Antelope Valley Station to Neset Transmission Project

Final Environmental Impact Statement

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Volume I

Antelope Valley Station to Neset Transmission Project

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Abstract:

This Final Environmental Impact Statement (FEIS) prepared by the U.S. Department of Agriculture (USDA), Rural Utilities Service (RUS) provides information about the potential environmental impacts of the proposed Antelope Valley Station (AVS) to Neset Transmission Project. This project, proposed by Basin Electric Power Cooperative (Basin Electric), would include the construction of 345-kilovolt transmission line facilities from Basin Electric's AVS generation facility in northwestern North Dakota to increase the capacity and reliability of the electricity transmission infrastructure of the region. The line would connect AVS with Basin Electric's Charlie Creek and Neset substations and the U.S. Department of Energy, Western Area Power Administration's (Western) Williston Substation. It would also provide new substation facilities to connect the proposed line to the current transmission system and provide locations for load-serving connections.

In addition to complying with all applicable federal regulations, several permits and approvals must be granted by the state of North Dakota prior to construction. The North Dakota Public Service Commission must grant a Certificate of Corridor Compatibility and a Route Permit in accordance with North Dakota Century Code.

Basin Electric has requested financial assistance from RUS to construct the project. RUS has determined that its decision about whether to finance the project would constitute a major federal action that may have a significant impact on the environment, within the context of the National Environmental Policy Act of 1969 (NEPA). RUS serves as the lead federal agency for the NEPA environmental review of the project.

Pursuant to 36 Code of Federal Regulations (CFR) 800.2(a)(2), RUS and the U.S. Forest Service designated Western as the lead agency for Section 106 review because of the availability of its regional staff to actively direct and participate in consultation. However, to meet their collective responsibilities under NEPA, RUS is designated as the lead agency because its financial assistance will affect all aspects of the AVS to Neset Transmission Project. Western and RUS have coordinated compliance with Section 106 and NEPA procedures in accordance with 36 CFR 800.8A.

This FEIS evaluates the environmental consequences that may result from the proposed action along two route alternatives. In addition, the FEIS analyzes the no-action alternative, under which RUS would not approve financial assistance for the project.

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ACRONYMS AND ABBREVIATIONS

ABPP	American Battlefield Protection Program
ACHP	Advisory Council on Historic Preservation
ADT	average daily traffic
APE	area of potential effect
APLIC	Avian Power Line Interaction Committee
AVS	Antelope Valley Station
BA	Biological Assessment
Basin Electric	Basin Electric Power Cooperative
BE	Biological Evaluation
BLM	Bureau of Land Management
BMP	best management practice
BNSF	BNSF Railway Company
BP	Before Present
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
DEIS	Draft Environmental Impact Statement
EMF	electric and magnetic field
ESA	Endangered Species Act

°F	degrees Fahrenheit
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FIRM	Flood Insurance Rate Maps
GHG	greenhouse gases
ICES	International Committee on Electromagnetic Safety on Non-Ionizing Radiation
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IS	Integrated System
KLJ	Kardmas, Lee & Jackson, Inc.
KMB	Killdeer Mountain Battlefield
kV	kilovolt
kV/m	kilovolts per meter
LMNG	Little Missouri National Grasslands
μT	microtesla
mG	milligauss
MIS	Management Indicator Species
MRO	Midwest Reliability Organization
MW	megawatts
MWEC	Mountrail-Williams Electric Cooperative
NAAQS	National Ambient Air Quality Standards
NDDMR	North Dakota Department of Mineral Resources
NDDOH	North Dakota Department of Health
NDGFD	North Dakota Game and Fish Department
NDPSC	North Dakota Public Service Commission

NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NHPA	National Historic Preservation Act
NIEHS	National Institute of Environmental Health Sciences
NO_x	nitrogen oxide
North Dakota SHPO	North Dakota State Historic Preservation Office
NPS	U.S. Department of the Interior, National Park Service
NPWRC	Northern Prairie Wildlife Research Center
NRCS	U.S. Department of Agriculture, Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWP	nationwide permit
OHGW	overhead groundwire
OPGW	optical groundwire
PA	Programmatic Agreement
PM_{10}	particles with a diameter less than or equal to a nominal 10 micrometers
$PM_{2.5}$	particles with a diameter less than or equal to a nominal 2.5 micrometers
PSD	Prevention of Significant Deterioration
ROW	right-of-way
RUS	U.S. Department of Agriculture, Rural Utilities Service
SHSND	State Historical Society of North Dakota
SIO	scenic integrity objective
SRST	Standing Rock Sioux Tribe
SUP	Special Use Permit
Supplemental DEIS	Supplemental Draft Environmental Impact Statement
SWO	Sisseton Wahpeton Oyate

TMDL	Total Maximum Daily Load
TPL	transmission planning
TRNP	Theodore Roosevelt National Park
UGPTI	Upper Great Plains Transportation Institute
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Department of Agriculture, Forest Service
USFWS	U.S. Department of the Interior, Fish and Wildlife Service
USGS	U.S. Department of the Interior, U.S. Geological Survey
Western	U.S. Department of Energy, Western Area Power Administration
WMA	wildlife management area

EXECUTIVE SUMMARY

This executive summary briefly describes the proposed Antelope Valley Station (AVS) to Neset Transmission Project (proposed project), the various components of Basin Electric Power Cooperative's (Basin Electric) proposed development, the purpose and need for federal agency actions related to the project, the project's purpose and objective, and the scoping process undertaken for the project. This Final Environmental Impact Statement (FEIS) informs federal decision-makers and the public of the preferred alternative and the potential environmental impacts that could result from the proposed project if the preferred alternative is carried forward. The FEIS was prepared by the U.S. Department of Agriculture's (USDA) Rural Utilities Service (RUS). The U.S. Department of Energy, Western Area Power Administration (Western) and the USDA, U.S. Forest Service (USFS) are cooperating agencies for the FEIS. The FEIS will be used by the responsible federal officials to make informed decisions on the proposed federal actions.

Basin Electric is proposing to construct, operate, and maintain a new electrical transmission line connecting the existing AVS, Charlie Creek, Williston, and Neset substations with five newly proposed delivery substations. The overall project area identified for this project encompasses parts of Mercer, Dunn, McKenzie, Williams, and Mountrail counties in North Dakota. The proposed project includes the construction of 345-kilovolt (kV) transmission line facilities from Basin Electric's AVS generation facility in northwestern North Dakota to increase the capacity and reliability of the electricity transmission infrastructure of the region. The line would connect AVS with Basin Electric's Charlie Creek and Neset substations and Western's Williston Substation. It would also provide new substation facilities to connect the proposed line into the current transmission system and provide locations for load-serving connections. Several alternatives, including a no-action alternative and three different build alternatives were evaluated in this EIS.

RUS issued a Draft Environmental Impact Statement (DEIS) evaluating the environmental implications of Basin Electric's AVS to Neset Transmission Project in November 2012. The originally proposed project, as evaluated in the DEIS, considered the development of a single 345-kV transmission line and two new substations in one of two alternatives. The project was proposed to increase transmission line capacity to meet the expected increase in load. However, the new load forecasts show the load increasing above and beyond the original forecast by nearly 50 percent (Kardmas, Lee & Jackson, Inc. [KLJ], 2012). Therefore the original project as described in the DEIS would not achieve capacity needs or reliability standards.

RUS prepared a Supplemental Draft Environmental Impact Statement (Supplemental DEIS) for the AVS to Neset Transmission Project to evaluate project changes that occurred after the DEIS was published and the comment period closed. To accommodate additional load requirements, new alternatives were evaluated in the Supplemental DEIS that included building a transmission line on both routes A and B, and parallel and double circuit lines on route B. Additional project components including substations and switchyards were evaluated under each of these alternatives. in the Supplemental DEIS. The Supplemental DEIS was published in the *Federal Register* in December 2013.

This executive summary provides a summary of conclusions from the FEIS. This includes a description of the proposed project and the alternatives evaluated; identification of the agency preferred alternative; and a brief summary of findings highlighting conclusions, areas of controversy, and resolution of issues.

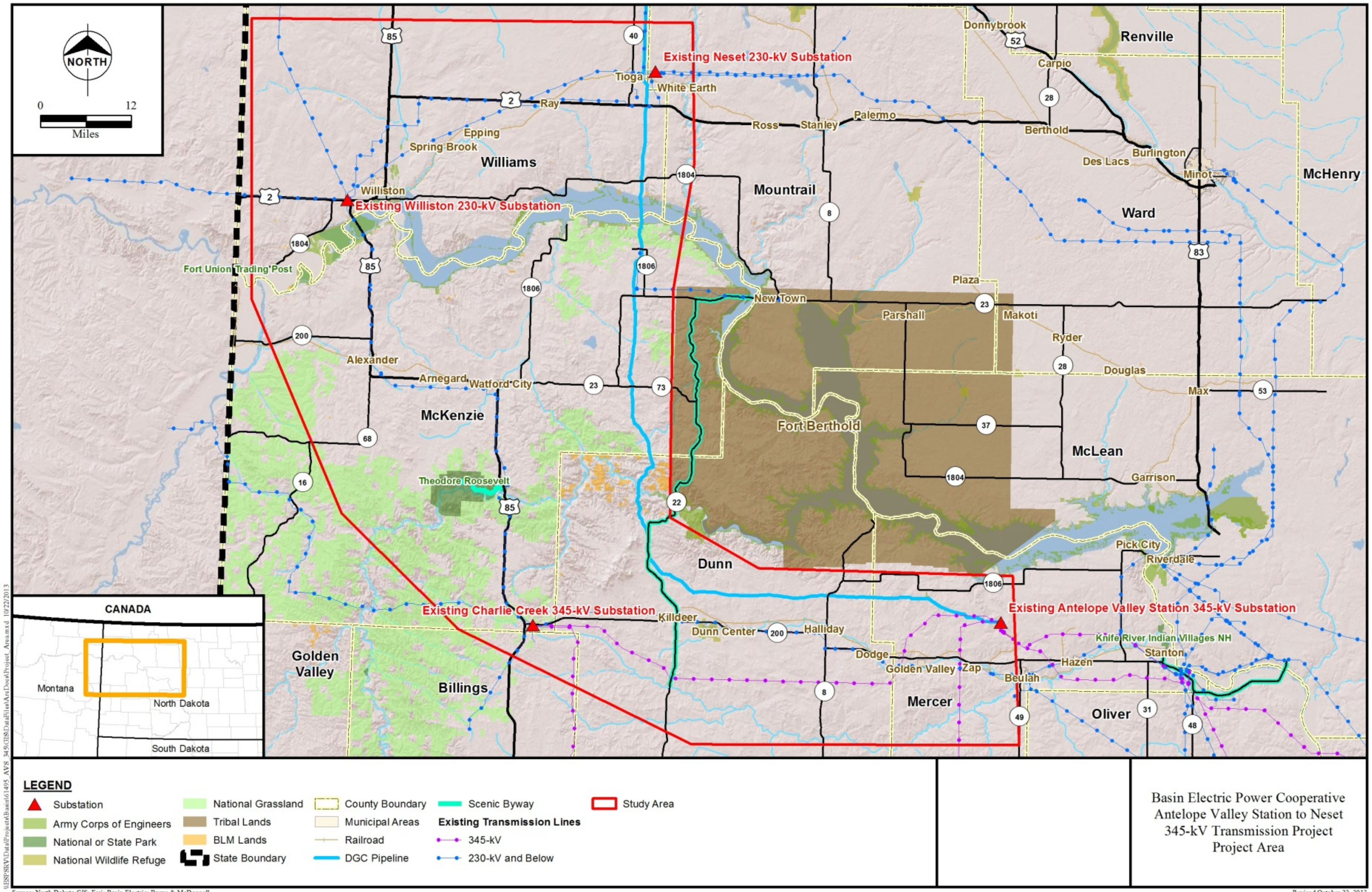
PROJECT INTRODUCTION

Basin Electric proposes to construct, operate, and maintain a new, approximately 278 mile, electrical transmission line connecting the existing AVS, Charlie Creek, Williston, and Neset substations with five newly proposed delivery substations and one switchyard. The number of miles of line could increase to up to 314 miles with an additional 345-kV switchyard depending on the alternative selected. The overall project area identified for this project encompasses parts of Mercer, Dunn, McKenzie, Williams, and Mountrail counties in North Dakota, and is shown in Figure ES-1.

The new 345-kV transmission line would start at the AVS electric generation facility near Beulah, North Dakota, and extend west where it would connect with Basin Electric's existing Charlie Creek 345-kV Substation near Grassy Butte. The line would then extend north where it would connect with Basin Electric's proposed Judson 345-kV Substation near Williston and terminate at Basin Electric's newly proposed Tande 345-kV Substation. Additional 230-kV transmission lines would be constructed between the new Judson Substation and Western's existing Williston Substation, between a new 345/230/115-kV substation, referred to as the Blue Substation, and Western's existing 230-kV transmission line, and also between the new Tande Substation and Basin Electric's existing Neset 230-kV Substation near Tioga, North Dakota.

The new 345-kV Red Substation would be constructed along this segment of the transmission line in the Killdeer area to connect a 63-mile, 345-kV line to a new 345/115-kV Substation (referred to as the White Substation) and the Blue Substation. The Charlie Creek Substation would also be connected by a 51-mile segment to the new Blue Substation. The Blue Substation would be located south of the Missouri River to connect the 345-kV transmission line with Western's 230-kV transmission line. Approximately 10 miles of 230-kV line would connect the Blue Substation with the existing 230-kV Western transmission line. A 345/115-kV substation would also be located at the Blue Substation location to connect to the local 115-kV system. The interconnections described above would provide a delivery loop within the Williston Load Pocket area. This delivery loop provides connections to the local 115-kV system and a reliable power delivery to the McKenzie County load delivery area.

Figure ES-1: Project Area



The White Substation would be constructed along with the Red Substation to the Blue Substation transmission line segment to interconnect with the local 115-kV system for load-serving purposes. A single 345-kV transmission line would extend approximately 24 miles north from the Blue Substation to the proposed Judson Substation near Williston. The Judson Substation would then interconnect with the proposed Tande Substation by a 61-mile line segment (including approximately 31 miles of double circuit with Mountrail-Williams Electric Cooperative [MWEC] 115-kV line) and a 2-mile 230-kV transmission line would interconnect the proposed Judson Substation to Western's existing Williston 230/115-kV Substation. Finally, the proposed Tande Substation would interconnect with the existing Neset Substation by a 1-mile, 230-kV line segment.

This FEIS considers two additional alternatives, similar to the alignment of Alternative B discussed in the DEIS. The primary difference is a double-circuit 345-kV line (Alternative D) or two parallel lines (Alternative E) running 63 miles from the Red Substation near Killdeer to the new White Substation and on to the Blue Substation. These options would also require the additional Killdeer South Switchyard. The Killdeer South Switchyard would interconnect the Red Substation to the existing AVS to Charlie Creek 345-kV transmission line by 12 miles of parallel 345-kV single-circuit transmission line. Table ES-1 describes the components of the alternatives included in this Final EIS.

Table ES-1: Components of Project Alternatives

		Alternative C	Alternative D	Alternative E
Transmission Line Segments	**Kilovolts**	**Miles**	**Miles**	**Miles**
AVS Substation to Red Substation	345	45	45	45
Red Substation to Charlie Creek Switchyard	345	21	21	21
Red Substation to Killdeer South Switchyard	345	N/A	24	24
Charlie Creek Substation to Blue Substation	345	51	N/A	N/A
Red Substation to White Substation	345	27	27	54
White Substation to Blue Substation	345	36	36	72
Blue Substation to Western's 230-kV Line	230	10	10	10
Blue Substation to Judson Substation	345	24	24	24
Judson Substation to Williston Substation	230	2	2	2
Judson Substation to Tande Substation	345	61	61	61
Tande Substation to Neset Substation	230	1	1	1
Total miles		**278**	**251**	**314**

		Alternative C	Alternative D	Alternative E
Substations/Switchyards				
		Acres	**Acres**	**Acres**
AVS Substation (345kV)	Existing	19	19	19
Red Substation (345kV)	Proposed	12	12	12
Charlie Creek Substation (345/230/115kV)	Existing	10	10	10
White Substation (345/115kV)	Proposed	12	12	12
Blue Substation (345/230/115kV)	Proposed	25	25	25
Judson Substation (345/230kV)	Proposed	12	12	12
Williston Substation (230/115kV)	Existing	9	9	9
Tande Substation (345/230kV)	Proposed	12	12	12
Neset Substation (230/115kV)	Existing	8	8	8
Killdeer South Switchyard (345kV)	Proposed	N/A	12	12
Cost Analysis				
Total Cost Transmission		$352 million	$374 million	$399 million
Total Cost Substation		$155 million	$188 million	$188 million
Total Project Cost		$507 million	$562 million	$587 million
Incremental Cost from Alternative C		--------	$55 million	$80 million

LEAD AGENCY - UNITED STATES DEPARTMENT OF AGRICULTURE, RURAL UTILITIES SERVICE

Basin Electric intends to request financial assistance from RUS to construct the AVS to Neset Transmission Project. RUS has determined that the agency's decision to finance the project would constitute a major federal action that may have a significant impact on the environment within the context of the National Environmental Policy Act of 1969 (NEPA). As noted above, RUS is serving as the lead federal agency for the NEPA environmental review of the project, and Western and USFS are serving as cooperating agencies for the project. RUS, in cooperation with Western and USFS, has prepared this FEIS in compliance with the requirements of NEPA and the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508). Western is serving as the lead federal agency for compliance with Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR 800) to take into account effects to historic properties and consultation under Section 7 of the Endangered Species Act (ESA) for threatened and endangered species.

COOPERATING FEDERAL AGENCIES

The roles of the cooperating agencies are described below.

Western Area Power Administration

Basin Electric is requesting to interconnect its proposed project with Western's Williston Substation and Western's Williston to Charlie Creek 230-kV transmission line. Western must consider the interconnection request in accordance with its General Requirements for Interconnection and the Federal Power Act.

Western is also serving as the lead federal agency for compliance with Section 106 of NHPA for cultural resources and for consultation regarding Section 7 of the ESA.

U.S. Forest Service

USFS has proposed to authorize and subsequently issue a Special Use Permit (SUP) under the Federal Land Policy and Management Act, with terms and conditions for the construction, maintenance, and operation of a transmission line through lands administered by USFS on the Little Missouri National Grassland (LMNG).

PURPOSE AND NEED FOR ACTION

Basin Electric proposes to construct, operate, and maintain the project in order to meet projected future electric demand and to maintain electric transmission reliability standards in accordance with the requirements of the North American Reliability Council (NERC). The existing high voltage system in the Williston/Tioga region consists of 230-kV and 115-kV systems that connect to Saskatchewan, Canada; eastern Montana; central North Dakota; and western North Dakota. Outages of any of these paths could cause low voltage criteria violations and overload adjacent transmission lines in the Williston/Tioga region and therefore be in violation of NERC reliability standards.

Basin Electric's August 2011 load forecast indicates an acceleration of growth in the northwestern North Dakota area primarily as a result of oil development of the Bakken Formation (Basin Electric, 2011). Much of the short-term load growth in this area is associated with provision of electrical service to support the rapid expansion of the number of facilities for oil and natural gas production, as well as the supporting infrastructure and services.

The Bakken shale development is currently concentrated in McKenzie, Mountrail, and Williams counties. The level of development that has occurred and is planned for the future will require an increase in electrical transmission capacity and reliability. Initially, studies of power supply for the region and the upper Midwest determined that one 345-kV transmission line would be sufficient to meet future growth and this was the basis for the DEIS. However, current development forecasts are causing load growth forecasts to be revised (KLJ, 2012).

Basin Electric concluded that to meet the revised load forecasts, the AVS to Neset Transmission Project would need to include an additional 345-kV line in McKenzie County. In the region, demand for electric power from the oil industry alone is projected to increase from 9 to 22 percent of Basin Electric's overall power production by 2025. The demand from large commercial operations follows a similar increase as it supports the oil and gas industry. This project would address system capacity issues resulting from rapid growth in the area. In reassessing project need, Basin Electric determined that the single 345-kV line from AVS to Killdeer and from south of Williston to Tioga would not be sufficient to meet the original projected need. Based on the new load forecast, two 345-kV lines would be required in the middle of the project, one from Charlie Creek to south of Williston and one from Killdeer to south of Williston.

REGULATORY FRAMEWORK

The following sections summarize the primary framework that provides the regulatory basis for each federal and state agency's role in approving Basin Electric's project and guides the permitting process.

National Environmental Policy Act

NEPA requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of, and reasonable alternatives to, their proposed actions. For major federal actions that have the potential to cause significant adverse impacts on the environment, NEPA requires agencies undertaking the action to prepare an EIS.

RUS has determined that providing financial assistance for the construction and operation of the project constitutes a major federal action that may significantly affect the quality of the natural and human environment. Therefore, the EIS process is underway in accordance with 7 CFR 1794 Subpart G–Procedure for Environmental Impact Statement.

Endangered Species Act

The ESA of 1973 designates and provides for the protection of threatened and endangered plants and animals and their critical habitat. For the proposed project, Western is acting as the lead agency for Section 7 consultation under the ESA. It is Western's responsibility to consult with the U.S. Department of the Interior, Fish and Wildlife Service (USFWS) to establish a list of protected species; prepare a Biological Assessment (BA) of the potential for the proposed project to adversely affect listed species; provide coordination between state and federal biological resource agencies to assess impacts and propose mitigation; and develop appropriate mitigation strategies for all adverse impacts on federally listed species. If Western determines in its BA that threatened or endangered species would be adversely affected by the project, it would need to request formal consultation with USFWS. USFWS would review the information in the BA and develop a Biological Opinion as to whether or not the proposed project would likely result in jeopardy to the species adversely affected.

National Historic Preservation Act

Section 106 of NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and seek to accommodate historic preservation concerns through consultation among the agency officials and other parties. The goal of consultation is to identify historic properties potentially affected by the undertaking; assess effects; and seek ways to avoid, minimize, or mitigate any adverse effects on historic properties.

Pursuant to 36 CFR 800.2(a)(2), RUS and USFS designated Western as the lead agency for Section 106 review because of the availability of its regional staff to actively direct and participate in consultation. However, to meet their collective responsibilities under NEPA, RUS is designated as the lead because its financial assistance will affect all aspects of the AVS to Neset Transmission Project. Western and RUS have coordinated compliance with Section 106 and NEPA procedures in accordance with 36 CFR 800.8A.

Clean Water Act

Clean Water Act (CWA) Section 404 authorizations may be required for the project, because its construction may result in discharge of dredged and/or fill material into waters of the United States. The U.S. Army Corps of Engineers (USACE) is the agency responsible for determining whether to issue a permit for wetland impacts associated with the project. Receipt of a Section 404 permit and adherence to the terms and conditions of the permit, including any associated compensatory mitigation and best management practices (BMPs) to reduce sedimentation and erosion control, would demonstrate the project’s compliance with the CWA. Specific permit conditions, including the quantity or extent of compensatory mitigation and specific BMPs, would be determined by USACE after a project alternative has been selected. Field inspections of the project would evaluate and verify compliance with permits and the CWA.

Energy Policy Act

The Energy Policy Act of 2005 granted the Federal Energy Regulatory Commission (FERC) the authority to impose mandatory reliability standards on transmission systems. To accomplish this, FERC designated NERC as the Electric Reliability Organization with the authority to establish, approve, and enforce the reliability standards. NERC then delegated the authority for proposing and enforcing the reliability standards to particular regions. For the Basin Electric service area, the Midwestern Reliability Organization (MRO) was designated. The MRO accomplishes its monitoring and enforcement obligations by designating Reliability Coordinators. For the Basin Electric service area, the designated Reliability Coordinator is the Integrated System (IS). It is the responsibility of the IS to adhere to the reliability standards by providing a high-voltage transmission system grid in the region of eastern Montana, North Dakota, and South Dakota.

North Dakota Energy Conversion and Transmission Facility Siting Act

The North Dakota Energy Conversion and Transmission Facility Siting Act states that it is necessary to ensure that the location, construction, and operation of energy conversion facilities and transmission facilities will produce minimal adverse effects on the environment and on the welfare of the citizens of the state by providing that no energy conversion facility or transmission facility shall be located, constructed, and operated within North Dakota without a certificate of site compatibility or a route permit acquired pursuant to Chapter 49-22 of the North Dakota Century Code (North Dakota Century Code, 2011a). It is state policy to site energy conversion facilities and to route transmission facilities in an orderly manner compatible with environmental preservation and the efficient use of resources. According to the Act, sites and routes shall be chosen to 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.

PROPOSED ACTION, ALTERNATIVES, AND SCOPE OF THE EIS

Basin Electric proposes to construct, operate, and maintain approximately 278 miles of transmission line, including 265 miles of new 345-kV electrical line and 13 miles of new 230-kV line, five new substations and equipment additions, but no expansion to four existing substations. The overall project area identified for this project encompasses parts of Mercer, Dunn, McKenzie, Williams, and Mountrail counties in North Dakota.

To efficiently and reliably meet the increasing load demand projections, Basin Electric would need to construct additional transmission capacity, a new interconnection with Western's Williston to Charlie Creek 230-kV transmission line, at least one new 345/345-kV substation and two 345/115-kV load-serving substations. Three alternatives were developed and the no-action alternative was retained for full evaluation in this FEIS. This section provides an overview of these alternatives as well as their potential impacts and mitigation measures.

Three alternatives that would meet project requirements are evaluated in this FEIS. Alternative C combines Alternative A, McKenzie County portions of Alternative B from the DEIS, and three new substations (Red, White, and Blue substations). Alternative D is a modification of Alternative B, with the primary differences being the construction of 345/345-kV double-circuit lines north of Killdeer for 63 miles and the addition of the Red, White, and Blue substations, also included in Alternative C. Alternative E is similar to Alternative D except that it includes the construction of two single-circuit 345-kV lines running parallel north of Killdeer for 63 miles. Both Alternatives D and E would require constructing an approximately 12-mile interconnection of two single-circuit 345-kV lines running parallel between the Red Substation and the Killdeer South Switchyard on the existing AVS to Charlie Creek 345-kV transmission line.

No-action Alternative

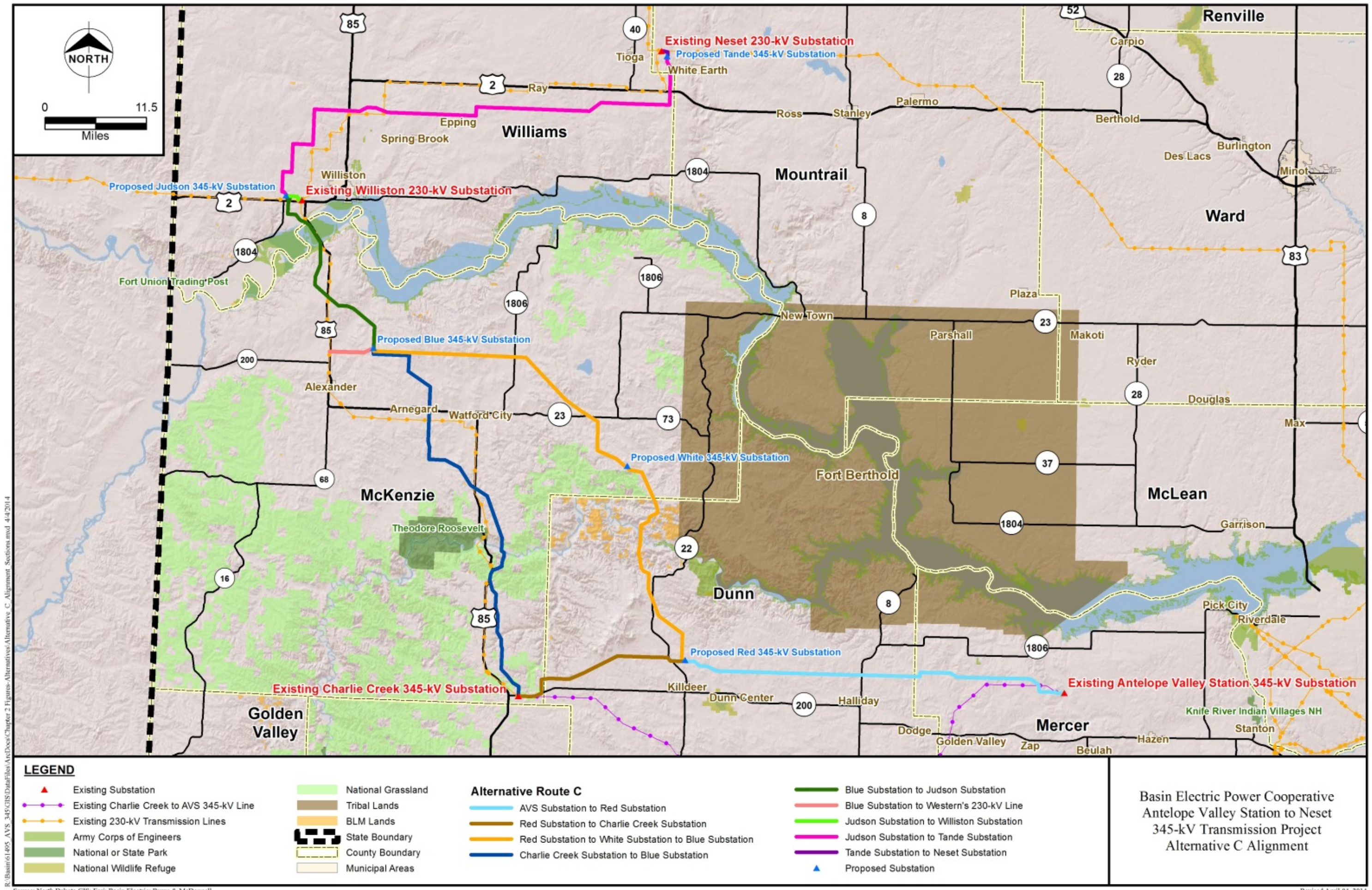
Under the no-action alternative, the AVS transmission line would not be constructed. The existing environment within the project area would remain the same and no land would be used for development of transmission lines, facilities, or substations. The no-action alternative does not meet the identified purpose and need for the project. Under this alternative, it is expected that load growth would increase beyond the load-serving capacity of the existing transmission system for the Williston/Tioga region by 2016, resulting in transmission system reliability issues and violating the criteria established by NERC for transmission reliability in the region.

FEDERALLY PREFERRED ALTERNATIVE

NEPA requires that the lead federal agency identify a preferred alternative. As the lead federal agency, RUS' preferred alternative is shown in Figure ES-2 and is described in more detail below as Alternative C. The preferred alternative is consistent with the purpose and need of the proposal and complies with applicable laws and regulations. Route characteristics and potential impacts of each of the alternatives are discussed in more detail in Chapter 3.

RUS concluded that Alternative C is the preferred alternative because it best meets the project's stated purpose and need while minimizing or mitigating potential impacts. This project is critical to serve the growing load of electric consumers in western North Dakota and eastern Montana in the vicinity of the Bakken oil fields. The preferred alternative best meets both the capacity needs (a forecasted load of 909 megawatts [MW] expected to occur by 2018-2019 winter season) and reliability standards (adequacy and security). Given the possibilities of transmission line outages and the required application of NERC/MRO standards, a looped system like the one provided by Alternative C is much more reliable than either a double-circuit transmission line presented in Alternative D or two parallel lines presented in Alternative E. It is likely that over time an event, like a tornado in summer or icing in the winter, will occur in the area of the proposed lines. While it is less likely that such an event would affect a single area when it occurs, it is likely to take out a portion of the double-circuit line (Alternative D) or both the parallel lines (Alternative E). Such a loss of both 345-kV lines to the load centers near Watford City and Williston, North Dakota, would result in interruptions to large numbers of electrical customers. In contrast, with the looped system proposed under Alternative C, the likelihood of a severe event resulting in an outage of both 345-kV lines proceeding northward would be greatly reduced because the critical high-voltage lines are not on common structures or near each other. This aspect of Alternative C was a significant consideration in the identification of the preferred alternative along with the lowest cost alternative. Further Alternative C presents geographical separation that provides for future growth in the area of western McKenzie County.

Figure ES-2: Alternative C Overview Map



Western and USFS concur with RUS' selection of Alternative C as the preferred alternative. Concurrence of both agencies is dependent on the proponent implementing all mitigation measures outlined in Appendix A and obtaining a SUP from USFS for portions of the line that cross the LMNG.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

According to 40 CFR 1505.2(b), the agency shall identify which alternative is considered to be "environmentally preferable." In the case of the AVS to Neset Transmission Project, Alternative D is considered the environmentally preferable alternative. Alternative D was determined to be environmentally preferable because it would impact the least acreage of any of the action alternatives, which implies that it would have the fewest environmental impacts. In addition, this alternative would have no impacts on Theodore Roosevelt National Park. However, Alternative D does not meet the overall project purpose and need as well as Alternative C and thus was not selected as the agency preferred alternative.

ALTERNATIVES CONSIDERED IN THE FEIS

NEPA requires that an EIS consider a full range of alternatives to the proposed action and fully evaluate all reasonable alternatives. In addition, the EIS must also consider the no-action alternative. For the AVS to Neset Transmission Project, alternatives consist of individual route segments that, when combined, form various complete route alignment alternatives within each macro-corridor between the proposed endpoints. Figures ES-2, ES-3, and ES-4 show the individual, 1,000-foot-wide alternative route corridors located within the 6-mile-wide macro-corridors that were identified for the proposed project. The following section provides a discussion of the action alternatives considered in this FEIS.

Alternative C

Alternative C includes approximately 278 miles of transmission line, including 265 miles of new 345-kV transmission line and 13 miles of new 230-kV line, five new substations and additional equipment, but no expansion, to four existing substations (see Figure ES-2). Alternative C includes the following characteristics with each segment color-coded on Figure ES-2:

- 45 miles of 345-kV transmission line connecting the existing AVS Substation to a new Red Substation near Killdeer (light blue), including 2.3 miles immediately west of AVS Substation where the proposed line would be double-circuited[1] with an existing line to facilitate future coal mine operations

[1] MRO standard TPL-503-MRO-01, System Performance, Section R1.2 provides for a variance from the 1 mile limitation on double-circuiting on a case-by-case basis, including at substation entrances as in this case.

- 21 miles of 345-kV transmission line connecting the new Red Substation to the existing Charlie Creek Substation (brown)
- 27 miles of 345-kV transmission line connecting the new Red Substation to the new White Substation and 36 miles of 345-kV transmission line connecting the White Substation to the new Blue Substation (yellow)
- 51 miles of 345-kV transmission line from the Charlie Creek Substation to the Blue Substation (dark blue)
- 24 miles of 345-kV transmission line from the Blue Substation to the proposed Judson Substation (dark green)
- Two 230-kV single-circuit transmission lines running parallel for 5 miles connecting the Blue Substation to Western's 230-kV transmission line (orange)
- 2 miles of 230/115-kV double-circuit transmission line connecting the proposed Judson Substation to the Williston Substation (light green)
- 61 miles of 345-kV transmission line connecting the proposed Judson Substation to the proposed Tande Substation, approximately 31 miles of which would be double-circuited with a MWEC 115-kV line associated with other regional improvement projects (pink)
- 1 mile of 230-kV transmission line connecting the proposed Tande Substation to the Neset Substation (purple)

Judson, Tande, and Blue 345/230-kV Substations

The proposed Judson and Blue substations would be constructed to interconnect the proposed 345-kV lines to Western's Williston Substation and to Western's Williston to Charlie Creek 230-kV transmission line along U.S. Highway 85 south of the Missouri River, respectively. Basin Electric's Tande Substation would be constructed to interconnect the 345-kV transmission system to the existing 230-kV system at Basin Electric's Neset Substation located near Tioga. The Judson and Tande substations would each occupy approximately 12 acres of land. The Blue Substation consists of both 345/230-kV and 345/115-kV equipment, therefore a 25 acre parcel would be required.

Red, White, and Blue 345/115-kV Substations

To interconnect the proposed 345-kV lines into the local 115-kV system and serve the load demands of the Williston Load Pocket and surrounding area, three new 345/115-kV substations would be constructed along the 345-kV system (Figure ES-2). The Red Substation would be located near Killdeer. The White Substation would be located north of the Red Substation, east of Watford City. The Blue Substation would be located south of the Missouri River. The Red Substation and White Substation would occupy approximately 12 acres of land each. The Blue

Substation site would be approximately 25 acres because it would also include a 345/230-kV component as noted above.

Route Alignment

The alignment for the 345-kV lines and associated facilities are shown on Figure ES-2. Throughout the environmental review process, Basin Electric continued engineering development of the project and worked with agencies and landowners to address potential project-related concerns. As final design, right-of-way (ROW) acquisition, and construction progress, Basin Electric will continue to work with agencies and landowners to address site-specific concerns. Minor adjustments are likely to occur. However, they would be designed to address concerns and minimize overall impacts, resulting in little if any changes to the potential impacts of the project.

Alternative D

Alternative D is similar to Alternative C with the primary differences being the construction of a 345/345-kV double-circuit lines north of Killdeer for 63 miles to the Blue Substation, the additional Killdeer South 345-kV Switchyard, a 345-kV transmission line connection between the Red Substation and the Killdeer South Switchyard, and no line construction between the existing Charlie Creek Substation and the new Blue Substation. Alternative D would include construction of approximately 251 miles of transmission line beginning at the AVS Substation and ending at the Neset Substation, including 13 miles of new 230-kV line and 238 miles of new 345-kV transmission line, of which 65.3 miles would be 345/345-kV double-circuit. Alternative D would also include construction of five new substations, one switchyard, and additional equipment but no expansion to the four existing substations. Alternative D includes the following characteristics with each segment color coded on Figure ES-3:

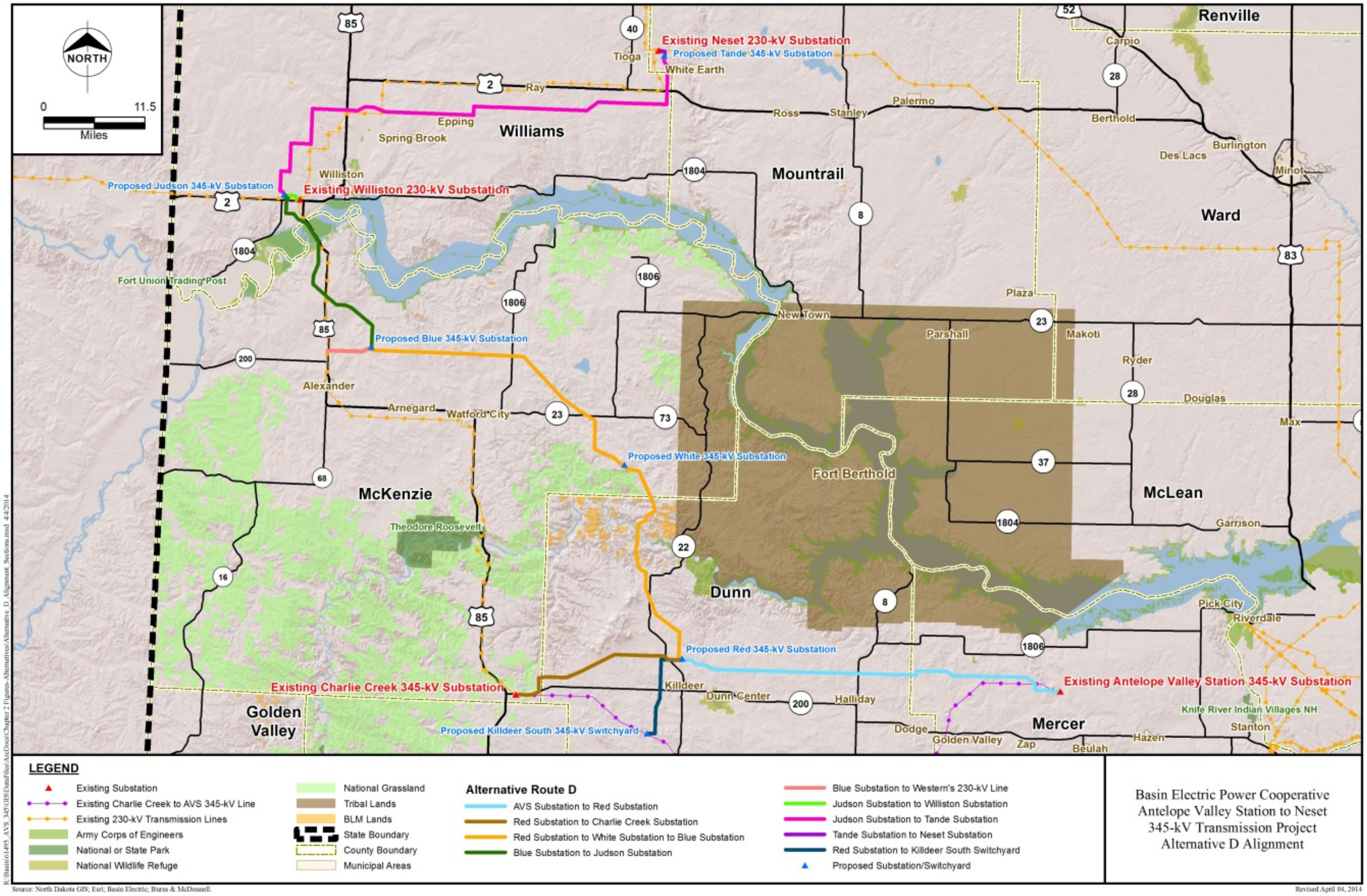
- 45 miles of 345-kV transmission line connecting the existing AVS Substation to a new Red Substation near Killdeer (light blue), including 2.3 miles immediately west of AVS where the proposed line would be double-circuited with an existing line to facilitate future coal mine operations
- 21 miles of 345-kV transmission line connecting the Red Substation to the existing Charlie Creek Substation (brown)
- A new Killdeer South Switchyard south of Killdeer along Basin Electric's existing AVS to Charlie Creek 345-kV transmission line
- Two 345-kV single-circuit transmission lines running parallel for approximately 12 miles between the Red Substation and the new Killdeer South Switchyard (blue)
- 27 miles of 345/345-kV double-circuit transmission line connecting the Red Substation to the new White Substation and 36 miles of 345/345-kV double-circuit

transmission line connecting the White Substation to the new Blue Substation (yellow)

- 24 miles of 345-kV transmission line from the Blue Substation to the proposed Judson Substation (dark green)
- Two 230-kV, single-circuit transmission lines running parallel for 5 miles connecting the Blue Substation to Western's 230-kV transmission line (orange)
- 2 miles of 230/115-kV double-circuit transmission line connecting the proposed Judson Substation to the Williston Substation (light green)
- 61 miles of 345-kV transmission line connecting the proposed Judson Substation to the proposed Tande Substation, approximately 31 miles of which would be double-circuited with a MWEC 115-kV line associated with other regional improvement projects (pink)
- 1 mile of 230-kV transmission line connecting the proposed Tande Substation to the Neset Substation (purple)

Additional substation facilities for Alternative D would be the same as those discussed previously for Alternative C.

Figure ES-3: Proposed Alternative D for AVS to Neset Transmission Project



Alternative E

Alternative E would include constructing two parallel 345-kV lines between the Red and Blue substations, along the eastern corridor. Alternative E would be the same as Alternative D with the primary difference being the construction of two parallel 345-kV transmission lines north of Killdeer for 63 miles rather than a double-circuit 345/345-kV line proposed as part of Alternative D. Alternative E would include construction of approximately 314 miles of transmission line beginning at the AVS Substation and ending at the Neset Substation, including 13 miles of new 230-kV line and 301 miles of new 345-kV transmission line, of which 126 miles (63 miles times two) would be two single-circuit 345-kV parallel lines. Alternative E would also include construction of five new substations, one switchyard, and additional equipment but no expansion to four existing substations. Alternative E includes the following characteristics with each segment color coded on Figure ES-4:

- 45 miles of 345-kV transmission line connecting the AVS Substation to a new Red Substation near Killdeer (light blue), including 2.3 miles immediately west of the AVS Substation where the proposed line would be double-circuited with an existing line to facilitate future coal mine operations
- 21 miles of 345-kV transmission line connecting the Red Substation to the existing Charlie Creek Substation (brown)
- A new Killdeer South Switchyard south of Killdeer along Basin Electric's existing AVS to Charlie Creek 345-kV transmission line
- Two 345-kV single-circuit transmission lines running parallel for approximately 12 miles between the Red Substation and the new Killdeer South Switchyard (blue)
- 27 miles of two single-circuit parallel 345-kV transmission lines connecting the Red Substation to the new White Substation and 36 miles of two single-circuit, parallel 345-kV transmission lines connecting the White Substation to the new Blue Substation (yellow)
- 24 miles of 345-kV transmission line from the Blue Substation to the proposed Judson Substation (dark green)
- Two 230-kV single-circuit transmission lines running parallel for 5 miles connecting the Blue Substation to Western's 230-kV transmission line (orange)
- 2 miles of 230/115-kV double-circuit transmission line connecting the proposed Judson Substation to the Williston Substation (light green)
- 61 miles of 345-kV transmission line connecting the proposed Judson Substation to the proposed Tande Substation, approximately 31 miles of which would be double-circuited with a MWEC 115-kV line associated with other regional improvement projects (pink)

- 1 mile of 230-kV transmission line connecting the proposed Tande Substation to the Neset Substation (purple)

Additional substation facilities for Alternative E would also be the same as those discussed previously for Alternative C.

POTENTIAL IMPACTS

Potential direct and indirect impacts were identified and evaluated for each aspect of the natural and built environments potentially affected by the project. The potential impacts of the project route alternatives and the no-action alternative are summarized in Table ES-2.

MITIGATION MEASURES FOR POTENTIAL IMPACTS

Numerous mitigation measures and BMPs have been incorporated into the development and construction of the proposed project to protect environmental and human resources. These measures are varied and may be intended to address specific resource concerns, be more general in nature, or address multiple areas of concern for different resources. Minimizing measures range from avoiding sensitive resources during project and route development to conditions for restoring the project ROW following construction. Mitigation measures and BMPs identified to date that would be implemented as part of the project are discussed in Appendix A of this document.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible commitment of resources refers to the loss of future options for resource development or management, especially of nonrenewable resources such as cultural resources. Construction and operation of the proposed project would require up to 5,600 (Alternative E) acres for the ROW, which would restrict some types of development in the future. This would include federal, state and private lands. Most of these areas are in agricultural production or natural areas and in most cases these uses would continue after the transmission line and facilities are constructed and operating. The introduction of new transmission lines would permanently change the visual landscape in some areas. The construction of the project would require the irretrievable commitment of non-recyclable building materials and fuel consumed by construction equipment.

Figure ES-4: Proposed Alternative E for AVS to Neset Transmission Project

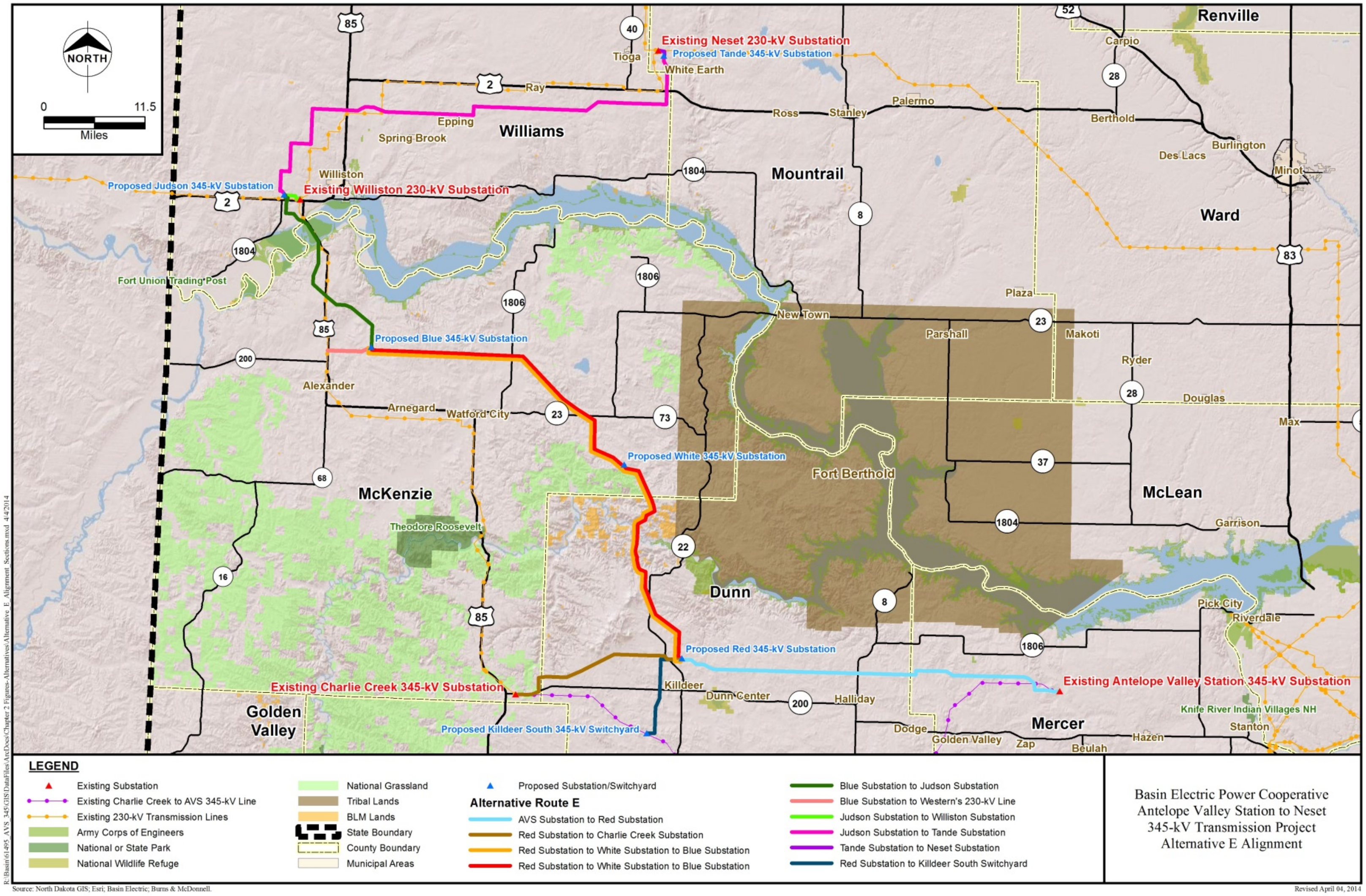


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Table ES-2: Comparison of Alternatives

Resource	Alternative C		Alternative D		Alternative E		
Impact	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**No-action Alternative**
Land Use	Approximately 4,956.8 acres of right-of-way (ROW) would be required and would be restricted from some types of future development. ROW would include 413.3 acres of state and federal properties. ROW would include approximately 152.9 acres of Little Missouri National Grasslands (LMNG), 57.9 acres of U.S. Army Corps of Engineers (USACE) property, approximately 202 acres of school trust land, and cross within approximately 200 feet of Bureau of Land Management (BLM) land. A Special Use Permit (SUP) would be obtained from the U.S. Forest Service (USFS) for crossing the LMNG. Outgrant would be obtained from USACE for crossing USACE lands. Approximately 1.4 acres would be occupied by transmission line structures and 73 acres would be permanently converted from agriculture use to utility use for the five new substations.	Loss of use for landowners within ROW on private lands during construction. Access restrictions and/or loss of use within ROW during construction on state or federal properties. Disturbance from heavy equipment may result in some crop loss during construction Substation construction-related impacts such as increased noise and dust on surrounding agricultural lands.	Approximately 4,458.6 acres of ROW would be required and would be restricted from some types of future development. ROW would include 258.8 acres of state and federal properties. ROW would include approximately 57.0 acres of LMNG, 57.9 acres of USACE property, approximately 143.9 acres of school trust land, and cross within approximately 200 feet of BLM land. A SUP would be obtained from USFS for crossing the LMNG. Outgrant would be obtained from USACE for crossing USACE lands. Approximately 1.3 acres would be occupied by transmission line structures and 85 acres would be permanently converted from agriculture use to utility use for the six new substations/switchyards.	Loss of use for landowners within ROW on private lands during construction. Access restrictions and/or loss of use within ROW during construction on state or federal properties. Disturbance from heavy equipment may result in some crop loss during construction Substation/switchyard construction-related impacts such as increased noise and dust on surrounding agricultural lands.	Approximately 5,597.3 acres of ROW would be required and would be restricted from some types of future development. ROW would include 324.8 acres of state and federal properties. ROW would include approximately 57.0 acres of LMNG, 57.9 acres of USACE property, approximately 209.9 acres of school trust land, and cross within approximately 200 feet of BLM land. A SUP would be obtained from USFS for crossing the LMNG. Outgrant would be obtained from USACE for crossing USACE lands. Approximately 1.6 acres would be occupied by transmission line structures and 85 acres would be permanently converted from agriculture use to utility use for the six new substations/switchyards.	Loss of use for landowners within ROW on private lands during construction. Access restrictions and/or loss of use within ROW during construction on state or federal properties. Disturbance from heavy equipment may result in some crop loss during construction Substation/switchyard construction-related impacts such as increased noise and dust on surrounding agricultural lands.	No direct effect; indirect effect if future land uses were impeded by lack of increased electrical supply necessary to meet demands of development.
Socioeconomic Resources	Economic benefit to businesses and surrounding communities from increased electrical capacity and reliability. Potential changes in property values with six residences within 500 feet of the route. Property tax revenues of about $83,130 annually to study area counties.	Economic benefit to local communities during construction as a result of construction crews generating local revenue.	Economic benefit to businesses and surrounding communities from increased electrical capacity and reliability. Potential changes in property values with five residences within 500 feet of the route. Property tax revenues of about $74,900 annually to study area counties.	Economic benefit to local communities during construction as a result of construction crews generating local revenue.	Economic benefit to businesses and surrounding communities from increased electrical capacity and reliability. Potential changes in property values with six residences within 500 feet of the route. Property tax revenues of about $93,660 annually to study area counties.	Economic benefit to local communities during construction as a result of construction crews generating local revenue.	No direct effect; indirect effect if no improved electric reliability and capacity. This would harm local communities by limiting future development opportunities.
Environmental Justice	No disproportionate and adverse impacts to environmental justice populations are anticipated.	No disproportionate and adverse impacts to environmental justice populations are anticipated.	No disproportionate and adverse impacts to environmental justice populations are anticipated.	No disproportionate and adverse impacts to environmental justice populations are anticipated.	No disproportionate and adverse impacts to environmental justice populations are anticipated.	No disproportionate and adverse impacts to environmental justice populations are anticipated.	No impacts to environmental justice populations are anticipated.

