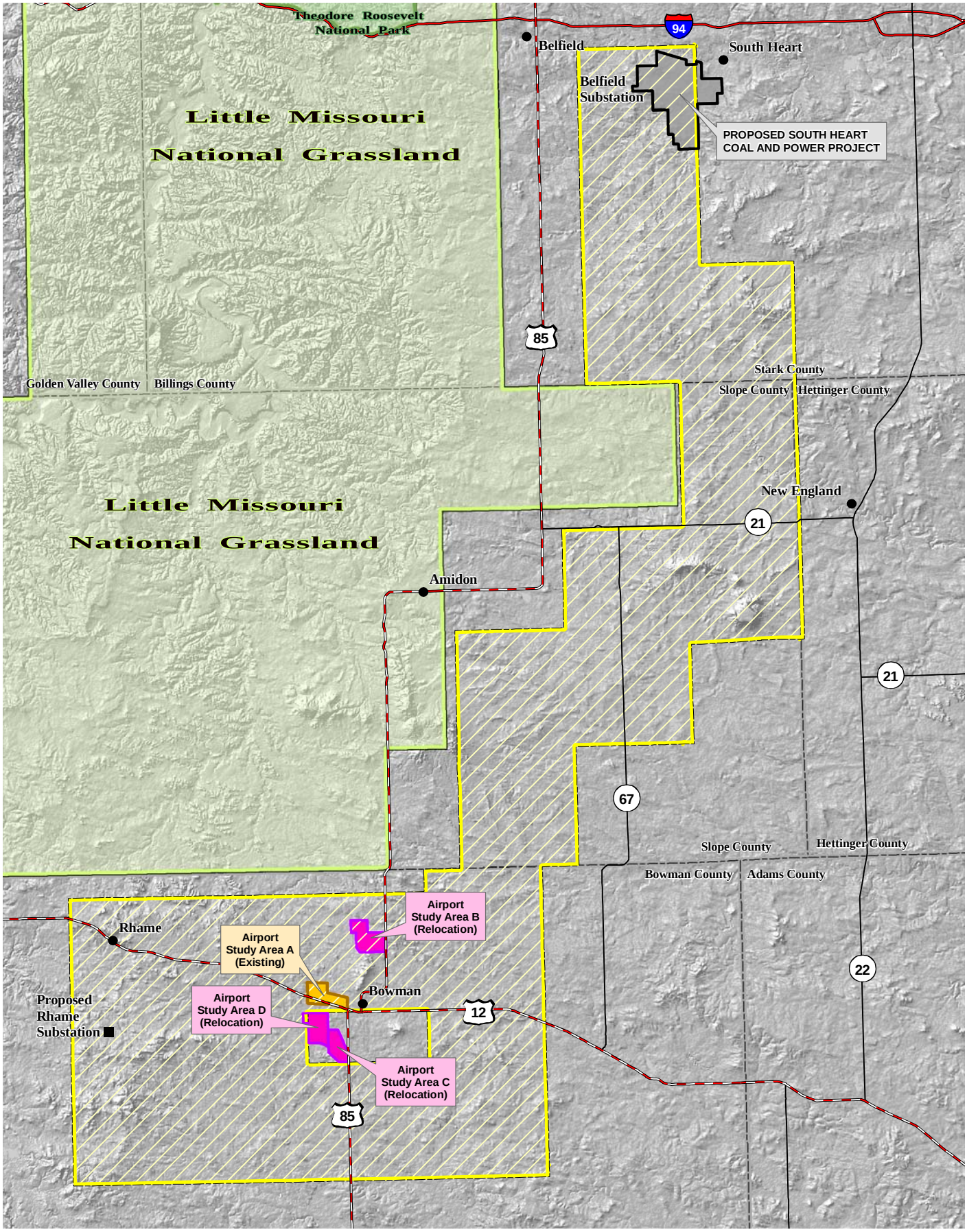

Figure 7-1
Projects Considered in Cumulative Impacts Analysis

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9.0 References

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Appendix A

Notification

Appendix A

Belfield to Rhame Transmission Project
EA Notification List
July 3, 2007

Federal Agencies

U.S. Fish and Wildlife Services

Field Supervisor for Ecological Services
U.S. Fish and Wildlife Service
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Regional Administrator
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Representative Keith Kempenich, District 39
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Representative C. B. Haas, District 36
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Representative Shirley Meyer, District 36
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Paul Brooks, Chair
Michael Sonsalla, Mike Teske
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Amidon, ND 58620-0000

Bowman County, North Dakota
County Commissioners
Kenneth Steiner, Chair
Pine Abrahamson, Bill Bowman
County Courthouse
104 1st Street NW
Bowman, ND 58623

Stark County, North Dakota
County Commissioners
Duane Wolf, Chair
Russ Hoff, George Nodland, Chester Willer, Ken Zander
County Courthouse
51 3rd Street East
Dickinson, ND 58601

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City Administrator
City of Bowman
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Bowman, ND 58623-4461

Greg Sund, City Administrator
City of Dickinson
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Dickinson, ND 58601-5222

City Administrator
City of New England
9 East 7th Street
New England, ND 58647-7137

City Administrator
City of South Heart
103 6th Street NW
South Heart, ND 58655-7116

City Administrator
City of Rhame
53 Main Street
Rhame, ND 58651
City of Amidon
Ronald Clendenen
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Executive Director
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Bismarck, ND 58501

Executive Director
Nature Preserves Program
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Executive Director
The Nature Conservancy
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Sierra Club, Dacotah Chapter
Executive Director
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Appendix B

Public Comments

Appendix B

Summary List of Key Public Comments

Agricultural Impacts

- Preference stated that the transmission line route be located ½ mile south of White Lake where there is less impact to cropland.
- Consider impacts to potential housing, existing tree rows, and feedlot operations in T132N R102W Section 16.
- Address overall impacts to farming during construction following completion.
- Since the proposed project is not federally funded and the Farmland Protection Policy Act does not apply, the NRCS does not have any comment on the proposed project.
- Prefers that the proposed route follow section lines to avoid impacts to farming activities in T133N R100W Section 5.
- Evaluate transmission line interference with moving cattle to feed and calf-out in T132N R102W Section 15.
- Consider the potential of the proposed project interfering with wide farm equipment.
- Prefers the transmission line be routed in pastureland to avoid impacts to farming activities.
- Segment 150 of the proposed transmission line could impact farming operations in T137N R98W Section 33, west ½ of Section 34, and N ½ of Section 6.

Routing Alternatives

- Numerous comments indicated that landowners preferred transmission line alignments to be located along section lines.
- Some landowners preferred alignments that would be off-set approximately 130 feet into their property from the fence line. The 130-foot inset would allow movement of large equipment between the fence line and the transmission line structures
- Some landowners preferred the transmission line be routed along the mid-section and quarter-section.
- A landowner indicated that a coal mining interest has paid options on a 160-acre parcel in the NE quarter of Section 29 of T139N R98W. The parcel would be on the western edge of proposed mining operations. The area would preclude construction along the east side of Section 29.
- A landowner indicated that large farming operations dominate Sections 6, 7, and 18 of T136N R98W and Section 34 of T137N R98W and was opposed to routing the transmission line across these sections.
- Consider transmission line routing to avoid a house that does not show up on aerial photography located in the SW quarter of the NW quarter of Section 32 of T139N R98W.

- Suggestion made to route the proposed transmission line through federal lands to avoid disruption to private lands.

- Landowner concern about conflicts with land use agreement signed with a potential coal mining company for the NE ¼ of Section 29 T139N R98W.

- Avoid proposed transmission line segments 190 and 210 – proposes to cross along the north side of Section 1, 2, 3 T134N R100W.

- Supports Segment 220 – the alignment would run 11 to 12 miles north/south of Section 28 T132N R102W.

- Concern that the proposed line would cut through the mid-section making it difficult for maneuvering farm equipment – NE ¼ E1/2 SE1/4 Section 16 T132N R102W.

- Recommends contacting the FAA technical operations to insure no impacts to aircraft navigation and/or communication equipment in the proposed transmission line study area (see letter to contact information).

- Consider the potential impacts to the proposed location of the Bowman Municipal Airport and the proximity of the proposed project.

- Suggests Segment 340 and 330 be considered as alternative routes to avoid farmsteads and tilled fields.

- Concern about the proposed transmission line route in T134N R100W SW 1/3 of Section 14 (Segment 210) – suggests 200.

- Suggests working with Senators and Representatives to get permission to cross federal lands.

- Prefers the transmission line be routed in pastureland to avoid impacts to farming activities.

- Consider transmission line Segment 140 and 160 because it crosses more pastureland and would minimize impacts to farmlands.

<u>Biology Resources</u>

- The project area is located on the western edge of known whooping crane migratory route. Consider the potential for whooping crane collision with power lines.

- Recommends “Mitigating Bird Collisions with Power Lines: The State of the Art in 1994” and “Suggested Practices for Avian Protection on Power Lines to increase the visibility of the transmission line and reduce bird collisions.

- Avoid wildlife nesting seasons by scheduling construction in the late summer or fall.

- Design, construction, and operation of the transmission line and its components should comply with FAA AC 140/5200-33A, Hazardous Wildlife Attractants on or near airports.

- A 5-mile separation distance is recommended when the attractant could cause movement of wildlife into or across the approach and departure airspace.

- A 10,000-foot separation distance is required between certain airports and a hazardous wildlife attractant.

- Design, construction, operation, and wetland mitigation activities should not create a hazardous wildlife attraction to the surrounding airports.

Construction Process

- The Little Badlands are considered to have highly erodible soils. Evaluate the potential for impacts with regard to access and construction difficulties.

- Construction should be scheduled to avoid damage to crops.

- During construction, all necessary measures should be taken to minimize fugitive dust emission.

- Powerlines should be constructed away from small drainages and streams in flood-prone areas.