Resource	Alternative C		Alternative D		Alternative E		
Impact	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**No-action Alternative**
Recreation and Tourism	Approximately 413.3 acres of state or federal land potentially open to dispersed recreational activities such as hunting would be located within the ROW. One USFS campground (Summit Campground) would be located within 0.5 mile of the ROW. Conversion of 1.4 acres of land for transmission line structures and 73 acres of land for the five substations would remove it from further land use, including recreational use.	Increased noise, dust, and traffic congestion in recreational areas. Temporary access restrictions during construction on public use areas. Increased noise, ground disturbance, access restrictions, and human activity may impede hunting activities around the substation sites.	Approximately 258.8 acres of state or federal land potentially open to dispersed recreational activities such as hunting would be located within the ROW. Conversion of 1.3 acres of land for transmission line structures and 85 acres of land for the six substations/switchyards would remove it from further land use, including recreational use.	Increased noise, dust, and traffic congestion in recreational areas. Temporary access restrictions during construction on public use areas. Increased noise, ground disturbance, access restrictions, and human activity may impede hunting activities around the substation/switchyard sites.	Approximately 324.8 acres of state or federal land potentially open to dispersed recreational activities such as hunting would be located within the ROW. Conversion of 1.6 acres of land for transmission line structures and 85 acres of land for the six substations/switchyards would remove it from further land use, including recreational use.	Increased noise, dust, and traffic congestion in recreational areas. Temporary access restrictions during construction on public use areas. Increased noise, ground disturbance, access restrictions, and human activity may impede hunting activities around the substation/switchyard sites.	No effect.
Utility Infrastructure and Transportation	No long-term effects on utility infrastructure are anticipated. No long-term effects on transportation are anticipated. An air space obstruction would result in the vicinity of the Sloulin Field International Airport in the city of Williston. Approvals would be necessary from the Federal Aviation Administration (FAA). No obstruction would result if the airport is relocated as proposed. Basin Electric would coordinate with BNSF Railway Company (BNSF) to minimize or avoid potential impacts on railroads in areas where the transmission line would be strung over existing railroad tracks.	Existing utility infrastructure would be traversed during construction activities and may be temporarily taken out of service. During substation/switchyard construction, short-term interruption of existing transmission lines would be coordinated to avoid any service outages. The movement of heavy material haul trucks and road closures during construction activities, both of the transmission line and substations, may result in short-term adverse impacts. Basin Electric would also coordinate with BNSF to string the transmission line over existing railroad tracks.	No long-term effects on utility infrastructure are anticipated. No long-term effects on transportation are anticipated. An air space obstruction would result in the vicinity of the Sloulin Field International Airport in the city of Williston. Approvals would be necessary from FAA. No obstruction would result if the airport is relocated as proposed. Basin Electric would coordinate with BNSF to minimize or avoid potential impacts on railroads in areas where the transmission line would be strung over existing railroad tracks.	Existing utility infrastructure would be traversed during construction activities and may be temporarily taken out of service. During substation/switchyard construction, short-term interruption of existing transmission lines would be coordinated to avoid any service outages. The movement of heavy material haul trucks and road closures during construction activities, both of the transmission line and substations, may result in short-term adverse impacts. Basin Electric would also coordinate with BNSF in order to string the transmission line over existing railroad tracks.	No long-term effects on utility infrastructure are anticipated. No long-term effects on transportation are anticipated. Air space obstruction would result in the vicinity of the Sloulin Field International Airport in the city of Williston. Approvals would be necessary from FAA. No obstruction would result if the airport is relocated as proposed. Basin Electric would coordinate with BNSF to minimize or avoid potential impacts on railroads in areas where the transmission line would be strung over existing railroad tracks.	Existing utility infrastructure would be traversed during construction activities and may be temporarily taken out of service. During substation/switchyard construction, short-term interruption of existing transmission lines would be coordinated to avoid any service outages. The movement of heavy material haul trucks and road closures during construction activities, both of the transmission line and substations, may result in short-term adverse impacts. Basin Electric would also coordinate with BNSF in order to string the transmission line over existing railroad tracks.	Significant utility system failures and damage if capacity is not increased and demand increases, as projected. Electrical equipment used for oil and gas pipelines could be limited by reliability thereby causing more distribution via truck, causing road damage.
Geology and Landforms	Displacement of 2.4 million cubic feet of soil and rock during construction.	Potential for erosion on steeper slopes during construction.	Displacement of 2.2 million cubic feet of soil and rock during construction.	Potential for erosion on steeper slopes during construction.	Displacement of 2.7 million cubic feet of soil and rock during construction.	Potential for erosion on steeper slopes during construction.	No effect.

Resource	Alternative C		Alternative D		Alternative E		
Impact	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**No-action Alternative**
Soils and Farmland	Approximately 1.4 acres of soil surface (0.0009-acre per structure) would be permanently removed from production. Farmland for crop production permanently impacted only at structure locations. Any farmland within the five substation sites (73 acres total) would be permanently converted to utility use.	Approximately 1,754 acres of temporary soil disturbance to prime farmland and farmland of statewide importance during construction within the ROW, with temporary loss of crop production.	Approximately 1.3 acres of soil surface (0.0009-acre per structure) would be permanently removed from production. Farmland for crop production permanently impacted only at structure locations. Any farmland within the six substation/switchyard sites (85 acres total) would be permanently converted to utility use.	Approximately 1,737 acres of temporary soil disturbance to prime farmland and farmland of statewide importance during construction within the ROW, with temporary loss of crop production.	Approximately 1.6 acres of soil surface (0.0009-acre per structure) would be permanently removed from production. Farmland for crop production permanently impacted only at structure locations. Any farmland within the six substation/switchyard sites (85 acres total) would be permanently converted to utility use.	Approximately 1,900 acres of temporary soil disturbance to prime farmland and farmland of statewide importance during construction within the ROW, with temporary loss of crop production.	No effect.
Water Resources	No effects anticipated. Approximately 14.3 acres of open water occur within the ROW; 19 perennial waterways and 16.5 acres of Federal Emergency Management Agency (FEMA) floodplain would be crossed, but all would be spanned. A Section 10 permit would be obtained from USACE for crossing the Missouri River.	Potential sedimentation and runoff caused by construction.	No effects anticipated. Approximately 12.7 acres of open water occur within the ROW; 17 perennial waterways and 16.5 acres of FEMA floodplain would be crossed, but all would be spanned. A Section 10 permit would be obtained from USACE for crossing the Missouri River.	Potential sedimentation and runoff caused by construction.	No effects anticipated. Approximately 14.5 acres of open water occur within the ROW; 20 perennial waterways and 16.5 acres of FEMA floodplain would be crossed, but all would be spanned. A Section 10 permit would be obtained from USACE for crossing the Missouri River.	Potential sedimentation and runoff caused by construction.	No effect.
Vegetation	Approximately 183 acres of woodland potentially removed within ROW, depending on slope. Approximately 1.4 new acres of vegetation permanently removed within ROW at structure locations. Potential introduction of noxious weeds within ROW to be avoided by weed mitigation measures. Approximately 73 acres of vegetation removed from the five substation sites and converted to utility use.	Disturbance of vegetation within the ROW and along construction access trails during construction. Natural Heritage Inventory sensitive ecological community potentially impacted.	Approximately 120 acres of woodland potentially removed within ROW, depending on slope. Approximately 1.3 acres of vegetation permanently removed within ROW at structure locations. Potential introduction of noxious weeds within ROW to be avoided by weed mitigation measures. Approximately 85 acres of vegetation removed from the six substation/switchyard sites and converted to utility use.	Disturbance of vegetation within the ROW and along construction access trails during construction. Natural Heritage Inventory sensitive ecological community potentially impacted.	Approximately 189 acres of woodland potentially removed within ROW, depending on slope. Approximately 1.6 acres of vegetation permanently removed within ROW at structure locations. Potential introduction of noxious weeds within ROW to be avoided by weed mitigation measures. Approximately 85 acres of vegetation removed from the six substation/switchyard sites and converted to utility use.	Disturbance of vegetation within the ROW and along construction access trails during construction. Natural Heritage Inventory sensitive ecological community potentially impacted.	No effect.
Wildlife	Loss of forested habitat as a result of the removal of up to 183 acres of woodland within the ROW. Some mortality of small, less-mobile species. Potential avian species collisions with power lines. Loss of 73 acres of habitat within the five substation sites.	Disturbance within and near the ROW during construction due to human intrusion, noise, and construction activity. Temporary loss of habitat due to vegetation clearing and disturbance within ROW during construction. Disturbance to nearby species due to construction activities at the five substation sites.	Loss of forested habitat as a result of the removal of up to 120 acres of woodland within the ROW. Some mortality of small, less-mobile species. Potential avian species collisions with power lines. Loss of 85 acres of habitat within the six substation/switchyard sites.	Disturbance within and near the ROW during construction due to human intrusion, noise, and construction activity. Temporary loss of habitat due to vegetation clearing and disturbance within ROW during construction. Disturbance to nearby species due to construction activities at the six substation sites.	Loss of forested habitat as a result of the removal of up to 189 acres of woodland within the ROW. Some mortality of small, less-mobile species. Potential avian species collisions with power lines. Loss of 85 acres of habitat within the six substation/switchyard sites.	Disturbance within and near the ROW during construction due to human intrusion, noise, and construction activity. Temporary loss of habitat due to vegetation clearing and disturbance within ROW during construction. Disturbance to nearby species due to construction activities at the six substation/switchyard sites.	No effect.

Resource	Alternative C		Alternative D		Alternative E		
Impact	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**No-action Alternative**
Aquatic Resources	Change in local aquatic habitats in areas where vegetation would be cleared along shoreline.	Potential for sedimentation, runoff, and spills during construction; to be avoided by use of BMPs.	Change in local aquatic habitats in areas where vegetation would be cleared along shoreline.	Potential for sedimentation, runoff, and spills during construction; to be avoided by use of BMPs.	Change in local aquatic habitats in areas where vegetation would be cleared along shoreline.	Potential for sedimentation, runoff, and spills during construction; to be avoided by use of BMPs.	No effect.
Special Status Species	Will not affect the gray wolf, pallid sturgeon, or the black-footed ferret. This proposed project may affect, but is not likely to adversely affect the Sprague's pipit, piping plover, critical habitat for the piping plover, interior least tern, whooping crane, northern long-eared bat, Dakota skipper, or the rufa red knot. This effects determination is pending the outcome of consultation with the U.S. Fish and Wildlife Service (USFWS) and USFS.	Potential impacts on grassland habitat within ROW during construction may result in temporary habitat loss for Sprague's pipit.	Will not affect the gray wolf, pallid sturgeon, or the black-footed ferret. This proposed project may affect, but is not likely to adversely affect the Sprague's pipit, piping plover, critical habitat for the piping plover, interior least tern, whooping crane, northern long-eared bat, Dakota skipper, or the rufa red knot. This effects determination is pending the outcome of consultation with USFWS and USFS.	Potential impacts on grassland habitat within ROW during construction	Will not affect the gray wolf, pallid sturgeon, or the black-footed ferret. This proposed project may affect, but is not likely to adversely affect the Sprague's pipit, piping plover, critical habitat for the piping plover, interior least tern, whooping crane, northern long-eared bat, Dakota skipper, or the rufa red knot. This effects determination is pending the outcome of consultation with USFWS and USFS.	Potential impacts on grassland habitat within ROW during construction	No effect.
Wetlands	Approximately 33 acres of wetland within ROW. Wetlands would be spanned and no structures would be placed in wetlands where practicable. A nationwide permit (NWP) 12 would be obtained from USACE for any wetland impacts.	Potential sedimentation and runoff caused by construction near wetlands.	Approximately 31 acres of wetland within ROW. Wetlands would be spanned and no structures would be placed in wetlands where practicable. NWP 12 would be obtained from USACE for any wetland impacts.	Potential sedimentation and runoff caused by construction near wetlands.	Approximately 40 acres of wetland within ROW. Wetlands would be spanned and no structures would be placed in wetlands where practicable. NWP 12 would be obtained from USACE for any wetland impacts.	Potential sedimentation and runoff caused by construction near wetlands.	No effect.
Aesthetics and Visual Resources	Change in the visual characteristics and viewshed within project area and for residents located near the transmission line (six residences within 500 feet). Additional visual element added to the landscape at the five substation sites.	Visibility of construction vehicles and equipment along ROW. Disturbance to vegetation and soil surfaces, would be restored when construction is completed.	Change in the visual characteristics and viewshed within project area and for residents located near the transmission line (five residences within 500 feet). Additional visual element added to the landscape at the six substation/switchyard sites.	Visibility of construction vehicles and equipment along ROW. Disturbance to vegetation and soil surfaces would be restored when construction is completed.	Change in the visual characteristics and viewshed within project area and for residents located near the transmission line (six residences within 500 feet). Additional visual element added to the landscape at the six substation/switchyard sites.	Visibility of construction vehicles and equipment along ROW. Disturbance to vegetation and soil surfaces would be restored when construction is completed	No effect.

Resource	Alternative C		Alternative D		Alternative E		
Impact	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**No-action Alternative**
Cultural Resources	286 cultural resources have been identified within or immediately adjacent to the 1,000-foot preliminary area of potential effect (APE). Studies to identify archeological sites and tribal cultural resources are ongoing and will be directed by the Programmatic Agreement (PA) to be executed to conclude review under Section 106 of the National Historic Preservation Act (NHPA). Cumulative losses of cultural resources are unlikely because the project seeks to successfully avoid affecting such cultural resources, especially those that are listed or eligible resources. The Killdeer Mountain Battlefield (KMB) is the only affected historic property that has been identified to date in the APE. The project would have less than adverse impacts because past activities already have significantly altered the character, setting, and feeling of the historic property.	Temporary impacts to cultural resources are unlikely because the project seeks to successfully avoid affecting such cultural resources, especially those that are listed or eligible resources.	88 cultural resources have been identified within or immediately adjacent to the 1,000-foot preliminary APE. Cumulative loss of cultural resources is unlikely because the project seeks to successfully avoid affecting such cultural resources, especially those that are listed or eligible resources. The KMB is the only affected historic property that has been identified to date in the APE. The project would have less than adverse impacts because past activities already have significantly altered the character, setting, and feeling of the historic property.	Temporary impacts to cultural resources are unlikely because the project seeks to successfully avoid affecting such cultural resources, especially those that are listed or eligible resources.	88 cultural resources have been identified within or immediately adjacent to the 1,000-foot preliminary APE. Cumulative loss of cultural resources is unlikely because the project seeks to successfully avoid affecting such cultural resources, especially those that are listed or eligible resources. The KMB is the only affected historic property that has been identified to date in the APE. The project would have less than adverse impacts because past activities already have significantly altered the character, setting, and feeling of the historic property.	Temporary impacts to cultural resources are unlikely because the project seeks to successfully avoid affecting such cultural resources, especially those that are listed or eligible resources.	No effect.
Noise	No effect.	Increases in noise levels along the ROW from construction vehicles and equipment. Increases in noise levels for nearby residences during construction of the five substations.	No effect.	Increases in noise levels along the ROW from construction vehicles and equipment. Increases in noise levels for nearby residences during construction of the six substations/switchyards.	No effect.	Increases in noise levels along the ROW from construction vehicles and equipment. Increases in noise levels for nearby residences during construction of the six substations/switchyards.	No effect.
Air Quality and Greenhouse Gas (GHG) Emissions	Minimal increase in GHG levels as a result of maintenance activities during operation of the transmission line and substations.	Increases in fugitive dust caused by construction activity, vehicles, and equipment. Increased emissions, including GHG levels, from construction vehicles and equipment.	Minimal increase in GHG levels as a result of maintenance activities during operation of transmission line and substations/switchyards.	Increases in fugitive dust caused by construction activity, vehicles, and equipment. Increased emissions, including GHG levels, from construction vehicles and equipment.	Minimal increase in GHG levels as a result of maintenance activities during operation of the transmission line and substations/switchyards.	Increases in fugitive dust caused by construction activity, vehicles, and equipment. Increased emissions, including GHG levels, from construction vehicles and equipment.	No effect.

Resource	Alternative C		Alternative D		Alternative E		
Impact	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**No-action Alternative**
Public Health and Safety	Long-term adverse effects are anticipated to be negligible to minor. EMFs would be well below identified thresholds to protect the public. Standard operating and safety procedures would be employed to ensure the safe delivery of services. The operation of farm equipment near proposed structures could result in unnecessary contact and/or damage to machinery and/or operators.	Hazardous and/or potentially hazardous materials may be encountered during construction, or exposure to energized transmission lines. These impacts are likely to be minor with the implementation of construction action plans that ensure worker safety, proper handling of hazardous materials, and spill cleanup.	Long-term adverse effects are anticipated to be negligible to minor. EMFs would be well below identified thresholds to protect the public. Standard operating and safety procedures would be employed to ensure the safe delivery of services. The operation of farm equipment near proposed structures could result in unnecessary contact and/or damage to machinery and/or operators.	Hazardous and/or potentially hazardous materials may be encountered during construction, or exposure to energized transmission lines. These impacts are likely to be minor with the implementation of construction action plans that ensure worker safety, proper handling of hazardous materials, and spill cleanup.	Long-term adverse effects are anticipated to be negligible to minor. EMFs would be well below identified thresholds to protect the public. Standard operating and safety procedures would be employed to ensure the safe delivery of services. The operation of farm equipment near proposed structures could result in unnecessary contact and/or damage to machinery and/or operators.	Hazardous and/or potentially hazardous materials may be encountered during construction, or exposure to energized transmission lines. These impacts are likely to be minor with the implementation of construction action plans that ensure worker safety, proper handling of hazardous materials, and spill cleanup.	No effect.

1 INTRODUCTION

This chapter describes the proposed Antelope Valley Station (AVS) to Neset Transmission Project (proposed project), the various components of Basin Electric Power Cooperative's (Basin Electric) proposed development, the purpose and need for federal agency actions related to the project, the project's purpose and objective, and the scoping process undertaken for the project. This Final Environmental Impact Statement (FEIS) informs federal decision-makers and the public of the preferred alternative and the potential environmental impacts that could result from the proposed project if the preferred alternative is carried forward. The FEIS was prepared by the U.S. Department of Agriculture's (USDA) Rural Utilities Service (RUS). The U.S. Department of Energy, Western Area Power Administration (Western) and the USDA, U.S. Forest Service (USFS) are cooperating agencies for the FEIS. The FEIS will be used by the responsible federal officials to make informed decisions on the proposed federal actions.

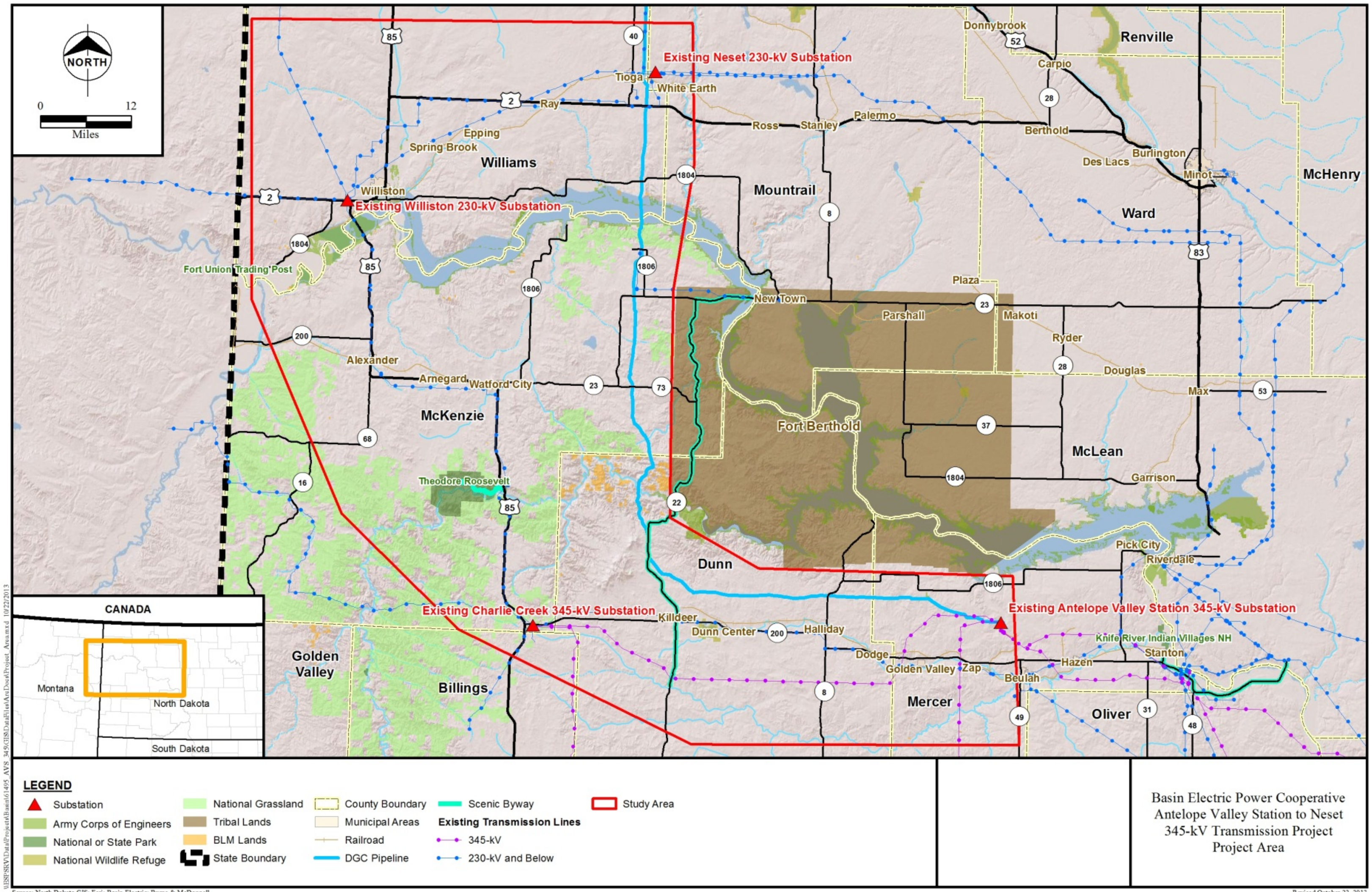
In November 2012, RUS issued a Draft Environmental Impact Statement (DEIS) evaluating the environmental implications of the AVS to Neset Transmission Project. The originally-proposed project, as evaluated in the DEIS, considered the development of a single 345-kilovolt (kV) transmission line and two new substations in conjunction with one of two alternatives (A and B). The proposed project was designed to increase transmission line capacity to meet the expected increase in loads developing in northwestern North Dakota. However, new load forecasts completed after the issuance of the DEIS in 2012 showed the load increasing above and beyond the original forecasts in 2016-2017 by nearly 50 percent (Kardmas, Lee & Jackson, Inc. [KLJ], 2012). Therefore, the original project as described in the DEIS would not achieve the required capacity needs or reliability standards to meet the updated load increase.

RUS issued a Supplemental Draft Environmental Impact Statement (Supplemental DEIS) for the AVS to Neset Transmission Project in December 2013, to evaluate significant project changes that had occurred since the DEIS was published and the comment period closed. To meet the increased demand projections, additional alternatives, including building transmission lines on both DEIS-identified alternatives (A and B), parallel and double-circuit lines on the route B alternative, and additional substation components were evaluated in the Supplemental DEIS.

1.1 PROJECT OVERVIEW AND DESCRIPTION

Basin Electric is proposing to construct, operate, and maintain a new electrical transmission line connecting the existing AVS, Charlie Creek, Williston, and Neset substations with five newly proposed delivery substations. The overall project area identified for this project encompasses parts of Mercer, Dunn, McKenzie, Williams, and Mountrail counties in North Dakota, and is shown in Figure 1-1.

Figure 1-1: Project Area



This overall project includes the construction of 345-kV transmission line facilities from Basin Electric's AVS generation facility in northwestern North Dakota to increase the capacity and reliability of the electricity transmission infrastructure of the region. The line would connect AVS with Basin Electric's Charlie Creek and Neset substations, Western's Williston Substation, and provide new substation facilities to connect the proposed line into the current transmission system and provide locations for load-serving connections. Several alternatives, including a no-action alternative and three different build alternatives are discussed in detail in Chapter 2.

This FEIS considers two additional alternatives, similar to the alignment of Alternative B discussed in the DEIS. The primary difference is a double-circuit 345-kV line (Alternative D) or two parallel lines (Alternative E) running 63 miles from the Red Substation near Killdeer to the new White Substation and on to the Blue Substation and the additional Killdeer South Switchyard would be required. The Killdeer South Switchyard would interconnect the Red Substation to the existing AVS to Charlie Creek 345-kV transmission line by 12 miles of parallel 345-kV single-circuit transmission line. A detailed description of the project alternatives is included in Chapter 2.

1.2 PROJECT REVIEW PROCESS

Basin Electric intends to request financial assistance from RUS to construct the AVS to Neset Transmission Project. RUS has determined that the agency's decision to finance the project would constitute a major federal action that may have a significant impact on the environment within the context of the National Environmental Policy Act of 1969 (NEPA). As noted above, RUS is serving as the lead federal agency for the NEPA environmental review of the project, and Western and USFS are serving as cooperating agencies for the project. RUS, in cooperation with Western and USFS, has prepared this FEIS in compliance with the requirements of NEPA and the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508). Western is serving as the lead federal agency for compliance with Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR 800) to take into account effects to historic properties and consultation under Section 7 of the Endangered Species Act (ESA) for threatened and endangered species.

1.2.1 Certificate of Corridor Compatibility (Public Service Commission)

In addition to compliance with all applicable federal regulations, permits and approvals must be granted by the state of North Dakota. The North Dakota Energy Conversion and Transmission Facility Siting Act states that it is necessary to ensure that the location, construction, and operation of energy conversion and transmission facilities will produce minimal adverse effects on the environment and on the welfare of the citizens of the state by providing that no energy conversion or transmission facility shall be located, constructed, and operated within North Dakota without a certificate of site compatibility and a route permit acquired pursuant to Chapter 49-22 of the North Dakota Century Code (North Dakota Century Code, 2011a). It is state policy to site energy conversion facilities and to route transmission facilities in an orderly manner compatible with environmental preservation and the efficient use of resources. To comply with the North Dakota Energy Conversion and Transmission Facility Siting Act, sites and routes shall be chosen to 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. The Certificate of Corridor Compatibility establishes a corridor through which the proposed facilities may be routed. The Route Permit is acquired through a pre-application route development phase, a review of completeness, a public meeting process, and finally a route approval that is contingent on adherence to other federal, state, or local permitting considerations (North Dakota Public Service Commission [NDPSC], 2012).

1.2.2 National Historic Preservation Act Section 106

Pursuant to 36 CFR 800.2(a)(2), RUS and USFS designated Western as the lead agency for Section 106 review because of the availability of its regional staff to actively direct and participate in consultation. However, in order to meet their collective responsibilities under NEPA, RUS is designated as the lead because its financial assistance will affect all aspects of the AVS to Neset Transmission Project. Western and RUS coordinated compliance with Section 106 and NEPA procedures in accordance with 36 CFR 800.8(a). Additional information on the Section 106 process is provided in Section 3.6.

Western initiated Section 106 review with North Dakota State Historic Preservation Office (North Dakota SHPO) at the agency scoping meeting in November 2011. On January 31, 2012, Western notified Indian tribes of its intent to prepare an EIS and invited the following Indian tribes to participate in government-to-government consultation: Flandreau Santee Sioux, Santee Sioux Nation, Assiniboine and Sioux Tribes of the Fort Peck Reservation, Spirit Lake Nation, Fort Belknap Indian Community, Standing Rock Sioux Tribe (SRST), Leech Lake Band of Ojibwa, Three Affiliated Tribes, Lower Sioux, Turtle Mountain Chippewa, Minnesota Chippewa, Upper Sioux, Prairie Island, and White Earth Band. In February 2013 and August 2013, respectively, the SRST and Sisseton Wahpeton Oyate (SWO) requested and were granted consulting party status. In October 2012, USFS notified SRST and the Three Affiliated Tribes that they would be participating in the project as cooperating agencies to determine if a Special Use Permit (SUP) should be issued to Basin Electric for portions of the line that would cross the Little Missouri National Grassland (LMNG).

Because the AVS to Neset Transmission Project consists of a corridor for which permission for study has not been uniformly granted, Western, as authorized pursuant to 36 CFR 800.4(b)(2) and 36 CFR 800.5(a)(3), has elected to phase identification and evaluation of historic properties, and application of the criteria of adverse effect. Accordingly, pursuant to 36 CFR 800.14(b)(1)(ii), Western will conclude Section 106 review using a Programmatic Agreement (PA) because effects to historic properties cannot be fully determined prior to approval of the project. To assist Western in conducting Section 106 review, RUS has agreed to oversee and manage the development and execution of the Section 106 PA. Because a PA is being developed, RUS, on behalf of Western, invited the Advisory Council on Historic Preservation (ACHP) to participate and consult in accordance with 36 CFR 800.6A1(i)(C). ACHP entered consultation on April 11, 2014.

1.3 PUBLIC INVOLVEMENT

A Notice of Intent was published in the *Federal Register* on November 2, 2011, informing the public of the intent by RUS to prepare an EIS with scoping. The notice initiated the 30-day public scoping period and included the dates for public scoping meetings that were held November 15 and 16 in Williston and Killdeer, North Dakota, respectively. The purpose of the public scoping meetings was to provide the public with information regarding the proposed project, answer questions, identify concerns regarding the potential environmental impacts that may result from construction and operation of the project, and gather information to determine the scope of issues to be addressed in the RUS environmental review and documentation of the project (RUS, 2002). The notification process, public scoping meeting materials, and the process for collecting public comments are described in more detail in the Public Scoping Report (RUS, 2012).[2]

A notice of availability of the DEIS for the AVS to Neset Transmission Project was published in the *Federal Register* on December 7, 2012. Two public hearings were held on January 15 and 16, 2013, in Killdeer and Williston, North Dakota, respectively. Approximately 30 comments were submitted to RUS on the DEIS during the public comment period that ended on January 22, 2013. These comments are summarized in Appendix B. No comments regarding impacts to historic resources were submitted.

A notice of availability of the Supplemental DEIS was published in the *Federal Register* on December 20, 2013, followed by a public hearing held in Watford City, North Dakota on January 16, 2014. Public comments were accepted on the document until February 3, 2014. Approximately 45 comments were received on the document; these comments are summarized in Appendix C.

1.4 PURPOSE AND NEED FOR ACTION

Several agencies will use this analysis to make decisions related to funding, authorizing, or permitting various components of the proposed transmission line. RUS, the lead federal agency for NEPA, will determine whether or not to provide financial assistance for the project. As a cooperating agency for NEPA, Western will evaluate the request by Basin Electric to interconnect the proposed project with the Williston Substation and connect to Western's Williston to Watford City 230-kV transmission line south of Williston. USFS, the other NEPA

[2] This report is also available on the RUS website at http://www.rudev.usda.gov/uwp-avs-neset.html.

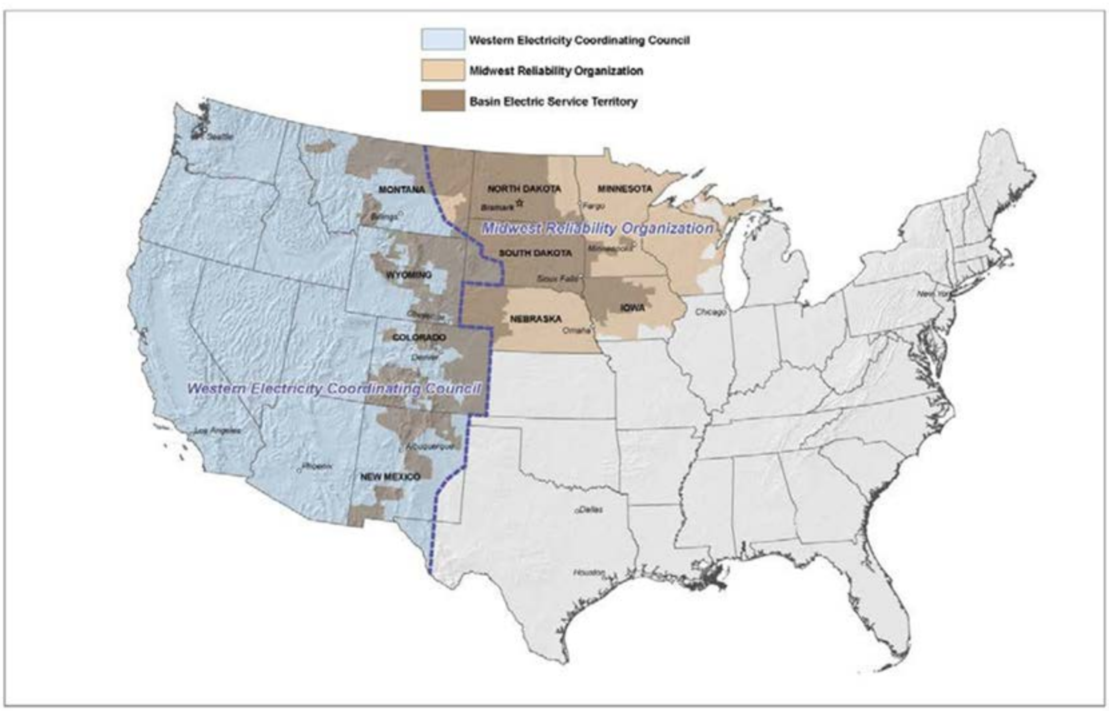
cooperating agency, has sole responsibility to issue special use authorizations for construction, operation, and maintenance of a transmission line on National Forest System lands. USFS Supervisor of the Dakota Prairie Grasslands will use this analysis to make a decision on whether or not to approve a SUP submitted by Basin Electric to construct, maintain, and operate a transmission line through lands administered by USFS on the LMNG followed by issuance of the actual authorization.

The following section describes the purpose and need for the AVS to Neset Transmission Project. The purpose and need addresses the different perspectives of the proponent and the federal agencies responsible for the environmental review of the project. These include Basin Electric, RUS, Western, and USFS.

1.4.1 Basin Electric Purpose and Need

Basin Electric is a regional wholesale electric generation and transmission cooperative owned and controlled by the 134 member cooperatives it serves. It was created in May 1961 as a result of regional efforts by electric distribution cooperatives. Basin Electric serves approximately 2.8 million customers in 540,000 square miles, covering portions of nine states, including Colorado, Iowa, Minnesota, Montana, Nebraska, New Mexico, North Dakota, South Dakota, and Wyoming (Figure 1-2). Portions of Basin Electric's system operate within the Integrated System (IS) that consists of Western, Basin Electric, and Heartland Consumers Power District. The IS oversees the high-voltage transmission system grid in eastern Montana, North Dakota, and South Dakota.

Figure 1-2: Basin Electric Service Territory



Source: Western, 2010a

The IS transmission facilities consist of approximately 9,200 miles of interconnected high-voltage transmission lines, of which approximately 1,340 miles are owned by Basin Electric. The IS transmission system provides for delivery of power from federal hydroelectric facilities and thermal generation plants owned by Basin Electric and Heartland Consumers Power District. The IS provides open-access transmission service to customers in the region.

The Basin Electric service area in northwestern North Dakota is experiencing a rapid increase in development as a result of the activities associated with oil and gas extraction from the Bakken shale formation, currently concentrated in McKenzie, Mountrail and Williams counties. The level of development that has occurred and is planned for the future will require numerous infrastructure upgrades throughout the region, including an increase in electrical transmission capacity and reliability. Studies of power supply for the region and the upper Midwest (IS, 2011) indicate that a new 345-kV transmission line and associated substation additions and upgrades are needed to increase the capacity to distribute electricity to serve the long-term needs of northwestern North Dakota. In addition, the project is expected to help maintain the reliability of the delivery system. The purpose of this EIS is to identify an acceptable alternative that minimizes the impacts on the environment and regional socioeconomic resources of the AVS to Neset Transmission Project while meeting the capacity and reliability requirements identified in the IS study. Initially Basin Electric and IS load forecasts determined that one 345-kV transmission line would be sufficient to meet future growth and delivery requirements and this was the basis for the AVS to Neset Transmission Project 2012 DEIS. However, subsequent development forecasts resulted in updated revised load growth forecasts in 2012 (KLJ, 2012). Basin Electric concluded that to meet the current load forecasts and system delivery requirements, the AVS to Neset Transmission Project would need to include an additional 345-kV line in the McKenzie County area and provide additional load-serving substations to connect with the transmission system in the area. In the region, demand from the oil industry alone is projected to increase from 9 to 22 percent of Basin Electric's overall power production by 2025. The demand from large commercial operations follows a similar increase as it supports the oil and gas industry. This proposed project would address system capacity issues resulting from rapid growth in the area. In assessing project need, Basin Electric determined that the single 345-kV line from AVS to Killdeer and from south of Williston to Tioga would not be sufficient to meet the projected capacity, delivery, and reliability needs. Based on the new load forecast, two 345-kV lines are required in the McKenzie County area, including one from Charlie Creek to the proposed Blue Substation south of Williston and one from the Killdeer area (Red Substation), also to the proposed Blue Substation.

System Reliability Requirements

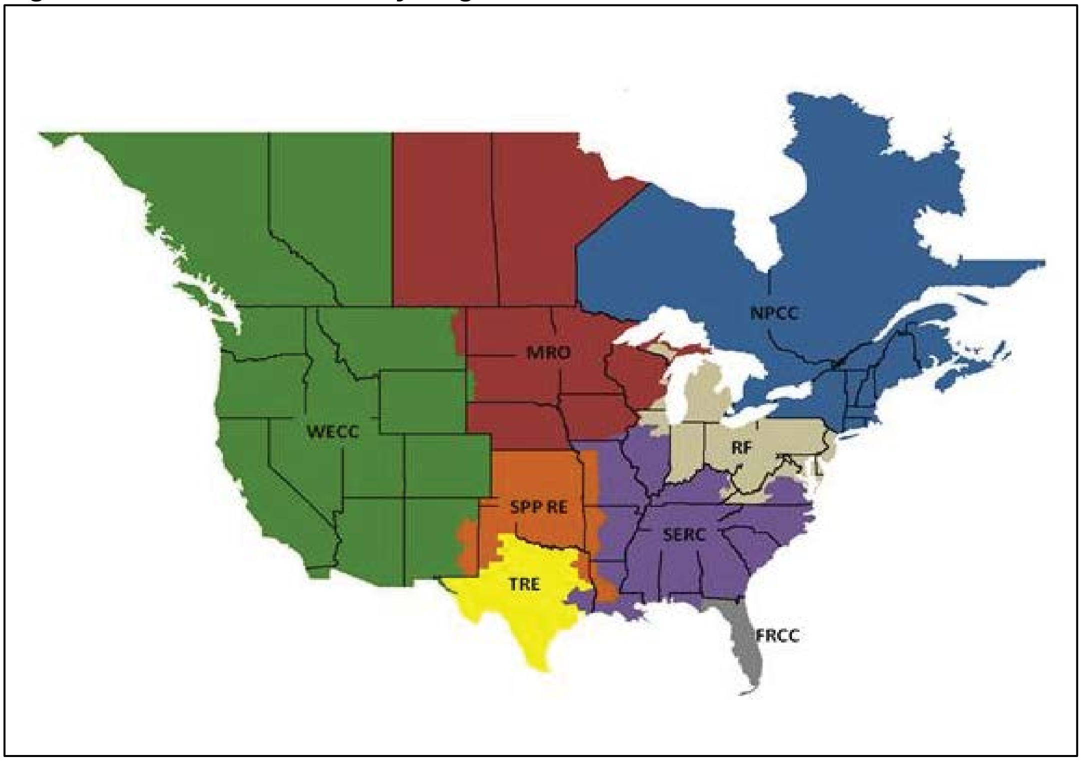
The Federal Energy Regulatory Commission (FERC) has the authority to develop and enforce reliability standards. These standards are in place to ensure system reliability, which is defined by the U.S. Department of Energy's Energy Information Administration as "a measure of the ability of the system to continue operation while some lines or generators are out of service. Reliability deals with the performance of the system under stress" (Energy Information Administration, 2012). The system load-serving capacity is the amount of load that can be accommodated without violating reliability criteria. The term "system" as it is used here refers to both generation and transmission components. It does not, however, include the low-voltage distribution lines that deliver electricity to consumers.

Section 215 of the Energy Policy Act of 2005 (Public Law 109-58) requires the creation of an Electric Reliability Organization with authority to establish, approve, and enforce mandatory electricity reliability standards, subject to review and approval by FERC. In 2006, FERC established rules for certification of the Electric Reliability Organization and procedures for establishment, approval, and enforcement of reliability standards.

In 2006, the North American Electric Reliability Corporation (NERC), a pre-existing voluntary reliability organization, was certified as the Electric Reliability Organization in the United States. The authority and certification granted to NERC also included a provision for the newly-certified Electric Reliability Organization to delegate certain authority to regional entities as shown in Figure 1-3 for the purpose of proposing and enforcing reliability standards in particular regions of North America (FERC, 2006).

NERC Reliability Standards define the reliability requirements for planning and operating the North American Bulk-Power System and are focused on performance, risk management, and entity capabilities. NERC reliability standards apply to all owners, users, and operators of the bulk power system, which includes the electric generation and transmission system in North America. The reliability standards developed by NERC have been approved by FERC.

Figure 1-3: NERC Reliability Regions



Source: NERC, 2013

WECC=Western Electricity Coordinating Council; MRO=Midwest Reliability Organization; SPP=Southwest Power Pool; TRE=Texas Reliability Entity; NPCC=Northeast Power Coordinating Council; RFC=Reliability First Corporation; SERC=SERC Reliability Corporation; and FRCC=Florida Reliability Coordinating Council

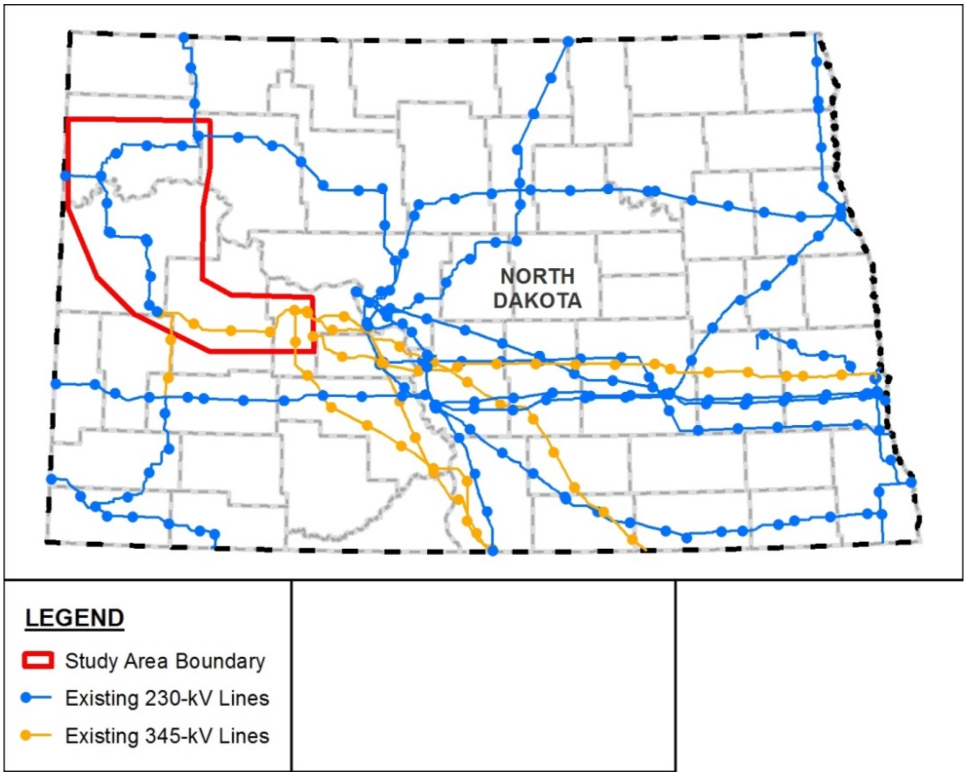
Among the many reliability standards NERC has developed are sets of standards for transmission operations and transmission planning (TPL). NERC reliability standards for TPL include four categories of standards (NERC, 2014):

- TPL-001—System performance under normal operating conditions
- TPL-002—System performance following loss of a single bulk electric system element (a bulk electric system element could be a substation, transmission line, etc.)
- TPL-003—System performance following loss of two or more bulk electric system elements
- TPL-004—System performance following extreme events resulting in the loss of two or more bulk electric system elements.

The following discussion demonstrates how these standards would be applied to the proposed AVS to Neset Transmission Project.

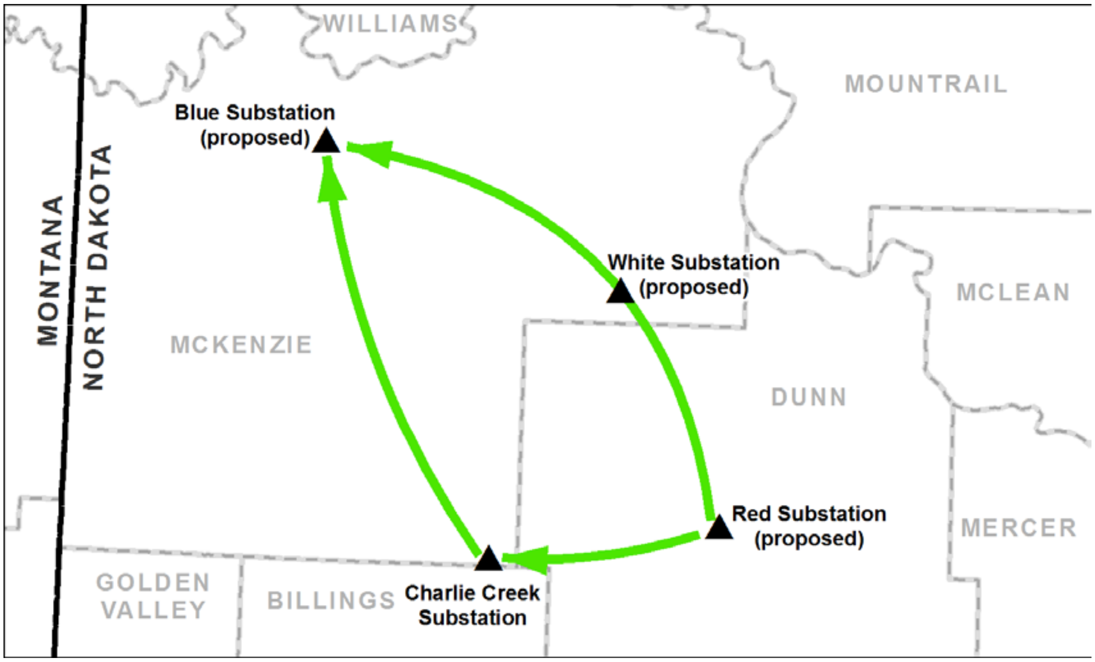
The existing 230-kV and 345-kV transmission infrastructure throughout North Dakota and within the AVS Transmission Project study area is shown in Figure 1-4. Within the study area, the current system includes one 345-kV line running east and west and one 230-kV line running north and south.

Figure 1-4: Existing 230-kV and 345-kV Transmission Lines in North Dakota



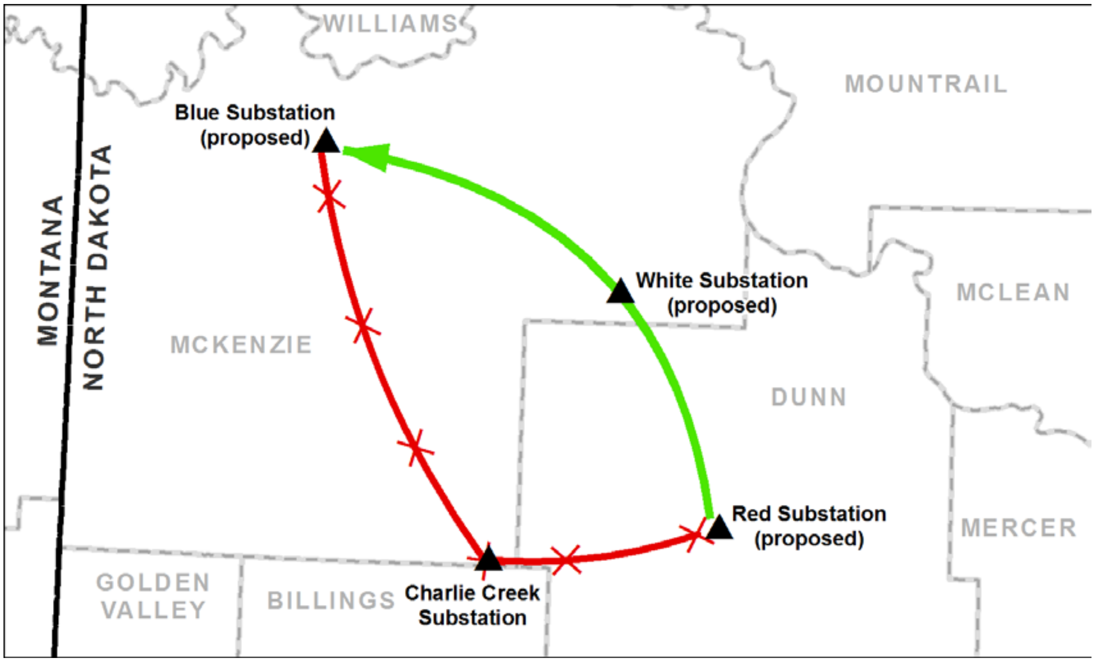
For the preferred alternative, normal operating conditions are shown in Figure 1-5. Both 345-kV lines would supply power to their respective substations.

Figure 1-5: Normal Operating Conditions for the Preferred Alternative



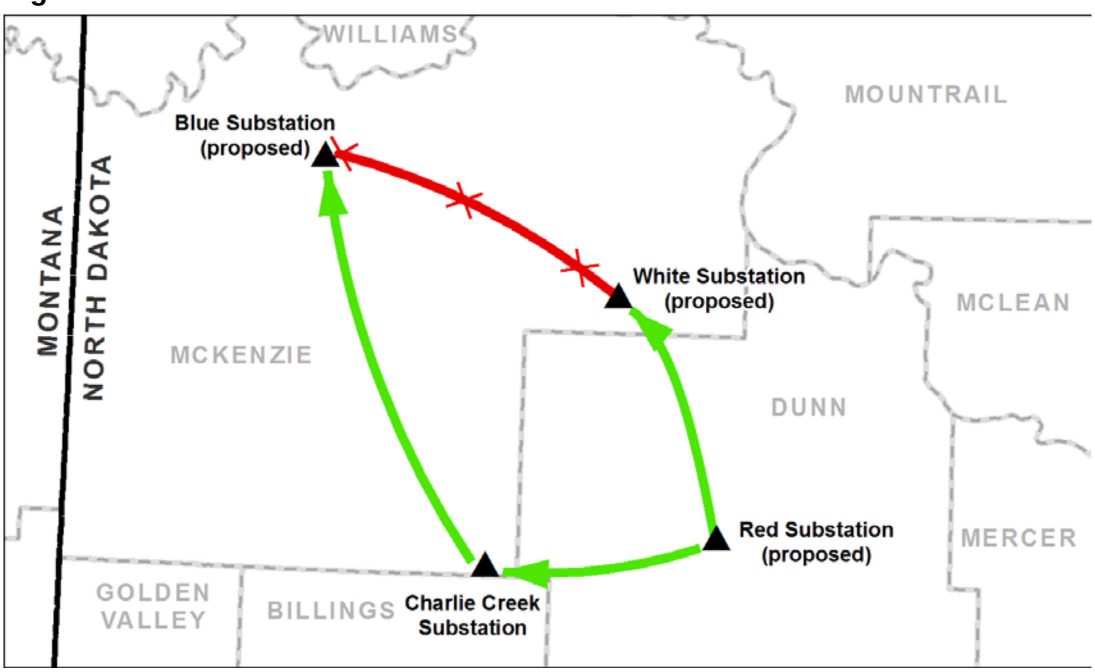
For the loss of a single bulk electric system element scenario (TPL-002), the Red-Charlie Creek-Blue 345-kV transmission line could experience an outage and electricity could still be supplied on the Red-White-Blue 345-kV transmission line to the Red and Blue substations (Figure 1-6). The existing Charlie Creek Substation would have service from the existing Charlie Creek to AVS 345-kV transmission line. The critical outage is the loss of the Charlie Creek-Watford City 230-kV line, which results in low voltages across northwest North Dakota and also overloads the Richland-Williston 115-kV line. Under this scenario, reliability of the system is maintained when one bulk electric system element is lost and all substations are able to remain in service.

Figure 1-6: Loss of the Red-Charlie Creek-Blue 345-kV Transmission Line



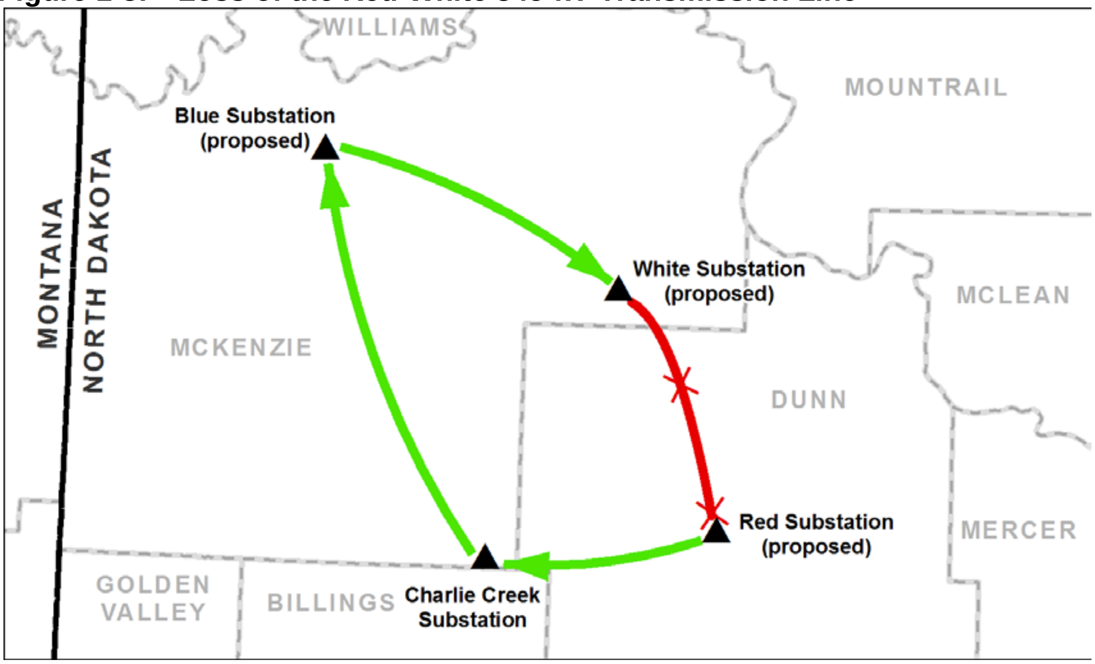
Likewise, the White to Blue 345-kV transmission line could experience an outage and power could be supplied on the Red-Charlie Creek-Blue 345-kV transmission line to the Red, White, Charlie Creek, and Blue substations (Figure 1-7).

Figure 1-7: Loss of the White-Blue 345-kV Transmission Line



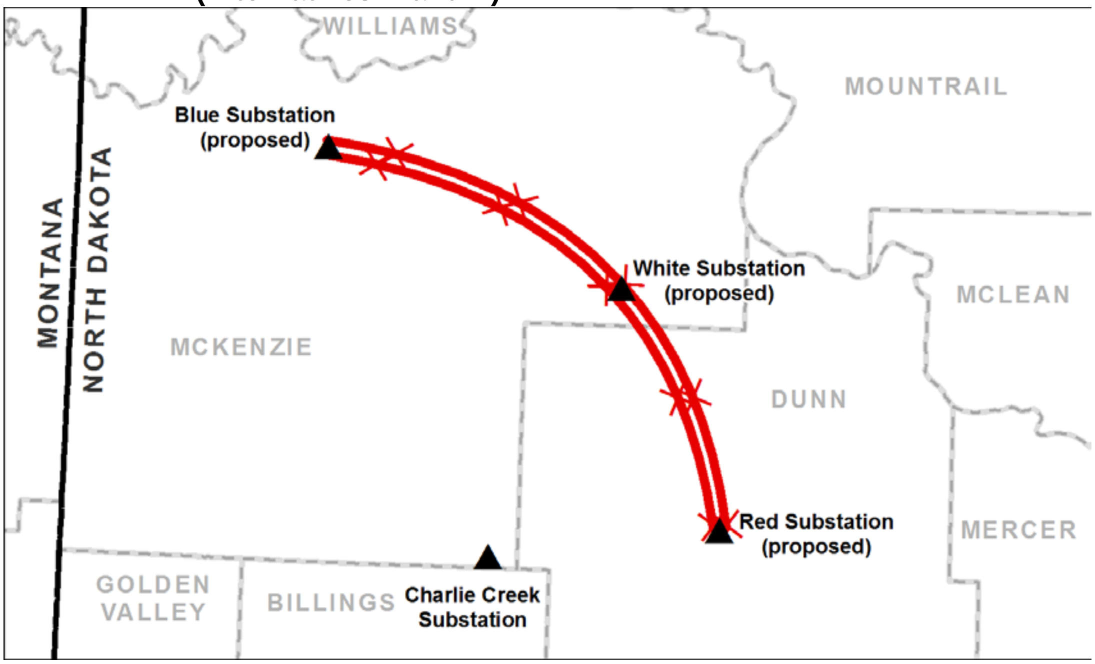
Finally, the Red-White 345-kV transmission line could experience an outage and all substations could remain in service with the Blue Substation back feeding power to the White Substation (Figure 1-8). By creating this loop service, Basin Electric would be able to ensure reliable power service to all substations during the loss of one part of the transmission system. In addition, the two 345-kV transmission lines are separated by approximately 20 miles, which minimizes the potential for the same event to cause an outage on both transmission lines.

Figure 1-8: Loss of the Red-White 345-kV Transmission Line



The reliability of the electric system would not be maintained under a fourth scenario. If the two transmission lines were sited in one corridor with service to the same substations, the same weather event could take both facilities out of service at the same time. The failure of both lines would not allow for electrical service between the Red, White, and Blue substations and the Charlie Creek Substation would be limited to the power supplied by the existing Charlie Creek to AVS 345-kV transmission line (Figure 1-9).

Figure 1-9: Loss of Both 345-kV Transmission Lines within the Same Corridor (Alternatives D and E)



This scenario creates an unacceptable risk in which the loss of two or more transmission lines in the same corridor may involve a substantial loss of power to consumers in a widespread area. It could also create an issue for other substations in the area by overloading them with demand for electric service to compensate for the loss of the two 345-kV transmission lines. For this reason, the loop service is the most acceptable to manage risk and ensure reliability of the system.

The Midwest Reliability Organization

The Midwest Reliability Organization's (MRO) current primary function is to monitor and enforce the NERC Reliability Standards. The MRO has delegated much of its transmission reliability responsibility to two Reliability Coordinators. NERC guidelines require that each regional reliability organization establish one or more Reliability Coordinators to "continuously assess transmission reliability and coordinate emergency operations among the operating entities within the region and across the regional boundaries" (MRO, 2010).

For the Basin Electric service area in northwestern North Dakota, the Reliability Coordinator is the Midcontinent Independent System Operator known as MISO.

Project Area Reliability Issues

The existing high voltage system in the Williston/Tioga region consists of 230-kV and 115-kV systems that connect to Saskatchewan, Canada; eastern Montana; central North Dakota; and western North Dakota. An IS study was completed in 2011 that evaluated and identified system additions needed in this area. In part, the study evaluated the unexpected network load growth because of increasing oil development. The IS study focused on eastern Montana and western North Dakota (the Williston Load Pocket) as the area with the most rapidly changing and increasing demand and the greatest potential for outage issues. In conducting the analysis and to maintain consistency, various demand and outage scenarios were used that other MRO service providers and reviewing authorities had previously approved. The IS analysis identified serious short- and long-term overload and low voltage NERC criteria violations (IS, 2011) in scenarios with modeled high load growth. Should the load level exceed transmission system capacity, outages could cause low voltage criteria violations and overload adjacent transmission lines in the Williston/Tioga region and therefore be in violation of NERC reliability standards.

Reliability standards require consideration of both load demands and ways to avoid common modes of failures. Load forecasts for the project area are increasing significantly and are discussed in more detail in the following section. Severe winter storms are common in northwest North Dakota and have historically caused numerous transmission line outages and, of particular concern, multiple transmission line outages in the same vicinity. Examples of such events include the fall 2013 storm in northwestern South Dakota and southwestern North Dakota that damaged numerous transmission and distribution facilities, and the 2010 ice storm that impacted Morton County, North Dakota and damaged Western's Mandan-Dickinson 230-kV transmission line, destroyed more than a dozen structures, and resulted in a multiple week line outage.

Load Forecast

The power load forecast indicates growth in the northwestern North Dakota area is accelerating over the next several years primarily because of development of the Bakken Formation. Based on the projected load growth of increases of approximately 15 percent in 2014 and 2015, the timeliness of project completion is critical. Much of the short-term load growth in this area is associated with provision of electrical service to support the rapid expansion of facilities for oil production, and support infrastructure and services. As a follow-up to previous Basin Electric load forecasts, a third-party study undertaken in 2012 (KLJ, 2012) confirms the load projections in northwestern North Dakota due to rapidly expanding electrical service in this region.

While there are 17 oil-producing counties in North Dakota, all of which are located in the western third of the state, the top producing counties in 2012 included Mountrail, McKenzie, Dunn, and Williams in northwestern North Dakota. Oil production in North Dakota increased from 62.8 million barrels of oil in 2008 to 2.9 billion barrels in 2013 (a 361 percent increase) (North Dakota Industrial Commission, 2014). Production is expected to continue to increase with the development of an estimated 1,100 to 2,700 new wells per year in western North Dakota and 40,000 to 45,000 new wells over the next 20 plus years (Bangsund and Hodur, 2013). Electric transmission lines, including the proposed project and other lower voltage lines and natural gas simple cycle generation facilities, have recently been constructed or are in development in western North Dakota to support expanding development and supporting infrastructure.

Table 1-1 shows the load forecasts for northwestern North Dakota in the Williston/Tioga region that were developed during 2011 (column 2) compared with the forecast that was released in 2013 (column 3). The load forecast completed in 2013 shows a significant increase over the forecast published in 2011, ranging from a 25 percent increase in the 2013-2014 winter season to nearly 50 percent by 2016-2017. In addition, it is likely that similar trends are occurring in the regions adjacent to the Williston/Tioga area.

The significant change in the load forecast led to a reevaluation of solutions to meet the project need. The originally proposed project, as evaluated in the DEIS published in November 2012, considered the development of a single 345-kV transmission line and three new substations as part of one of two alternative routes. The proposed project was designed to increase transmission line capacity to meet the expected increase in load of 538 megawatts (MW) in 2016. However, the new load forecasts show the load increasing above and beyond the original forecast by nearly 50 percent. Therefore the original project as described in the DEIS would not achieve the increased capacity needs or reliability standards. The FEIS identifies a preferred alternative that would meet both the capacity needs (forecasted load of 909 MW expected to occur by 2018-2019 winter season) while meeting reliability standards (adequacy and security).

Table 1-1: Basin Electric Member Load Forecast for Transmission Lines in the Williston/Tioga Region

(1)	(2)	(3)	(4)	(5)
Winter Peak	**2011 Forecast Load (MW)[a]**	**2013 Forecast Load (MW)[b]**	**Percentage Change in Load Forecast between 2011 and 2013**	**Annual Percentage Increase in Load (2013 Forecast)**
2013-2014	454	568	25	-
2014-2015	481	660	37	16
2015-2016	509	752	48	14
2016-2017	538	804	49	7
2017-2018		863		7
2018-2019		909		5

[a] Basin Electric, 2011
[b] Basin Electric, 2013a

1.4.2 Rural Utilities Service Purpose and Need

RUS is authorized to make loans and loan guarantees to finance the construction of electric distribution, transmission, and generation facilities including system improvements and replacements required to furnish and improve electric service in rural areas, as well as demand side management, energy conservation programs, and on- and off-grid renewable energy systems. Basin Electric is requesting financing assistance from RUS for the proposed 345-kV transmission line(s) and substations in Mercer, Dunn, McKenzie, Williams, and Mountrail counties. RUS' proposed federal action is to decide whether to provide financing assistance for the project; accordingly completing the NEPA process is one requirement, along with other technical and financial considerations in processing Basin Electric's application.

The Rural Electrification Act of 1936, as amended, (7 United States Code [U.S.C.] 901 et seq.) generally authorizes the Secretary of Agriculture to make rural electrification and telecommunication loans, including specifying eligible borrowers, references, purposes, terms and conditions, and security requirements.

RUS' agency actions include the following:

- Provide engineering reviews of the purpose and need, engineering feasibility, and cost of the proposed project.
- Ensure that the proposed project meets the borrower's requirements and prudent utility practices.
- Evaluate the financial ability of the borrower to repay its potential financial obligations to RUS.
- Review and study the alternatives to mitigate and improve transmission reliability issues.
- Ensure that adequate transmission service and capacity are available to meet the proposed project needs.
- Ensure that NEPA and other environmental laws and requirements and RUS environmental policies and procedures are satisfied prior to taking a federal action.

1.4.3 Western Area Power Administration Purpose and Need

Pursuant to the *Contract for Management and Operation of the Integrated System*, Western, Basin Electric, and Heartland Consumer Power District jointly plan and operate their respectively owned transmission facilities as a single IS. The Agreement results in a one system approach to construction and operation of transmission facilities within the IS. Western's purpose and need is to consider the connection of the proposed AVS to Neset 345-kV transmission line with its Williston Substation and its Williston to Charlie Creek 230-kV transmission line in the vicinity of Watford City, North Dakota, with regard to the planning and operation of the IS.

1.4.4 U.S. Forest Service Purpose and Need

USFS has sole responsibility to issue special use authorizations for right-of-way (ROW) on National Forest System lands under the Federal Land Policy Management Act. USFS has been actively involved in preparing and reviewing this document per the requirements of 40 CFR 1506.3, and will use this analysis to make an independent decision related to the approval of the

SUP submitted by Basin Electric to construct, maintain, and operate a transmission line through lands administered by USFS on the LMNG. The USFS proposed action is to authorize and subsequently issue a SUP with terms and conditions for the construction, maintenance, and operation of a transmission line through lands administered by USFS on the LMNG.

USFS' draft decision will be subject to the public objection processes described in 36 CFR 218 Subparts A and B. Objections will be restricted to specific written comments (defined in 36 CFR 218.1 and 218.5) that are within the scope of USFS' proposed action. After the objection process is complete, the USFS Supervisor of the Dakota Prairie Grasslands will issue a decision on whether or not to authorize the SUP to Basin Electric. The subsequent SUP, once issued, is not subject to further public appeal or objection.

1.5 REGULATORY FRAMEWORK/AUTHORIZING ACTIONS

A summary of the permits, regulations, consultations and other required actions that would be necessary for the project is provided in Chapter 6.

2 PROPOSED ACTION AND ALTERNATIVES

Under NEPA regulations established by CEQ, RUS is required to identify and evaluate reasonable alternatives to the project, as well as the no-action alternative. Reasonable alternatives are those that are "practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant" (CEQ, 1981). In determining reasonable alternatives, RUS is required to consider a number of factors that may include, but are not limited to "the proposed action's size and scope, state of the technology, economic considerations, legal considerations, socioeconomic concerns, availability of resources, and the timeframe in which the identified need must be fulfilled" (40 CFR 1500-1508).

Two alternatives, A and B, and a no-action alternative were considered and evaluated in the DEIS. A Supplemental DEIS was prepared to address the increased electricity demand projections required to meet the need for the project, particularly in McKenzie County. Alternatives A and B were eliminated from further consideration in the Supplemental DEIS because they no longer satisfied the purpose and need for the project as a result of the increase in load demand. The Supplemental DEIS evaluated three alternatives and a no-action alternative. These alternatives included:

- Alternative C, which combines Alternative A and portions of Alternative B (identified in the DEIS)
- Alternative D, which includes the construction of 345/345-kV double-circuit lines north of Killdeer for 63 miles along Alternative B
- Alternative E, which is similar to Alternative D except for the construction of two 345-kV lines running parallel north of Killdeer for 63 miles

Of all the corridors and alignments considered, the corridors and alignments for Alternatives C, D, and E were determined to best avoid physical and environmental constraints, and route alignments within these corridors are considered fully in the FEIS. Constructing the AVS-to-Charlie Creek-to-Judson-to-Tande-to-Neset transmission line with the North Killdeer Loop using 345-kV transmission lines with associated substations and inter-connections was determined to best satisfy the project's purpose and need.

2.1 ALTERNATIVES CONSIDERED AND ELIMINATED FROM FURTHER CONSIDERATION

This section discusses the alternatives that have been considered throughout the planning process but were eliminated for various reasons from further consideration. These alternatives, as well as other alternatives considered as a result of the revised purpose and need for the project, are summarized below.

2.1.1 System Upgrades

As an alternative to constructing a new line, numerous operating scenarios and system facility upgrades were developed and evaluated for the IS system. These scenarios were modeled with different line ratings, line carrying capacities, and system contingencies. The initial effort to improve the area transmission system focused on upgrading local equipment to reduce system limitations. These improvements included a second 230/115-kV transformer at the Williston Substation and second 345/230-kV transformers at both Belfield and Charlie Creek substations.

Area line ratings are increased by upgrading terminal equipment or actually raising transmission line structures to increase clearances to improve the line rating. These line rating increases have already or are scheduled to occur on the Richland-Williston 115-kV line, the Baker-Hettinger 230-kV line, and the Mandan-Dickinson-Belfield 230-kV line. To improve voltage profile, several capacitor bank installations are underway at the existing Watford City, Kennaston, Grenora, Minot SW, and Logan substations.

In addition, 115-kV line improvements are underway. These include a new 115-kV line connecting the Blaisdell to Berthold substations and a new 115-kV line connecting the Snake Creek Pump Station to the Blaisdell and Tioga substations. These projects are being implemented through a shared effort of Basin Electric, its membership, and Western.

However, evaluation of these system upgrades indicated that this alternative would not meet the increased load forecast.

2.1.2 Additional 115-kV Lines

Constructing and operating several additional 115-kV lines based on predicted load growth were considered. Basin Electric member cooperatives identified these proposed new lines to serve specific loads. These transmission lines would not have been operated as part of the overall electricity transmission network and are needed with or without the proposed project. Identified lines include:

- Mountrail-Williams Electric Cooperative (MWEC) 115-kV lines to serve the Tioga and Blaisdell areas
- MWEC 115-kV line between Watford City and Swenson
- MWEC 115-kV lines between Charlie Creek and Halliday
- 115-kV line connection between Snake Creek Pumping Station and Parshall with an interconnection at Blaisdell

Construction and operation by the different member cooperatives of these 115-kV facilities would mitigate many of the existing system limitations through 2014. These facilities would reduce loading on the McHenry-Souris 115-kV line, Logan-Tioga 115-kV line, and Charlie

Creek-Williston 230-kV line, which could be transmission constraints during peak load conditions. However, many of the current system limitations, such as the potential for low voltages, voltage collapses, and transmission line overloads could still occur even with the construction and operation of the proposed new lines as early as 2015. The critical outage is the loss of the Charlie Creek-Watford City 230-kV line, which results in low voltages across northwest North Dakota and also overloads the Richland-Williston 115-kV line.

Based on the limitations of the system even with the proposed new lines and the subsequent NERC criteria violations, these projects would not fully meet the need of the proposed project in creating system reliability and therefore were not carried forward for analysis.

2.1.3 Alternative Corridors

Potential alternatives to address the inability of the current system to meet projected load forecasts beyond the 2014-2016 time period were identified and analyzed. These alternatives included an evaluation of numerous macro-corridors, as discussed in Appendix D and the RUS Macro-Corridor Report (Burns & McDonnell Engineering Company, 2011), for constructing additional 345-kV or greater voltage. Corridors for the development of alternative routes for project construction were identified in the macro-corridor analysis. Other macro-corridors were dismissed. A summary of these corridors and reasons for dismissal are provided below.

One macro-corridor that was evaluated and eliminated would run north from the AVS Substation to the existing Neset Substation near Tioga. This alternative would require the line to cross both the Fort Berthold Reservation and Lake Sakakawea. Crossing the Fort Berthold Reservation would involve a lengthier approval process that would likely delay the project well beyond 2016, leading to declines in the electric reliability of the region. Based on the project load growth of increases of approximately 15 percent in 2014 and 2015, the timeliness of project completion is critical, and this route creates a scenario that does not meet the need of the proposed project.

In addition, crossing Lake Sakakawea presents some significant engineering challenges. The line would have to be placed at significant depths in the lake and would require specialized equipment that is normally used for ocean work and not available within the region. This would add significant costs and logistical issues to the project. For these reasons, this north corridor was eliminated from further consideration.

An additional macro-corridor that was considered and subsequently eliminated included a corridor that would have extended westward from the existing Charlie Creek Substation. This corridor would cross a significant distance of very rough terrain with limited access for structure placement. It would also cross significant areas of the LMNG and increase overall project length. This corridor would increase costs and create logistical obstacles for the project. Therefore, it was eliminated from further consideration.

Another corridor evaluated and eliminated connected the Leland Olds Station to the Neset Substation by routing a 345-kV line around the east side of Lake Sakakawea. Leland Olds Station is located near Stanton, North Dakota approximately 18 miles east of AVS. This corridor would extend northward towards Minot, connecting at the existing Logan Substation, extending westward to connect with the proposed Tande Substation, and finally terminating at the existing Neset Substation. This alternative would cross the Missouri River, be adjacent to significant U.S. Department of the Interior, Fish and Wildlife Service (USFWS) refuge complexes, and cross hundreds of miles of the Missouri Coteau region that includes significant wetland resources and migratory waterfowl nesting and stopover habitat. Although the electrical delivery capacity of this alternative to the Tioga area is similar to the alternatives being carried forward, this alternative would not address the added load-serving capacity in McKenzie County and Alternatives C, D, or E would still be required to meet the overall project purpose and need. As a result of the additional infrastructure required, length of line, and the potential for additional environmental consequences, this alternative was eliminated from further consideration.

All routes considered would cross the Missouri River and/or Lake Sakakawea. In addition, several of the corridors eliminated would cross significant areas of topographic relief with limited access, as well as more remote, undisturbed natural areas. The construction of the AVS-to-Charlie Creek-to-Judson-to-Tande-to-Neset 345-kV transmission lines with associated substations and interconnections was determined to best satisfy the project’s purpose and need.

One alternative to constructing and operating the single 345-kV North Killdeer Loop circuit between the Red and Blue substations would be to construct two parallel 345-kV lines between the Charlie Creek Substation and the Blue Substation. These parallel lines would follow the proposed alignment of Alternative C between the Charlie Creek and Blue substations. This alternative would provide adequate power delivery to McKenzie County. The primary obstacle for construction of two parallel lines from Charlie Creek Substation to the Blue Substation would be their placement on USFS managed lands east of U.S. Highway 85 and east of the Theodore Roosevelt National Park (TRNP). To maintain power delivery in the event that one line fails as part of a catastrophic event or natural disaster, such as tornadoes or icing, the two circuits would need to be constructed on separate poles on separate alignments. The separation between the lines would need to be a minimum of 150 feet—centerline to centerline (NERC, 2014). Two sets of structures would increase the visual impact of the project, and in addition, it is likely that one set would be located outside the USFS preferred utility corridor (as considered in the Northern Great Plains Management Plan Revision FEIS [USFS, 2001]) along the east side of U.S. Highway 85. Furthermore, the terrain east of U.S. Highway 85, which cuts into the Little Missouri River Valley, would force a second parallel line up to higher ground adjacent to the road corridor causing the second line to be more visible from the TRNP and the USFS designated Roadless areas (Lone Butte and Long X Divide).[3] North of this area, the parallel lines would also cross LMNG parcels that were avoided or minimized in the routing of Alternative C as a single 345-kV line. Most notably, a parallel line further east of the Alternative C alignment would extend into the Lone Butte designated Roadless area and would not be consistent with USFS management activities for that area. Additionally, having two 345-kV lines within relative proximity increases the risk of regional power delivery failure to this critical area from a catastrophic event.

2.1.4 New 500-kV Line AVS to Williston Area to Neset

Several alternatives were considered that evaluated constructing a 500-kV line. These included a single 500-kV line within a retained macro-corridor or a combination of single 345-kV lines between AVS and Charlie Creek and Judson and Tande along with a single 500-kV line between Charlie Creek and Williston to provide additional capacity within the service area. While the construction of a 500-kV line could address the system capacity needs of the project purpose and need, no other 500-kV facilities are present in North Dakota. Thus, development of a 500-kV line would require significant expansion and possible relocation of numerous substations throughout the area to accommodate the 500-kV transformers and other equipment, including AVS, Charlie Creek, and Judson, which increase project cost and timeline. In addition, constructing a 500-kV line would require a larger ROW and increased tower height. Construction of 500-kV facilities was eliminated from further consideration because of the increased environmental impact, cost, and schedule.

2.1.5 Additional Generation

The results of the power supply study (IS, 2011) indicate that sufficient regional electrical generation is available to serve the region. However, limited transmission capacity prevents it from being accessible to serve the regional demand. As a result, additional generation is not required, nor would it meet the purpose and need for the project. The IS did indicate, however, that between 2012 and 2016 several local distribution transmission line projects will be required to correct deficiencies at specific locations. In addition, the study notes that voltage support, provided through new generation, would be required at strategic locations to prevent any interruptions of service on the existing transmission lines that would result from the increased thermal loading because of voltage or current flow fluctuations on the lines due to the increasing electrical demand. In response to those studies, Basin Electric is developing the Pioneer Generation Station, near Williston and the Lonesome Creek Station, near Alexander to provide the necessary voltage support during periods of peak demand in the region.

[3] See Section 3.1.2 for a discussion of the visual simulation conducted for this area and potential visual impacts of the proposed transmission line.

Phase I of both projects includes a 45-MW simple cycle combustion turbine that was brought online in 2013. Phase II of both projects consists of placing two additional 45-MW simple cycle combustion turbines at each location. At the present time, the Pioneer Phase II project is operational, while Lonesome Creek Station Phase II is under construction and expected to begin initial commercial operations in December 2014. These projects, consisting of approximately 270 MW of capacity, are needed to protect the reliability of power delivery and load-serving capacity in the region of the proposed AVS to Neset Transmission Project. Further, because these facilities are intermediate and peaking resources that can chase load, they are ideal for addressing the immediate power needs in this area and providing reliable peaking power for the whole IS once the AVS to Neset Transmission Project is completed. This is an ideal complementary form of generation to any additional wind generation that is added to the IS in the future. Because most of the new load in northwest North Dakota is of a 24-hour-a-day, 7-days-a-week, 365-days-a-year variety, wind is a not an available option to supply this new load. Thus, complementary generation such as natural-gas-combustion-turbines would also need to be developed along with the available wind resources.

Further, this new generation would avoid and displace portable generation and combustion-engine-driven oil and gas extraction engines at the wells. It would also hasten the capture of more of the natural gas at the well-heads, and avoid both the flaring and release of natural gas during the oil extraction process.

New generation built to serve the growing load on the IS since 2000 has been almost exclusively wind and natural gas, including:

- More than 700 MW of new wind generation capacity owned or purchased through power-purchase contracts by Basin Electric
- Approximately 300 MW of natural-gas-combined-cycle generation owned and operated by Basin Electric that began commercial operation in August 2012 near White, South Dakota
- Approximately 380 MW of natural-gas-combustion-turbine generation owned and operated by Basin Electric near Groton, South Dakota, and Culbertson, Montana

The purpose of the AVS to Neset Transmission Project is to increase high voltage transmission line system reliability and the transmission load-serving capacity in the region. Once the AVS to Neset Transmission Project is completed, new additional natural-gas-peaking power would become more readily available to all IS customers, not just the customers in northwest North Dakota. As such, development of additional generation, without considerable additional transmission capacity, would not meet the regional load requirements. Except for voltage support type projects, sufficient regional electrical generation is available to serve the region. However, limited transmission capacity prevents it from being accessible to serve the regional demand. As a result, additional generation is not sufficient to meet the purpose and need for the project, and was therefore dropped from further consideration.

2.1.6 Alternative C Variations

To address the concerns of USFS and commenters regarding the potential impacts of the Project to LMNG, an additional alternative was evaluated that would double circuit a portion of Alternative C along the U.S. Highway 85 corridor (see Figure 2-1).

This modification of Alternative C investigated the potential to double circuit the proposed 345-kV line with an existing Western 230-kV line located within the U.S. Highway 85 corridor area. Double-circuiting focused on the area of the Little Missouri River Badlands.

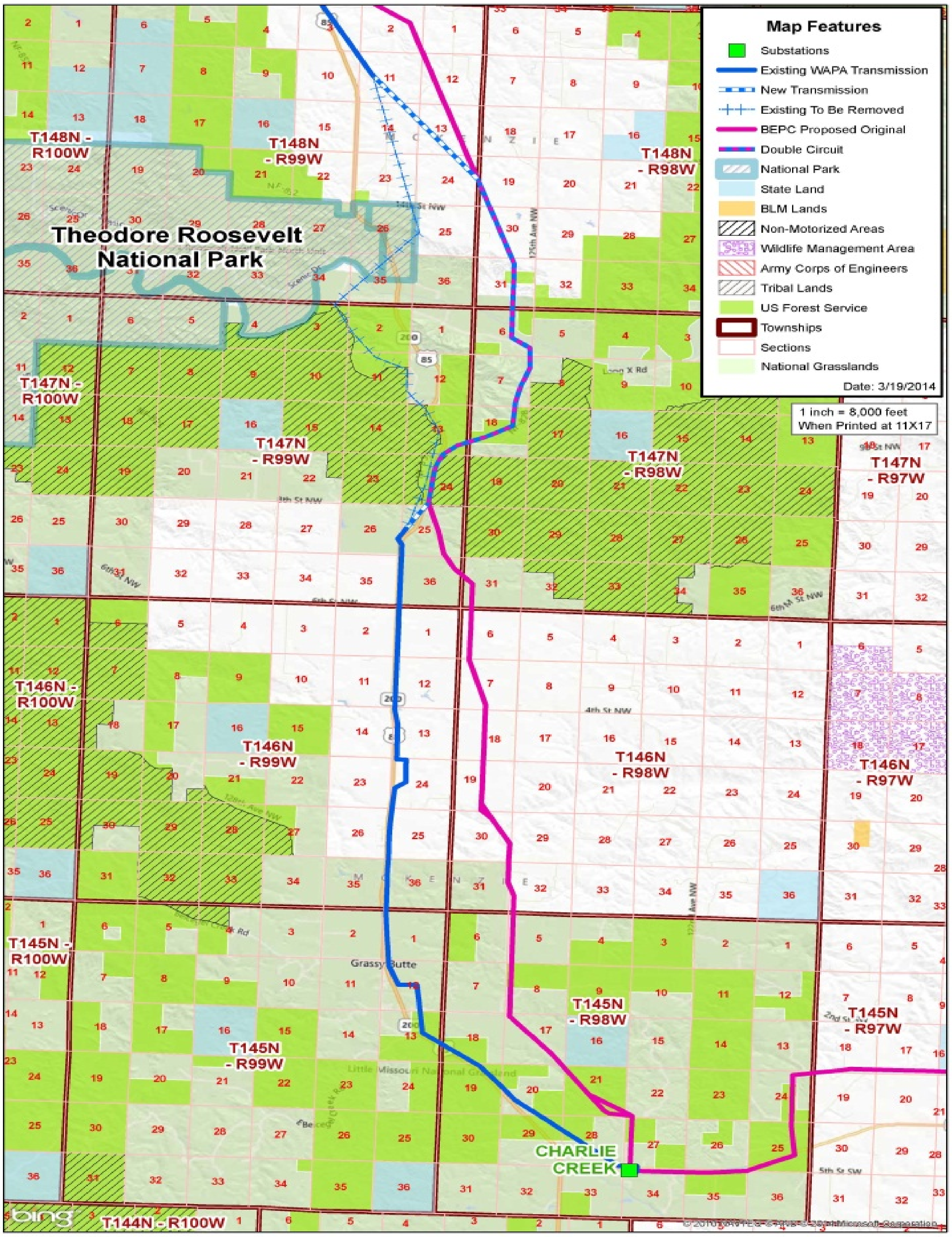
While different voltages, the 345-kV Basin Electric line and the Western 230-kV line would provide system redundancy and back up for each other. Double-circuiting these lines present the potential for both lines to be out of service at the same time as a result of maintenance requirements, a weather event, or other circumstances. Basin Electric and Western are required to comply with the reliability standards of the NERC/MRO (see Chapter 1). A loss of both lines to the load centers near Watford City and Williston, North Dakota, would result in interruptions to large numbers of electrical customers. To prevent such reliability failures, the MRO standard for reliability limits the length of double circuit segments of transmission lines to less than 1 mile for any transmission segment.[4]

One option for double-circuiting in this area was to relocate the alignment of Alternative C to follow the alignment of the existing 230-kV line and rebuild the existing 230-kV line as a double circuit 345/230-kV line. This alternative was eliminated from consideration for several reasons.

- The existing 230-kV line could not be taken out of service to allow construction of the double circuit line, requiring the new line to be constructed while the existing line was still energized. Such construction poses considerable safety risks and therefore significantly increases construction time and cost.
- The double-circuit structures would be approximately 25 feet taller than the single circuit 345-kV structures and approximately 50 to 60 feet taller than the existing 230-kV structures and increase potential visual impacts, particularly for the TRNP, which the existing line crosses.

[4] MRO standard TPL-503-MRO-01, System Performance

Figure 2-1: Alternative C Variations



- While double circuiting the line segment through the Little Missouri River Badlands would address considerations of impacts to USFS and the U.S. Department of the Interior, National Park Service (NPS) lands, it would not be viable because the modification would not be compliant with MRO standards as noted above.

Consideration was also given to building a new 345/230-kV double-circuit line parallel and adjacent to the existing Western 230-kV line. This option would avoid the construction difficulties and safety concerns with construction in an energized transmission ROW and also enable the Western line to stay in service until construction was completed. At that time, with Alternative C completed, it would be possible to take the 230-kV line out of service for a short period to transfer it to the new double-circuit structures. The portion of the existing 230-kV line transferred could then be removed and the ROW restored. This alternative was also eliminated from further consideration because of potential impacts associated with acquiring and constructing a new ROW across the TRNP and associated impacts from removal of the existing line. The new double-circuit line would also be considerably taller (approximately 50 to 60 feet) than the existing 230-kV structures, contributing to greater visual impacts.

Finally, construction of several miles of a 345/230-kV double circuit line along the alignment of Alternative C within the U.S. Highway 85 corridor was considered. For this modification, Alternative C would be constructed along the proposed alignment, but would include double-circuit structures for several miles in the U.S. Highway 85 corridor. Following construction, the 230-kV line corresponding to the section of double-circuit 345/230-kV line would be transferred to the 345-kV structures. These structures would need to be approximately 25 feet taller than the single circuit 345-kV structures. Once transferred, the 230-kV structures would be removed and the ROW restored. This modification was also eliminated from further consideration because it would not meet the overall purpose and need for the project of increasing system reliability because it would fail to meet MRO standard TPL-503-MRO-01. This standard requires that a double-circuit transmission line be less than 1 mile long to maintain system reliability. These system reliability standards would apply to both Western's 230-kV line and the 345-kV line proposed by Basin Electric. In addition, this option would have an additional administrative burden under the Federal Land Policy Management Act, which governs the issuance and management of ROWs on federal public lands.[5]

[5] According to Section 507 of the Federal Land Policy Management Act [43 U.S. C. 1767] (b), where a ROW has been reserved, the Secretary shall not take any action to terminate or otherwise limit the use of that ROW without the consent of the head of such department or agency [in this case the Department of Energy]. NPS would need the consent of the Department of Energy to modify Western's ROW under this alternative. Neither NPS nor Western has requested this.

Additional Alternative C Variations

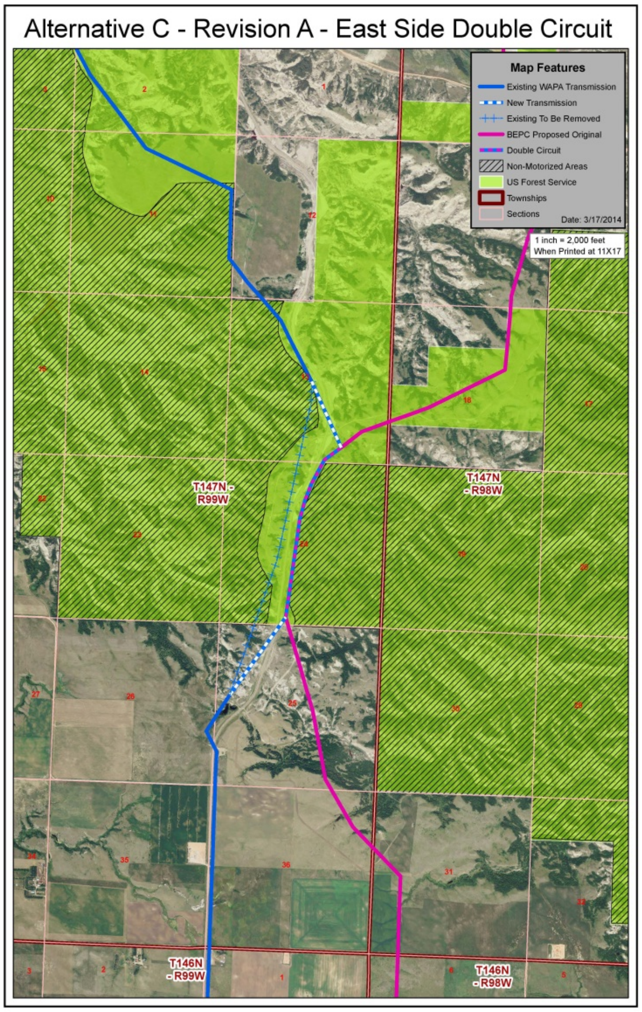
In the Little Missouri River Badlands area, the alignment of Alternative C would cross approximately 2.6 miles of LMNG within the U.S. Highway 85 corridor. Several commenters expressed concern for the potential visual impacts of locating Alternative C along the east side of the highway, while a Western 230-kV line currently exists along the west side of the highway. In response to these concerns, variations of double-circuit and parallel alignments and configuration of Alternative C were considered in this limited area where the line crosses LMNG lands to better compare and assess the potential impacts, including visual impacts. Those variations are described below.

Alternative C is located on the east side and parallel to U.S. Highway 85 for approximately 1 mile in T147N; R99W; Section 24. The area in Section 24 is a topographical ridge that separates two large drainages; the larger basin to the west represents a much larger viewshed from a highway traveler's perspective. To the east of U.S. Highway 85, the drainage is much smaller and falls to the east prior to turning north toward the Little Missouri River. Immediately on the west side of the highway there is a generally flat area approximately 700 feet wide that is occupied by U.S. Highway 85, the USFS Summit Campground and Trailhead Park, and Western's existing north to south aligned 230-kV transmission line. Immediately west of this area the topography falls off quickly in a large heavily eroded area of the Little Missouri River Badlands. Conversely, the east side of the highway looks into the side-hill of the engineering cut created in the construction of the highway grade.

Three variations of a proposed double-circuit alignment are possible in this area. A map of the double circuiting is shown on Figure 2-2. For simplicity, only the east side double circuiting is visually depicted on the figure. Alignments on the west side of U.S. Highway 85 would follow the existing Western 230-kV line.

The three variations that were evaluated to possibly minimize the visual impacts to LMNG lands are described as follows. Each of these variations involved less than 1 mile of double circuit to remain compliant with MRO reliability requirements. A double-circuit segment could be constructed on the west side of U.S. Highway 85 that would eliminate the need for any structures on the east side of the highway for this particular segment. The second variation to Alternative C would be to place a single circuit 345-kV line parallel to the existing 230-kV segment on the west side of U.S. Highway 85. Under this scenario, no structures would be placed on the east side of the segment in question. The single circuit structures would not require the additional 25 foot structure height. However because there is insufficient room between the existing 230-kV line and the existing U.S. Highway 85 Highway, the parallel 345-kV alignment would be required to be constructed to the west of the existing 230-kV line. To accomplish this, the proposed 345-kV line would pass over the existing 230-kV line and the corresponding structure height would be increased approximately 20 feet. This alternative would require an additional 150 feet of ROW within the USFS Summit Campground and Trailhead Park.

Figure 2-2: Alternative C-1



The west side double-circuit and west side single-circuit alternatives present additional construction, engineering, operational safety complexities, increased costs, and visual impacts that are not present on the east side alternative. Therefore these alternatives were considered but dismissed from further consideration.

A third variation considered included constructing Alternative C along the proposed alignment east of U.S. Highway 85, using double-circuit structures for approximately 1 mile. Following completion of construction, the corresponding section of Western's 230-kV line along the west side of the highway would be relocated onto the 345/230-kV double circuit structures. This variation of Alternative C was retained for further consideration in the FEIS and is discussed in Section 2.4.2.

2.1.7 Undergrounding All or Portions of Transmission Line

Underground construction of electricity transmission lines, particularly extra high voltage lines[6] is generally considered as part of the evaluation of project alternatives for the routing and development of new EHV transmission lines. Construction of underground transmission lines has been effectively used for many years in a number of specific applications and circumstances around the country. These applications include:

- areas of considerable congestion where new, undeveloped ROW is unavailable or so limited that the reduced ROW width for undergrounding presents not just a viable alternative, but in many cases, the only practical alternative;
- areas where height restrictions (such as on or around airports) prevent use of overhead lines;
- areas of considerable visual sensitivity (such as nationally designated scenic resources or National Register historic structures) where overhead lines would significantly impact the visual setting of the area; and
- areas of significantly elevated land values where large portions of the additional costs of underground construction can be off-set by significant reductions in overall project cost obtained through the use of much narrower ROW.

The AVS to Neset Transmission Project area in North Dakota presents none of these challenges or constraints. While there are areas with height restrictions, these have been easily avoided through route development. Additionally, areas of scenic value would be crossed by the proposed project and may affect certain viewsheds but others can be avoided. The abundance of open, undeveloped land creates no compelling reason to consider underground construction and its associated costs, challenges, and impacts; therefore, undergrounding has not been considered as a viable alternative for this project.

2.2 FEDERALLY PREFERRED ALTERNATIVE

NEPA requires that the lead federal agency identify a preferred alternative. As the lead federal agency, RUS' preferred alternative is shown in Figure 2-3 and is described in more detail below as Alternative C. The preferred alternative is consistent with the purpose and need of the proposal and complies with applicable laws and regulations. Route characteristics and potential impacts of each of the alternatives are discussed in more detail in Chapter 3.

RUS concluded that Alternative C is the preferred alternative because it best meets the project's stated purpose and need while minimizing or mitigating potential impacts. This project is critical to serve the growing load of electric consumers in western North Dakota and eastern Montana in

[6] Extra high voltage are defined as transmission lines of 230 kV or above.

the vicinity of the Bakken oil fields. The preferred alternative best meets both the capacity needs (a forecasted load of 909 MW expected to occur by 2018-2019 winter season) and reliability standards (adequacy and security). Given the possibilities of transmission line outages and the required application of NERC/MRO standards, a looped system like the one provided by Alternative C is much more reliable than either a double-circuit transmission line as presented in Alternative D or two parallel lines as presented in Alternative E. It is likely that over time an event, like a tornado in summer or icing in the winter, will occur in the area of the proposed lines. While it is less likely that such an event would affect a single area when it occurs, it is likely to take out a portion of the double-circuit line (Alternative D) or both the parallel lines (Alternative E). Such a loss of both 345-kV lines to the load centers near Watford City and Williston, North Dakota, would result in interruptions to large numbers of electrical customers. In contrast, with the looped system proposed under Alternative C, the likelihood of a severe event resulting in an outage of both 345-kV lines proceeding northward would be greatly reduced because the critical high-voltage lines are not on common structures or near each other. This aspect of Alternative C, as well as the fact that it is the lowest cost alternative, were significant considerations in identifying it as the preferred alternative. Further Alternative C presents geographical separation that provides for future growth in western McKenzie County.

Western and USFS concur with RUS' selection of Alternative C as the preferred alternative. Concurrence of both agencies is dependent on the proponent implementing all mitigation measures outlined in Appendix A and obtaining a SUP from USFS for portions of the line that cross the LMNG.

2.3 ENVIRONMENTALLY PREFFERED ALTERNATIVE

According to 40 CFR 1505.2(b), the agency shall identify which alternative is considered to be "environmentally preferable." In the case of the AVS to Neset Transmission Project, Alternative D is considered the environmentally preferable alternative. Alternative D was determined to be environmentally preferable because it would impact the least acreage of any of the action alternatives, which implies that it would have the fewest environmental impacts. In addition, this alternative would have no impacts on TRNP. However, Alternative D does not meet the overall project purpose and need as well as Alternative C and thus was not selected as the agency preferred alternative.

2.4 ALTERNATIVES CONSIDERED IN THE FEIS

NEPA requires that an EIS consider a full range of alternatives to the proposed action and fully evaluate all reasonable alternatives. The EIS must also consider the no-action alternative. For the AVS to Neset Transmission Project, alternatives consist of individual route segments that, when combined, form various complete route alignment alternatives within each macro-corridor between the proposed endpoints. Figures 2-3, 2-4, and 2-5 show the individual, 1,000-foot-wide alternative route corridors located within the 6-mile-wide macro-corridors that were identified for the proposed project after consideration of several macro-corridors and numerous route corridors within each retained macro-corridor. Appendix D describes the route development process and routing principles used to develop alternative route corridors for the project.

Two route alternatives were identified and evaluated in the DEIS. Initially, these alternatives were identified as two separate route alternatives for the construction and operation of a new 345-kV line. With the increase in load forecast requirements for the area, these two alternatives were combined into a single alternative consisting of numerous line segments and interconnections to both the existing and new substations necessary to meet the project purpose and need. Each alternative route segment is defined as a 150-foot-wide ROW within a larger 1,000-foot-wide route corridor. It is likely that as the project continues to be developed, conditions will be identified or encountered during survey, engineering, ROW acquisition, and construction, and the Public Service Commission may require changes (should the project be approved) that may necessitate Basin Electric that make adjustments to these route segments or substation locations. These adjustments would address specific localized conditions, circumstances, and landowner requests not readily apparent as part of the route development and environmental review process and would not be anticipated to result in substantial (if any) additional or different impacts. Any adjustments would generally be intended to reduce overall environmental impacts, reduce project inconvenience to landowners, and/or protect public safety. To the extent these adjustments have been identified during the environmental review process the revised alignment and its characteristics and potential impacts are assessed in this FEIS. A detailed description of the alternatives is provided below. Table 2-1 summarizes the various components of each of the alternatives for the AVS to Neset Transmission Project, and includes a comparison of costs for each alternative.