Cultural Resources

- A landowner identified an area known as “Custer Hill” (T139N R98W) is of local interest and should be considered in the environmental analysis.

- The Northern Cheyenne Tribe, Tribal Historical Preservation Office had no comments related to the proposed project, but requested they be notified if cultural resources are found during site investigations and construction.

- The Rosebud Sioux Tribe commented that they had no concerns about the proposed project as planned and requested a copy of the EA.

Geology/Minerals/Soils

- Potential impacts to scoria resources within Section 16 T132N R102W should be evaluated in the environmental analysis.

- Soils are highly erodible in T137N R98W; evaluate the potential of increased soil erosion resulting from construction of the proposed transmission line.

Land Use

- Landowners indicated that a transmission line across the property would interfere with future property development, agricultural practices, and could devalue the land.

- Concern about impacts to potential housing, existing tree rows, and feedlot operations in Sec 16 R132N T102W.

- Consider the potential for impacts to two 20-acre coverlocks with the North Dakota Fish and Game; one on the north ends of NE ¼ Section 29 T139N R98W; the other in the center of the SW ¼ of Section 29.

- Conflicts with land use agreement signed with a potential coal mining company for the NE1/4 of Section 29 T139N R98W.

- Question about whether the landowner would be responsible for the taxes within the right-of-way.

- Question about whether the transmission line could be routed through the National Grasslands areas.

- Question regarding compensation for land damaged as a result of transmission line construction on their land.

- Concern about project's impacts to residences.

Noise

- Construction equipment should be equipped with a recommended muffler in good working order to minimize adverse noise effects to people living in close proximity.

Public Health and Safety

- Evaluate the potential dangers of working around the proposed transmission line.

- Analyze whether the proposed project will have an effect on TV reception, cell phone reception, and personal health.

- Concern about impacts to health and safety from construction of the proposed transmission line.

Project Purpose and Need

- Landowners expressed concern that they were paying for the transmission line to be constructed so that the oil companies could make a profit.

- Question about whether the power would stay in southwestern North Dakota or would the power serve other states?

- Question about why the need for the proposed transmission lines and what is the growth creating the demand?

Recreation

- Evaluate the potential impacts to game bird hunting with construction of transmission lines that severs a block of land.

Socioeconomics

- Analyze project effects on the value of farm lands.

Soils

- The appropriate erosion control measures should be installed and maintained during construction to reduce sediment transport.

Vegetation

- Following construction, disturbed areas should be re-seeded with a mixture of native grass and forb species.

- Trees/shrubs removed during construction should be replaced at a ratio of 2 to every one removed.

Visual Resources

- Suggests avoiding a transmission route alignment near White Butte that could potentially result in visual impacts.

- Avoid transmission line routing near residences to reduce visual impacts.

Water Resources

- Consider potential impacts to spring where the proposed transmission line crosses T137N R98W, Sections 21 and 28.

- The U.S. Army Corps of Engineers should be contacted if construction of transmission lines intersect wetlands, streams, or rivers.

- Transmission line construction should not alter stream channels or drainages.

- Avoid placement of structures in wetlands or stream channels. Structures should be located as far from the banks of drainage ways and streams as possible.

- Contact the U.S. Army Corps of Engineers should transmission line construction involve work in waters of the U.S.

- Recommends that the Environmental Protection Agency be contacted regarding any potential impacts to groundwater.

- All aboveground construction, such as electrical boxes, should be placed above the level of a 100-year flood elevation.

- Transmission line construction should avoid small drainages and streams in flood-prone areas.

- Design, construction, operation, and wetland/wildlife mitigation activities should not create a hazardous wildlife attraction to the surrounding airports.

Appendix C

Detailed Routing

Appendix C

Detailed Routing

Refined routing was carried out by BEPC engineers and lands specialists to avoid or reduce impacts to local landowners. Specific routing considerations are identified in the following table.

Refined Routing Comments

Belfield-Rhame 230-kV Transmission Line Route Selection and Analysis Summary				
No.	**Township**	**Range**	**Section**	**Routing Rationale/Discussion**
1	139	98	20	SE1/4 has existing coal mine lease for construction of operations area. Line was routed in SW1/4.
2			29	Maintaining straight alignment. South end of section has houses on each corner. On east side, house is in NW1/4 of Section 32.
3			32	Maintaining straight alignment and adequate distance from house in NE1/4. Route diagonal to SE corner of Section 5, Township 138, Range 98 to avoid house in Section 8, Township 138, Range 98.
4	138	98	5	Maintaining straight line diagonal.
5			8	Maintaining straight line along East section line, avoiding house in middle of section.
6			17	The line shifted to the quarter line here to avoid the rough terrain in the Little Badlands, avoid two eagles' nests, and accommodate a landowner preference further south.
7			20, 29, 32	Continue straight south along 1/4 line. Farmers have indicated they prefer the line be on the 1/4 line, not the section line. Private landowners are in agreement with this alignment. These landowners are further south, but the eagles' nests and these preferences justify placing the line on the 1/4 line.
8	137	98	5	Private landowner owns entire section. He prefers the line be angled over to East to stay on pasture land and to accommodate Myron Eberts in Section 8.
9			8	Private landowner requested the line be moved over to the property line, 1/4-mile east. Line was moved 1/4 mile east.
10			17	Angle across section to get back to 1/4 line.
11			20	Different ownership in each 1/4 section. Private landowners prefer line there. Structure poles will be into each field only 10 feet.
12			29	Continue along 1/4 line. Line will be along edges of adjacent fields. Also, private landowner preferred line at this location (line is west of her parent's original farmstead and family homestead.) Line turns and goes along south edge of section.

Refined Routing Comments

Belfield-Rhame 230-kV Transmission Line Route Selection and Analysis Summary				
No.	**Township**	**Range**	**Section**	**Routing Rationale/Discussion**
13			28, 33, 34	Line will be along section line, then follow creek bed across section. Structures will be placed in areas that are not farmed, if possible. Line turns south and follows creek bed to 1/4 line at north edge of Section 6.
14	136	98	6, 7, 18, 19	Line follows 1/4 line. Private landowners prefer this route. Line is kept 0.5 mile away from National Grasslands. Also, line is kept 0.5 mile from private landowner's house in Section 20. If line was taken 0.5 mile to east to section line, it would have to go back west before private landowner's place, resulting in 1 mile extra line.
15			30	Line is angled over to section line along creek bed to stay away from the private landowners' residences.
16			31	Line continues along section line.
17	135	98	6, 5	Line angles to east to go around private landowner's old farmstead. No house on this farmstead. Line then angles back into Section 6 at south end.
18			7	Line follows section line down to 1/4 line, then turns west. Line is along 1/4 line to avoid nice grove of pine trees, private landowner residence (Section 6), and another private landowner residence (Section 1).
19		99	12	Line continues along quarter line to minimize impact on crop fields.
20			11	Extensive crop land to south and east. Also White Lake Wildlife Refuge to west, so line is taken diagonally to SW to get on section line to minimize crop land impact. Land use in this section is pasture.
21	135	99	14	Crop fields on both sides of section line. Line is parallel to section line.
22			23, 26, 35	This area is crop land primarily. Line is kept on east side of section line because an area in Section 23 is pasture. West side of section line is all crop land.
23	134	99	2, 3	Pasture and hay land allow for a diagonal section to go SW. A house is avoided (private landowner) in Section 2. Line now needs to go south and west.
24			4, 5, 6	Line stays parallel to section line. Land use is primarily hay on north side of section line.
25	134	100	1	Line turns south here. Investigated going further west before turning, but would be close to farmsteads.
26			12	Continue south along section line. Staying on west side to take advantage of pasture land in Section 13.

Refined Routing Comments

Belfield-Rhame 230-kV Transmission Line Route Selection and Analysis Summary				
No.	**Township**	**Range**	**Section**	**Routing Rationale/Discussion**
27			13, 24	Diagonal to SW. Avoiding stock-watering pond in Section 13. Also avoid going into field that extends across the section line between 19 and 34 (private landowner's request).
28			26, 35	Running south parallel to section line, staying on pasture and hay land. In this area, the line was routed around a private landowner residence in Section 30 and a gravel pit in Section 25.
29	133	100	2	Pasture in the north 1/2 of section is crossed diagonally.
30			3, 10	Crop land on both sides of section line. Staying on west side to take advantage of pasture in Section 15.
31			15	Line diagonals across pasture.
32	133	100	21, 28	Line runs parallel to section line on west side to stay on pasture land for most of this segment.
33			33	In SE1/4, line diagonals on pasture land to SW. This is the start of a long diagonal on pasture land.
34	132	101	1, 12, 13	The line is approaching an area with seven farmsteads. Numerous options were considered in and all landowners were consulted. In these three sections, the line diagonals across pasture land in SW direction.
35			14	Line goes across pasture land along a creek bed, avoiding adjacent farm land.
36			15	Line runs diagonal on pasture land along creek bed. Crop land in SE1/4 will be avoided. Line is approximately 1,000 feet from farmstead. This farmstead is rented out. Options to pass through this area are limited.
37			16	Line runs parallel and adjacent to south section line on pasture land. Line is about 0.5 mile north of private landowner residence.
38	132	101	20, 19	Line runs diagonal on CRP and pasture land. Line crosses Highway 85, 1 mile north and 1 mile south of two private residences.
39	132	102	24, 23	Line parallels south section lines, staying on north side to avoid continuous crop land on south side. Line passes through an abandoned farmstead in SW1/4. Line avoids farmsteads to north and south.
40	132	102	27, 28	Line diagonals across pasture and hay land to SW. Farmstead in NE1/4 of Section 28 is avoided.
41			29	Diagonal route crosses SE1/4 on pasture land.