Table 2-1: Components of Project Alternatives

		Alternative C	Alternative D	Alternative E
Transmission Line Segments	**Kilovolts**	**Miles**	**Miles**	**Miles**
AVS Substation to Red Substation	345	45	45	45
Red Substation to Charlie Creek Switchyard	345	21	21	21
Red Substation to Killdeer South Switchyard	345	N/A	24	24
Charlie Creek Substation to Blue Substation	345	51	N/A	N/A
Red Substation to White Substation	345	27	27	54
White Substation to Blue Substation	345	36	36	72
Blue Substation to Western's 230-kV Line	230	10	10	10
Blue Substation to Judson Substation	345	24	24	24
Judson Substation to Williston Substation	230	2	2	2
Judson Substation to Tande Substation	345	61	61	61
Tande Substation to Neset Substation	230	1	1	1
Total miles		**278**	**251**	**314**
Substations/Switchyards				
		Acres	**Acres**	**Acres**
AVS Substation (345kV)	Existing	19	19	19
Red Substation (345kV)	Proposed	12	12	12
Charlie Creek Substation (345/230/115kV)	Existing	10	10	10
White Substation (345/115kV)	Proposed	12	12	12
Blue Substation (345/230/115kV)	Proposed	25	25	25
Judson Substation (345/230kV)	Proposed	12	12	12
Williston Substation (230/115kV)	Existing	9	9	9
Tande Substation (345/230kV)	Proposed	12	12	12
Neset Substation (230/115kV)	Existing	8	8	8
Killdeer South Switchyard (345kV)	Proposed	N/A	12	12
Cost Analysis				
Total Cost Transmission		$352 million	$374 million	$399 million
Total Cost Substation		$155 million	$188 million	$188 million
Total Project Cost		$507 million	$562 million	$587 million
Incremental Cost from Alternative C		--------	$55 million	$80 million
Discussion:		Preferred based on higher reliability rating at a lower cost, provides future growth	Removed from consideration due to failure to achieve stated purpose and need due to lower reliability and redundancy at higher cost	Removed from consideration due to failure to achieve stated purpose and need due to lower reliability and redundancy at much higher cost

2.4.1 No-action Alternative

Under the no-action alternative, the AVS to Neset Transmission Project would not be constructed. The existing environment within the project area would remain the same and no land would be used for transmission lines, facilities, or substations. The no-action alternative does not meet the identified purpose and need for the project. Under this alternative, it is expected that load growth will increase beyond the load-serving capacity of the existing transmission system for the Williston/Tioga region by 2016, resulting in transmission system reliability issues and violating the criteria established by NERC for transmission reliability in the region. Moreover, if the transmission lines are not built, it is probable that oil and gas operations would develop alternative sources of electrical power, including the use of diesel generators, which could potentially lead to greater environmental impacts.

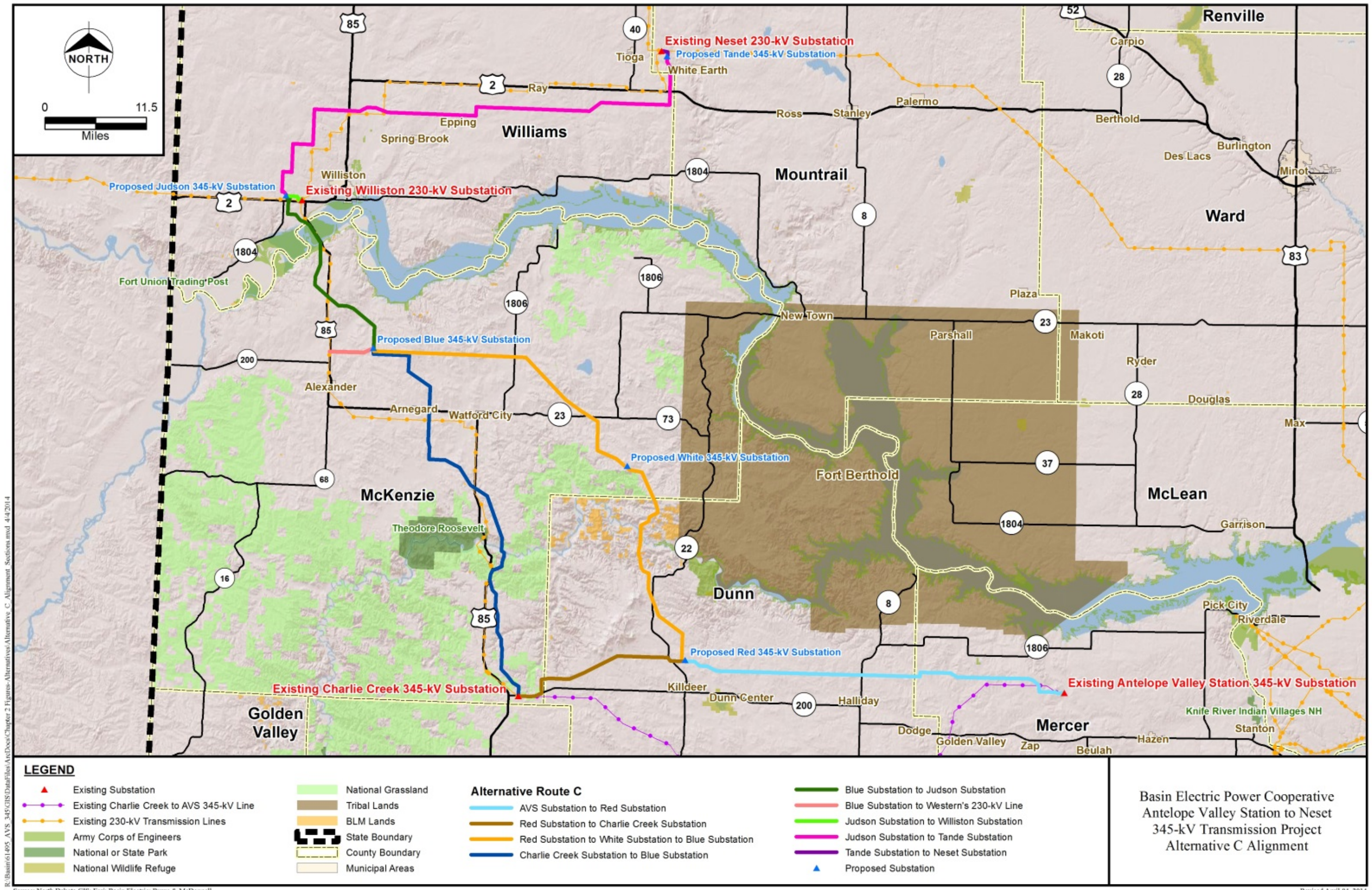
2.4.2 Alternative C

Alternative C includes approximately 278 miles of transmission line, including 265 miles of new 345-kV transmission line and 13 miles of new 230-kV line, five new substations and additional equipment, but no expansion, to four existing substations (see Figure 2-3). Alternative C includes the following characteristics with each segment color coded on Figure 2-3:

- 45 miles of 345-kV transmission line connecting the existing AVS Substation to a new Red Substation near Killdeer (light blue), including 2.3 miles immediately west of AVS Substation where the proposed line would be double circuited[7] with an existing line to facilitate future coal mine operations
- 21 miles of 345-kV transmission line connecting the new Red Substation to the existing Charlie Creek Substation (brown)
- 27 miles of 345-kV transmission line connecting the new Red Substation to the new White Substation and 36 miles of 345-kV transmission line connecting the White Substation to the new Blue Substation (yellow)
- 51 miles of 345-kV transmission line from the Charlie Creek Substation to the Blue Substation (dark blue)
- 24 miles of 345-kV transmission line from the Blue Substation to the proposed Judson Substation (dark green)

[7] Midwest Reliability Organization (MRO) standard TPL-503-MRO-01, System Performance, Section R1.2 provides for a variance from the 1 mile limitation on double circuiting on a case-by-case basis, including at substation entrances as in this case.

Figure 2-3: Proposed Alternative C for AVS to Neset Transmission Project



- Two 230-kV single-circuit transmission lines running parallel for 5 miles connecting the Blue Substation to Western's 230-kV transmission line (orange)
- 2 miles of 230/115-kV double-circuit transmission line connecting the proposed Judson Substation to the Williston Substation (light green)
- 61 miles of 345-kV transmission line connecting the proposed Judson Substation to the proposed Tande Substation, approximately 31 miles of which would be double-circuited with a MWEC 115-kV line associated with other regional improvement projects (pink)
- 1 mile of 230-kV transmission line connecting the proposed Tande Substation to the Neset Substation (purple)

Judson, Tande, and Blue 345/230-kV Substations

The proposed Judson and Blue substations would be constructed to interconnect the proposed 345-kV lines to Western's Williston Substation and to Western's Williston to Charlie Creek 230-kV transmission line along U.S. Highway 85 south of the Missouri River, respectively. Basin Electric's Tande Substation would be constructed to interconnect the 345-kV transmission system to the existing 230-kV system at Basin Electric's Neset Substation located near Tioga. The Judson and Tande substations would each occupy approximately 12 acres of land. The Blue Substation consists of both 345/230-kV and 345/115-kV equipment, therefore a 25 acre parcel would be required.

Red, White, and Blue 345/115-kV Substations

To interconnect the proposed 345-kV lines into the local 115-kV system and serve the load demands of the Williston Load Pocket and surrounding area, three new 345/115-kV substations would be constructed along the 345-kV system (Figure 2-3). The Red Substation would be located near Killdeer. The White Substation would be located north of the Red Substation, east of Watford City. The Blue Substation would be located south of the Missouri River. The Red Substation and White Substation would occupy approximately 12 acres of land each. The Blue Substation site would be approximately 25 acres because it would also include a 345/230-kV component as noted above.

Route Alignment

The alignment for the 345-kV lines and associated facilities are shown on Figure 2-3. Throughout the environmental review process, Basin Electric continued engineering development of the project and worked with agencies and landowners to address potential project-related concerns. As final design, ROW acquisition, and construction progress, Basin Electric will continue to work with agencies and landowners to address site-specific concerns. Minor adjustments are likely to occur, which would be designed to address concerns and minimize overall impacts, resulting in few if any changes to the potential impacts of the project.

Alternative C-1—East Side Double Circuit

A variation to a short section of the Alternative C alignment along U.S. Highway 85 was retained to address USFS and commenter concerns for the LMNG. Basin Electric would construct the proposed project along the proposed alignment of Alternative C on the east side of U.S. Highway 85 as a 345/230-kV double-circuit line for approximately 1 mile (Figure 2-2). After completion of project construction for all of Alternative C, including both the AVS to Neset and North Killdeer Loop 345-kV lines, expected to be in service the end of 2016, approximately 1 mile of Western's existing 230-kV line on the west side of U.S. Highway 85 would be transferred to the Basin Electric 345/230-kV line section. Double circuit structures would be approximately 25 feet taller than single circuit 345-kV structures. The Western 230-kV line would then be energized on the new double circuit configuration. The section of Western's existing 230-kV transferred to the east side structures would be removed from the USFS Summit Campground and Trailhead Park and the area would be restored to its previous use. Energizing the 230-kV segment of the double-circuited line and removal of Western's abandoned 230-kV line segment would occur in 2017.

2.4.3 Alternative D

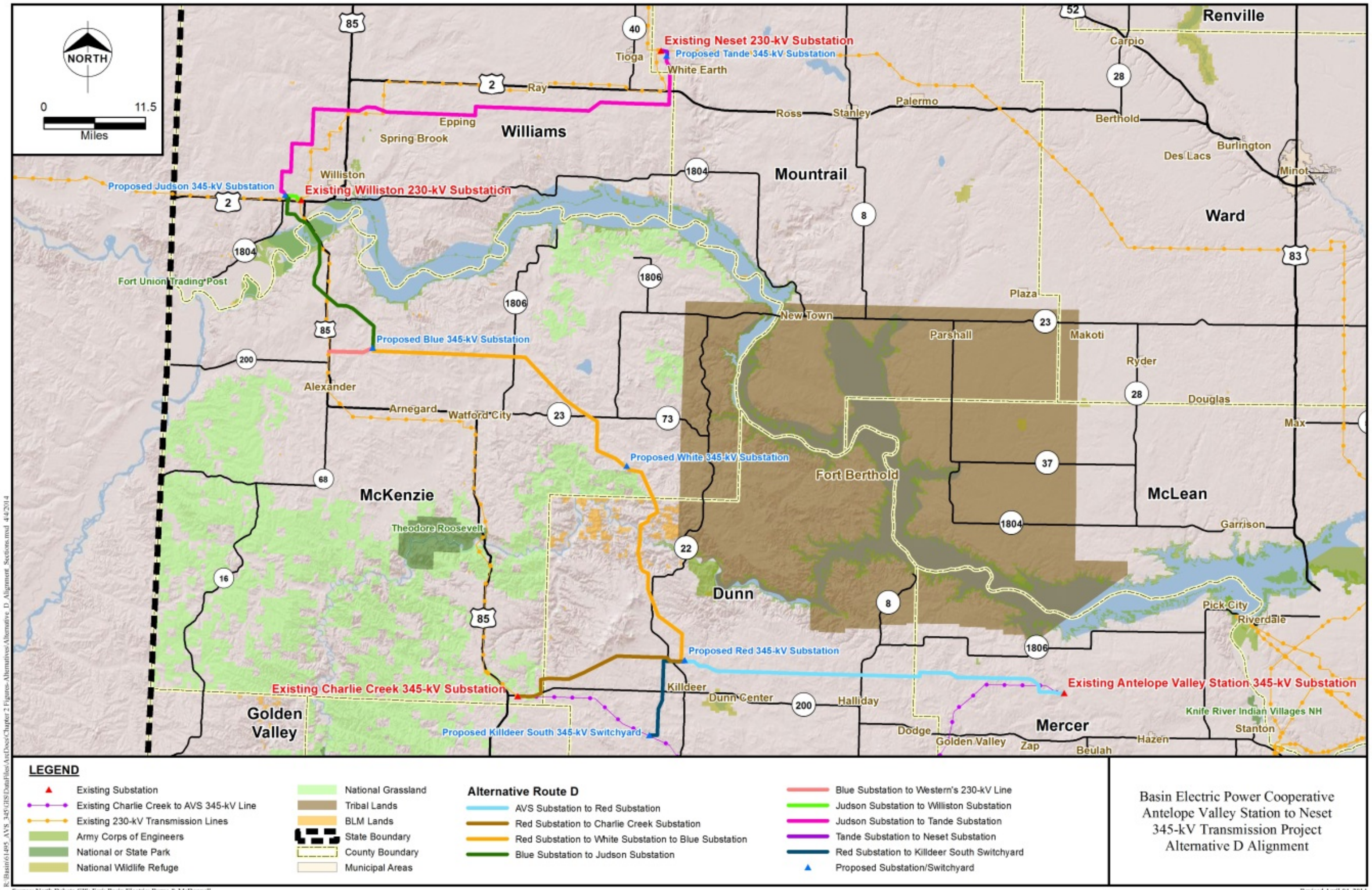
Alternative D is similar to Alternative C with the primary differences being the construction of a 345/345-kV double-circuit lines north of Killdeer for 63 miles to the Blue Substation, the additional Killdeer South 345-kV Switchyard, a 345-kV transmission line connection between the Red Substation and the Killdeer South Switchyard, and no line construction between the existing Charlie Creek Substation and the new Blue Substation. Alternative D would include construction of approximately 251 miles of transmission line beginning at the AVS Substation and ending at the Neset Substation, including 13 miles of new 230-kV line and 238 miles of new 345-kV transmission line, of which 65.3 miles would be 345/345-kV double-circuit. Alternative D would also include construction of five new substations, one switchyard, and additional equipment but no expansion to the four existing substations. Alternative D includes the following characteristics with each segment color coded on Figure 2-4:

- 45 miles of 345-kV transmission line connecting the existing AVS Substation to a new Red Substation near Killdeer (light blue), including 2.3 miles immediately west of AVS substation where the proposed line would be double circuited with an existing line to facilitate future coal mine operations
- 21 miles of 345-kV transmission line connecting the Red Substation to the existing Charlie Creek Substation (brown)
- A new Killdeer South Switchyard south of Killdeer along Basin Electric's existing AVS to Charlie Creek 345-kV transmission line

- Two 345-kV single-circuit transmission lines running parallel for approximately 12 miles between the Red Substation and the new Killdeer South Switchyard (blue)
- 27 miles of 345/345-kV double-circuit transmission line connecting the Red Substation to the new White Substation and 36 miles of 345/345-kV double-circuit transmission line connecting the White Substation to the new Blue Substation (yellow)
- 24 miles of 345-kV transmission line from the Blue Substation to the proposed Judson Substation (dark green)
- Two 230-kV, single-circuit transmission lines running parallel for 5 miles connecting the Blue Substation to Western's 230-kV transmission line (orange)
- 2 miles of 230/115-kV double-circuit transmission line connecting the proposed Judson Substation to the Williston Substation (light green)
- 61 miles of 345-kV transmission line connecting the proposed Judson Substation to the proposed Tande Substation, approximately 31 miles of which would be double-circuited with a MWEC 115-kV line associated with other regional improvement projects (pink)
- 1 mile of 230-kV transmission line connecting the proposed Tande Substation to the Neset Substation (purple)

Additional substation facilities for Alternative D would be the same as those discussed previously for Alternative C.

Figure 2-4: Proposed Alternative D for AVS to Neset Transmission Project

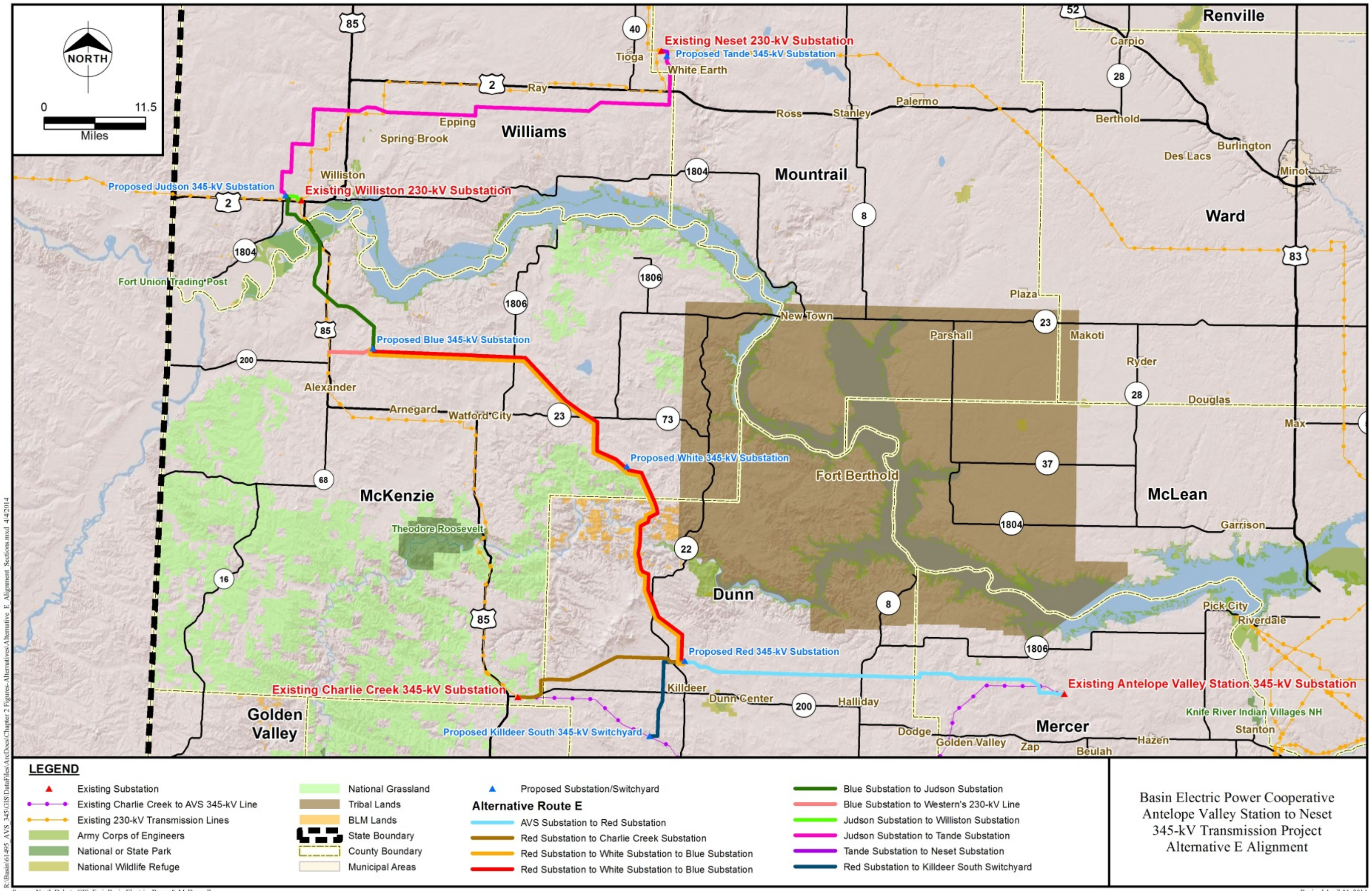


2.4.4 Alternative E

Alternative E would include constructing two parallel 345-kV lines between the Red and Blue substations, along the eastern corridor. Alternative E would be the same as Alternative D with the primary difference being the construction of two parallel 345-kV transmission lines north of Killdeer for 63 miles rather than a double-circuit 345/345-kV line proposed as part of Alternative D. Alternative E would include construction of approximately 314 miles of transmission line beginning at the AVS Substation and ending at the Neset Substation, including 13 miles of new 230-kV line and 301 miles of new 345-kV transmission line, of which 126 miles (63 miles times two) would be two single-circuit 345-kV parallel lines. Alternative E would also include construction of five new substations, one switchyard, and additional equipment but no expansion to four existing substations. Alternative E includes the following characteristics with each segment color coded on Figure 2-5:

- 45 miles of 345-kV transmission line connecting the AVS Substation to a new Red Substation near Killdeer (light blue), including 2.3 miles immediately west of the AVS Substation where the proposed line would be double circuited with an existing line to facilitate future coal mine operations
- 21 miles of 345-kV transmission line connecting the Red Substation to the existing Charlie Creek Substation (brown)
- A new Killdeer South Switchyard south of Killdeer along Basin Electric's existing AVS to Charlie Creek 345-kV transmission line
- Two 345-kV single-circuit transmission lines running parallel for approximately 12 miles between the Red Substation and the new Killdeer South Switchyard (blue)
- 27 miles of two single-circuit parallel 345-kV transmission lines connecting the Red Substation to the new White Substation and 36 miles of two single-circuit, parallel 345-kV transmission lines connecting the White Substation to the new Blue Substation (yellow)
- 24 miles of 345-kV transmission line from the Blue Substation to the proposed Judson Substation (dark green)
- Two 230-kV single-circuit transmission lines running parallel for 5 miles connecting the Blue Substation to Western's 230-kV transmission line (orange)
- 2 miles of 230/115-kV double-circuit transmission line connecting the proposed Judson Substation to the Williston Substation (light green)
- 61 miles of 345-kV transmission line connecting the proposed Judson Substation to the proposed Tande Substation, approximately 31 miles of which would be double-circuited with a MWEC 115-kV line associated with other regional improvement projects (pink)

Figure 2-5: Proposed Alternative E for AVS to Neset Transmission Project



- 1 mile of 230-kV transmission line connecting the proposed Tande Substation to the Neset Substation (purple)

Additional substation facilities for Alternative E would also be the same as those discussed previously for Alternative C.

2.5 ELEMENTS COMMON TO ALL ACTION ALTERNATIVES

There are several elements common to each of the alternatives, including various transmission line components, substation components, construction techniques, and operation and maintenance procedures. These items are discussed in more detail below.

2.5.1 Transmission Line Characteristics

The proposed 345-kV, single-circuit transmission line would be constructed using single-pole or H-frame self-supporting structures within a 150-foot-wide ROW. Double-circuit 345/345-kV, 345/115-kV, and 230/115-kV lines would be constructed using single-pole, self-supporting structures. Detailed construction access considerations and construction techniques are described further in the following sections. Several transmission line structure types would be necessary to address the various voltages, terrain, and connector scenarios included as part of different components of the proposed project. A summary of Basin Electric's proposed structure characteristics for each of these structure types is provided in Table 2-2. Structures proposed for this project by Basin Electric are shown in Figures 2-6 through 2-11.

Project construction and design would meet the requirements of the National Electrical Safety Code (NESC)-Heavy Loading District, RUS design criteria (USDA, 2009a), and other applicable local or national building codes (Institute of Electrical and Electronics Engineers Standards Association, 2012). The Heavy Loading District refers to those areas (including North Dakota) that are subject to severe ice and wind loading. Minimum conductor clearance is measured at the point where conductor sag is in closest proximity to the ground. The proposed transmission line would be constructed with clearances that exceed standards set by NESC.

Table 2-2: AVS to Neset Transmission Project Typical Structure Design Characteristics

Description of Design Component[c]	345kV (Fig 2-6)	230/115kV (Fig 2-7)	345/115kV (Fig 2-8)	230kV (Fig 2-9)	345kV H-Frame (Fig 2-10)	345/345kV (Fig 2-11)
Conductor size (inches)	1.8	1.345/1.108	1.8/1.108	1.345	1.8	1.8
ROW width (feet)	150	100	150	100	150	150
Typical minimum and maximum span distance between structures (feet)[a]	650-1,100	700-900	650-1,000	650-950	900-1,000	650-1,000
Average span (feet)	900	800	800	800	1,000	900
Minimum and maximum structure height (feet)	100-130	97-127	115-145	70-110	80-100	100-155
Average height of structures (feet)	115	112	130	95	90	130
Average number of structures per mile	6	6.5	6.5	6.5	5.5	6
Temporary disturbance per structure (acre)[b]	0.4	0.4	0.4	0.4	0.4	0.4
Temporary disturbance per mile (acre)	4.0	4.0	4.0	4.0	4.0	4.0
Permanent disturbance per structure (acre)	0.0003	0.0002	0.0003	0.0002	0.0004	0.0003
Minimum conductor-to-ground clearance to agricultural lands, rural roads, and paved highways at 100 degrees Celsius (feet)	30	26	30	26	30	30
Minimum conductor-to-ground clearance to railroads at 100 degrees Celsius (feet)	As required by specific railroad					

[a] Actual span distance will vary depending on topography.

[b] Angle and dead-end structures (for longitudinal stability) would be constructed with concrete foundations. Guy wires would not typically be required.

[c] Single pole tangent structures would be freestanding on concrete foundations. H-frame tangent structures would likely be directly embedded into the ground.

Figure 2-6: 345-kV Single Circuit Structure

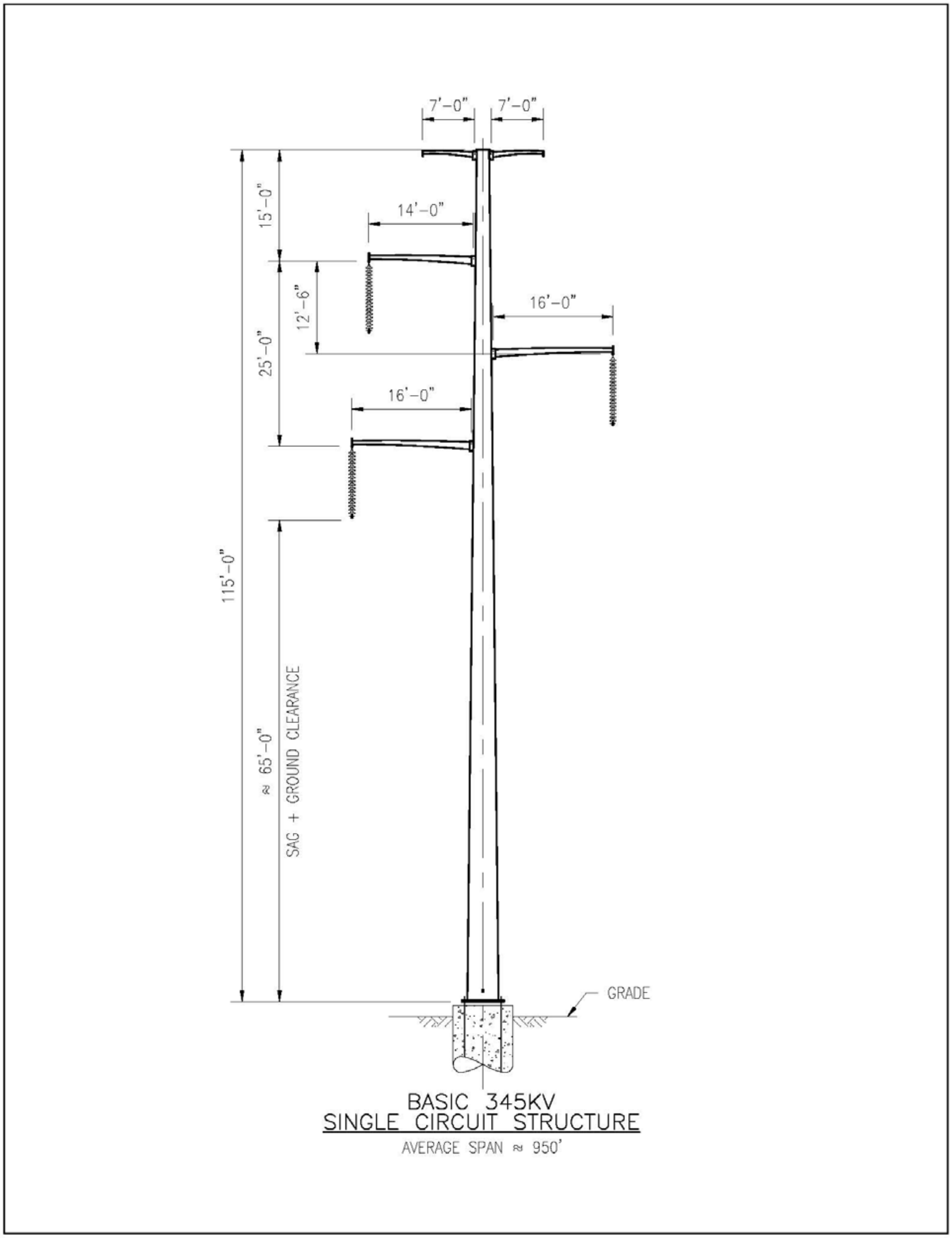


Figure 2-7: 230/115-kV Double Circuit Structure

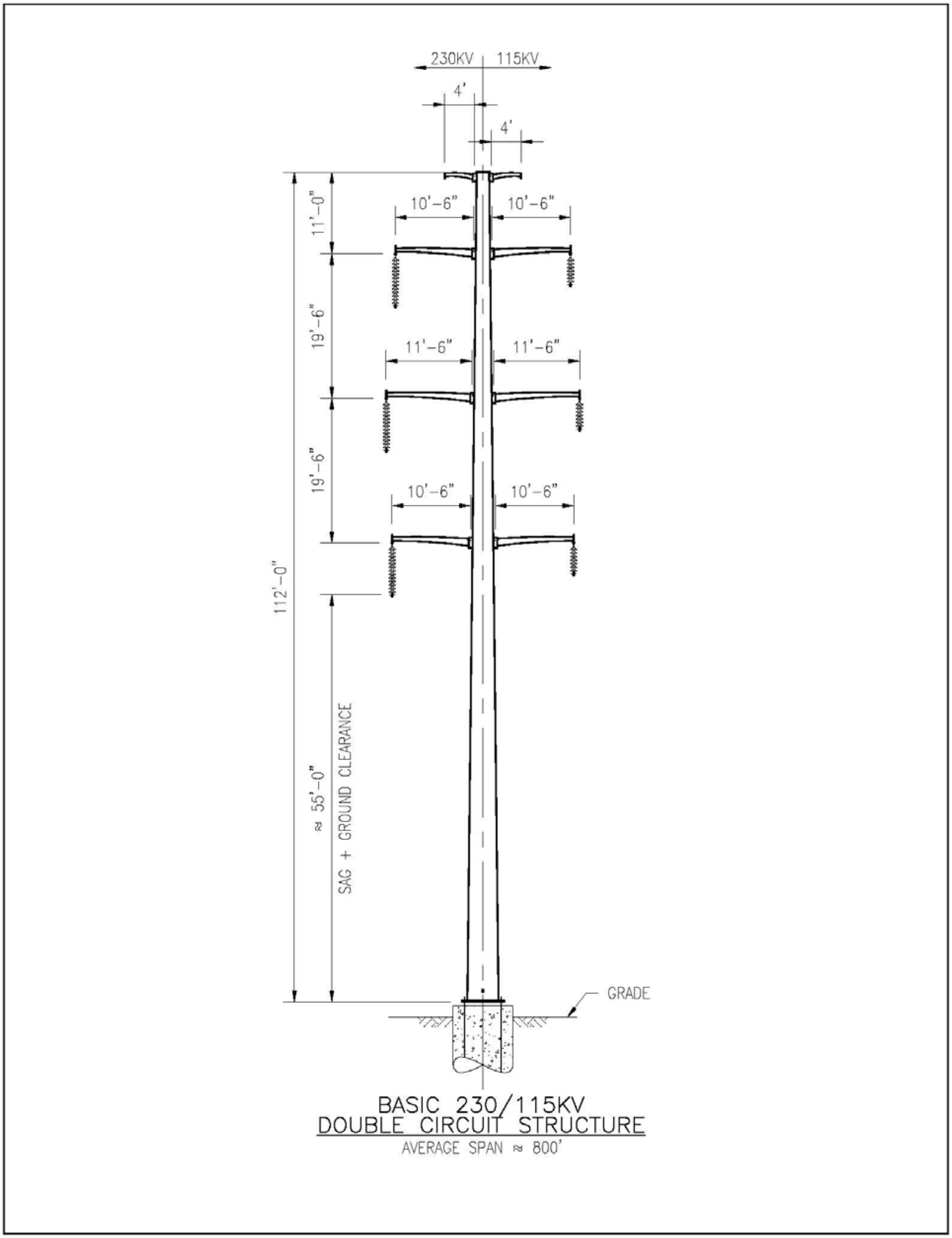


Figure 2-8: 345/115-kV Double Circuit Structure

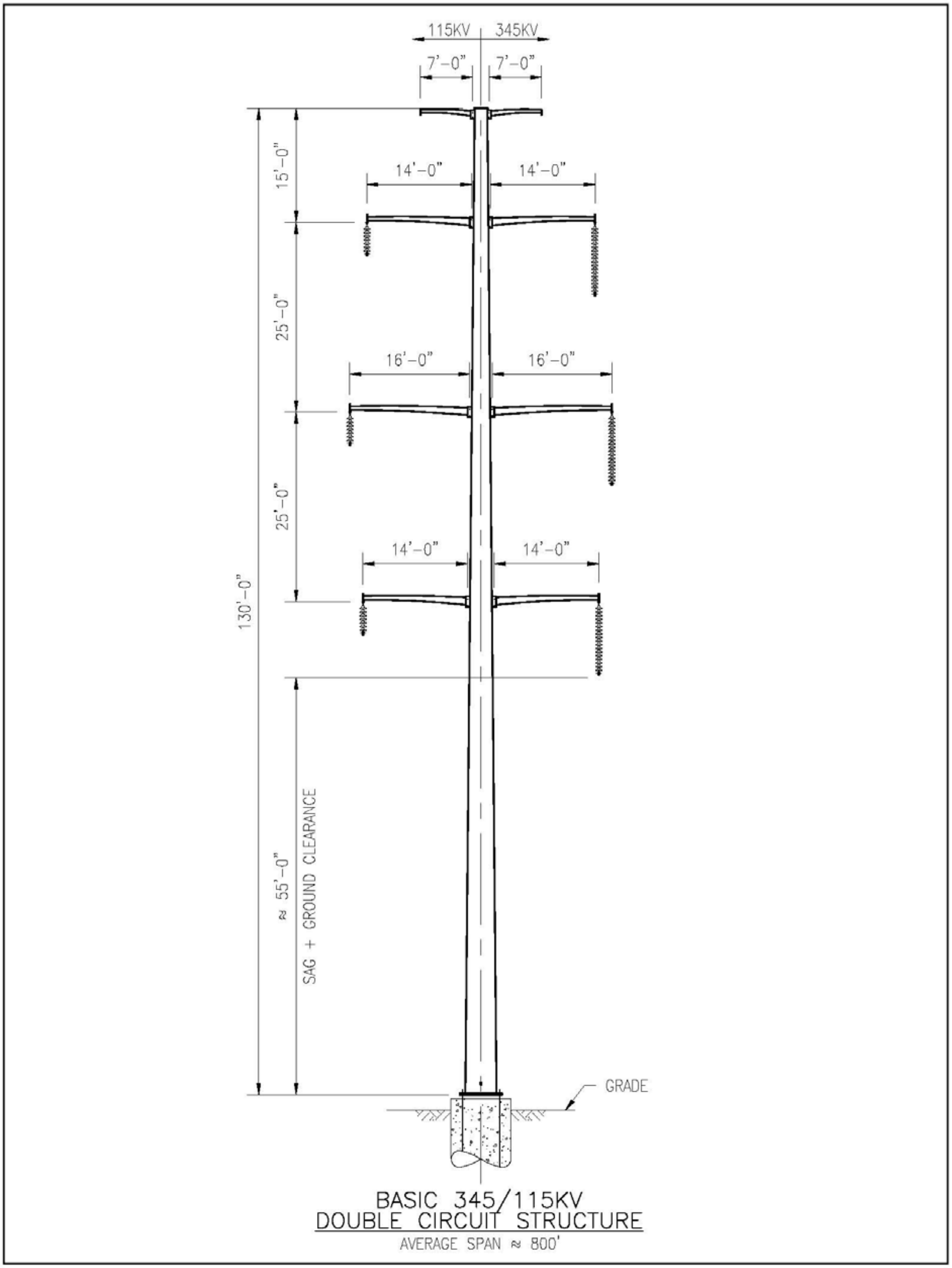


Figure 2-9: 230-kV Single Circuit Structure

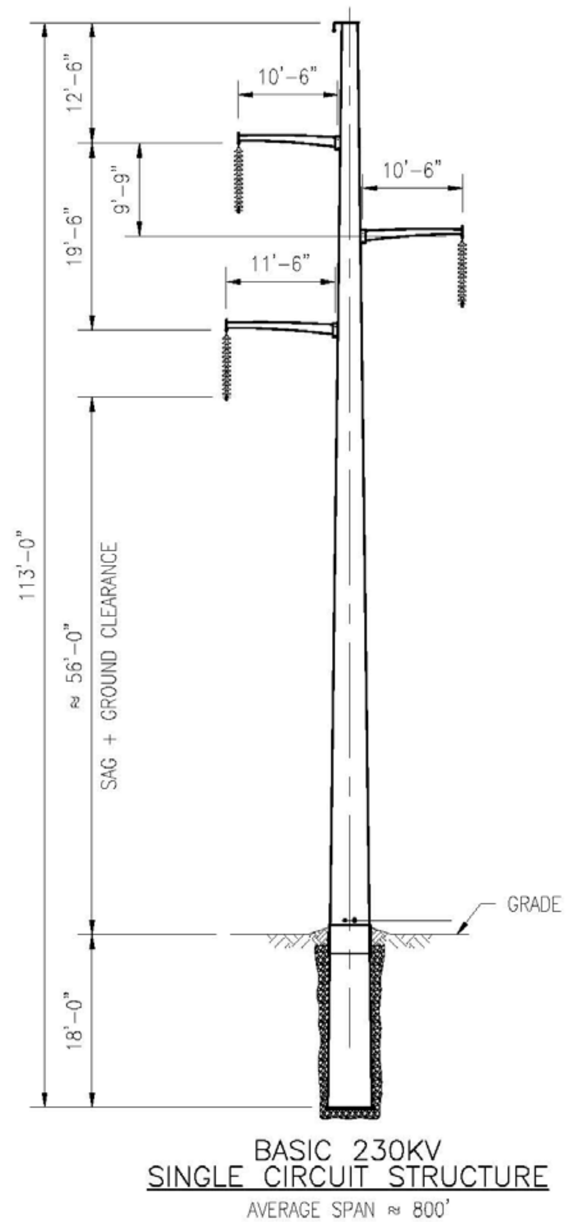


Figure 2-10: 345-kV Single Circuit H-Frame Structure

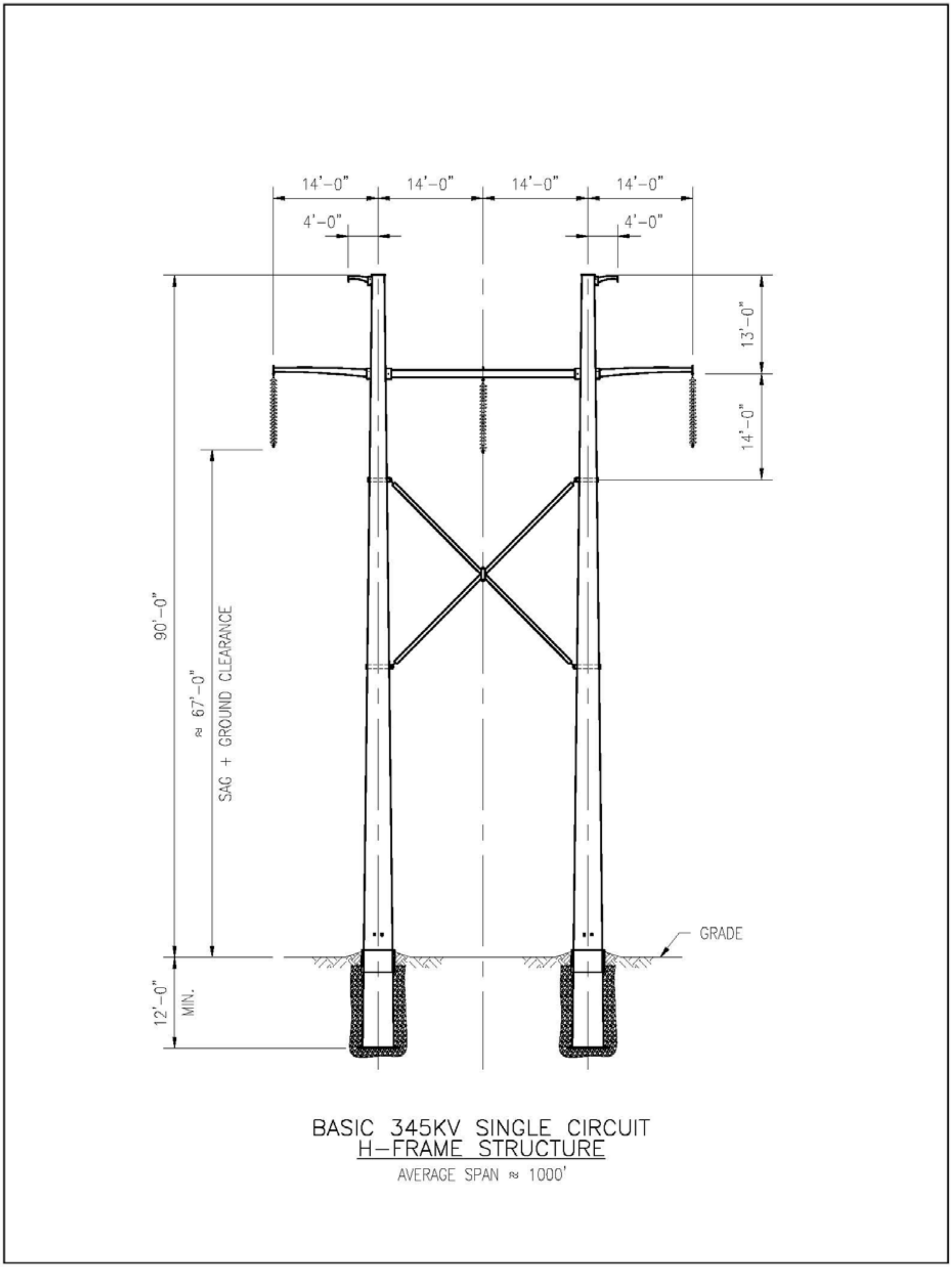
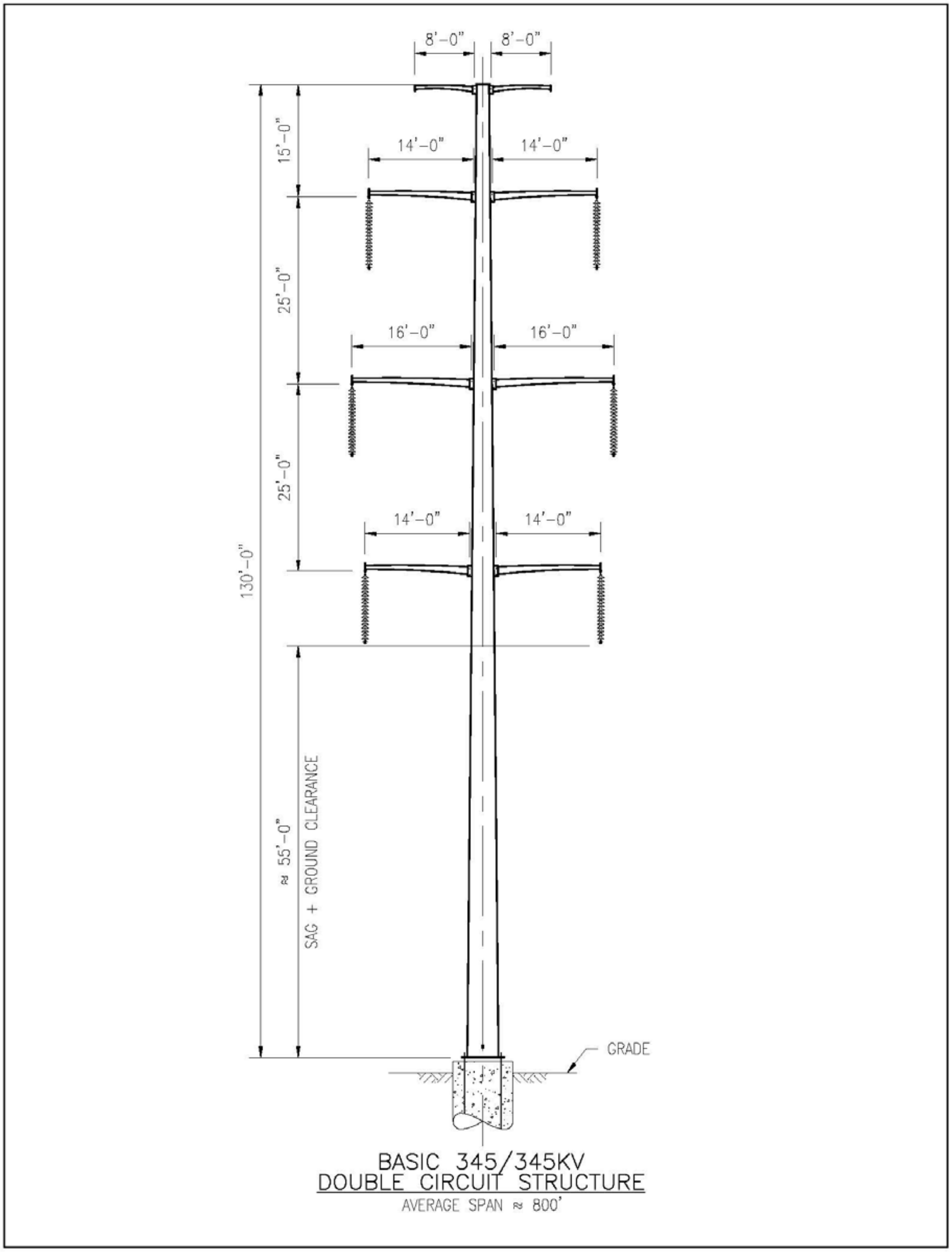


Figure 2-11: 345/345-kV Double Circuit Structure



2.5.2 Transmission Line and Substation Construction

Pre-construction Activities

Basin Electric and/or its contractors would perform engineering surveys prior to construction of the transmission line. These surveys would consist of centerline location, profile, and access surveys. Pre-construction surveys would likely coincide with other pre-construction activities.

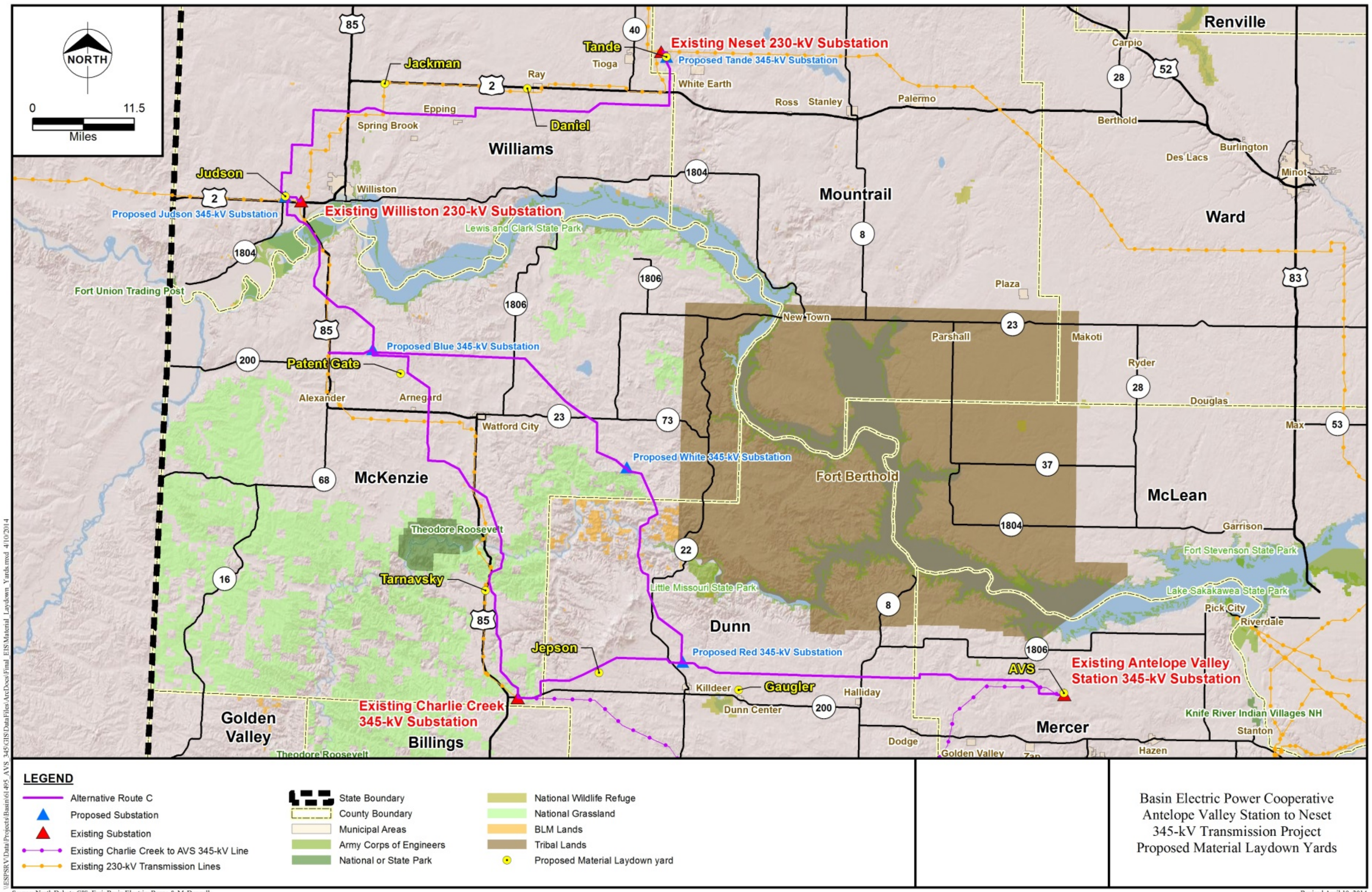
Geotechnical studies would be conducted along the transmission line route to determine engineering requirements for structures and foundations. Truck-mounted augers would be transported to selected locations to drill small-diameter boreholes, and borehole cuttings would be analyzed to determine specific soil characteristics. These activities would be conducted after harvest to minimize impacts on agricultural fields. Minimal land disturbance (approximately 400 square feet) would be anticipated for each geotechnical boring site. Additionally, small access trails may be required for some of the boring locations.