Refined Routing Comments

Belfield-Rhame 230-kV Transmission Line Route Selection and Analysis Summary				
No.	**Township**	**Range**	**Section**	**Routing Rationale/Discussion**
42			32	Line enters section on north edge just to west of steep scoria outcrop. Route turns to west along north edge and parallel to section line. Land use is pasture.
43			31	At request of landowner, line runs parallel to section lines on north and west sides.
44	131	102	6	Highway 12 and railroad crossings. This location was selected because of terrain and both are close together and parallel. Line crosses Section 6 in small grass area in NW1/4, avoiding crop land.
45	131	103	1, 2	At request of landowners, line runs along 1/4 line east to west. In Section 2, line turns south and runs adjacent to section line in SW1/4. At SW corner, line turns west.
46			3, 4	The new Rhame Substation site is nearly due east of this location. So, the line was routed in a straight line, following the section line. This section line was selected to avoid residences one mile north and one mile south would not provide good access to the substation site.
47	131	103	5, 6	Line continues along south section line.
48	131	104	1, 2	Line continues along south section line. In Section 2, line turns south at 1/4 corner. Line must turn here to avoid rough terrain and winding highway.
49			11	Line runs along 1/4 line, which minimizes impact on crop land.
50			14	Line runs along 1/4 lines, turning west in middle of section. Line crosses highway at 1/4 corner.
51			15	Line enters section at 1/4 corner, turns and terminates at new substation.

The following paragraphs describe in detail how the routing criteria were applied to each segment of the proposed route.

Belfield Substation to 48th Street SW Segment

This segment starts at the Belfield Substation. For reliability purposes, transmission operating regulations do not allow transmission lines to parallel each other; therefore, the proposed route can not go directly east or west because of existing transmission lines. Directly southeast of the Belfield Substation, land is currently under lease for a proposed coal mine to be developed by South Heart Coal, LLC. The proposed route proceeds south along the mid-section line for two miles and avoids houses on both corners of the section and a wooded creek bottom.

For the next 5 miles, the proposed route predominantly traverses grassland. Within this area, alignment adjustments were made to avoid a farmstead and golden eagle nests. The proposed route crosses the fringe of the Little Badlands area to avoid soils that are prone to erosion and to facilitate maintenance access. The remainder of this segment follows the mid-section line because of landowner preference.

48th Street SW to State Route 21 Segment

At the beginning of this segment, the proposed route angles to the east across 1 mile of grassland and along a property line in response to two landowners' requests. The next 3 miles of the proposed route traverse cropland. To minimize impact to the cropland, the proposed route is angled back to the mid-section line at the request of area landowners. From this point, the proposed route turns east then southeast to avoid the Little Missouri National Grasslands boundary and follow a creek bed. This location was selected to minimize the impact to their farming operation as requested by the landowner's tenant. The proposed route then follows the mid-section line across cropland for 4 miles. Generally, the landowners in this area prefer the proposed route to follow the mid-section line in the middle of each section.

The proposed route then turns east to the section line to avoid passing in front of a farmstead, as requested by landowners in the area. The alignment crosses the section line to the east to avoid steep terrain. This segment ends at the crossing of State Route 21, approximately 7 miles east of New England.

State Route 21 to Slope/Bowman County Line Segment

This segment begins by crossing State Route 21 and extending to the mid-section line before turning west, which avoided a mature row of evergreen trees. The next 3 miles predominantly traverses grassland, which was the preferred alignment requested by the landowners. From this point, the proposed route turns south along the section line for 4 miles. Once reaching this point, the proposed route turns to avoid more rugged terrain and the White Lake National Wildlife Refuge to the west. The land use in this area is cropland. The proposed route crosses grassland on the eastern side of the section line and avoids cropland on the western side of the section line. From this point, the proposed route turns to the west to avoid a farmstead and traverses west along the section line for 4 miles across hay fields.

The proposed route turns southwest to avoid farmsteads to the west and diagonally crosses 2 miles of grassland and avoids a stock-watering dam. Also, this diagonal portion allows a large field of cropland to be avoided at the request of a landowner. The remainder of this segment traverses land in a southerly direction to the Slope County line. A gravel pit and a planned new residence were avoided by two diagonal alignment adjustments across grassland.

Slope/Bowman County Line to U.S. Highway 12 Segment

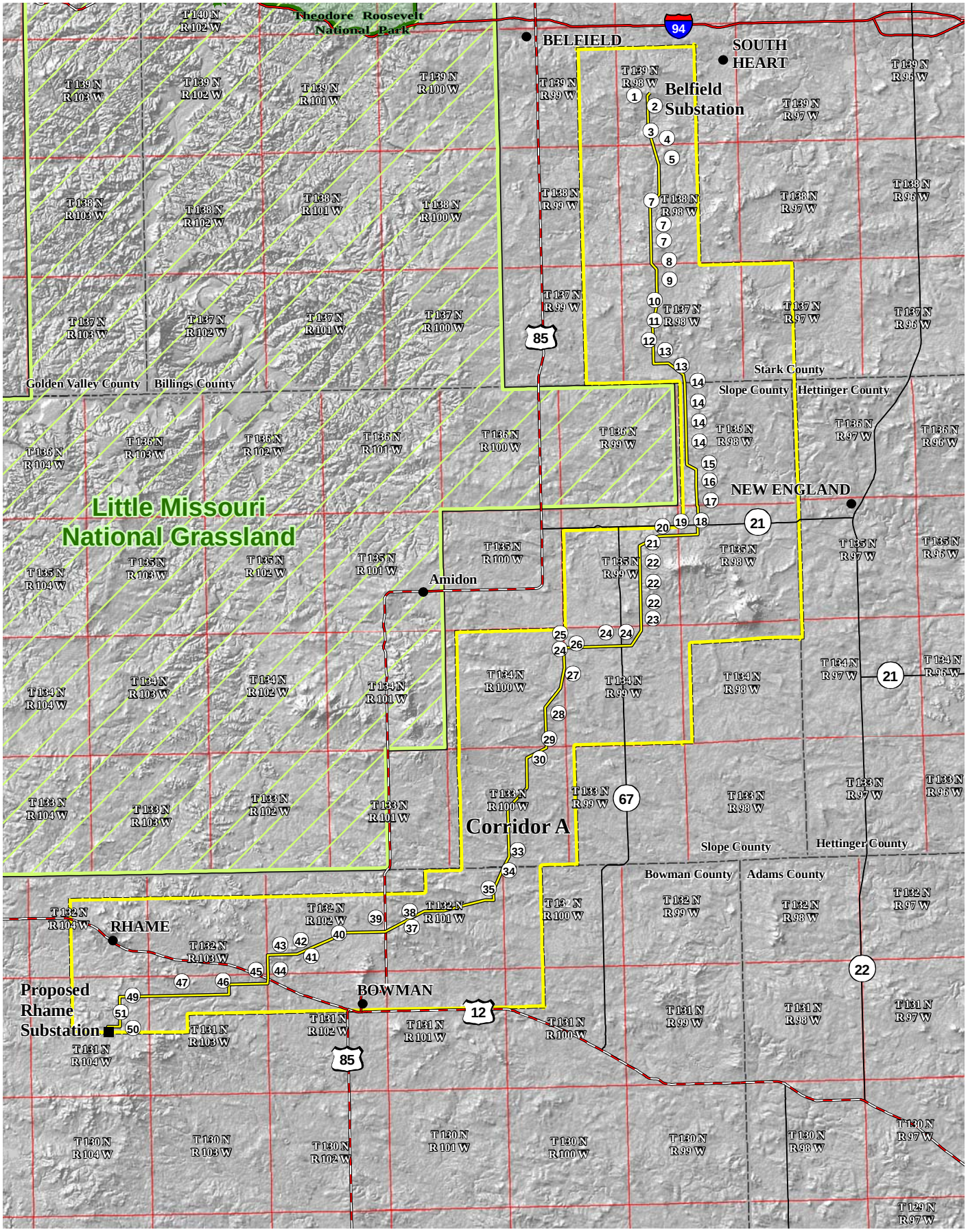
This segment begins in Bowman County with the proposed route continuing in a southwesterly direction across grassland and approaches an area with seven farmsteads, which were avoided as requested by several landowners. From this point, the proposed route follows the mid-section line across cropland and grassland to the crossing of U.S. Highway 85 approximately 3 miles north of Bowman.

The location of the proposed Bowman Airport was considered in the route selection. On the western side of U.S. Highway 85, the proposed route follows the section line across grassland and cropland. Farmsteads to the north and south were avoided. For the next 5 miles, the proposed route crosses grassland. At the request of a landowner, the proposed route follows the section line instead of crossing diagonally immediately north of U.S. Highway 12. Also in this section, the proposed route accommodates the location of a new rural water pipeline. This segment ends at U.S. Highway 12.

U.S. Highway 12 to Proposed Rhame Substation Segment

This segment begins with the crossing of the Burlington Northern-Sante Fe Railroad and U.S. Highway 12. This crossing was selected because the railroad and highway are close together and parallel. A small field of cropland immediately north of the crossing was avoided. The proposed route turns west at the mid-section line, as requested by the landowner, and turns south for 0.5 mile at Griffin Road.

From this point, the proposed route turns to the west and extends for 5.5 miles across cropland and grassland along the section line, which was selected to avoid farmsteads 1 mile to the north and 1 mile to the south. The proposed route turns south 0.5 mile east of the proposed Rhame Substation to avoid rough terrain and the winding highway. The proposed route runs along the mid-section line to minimize impact to cropland and turns west and then south to enter the proposed Rhame Substation site.



North Dakota

Area of Detail

LEGEND

- Proposed Route
- Proposed Corridor
- Substation
- City or Town
- National Grassland
- National Park
- Township

5 4 3 2 1 0 5

Scale in Miles

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE

Western Area Power Administration

Appendix C
Refined Routing Locations

Appendix D

Project-Specific Mitigation Measures

Appendix D

BELFIELD TO RHAME 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 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 proposed transmission line 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 as an alternative 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, discing, 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

- Topsoil will be salvaged and stockpiled during construction of the proposed Rhame Substation; after construction, topsoil will be re-spread.
- Erosion and sediment controls will be established prior to construction, then maintained and controlled through application of stormwater 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.