Approximately ten temporary construction material and equipment laydown areas would be used for the duration of construction. Figure 2-12 shows the location of proposed material laydown areas that have been identified. These laydown areas would be approximately 5 acres.

Where feasible, construction laydown areas are typically located at previously disturbed or developed locations such as vacant lots, existing utility yards, or parking lots to avoid or minimize impacts on sensitive resources. If existing yard locations are not available, preferred locations for yards would be undeveloped areas, such as grazing or cropland that are cleared and flat; have all-weather access; and do not contain streams, wetlands, or other environmentally sensitive resources. Laydown yards would typically consist of flat or gently sloping lands where construction material would be placed on pallets or cribbing. It is expected that these areas would not require removal of vegetation or topsoil and would require minimal if any re-grading. Laydown areas would be returned to pre-construction conditions upon completion of the project.

Vegetation removal within the ROW is anticipated to be minimal throughout a large portion of the project, especially in rangeland and cropland areas. In more forested portions of the ROW, trees and shrubs would be removed if they interfere with construction activities or the safe and reliable operation of the transmission line. Vegetation would be removed at ground level to provide access to the ROW. Disposal of trees and shrubs would be consistent with the landowner’s wishes, permitting requirements, and all state waste management regulations. It is expected that the woody species removed would be replaced at a minimum 2:1 ratio. Final replacement species and quantities would be determined after a tree and shrub inventory has been completed on the final alignment and would be stipulated for the project through the NDPSC’s siting process.

Figure 2-12: Temporary Construction Material and Equipment Laydown Areas



Transmission Structure Site Preparation

Transmission structure site clearing is expected to be minimal over a large portion of the project because much of the ROW would be located across rangeland, grasslands, or agricultural areas. In these areas, site leveling is expected to be minimal. In areas of difficult terrain, structure location sites may require more extensive leveling using bulldozers or front-end loaders to ensure the safe operation of equipment. In areas where access is extremely difficult, structure placement would be performed through the use of helicopters. All blading and leveling would occur within the boundary of the ROW throughout the length of the project. Soil removed during leveling of structure sites would be stockpiled nearby and replaced following construction. Disturbed ground would be re-graded to as close to pre-construction condition as appropriate for stabilization and revegetated or approved for tillage depending on pre-construction land use.

Structure holes would be drilled by truck-mounted auger or power auger at identified structure locations along the length of the ROW. Total land disturbance at each structure location would vary depending on location (i.e., level terrain versus steep, rugged terrain) and structure type. All disturbances related to the boring of structure holes would be confined to the ROW.

Structures used for the project would be either directly imbedded into the ground or bolted on reinforced poured concrete foundations. Determinations on whether a structure would be directly imbedded into the hole or require a foundation would be based on access, terrain, and soil conditions. Between 1,465 and 1,835 structures (depending on the alternative) would be used for the proposed project, with an average of approximately six structures per mile.

Structure Assembly and Erection

Structure components such as pole segments, davit arms, hardware, and insulators would be brought to the structure site via truck and assembled on-site. Davit arms, insulators, and other components would be attached to the structure while on the ground. The bottom section of the structure would be placed into the boreholes and backfilled or bolted onto reinforced foundations using cranes or large boom trucks. In areas of very rough terrain that are inaccessible or have limited accessibility, such as those areas around the Little Missouri River or Missouri River Badlands, some aerial placement of structures by helicopter may be required. The upper sections of the structure would then be bolted onto the lower section. Structure setting activities would be done within the boundaries of the ROW. Conductor pulling may require some work outside of the permanent ROW but within the area of the construction easement.

Stringing and Tensioning of Conductors

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

Pulling and tensioning sites are typically located at 8,000 to 9,000-foot intervals or at angle point structures. Sites along tangent structures are located within the construction ROW; those at angle points typically are located partially outside of the permanent ROW. Stringing equipment consists of wire pullers, tensioners, conductor OHGW and OPGW reels, and sheave blocks. After the conductors, OHGW, and OPGW are pulled for a section of line, they are tightened or sagged to the required design tension in compliance with the NESC. The process is repeated until the OPGW and conductors are pulled through all sheaves. Conductor stringing also requires access to each structure for securing the conductor to the insulators, OHGW, or OPGW to each structure, once final line sag is established.

For public safety and property protection, temporary wooden guard structures would be used to provide temporary support when stringing conductors, OHGW, and OPGW across existing power lines, roads, highways, railroads, and other linear obstacles. The structures would be removed when stringing is complete; the guard structure holes would be backfilled and the sites would be reclaimed. All temporary wooden guard structures would be installed within the transmission line ROW. Pipeline crossings would be identified on construction plans and would be visibly marked in the field. Matting would be installed across pipeline ROWs as necessary to allow equipment to safely cross these areas. Following construction, matting would be removed and the area restored. All utilities would be located and marked through the North Dakota One Call service. Additional measures that would be implemented for the project for public health and safety are discussed in Appendix A of this document.

Structure Site Access and Traffic

Construction crews would gain access to the ROW from public roads and section line trails, as well as within the transmission ROW itself in areas with no public access. Access for line construction would be by truck within the ROW. Structures located along section lines would be accessed from section line roads and trails where possible. These construction access trails would be temporary, two-track limited maintenance passageways requiring minimal, if any, leveling, temporary culverts, or other improvements to access structure locations. The exception would be on the LMNG where permission would need to be obtained from USFS to access any trails or roads that exist along section lines. New surface access roads are not anticipated for a majority of the line; however, they may be required in certain areas with no access. Access in areas with steep or rugged terrain, particularly near the Little Missouri River and associated tributaries would likely be gained using helicopters and would not require additional new roads.

Existing construction access trails would be rehabilitated after construction to comparable or better conditions than they were prior to construction activities. New construction access trails would be restored to the natural condition of the surrounding area (see Appendix A). Gates installed to facilitate access and keep livestock from roaming on-site during the construction process would be left in place, with landowner concurrence, following construction of the line. Fences and gates removed during the construction process would be replaced or rebuilt following completion of construction.

Temporary overland access would be used in areas not accessible by local roadways or section line trails with the exception of the LMNG. If possible, access through cultivated fields would be done during the non-growing season. If crop damage occurs, landowners would be compensated for loss of crops.

Temporary overland access routes would result in temporary disturbance and compaction of soil and vegetation. Vegetation along these routes would recover quickly, as no grading would be required. Landowners would be compensated for temporary overland access routes.

Substation/Switchyard Construction Procedures

Construction procedures for all the new 345/230-kV and 345/115-kV substations and 345-kV switchyards would be essentially the same, except for the specific equipment installed. Each site would be approximately 12 acres, except for the Blue Substation which would actually be two adjacent substations (345/230-kV and 345/115-kV), requiring 25 acres. Additional land around each substation/switchyard would be acquired for buffer with adjacent lands and to provide space for transmission line connections. Following survey and staking of the site, erosion control best management practices (BMPs) would be followed. Site access would be developed, including installation of culverts in adjacent road drainage ditches for installation of a gravel driveway. No clearing of forested areas is anticipated for any of the substation/switchyard locations. The site would be graded and fenced. Concrete pads and footings for equipment would be installed. Aggregate would be spread throughout the fenced area. Equipment would be delivered to the site and generally stored inside the fenced area, although some materials may need to be stored on the property outside the fence due to size or safety considerations. Equipment such as circuit breakers, bus work, capacitors, and dead-ends would be assembled and installed. Transformers, where required, would be delivered to the site and installed. Substation/switchyard control house and supervisory control and data acquisition equipment would be installed. Upon completion of construction activities, disturbed areas outside the fence would be restored and erosion control measures removed.

Construction Schedule and Projected Workforce

Although construction would occur over 2 years, individual crews may be required for only a few months in a particular construction area before moving out to another area on a subsequent phase of the project. Additionally, construction would not be confined to one area or community, but workers would be spread out over 278 miles in four crews of approximately 50 workers each, for a total of 200 workers.

Right-of-way and Property Issues

Basin Electric's Lands and Right-of-Way Division is responsible for acquiring easements for the project. Due to the tremendous increase in development across this region, Basin Electric has been obtaining easements where possible prior to approval of the final route. During the easement process, landowners are contacted to request permission for property boundary, biological, terrain mapping, and archeological surveys. The survey permit form is not an easement and not all properties would require all types of surveys.

During the easement process, Basin Electric staff provides landowners ample time to review and comment on the easement location. Landowners are compensated for the easement and any damages to existing crops or other property features, potential future years of agricultural impacts from the transmission ROW, and transmission structures on the property.

2.6 TRANSMISSION LINE MAINTENANCE AND OPERATION

Continued access to the transmission line ROW would be needed following construction to conduct periodic inspections, perform routine maintenance, and repair any damage to the transmission line or structures. Maintenance activities would be limited to the ROW where possible, and would be in accordance with all local, state, and federal regulations and permits. Landowners would be compensated for any damages occurring during routine maintenance, inspections, or repairs.

Substations would be subject to regular inspections to ensure equipment is in good working order and the area is neat and tidy. Faulty or worn equipment would be repaired or replaced. Trash would be collected and properly disposed of off-site. Fluid levels in transformers would be monitored remotely by system operators and would be regularly checked and transformers would be inspected for leaks. Batteries for emergency back-up operations would be inspected, fluid levels checked, and replaced as necessary. In the event of system disturbances, equipment would be inspected and reset as necessary. Any potential security concerns such as damage to the fence, exterior lighting, or locks would be addressed. The control house would be kept clean and in good structural and visual condition. All maintenance and operations activities would occur within the fenced area of the substation.

2.7 PROCEDURES FOR MINIMIZING ENVIRONMENTAL IMPACT DURING CONSTRUCTION, OPERATION, AND MAINTENANCE

Numerous BMPs and mitigation measures have been incorporated into the development and construction of the proposed project to protect environmental and human resources. These measures are varied and may be intended to address specific resource concerns, be more general in nature, or address multiple areas of concern for different resources. Minimizing measures range from avoiding sensitive resources during project and route development to conditions for restoring the project ROW following construction. BMPs that have been identified to date and would be implemented as part of the project are discussed in Appendix A of this document. Other mitigation measures would continue to be evaluated and considered throughout the design, ROW acquisition, permitting, and construction processes.

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

Overview

This chapter describes the existing environmental resources that could be affected by the project and the potential impacts that the project alternatives would have on those resources. Generally, the proposed action defines the project area considered; however, that area may change based on specific affected resource conditions—these resource-specific areas are referred to as study areas. The affected environment and potential impacts are determined through research and field observations along the proposed transmission line routes and at the substation sites by environmental specialists and from information provided in agency and public comments. Desktop analyses and field surveys of the proposed action were conducted during the fall of 2011 and spring of 2012. For each resource, potential mitigation measures to reduce or avoid impacts are also identified as well as those impacts that are unavoidable even after implementation of mitigation.

Affected Environment

NEPA requires that the environment of the area to be affected or created by the alternatives under consideration is sufficiently described (40 CFR 1502.15). The "Affected Environment" section describes the resources that could be affected by the implementation of the proposed action. The resource descriptions provided in this section serve as the baseline from which to evaluate the potential impacts of the proposed action.

The resources that could be affected by the project include the following:

- Aesthetics and visual resources
- Air quality and greenhouse gases (GHGs)
- Geology and soils
- Water resources, including groundwater, surface water, and floodplains
- Biological resources, including vegetation, wildlife, wetlands, and threatened and endangered species
- Cultural resources
- Land use
- Socioeconomics
- Environmental justice populations
- Recreation and tourism

- Infrastructure and transportation
- Public health and safety
- Noise

Environmental Effects

The "Environmental Effects" section analyzes both beneficial and adverse impacts that would result from implementing any of the alternatives considered. NEPA requires agencies to assess the direct, indirect, and cumulative impacts of its proposed action. Direct impacts are those that are caused by the proposed action and happen at the same location and time. Indirect impacts are those impacts that happen later in time and/or further removed from the proposed action, but are still reasonably foreseeable. Cumulative impacts are defined as the "impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are discussed in Chapter 4 of this document.

To determine whether an action has the potential to result in significant impacts, the context and intensity of the action must be considered. Context refers to area of impacts, timing, and the duration. Intensity refers to the severity of the impact. Intensity definitions have been developed to assess the magnitude of effects for all of the affected resource categories resulting from implementing the proposed action. Context in terms of duration of impact are estimated as either short term or long term. The definitions of intensity and duration are specific to each resource evaluated, and are described in Table 3-1.

For purposes of this FEIS, impacts resulting from the project have been quantified, to the extent possible, based on a proposed alternative's route alignment and associated 150-foot-wide ROW. Additional impacts from substation construction, operation, and maintenance, as well as temporary off-ROW impacts associated with access roads and construction material laydown yards are also discussed. Temporary construction easements outside the ROW may also be required, particularly for pulling conductor at an angle location. However, the locations of these requirements, while minor, temporary and having minimal impact, would be determined during final design, and while discussed in the FEIS, have not been quantified.

Table 3-1: Context and Intensity Definitions by Resource Area

Context (Duration)	Low Intensity	Moderate Intensity	High Intensity
AESTHETICS AND VISUAL RESOURCES			
Short term: During construction period Long term: Life of the line (50 years)	Proposed changes could attract attention but would not dominate the view or detract from current user activities.	Proposed changes would attract attention, and contribute to the landscape, but would not dominate. User activities would remain unaffected.	Changes to the characteristic landscape would be considered significant when those changes dominate the landscape and detract from current user activities.
AIR QUALITY AND GREENHOUSE GAS EMISSIONS			
Short term: During construction period Long term: Life of the line (50 years)	The impact on air quality associated with emissions from the operation, maintenance and construction is measureable, but localized and small such that emissions do not exceed USEPA's de minimis criteria for a general conformity analysis, or the USEPA mandatory reporting threshold for GHG emissions.	The impact on air quality would be measurable and primarily localized, but have the potential to result in regional impacts. Emissions of criteria pollutants associated with operation, maintenance and construction would be at the USEPA's de minimis criteria levels for general conformity analysis and the USEPA mandatory reporting threshold for GHG emissions.	The impact on air quality would be measurable on a local and regional scale. Emissions from operation, maintenance and construction are high, such that they would exceed USEPA's de minimis criteria levels for a general conformity analysis and the USEPA mandatory reporting threshold for GHG emissions.
GEOLOGY AND SOILS			
Short term: During construction period Long term: Life of the line (50 years)	Disturbance to geology or soils from construction and operation would be detectable but localized and discountable. Erosion and/or compaction would occur from construction and operation in localized areas. Landslide hazard potential would be of little consequence.	Disturbance would occur over a relatively wide area from construction and operation of the project. Impacts to geology or soils would be readily apparent and result in short-term changes to the soil character or local geologic characteristics. Erosion and compaction impacts would occur over a wide area. There would be an increased risk of increased landslides.	Disturbance would occur over a large area from construction and operation of the project. Impacts to geology or soils would be readily apparent and would result in short-term and long-term changes to the character of the geology or soils over a large area both in and out of the project boundaries. Erosion and compaction would occur over a large area. There would be a high risk landslide hazard.

Context (Duration)	Low Intensity	Moderate Intensity	High Intensity
WATER RESOURCES			
Groundwater			
Short term: During construction period Long term: Life of the line (50 years)	Impacts would result in a detectable change to water quality, but the change would be expected to be small, of little consequence, and localized. Impacts would quickly become undetectable. State water quality standards would not be exceeded as set forth by the Standards of Quality for Waters of the State–NDAC 33-16-02.1.	Impacts would result in a change to water quality that would be readily detectable and relatively localized. Change in water quality would persist; however, it would not exceed state water quality standards as set forth by the Standards of Quality for Waters of the State – NDAC 33-16-02.1or impair designated beneficial uses of a waterbody.	Impacts would result in a change to water quality that would be readily detectable and over a large area. Impacts would result in exceedance of state water quality standards as set forth by the Standards of Quality for Waters of the State – NDAC 33-16-02.1 and/or would impair designated beneficial uses of a waterbody.
Surface Water			
Short term: During construction period Long term: Life of the line (50 years)	The effect on surface waters would be measurable or perceptible, but small and localized. The effect would not alter the physical or chemical characteristics of the surface water or aquatic influence zone resource.	The effect on surface waters would be measurable or perceptible and could alter the physical or chemical characteristics of the surface water resource to an extent requiring mitigation, but not to large areas. The functions typically provided by the surface water or aquatic influence zone would not be substantially altered.	The impact would cause a measurable effect on surface waters and would modify physical or chemical characteristics of the surface water. The impact would be substantial and highly noticeable. The character of the surface water or aquatic influence zone would be changed so that the functions typically provided by the surface water or aquatic influence zone would be substantially altered.
Floodplains			
Short term: During construction period Long term: Life of the line (50 years)	Impacts would result in a detectable change to natural and beneficial floodplain values, but the change would be expected to be small, of little consequence, and localized. There would be no appreciable increased risk of flood loss including impacts on human safety, health, and welfare.	Impacts would result in a change to natural and beneficial floodplain values that would be readily detectable and relatively localized. Location of operations in floodplains could increase risk of flood loss including impacts on human safety, health, and welfare.	Impacts would result in a change to natural and beneficial floodplain values that would have substantial consequences on a regional scale. Location of operations would increase risk of flood loss including impacts on human safety, health, and welfare.

Context (Duration)	Low Intensity	Moderate Intensity	High Intensity
BIOLOGICAL RESOURCES			
Vegetation			
Short term: Lasting less than two growing seasons Long term: Lasting longer than two growing seasons	Impacts on native vegetation would be detectable but discountable, and would not alter natural conditions measurably. Infrequent disturbance to individual plants could be expected, but without affecting local or range-wide population stability. Infrequent or insignificant one-time disturbance to local populations could occur, but sufficient habitat would remain functional at both the local and regional scales to maintain the viability of the species. Opportunity for increased spread of noxious weeds would be detectable but discountable. There would be some minor potential for increased spread of noxious weeds, as defined by North Dakota.	Impacts on native vegetation would be detectable and/or measurable. Occasional disturbance to individual plants could be expected. These disturbances could affect local populations negatively, but would not be expected to affect regional population stability. Some impacts might occur in key habitats, but sufficient local habitat would remain functional to maintain the viability of the species both locally and throughout its range. Opportunity for increased spread of noxious weeds would be detectable and/or measurable. There would be some moderate potential for increased spread of noxious weeds as defined by North Dakota.	Impacts on native vegetation would be measurable and extensive. Frequent disturbances of individual plants would be expected, with negative impacts to both local and regional population levels. These disturbances could negatively affect local populations, and could affect range-wide population stability. Some impacts might occur in key habitats, and habitat impacts could negatively affect the viability of the species both locally and throughout its range. Opportunity for increased spread of noxious weeds would be measurable and extensive. There would be major potential for increased spread of noxious weed as defined by North Dakota.
Wildlife			
Short term: Lasting one to two breeding seasons, depending on length of breeding season Long term: Lasting beyond two breeding seasons	Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, but discountable and would not measurably alter natural conditions. Infrequent responses to disturbance by some individuals could be expected, but without interference to feeding, reproduction, resting, or other factors affecting population levels. Small changes to local population numbers, population structure, and other demographic factors could occur. Sufficient habitat would remain functional at both the local and range-wide scales to maintain the viability of the species.	Impacts on native species, their habitats, or the natural processes sustaining them would be detectable and/or measurable. Occasional responses to disturbance by some individuals could be expected, with some negative impacts to feeding, reproduction, resting, migrating, or other factors affecting local population levels. Some impacts might occur in key habitats. However, sufficient population numbers or habitat would retain function to maintain the viability of the species both locally and throughout its range.	Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, and would be extensive. Frequent responses to disturbance by some individuals would be expected, with negative impacts to feeding, reproduction, or other factors resulting in a decrease in both local and range-wide population levels and habitat type. Impacts would occur during critical periods of reproduction or in key habitats and would result in direct mortality or loss of habitat that might affect the viability of a species. Local population numbers, population structure, and other demographic factors might experience large changes or declines.

Context (Duration)	Low Intensity	Moderate Intensity	High Intensity
Wetlands			
Short term: Lasting less than two growing seasons Long term: Lasting longer than two growing seasons	The effect on wetlands would be measurable or perceptible, but small in terms of area and the nature of the impact. A small effect on size, integrity, or connectivity would occur; however, wetland function would not be affected and natural restoration would occur if left alone.	The impact would cause a measurable effect on one of the three wetlands indicators (size, integrity, connectivity) or would result in a permanent loss of wetland acreage over small areas. However, wetland functions would not be adversely affected.	The impact would cause a measurable effect on two or more wetlands indicators (size, integrity, connectivity) or a permanent loss of large wetland areas. The impact would be substantial and highly noticeable. The character of the wetland would be changed so that the functions typically provided by the wetland would be substantially altered.
Special Status Species			
Short term: Lasting one breeding season Long term: Lasting beyond one breeding seasons.	Impacts on sensitive species, their habitats, or the natural processes sustaining them would be detectable, but discountable and would not measurably alter natural conditions. Infrequent responses to disturbance by some individuals could be expected, but without interference to feeding, reproduction, resting, or other factors affecting population levels. Small changes to local population numbers, population structure, and other demographic factors might occur. However, some impacts might occur during critical reproduction periods or migration for a species, but would not result in injury or mortality. Sufficient habitat would remain functional at both the local and range-wide scales to maintain the viability of the species. No take of federally listed species or impacts to designated critical habitat would be expected to occur. Impacts would likely result in a may affect, unlikely to adversely affect determination.	Impacts on sensitive species, their habitats, or the natural processes sustaining them would be detectable and/or measurable. Some alteration in the numbers of sensitive or candidate species, or occasional responses to disturbance by some individuals could be expected, with some negative impacts to feeding, reproduction, resting, migrating, or other factors affecting local population levels. Some impacts might occur in key habitats. However, sufficient population numbers or habitat would remain functional to maintain the viability of the species both locally and throughout its range. No mortality or injury of federally listed species would be expected; however, some disturbance to individuals or impacts to potential or designated critical habitat could occur. Impacts would likely result in a may affect, unlikely to adversely affect determination.	Impacts on sensitive species, their habitats, or the natural processes sustaining them would be detectable, and would be permanent. Substantial impacts on the population numbers of sensitive or candidate species, or an impact on the population numbers of any federally listed species, or interference with their survival, growth, or reproduction would be expected. There would be direct or indirect impacts on candidate or sensitive species populations or habitat, resulting in substantial reduction to species numbers, take of federally listed species numbers, or the destruction or adverse modification of designated critical habitat. Impacts would like result in an adverse effect determination.

Context (Duration)	Low Intensity	Moderate Intensity	High Intensity
LAND USE			
Short term: During construction period Long term: Life of the line (50 years)	Other than at the footprint of project features (transmission tower structures, substations, access roads, etc.) previous land uses would continue without interruption. Existing land uses such as agriculture, grazing, oil and gas development, and potential methane (CH_4) gas development may experience temporary construction-related disturbances and intermittent, infrequent interruptions due to operation and maintenance. There would be no conflicts with local zoning.	Previous land uses (e.g. agriculture, grazing, oil and gas development and potential CH_4 gas development) would be diminished or required to change on a portion of the project area in order to be compatible with the project. Only a few parcels within the project area would require zoning changes to be consistent with local plans. Some parcels within the project area (transmission ROW, substation, access roads, etc.) may require a change in land ownership through purchase or condemnation.	More than 25 percent of the project area (transmission ROW, substations, access roads, etc.) would require a change in land ownership through purchase or condemnation. All land use (e.g. agriculture, grazing, oil and gas development and potential CH_4 gas development) on these parcels would be discontinued. Most parcels of land within the project area would require zoning changes to be consistent with local plans.
SOCIOECONOMICS			
Short term: During construction period Long term: Life of the line (50 years)	A few individuals, groups, businesses, properties or institutions would be impacted. Impacts would be minor and limited to a small geographic area. These impacts are not expected to substantively alter social and/or economic conditions.	Many individuals, groups, businesses, properties or institutions would be impacted. Impacts would be readily apparent and detectable across a wider geographic area and could have a noticeable effect on social and/or economic conditions.	A large number of individuals, groups, businesses, properties or institutions would be impacted. Impacts would be readily detectable and observed, extend to a wider geographic area, possibly regionally, and would have a substantial influence on social and/or economic conditions.
ENVIRONMENTAL JUSTICE			
Short term: During construction period Long term: Life of the line (50 years)	A few environmental justice communities would be impacted, and impacts would be limited to a small geographic area. Additionally, impacts on these communities would not be high and adverse, and would not be experienced disproportionately when compared to other communities in the study area.	Many environmental justice communities would be impacted across a wider geographic area. Impacts would be adverse, but not necessarily high. Environmental justice communities would possibly be disproportionately affected when compared to other impacted communities in the study area.	A large number of environmental justice communities would be impacted in a wider geographic area. Impacts would be high and adverse and would affect more environmental justice communities than other communities in the study area (disproportionate impact).

Context (Duration)	Low Intensity	Moderate Intensity	High Intensity
RECREATION AND TOURISM			
Recreation—Developed and Undeveloped Recreational Facilities (only for NPS-, BLM-, or USFS-developed recreational areas if applicable)			
Short term: During construction period Long term: Life of the line (50 years)	There would be partial site closures to protect public safety. The same site capacity and visitor experience would remain unchanged after construction.	There would be complete site closures to protect public safety. However, the sites would be reopened after activities occur. There could be slightly reduced site capacity. The visitor experience would be slightly changed but would still be available.	All developed site capacity would be eliminated because developed facilities would be closed and removed. Visitors would be displaced to facilities at other regional or local locations and the visitor experience would no longer be available at this location.
Recreation—Use			
Short term: During construction period Long term: Life of the line (50 years)	The impact would be detectable and/or would only affect some recreationalists. Users would likely be aware of the action but changes in use would be slight. There would be partial area closures to protect public safety.	The impact would be readily apparent and/or would affect many recreationalists. Users would be aware of the action. There would be complete area closures to protect public safety. However, the areas would be reopened after activities occur. Some users would choose to pursue activities in other available local or regional areas.	The impact would affect the majority of recreationalists in the area. Users would be highly aware of the action. All recreational areas would be closed or eliminated. Users would choose to pursue activities in other available local or regional areas and completely avoid the area.
INFRASTRUCTURE AND TRANSPORTATION			
-The transportation system in the project area includes state and local roadways (including rural roads and private/public off-road ones), railroads, and airports. -Waterways are not considered for this project.			

Context (Duration)	Low Intensity	Moderate Intensity	High Intensity
Short term: During construction period Long term: Life of the line (50 years)	Negligible increase in daily traffic volumes resulting in perceived inconvenience to drivers but no actual disruptions to traffic. Perceived inconvenience to drivers due to routine inspections by small vehicles or pickup trucks.	Detectable increase in daily traffic volumes (with slightly reduced speed of travel) resulting in slowing down traffic and delays, but no change in level of service. Short service interruptions (temporary closure for a few hours) to roadway and railroad traffic.	Extensive increase in daily traffic volumes (with reduced speed of travel) resulting in an adverse change in level of service to worsened conditions. Extensive service disruptions (temporary closure of one day or more) to roadways or railroad traffic. Permanent physical change in transportation system Permanent change in traffic patterns along primary roadways including U.S. Highway 85, U.S. Highway 2, ND State Highway 200 and ND State Highway 40 with an adverse change in level of service to worsened conditions. Infrequent but extensive operation delays and/or disruptions (temporary closure of one day or more) to roadways or railroad during sporadic "heavy-work" event (flatbed trucks and cranes for tower or transmission line replacement) associated with the transmission lines long-term maintenance program.
PUBLIC HEALTH AND SAFETY			
Short term: During construction period Long term: Life of the line (50 years.)	Construction of the proposed project would not result in (1) exposure of contaminated media to construction workers and/or (2) incidents associated with the installation of the transmission line and supporting infrastructure. Operation of the proposed project would not result in an increase of EMF levels that would rise to a level of concern with regard to public health and safety.	Construction of the proposed project may result in exposure of contaminated media by construction workers either through the disturbance of hazardous materials and/or chemical spills. The potential for incidents associated with the installation of the transmission line and supporting infrastructure increases. Operation of the proposed project would increase EMF levels, but not to a level that would adversely affect public health and safety.	Construction of the proposed project would result in exposure of contaminated media by construction workers either through the disturbance of hazardous materials and/or chemical spills. Incidents associated with the installation of the transmission line and supporting infrastructure would likely result. Operation of the proposed project would increase EMF levels to a level high to adversely affect public health and safety.

Context (Duration)	Low Intensity	Moderate Intensity	High Intensity
NOISE			
Short term: During construction period Long term: Life of the line (50 years)	Noise impacts could attract attention, but would not dominate the soundscape or detract from current user activities.	Noise impacts would attract attention, and contribute to the soundscape, but would not dominate. User activities would remain unaffected.	Impacts on the characteristic soundscape would be considered significant when those impacts dominate the soundscape and detract from current user activities.

3.1 AESTHETICS AND VISUAL RESOURCES

3.1.1 Affected Environment

Aesthetics can be defined as a mix of landscape character, the context in which the landscape is being viewed, and the scenic integrity of the landscape. Landscape character encompasses the patterns of landform (topography), vegetation, land use, and aquatic resources (i.e., lakes, streams, and wetlands). The visual character is influenced by natural systems as well as by human interactions and use of land. In natural settings, visual character attributes are natural elements, whereas in rural or pastoral/agricultural settings, attributes may include manmade elements such as fences, walls, barns and outbuildings, infrastructure (roads, utility poles, radio/cellular towers, water towers), and occasional residences. In a more developed setting, the visual character may include buildings, groomed lawns and landscaping, pavement (sidewalks and roads), and more extensive utility infrastructure. Scenic integrity is the degree from which the landscape character deviates from a natural, natural-appearing landscape in line, form, color, and texture. In general, natural and natural-appearing landscapes have the greatest scenic integrity. As manmade incongruities are added to the landscape, the scenic integrity is considered diminished.

Regional Setting

The project area is located in the northwest corner of North Dakota and contains portions of two ecoregions: the Northwestern Glaciated Plains Ecoregion and the Northwestern Great Plains Ecoregion. Within these major ecoregions there are numerous smaller physiographic ecoregions (see Section 3.3, Geology and Soils for further descriptions). The Northwestern Glaciated Plains Ecoregion is located north of Lake Sakakawea and the Northwestern Great Plains Ecoregion encompasses the area south of Lake Sakakawea (Bryce et al., 1998). Different ecoregions within the project area inherently mean the project area contains a diversity of topographic features and associated visual landscapes.

Description of the Natural Setting

Within the project area, there are two state parks, one national grassland (consisting of numerous tracts), and one national park offering designated scenic areas within their boundaries. In addition, the Lewis and Clark National Historic Trail and Auto Route run throughout the study area. TRNP, LMNG (owned by USFS), Lewis and Clark State Park, and Little Missouri State Park offer scenic trails and views within their boundaries. Killdeer Mountain Four Bears Scenic Byway (ND State Highway 22), the Lewis Clark National Historic Trail Auto Route (Highways 1804 and 1806 near Lake Sakakawea), and TRNP-North Unit Scenic Byway (located off of U.S. Highway 85) provide scenic views of the rural landscape in the central section of the project area.

The project area can generally be divided into three regions based on similar visual characteristics and geographic reference to Lake Sakakawea. These regions are referred to as the southern (areas south of Lake Sakakawea), central (areas west of Lake Sakakawea), and northern (areas north of Lake Sakakawea) portions of the project area. Lake Sakakawea, an impoundment of the Missouri River, extends east-west through the central portion of the project area. It provides a good reference point to separate the different ecoregions and their visual characteristics within the project area.

Topography in the southern part of the project area is gently rolling to level, with few trees and sparse wetlands. The landscape can be described as a mosaic of agricultural fields and rolling prairie, with areas of grazing along steeper slopes. Although lack of woody vegetation tends to enable long and wide views, topographical features and elevation changes provide screening and visual barriers throughout the landscape. Rural homesteads and human influences are scattered throughout the area (see Figures 3-1 and 3-2). Figure 3-2 is located near the southwest corner of Lake Sakakawea, where the transition to high elevations can be seen in the background.

The central portion of the project area is approximately 20 to 25 miles southwest of Lake Sakakawea and is located in the “bend” of the project area. Areas around the Little Missouri River and southwest of Lake Sakakawea consist of deep, highly-eroded canyons and badlands with heavily-wooded draws (Figure 3-3), compared with the eastern portion of the project area, which exhibits more rolling agricultural terrain. Typical of a badlands landscape, this area includes grassy ridgelines or butte-like hills and color-banded mounds (USFS, 2001).

The central portion of the project area contains a section of the North Dakota Badlands, TRNP (including a scenic road), LMNG (part of the Dakota Prairie National Grasslands), and Little Missouri State Park. The badlands geographic area includes approximately 573,700 acres of National Forest System lands of the LMNG (USFS, 2001).

Figure 3-1: Cropland and Rolling Prairie Topography South of Lake Sakakawea

Figure 3-2: Area Southwest of Lake Sakakawea (Killdeer Mountains in Background)

Figure 3-3: Central Project Area: West of Lake Sakakawea (Little Missouri Badlands)

Lands within the LMNG throughout the central project area have been assigned a visual classification using the USFS Scenery Management System. The USFS Scenery Management System provides a tool for managing scenic resources and is incorporated into forest plans to determine the relative value and importance of scenery on National Forest System lands. The process involves classifying landscapes, and setting goals and objectives for maintaining, enhancing, restoring, and monitoring scenic integrity. Under the administration of USFS, discrete units of the National Grasslands have been assigned scenic integrity objectives (SIOs) within the Northern Great Plains Management Plans Revision. SIOs guide the amount, degree, intensity, and distribution of management activities needed to achieve desired scenic conditions. SIO classifications range from very high to unacceptably low.

These SIOs are the management objectives adopted through the approval of the Forest Land and Resource Management Plan.[8] The LMNG areas within the project area are mostly classified as having low SIOs; although there are areas with both moderate and high SIOs (USFS, 2001). National Grassland areas within the project area with moderate and high SIOs are primarily found adjacent to or near TRNP-North Unit.

The northern portion of the project area transitions back to a rural agricultural setting similar to the southern project area. Particularly north of the Little Missouri River and the Lewis and Clark State Park, the landscape begins to flatten out and human influences become more abundant and visible on the landscape (Figure 3-4).

Figure 3-4: Northern Project Area: North of the Little Missouri River

Description of the Built Environment

Rural homesteads are visible throughout much of the eastern and northern portions of the project area, with fewer residences occurring in the more rugged, badlands areas around the Little Missouri River and its tributaries. Incorporated towns and unincorporated communities also occur as part of the manmade environment within the project area. Many of these towns and small communities are experiencing rapid residential and commercial growth to support oil and gas development activities in the region.

[8] Scenic integrity levels (SILs) are the proposed management objectives presented in the alternatives development of the EIS. SILs become SIOs when the preferred alternative is selected. The SILs define the degrees of acceptable deviation in form, line, color, and texture that may occur at any given time. SILs ranging from high to low are assigned to all management areas. Usually they are described at the management prescription level. A high SIL means human activity is not scenically evident, a moderate SIL describes a valued landscape character that is slightly altered, and a low SIL indicates that a landscape is moderately altered.

U.S. and state highways, county roads, and unpaved roads traverse the project area as part of the built environment. Numerous overhead transmission and distribution lines also occur within the project area. Western's 230-kV transmission line that originates at Charlie Creek Substation crosses the eastern boundary of the TRNP and scenic byway, as well as a tributary to the Little Missouri River and U.S. Highway 85. The line continues to roughly parallel U.S. Highway 85 north for approximately 11 miles, before turning west to parallel ND State Highway 200 and several other roads throughout the project area, crosses the Missouri River near Williston and interconnects with the Williston 230-kV Substation.

Recent increases in oil and gas production in the project area have led to an increase in the number of oil and gas wells, drill rigs, and associated equipment that are visible on the landscape (Figure 3-5) and on local roads (Figure 3-6). The northwest corner of North Dakota is particularly heavy in oil and gas production and currently has the highest concentration of sites in the state. However, oil and gas production is increasing and expanding throughout the entire project area and region. Due to the abundance of drilling, oil and gas sites frequent the landscape within all areas of the project area.

Figure 3-5: Typical Oil and Gas Development Activities Visible on the Landscape within the Project Area

Figure 3-6: Traffic on Local Roads near Oil and Gas Development

Each oil well pad site incorporates between 5 and 7 acres of surrounding land and includes a drill rig, pump jack, storage tanks, and gas flaring equipment on a gravel pad and containment berms (Figure 3-7). Based on available data from the North Dakota Industrial Commission, there are approximately 9 gas plants, 90 oil rigs, and 5,500 oil wells within the project area (North Dakota Industrial Commission, 2014b). New oil well storage tank facilities, oil and natural gas pipelines, gas processing facilities and associated industrial facilities have also been recently constructed within the project area, with more of these currently under construction and projected to be built in the future to support the expanding oil and gas industry in the Bakken oil field. Oil and gas production activities have also led to the widespread development of temporary employee housing, which generally consist of clusters of mobile home, recreational vehicle (RV), or trailer units (Figure 3-8). These housing clusters are increasingly visible on the landscape, mainly on the outskirts of established communities. Temporary housing is currently giving way to more permanent apartment and other multi-family type housing, particularly in and around rural communities where access to utilities is available. Such growth and development is expanding into more rural areas, converting the visual character from undeveloped landscapes to a more industrialized environment.

Figure 3-7: Typical Oil Well Pad Site

Figure 3-8: Typical Temporary Employee Housing within the Project Area

3.1.2 Direct and Indirect Effects

This visual impacts assessment focuses primarily on sensitive viewpoints that fall within the viewshed of the proposed project facilities, and secondarily, on the general visual impacts of the project on the visual character of the project area. Visual impact assessments consider the current visual character of the area, the intrusive effect that project actions may have on that visual character, and the ability of certain areas to absorb the changes in scenery without altering the visual character of the area. The level of visual intrusion created by the project facilities will be described with respect to the different distance zones, types of observers, and observation points. Additionally, thresholds are used to assess the level of impacts each alternative would have on visual resources. The context and intensity definitions established for this project are described in Table 3-1.

Potential Viewers and Sensitivities

Many factors influence the visual impact of any project. It is important to consider the viewer, including their expectations, activities, and frequency of viewing the line. Three types of viewers have been identified within the project area. These include local residents, employees, and recreational users. These three groups are discussed in more detail below.

<u>Local Residents</u>

Local residents are people who live in the project area of the proposed transmission line. Most residents within the project area live on rural farmsteads with large viewsheds and may view the line from their yards or homes, while driving on local roads, or during other activities in their daily lives. The sensitivity of local residents to the visual impact of the line may be mitigated by exposure to existing transmission lines and other dissonant features already within the viewshed. Local residents can be highly sensitive to changes in the landscape that can be viewed from their homes and neighborhoods.

<u>Employees</u>

Employees, the majority of whom work in the project area, primarily in the oil and gas or agricultural industries, would experience the line as they commute and potentially from their place of employment. Because many employees in the area live in temporary housing near oil or gas wells, they are likely surrounded by industrial influences. As a result, employees are not anticipated to have high sensitivity to a new transmission line near their place of work or within the landscape.

<u>Recreational and Traditional Users</u>

Recreational users include local residents and tourists involved in recreational activities at North Dakota Badlands, TRNP, LMNG, Lewis and Clark State Park and Little Missouri State Park, Lewis and Clark National Historic Trial and Auto Trail Route, historic and cultural sites, and natural areas. Scenery and visual quality may or may not be an important recreational experience for these viewers. For some recreational users, scenery is an important part of their experience because their activities require attentiveness to views of the landscape for long periods of time. Such viewers also may have a high appreciation for visual quality and high sensitivity to visual change. However, changes to the visual landscape would only be recognized by repeat visitors to the area. For traditional users, such as Native American tribes and groups with an ethnographic affiliation to the areas of potential visual change, the preservation of aesthetic aspects of the landscape quality may be of critical importance. Consultation with these traditional users is ongoing. The consultation process, including a list of tribes contacted, is presented in Chapter 7 of the FEIS. Visual impacts on important cultural and historical resources are discussed in more detail in Section 3.6.

Scenic Integrity and Visual Absorption

Scenic integrity is the degree to which the character of a landscape does not deviate from the natural or natural-appearing landscape in terms of line, form, color, and texture of the landscape. In general, natural and natural-appearing landscapes have the greatest scenic integrity. As incongruities are added to the landscape, the scenic integrity diminishes.

Some landscapes have a greater ability to absorb alterations with limited reduction in scenic integrity. The landscape character and complexity, as well as environmental factors, influence the ability of a landscape to absorb changes in landscape. A new transmission line next to an existing line provides less contrast, and therefore can be absorbed into that landscape more readily than if a transmission line is introduced as a new feature into an undeveloped area.

No-action Alternative

Under the no-action alternative, the project would not be constructed. The existing environment within the project area would remain the same, and no land would be used for transmission lines, facilities, or substations. Because no construction would occur, there would be no impacts on the visual resources or aesthetics in the area. However, even if the project is not developed, it is reasonably foreseeable that there would be other development occurring throughout the project area, including continued oil and gas development and associated facilities, and commercial and residential expansion that would cause additional visual impacts. This development, in the absence of the proposed transmission line, may include using small gas-fired turbines or diesel generators at individual well sites that could cause additional visual impacts.

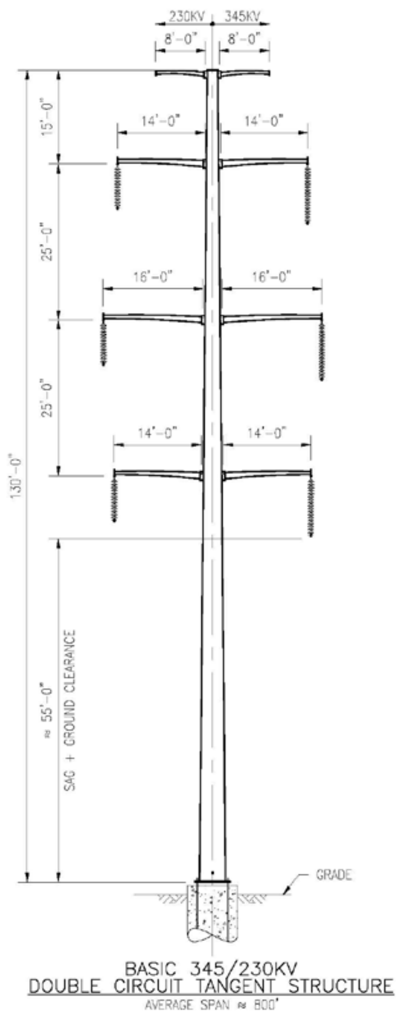
Alternative C

Under Alternative C, the transmission line would be built. As described in Chapter 2, several tower types would be required for the construction of this alternative. Table 3-2 below shows the different structure types and the associated structure height. Diagrams illustrating the visual appearance of these towers are provided in Chapter 2, Figures 2-6 to 2-11. Figure 3-9 provide an additional diagram illustrating the height and other dimensions of the 345/230-kV tower option.

Table 3-2: Tower Structure Types and Heights

Description of Design Component	345kV	230/115kV	345/115kV	230kV	345kV (H-Frame)	345/345 345/230kV
Minimum and maximum structure height (feet)	100-130	97-127	115-145	70-110	80-100	115-155
Average height of structures (feet)	115	112	130	95	90	130

Figure 3-9: 345/230-kV Double Circuit Tower Structure Dimensions



Construction and operation of the transmission line would result in the introduction of an additional constructed feature into the visual landscape and would change the existing viewshed throughout the project area. Potential visual impacts to individuals or resources as a result of the proposed project could include the following:

- Changes to the viewshed from residences and residential areas as a result of the introduction and proximity of the transmission line and/or structures
- Changes to the visual landscape with respect to the Little Missouri River, a state-designated scenic river
- Changes to the landscape in traditional use areas
- Changes to the visual landscape near state historic sites
- Changes to the visual landscape within or near recreational areas and historical sites such as state and national parks, including the LMNG, TRNP, the North Dakota Badlands, Lewis and Clark State Park, Little Missouri State Park, and the Killdeer Mountain Battlefield (KMB) site
- Reduction in the visual quality of the Lewis and Clark Historic Trail and auto route

Alternative C would comprise multiple route segments, for a total length of approximately 278 miles and would be constructed through varying types of terrain. Distance from the line, terrain, topographical features in the area, differences in elevation, manmade features, and natural features such as forest cover would all influence the level of potential visual impact at specific locations throughout the project area. Alternative C includes clearing a 150-foot ROW to construct a new transmission line, associated structures and conductors.

Based on the visual integrity objectives identified in the Northern Great Plains Management Plans Revision (USFS, 2001), the majority of the LMNG tracts within the project area have a low SIO. As a result, with the exception of area paralleling the Lone Butte Management Area of the LMNG, most of the project area would coincide with a low SIO on federal lands. A low SIO is described as a landscape appearing heavily fragmented, with human activities strongly dominating the natural landscape. However, there are some less developed areas with a low-moderate SIO within the same affected management areas on the LMNG.

Most private lands in western portions of the project area are experiencing development in the form of oil and gas infrastructure or are presently in agricultural use, resulting in low scenic integrity. The proposed project would be consistent with the definition of a low (or low-moderate) SIO and would not likely contribute to adverse changes to the existing visual setting throughout the majority of the project area because the transmission line would be located within an already visually-altered setting, characterized by development and existing infrastructure.

Alternative C would include approximately 130 road crossings along the length of the route and would introduce a new visual element to the surrounding area for motorists and local landowners at each of these road crossings. The addition of a transmission line would be noticeable to more viewers at road crossings locations or along larger, well-traveled roads, and the features of the transmission line would be particularly noticeable where no existing transmission lines are currently within view of the road. Although transmission lines in county roads would be noticeable to the local landowners using these roads, many of these roads are county section-line gravel roads that receive only very minimal local traffic.

The transmission line would be most viewed by motorists travelling along U.S. Highway 85, where uninterrupted views of the line would be readily available and traffic levels would be considerably higher than along more local county roads. Average daily traffic volume in 2012 along U.S. Highway 85 between the junction with ND State Highway 200 south of Grassy Butte and the junction with Highway 23 in Watford City was between 4,800 and 9,965 (North Dakota Department of Transportation, 2013a). It is therefore probable that an estimated 7,383 daily observers travelling in vehicles at an average speed of 65 miles per hour along the roughly 70-mile length of U.S. Highway 85 where the transmission line would be present would be able to periodically see the line during the approximately 1 hour and 5 minutes to travel this distance. This would vary, however, based on the topography adjacent to the road, which would generally block views of the line for long stretches of the route, as well as the inability of observers to see the line when the transmission ROW would depart from the roadway. Travelers would be able to see the transmission line along the road and potentially take note of its visual contrast with the surrounding landscape.

Alternative C would be located within 500 feet of six residences, two of which are located at points where the route would cross the Missouri River (see Visual Simulations 1 and 4 in Appendix E, which depict views from the Missouri River facing north and southeast, respectively). Although the precise placement of the transmission line within the proposed corridor is not known at this time, homes in the area of the Missouri River crossing may experience elevated concerns related to visual impacts. However, throughout much of the project area, including at the Missouri River crossing, visual changes around residences would be minimal because there are few residences near the line and because the transmission line would be located along existing transmission lines, roads, or in areas that contain other constructed visual elements such as oil and gas facilities or communications towers. Minimum set-back requirements from residences would also help to mitigate visual impacts. These requirements would be followed during site-specific planning, engineering, and construction phases of the project.

Potential impacts pertaining to aesthetic and visual resources associated with the placement of the transmission line along each segment of Alternative C are described in greater detail in the following discussion.

Eastern Segment

Alternative C begins at the AVS Substation in Mercer County and runs directly west, roughly paralleling a carbon dioxide (CO_2) gas line located 1.5 miles to the south. The landscape in this area has dispersed rural and agricultural development, with rolling to flat topography and little intervening woody vegetation for screening. After approximately 45 miles, Alternative C diverges into two segments at the Red Substation, located near Killdeer. While one segment of Alternative C (Red Substation to Charlie Creek Substation to Blue Substation) continues west, the other segment (Red Substation to White Substation to Blue Substation) turns north, continuing to roughly parallel the CO_2 gas transmission pipeline. The two segments then converge north of Arnegard, North Dakota.

The eastern segment of Alternative C would cross the Killdeer Mountain Four Bears Scenic Byway and the Lewis and Clark Historic Trail Auto Route in an area where a 115-kV transmission line and the CO_2 pipeline are directly parallel to the road and also through a North Dakota state lands parcel. The crossing of the scenic byway along the eastern segment occurs amid a setting characterized by constructed elements along open grassland and croplands that do not offer increased scenic value along the byway in these areas (see Visual Simulations 5 and 6 in Appendix E, which depict the views to the north and northeast from ND State Highway 22). The eastern segment of Alternative C continues to parallel the road approximately 0.5 mile west of the scenic byway; however, there is an existing 115-kV line between the road and the proposed route, which would cause viewers to have to look through an existing transmission line to notice any transmission line that was constructed as part of Alternative C. Topography and the twisting nature of portions of the highway also limit views of the line to generally short sections where motorists would only have momentary opportunities to see the line. In areas adjacent to or near the crossing, the line may be visible to motorists for slightly longer periods of time while on the byway.

Continuing north, the eastern segment of Alternative C enters the scenic area of the North Dakota Badlands and the Little Missouri River. Alternative C would cross the Little Missouri River west of the Killdeer Mountain Four Bears Scenic Byway. This crossing area contains considerable badlands topography, vegetation and river valley features, and opportunities for wide picturesque viewsheds. This area is not part of LMNG, and therefore has not been assigned an SIO. Additionally, the area is located in a remote setting and therefore limits opportunities for both development and viewing by visitors. The general location for the eastern segment of Alternative C to cross the Little Missouri River, which is a state-designated scenic resource, is in the corridor of an existing CO_2 pipeline and 0.8 mile west of a 115-kV transmission line. This corridor currently contains constructed visual elements and access for construction and maintenance. The placement of an additional transmission line into the landscape would result in an incremental increase in visual disturbance when compared with the existing conditions.

This is particularly true given that the additional structural component could be located as much as a mile from the existing transmission line and would include considerably larger structures.

The eastern segment of Alternative C continues to parallel the CO_2 gas pipeline for approximately 8.5 miles after the river crossing and passes within 0.1 mile of several tracts of LMNG in McKenzie County. As these areas are classified as having low scenic integrity, no adverse concerns for the visual landscape of these areas is expected. At this location, the route lies approximately 6 miles southwest of the Blue Buttes traditional area in the LMNG located north of ND State Highways 23 and 73. The nearest high use area of Blue Buttes would be approximately 10 miles northeast of the Alternative C corridor. As a result, the transmission line would result in minimal visual effects to the Blue Buttes traditional use area. The route diverts northwest from the gas line, traversing across open country and not parallel to any other existing linear features. The route interconnects with the White Substation east of Watford City before it extends northwest to the Blue Substation. The topography through this area is indicative of the scenic badlands of the area. As mentioned previously, there are currently few roads through this area, thus limiting access to view these vistas and the proposed project. The current oil and gas development is resulting in additional roadways to service the new well locations, however, these roads would typically not be used by the general public or area tourists. Any use, and thus viewing, associated with these roads would be very localized and minimal traffic.