- Staging areas will be located in previously disturbed areas. .

Geology

- Transmission line structures will not be sited on any potentially active faults.

3. 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.

- 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.

4. Vegetation Resources

- In areas where wooded areas or shelterbelts 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 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 or local agencies.

- 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.

5. Wildlife and Fisheries

- Prior to surface disturbance activities during the migratory bird (not including raptors) breeding season (April 15 through July 31), 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* (APLIC 1994), will be examined and appropriate measures will be developed in coordination with the USFWS and 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.

6. Special Status Species and Noxious Weeds

Special Status Species

Prairie dog town, black-footed ferret, and burrowing owl occurrence surveys will not be required prior to construction. Field surveys identified one prairie dog town that would be along the preferred transmission line alternative; however, the town was not of sufficient size (80 or more acres) to support black-footed ferret.

- Prior to construction activities, surveys for the presence of migrating whooping cranes will be conducted during the migration periods (April to mid-May and mid-September to October) by a qualified biologist within 1 mile of the project area. If whooping cranes are observed during the survey, Western will coordinate with the USFWS regarding additional mitigation that would be warranted.

- Mitigation measures developed during Section 7 consultations, as specified by the USFWS, will be implemented.

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.) also may be used for weed control.

- 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 issues.

- Herbicide applications will occur in late spring or early summer to eradicate or control noxious weeds before they mature.

7. Archaeological and Historic Resources

- 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, could 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.

- All cultural resources will 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 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.

8. Paleontological Resources

- Prior to construction, a field survey for paleontological resources will be conducted within the construction ROW and other surface disturbance areas only in exposed rock areas associated with the White River Group and Golden Valley, Sentinel Butte, and Bullion Creek formations. A paleontological report will be developed and provided to Western, which will summarize the results of the field survey. If fossils are observed in these areas, a paleontologist will be present during construction in these areas in order to identify any 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.

9. 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.

10. Socioeconomic Values

- Potential impacts to populations and housing within the project area will be minimized.

11. 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.

12. 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, to the extent practicable.
- 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 and proposed Rhame Substation site will not be permitted and all waste materials will be disposed of at permitted waste disposal areas or landfills.

Appendix E

Special Status Species

Appendix E
Basin Electric Belfield to Rhame Transmission Project
Special Status Species

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
MAMMALS								
Black-footed ferret	*Mustela nigripes*	FE; ND Level I	Suitable habitat consists of prairie dog colonies or complexes (80 acres or greater) with towns no further than three miles apart to sustain a viable population of 120 ferrets. The black-footed ferret is presumed extirpated from North Dakota.	Prairie Dog Colonies	No	Yes, insufficient prairie dog populations to support the species	Bowman Slope Stark	USFWS Webpage – Region 6; Hagen et al. 2005; USFWS 2007a
Black-tailed prairie dog	*Cynomys ludovicianus*	ND Level I	This species inhabits prairie communities with short vegetation and flat topography. Often found in relation to areas grazed by livestock and live in large colonies known as “towns”.	Shortgrass prairie/grazed areas	Yes	Yes, insufficient numbers and habitat.	Bowman Slope Stark	Hagen et al. 2005; NatureServe 2007
Gray wolf	*Canis lupis*	FE; ND Level III	This species inhabits a wide range of habitats where large ungulates are found. Use mixed hardwood-coniferous forests in wilderness and sparsely settled areas, to forest and prairie landscapes dominated by agricultural and pasture lands.	Any	Yes	No	Bowman Slope Stark	Hagen et al. 2005; USFWS 2007a
Hispid pocket mouse	*Chaetodipus hispidus*	ND Level III	This species prefers short and mixed-grass prairie and may also utilize grain fields.	Short and mixed-grass prairie.	Yes	No	Bowman Slope	Hagen et al. 2005
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. They are also associated with coniferous trees. This species hibernates in caves and abandoned mines.	Rugged terrain and coniferous trees	No	Yes, lack of suitable habitat (rugged terrain, coniferous trees, caves, mines).	Bowman Slope Stark	Hagen et al. 2005; NDGFD 2007b
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 are also associated with coniferous trees.	Rugged terrain and coniferous trees	No	Yes, lack of suitable habitat (rugged terrain, coniferous trees).	Bowman Slope	Hagen et al. 2005; NDGFD 2007b
River otter	*Lontra canadensis*	ND Level II	This species prefers aquatic habitats with year-round water supplies. They utilize wetland/riparian areas with a constant food supply and adequate cover. Also associated with beaver activity.	Riparian	Yes	No	Bowman Slope Stark	Hagen et al. 2005

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Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
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	Yes	No	Bowman Slope Stark	Hagen et al. 2005; NDGFD 2007b
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. Young are born in late March, April, or early May. The swift fox is presumed extirpated in North Dakota.	Grasslands	Yes	No	Bowman Slope Stark	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 are also associated with coniferous trees.	Rugged terrain and coniferous trees	Yes	No	Stark	Hagen et al. 2005; NDGFD 2007b
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	Bowman Slope Stark	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 will also nest in tall, dense grassland. Peak breeding season: mid June to late July	Wetlands and tall, dense grasslands	Yes	No	Secondary range: Bowman Slope Stark	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. Peak breeding season: early June to late July	Extensive tracts of native mixed grass prairie and lightly grazed pastures	Yes	No	Bowman Slope Stark	Hagen et al. 2005

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Basin Electric Belfield to Rhame Transmission Project
Special Status Species

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
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 season: November 15 through March 15.	Large rivers and waterbodies	Yes	No	Bowman Slope Stark	Hagen et al. 2005; USFWS 2007a
Bobolink	*Dolichonyx oryzivorus*	ND Level II	This species uses a variety of grasslands but prefers moderate to tallgrass prairie, hayland, and retired croplands. Peak breeding season: early June to mid-July.	Grasslands	Yes	No	Bowman Slope Stark	Hagen et al. 2005
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. Peak breeding season: mid-June to late July	Wooded areas	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Brewer's sparrow	*Spizella breweri*	ND Level II	This species inhabits shrubland communitites dominated by sagebrush and juniper woodlands. This species is present in North Dakota from May to mid-September. Peak breeding season: mid-May to late July	Sagebrush communities	Yes	No	Bowman Slope	Hagen et al. 2005; NDNHI 2007; NDGFD 2007b
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. Peak breeding season: early May to mid-August.	Prairie dog colonies	No	Yes, Insufficient numbers of prairie dog town colonies.	Bowman Slope Stark	Hagen et al. 2005

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Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
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. Peak breeding season: early May to mid-July	Native prairie	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Canvasback	*Aythya valisineria*	ND Level II	This species prefers deep wetlands, particularly semipermanent wetlands with emergent cover. Peak breeding season: mid-May to mid-August.	Open water	Yes	No	Bowman Slope Stark	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. Peak breeding season: early June to mid-August.	Grasslands	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Ferruginous hawk	*Buteo regalis*	ND Level I	This species inhabits a variety of open country and shrubland. Usually avoids cultivated fields, heavily grazed pastures, high elevations, and forest interiors. May be associated with prairie dog towns. Peak breeding season: late April to mid-July.	Open country and shrublands	Yes	No	Bowman Slope Stark	Hagen et al. 2005; Gomes (No Date)
Golden eagle	*Aquila chrysaetos*	ND Level II	This species inhabits rugged portions of badlands and buttes over looking open shrubland and grasslands. Typically nests on south facing cliffs and may be associated with prairie dog towns. Peak breeding season: late April to late June.	Cliffs	Yes	No	Bowman Slope Stark	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. Peak breeding season: early June to late July	Open country	Yes	No	Bowman Slope Stark	Hagen et al. 2005

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Basin Electric Belfield to Rhame Transmission Project
Special Status Species

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Greater sage grouse	*Centrocercus urophasianus*	ND Level II	This species uses a wide variety of sagebrush mosaic habitats, including tall, low and a mixture of sagebrush types. Riparian and upland meadows, irrigated and non-irrigated croplands and pasturelands are also used. Peak breeding season: early May to mid July	Sagebrush habitats	Yes	No	Bowman Slope	NDGFD Webpage – GSG Conservation plan; NDGFD 2007a
Lark bunting	*Calamospiza melanocorys*	ND Level I	This species inhabits mixed-grass prairies and sagebrush communities. Weedy cropland, CRP, hayland, and pastures are also used. Peak breeding season: early June to early August	Open country and shrubland	Yes	No	Bowman Slope Stark	Hagen et al. 2005
LeConte's sparrow	*Ammodramus leconteii*	ND Level II	This species prefers fens, wet meadows, and marshes of sedge grasses. Peak breeding season: late May to mid-August.	Wetlands	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Loggerhead shrike	*Lanius ludovicianus*	ND Level II	This species prefers open country with thickets of small trees, shrubs, and shelterbelts. Peak breeding season: early May to mid-June.	Open country with tree clumps	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Long-billed curlew	*Numenius americanus*	ND Level I	This species uses expansive, open, level to gently rolling or sloping grasslands of short vegetation such as short-grass and grazed mixed-grass prairie for breeding. Proximity to water is an important factor in habitat selection. Nests in dry uplands next to wet meadows. Peak breeding season: early May to early July	Open grasslands adjacent to water	Yes	No	Bowman Slope Stark	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. Peak breeding season: early May to late June.	prairie adjacent to wetlands	Yes	No	Bowman Slope Stark	Hagen et al. 2005