Western Segment

The western segment of Alternative C crosses the Killdeer Mountain Four Bears Scenic Byway (ND State Highway 22), a state-designated scenic byway, north of the town of Killdeer in western Dunn County near service facilities (gas stations, convenience stores, restaurants) and other human influences. The Lewis and Clark Historic Trail Auto Route also follows ND State Highway 22 in this area. The crossing occurs adjacent to a large oil well, and other constructed features, including a recently constructed 115-kV transmission line (directly parallel to the byway), oil and gas development, rural farmsteads, and communications structures. Topography and the winding nature of portions of the highway would limit views of the line to generally short sections where motorists would only have momentary views of the line. The proposed route would not be anticipated to adversely change the scenic designation of ND State Highway 22 or the overall scenic integrity along the roadway.

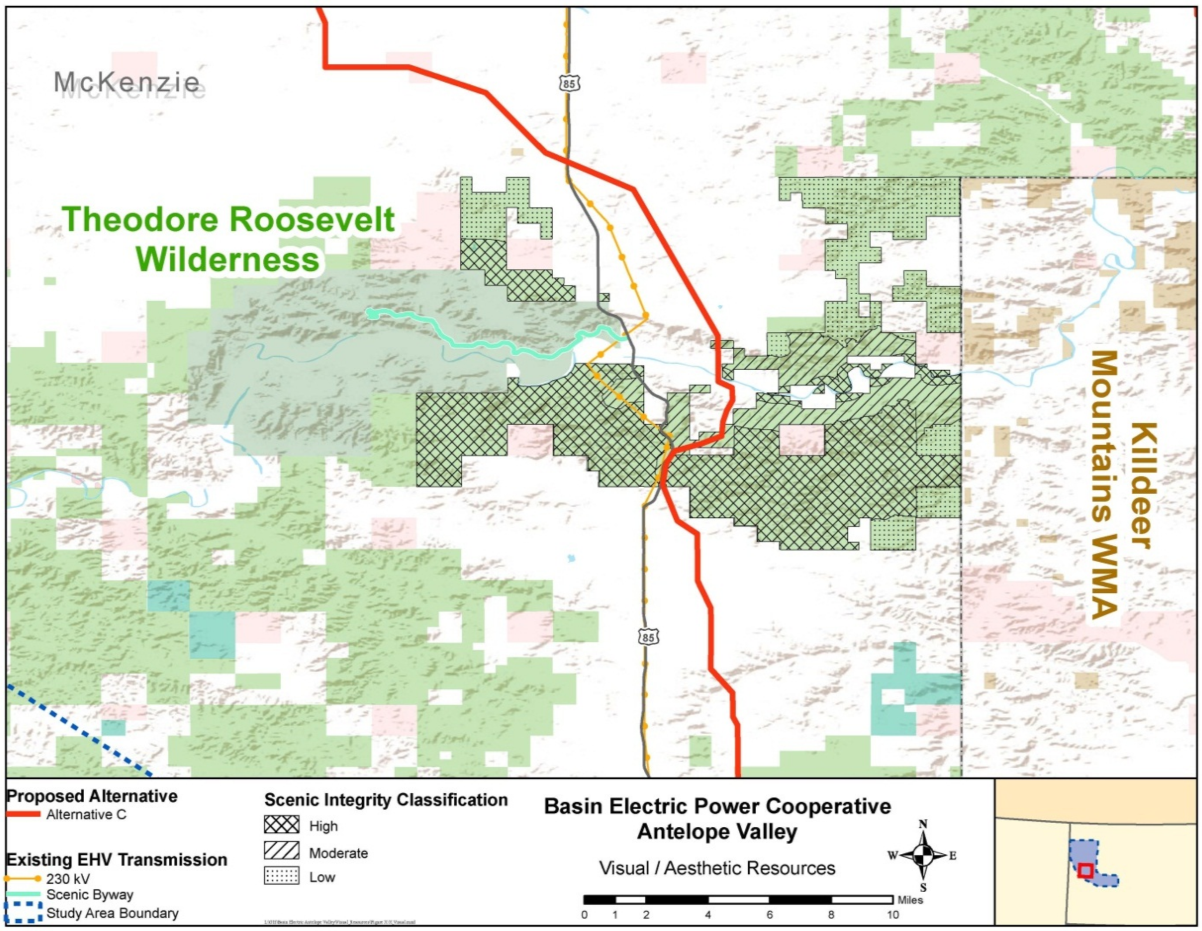
After crossing ND State Highway 22, the western segment of Alternative C shifts slightly south to generally parallel an existing 115-kV transmission line on the north side of North 3rd Street, before turning south and west into the Charlie Creek Substation. Alternative C then continues predominantly northward to Williston paralleling U.S. Highway 85. A large portion of the area along U.S. Highway 85 is part of LMNG. The route would be highly visible to drivers along U.S. Highway 85 and would introduce a new artificial feature through portions of the USFS-controlled LMNG in McKenzie County and would be visible to residents and other observers located within the primarily agricultural lands east of the highway. However, as previously noted, most of these areas are classified as having a low SIO and, while the route would visually change the existing viewshed for area users and motorists traveling on U.S. Highway 85 as it passes through or near the grassland areas, the scenic integrity of these areas would not be adversely affected by the introduction of a new artificial feature. The portion of the western segment of Alternative C along U.S. Highway 85 through the badland areas associated with the Little Missouri River would potentially contribute to visual impacts. Certain vantage points along U.S. Highway 85 offer commanding views of the area that would be interrupted by the presence of a utility line. However, the presence of an existing transmission line parallel to U.S. Highway 85 already presents some degree of visual contrast. Further, the Land and Resource Management Plan for the Dakota Prairie Grasslands encourages co-location of roads and utility corridors to mitigate adverse visual effects on the natural landscape and contain infrastructure and associated facilities to an existing corridor rather than allowing disturbances to be scattered across the LMNG.

The western segment of Alternative C would pass within 3.8 miles of Lone Butte (see Visual Simulation 2 in Appendix E, which depicts views to the west of Lone Butte). The route would not pass through the Lone Butte Management Area (designated by USFS as Roadless). However, the transmission line would be visible from points within the Lone Butte Management Area and Lone Butte itself. These western facing views of the project from Lone Butte (at a 2,749 feet elevation) would also include the agricultural lands, roadways, other infrastructure, and other generally low intensity development within which the transmission line would be situated. As a result, the project would not present a comparably greater contrast to the existing setting as seen from this Roadless area. The topography of the landscape west of Lone Butte includes numerous ridges ranging from 2,400 to 2,600 feet in elevation. The transmission line would not be visible in the foreground or middle ground to the west and northwest of vantage points near Lone Butte. Only very distant views of the corridor would be noticeable from this vantage point. Views to the north, east, and south would be unaffected by the proposed project.

An existing 230-kV transmission line, several communications towers, rural residences, and oil development facilities are currently visible along U.S. Highway 85 from the Lone Butte Management Area (see Visual Simulation 2 in Appendix E). As can be seen in the visual simulation prepared for this location, the visibility of the transmission line would be considerably limited due to the distance, topography, and vegetation in this area.

There are more than 28,500 acres of lands in the LMNG that are classified by USFS as having a moderate or high SIO. Lands classified as having moderate scenic integrity east of U.S. Highway 85 are illustrated in Figure 3-10. In an effort to accommodate the initial concerns of USFS, the original corridor proposed for the transmission line was subsequently revised and the transmission line was relocated away from areas of high scenic integrity. While the current route would avoid areas of high SIO, a small section of the line would still run through areas of moderate SIO.

Figure 3-10: Proximity of Proposed Route to Areas with Scenic Integrity on U.S. Forest Service Lands



SIO levels of moderate scenic integrity do allow for some level of human intrusion. This level refers to landscapes where the valued landscape character appears slightly altered. Noticeable deviations must remain visually subordinate to the landscape character being viewed (USFS, 2013). In portions of the project area where the proposed transmission line transects areas with moderate scenic integrity levels, special mitigation strategies could be employed to reduce impacts on visual and aesthetic resources. These strategies could include the following:

- Camouflage—Employing the application of natural colors and patterns of color from the surrounding landscape or visible background that may conceal the structures or reduce their visual effect. The use of weathering steel structures can provide this feature depending on the viewpoint of the observer. The use of camouflage is ideal in situations where the feature would not be skylined from key vantage points, in which case the use of galvanized poles or structures is preferred because they blend better with sky colors and tones.
- Maintenance/Decommissioning—Maintaining the structures to reduce visual impacts resulting from neglect over the duration of their useful life, and removing objects from the landscape once they have been deemed obsolete.
- Offsets—Correcting an existing aesthetic problem identified within the viewshed of a proposed project may qualify as an offset or compensation for project impacts. A decline in the landscape quality associated with a proposed project can, at least partially, be offset by the correction. In some circumstances a net improvement may be realized.[9]

The western segment of Alternative C would also pass approximately 1.5 miles east of TRNP and the TRNP-North Unit Scenic Byway, and would cross the state-designated scenic Little Missouri River. TRNP is a federal Class I Area airshed, which is a sensitive area that has been designated as requiring protection from air pollutants that can cause visibility impairment within the airshed, such as those found in vehicle emissions and fugitive dust. Although the western segment of Alternative C would pass close to TRNP, any air impacts resulting in reduced visibility would be limited to the short duration of construction near the park. Air emissions would be controlled as much as is practicable during construction phases through the incorporation of BMPs such as the use of water to suppress fugitive dust during ground disturbance and excavation activities.

A transmission line already exists across the eastern edge of TRNP, the TRNP-North Unit Scenic Byway, and the Little Missouri River just west of U.S. Highway 85, so an additional transmission line considerably east of this area (and not in the park) may not appear as intrusive as it might otherwise if a line was not already present. Only observations from the TRNP eastward would potentially view this segment of Alternative C. Many portions of the TRNP viewshed are experiencing constructed visual intrusions to the natural landscape such as oil and gas pumps, wells, and drill rigs. Television and radio communication towers are also visible. As illustrated in Visual Simulation 3 (Appendix E), which depicts views east of TRNP, the western segment of Alternative C would result in only minimal new visual contrast being introduced into

[9] At this time, no offset or maintenance/decommissioning projects have been identified by Agencies or the public that have commented on the AVS to Neset Transmission Project.

the landscape, and only to the east of the TRNP, beyond the existing line. The distance of the line from the boundaries of TRNP, as well as the existing topography, vegetation, and constructed features in the landscape, all contribute to minimal additional visual contrast resulting from the placement of the transmission line into the existing landscape.

NPS conducted an analysis demonstrating that visual impacts would occur to park resources from distant views of a length of less than 0.5 mile of the transmission line. These impacts would occur over less than 20 percent of the total area of the park's north unit. Impacts contained within this 20 percent portion of the total park area could be characterized as minor to moderate depending on the extent to which highly recreationally important landscapes are affected. It is unknown whether affected areas contain especially important recreational resources or whether they could be easily accessed by visitors. However, it can be assumed that there would be some visual impacts where frequently travelled areas coincide with views of the transmission line.

The western segment of Alternative C continues north from the Little Missouri River, TRNP, and LMNG, crossing over U.S. Highway 85 two more times before meeting the eastern segment of the route, north of Arnegard. Alternative C would cross the Missouri River adjacent to U.S. Highway 85 in an area with wide, flat, and generally open views on the south side of the river, giving way to a steep bluff on the north side. No designated scenic resources occur in this area, which currently is crossed by an existing 230-kV line, U.S. Highway 85, and several pipeline rights-of-way. Numerous residences have been constructed along the ridge north of the river, most oriented to provide a wide view of the river valley below. The current viewshed provides impeded views of the river, adjacent woodlands, and natural topographic features to the south. The setting also includes a view of U.S. Highway 85 and the existing transmission line adjacent to the highway. Oil and gas facilities are also visible within the river valley and adjacent areas above the valley to the north and south. This is illustrated in Visual Simulations 1 and 4 in Appendix E, which depict views from the Missouri River facing north and southeast, respectively. Construction of the proposed project would introduce a new artificial element to the viewshed. However, the additional visual element would not be unlike those already present in the landscape, and it would be located near these existing features. The visual contrast from these features would be less noticeable on the landscape from higher elevation vantage points where the features are not skylined as shown in these visual simulations. Thus, minor adverse impacts on the visual setting of this area are expected from the project.

<u>Northern Segments</u>

After the eastern and western segments of Alternative C converge north of Arnegard, at the Blue Substation, the route continues until its terminus at the Neset 345-kV Substation, crossing the Lewis and Clark National Historic Trail and an auto tour route along this section. The Lewis and Clark National Historic Trail itself follows the Missouri River. Alternative C would cross the trail at its crossing of the Missouri River near Williston adjacent to an existing transmission line and U.S. Highway 85. Thus, views from or of the Lewis and Clark National Trail in this area are not expected to be significantly altered following construction of a transmission line. Although the entire trail is not itself scenic, the auto tour route provides motorists with an opportunity to view some of the more scenic areas in the general vicinity of the trail. Alternative C would cross the auto tour route six times between the AVS and Judson substations. The crossings would include the Killdeer Mountain Four Bears Scenic Byway, U.S. Highway 85 west of Watford City, and U.S. Highway 2 west of Williston. All of these crossings would occur in primarily rural areas where constructed features such as oil wells and existing transmission and distribution lines are present. Agricultural uses are also present in these areas and include primarily grazing lands or croplands with little scenic value.

While Alternative C would cross the Little Missouri River in areas paralleling major thoroughfares (ND State Highway 22 and U.S Highway 85), new access trails may also be required in certain areas near the Little Missouri River and associated tributaries with no access and steep, rugged terrain. Given the relatively undeveloped character of these areas, it is likely that visual impacts associated with the construction of any new access trails for this alternative would have a low to moderate, temporary impact on visual resources. Short-term visual impacts would be expected to occur due to the presence of heavy machinery, equipment, and material staging during construction. However, because many of these areas are remote, they would not be visible to a large number of individuals traveling or recreating in the area. In addition, any new trails would be similar to existing field access trails throughout the area, would be reclaimed after construction, and would thus have only a temporary visual impact. They would be relatively unnoticed by visitors to the area and would meld back into the environment following cessation of construction activities.

Overall, due to the human influence and existing infrastructure in the area (in the form of transmission and distribution lines, oil and gas development, agricultural operations, and gas pipelines) and the distance from federally recognized visually sensitive areas and parks, it is likely that the construction of the transmission line under Alternative C would have short-term, low adverse impacts during construction and long-term, low to moderate adverse impacts on aesthetics and visual resources during the lifetime of the project.

Alternative C-1

In the Little Missouri River Badlands area, the alignment of Alternative C would cross approximately 2.6 miles of LMNG within the U.S. Highway 85 corridor. Several commenters expressed concern for the potential visual impacts of locating the transmission line along the east side of the highway, while Western’s 230-kV line currently exists along the west side of the highway. In response to these concerns, several variations of the alignment and configuration of Alternative C were considered in this area to better compare and assess the potential impacts, including visual effects.

The most viable variation, Alternative C-1, would locate the proposed transmission line on the east side and parallel to U.S. Highway 85 for approximately 1 mile in T147N; R99W; Section 24 (Figure 3-11). This section of Western's 230-kV line could be moved and double-circuited with the proposed line on the east side of the highway. This area in Section 24 is a topographical ridge that separates two large drainages; the larger basin to the west represents a much larger viewshed from a highway traveler's perspective. To the east of U.S. Highway 85, the drainage is much smaller and falls to the east prior to turning north toward the Little Missouri River. A generally flat area approximately 700 feet wide is located immediately west of the highway. This area is occupied by U.S. Highway 85, the USFS Summit Campground and Trailhead Park, and Western's existing north-to-south aligned 230-kV transmission line. Immediately west of this area the topography falls off quickly in a large heavily eroded area of the Little Missouri River Badlands. By contrast, the east side of the highway faces the side-hill of the engineering cut created in the construction of the highway grade. Visual simulations depicting the proposed project were developed to accompany the following discussion and are presented in Figures 3-13, 3-14 and 3-15 below. Figure 3-12 illustrates the photo location from where these simulations were created.

Figure 3-11: Alternative C-1—East Side Double-Circuit

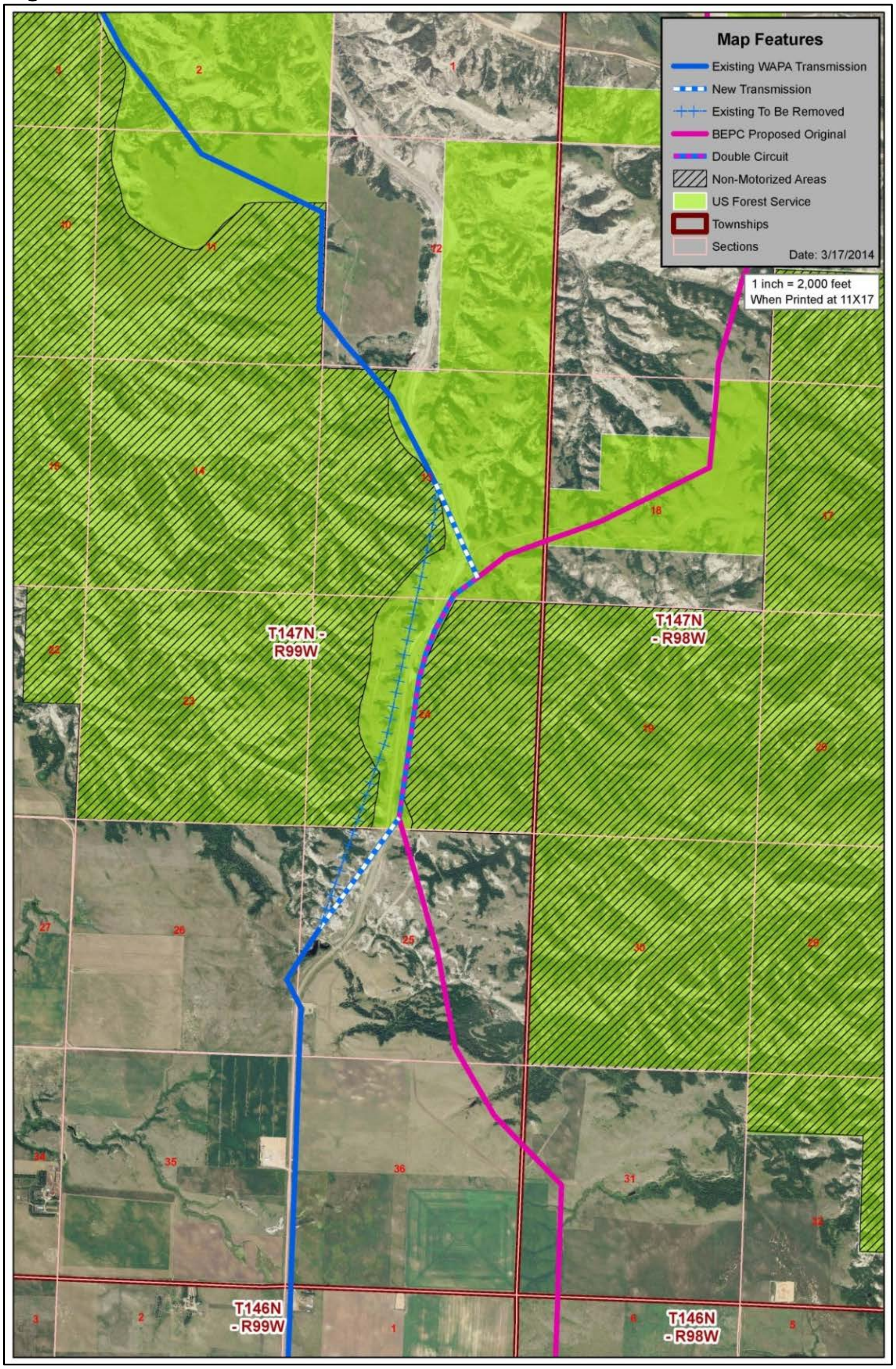
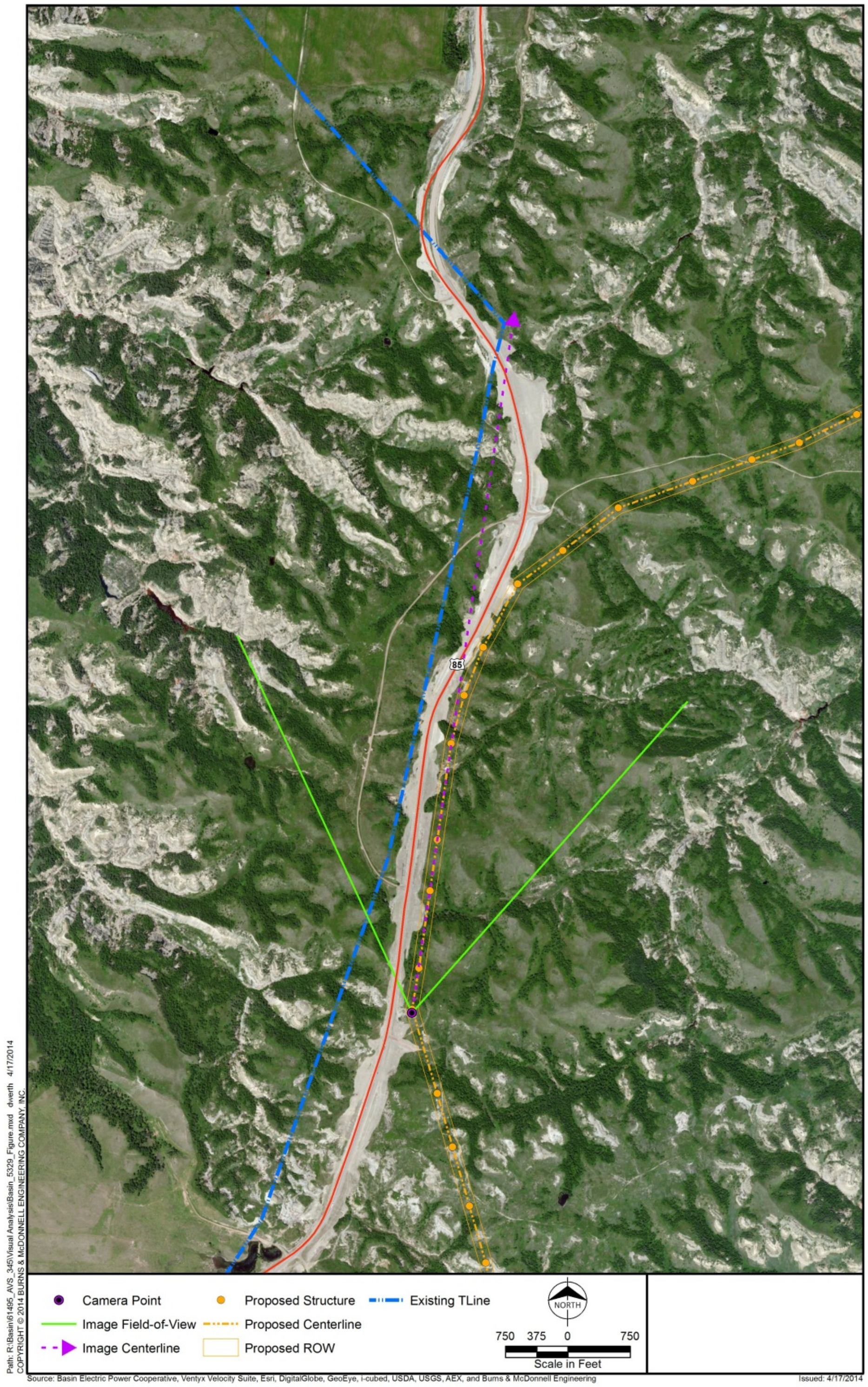


Figure 3-12: Photopoint for Visual Simulations



A visual simulation that depicts before and after views was developed to illustrate the visual effects of double circuiting the proposed 345-kV transmission line with Western's 230-kV line in this section of project area. Figure 3-13 shows the existing views looking north along U.S. Highway 85. Western's 230-kV line is located on the left side of the photo.

Figure 3-13: Existing Views of U.S. Highway 85 and Western's 230-kV Transmission Line

Under Alternative C-1, Basin Electric would construct the proposed project along the proposed alignment of Alternative C on the east side of U.S. Highway 85 as a 345/230-kV double circuit line for approximately 1 mile (Figure 3-11). When project construction for all of Alternative C is complete, including both the AVS to Neset and North Killdeer Loop 345-kV lines (expected to be in service the end of 2016), approximately 1 mile of Western's existing 230-kV line on the west side of U.S. Highway 85 would be transferred to the Basin Electric 345/230-kV line section. Double circuit structures would be approximately 25 feet taller than single circuit 345-kV structures. The Western 230-kV line would then be energized on the new double circuit configuration. The section of Western's existing 230-kV line transferred to the east side structures would be removed from the USFS Summit Campground and Trailhead Park and the area would be restored to previous use. Energizing the 230-kV segment of the double-circuited line and removal of Western's abandoned 230-kV line segment would occur in 2017.

Figure 3-14 shows the view if the transmission line was constructed under Alternative C as a single circuit line on the east side of the highway with Western's line remaining on the west side. Alternatively, Figure 3-15 shows the same view if the transmission line was constructed as a double circuit and located on the east side of the highway, with Western's line removed.

Although the design features of the proposed transmission line between Alternatives C and C-1 would be different, visual impacts would not differ substantially between the two alternatives. The development of a double-circuit transmission line under Alternative C-1 would result in visual impacts to the existing landscape. While the double circuit line would remove infrastructure from both sides of the road, thereby reducing visible impacts of development on the landscape, a double circuit line would also require a structure that is approximately 25-feet higher than a single circuit line. As a result, taller structures would be visible from greater distances within the LMNG. This is especially true for this section of the line which would be located on a ridge.

Figure 3-14: Alternative C as a Single Circuit Line

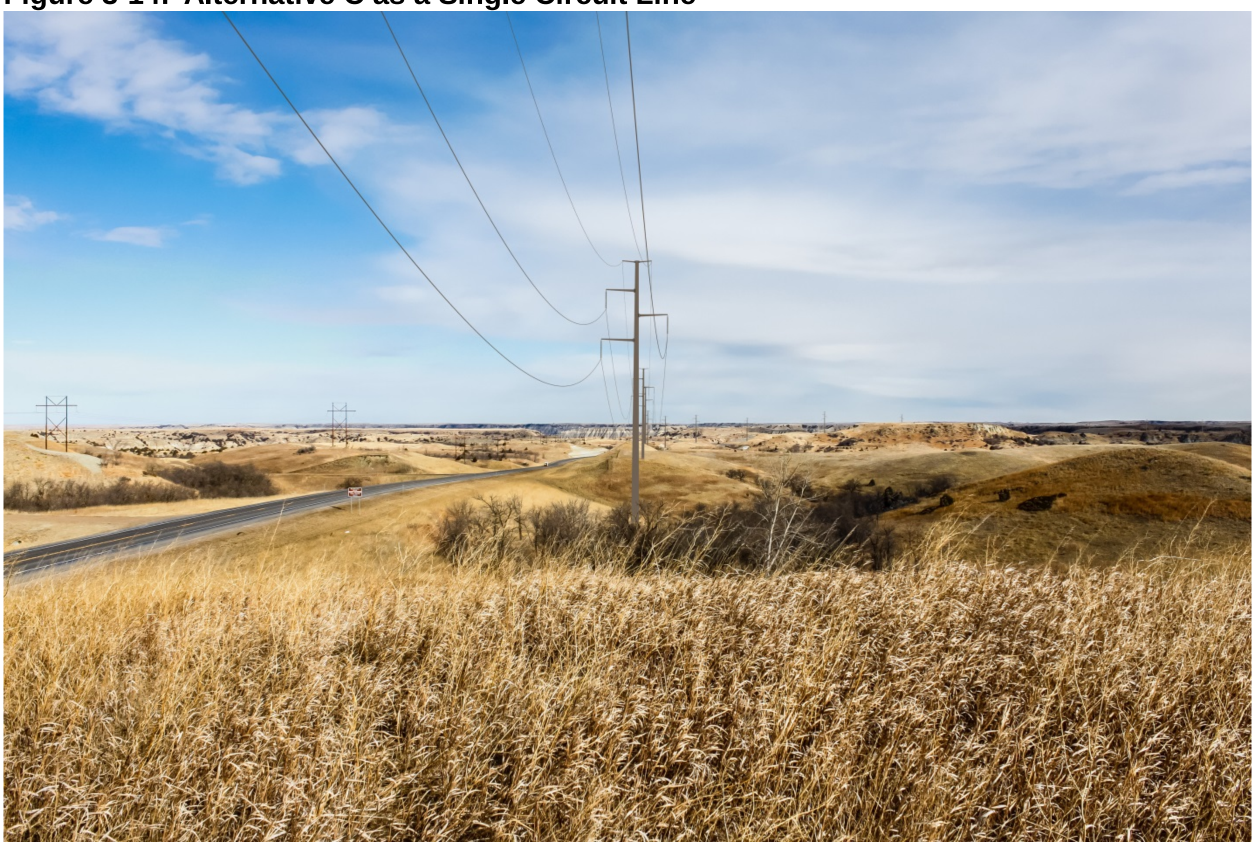


Figure 3-15: Alternative C-1 Double Circuit on East Side of U.S. Highway 85

Alternative D

Visual impacts associated with the construction and operation of Alternative D would be similar to those of Alternative C. Alternative D follows the same path as Alternative C with the exception that the Charlie Creek to Blue Substation line would not be required. The most notable visual difference between the two alternatives is that Alternative D would be composed of double-circuit poles along approximately 63 miles of the alignment between the Red and Blue substations, described for the eastern segment of Alternative C, two 12-mile parallel 345-kV lines extending south from the Red Substation to a new Killdeer South Substation, and would not include the visual impacts associated with the western segment of Alternative C along U.S. Highway 85. A description of structure types and tower heights required for the construction of Alternative D are provided in Chapter 2 (Figures 2-6 through 2-11). This double-circuit 345/345-kV arrangement would require taller structure and have twice the amount of conductor present, which would present a larger visual impact to the observer than Alternative C. The visual impacts of Alternative D, are discussed in more detail below.

Alternative D would be located within 500 feet of five residences, two of which are located at points where the route would cross the Missouri River, and would have 100 road crossings along the length of the route. Like Alternative C, a majority of these roads are county section-line gravel roads with very light traffic, likely only from the local residents. As described for the eastern segment of Alternative C, Alternative D would cross the Killdeer Mountain Four Bears Scenic Byway and the Lewis and Clark National Trail Auto Route near constructed features including an existing transmission line, oil and gas development, rural farmsteads, and distribution lines. These artificial elements along open grassland and cropland surrounding the crossings would not diminish existing scenic value along the byway in these areas (see Visual Simulations 5 and 6 in Appendix E for northern crossing of byway). Alternative D would continue to parallel the road approximately 0.5 mile west of the scenic byway; however, there is an existing 115-kV line between the road and the proposed route, causing viewers to have to look through an existing transmission line in order to see the Alternative D transmission line. Topography and the twisting nature of portions of the highway also limit views of the line to generally short sections where motorists would only have momentary views of the line. In areas adjacent to or near the crossing, the line may be visible to motorists for slightly longer periods of time while on the byway.

Continuing north, Alternative D would enter the scenic area of the North Dakota Badlands and the Little Missouri River, which is designated by the state as a scenic resource. Alternative D would cross the Little Missouri River west of the Killdeer Mountain Four Bears Scenic Byway. This crossing contains considerable badlands topography, vegetation, and river valley features, and opportunities for wide picturesque viewsheds. This area is not part of the LMNG and has not been assigned a SIO. Additionally, the area is located in a remote setting that limits development and visitor access, resulting in very few opportunities for public viewing. The approximate location where Alternative D would cross the Little Missouri River is within the corridor of an existing CO_2 pipeline and is 0.8 mile west of an existing 115-kV transmission line. This corridor currently contains constructed visual elements as well as visible access for construction and maintenance. However, the placement of an additional transmission line into the landscape would result in an incremental increase in visual disturbance when compared with the existing conditions. This is particularly true given that the additional structural component could be located as much as a mile from an already existing transmission line and would include considerably taller structures.

Alternative D would parallel the CO_2 gas pipeline for approximately 8.5 miles after the river crossing and pass within 0.1 mile of several tracts of the LMNG in McKenzie County. Because these areas are classified as having low scenic integrity, no adverse impacts would be anticipated from construction of a transmission line. Alternative D would then divert northwest from the gas line going cross-country and not parallel to any existing linear features. The topography through this area is indicative of the scenic badlands of the area. However, as previously described, lack of public access and development constrain any opportunities to view these vistas.

Continuing west, Alternative D crosses the Lewis and Clark National Historic Trail, the auto tour route, and the Missouri River at the same locations as Alternative C. These crossings would occur in primarily rural areas where constructed features such as oil wells and existing transmission and distribution lines are present. Agricultural uses are also present in these areas and include primarily grazing lands or croplands with little scenic value.

North of the Missouri River, the visual character of the landscape and topography is dominated mainly by crop-based agricultural land uses heavily interspersed with oil and gas production operations. The northern part of the project area is heavily influenced by human activity and contains two existing transmission lines. Depending on the exact placement of the transmission line within the landscape, the introduction of a new transmission line may impact the scenic value of the landscape. However, given the intensity of existing development in this area, impacts would be minor in level of severity and represent only incremental changes to existing conditions.

While Alternative D would cross the Little Missouri River in an area paralleling a major thoroughfare (ND State Highway 22), new access trails may also be required in certain areas near the Little Missouri River and associated tributaries with no access and steep, rugged terrain. Given the relatively undeveloped character of these areas, it is likely that the visual impacts associated with the construction of any new construction access trails for this alternative would have a low to moderate, temporary impact on visual resources. Short-term visual impacts would be expected to occur due to the presence of heavy machinery, equipment, and material staging during construction. However, because many of these areas are remote, they would not be visible to a large number of individuals traveling or recreating in the area. In addition, any new trails would be similar to existing field access trails throughout the area, would be reclaimed after construction, and would thus have only a temporary visual impact. They would be relatively unnoticed by visitors to the area and would meld back into the environment following cessation of construction activities.

Overall, due to the presence of human influence and existing infrastructure in the area (in the form of transmission and distribution lines, oil and gas development, agricultural operations, and gas pipelines) and the distance from federally recognized visually sensitive areas and parks, it is likely that the construction of the transmission line under Alternative D would have short-term, low adverse impacts during construction, and long-term, low to moderate adverse impacts on aesthetics and visual resources during the lifetime of the project.

Alternative E

Impacts to aesthetics and visual resources occurring under Alternative E would be similar to those described for Alternative D because the alignment of the two alternatives would generally occupy the same corridor on the landscape. However, although Alternative E would require shorter, single-circuit structures, it would include construction of an additional 345-kV line north of Killdeer for 63 miles between the Blue Substation and the Red Substation, resulting in two parallel lines, although located in the same general corridor, not always configured as two adjacent ROWs (total length of 126 miles of line). When adjacent, a 300-foot ROW would be established. At locations where the ROWs would not be adjacent, but in the same general corridor, two 150-foot ROWs in relatively close proximity would be established. Alternative E would be located within 500 feet of six residences, two of which are located at points where the route would cross the Missouri River and are also within 500 feet of Alternatives C and D.

Due to the incremental contribution to visual contrast on the landscape resulting from this additional component, Alternative E would be more visually intrusive than Alternatives D and C. Observers would be able to more readily view the modification to the landscape along this segment of the transmission corridor, which would be wider than under Alternative D and represent a higher degree of visible intrusion into the existing character of the landscape. Thus, the construction of the transmission line under Alternative E would have short-term, low-intensity adverse impacts during construction and long-term, moderate adverse impacts on aesthetics and visual resources during the lifetime of the project.

Similar to Alternatives C and D, it is expected that impacts from this alternative would be minor because of the presence of human influence and other existing infrastructure throughout the area (in the form of transmission and distribution lines, oil and gas development, agricultural operations, and gas pipelines), use of weathering steel structures in areas of higher visual sensitivity, and the distance from federally recognized visually sensitive areas and parks.

3.2 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

3.2.1 Affected Environment

Air Quality Conditions

Regional Setting

The proposed project is in western North Dakota traveling from the west-central portion of the state to the northwest portion. Major existing contributing sources of air emissions/criteria pollutants in the project area stem from oil and gas activities coming from manufacturing, construction, operation, and maintenance. Emissions from these sources have increased in recent years from the dramatic increase in oil and natural gas production that the hydraulic fracturing process provides for the industry to unlock previously inaccessible areas. There are a number of these oil and gas processing plants, gas flares, and production wells in the project area as well as a coal-fired electrical generating unit (AVS) and a synthetic natural gas production facility (Great Plains Synfuels Plant).

Other existing sources of air emissions result from infrastructure and include all transportation associated with the oil and gas industry; individual automobiles, trucks, and farm equipment; and residential emissions primarily from wood burning stoves. Vehicles are responsible for tailpipe emissions including nitrogen oxides (NO_x), carbon monoxide (CO), and sulfur dioxide (SO_2).

The primary pollutant produced by farm equipment is NO_x from the combustion of fuel. In addition to existing contributors to air emissions, the prevalence of farming and ranching activities and vehicles using unpaved roads are sources of fugitive dust.

National Ambient Air Quality Standards/Attainment

The U.S. Environmental Protection Agency (USEPA) defines ambient air in 40 CFR 50 as "that portion of the atmosphere, external to buildings, to which the general public has access." In compliance with the 1970 Clean Air Act and the 1977 and 1990 Clean Air Act Amendments, USEPA has promulgated National Ambient Air Quality Standards (NAAQS). NAAQS were enacted for the protection of public health and welfare, allowing for an adequate margin of safety. The Clean Air Act established two types of national air quality standards. Primary standards set limits to protect public health, including the health of "sensitive" populations such as children, the elderly, and those suffering from asthma. Secondary standards set limits to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. To date, USEPA has issued NAAQS for seven criteria pollutants: CO, SO_2, particles with a diameter less than or equal to a nominal 10 micrometers (PM_{10}), particles with a diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$), ozone, nitrogen dioxide (NO_2), and lead. Areas that do not meet NAAQS are called non-attainment areas. While ozone is monitored for ambient air quality levels, regulations limit NO_x and volatile organic compound emissions, which are ozone precursors. Table 3-3 displays the primary NAAQS for each criteria pollutant as well as state standards for ambient air quality. All counties in North Dakota are currently in attainment for all criteria pollutants. In 2010, USEPA established 1-hour standards for NO_2 and SO_2 and both USEPA and the North Dakota Department of Health (NDDOH) recommended that North Dakota be classified as in attainment or unclassifiable by these standards.

Ambient air quality is monitored throughout North Dakota by stations meeting USEPA's design criteria for State and Local Air Monitoring Stations and National Air Monitoring Stations. There are five monitoring stations near the project area and yearly monitoring data for the different pollutants is presented by the NDDOH. For 2010, all monitoring sites presented air quality data that was within federal and North Dakota state standards (NDDOH, 2010a).

To regulate the emission levels resulting from a project, federal actions located in non-attainment areas are required to demonstrate compliance with the general conformity guidelines established in Determining Conformity of Federal Actions to State or Federal Implementation Plans (40 CFR 93). Section 93.153 of this rule sets the applicability requirements for projects subject to it through the establishment of *de minimis* levels for annual criteria pollutant emissions. These *de minimis* levels are set according to criteria pollutant non-attainment area designations. Projects below the *de minimis* levels are not subject to the rule. Those at or above the levels are required to perform a conformity analysis as established in the rule. The *de minimis* levels apply to direct and indirect sources of emissions that can occur during the construction and operational phases of the action.

Table 3-3: State and Federal Ambient Standards for Criteria Air Pollutants

Pollutant	Averaging Period	Federal Primary Standard	North Dakota State Standard
Ozone	8-hour	0.075 ppm	Same as federal
	1-hour (daily max.)	0.12 ppm	Same as federal
$PM_{2.5}$	Annual (arithmetic mean)	15.0 µg/m^3	Same as federal
	24-hour	35 µg/m^3	Same as federal
PM_{10}	Annual (arithmetic mean)	NA	Same as federal
	24-hour	150 µg/m^3	Same as federal
CO	8-hour (less than 5,000 feet above mean sea level	9 ppm	Same as federal
	8-hour (greater than 5,000 feet above mean sea level	9 ppm	N/A
	1-hour	35 ppm	Same as federal
NO_2	Annual (arithmetic mean)	0.053 ppm	Same as federal
	1-hour	0.100 ppm	Same as federal
SO_2	Annual (arithmetic mean)	0.03 ppm	Same as federal
	24-hour	0.14 ppm	Same as federal
	3-hour	NA	0.50 ppm
	1-hour	75 ppm	Same as federal
Lead	Rolling 3-month average	0.15 µg/m^3	Same as federal
	Quarterly average	1.5 µg/m^3	Same as federal

Sources: USEPA, 2012; North Dakota Century Code, 2011b.
ppm = parts per million
µg/m^3 = micrograms per cubic meter

The proposed action is not located within a non-attainment area; therefore, a General Conformity Rule applicability analysis is not warranted.

Outside of the nonattainment areas, the Clean Air Act includes programs to maintain the air quality in attainment areas and ensure that new sources of criteria pollutants do not detrimentally affect the air quality. Programs established include: New Source Performance Standards, National Emission Standards for Hazardous Air Pollutants, Prevention of Significant Deterioration (PSD), and Title V Operating Permits. Of these programs, the only potential program applicable to this project is PSD. To determine the applicability of PSD, Congress set aside special land classifications where existing good air quality is especially important. These areas include but are not limited to national forests, national parks, and wilderness areas, all of which are defined as Class I areas. All other areas are designated as Class II areas. There are two Class I areas in North Dakota: TRNP and Lostwood Wildlife Area. TRNP is located within the project area and Lostwood Wildlife Area is located approximately 18 miles to the northeast.

PSD increments were established for Class I and Class II areas to ensure that air quality is maintained in attainment areas. If it is determined that a project is subject to PSD, the ground level air concentrations from the project must be below these increment values in attainment areas. In addition, all facilities must meet NAAQS with an appropriate background value added to the source impact concentration.

Greenhouse Gases

There is broad scientific consensus that humans are changing the chemical composition of Earth's atmosphere. Human activities such as fossil fuel combustion, deforestation, and other changes in land use are resulting in the increase in GHG emission rates above background levels and the accumulation of additional GHGs, such as CO_2, in our atmosphere above pre-industrial natural levels of those gases. An increase in human GHG emissions is said to result in an increase in the Earth's average surface temperature, commonly referred to as global warming or climate change. Climate change is expected, in turn, to affect weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates. The Intergovernmental Panel on Climate Change estimates that the average global temperature rise between 2000 and 2100 could range from 1.1 degrees Fahrenheit (°F) (with no increase in GHG emissions above year 2000 levels) to 9.2°F (with a substantial increase in GHG emissions). Even small increases in global temperatures could have considerable detrimental impacts on natural and human environments (IPCC, 2007).

GHGs include water vapor, CO_2, methane (CH_4), nitrous oxide, ozone, and several hydrocarbons and chlorofluorocarbons. Each GHG has an estimated Global Warming Potential, which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted from the Earth's surface. A gas's Global Warming Potential provides a relative basis for calculating its carbon dioxide equivalent (CO_2e), which is a metric measure used to compare the emissions from various GHGs based upon their Global Warming Potential. CO_2 has been assigned a Global Warming Potential of 1, and is therefore the standard to which all other GHGs are measured (IPCC, 2007).

Water vapor is a naturally occurring GHG and accounts for the largest percentage of the greenhouse effect. Next to water vapor, CO_2 is the second-most abundant GHG. Uncontrolled CO_2 emissions from power plants, heating sources, and mobile sources are a function of the power rating of each source, the feedstock (fuel) consumed, and the source's net efficiency at converting the energy in the feedstock into other useful forms of energy (e.g., electricity, heat, and kinetic). Because CO_2 and the other GHGs are relatively stable in the atmosphere and essentially uniformly mixed throughout the troposphere and stratosphere, the climatic impact of these emissions does not depend upon the source location on the earth (i.e., regional climatic impacts/changes will be a function of global emissions) (IPCC, 2007; USEPA, 2006a).

Other major human emissions contributing to increased global levels of GHGs include CH_4 and nitrous oxide and fluorocarbons. CH_4 is emitted during the production and transport of coal, natural gas, and oil; CH_4 is also emitted from livestock, agricultural processes, and organic waste decay and amounts to about 24 billion metric tons annually in the United States. Natural CH_4 emissions globally are from wetlands, oceans, hydrates, and fires. CH_4 accounts for approximately 15 percent of global manmade GHG emissions (USEPA, 2006b).

Nitrous oxide emissions are emitted during the combustion of fossil fuels and solid wastes, as well as during agricultural and industrial activities. Nitrous oxide accounts for approximately 8 percent of global manmade GHG emissions (USEPA, 2006b).

Fluorocarbon gases are unnatural and emitted from a variety of industrial process and include: perfluorocarbons, hydrofluorocarbons, and sulfur hexafluoride. Combined, these gases comprise 7 percent of GHG emissions (USEPA, 2006b). Although they are emitted in small quantities, fluorinated gases have the ability to trap more heat than CO_2 and are considered gases with high global warming potential (USEPA, 2006a).

While models predict that atmospheric concentrations of all GHG emissions will increase over the next century due to human activity, the extent and rate of change is difficult to predict, especially on a global scale. As a response to concerns over the predicted increase of global GHG levels, various federal and state laws address the need to reduce GHG emissions, including those described below.

- USEPA is in the process of establishing regulations to control emissions from large generation sources such as power plants under the federal Clean Air Act for new sources emitting 100,000 CO_2e tons or more of GHGs. Other limited regulation of GHG emissions occurs through a review of new sources and regulatory requirements related to mobile sources.
- USEPA has issued the Final Mandatory Reporting of Greenhouse Gases Rule that requires reporting of GHG emissions from large sources. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles or engines, and facilities that emit 25,000 metric tons or more per year of GHGs are required to submit annual reports to USEPA (USEPA, 2010); although no other action is required (40 CFR 86, 87, 89.).

- Executive Orders 13423 and 13514 require federal agencies to measure, manage, and reduce GHG emissions by agency-defined target amounts and dates.

The state of North Dakota currently does not cap GHG emissions nor is it part of a regional GHG emission cap agreement (IFER, 2012). The state has primacy over the PSD program, including its GHG provisions.

<u>Regional Haze</u>

The Regional Haze Rule (Clean Air Act 169A and 169B, 40 CFR 51, subpart P) was intended to protect and improve visibility in areas of the country known as federal Class I areas (primarily National Parks and National Wilderness areas). Several facilities in North Dakota were subject to a regional haze analysis per 40 CFR 51.308, known as the Best Available Retrofit Technology analyses. These analyses applied to facilities in 26 source categories (mainly power plants) that were constructed between approximately 1962 and 1977 (years prior to the Clean Air Act Amendments of 1977). Utilities are the most common facilities that met the requirements under the Best Available Retrofit Technology rules. Facilities constructed before or after the 1962 through 1977 period may be subject to Reasonable Progress requirements. North Dakota is in the process of updating its State Implementation Plan to include controls and emission limits required by the Best Available Retrofit Technology and Reasonable Progress analyses to improve visibility in Class I areas.

There is currently only one Class I area within the vicinity of the project area, TRNP-North Unit. During construction, the proposed transmission line and substations have the potential to contribute to haze in this area. However, based on USEPA memo, construction emissions are not a consideration in determining if PSD requirements apply to a source. Since the construction of the proposed transmission line and associated structures is not a major stationary source this project does not come under PSD review. In addition, it is expected that all emission limits established will be followed and that any contribution to visual haze will not be significant based on the proposed project (NDDOH, 2010b).

3.2.2 Direct and Indirect Effects

This section discusses potential impacts, their duration, and intensity on air quality and GHGs resulting from construction and operation of the proposed project, including the no-action alternative. Definitions for context and intensity are described in Table 3-1.

No-action Alternative

Under the no-action alternative, the proposed project would not be constructed, and current air quality conditions would remain. There would be no impacts on air quality as a result of project construction, operation, or maintenance. However, impacts would likely occur if no additional transmission capacity is developed in the region as small gas-fired turbines or diesel generators or other sources of generation would be required at individual well sites to meet increased electricity demand.

Alternative C

Under Alternative C, impacts on air quality would occur as a result of the construction and operation of the transmission line and substations. Potential impacts on air quality as a result of construction include increases in fugitive dust caused by construction activity, vehicles, and equipment, and emissions from construction vehicles and equipment. The primary construction impact on air quality comes from fugitive dust. The footprint of the proposed project occurs primarily on open ranges, undeveloped, or agricultural land with transportation occurring primarily on dirt or gravel roads. Increases in traffic on these roads from construction-related workers, equipment, earthmoving activities, and wind action on disturbed areas would all lead to increases in the production of fugitive dust. Site-preparation for the proposed transmission line and associated substations would require earthmoving and grading activities, exposing soils and increasing the potential for wind erosion. In addition, as a result of grading activities and the transportation of soil and other construction debris in uncovered trucks could also contribute to fugitive dust. The primary concern over fugitive dust would occur during the warmer, drier months when soils are not frozen and are more prone to dust generation. Impacts from fugitive dust would be expected to be short term and only occur during the construction period. Based on the relatively small size of the affected area and current air quality conditions, it is expected that Alternative C would result in low impacts on air quality.

Other impacts on air quality as a result of construction activities come from emissions from construction vehicles and heavy equipment used in the construction process. Emissions stemming from these vehicles and equipment would emit hydrocarbons, particulate matter, and CO_2. Emissions resulting from the construction activities would be highly localized in the immediate project area and ROW and would be similar to or less than those created as a result of agricultural activities taking place in a majority of the project area, but would somewhat incrementally increase total emissions. Air emissions as a result of construction are expected to be minimal as these activities are not excessive in nature. Estimated emissions are listed in Table 3-4. Emissions stemming from the construction of this alternative would not reduce air quality in the project area, would not exceed USEPA *de minimis* thresholds, and would not affect the current attainment status of North Dakota; resulting in short-term, low impacts.

Emissions potentially impacting air quality during operation of the transmission line and substations would only occur as a result of atmospheric interactions with the energized conductors. These minor emissions consist of ozone and nitrogen oxide (NO_x) and occur near the conductor from the development of a corona. These emissions relative to NAAQS would be negligible and not approach current *de minimis* standards, resulting in low impacts on air quality.

Table 3-4: Alternative C: Transmission Line and Substations Construction Emissions Estimates and General Conformity De Minimis Thresholds

Pollutant	Emissions (tons)	Emissions (tons/year)	General Conformity De Minimis Threshold (tons/year)
Nitrogen oxide	9.65	4.83	100
Volatile organic compounds	0.74	0.37	100
$PM_{2.5}$	1.36	0.68	100
Sulphur dioxide	0.31	0.16	100
Carbon monoxide	3.56	1.78	100

Note: $PM_{2.5}$ = particles with a diameter less than or equal to a nominal 2.5 micrometers

A potential area of concern regarding proposed air quality impacts associated with Alternative C is the proximity of the proposed transmission line to the TRNP-North Unit, a federal Class I airshed. The proposed transmission line would be approximately 5 miles from the TRNP. Class I areas are sensitive areas with determined important visual qualities and are protected from air pollutants that can potentially cause visibility impairments. Visibility can be affected by several air pollutants including PM_{10}, meters $PM_{2.5}$, sulfates, nitrates, and sulfuric acid mist. Potential pollutants occurring as a result of construction activities with the potential to impact visibility are both particulate matters. Impacts to the TRNP-North Unit airshed are currently occurring as a result of ongoing oil and gas development and while construction activities associated with this project would lead to an overall incremental increase in emissions and fugitive dust in the area, impacts of this project would be localized and short-term in nature and with the implementation of management practices to control emissions and fugitive dust, construction emissions would not cause visibility impairments to the Class I area.