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Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
McCown's longspur	*Calcarius mccownii*	ND Level III	This species prefers arid, shortgrass prairie or heavily grazed mixed-grass prairie. Peak breeding season: late May to mid-July.	Shortgrass prairie	Yes	No	Bowman Slope	Hagen et al. 2005
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: late April to early August.	Grasslands, Agriculture, and wetlands	Yes	No, could utilize rangeland for foraging.	Bowman Slope Stark	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. Peak breeding season: early April to early July.	Open water	Yes	No	Bowman Slope Stark	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. Peak breeding season: May to July	Cliffs	Yes	No, could utilize rangeland for foraging.	Bowman Slope Stark	Hagen et al. 2005; Gomes (No Date)
Prairie falcon	*Falco mexicanus*	ND Level II	This species inhabits shortgrass prairie, shrubsteppe, and agricultural areas in generally arid landscapes. Nests primarily on cliffs, buttes, canyon walls, rock outcrops, and ridges. May nest in trees and transmission line towers. Peak breeding season: April to July	Cliffs	Yes	No, could utilize rangeland for foraging.	Bowman Slope Stark	Hagen et al. 2005; Gomes (No Date)
Redhead	*Aythya americana*	ND Level II	This species uses a variety of wetland types but prefers semipermanent and deep seasonal wetlands. Peak breeding season: early June to late August.	Open water	Yes	No	Bowman Slope Stark	Hagen et al. 2005

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Basin Electric Belfield to Rhame Transmission Project
Special Status Species

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. Peak breeding season: early June to early August.	Deciduous tree stands	Yes	No	Bowman Slope Stark	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. Peak breeding season mid May to early August	Mixed grass prairie with patches of shrubs	Yes	No	Bowman Slope Stark	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. Peak breeding season: late April to mid-July	Open country	Yes	No	Bowman Slope Stark	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, low forb density, and little bare ground but low litter depth. Peak breeding season: early may to mid-August	Large native grasslands	Yes	No	Bowman Slope Stark	Hagen et al. 2005
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. Peak breeding season: April to August.	Open country with scattered trees and shrubs	Yes	No, could utilize rangeland and shelterbelts for foraging.	Bowman Slope Stark	Hagen et al. 2005; Gomes (No Date)

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Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Upland sandpiper	*Bartramia longicauda*	ND Level I	This species inhabits native and tame grassland, wet meadows, hayland, pastures, CRP, cropland, highway and railroad rights-of-ways. Often uses wooden fence posts for viewing. Peak breeding season: late May to early July	Open country	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Whooping crane	*Grus americana*	FE; ND Level III	During migration, this species uses primarily wetlands and cropland ponds for rooting 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	No	Bowman Slope Stark	USFWS Webpage – Region 6; Hagen et al. 2005; USFWS 2007a
Willet	*Cataptrophorus semipalmatus*	ND Level I	Large expanses of short, sparse grasslands, particularly native grasslands, are important for nesting and foraging. Prefer wetlands with shallow –water areas with sparse shoreline vegetation. Peak breeding season: late May to mid-July	Wetlands with sparse shorlines adjacent to native shortgrass prairie.	Yes	No	Bowman Slope Stark	Hagen et al. 2005
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. Peak breeding season: late May to early June	Wetlands adjacent to upland grasslands	Yes	No	Secondary range: Bowman Slope Stark	Hagen et al. 2005
Reptiles / Amphibians								
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.	Lakes or rivers	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Northern sagebrush lizard	*Sceloporus graciosus*	ND Level III	This species prefers sagebrush and rocky areas near water.	Sagebrush	Yes	No	Slope	Hagen et al. 2005; NDGFD 2007b

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Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
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.	Open grasslands	Yes	No	Bowman Slope Stark	Hagen et al. 2005
Short-horned lizard	*Phrynosoma douglassi*	ND Level II	This species prefers semi-arid, shortgrass prairie in rough terrain.	Arid landscapes	Yes	No	Bowman Slope	Hagen et al. 2005; NDGFD 2007b
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	Bowman Slope Stark	Hagen et al. 2005; NDGFD 2007b
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 suitable habitat crossed by the ROW	Slope	Hagen et al. 2005
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. Spawning occurs after water levels have subsided after peak flows, when water temperatures are warmer and substrate is more stable. Relies on flood flows to spawn successfully. Spawns after rivers have subsided following peak flow.	Turbid rivers with sandy substrate	Yes	No – suitable habitat for this species occurs within the Cannonball and Heart Rivers crossed by the Project.	Bowman Slope Stark	Hagen et al. 2005
Northern redbelly dace	*Phoxinus eos*	ND Level II	This species occurs in a variety of habitats ranging from streams to bog lakes.	Waterbodies	Yes	No – Suitable habitat for this species is found within the South Fork Heart and Cannonball Rivers crossed by the project.	Bowman Slope Stark	NDNHI 2007

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Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
Invertebrates								
Pink papershell	*Potamilus oheinsis*	ND Level III	This species occurs within the tributaries of large river systems. The substrate of the rivers is mud, sand, or gravel	Medium to large rivers	None – September Surveys	Yes – No suitable habitat crossed by the ROW	Slope Stark	Hagen et al. 2005
Plants								
Alkali sacaton	*Sporobolus airoides*	ND SOC	This perennial grows in large bunches 2-3.5ft tall on dry to moist sites with sand or gravelly soils. Most often found growing on alkaline flats, prairies, and sandy plateaus. Common along drainages in desert and semi-desert areas. Flowers in mid-summer.	Sand prairies	Yes	No	Bowman	NDNHI 2007; USDA, NRCS 2007
Bent-flowered milkvetch	*Astragalus vexilliflexus*	ND SOC	This perennial is rare but common where found. It occurs on rocky prairie knolls and ridges.	Rocky knolls and ridges	Yes	No	Slope Stark	NDNHI 2007; Kantrud 1995; USDA, NRCS 2007; NDGFD 2007
Narrow-leaved wirelettuce	*Stephanomeria tenuifolia*	ND SOC	Open, dry, often rocky areas in the foothills to moderate elevations. Blooms June through September.	Open, dry areas	Yes	No	Stark Slope Bowman	NDNHI 2007; USDA, NRCS 2007
Slim flowered scurfpea	*Psoralea tenuiflora*	ND SOC	This species occurs within dry prairies and open woodlands. This species is drought tolerant and prefers well drained soils.	Dry prairies	Yes	No	Bowman	NDNHI 2007; NatureServe 2007; USDA, NRCS 2007
Torrey's cat's-eye	*Cryptantha torreyana*	ND SOC	This annual is common in open areas at low to mid elevation ranges in the mountains. Flowers from May to July.	Open areas	Yes	No	Bowman	NDNHI 2007; NatureServe 2007; BMNHC 2007; USDA, NRCS 2007

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Basin Electric Belfield to Rhame Transmission Project
Special Status Species

Species	Scientific Name	Status[1]	Habitat Association	Primary Habitat	Occurrence Within Project Area	Eliminated from Detailed Analysis	Counties	Source
White locoweed	*Oxytropis sericea*	ND SOC	This perennial occurs on open, well-drained slopes of the western plains. It is infrequent to common on prairie uplands, streambanks, valleys, and alpine sites. It occurs on sandy, gravelly, or rocky soils but grows best on sandy loams. It is tolerant of moderately saline soils and low nutrient conditions but does not tolerate water-saturated soils such as heavy clay. Whitepoint locoweed is drought tolerant but is not tolerant of excessive shade. It is tolerant to freezing temperatures during the growing season and competes well on nutrient-rich, deep loam on subalpine sites. Whitepoint locoweed thrives at medium elevations. First bloom for whitepoint locoweed occurs in mid-June to early July. Seed dissemination begins in mid-July and lasts until mid-August. The plant begins to dry in late September.	Open slopes of the plains	Yes	No	Slope	NDNHI 2007; Esser 1993.

[1] FE = Federally Endangered, ND Level I, II, III = North Dakota Level I, II, III Species of Conservation Priority, ND SOC = North Dakota Species of Concern.

Exhibits

A1 – A4 Proposed Route and Exclusion Areas

B1 – B4 Proposed Route and Avoidance Areas

BELFIELD

SOUTH HEART

Belfield Substation

Laydown Area 1

48th St SW

Little Missouri National Grassland

Stark County

Slope County

Hettinger County

T 140 N R 99 W

T 140 N R 98 W

T 140 N R 97 W

T 139 N R 99 W

T 139 N R 98 W

T 139 N R 97 W

T 138 N R 99 W

T 138 N R 98 W

T 138 N R 97 W

T 137 N R 99 W

T 137 N R 98 W

T 137 N R 97 W

T 136 N R 100 W

T 136 N R 99 W

T 136 N R 98 W

T 136 N R 97 W

94

85

1

2

3

4

LEGEND

- Proposed Route
- Proposed Microwave Tower
- Proposed Corridor
- Substation
- Match Line
- Township
- City/Town

Exclusion Features

- Section With Natural Heritage Species Observations

Exclusion Features

- Golden Eagle Nest
- Rare Animal Observation
- Rare Ecological Community
- Rare Plant Observation
- Campground
- National Grassland

N W E S

1 0.5 0 1
Scale in Miles

2 1 0 2
Scale in Kilometers

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Western Area Power Administration

Exhibit A-1
Proposed Route
Exclusion Areas

ENSR | AECOM

May, 2008

Sources: Wildlife/Ecology - NDNHI 2007.