GHG emissions resulting from Alternative C were calculated for two types of activities that produce GHG emissions: construction of the transmission line and ongoing annual operations and maintenance for its estimated 50-year-long operational life. GHG emissions associated with construction activities would occur over a period of approximately 2 years. Based on existing data, it was assumed that an average of 200 workers (50 per four crews) located throughout the project area would work on the project daily during peak construction (including access and structure installation) and non-peak construction (including installing and removing BMP measures and staging areas, site preparation and restoration work, and equipment and materials moving). The transportation components of GHG emissions were estimated based on the approximate number of vehicles that would be used during project construction and the approximate distance those vehicles would travel. The number of round trips was conservatively estimated using the following assumptions.

- All workers would travel in separate vehicles to and within the project area each day.
- A maximum number of workers (200) would be required to construct the project.
- The round trip distance in the project area is approximately 100 miles, depending on the exact location of workers within the project area.
- Fuel consumption is based on the average fuel economy for standard pickup trucks of 18 miles per gallon. This is likely an overestimate as more efficient vehicles may be occasionally used. Average helicopter fuel mileage is anticipated to be around 1 mile per gallon.

Fuel consumption and GHG emissions would also result from operation of on-site heavy construction equipment. Heavy construction equipment may include augers, bulldozers, excavators, graders, heavy-duty trucks, and front-end loaders. It is also expected that the majority of heavy construction equipment use would occur during peak construction. Assumptions include a maximum of 50 equipment machines would be in operation during peak construction and 25 equipment machines during off-peak. It was also assumed that the average size of equipment would not exceed 250 horsepower and would operate at maximum power for 8 hours per day, 5 days a week, which is a significant overestimation because equipment commonly operates at idle or reduced power.

The implementation of Alternative C would require the permanent removal of trees and other vegetation as a result of access construction and ROW clearing. Permanent tree removal would reduce the level of solid carbon storage in the area. Tree growth and future carbon sequestration rates are highly variable and dependent on several factors, including, the species and age of the tree, climate, forest density, and soil conditions. In the North Central Region of the United States, the average carbon storage associated with forests is 160,000 pounds per carbon acre (USFS, 1992). As a result of Alternative C, a total of approximately 183.1 acres of forested area would potentially be removed. Assuming each affected acre contains the average carbon content for the North Central Region, the net carbon footprint associated with the removal of forested area would be an estimated 19,278 metric tons of CO_2e. However, NDPSC requires tree replacement on a 3:1 ratio. Assuming a 70 percent survival rate after 5 years, the net CO_2e impact is estimated to be considerably reduced. Given this estimate, the impact of vegetation removal on GHG emissions would be low.

During operation and maintenance of the transmission line it is expected that routine patrols, structures maintenance, and aerial inspections by helicopter would occur once per year and emergency maintenance and natural resource review would occur on average once every 4 years, with all activities estimated to incur 100 miles round trip. Operation and maintenance emissions are estimated for the 50-year life span of the transmission line.

Based on the above assumptions this alternative would result in an estimated total of 27,450 metric tons of CO_2e emissions each year during construction and a total of an estimated 62 metric tons of CO_2e emissions for ongoing operations and maintenance activities over the 50-year lifespan of the line. To provide context for this level of emissions, the USEPA mandatory reporting threshold for large sources of GHGs is 25,000 metric tons of CO_2e emitted annually (74 *Federal Register* 56260). This threshold is approximately the amount of CO_2e generated by 4,400 passenger vehicles per year. Comparatively, the emissions during project construction would be equivalent to the emissions generated by about 4,832 passenger vehicles per year. Operation and maintenance activities would translate into CO_2e emissions about equal to that of nine passenger vehicles per year. The construction of Alternative C would conservatively exceed the USEPA mandatory reporting threshold. However, based on the relatively minor operational emissions and the character of the project being a transmission line with associated substation facilities, the project does not qualify as a large source of emissions that would require reporting. Overall, the contributions of construction, operation, and maintenance of Alternative C on GHG concentrations would be low.

Alternative D

Because Alternative D is slightly shorter than Alternative C, impacts on air quality as a result of this alternative would be similar, albeit slightly less than those associated with Alternative C. Construction-related emissions and fugitive dust would occur in the immediate area of the proposed route and impacts would be short term, localized, and less than significant. Emission estimates from construction are detailed in Table 3-5. Emissions from operations would be localized and less than significant. This alternative would not cross any Class I airsheds and at the closest point would be 5 miles from the TRNP-North Unit Class I airshed.

The construction assumptions for Alternative C were used to calculate GHG emissions for Alternative D, with the exception of assumptions concerning construction workers—Alternative D assumptions use an average of 150 workers (50 per three crews) located throughout the project area who would work on the project daily during peak construction. Based on these assumptions Alternative D would result in an estimated total of 23,700 metric tons of CO_2e emissions and a total of 50 metric tons of CO_2e emissions for ongoing operations and maintenance activities over the 50-year lifespan of the line. Alternative D would likely impact approximately 119.5 acres of forested area to be removed. Assuming each affected acre contains the average carbon content for the North Central Region, the net carbon footprint associated with the removal of forested area would be an estimated 7,260 metric tons of CO_2e. Given this estimate, the impact of vegetation removal on GHG emissions from Alternative D would be low.

Table 3-5: Alternative D: Transmission Line and Substations Construction Emissions Estimates and General Conformity De Minimis Thresholds

Pollutant	Emissions (tons)	Emissions (tons/year)	General Conformity De Minimis Threshold
Nitrogen oxide	9.58	4.79	100
Volatile organic compounds	.73	.37	100
$PM_{2.5}$	.66	.33	100
Sulfur dioxide	.30	.15	100
Carbon monoxide	3.53	1.77	100

Note: PM2.5 = particles with a diameter less than or equal to a nominal 2.5 micrometers

Alternative E

Impacts on air quality as a result of Alternative E would be similar, albeit slightly greater due to the increased length of this alternative, to those presented in Alternative C. Construction-related emissions and fugitive dust would occur in the immediate area of the proposed route and impacts would be short term, localized, and less than significant. Emission estimates from construction are detailed in Table 3-6. Emissions from operations would be localized and less than significant. This alternative would not cross any Class I airsheds at the closest point would be 5 miles from the TRNP North Unit Class I airshed.

Table 3-6: Alternative E: Transmission Line and Substations Construction Emissions Estimates and General Conformity De Minimis Thresholds

Pollutant	Emissions (tons)	Emissions (tons/year)	General Conformity De Minimis Threshold
Nitrogen oxide	10.96	5.48	100
Volatile organic compounds	.84	.42	100
$PM_{2.5}$	.77	.39	100
Sulfur dioxide	.35	.17	100
Carbon monoxide	4.09	2.95	100

Note: PM2.5 = particles with a diameter less than or equal to a nominal 2.5 micrometers

The construction assumptions for Alternative C were used to calculate GHG emissions for Alternative E, with the exception of the assumptions for construction workers—Alternative E construction assumptions use an average of 150 workers (50 per three crews) located throughout the project area who would work on the project daily during peak construction. Based on these assumptions Alternative E would result in an estimated total of 27,400 metric tons of CO_2e emissions and a total of 50 metric tons of CO_2e emissions for ongoing operations and maintenance activities over the 50-year lifespan of the line. The exact acreage of trees to be removed as a result of this alterative is unknown; however, it is likely that it would result in a loss similar to Alternative C (189.4 acres). Assuming each affected acre contains the average carbon content for the North Central Region, the net carbon footprint associated with the removal of forested area would be an estimated 19,278 metric tons of CO_2e. Given this estimate, the impact of vegetation removal on GHG emissions from Alternative E would be low.

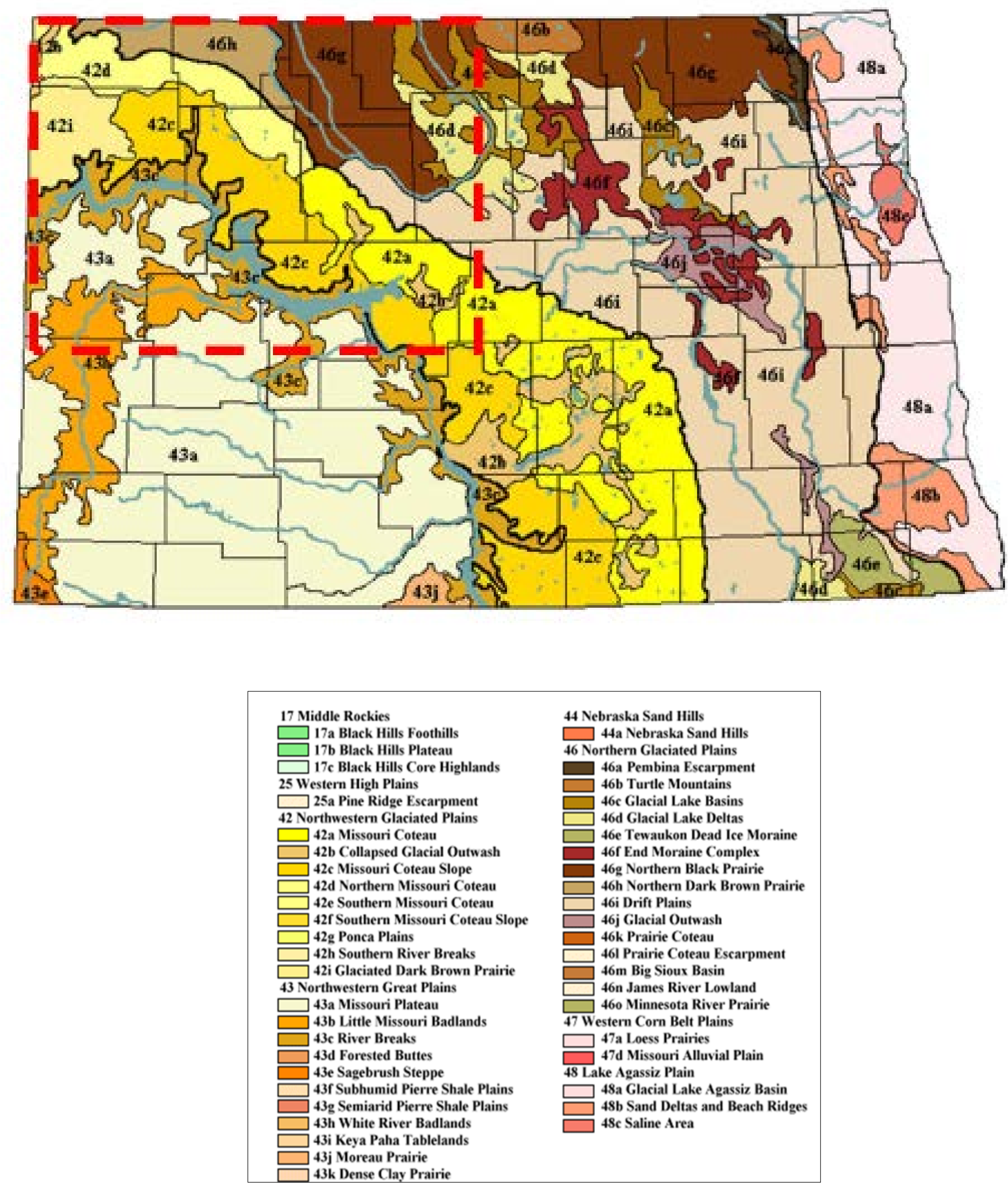
3.3 GEOLOGY AND SOILS

3.3.1 Affected Environment

Regional Geology

The project area is within the Northwestern Glaciated Plains and Northwestern Great Plains ecoregions within the Great Plains Province. The Northwestern Glaciated Plains encompasses the westernmost extent of continental glaciation, with high concentrations of wetlands. The Northwestern Great Plains encompasses the Missouri Plateau section of the Great Plains, and is a semi-arid region with rolling plains, buttes, and badlands. The Northwestern Glaciated Plains and Northwestern Great Plains are further divided into smaller ecoregions with specific geologic, topographic, or soil features. The northwestern portion of North Dakota, within which the project area is located (Figure 3-16) contains many of these unique ecoregions. North of Lake Sakakawea the region contains the Glaciated Dark Brown Prairie along with the River Breaks adjacent to Lake Sakakawea. The Glaciated Dark Brown Prairie consists primarily of glacial till over Tertiary sandstone and shale. The River Breaks, located adjacent to Lake Sakakawea, the Missouri River, and its tributaries contain broken terraces and uplands with dissected topography. These areas are unglaciated and consist of Tertiary sandstone and shale. South of Lake Sakakawea, not including the River Breaks, is the Little Missouri Badlands and Missouri Plateau. The Little Missouri Badlands are similar to the River Breaks, with highly-dissected topography prone to erosion. This area is also unglaciated, with Paleocene sediments of the Bullion Creek and Sentinel Butte Formations. The Missouri Plateau is unglaciated and consists of Tertiary sandstone, shale, and coal. The project area is also located within a region of the state where the Fox Hill and Hell Creek units of the Union Formation are underlain by calcareous shales, siltstones, and sandstones that are nearly all covered in glacial till plains. Kettle holes, kames, moraines, and small glacial lakes occur there as well. Alluvial deposits lie along the Missouri River (Bryce et al., 1998; U.S. Geological Survey [USGS]-Northern Prairie Wildlife Research Center [NPWRC], 2012).

Figure 3-16: Ecoregions in Northwestern North Dakota



Source: USGS-NPWRC, 2012

A majority of the project area location is glaciated, with the exception of the area southwest of the Missouri River. These areas are on an old, moderately dissected, rolling plain with badlands, buttes, and isolated hills. Terraces are adjacent to broad floodplains along most of the major drainages. Elevation in the eastern portion of the region is approximately 1,650 feet and sloping gradually to approximately 3,600 feet in the western portion.

Study Area Setting

For the purposes of describing the existing environmental setting, the area contained within the 6-mile-wide corridor distance for the proposed alternatives has been selected to provide the context of the local study area. Figure 3-17 illustrates the extent of the study area for geology and soils. This area comprises approximately 1.8 million acres in Williams, Mountrail, McKenzie, Billings, Dunn, and Mercer counties. Presenting the description of existing conditions as they relate to soils and geology within this more localized area, rather than a more generalized regional scale, creates a discrete unit of geographic interest that is more suited to the analysis of potential impacts stemming from construction and operation of the proposed transmission line. The information presented below—the description of bedrock geology, the location of landslide-prone areas, soil characterization, and farmland suitability—is constrained by the geographic boundaries of the study area as defined by these parameters. Similarly, soils and geologic conditions are detailed in the following maps as they occur within this study area.

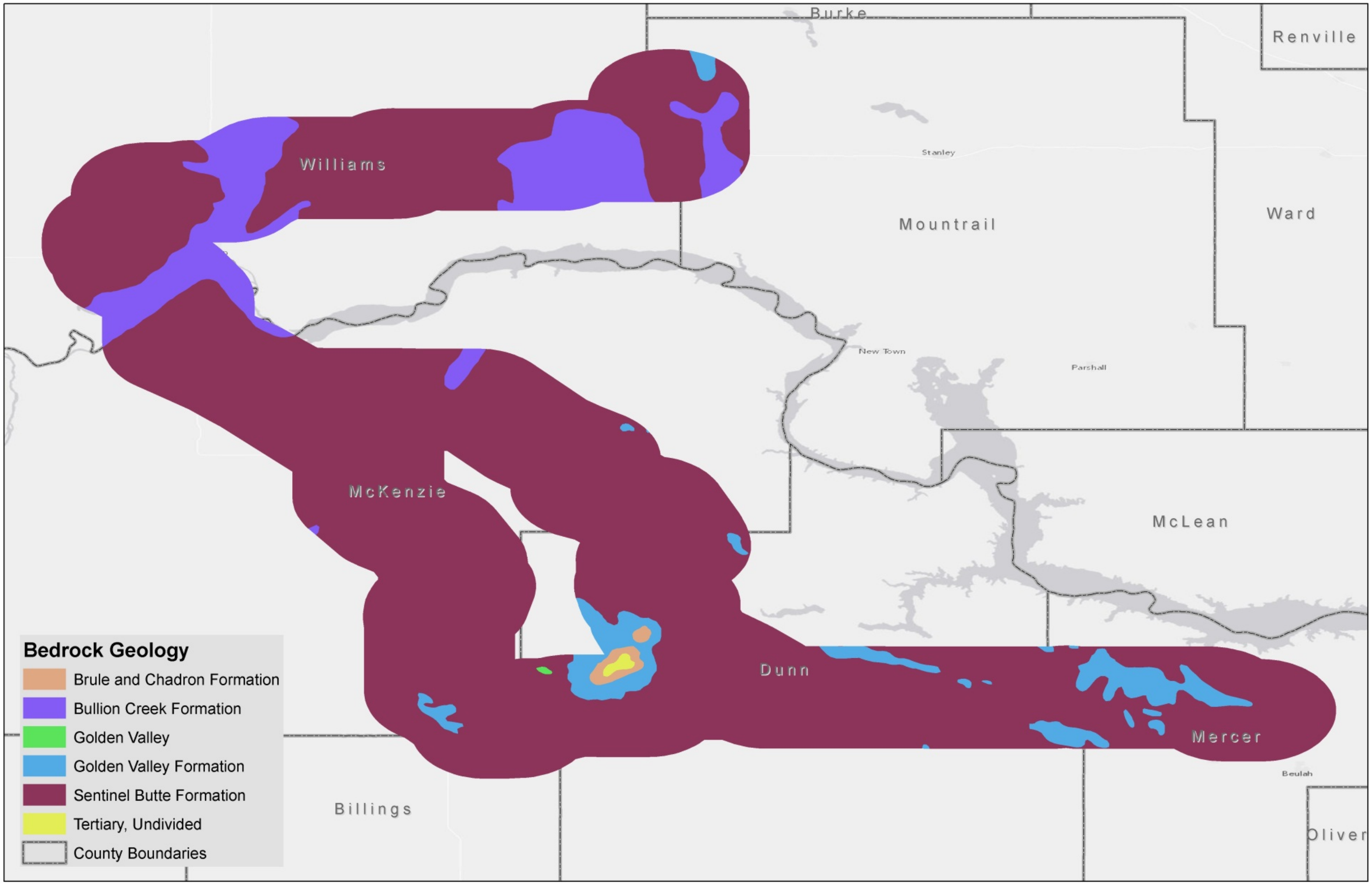
Geology

The bedrock geography of the study area is of the tertiary period and comprises the Sentinel Butte, Bullion Creek, Golden Valley and Brule and Chadron formations. Primarily silt, sand, clay, sandstone, and lignite, with small areas of siltstone and limestone, occur throughout the study area. Butte caprock also occurs in the study area northeast of the Killdeer. Bedrock geology of the study area is presented in Figure 3-17.

<u>Terrain</u>

The maximum local relief is about 330 feet, but relief is considerably lower in most of the area (Natural Resources Conservation Service [NRCS], 2012b).

Figure 3-17: Bedrock Geology within the Macro-corridors



Source: NRCS, 2012a

<u>Landslides</u>

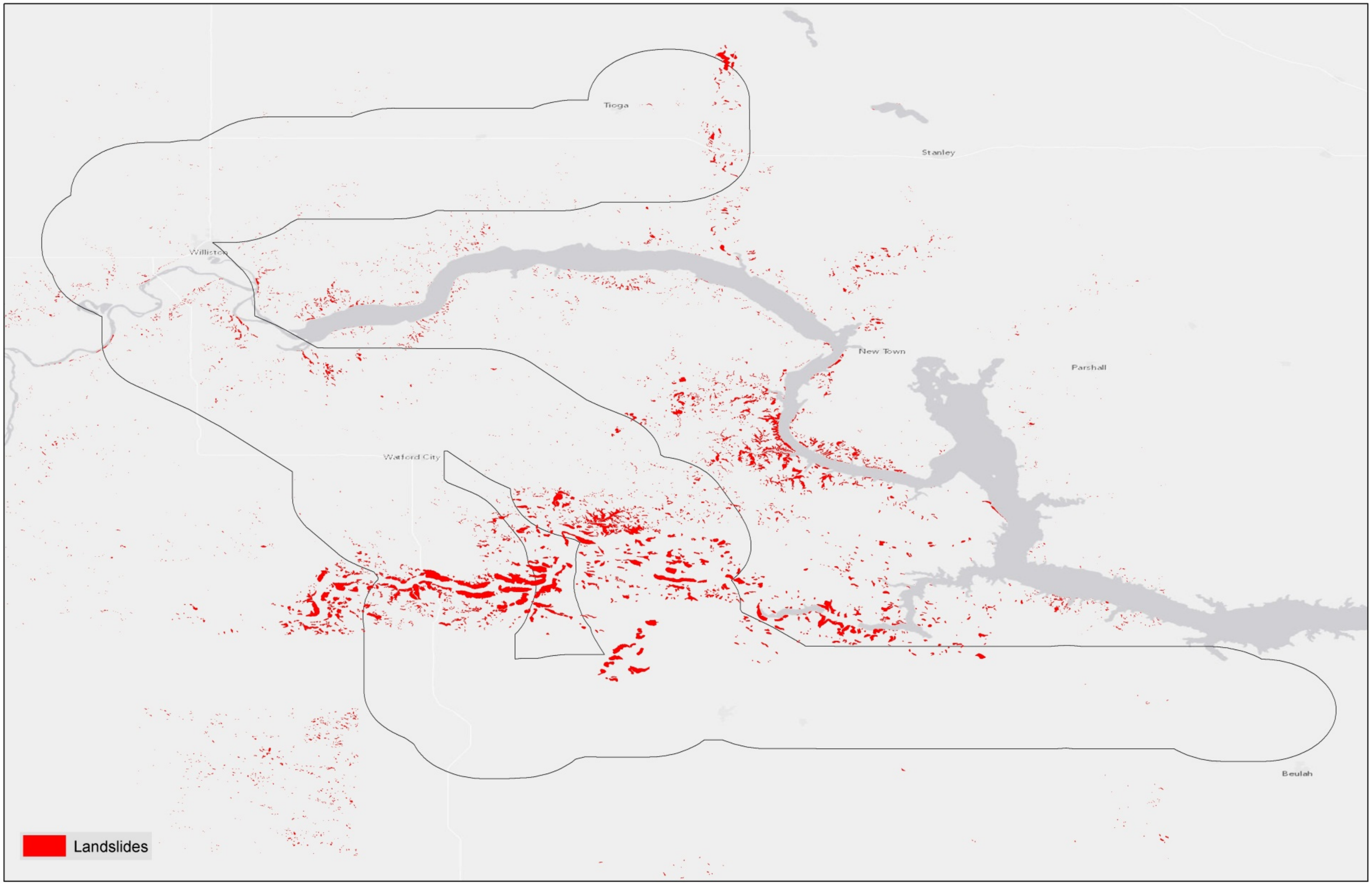
The North Dakota Geologic Survey (NDGS) has identified landslide areas within the study area. These areas have experienced landslides in the past, or may be subject to landslide activity due to geologic shifting or unstable soils. Within the study area, landslide-prone areas are primarily confined to the badland areas and river breaks areas surrounding the Missouri River and Little Missouri River. These areas exhibit steep terrain and exposed soils, which contribute to landslide activity. Figure 3-18 displays the occurrences of landslides within the study area.

Landslides are masses of rocks and sediment that have tumbled or slid down a slope under their own weight. They constitute geologic hazards that can damage buildings, roads, railroad tracks, pipelines, transmission lines, and other types of infrastructure. Landslides are generally characterized in the field by steep, near-vertical slopes (the scarp) that are upslope from a mound of displaced rock (the body). The body of the slide may be relatively intact or it may be severely fragmented. Recent or relatively new landslides are generally characterized by a fresh (well-exposed rock) scarp and a sparsely vegetated body. Older slides are typically more difficult to identify in the field because the scarps may be covered with vegetation and the landslide bodies are often well-vegetated and covered by mature trees.

Most landslides in western North Dakota are rotational slumps that have a well-defined head and toe. Typically, the part of the slope that breaks apart slides down the slope as a single unit and the beds tilt back in the direction of the slope. The failed mass of rock is, however, almost never a cohesive unit; tension cracks generally cause the failed material to splinter into smaller portions. Successive landslides may occur at the same location. Over time, the accumulated material from multiple, adjacent landslides can cover an area that is several thousand feet wide and several miles long (Murphy, 2003).

The potential for landslides exists at various locations throughout the study area, but landslide conditions predominate in southern McKenzie County. Most of this area is underlain by the Sentinel Butte Formation (Paleocene), which consists of alternating beds of sandstone, siltstone, mudstone, claystone, clinker, and lignite. A veneer of glacial deposits covers much of the upland areas. Landslides in this portion of the study area are most prevalent within the Little Missouri Badlands and in badlands topography north of Arnegard. The rock types in these two areas are no different than those outside of these landslide-prone areas. In contrast to the slow erosive processes that have carved most of the landforms in this map sheet, the buttes, valleys, coulees, and ravines within the Little Missouri Badlands were carved relatively quickly (in geologic terms) when glacial ice diverted the ancestral Little Missouri River into this area (Murphy, 2004). The Sentinel Butte Formation also occurs within Dunn County, where landslide potential exists on lands near the western extent of Lake Sakakawea in an area known as the Parshall Sheet. In the area covered by the Parshall Sheet, landslides are most prevalent within the Little

Figure 3-18: Landslide Occurrences within the Macro-corridors



Source: NDGS, 2012b

Missouri Badlands and the drainages along the west side of the Missouri River Valley between New Town and Independence Point (Murphy, 2003).

Regional Mineral Resources

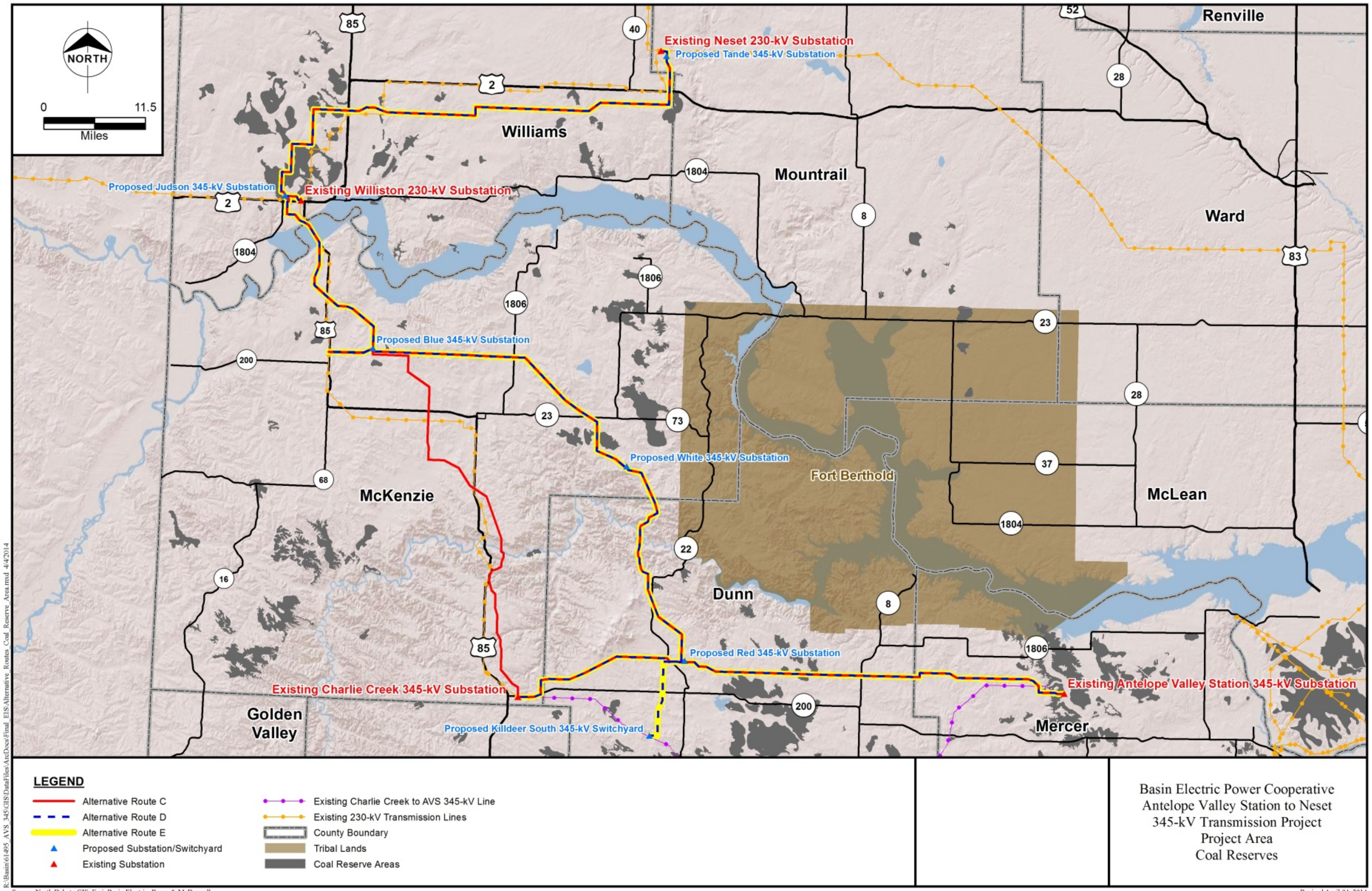
Several mineral resources are mined within the study area. Bedrock clays can be found from silty clay in the lower part of the Golden Valley Formation near Hebron. Lignite coals can be found mainly in the Tertiary, Bullion Creek, and Sentinel Butte formations within the study area in western North Dakota. The largest single deposit of lignite known in the world is found in western North Dakota within the project area, and is an estimated 351 billion tons. North Dakota also contains an estimated 25 billion tons of economically mineable coal found within the lower Fort Union Group in western and central North Dakota. Mining within the project area dates back to the late 1800s, and by 1920 there were approximately 250 mines operating within North Dakota. These mines consisted of underground and surface strip mines. Eventually, surface strip mining became more profitable, and the last underground mine closed in 1966. Currently, there are six operations that mine approximately 32 million tons of coal annually within western North Dakota. Four of these operations mine coal to feed electric generating plants in North Dakota, and two operations mine lignite that is used in soil stabilization and as a drilling fluid additive (NDGS, 2011). Figure 3-19 illustrates coal deposits present within the project area.

Salts in the study area consist of three main types of deposits within the Williston Basin of North Dakota: halite, potash, and Glauber salt or mirabolite. Halite (sodium chloride or table salt) and potash occur in thick deposits in the deep subsurface in the western part of the basin, while Glauber salt occurs at or within 70 feet of the surface throughout North Dakota.

Sand and gravel deposits that are formed from glacial deposits contain sand and gravel as either outwash or as isolated lenses of sand and gravel within till. Beach ridges and deltas that formed along glacial lakes Agassiz and Souris are also important sources of sand and gravel. Pliocene to Holocene-age sand and gravel deposits also occur as terrace deposits, and less commonly as pediments, in the western part of the state (NDGS, 2012a).

Transmission lines are capable of co-existing with coal and other mineral resources. Only areas around structures would potentially be precluded from mining and extraction operations. Coal and other resources present between structures, if recoverable, could be mined with proper implementation of safety procedures. Additionally, during geotechnical studies, structure spotting, and easement negotiations, Basin Electric would coordinate with the property owner to develop the project to accommodate access to recoverable coal and other mineral resources to the extent possible.

Figure 3-19: Coal Deposits within the Study Area



Soils

Within the study area, the dominant soil order (the highest level of soil taxonomy) is Mollisols. Mollisols are developed under grassland vegetation, and tend to be classified as prime farmland. The soils in the area have a soil temperature regime reflecting their northern location, a soil moisture regime reflecting a moist climate, and mixed mineralogy (NRCS, 2012b). Soil orders are composed of numerous soil series (the lowest level of soil taxonomy). Series found throughout the study area are described in greater detail in Table 3-7.

Table 3-7: Soil Series within the Study Area

Soil Series	Description	Counties with Occurrences
Cabba	The Cabba series consists of shallow, well-drained soils that formed in residuum or colluvium derived from semiconsolidated, loamy sedimentary beds. These soils are on hills, escarpments, and sedimentary plains. Slopes are from 2 to 70 percent. Cabba soils have moderate permeability, and runoff is very low to high depending on slope. These soils are used as rangeland. The potential native vegetation occurring on these soils is mainly little bluestem, western wheatgrass, needle-and-thread, prairie sandreed, bluebunch wheatgrass, green needlegrass, plains muhly, forbs, and shrubs.	Williams, McKenzie, and Dunn
Fleak	The Fleak series consists of excessively drained, rapidly permeable soils that formed in calcareous soft sandstone. These soils are shallow to soft sandstone and occur on crests of hills and ridges, and on valley sides. Slope ranges from 2 to 70 percent. These soils are excessively drained, with slow or medium runoff and permeability is rapid. They are used mainly for range and pasture. The potential native vegetation is prairie sandreed, little bluestem, needle-and-thread, and other mid and short grasses.	McKenzie and Dunn
Golva	The Golva series consists of very deep and deep, well drained, moderately permeable soils that formed in silty alluvium. These soils occur on fans and terraces, and in shallow concave swales. Slope ranges from 0 to 15 percent. They are well drained and runoff is negligible to medium depending on slope. Permeability is moderate. These soils are used mainly for small grains; some row crops, hay, and pasture. The potential native vegetation is mid and short prairie grasses, such as blue grama, green needlegrass, western wheatgrass, and some forbs.	McKenzie and Dunn
Lakoa	The Lakoa series consists of deep and very deep, well drained soils formed in residuum weathered from interbedded sandstone and shale on uplands. Slopes range from 2 to 60 percent. Well-drained; saturated hydraulic conductivity is moderately high; medium to very high runoff, depending on slope. Lakoa soils are used for livestock grazing, wildlife habitat, recreation, and home site and urban development. Native vegetation is ponderosa pine, bur oak, with an understory of shrubs, sedges, little bluestem, and green needlegrass.	Dunn
Rhame	The Rhame series consists of moderately deep, well-drained, moderately rapidly permeable soils that formed in material weathered from soft sandstone. These soils are on uplands and have slopes ranging from 0 to 70 percent. Runoff is slow or medium. Permeability is moderately rapid. Small grains, mainly spring wheat are raised in a crop-summer fallow rotation. Grassland is used for hay and pasture. Native vegetation is medium and short prairie grasses as blue grama, needle-and-thread and upland sedges.	Dunn

Soil Series	Description	Counties with Occurrences
Rhoades	The Rhoades series consists of deep and very deep, well or moderately well-drained, very slowly permeable soils formed in stratified loamy and clayey materials derived from soft shale, siltstone or mudstone. These soils are in swales on uplands and terraces and have slope of 0 to 25 percent. Moderately well and well drained. Runoff is medium to very high depending on slope. Permeability is very slow. Mostly in grassland used for range and pasture. Native vegetation is short- and mid-prairie grasses such as western wheatgrass, blue grama, sedges and also some legumes, prickly pear and clubmoss.	Williams, McKenzie, Billings, Mercer, and Dunn
Sen	The Sen series consists of well-drained, moderately permeable soils that formed in calcareous siltstone or shale. They are moderately deep to soft bedrock. These soils are on upland plains and have slope of 0 to 25 percent. Runoff is slow, medium or rapid. Permeability is moderate. Soils are cropped to small grains in a crop-summer fallow rotation. Native vegetation is mid and short prairie grasses as green needlegrass, needle-and-thread, western wheatgrass, blue grama and a variety of forbs.	McKenzie
Shambo	The Shambo series consists of deep and very deep, well-drained, moderately permeable soils that formed in calcareous alluvium mainly from soft sandstone, mudstone and shale. These soils are on terraces and fans along stream valleys and are on fans on uplands. Slope ranges from 0 to 35 percent. Runoff is negligible to high depending on slope and surface texture. Permeability is moderate. Soils are cropped to small grains, hay and pasture. Some is irrigated and some are in native rangeland. Native vegetation was green needlegrass, needle-and-thread, western wheatgrass, prairie junegrass, blue grama and a variety of forbs.	McKenzie
Straw	The Straw series consists of very deep, moderately well and well drained soils that formed in alluvium. These soils are on floodplains, stream terraces and drainage ways. Slopes are 0 to 8 percent. Moderately well and well drained. Moderate permeability. Runoff is negligible to medium depending on slope. Straw soils are used mainly for dry land cropland, irrigated cropland, and range. Potential native vegetation is mainly rough fescue, western wheatgrass, needle-and-thread, little bluestem, bluebunch wheatgrass, green needlegrass, forbs, and shrubs.	Mountrail and Dunn
Toby	The Toby series consists of very deep, well drained, moderately rapidly permeable soils that formed in alluvium or eolian deposits. These soils are on fans, terraces, hills and ridges and have slopes of 0 to 15 percent. Well drained. Runoff is slow or medium. Permeability is moderately rapid. These soils are used for crops, hay, and pasture. Native grasses include blue grama, needle-and-thread, prairie sandreed, and western wheatgrass.	McKenzie and Dunn
Trembles	The Trembles series are very deep, well and moderately well drained soils formed in alluvium. They are on floodplains, bottomlands and low terraces. Slopes range from 0 to 4 percent. Well and moderately well drained; slow and very slow runoff; moderately rapid permeability. Trembles soils are used mainly for irrigated cropland and for rangeland, The native vegetation is needle-and-tread, basin wildrye, western wheatgrass, big sagebrush, and scattered cottonwood trees.	McKenzie
Vebar	The Vebar series consists of well drained, moderately deep, moderately rapidly permeable soils that formed in residuum weathered from soft calcareous sandstone. These soils are on uplands and have slope ranging from 0 to 65 percent. Well drained. Runoff is negligible to medium depending on slope. Permeability is moderately rapid above paralithic beds. Soils are cropped to corn and small grains. Some is used for hay or pasture. Native grasses are needle-and-thread and prairie sandreed.	McKenzie, Billings, and Dunn

Soil Series	Description	Counties with Occurrences
Williams	The Williams series consists of very deep, well drained, moderately slow or slowly permeable soils formed in calcareous glacial till. These soils are on glacial till plains and moraines and have slope of 0 to 35 percent. Well drained. Runoff is negligible to high depending on slope and surface texture. Permeability is moderately slow or slow. Cultivated areas are used for growing small grains, flax, corn, hay or pasture. Native vegetation is western wheatgrass, needle-and-thread, blue grama, green needlegrass and prairie junegrass.	Mountrail, Mercer, and Dunn
Wilton	The Wilton series consists of very deep, well drained soils that formed in a silty loess mantle overlying till. Permeability is moderate in the silty loess mantle and moderately slow in the till. These soils are on uplands and have slopes of 0 to 9 percent. Well drained. Slow or medium runoff. Permeability is moderate in the silty loess mantle and moderately slow in the underlying till. Soils are mainly cropped to small grains, flax and corn. Some areas are used for hay and pasture. Native vegetation was western wheatgrass, green needlegrass, bearded wheatgrass, prairie junegrass, needle-and-thread and a variety of forbs.	McKenzie and Mercer
Zahl	The Zahl series consists of very deep, well drained, moderately slow or slowly permeable soils that formed in calcareous glacial till. These soils are on glacial till plains, moraines and valley side slopes and have slopes of 1 to 60 percent. Well drained. Runoff is very low to high depending on slope and surface texture. Permeability is moderately slow or slow. Used mainly for range and pasture. Some areas are cropped to small grains. Native vegetation is little bluestem, western wheatgrass and needle-and-thread.	Mountrail, McKenzie, and Mercer

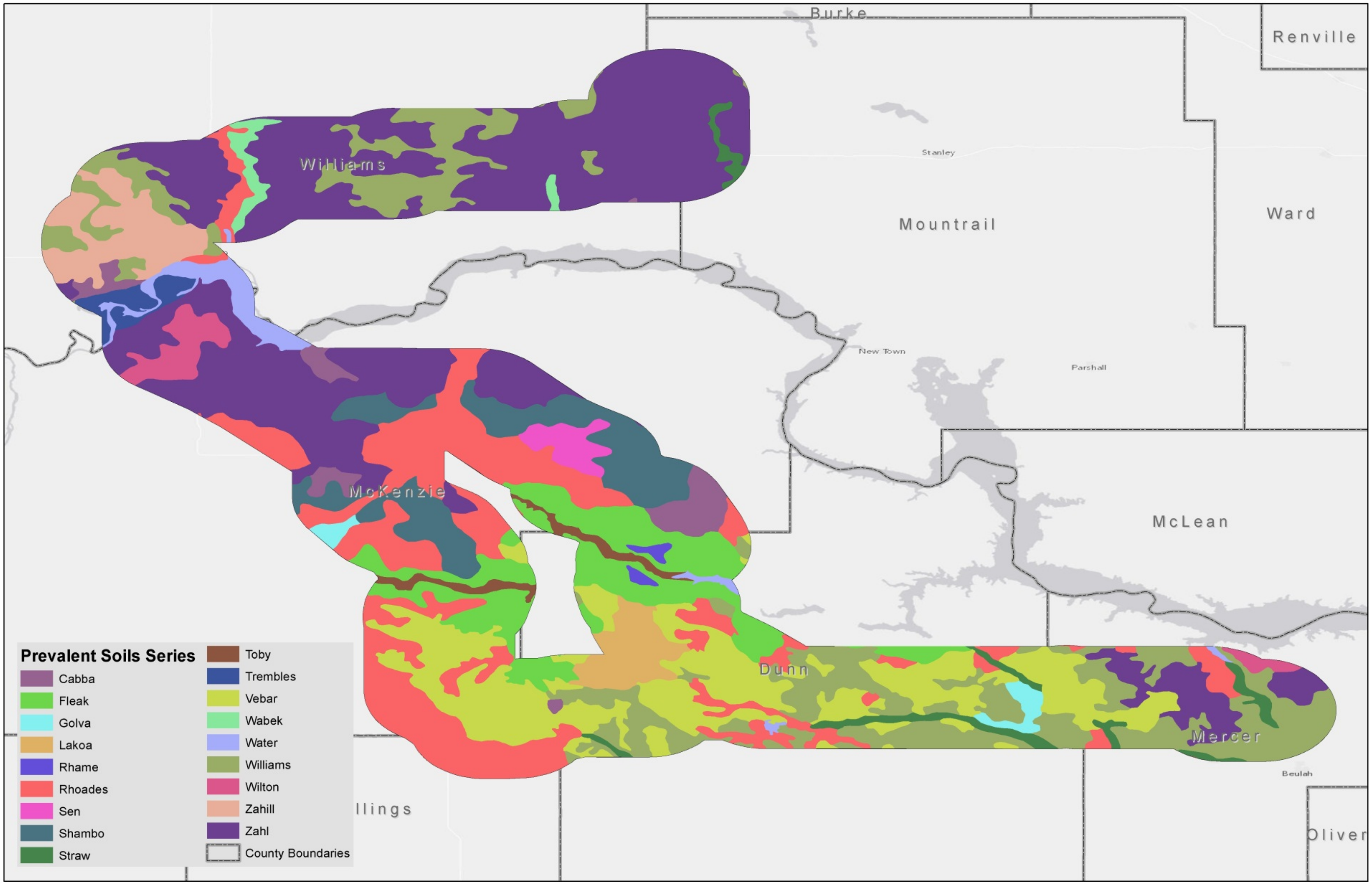
Source: NRCS, 2011e, 2012c

A generalized map of the most prevalent soils series occurring in the study area is provided in Figure 3-20.

<u>Prime Farmland Soils</u>

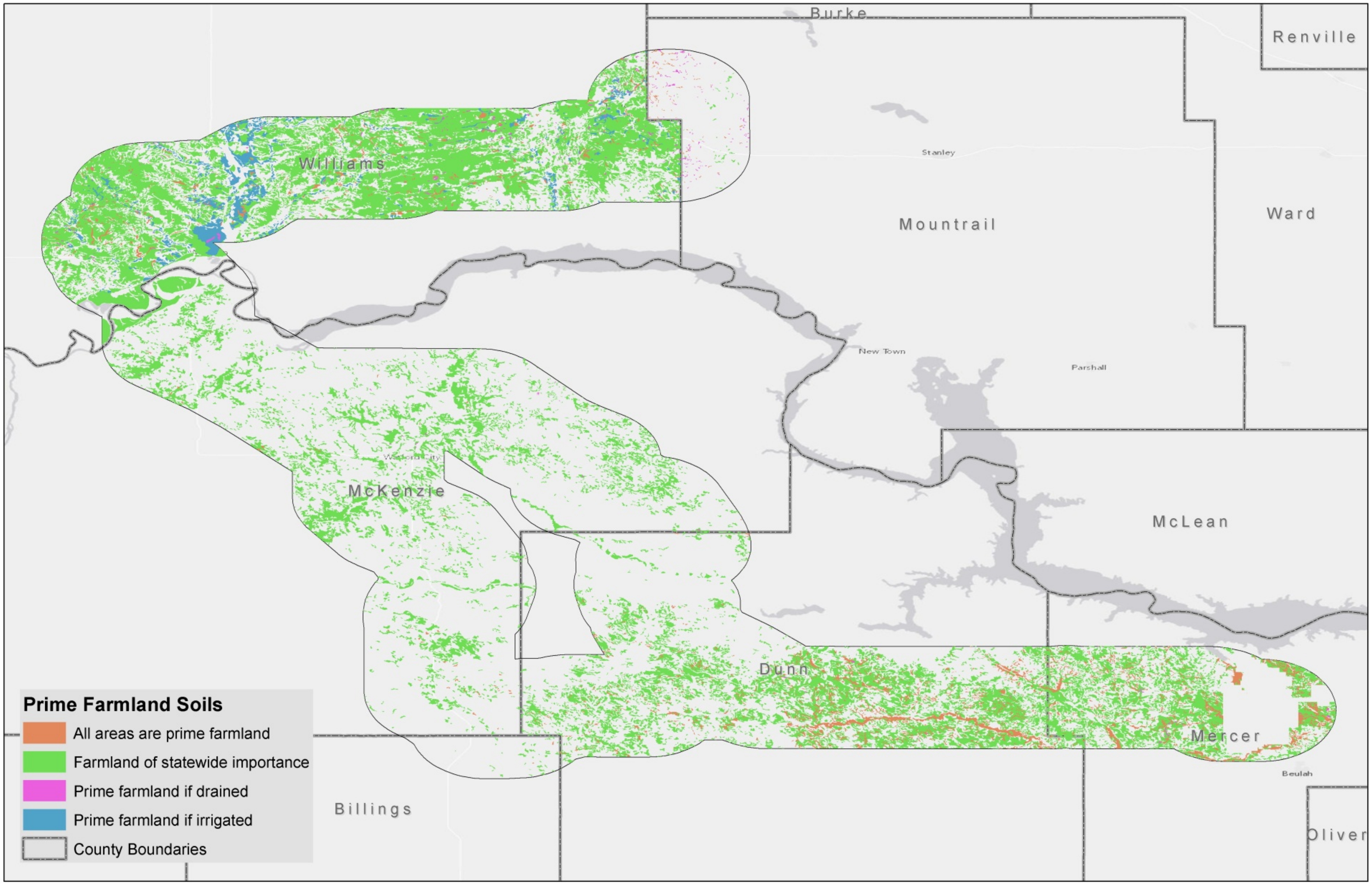
Prime farmland soils, as defined by the USDA, are soils that have been determined to have the best combination of physical and chemical properties for agricultural production (NRCS, 2011e). In addition to prime farmland, land may be classified as prime farmland if it is drained, irrigated, or of statewide importance, as determined by the state. Figure 3-21 visually illustrates important farmland soils found within the study area, while Table 3-8 shows a breakdown of the total important farmland acres by classification, by county within the study area.

Figure 3-20: Prevalent Soils Series Found within the Macro-corridors



Source: NRCS, 2012c

Figure 3-21: Occurrences of Prime Farmland Soils within the Macro-corridors



Source: NRCS, 2012a

Table 3-8: Prime and Important Farmland by County within the Study Area

County	Farmland Classification	Acres
Billings	All areas are prime farmland	53
Billings	Farmland of statewide importance	798
Billings County Total		**851**
Dunn	All areas are prime farmland	19,706
Dunn	Farmland of statewide importance	115,824
Dunn County Total		**135,530**
McKenzie	All areas are prime farmland	708
McKenzie	Farmland of statewide importance	106,804
McKenzie	Prime farmland if drained	162
McKenzie County Total		**107,674**
Mercer	All areas are prime farmland	12,472
Mercer	Farmland of statewide importance	106,804
Mercer	Prime farmland if drained	162
Mercer County Total		**67,884**
Montrail	All areas are prime farmland	622
Montrail	Farmland of statewide importance	6,543
Montrail	Prime farmland if drained	909
Montrail	Prime farmland if irrigated	43
Mountrail County Total		**8,118**
Williams	All areas are prime farmland	8,517
Williams	Farmland of statewide importance	230,837
Williams	Prime farmland if drained	2,598
Williams	Prime farmland if irrigated	24,902
Williams County Total		**266,854**

Source: NRCS, 2012a

3.3.2 Direct and Indirect Effects

This section discusses potential impacts on geology and soils and prime farmlands within the region as a direct result of the construction and operation of the project, including the no-action alternative. Definitions for duration and intensity of potential impacts to geology and soils and prime farmlands identified for this project are described in Table 3-1.

Potential impacts on soils from activities proposed under Alternatives C, D, and E would include soil compaction and rutting leading to accelerated soil erosion and the introduction of noxious weeds on the soil surface. Construction activities such as vegetation clearing, excavating, grading, topsoil segregation, and backfilling may also increase erosion potential by destabilizing the soil surface. Impacts on prime farmlands would occur from the loss of potentially productive prime farmland soil acreage in the project area resulting from the above-described effects.

The area of analysis is composed of the 150-foot-wide ROW for each 345-kV line component and the substation areas. Impacts on geology and landforms from construction and operation of alternatives within and adjacent to this corridor are presented here and described in detail.

No-action Alternative

Under the no-action alternative the project would not be constructed. Geologic features and landforms would remain undisturbed. Because no landscape changes would occur as the result of construction, surface geology would be unaffected. The underlying bedrock geology would similarly remain undisturbed given that no ground penetrating activities would occur under this alternative. Soils would remain undisturbed. Because no construction-related changes would occur, soil structure and underlying substrate would remain intact, and the suitability of prime farmland soils for agricultural uses would be unaffected. As a consequence, there would be no impacts on geology and soils resulting from the no-action alternative.

Alternative C

<u>Geology and Landforms</u>

Direct impacts resulting from the construction of Alternative C would consist of the displacement of soil and rock during construction of structure foundations. Borings for structure foundations would extend approximately 25 to 30 feet below the surface and would be approximately 8 feet in diameter, resulting in a typical volume of displaced soil and rock of approximately 1,500 cubic feet per structure location. With approximately 1,625 structures used for the construction of the route, a total of approximately 2.4 million cubic feet of displaced soil and/or rock would be anticipated. This displaced soil and rock would be used for backfilling around structure foundations with excess material removed from the site to locations directed by landowner or disposed of at another location. The use of heavy duty vehicles and earth moving equipment required for structure foundations and structure placement would result in short-term minor impacts on local surface geology as a result of compaction and the potential for localized rill erosion near unimproved roadbeds and on sensitive landscapes. In particular, in badland areas where vegetation is removed within the ROW along steep slopes and rugged terrain, construction-related impacts from erosion would accrue to these landscapes. Alternative C would cross terrain with slopes greater than 10 percent. In areas where steep slopes and highly erodible soils occur, an increased potential for landslides may result from these conditions. These effects are discussed below.