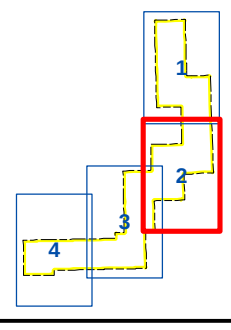
Little Missouri National Grassland

T 136 N R 100 W
T 136 N R 99 W
T 136 N R 98 W
T 136 N R 97 W
T 135 N R 100 W
T 135 N R 99 W
T 135 N R 98 W
T 135 N R 97 W
T 134 N R 100 W
T 134 N R 99 W
T 134 N R 98 W
T 134 N R 97 W
T 133 N R 100 W
T 133 N R 99 W
T 133 N R 98 W
T 133 N R 97 W

21
67

Laydown Area 2

Slope County
Hettinger County



LEGEND

- Proposed Route
- Proposed Microwave Tower
- Proposed Corridor
- Substation
- Match Line
- Township
- City/Town

Exclusion Features
- Section With Natural Heritage Species Observations

Exclusion Features
- Golden Eagle Nest
- Rare Animal Observation
- Rare Ecological Community
- Rare Plant Observation
- Campground
- National Grassland

N
W E
S

1 0.5 0 1
Scale in Miles

2 1 0 2
Scale in Kilometers

Belfield to Rhame Transmission Project

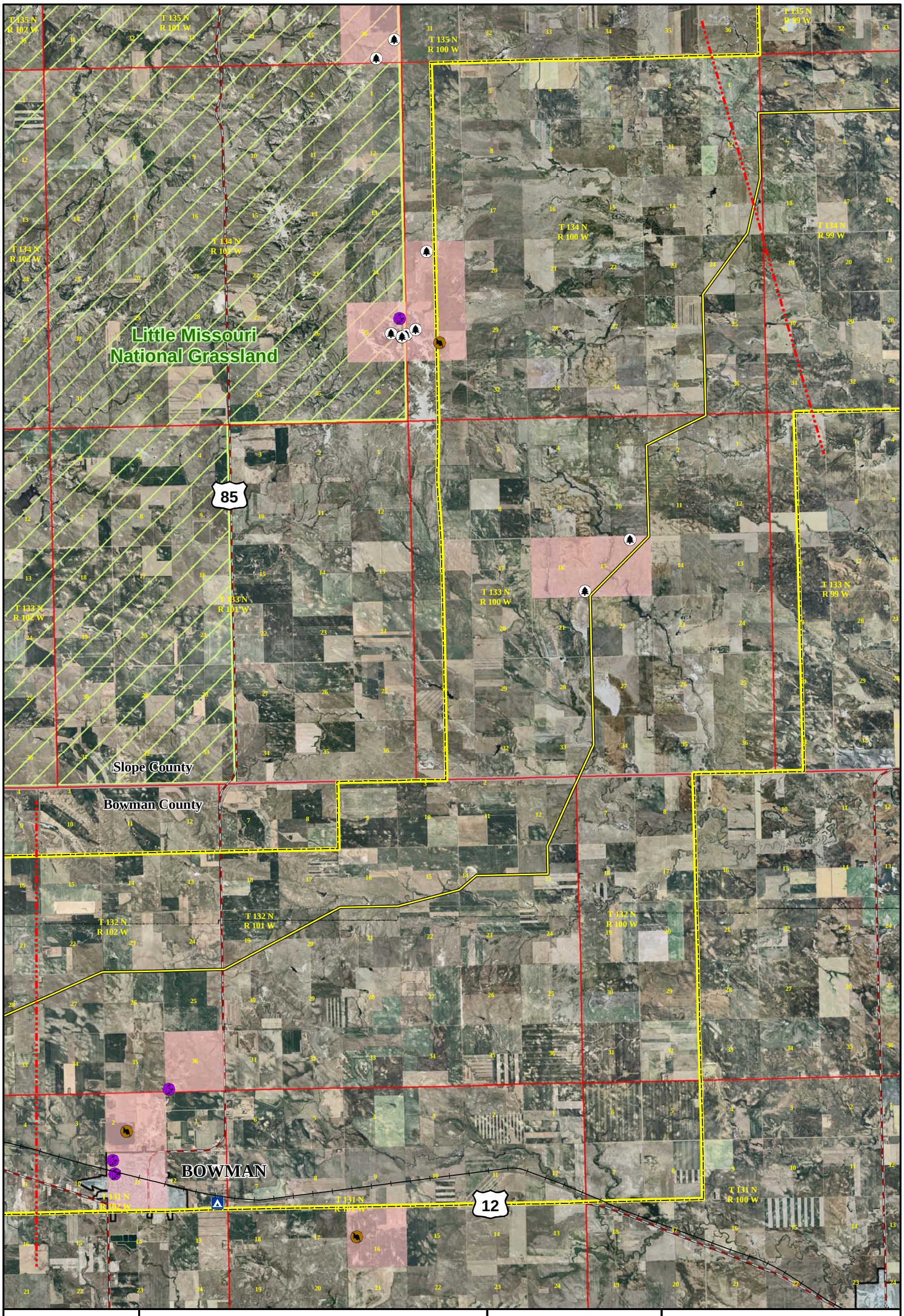
BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative
Western Area Power Administration

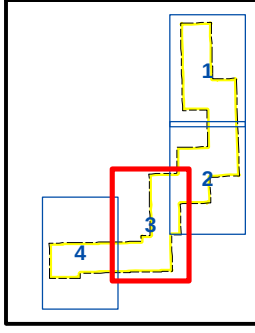
Exhibit A-2
Proposed Route
Exclusion Areas

ENSR | AECOM

May, 2008

Sources: Wildlife/Ecology - NDNHI 2007.





LEGEND

- Proposed Route
- Proposed Microwave Tower
- Proposed Corridor
- Substation
- Match Line
- Township
- City/Town

Exclusion Features

- Section With Natural Heritage Species Observations

Exclusion Features

- Golden Eagle Nest
- Rare Animal Observation
- Rare Ecological Community
- Rare Plant Observation
- Campground
- National Grassland

N
W E
S

1 0.5 0 1
Scale in Miles

2 1 0 2
Scale in Kilometers

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

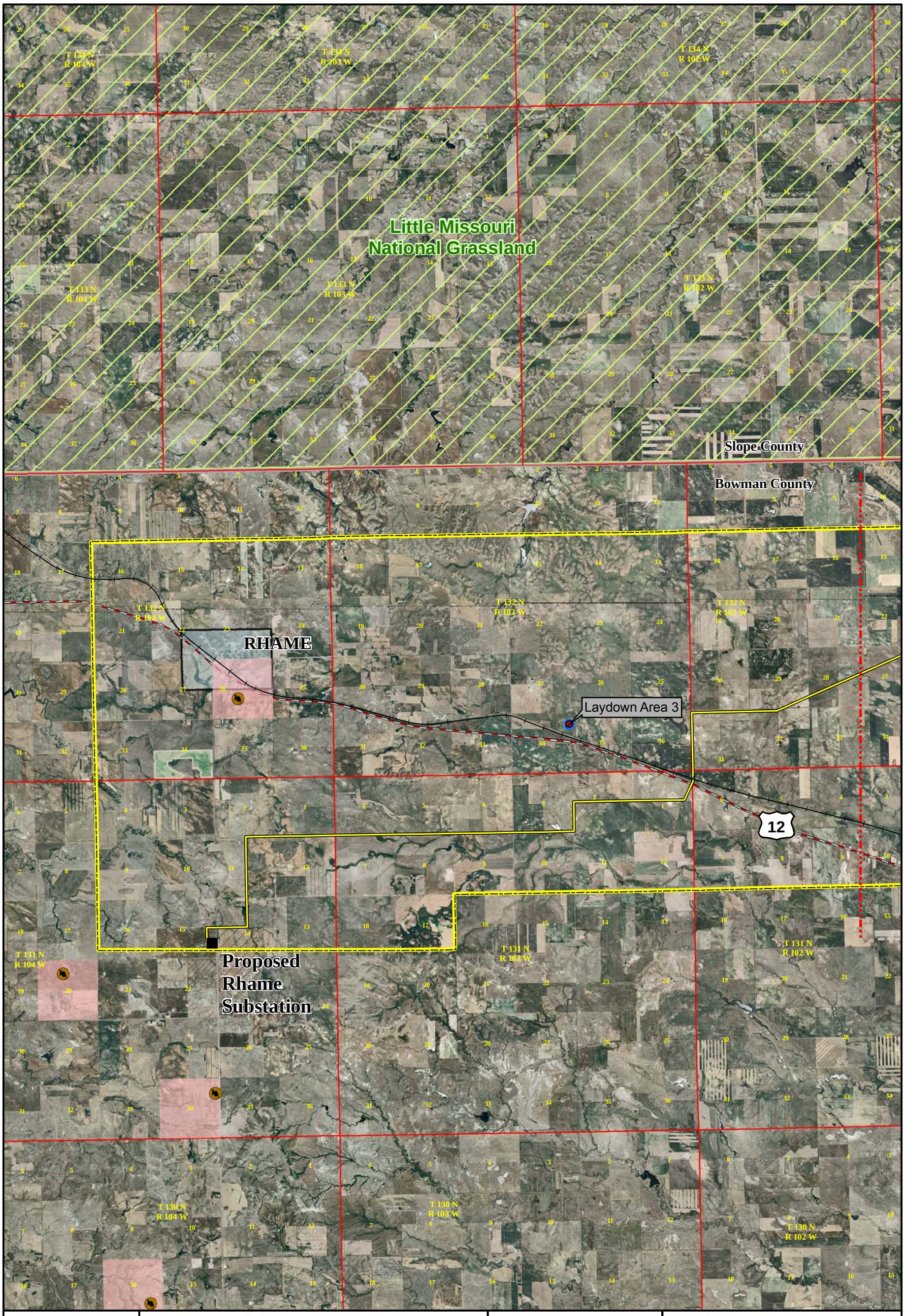
Western Area Power Administration

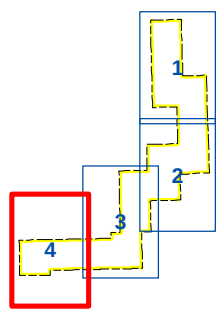
Exhibit A-3
Proposed Route
Exclusion Areas

ENSR | AECOM

May, 2008

Sources: Wildlife/Ecology - NDNHI 2007.





LEGEND

- Proposed Route
- Proposed Microwave Tower
- Proposed Corridor
- Substation
- Match Line
- Township
- City/Town

Exclusion Features

- Section With Natural Heritage Species Observations

Exclusion Features

- Golden Eagle Nest
- Rare Animal Observation
- Rare Ecological Community
- Rare Plant Observation
- Campground
- National Grassland

N
W E
S

1 0.5 0 1
Scale in Miles

2 1 0 2
Scale in Kilometers

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

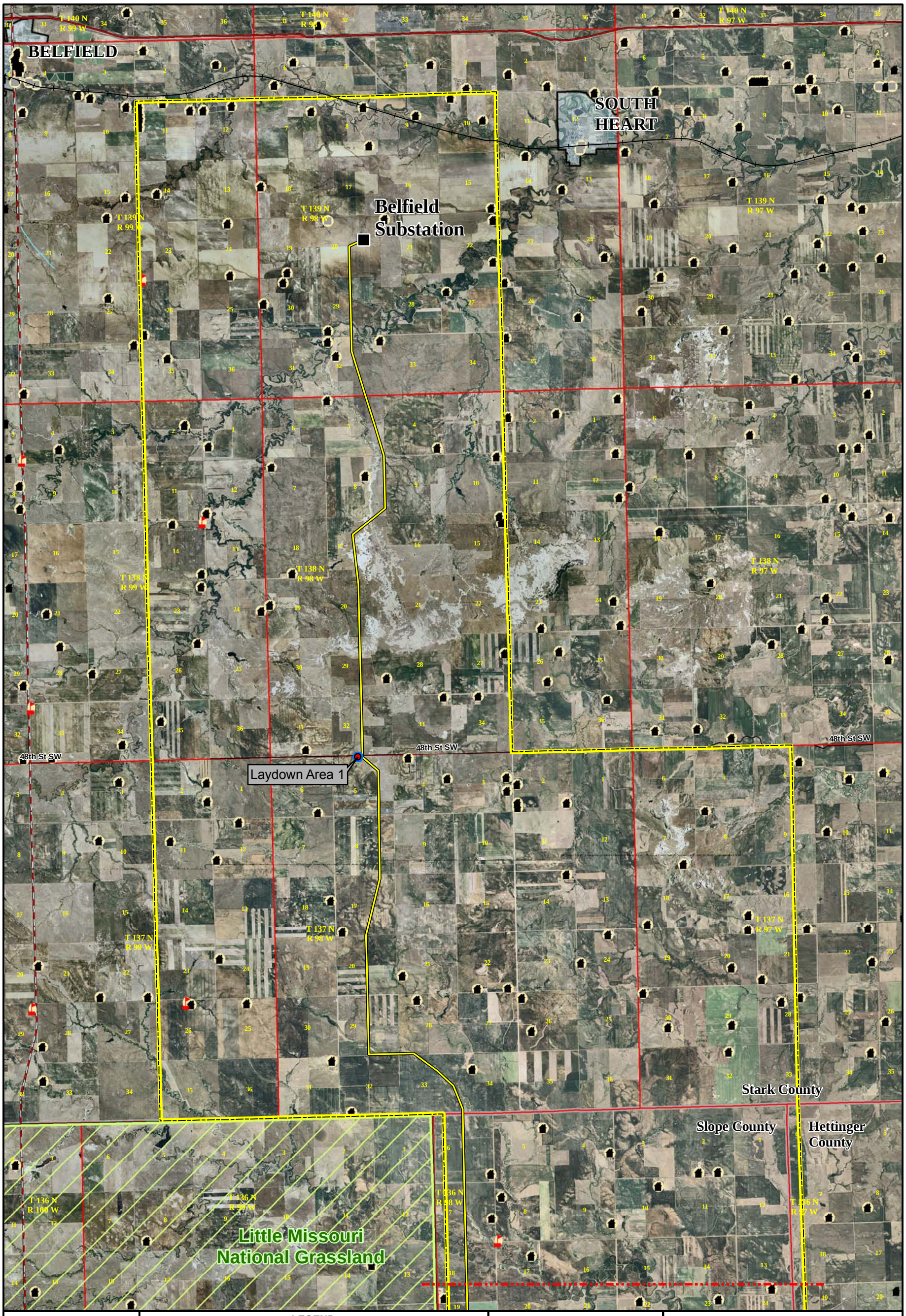
Western Area Power Administration

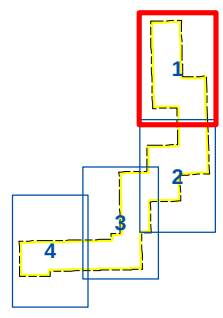
Exhibit A-4
Proposed Route
Exclusion Areas

ENSR | AECOM

May, 2008

Sources: Wildlife/Ecology - NDNHI 2007.





LEGEND

- Proposed Route
- Proposed Microwave Tower
- Proposed Corridor
- Substation
- Match Line
- Township
- City/Town

Avoidance Features

- U.S. Fish and Wildlife Service National Wildlife Refuge
- National Grassland
- School With 500 ft. Buffer
- Residence or Other Structure With 500 ft. Buffer
- Place of Business With 500 ft. Buffer
- Fault Line

N, W, E, S

1 0.5 0 1
Scale in Miles

2 1 0 2
Scale in Kilometers

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

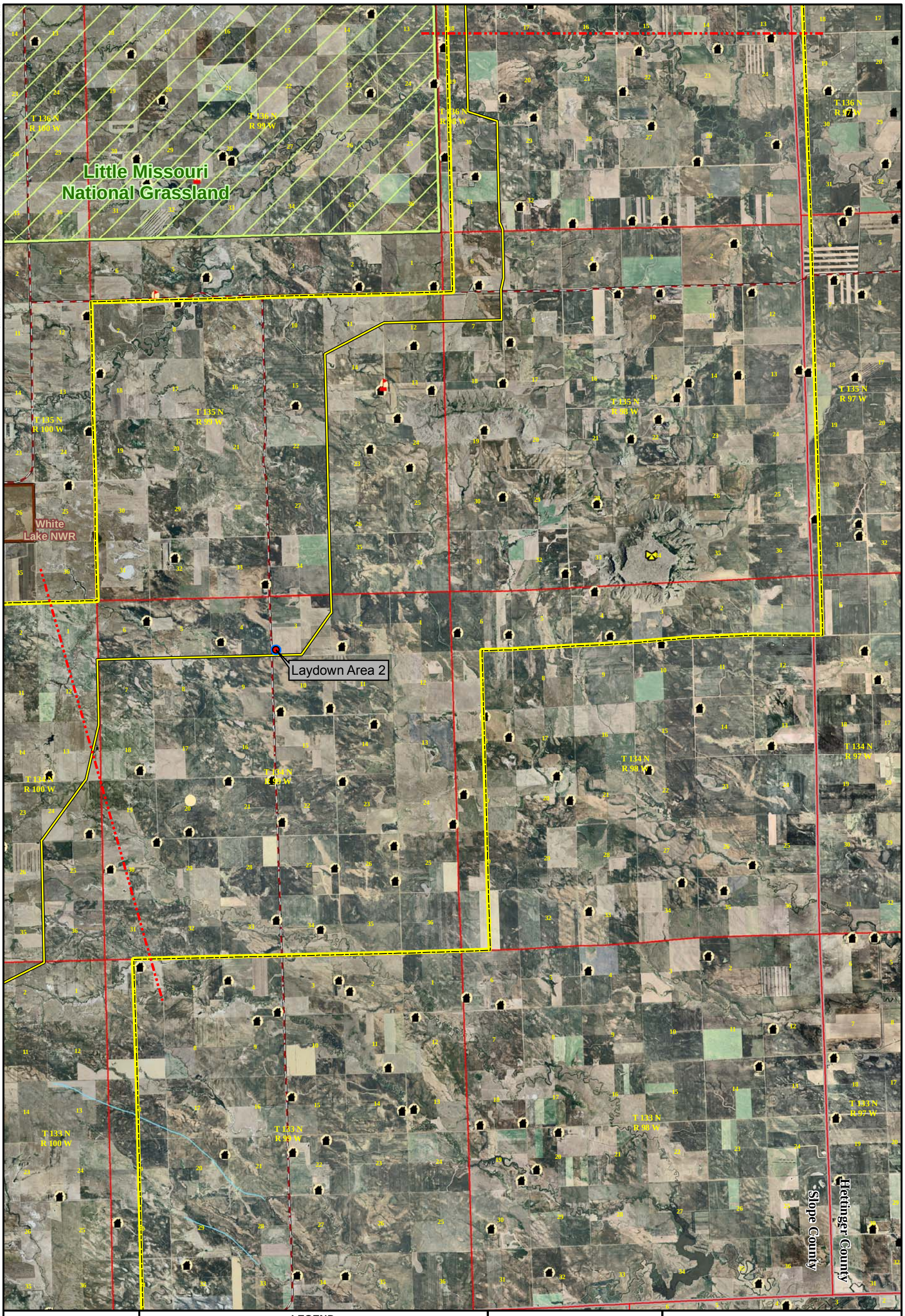
Western Area Power Administration

Exhibit B-1
Proposed Route
Avoidance Areas

ENSR | AECOM

May 2008

Sources: Schools - USGS, GNIS; Residences/Places of Business - NDDOT 2007; Geology - Clayton, 1980



LEGEND

- Proposed Route
- Proposed Microwave Tower
- Proposed Corridor
- Substation
- Match Line
- Township
- City/Town

Avoidance Features

- U.S. Fish and Wildlife Service National Wildlife Refuge
- National Grassland
- School With 500 ft. Buffer
- Residence or Other Structure With 500 ft. Buffer
- Place of Business With 500 ft. Buffer
- Fault Line

Scale in Miles: 1 0.5 0 1

Scale in Kilometers: 2 1 0 2

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

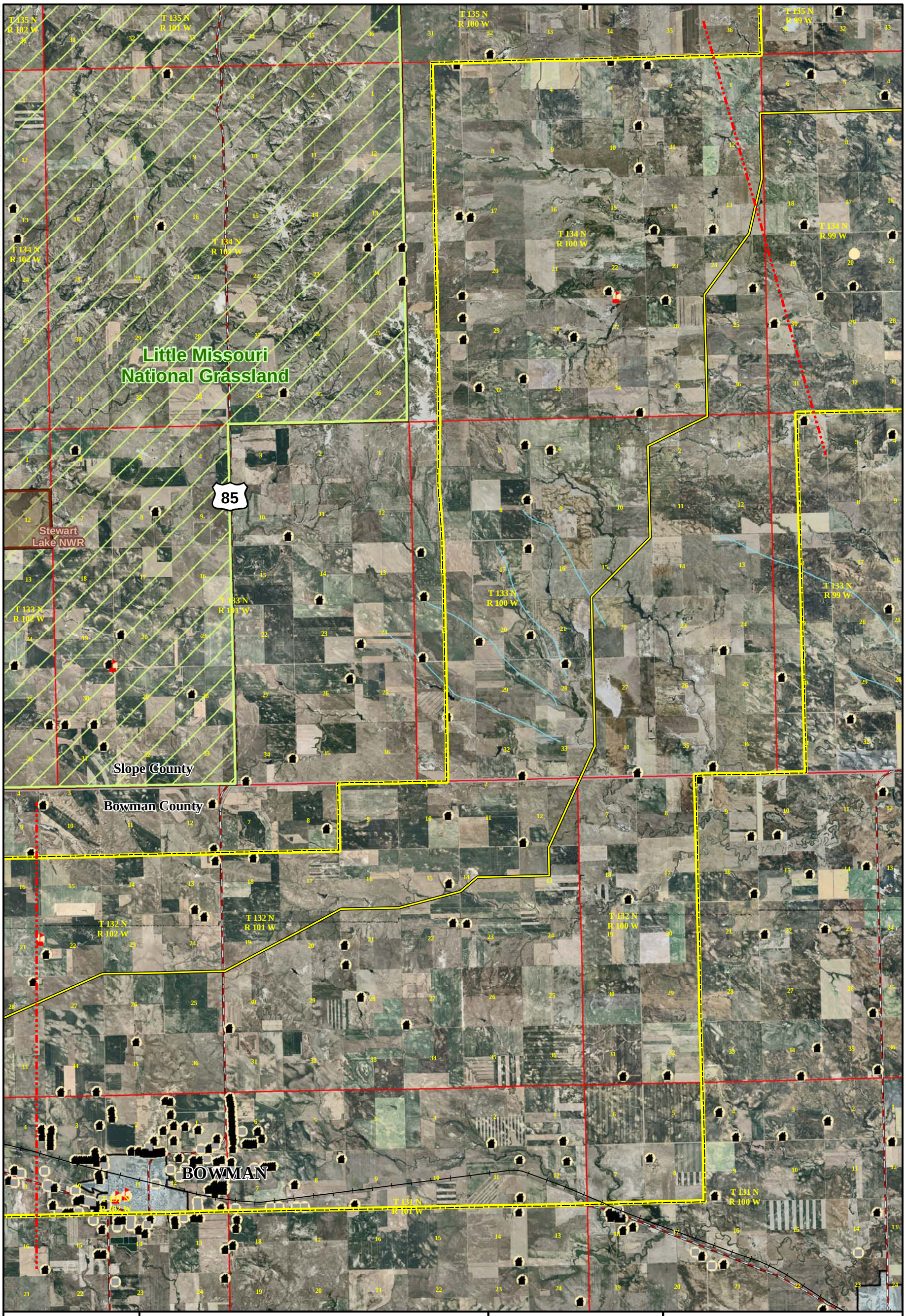
Western Area Power Administration

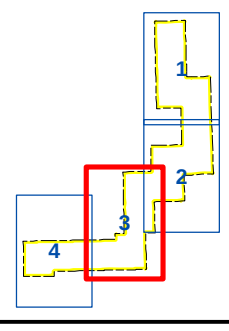
Exhibit B-2
Proposed Route
Avoidance Areas

ENSR | AECOM

May 2008

Sources: Schools - USGS, GNIS; Residences/Places of Business - NDDOT 2007; Geology - Clayton, 1980





LEGEND

- Proposed Route
- Proposed Microwave Tower
- Proposed Corridor
- Substation
- Match Line
- Township
- City/Town

Avoidance Features

- U.S. Fish and Wildlife Service National Wildlife Refuge
- National Grassland
- School With 500 ft. Buffer
- Residence or Other Structure With 500 ft. Buffer
- Place of Business With 500 ft. Buffer
- Fault Line

N, W, E, S

1 0.5 0 1
Scale in Miles

2 1 0 2
Scale in Kilometers

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

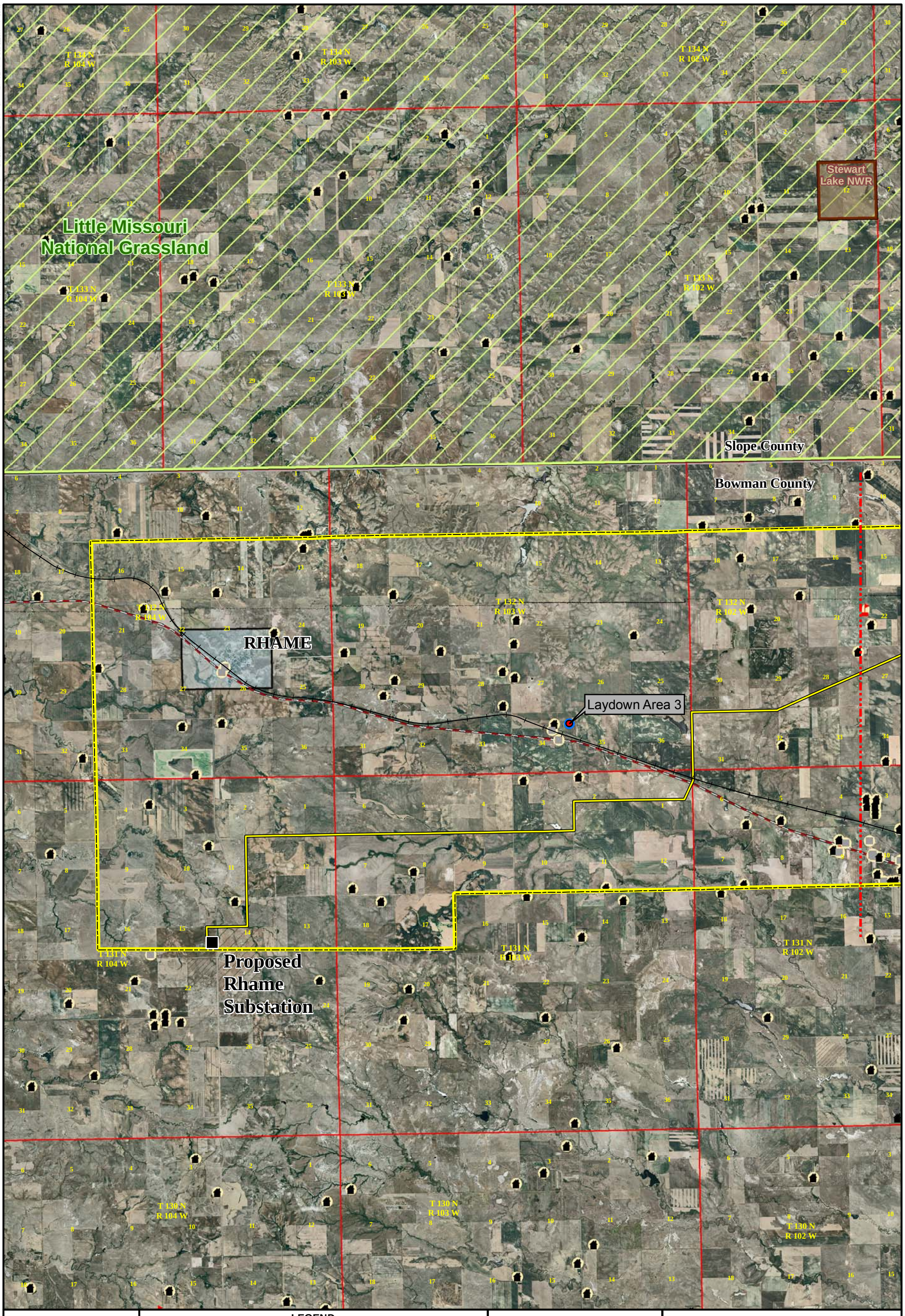
Western Area Power Administration

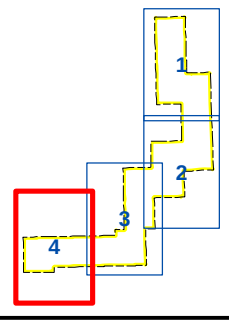
Exhibit B-3
Proposed Route
Avoidance Areas

ENSR | AECOM

May 2008

Sources: Schools - USGS, GNIS; Residences/Places of Business - NDDOT 2007; Geology - Clayton, 1980





LEGEND

- Proposed Route
- Proposed Microwave Tower
- Proposed Corridor
- Substation
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Avoidance Features

- U.S. Fish and Wildlife Service National Wildlife Refuge
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N W E S

1 0.5 0 1
Scale in Miles

2 1 0 2
Scale in Kilometers

Belfield to Rhame Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Western Area Power Administration

Exhibit B-4
Proposed Route
Avoidance Areas

ENSR | AECOM

May 2008

Sources: Schools - USGS, GNIS; Residences/Places of Business - NDDOT 2007; Geology - Clayton, 1980