Alternative C would incorporate approximately 30.6 acres within the ROW where landslides have occurred previously. The potential for landslide occurrence during project implementation is elevated in certain areas along the length of the route, such as in northwestern Dunn County and southeastern McKenzie County. Of particular note, badland areas along the transmission line route, consisting of steep sparsely-vegetated terrain, pose a greater likelihood of landslide occurrences than other, more gently-sloped areas along the route. Landslide events are more likely to occur during heavy precipitation.

Generally, project construction would require little disturbance to surface soil and would neither be large enough nor deep enough to have any type of impacts on geologic formations throughout the project area. Although linear in form and design, the installation of aerial lines would result in disturbances only at intervals along the path of the transmission corridor (such as for the placement of towers) or predetermined locations where the construction or installation of facilities was required (such as for the construction of substations). Consequently, impacts on geology would be limited to the sites selected for the erection of structures. At these locations, geologic impacts would be limited to minimal disturbances of subsurface rock during drilling and use of augers to prepare foundation holes. Potential impacts resulting from this activity include: displacement of soil and rock during construction activities; alteration of geologic features due to earth-moving activities during construction; increased likelihood of landslides caused by construction activities in areas of steep terrain and unstable soils; and an increased potential for erosion occurring to adjacent lands from either vehicle disturbances associated with construction activities or accelerated runoff resulting from the creation of impermeable surfaces.

As a main feature of implementation, areas with high landslide susceptibility would not have structures placed within them but would instead be spanned by the transmission line, thus avoiding the potential for landslides. Additional care would be taken to minimize disturbance in these areas both to reduce landslide potential and protect construction workers and equipment from slides and falls. In some specific areas, Basin Electric may use helicopter-aided construction in order to minimize ground disturbance in badland areas. This would reduce the need for grading and excavation typically necessary to develop vehicle access to structure locations. As a result of incorporating these mitigation measures, impacts on geology and landforms would be further reduced below the already expected less-than-significant levels.

As an overall result of the above-described short-term and low intensity disturbances, the impacts of Alternative C on geology and landforms would be minor.

Approximately 73 acres of soils would be permanently impacted to accommodate the Judson, Tande, Red, White, and Blue substations. Increased runoff potentially resulting from the additional acreage of impermeable ground cover could result in localized erosion. However, impacts on soils at these sites, while permanent, would be localized and not extend beyond the area of impact.

Impacts on geologic features, resources, or surface landforms from the construction and operation of the Judson, Tande, Red, White, and Blue substations are anticipated to be negligible. The substation sites are located primarily on terrain with little slope, and impacts on geological resources related to construction and operation of these substations are not anticipated. Some surface grading, subsurface excavation, and trenching would be necessary, but would be relatively shallow and not expected to encounter significant bedrock.

Soils

Under Alternative C, construction activities along the ROW and at the substation locations would cause disturbance to soils. Impacts would accrue from construction activities such as vegetation clearing, excavating, grading, topsoil segregation, vehicle traffic, and back-filling. These activities may increase erosion potential by destabilizing the soil surface. Additionally, soil compaction and rutting can result from the movement of heavy construction vehicles along the ROW and outside the permanent ROW. However, the degree of compaction and rutting would depend on the moisture content and texture of the soil, weight of equipment, and frequency of movement over the area.

Approximately 4,957 total acres of surface soil would be incorporated into the ROW for the transmission route. While the majority of the acreage within the ROW would not be disturbed, permanent impacts on soils would occur at locations where the approximately 1,625 transmission structures used for the transmission line would be placed. The total permanent disturbance area under Alternative C would be approximately 1.4 acres. The removal of woodland areas would also occur within the ROW. This tree clearing activity would result in exposure of soils to erosional forces. Additionally, some portions of the ROW are located along areas of steep slopes and incorporate land that is susceptible to landslides. The development of construction access trails would also result in short-term adverse impacts on soils from compaction. Disturbances in these areas are anticipated to be minimal, most access to the ROW would be provided at locations where the ROW crosses existing roads or by using the ROW itself for access along the transmission line.

Overall, impacts on soils from the construction of Alternative C would be low and primarily short term with only minimal long-term impacts.

Approximately 73 acres of soils would be permanently impacted to accommodate the Judson, Tande, Red, White, and Blue 345-kV substations. Increased runoff potential resulting from the additional acreage of impermeable ground cover could result in localized erosion. However, impacts on soils at these sites, while permanent, would be localized and not extend beyond the area of impact.

Prime Farmland

Construction activities associated with the transmission line for Alternative C would have short-term effects on prime farmland soils in portions of the project ROW that would be temporarily closed throughout the duration of construction activity. The temporary loss of these lands would be reversed when construction is completed and these soils would be returned to production. Long-term (permanent) impacts on prime and important farmland soils would also occur where transmission line structures are placed within the ROW. However, these losses would constitute a small fraction of total lands within the project ROW.

The transmission line ROW would cross about 88 acres of prime farmland, 1,604 acres of farmland of statewide importance, and 62 acres of prime farmland if drained or irrigated (see Table 3-9). Together, these categories constitute 35 percent of the total lands in the ROW.

Table 3-9: Acres of Prime Farmland within 150-foot Right-of-way

Farmland Classification	Alternative C (acres)	Expected Permanent Disturbance (acres)
Not prime farmland	3,203	32
Prime farmland	88	0.88
Farmland of statewide importance	1,604	16
Prime farmland if drained	4	0.04
Prime farmland if irrigated	58	0.58
TOTAL	4,957	49.5

Because the amount of expected permanent disturbance occurring from the placement of structures within the ROW constitutes less than 1 percent of the total land within the ROW, it is anticipated that a minimal amount of prime farmland would be permanently taken out of production due to transmission line structures placement within the ROW. As a result, adverse impacts on prime farmland soils under Alternative C would be minor. Alternatively, areas cleared of trees within the ROW on prime farmland could be converted to agricultural use. The reduction in prime farmland availability would represent a small fraction of 1 percent of the 42,077 acres of prime farmland within the larger five county project area (Williams, Mountrail, Mercer, McKenzie, and Dunn counties). This loss is not expected to be significant.

For construction of the Judson, Tande, Red, and White substations, approximately 12 acres of prime farmland at each location would be permanently taken out of production. In addition to the acres of prime farmland taken out of production for the substations, it is possible that up to 25 acres of prime farmland would be permanently impacted for construction of the Blue Substation. Because the exact location of the substations has not been determined, an accurate assessment of the acreage of potentially-impacted prime farmland within the 25-acre Blue Substation and each of the 12-acre Red, White, Judson, and Tande substations sites is not known. Conservative estimates assume that all 73 acres of these substation sites are located on prime farmland soils. In addition, there are approximately 90 acres of prime farmland within the transmission line ROW. Structures would permanently remove soils over 1.4 acres, of which only a portion would be classified as prime farmland. This loss is not expected to be significant.

Alternative D

Geology and Landforms

Potential impacts associated with Alternative D on geology and landforms within the project area are anticipated to be similar to those for Alternative C. With approximately 1,465 structures used for the construction of Alternative D, the total area of permanent surface disturbance would be approximately 1.3 acres. Approximately 2.2 million cubic feet of displaced soil and/or rock would be anticipated to be removed for structure construction, with some of this material disposed of off-site. Alternative D would incorporate approximately 15.6 acres within the ROW where landslides have occurred previously, and traverse over approximately 6,334 feet of terrain (21.6 acres within the ROW) with a slope greater than 10 percent. In areas where steep slopes and highly erodible soils occur, an increased potential for landslides may result from these conditions. However, mitigation measures described for Alternative C would also be incorporated into the project design and implementation under Alternative D. As a result, the impacts of Alternative D on geology and landforms would be minor.

For reasons similar to those described for Alternative C, impacts on geologic features, resources, or surface landforms resulting from the construction and operation of the Judson, Tande, White, and Blue substations are anticipated to be negligible. Impacts associated with the construction and operations of the Killdeer South switchyard are also expected to be negligible.

Soils

Impacts on soils under Alternative D would be similar to those described for Alternative C, and would include soil disturbance and the potential for erosion resulting from construction activities and soil removal for placement of transmission line and substation structures. Alternative D would require approximately 1,465 structures that would permanently occupy approximately 1.3 acres within the ROW. Approximately 120 acres of woodland vegetation clearing would occur within the ROW for Alternative D, resulting in exposure of soils to erosional forces. The ROW would also incorporate approximately 16 acres of land that has experienced landslides in the past, indicating the increased potential for erosion in these areas. The total acreage of ROW required for Alternative D is slightly less than Alternative C; therefore, soil impacts would occur over a slightly smaller area. Overall, however, adverse impacts on soils under Alternative D would be insignificant.

Approximately 85 acres of soils would be permanently impacted to accommodate the Judson, Tande, Red, White, and Blue substations and Killdeer South switchyard. Increased runoff potential resulting from the additional acreage of impermeable ground cover could result in localized erosion. However, impacts on soils at these sites, while permanent, would be localized and not extend beyond the area of impact.

Prime Farmland

Impacts on prime farmland soils would be similar for Alternatives C and D, with short-term minor impacts during construction throughout the ROW and permanent impacts at the transmission line structure locations. While the total amount of prime farmland and farmland of statewide importance within the ROW is approximately 1,737 acres, it is anticipated that the placement of transmission line structures within the ROW of Alternative D would result in approximately 1.3 acres of prime or important farmland being permanently removed from production, which is comparable to that of Alternative C due to the increased overall length of Alternative D. Overall, adverse impacts on prime farmland soils within the ROW under Alternative D would be minor.

For construction of the Judson and Tande substations, approximately 12 acres of prime farmland at each location would be permanently taken out of production. In addition to the acres, it is possible that up to 49 acres of prime farmland would be permanently impacted for construction of the Red, White, and Blue substations and the Killdeer South switchyard. Because the exact location of the substations and switchyard has not been determined, an accurate assessment of the acreage of potentially-impacted prime farmland within the 25-acre Blue Substation and each of the 12-acre Red and White substations sites is not known. Conservative estimates assume that all 85 acres of these substation sites are located on prime farmland soils. Additionally, there are approximately 90 acres of prime farmland within the transmission line ROW. Structures would permanently remove soils over 1.4 acres, of which only a portion would be classified as prime farmland. This loss is not expected to be significant.

Alternative E

Impacts on geology and soils occurring under Alternative E would be similar to those described for Alternative D because the alignment would traverse the same terrain under both alternatives. However, the amount of disturbance under Alternative E would be larger because of the construction of an additional 345-kV line north of Killdeer for 63 miles between the Blue and Red substations, which would result in two parallel lines located within a wider 300-foot ROW.

Geology and Landforms

Alternative E would result in the removal of 2.7 million cubic feet of soils, compared to 2.2 and 2.4 million cubic feet under Alternatives D and C, respectively. Impacts on soils under Alternative E would be slightly greater than those described for Alternatives C and D, with 1.6 acres of surface soils permanently removed as a result of the placement of approximately 1,832 structures. Alternative E would incorporate approximately 24.4 acres within the ROW where landslides have occurred previously, and traverse approximately 12,507 feet of terrain (42.6 acres within the ROW) with a slope greater than 10 percent. In areas where steep slopes and highly erodible soils occur, an increased potential for landslides may result from these conditions. However, mitigation measures, similar to those described for Alternative C would also be incorporated into the project design and implementation for Alternative E. As a result, the impacts of Alternative E on geology and landforms would be minor.

For reasons similar to those described for Alternative C, impacts on geologic features, resources, or surface landforms resulting from the construction and operation of the Judson, Tande, Red, White, and Blue substations are anticipated to be negligible. Impacts associated with the construction and operations of the Killdeer South switchyard are expected to be negligible.

Soils

Impacts on soils under Alternative E would be similar to those described for Alternatives C and D, and would include soil disturbance and the potential for erosion resulting from construction activities and soil removal for placement of transmission line and substation/switchyard structures. Approximately 189 acres of woodland vegetation clearing would occur within the ROW for Alternative E, resulting in damage to soil structure and exposure of soils to erosional forces. For 63 miles north of Killdeer, between the Blue and Red substations, the total acreage of ROW required for Alternative E would be larger than either Alternatives C or D; therefore, soil impacts would occur over a larger area. Overall, however, adverse impacts on soils under Alternative E would remain minor for the majority of the route.

Approximately 85 acres of soils would be permanently impacted to accommodate the Killdeer South switchyard and the Judson, Tande, Red, White, and Blue substations. Increased runoff potential resulting from the additional acreage of impermeable ground cover could result in localized erosion. However, impacts on soils at these sites, while permanent, would be localized and not extend beyond the area of impact.

Prime Farmland

Impacts on prime farmland soils would be similar among all alternatives, with short-term minor impacts during construction throughout the ROW and permanent impacts at the transmission line structure locations. While the total amount of prime farmland and farmland of statewide importance within the ROW is approximately 1,900 acres, it is anticipated that the placement of transmission line structures within the ROW of Alternative E would result in approximately 1.6 acres of prime or important farmland being permanently removed. Overall, adverse impacts on prime farmland soils within the ROW under Alternative E would be minor.

Prime farmland for Alternative E would be the same as for Alternative D. Up to approximately 85 acres of prime farmland could be permanently taken out of production. This loss is not expected to be significant.

3.4 WATER RESOURCES

3.4.1 Affected Environment

Hydrologic features including lakes, rivers, streams, wetlands, and floodplains perform important functions within a landscape, including attenuating floods, recharging groundwater, protecting water quality, and producing wildlife habitat. This section provides a summary of groundwater, surface water, water quality, and floodplains present in the project area.

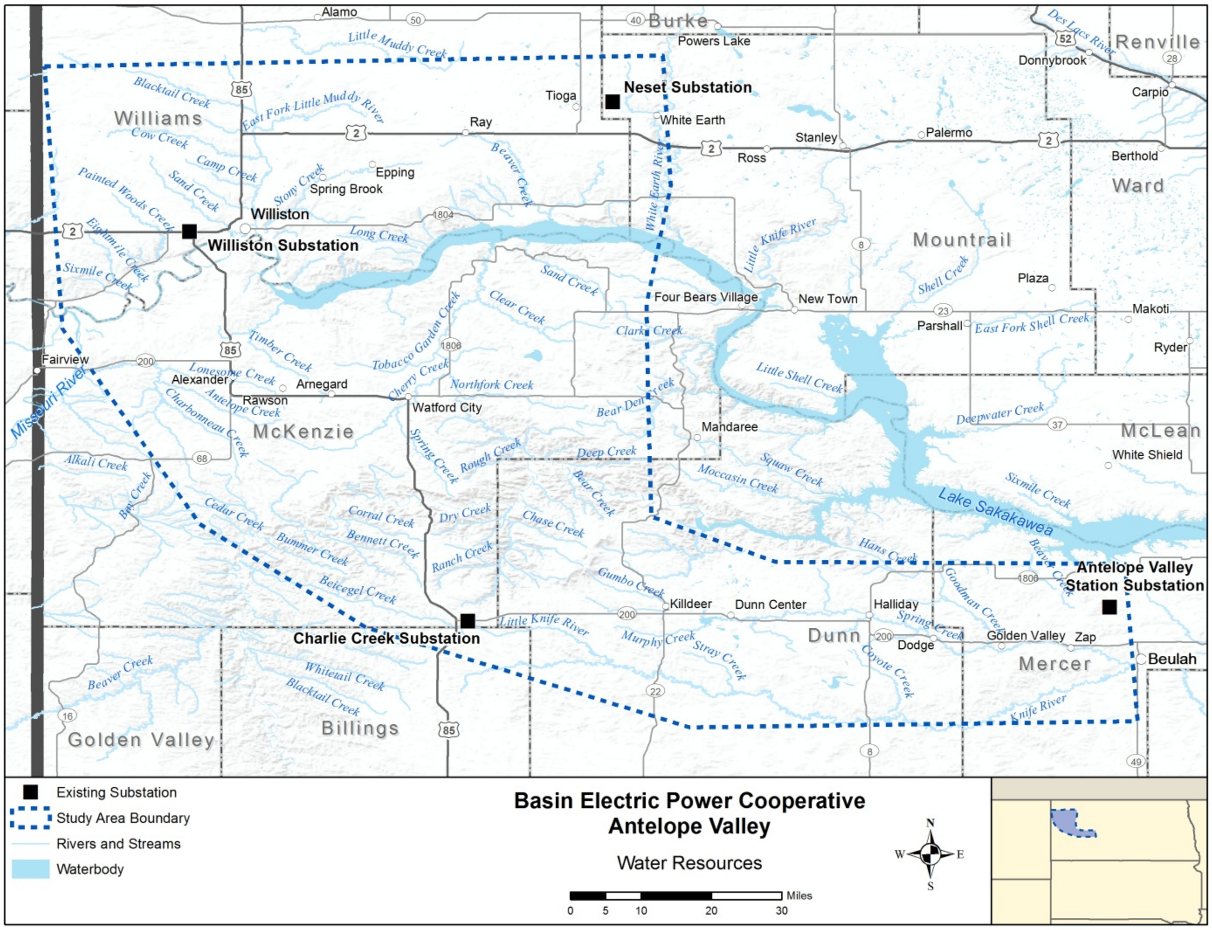
Regional Setting

The area encompassing the project contains several major surface water and groundwater features. Groundwater within the project area includes Paleozoic aquifers, lower and upper Cretaceous aquifers, lower Tertiary aquifers, and unconsolidated-deposit aquifers. Surface waters located within and adjacent to the project area include the Knife River, Spring Creek, Little Missouri River, Lake Sakakawea (Upper Missouri River), and Little Muddy River. Floodplains occur throughout the project area in areas bordering lakes, rivers and streams. Isolated wetlands, smaller creeks and tributaries, and unnamed intermittent and ephemeral streams also occur within the project area. See Figure 3-22. Wetlands are discussed further in the biological resources section.

Groundwater

Groundwater is water located below the earth's surface that accumulates in soil pore space and in fractures of rock formations. An aquifer is an area that is able to yield a usable quantity of groundwater. Deep Paleozoic aquifers extend throughout the project area, but generally contain highly-mineralized water due to their depth. Cretaceous aquifers are found throughout the project area and provide a valuable source of water for farms, ranches, and communities. Lower Tertiary aquifers are found closer to the surface, are composed primarily of sandstone and lignite, and also provide a source of water for various uses (Whitehead, 1996). Aquifers composed of unconsolidated rocks are generally productive, but are smaller and more scattered in nature throughout the project area, occurring primarily around river valleys and lakes.

Figure 3-22: Water Resources in the Project Area

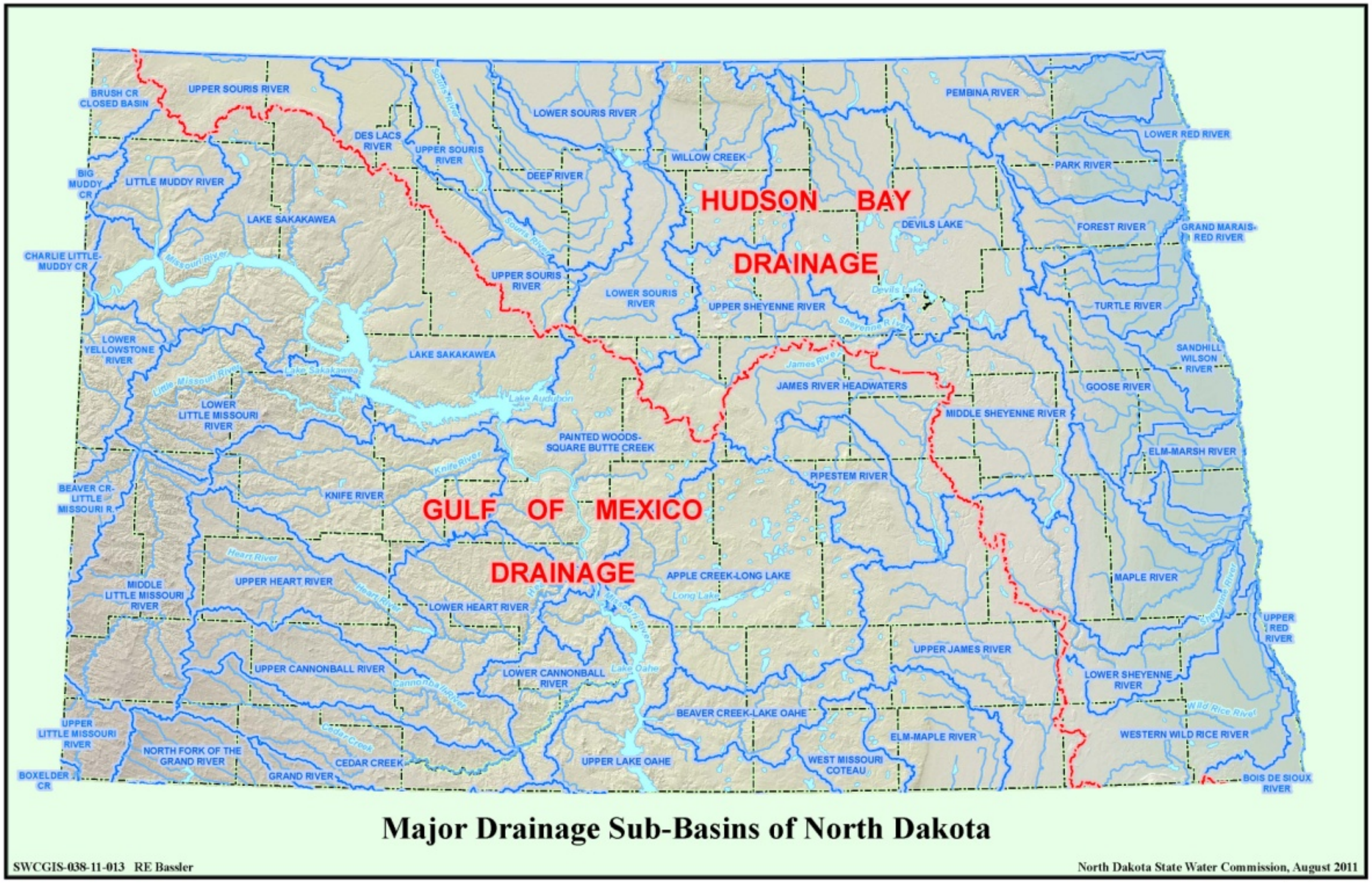


Surface Water

Lake Sakakawea is a major water feature in the area, and was formed by the construction of the Garrison Dam on the Missouri River near the community of Pick City. Lake Sakakawea spans all of the affected counties within the project area, except Billings, serving as the county boundary in many locations. Lake Sakakawea has a catchment area of approximately 122,500 square miles and generally flows from northwest to southeast. The proposed project crosses the Missouri River near the upper end of the lake, southwest of the town of Williston. Major drainage sub-basins within the project area are depicted in Figure 3-23, and are discussed in further detail below.

The Upper Missouri/Lake Sakakawea Basin drains the extreme northern portions of Mercer and Dunn counties within the project area, the northern half of McKenzie County, and all of the portions of Williams and Mountrail counties included within the project area.

Figure 3-23: Major Drainage Sub-basins within North Dakota Area



The Knife River Basin drains a majority of Mercer County and the southern portion of Dunn County within the project area. The Knife River flows generally from west to east and empties into the Missouri River below Lake Sakakawea. Spring Creek is a tributary of the Knife River, that travels in a generally west to east direction before joining the Knife River near the town of Zap. Both the Knife River and Spring Creek are located just outside the project area to the south.

The Little Missouri River Basin drains the central portion of Dunn County within the project area, and also the southern portion of McKenzie County. The Little Missouri River flows generally south to north and then turns easterly across the project area. Alternatives C, D, and E would cross the Little Missouri River. Alternative C would cross in the eastern portion of McKenzie County just east of TRNP and approximately 20 miles northwest of the community of Killdeer within the U.S. Highway 85 corridor. Alternatives D and E would both cross at a location north of Killdeer, approximately 5 miles west of ND State Highway 22, with Alternative E crossing twice at this area. The Little Missouri River flows into Lake Sakakawea just after passing through the project area.

The Little Muddy River flows from north to south through Williams County, and empties into Lake Sakakawea on the east side of Williston (USGS, 2009). The proposed project crosses the Little Muddy River approximately 10 miles north of Williston.

USACE has regulatory jurisdiction over waters of the United States including many lakes, rivers, streams, and wetlands pursuant to Section 404 of the Clean Water Act (CWA), and jurisdiction over Navigable Waters of the United States pursuant to Section 10 of the 1899 Rivers and Harbors Act. The placement of transmission line pole structures, land clearing that involves soil disturbance, or placement of construction mats may be considered a discharge of fill material that would require a permit from USACE pursuant to CWA Section 404. Receipt of a Section 404 permit and adherence to the terms and conditions of the permit, including any associated compensatory mitigation and BMPs to reduce sedimentation and erosion control, would demonstrate the project's compliance with the CWA. Basin Electric would obtain a CWA Section 404 Nationwide Permit (NWP) Number 12 for construction of utilities that may affect waters of the United States, including wetlands. Field inspections of the project would evaluate and verify compliance with permits and the CWA. In addition, the placement of a transmission line over a navigable waterbody would require a permit pursuant to Section 10.

Transmission lines that cross Navigable Waters of the United States, as defined by Section 10 of the 1899 Rivers and Harbors Act, must maintain a minimum height requirement above that required for bridges. For a 345-kV transmission line, the minimum height requirement is 30 feet above required bridge height for a new fixed bridge or existing bridge in the vicinity, as stated in 33 CFR 322.5. The Missouri River is the only waterway classified as navigable and subject to Section 10 permitting. A Section 10 permit would be required for each action alternative because the project would cross the Missouri River.

Basin Electric is currently seeking NWP12 and Section 10 permits from USACE. USACE has indicated it will use this FEIS and the Record of Decision to complete its NEPA review prior to issuing these permits.

Water Quality

NDDOH has primacy of implementation of Section 401of the CWA, and USEPA has oversight and is ultimately responsible for monitoring and enforcing water quality standards. North Dakota's Century Code describes Standards of Quality for Waters of the State (NDDOH, 2012). Pursuant to these rules, NDDOH notes that it is state and public policy to develop a classification system for waters of the state, provide standards of water quality for waters of the state, and protect existing and beneficial uses of waters of the state. The state of North Dakota accomplishes this through compliance with CWA Sections 305(b) (producing a biannual Water Quality Assessment Report), and 303(d) (listing of waters needing Total Maximum Daily Load [TMDL] limits).

As required under Section 303(d) of the CWA, NDDOH has identified and created a list of impaired waterbodies that require the development of TMDLs. A TMDL is the amount of pollution a waterbody can receive and still maintain water quality standards established by USEPA. As required by Section 305(b) of the CWA, NDDOH produced the 2012 Integrated Report that states that 83 percent (4,799 miles) of rivers and streams assessed fully support the beneficial use designated as aquatic life. Of these streams, slightly more than 50 percent (2,434 miles), including streams within the project area, are under threat of being unable to support their designated use if water quality trends continue. The primary causes of impairment were siltation/sedimentation and stream habitat loss or degradation. Other forms of impairment include trace element contamination, flow alteration, and oxygen depletion due to excess nutrient inputs (NDDOH, 2012).

The main cause of impairment within the three river basins draining the project area is fecal coliform, resulting mostly from livestock operations and grazing near riparian areas. Rivers and lakes within the Knife, Little Missouri, and Upper Missouri/Lake Sakakawea basins, which are impaired, include portions of the Knife River, Little Missouri River, and Lake Sakakawea (USEPA, 2011).

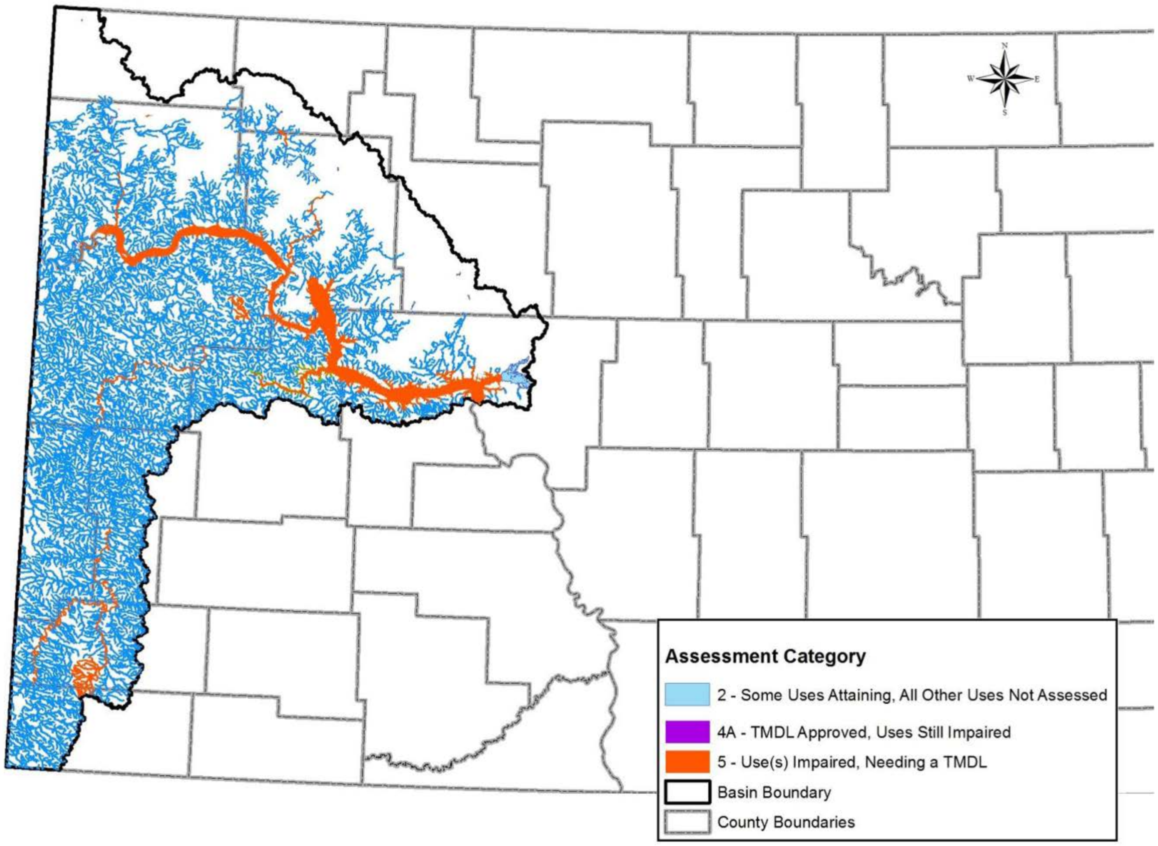
According to guidance provided by USEPA, states should report water quality based on five assessment categories outlined in Table 3-10. All waterbodies designated as category 5 must provide TMDL information (the amount of pollution a waterbody can receive while maintaining water quality standards). Within the Missouri River Basin and within the project area, there are several category 5 waterbodies that require TMDLs. Lake Sakakawea, which has the designated use of fish consumption, is impaired with methylmercury. The Little Knife River from Stanley Reservoir, downstream to Lake Sakakawea; the Little Muddy River from its confluence with East Fork Little Muddy River, downstream to Lake Sakakawea; and the Little Missouri River from its confluence with Little Beaver Creek downstream to its confluence with Deep Creek are all designated for recreational uses, and are all impaired with fecal coliforms. The Little Missouri River from its confluence with Beaver Creek downstream to U.S. Highway 85; the Little Missouri River from U.S. Highway 85 downstream to its confluence with Cherry Creek; the Knife River from its confluence with Antelope Creek downstream to its confluence with the Missouri River; the Knife River from its confluence with Spring Creek downstream to its confluence with Antelope Creek; the Knife River from its confluence with Coyote Creek downstream to its confluence with Spring Creek; and the Knife River from its confluence with Branch Knife River downstream to its confluence with Coyote Creek are also designated for recreational use and are all impaired with *Escherichia coli*. Figures 3-24 and 3-25 provide a graphical depiction of Section 303(d) Listed Waters needing TMDLs.

Table 3-10: EPA Water Quality Categories

Category	Description
1	All designated uses are met.
2	Some designated uses are met, but there are insufficient data to determine if remaining designated uses are met.
3	There are insufficient data to determine whether any designated uses are met.
4	Water is impaired or threatened, but a TMDL is not needed for one of three reasons: (a) a TMDL already has been approved for all pollutants causing impairment; (b) the state can demonstrate that "other pollutant control requirements required by local, state or federal authority" are expected to address all waterbody-pollutant combinations and attain all water quality standards in a reasonable period of time; or (c) the impairment or threat is not due to a pollutant.
5	The waterbody is impaired or threatened for at least one designated use, and a TMDL is needed.

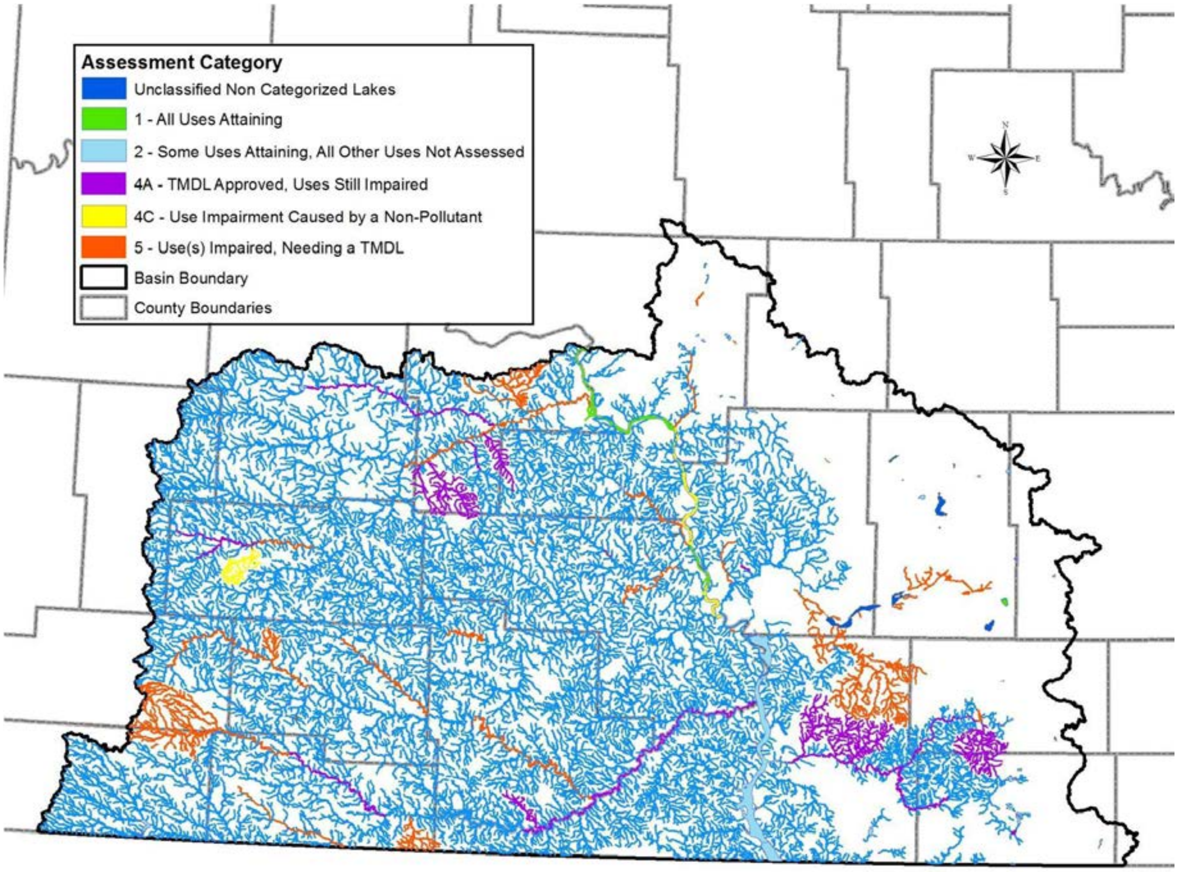
Source: NDDOH, 2012

Figure 3-24: 2012 Section 303(d) Listed Waters Requiring TMDLs (Category 5) in the Lake Sakakawea/Missouri River Basin



Source: NDDOH, 2012

Figure 3-25: 2012 Section 303(d) Listed Waters RequiringTMDLs (Category 5) in the Lake Oahe/Missouri River Basin



Source: NDDOH, 2012

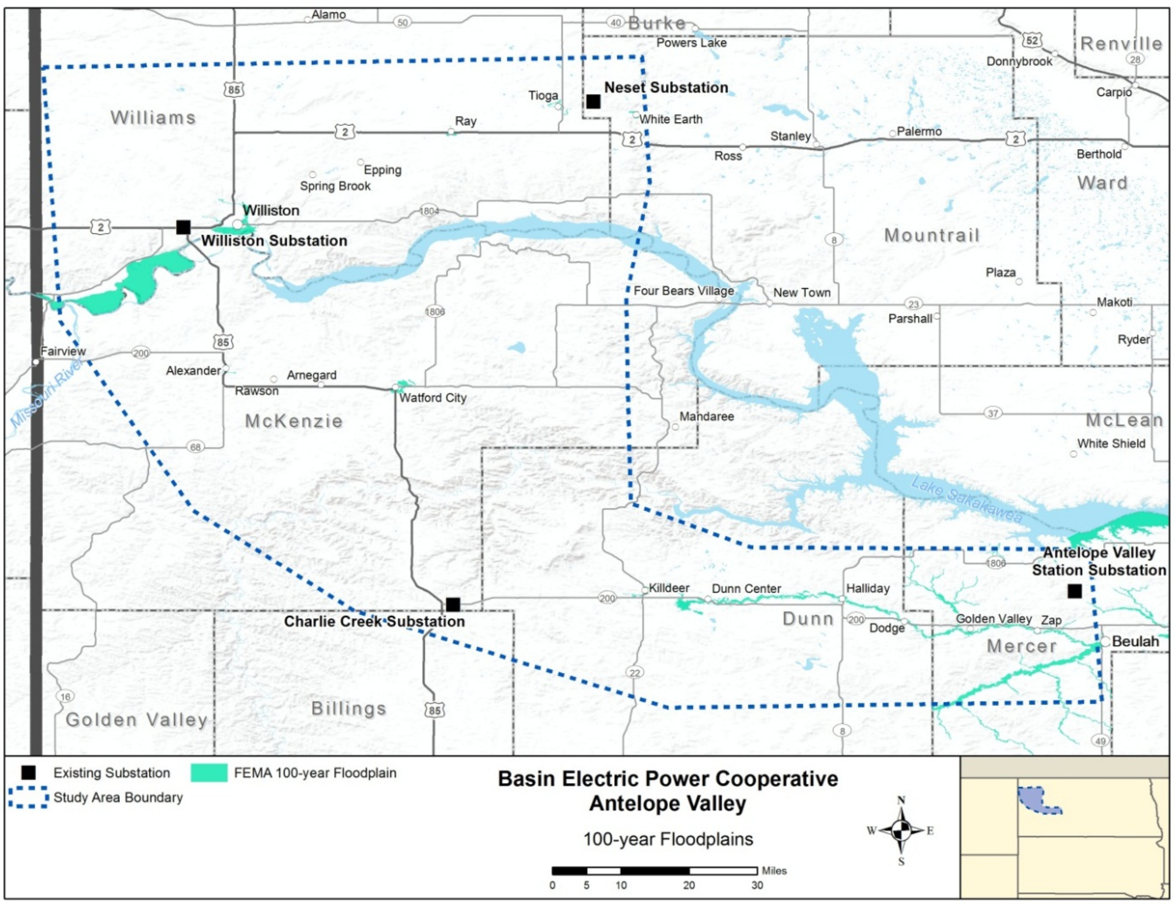
Floodplains

Floodplains are low-lying areas that are subject to periodic inundation due to heavy rains or snowmelt. These areas are generally adjacent to lakes, rivers, and streams and are necessary for temporary water storage during flooding events. The periodic flooding and drying in these areas creates unique habitat that supports a wide variety of plant and animal species.

Mercer, Dunn, Williams, and Mountrail counties participate in the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program, which allows residents to purchase special insurance at subsidized rates. Flood data derived from FEMA Flood Insurance Rate Maps (FIRM) were used to identify areas within the project area that are designated as 100-year floodplains. Within the counties affected by the proposed project, designated 100-year floodplains are not mapped county-wide, but include those areas near communities or other populated areas. FEMA floodplains identified within the project area include several unnamed tributaries to Spring Creek, located approximately 10 miles west of AVS in Mercer County, unnamed tributaries to Lake Sakakawea located approximately 10 miles north of the community of Zap in Mercer County, and portions of Spring Creek located approximately 2 miles northeast of the community of Killdeer in Dunn County. Identified floodplains also occur along the upper regions of Lake Sakakawea, approximately 6 miles southwest of the community of Williston in Williams and McKenzie counties. Additional floodplain areas not listed on FEMA FIRM are likely present within the project area. These areas include, but are not limited to the Knife River, Little Missouri River, Little Muddy River, and associated tributaries (ND GIS, 2011). A floodplain map is provided in Figure 3-26.

It is FEMA's policy to provide leadership in the management of floodplains by avoiding adverse impacts associated with the occupancy and modification of floodplains (44 CFR 9). Authority for regulating this management is provided under Executive Order 11988, which established procedures to ensure that potential effects of floodplain hazards and floodplain management are considered when taking an action that may cause adverse impacts on floodplains. The proposed project would locate structures outside of floodplains to the extent practicable, such that potential impacts are expected to be minimal. Implementing mitigation measures would prevent or reduce potential impacts on floodplains.

Figure 3-26: Map of FEMA-Designated 100-year Floodplains



3.4.2 Direct and Indirect Effects

To determine whether the proposed project would have the potential to result in significant impacts to water resources, it is necessary to consider both the duration and the intensity of the impacts. Definitions for duration and intensity of water resources impacts established for this project are described in Table 3-1.

Because construction activities would not result in any detectable change to groundwater quality, no wells would be drilled, and no groundwater would be used, no direct impacts are anticipated to groundwater resources under the no-action alternative, Alternative C, Alternative D, or Alternative E as a result of either the construction or operation of the project.

No-action Alternative

Under the no-action alternative, the proposed project would not be constructed, and there would be no impacts on surface water resources or floodplains.

Action Alternatives

Construction and operation of the project under all three alternatives have the potential to impact surface water resources. These impacts include: increased sedimentation into surface waters from stormwater runoff, increased sedimentation into USEPA-classified impaired waters from stormwater runoff or construction activities, and the possible introduction of contaminants into surface water resources.

There would also be the potential for impacts on floodplains, including disruption of floodwaters due to structures in floodplain areas, and loss or impairment of floodplains and floodplain storage. The project would locate structures outside of floodplains to the extent practicable, such that potential impacts would be expected to be minimal. If structures are placed directly in floodplains, construction of the transmission lines would not be expected to alter existing drainage patterns or floodplain elevations due to the small footprint of the poles and their relatively wide spacing. No change in floodplain functions would occur from construction of the project under Alternatives C, D, or E.

<u>Proposed Substations</u>

Minimal impacts on surface water resources resulting from the construction and operation of the proposed Judson, Tande, Red, White, or Blue substations and the Killdeer South switchyard are expected because of the use of BMPs to prevent soil erosion and sedimentation (Appendix A). No streams or other waterbodies are present within any of the substation/switchyard sites. The Tande 345-kV Substation would be located within a larger parcel of land being acquired by Basin Electric, but the actual site location is yet to be determined. An unnamed tributary to Paulsen Creek is located on the eastern portion of this property, but the substation site would be constructed on the western side of the property, and the use of BMPs would minimize impacts on this stream. All construction activities would employ BMPs to prevent erosion or sediment runoff that may impact any nearby waterbodies. Minimal impacts on floodplains resulting from the construction and operation of the proposed substations are expected. The substation sites would not be located within FEMA-designated floodplains.

<u>Alternative C</u>

The ROW for Alternative C would cross 14.3 acres of open water, 19 perennial waterways (including the Little Missouri River [twice] and Missouri River), and numerous intermittent streams. Three of the crossings would be over waterbodies classified by USEPA as impaired waters. Alternative C would cross Antelope Creek shortly after exiting the AVS Substation, the Little Missouri River east of U.S. Highway 85 and TRNP, and west of ND State Highway 22 and the Little Muddy River north of Williston. All of these waters are listed as impaired due to high fecal coliform levels resulting from nearby agricultural activities. It is not anticipated that construction would contribute to further fecal coliform contamination, although access to the corridor through agricultural areas may have minor impacts. BMPs would be implemented to reduce this impact where necessary (see Appendix A). Since there are no other major sources of impairment requiring total maximum daily loads in areas where crossings would occur (USEPA, 2011), impacts are expected to be minor. All stream crossings, including the impaired waters, would be spanned by Alternative C, and no transmission structures would be placed in the streambed. Basin Electric would obtain all necessary permits for the protection of water resources including wetlands (NWP12) and water quality. A Section 10 permit would be required for the crossing the Missouri River. Because standard BMPs would be followed, minimal impacts on water resources during operation of the proposed project are anticipated.

Considerable area within the Missouri River lowlands is subject to regular flooding. However, very little of this area is designated as floodplain on the FEMA FIRM, which designate floodways and 100- and 500- year flood zones. The 150-foot-wide ROW for Alternative C contains approximately 16.5 acres of FEMA-designated floodplain along the length of the route. These designated areas consist of many small, narrow floodplains associated with rivers and streams within the project area. While Alternative C would cross these geographical floodplain areas, all FEMA-designated floodplain areas within the ROW for Alternative C would be spanned and BMPs would be followed; therefore, minimal impacts to these areas are expected during construction or operation of the project. The Missouri River floodplains are located within the bluff-to-bluff area, which is approximately 3 miles across and occurs on lands owned by USACE and managed by the North Dakota Game and Fish Department (NDGFD). The project would be constructed parallel and immediately adjacent to an existing 230-kV transmission line and a rural water pipeline within a utility corridor identified by the agencies. Construction would be timed to avoid potential flooding of these areas. Excavated material would be removed to appropriate upland areas. Any debris such as trees or brush generated during construction would be removed from the floodplain or other areas subject to flooding.

Alternative D

Potential impacts on surface water resources resulting from the construction of Alternative D would be similar to those for Alternative C with the exception of only one Little Missouri River crossing west of ND State Highway 22. The ROW for Alternative D would cross 12.7 acres of open waters and 17 perennial waterways, all of which would be spanned. Alternative D would cross Antelope Creek and the Little Muddy River (impaired waters), but would not cross the Little Missouri River in an area where it is classified as impaired. As described for Alternative C, these impaired waters are listed due to high fecal coliform levels resulting from nearby agricultural activities (USEPA, 2011). Since there are no other major sources of impairment requiring total maximum daily loads in areas where crossings would occur (USEPA, 2011), impacts are expected to be minor. Alternative D would cross numerous intermittent streams. All stream crossings, including the impaired waters, would be spanned by Alternative D, and no transmission structures would be placed in the streambed. Basin Electric would obtain all necessary permits for the protection of water resources including wetlands (NWP12) and water quality. A Section 10 permit to cross the Missouri River would also be required for this alternative. Standard BMPs would be followed (see Appendix A), and minimal impacts on water resources during operation of the proposed project are anticipated.

As described for Alternative C, considerable area within the Missouri River lowlands is subject to regular flooding, although little of this area is designated as floodplain on the FEMA FIRM maps. The 150-foot-wide ROW for Alternative D contains approximately 16.5 acres of FEMA-designated floodplain along the length of the route. These designated areas consist of many small, narrow floodplains associated with rivers and streams within the project area. While Alternative D would cross these geographical floodplain areas, all FEMA-designated floodplain areas within the ROW for Alternative D would be spanned and BMPs would be followed; therefore, minimal impacts to these areas are expected during construction or operation of the proposed project. Construction would be timed to avoid potential flooding of these areas. Excavated material would be removed to appropriate upland areas. Any debris such as trees or brush generated during construction would be removed from the floodplain or other areas subject to flooding.

Alternative E

Potential impacts on surface water resources resulting from the construction of Alternative E would be similar to those for Alternative D with the addition of a second Little Missouri River crossing, both west of ND State Highway 22. The ROW for Alternative E would cross 16.3 acres of open waters and 20 perennial waterways, all of which would be spanned. Alternative E would cross Antelope Creek and the Little Muddy River (impaired waters), but would not cross the Little Missouri River in an area where it is classified as impaired. Since there are no other major sources of impairment requiring total maximum daily loads in areas where crossings would occur (USEPA, 2011), impacts are expected to be minor. Alternative E would cross numerous intermittent streams. All stream crossings, including the impaired waters, would be spanned, and no transmission structures would be placed in the streambed. Basin Electric would obtain all necessary permits for the protection of water resources including wetlands (NWP12) and water quality. A Section 10 permit would be required for crossing the Missouri River. Standard BMPs would be followed (see Appendix A), and minimal impacts on water resources during operation of the proposed project are anticipated.

Similar to Alternatives C and D, considerable area within the Missouri River lowlands is subject to regular flooding and very little of this area is designated as floodplain on the FEMA FIRM maps. The 150-foot-wide ROW for Alternative E contains approximately 16.5 acres of FEMA-designated floodplain along the length of the route. The designated areas consist of many small, narrow floodplains associated with rivers and streams within the project area. While Alternative E would cross these geographical floodplain areas, all FEMA-designated floodplain areas within the ROW for Alternative E would be spanned and BMPs would be followed; therefore, minimal impacts to these areas are expected during construction or operation of the proposed project. Construction would be timed to avoid potential flooding of these areas. Excavated material would be removed to appropriate upland areas. Any debris such as trees or brush generated during construction would be removed from the floodplain or other areas subject to flooding.

3.5 BIOLOGICAL RESOURCES

3.5.1 Affected Environment

The study area extends across six physiographic ecoregions: Missouri Plateau, Missouri Coteau Slope, Northern Missouri Coteau, Little Missouri Badlands, River Breaks, and Glaciated Dark Brown Prairie (Bryce et al., 1998). Physiographic regions generally characterize areas by their topography and geologic features. The Glaciated Dark Brown Prairie, Missouri Coteau Slope, and Northern Missouri Coteau ecoregions are confined to the north of the Missouri River/Lake Sakakawea. The River Breaks ecoregion encompasses the area immediately adjacent to the Missouri River/Lake Sakakawea and its tributaries. The Missouri Plateau and Little Missouri Badlands ecoregions occur south of the Missouri River/Lake Sakakawea.

The study area contains a variety of biological resources within diverse landscapes consisting of rolling prairies, badland areas, cultivated farmlands, and riparian areas. These landscapes contain diverse vegetative communities that serve as habitat to many species of wildlife. Riparian areas and wetlands within the study area also provide habitat for plant and animal species dependent on these areas.

3.5.2 Direct and Indirect Effects

This section discusses potential impacts on vegetation, wildlife, wetlands, and special status species resources resulting from construction and operation of the proposed project, including the no-action alternative. Definitions for duration and intensity developed for this project are described in Table 3-1.

Comparison of Action Alternatives

All of the alternatives cross a wide variety of terrain, vegetative communities, and habitat types used by a variety of wildlife. Construction and operation of the chosen alternative would have impacts on vegetation, wetlands, and wildlife. Appropriate mitigation measures would reduce the severity of these impacts. Potential impacts, common to all of the alternatives, would include the following:

- Disturbance or change to vegetative communities as a result of construction activities within the ROW
- Introduction and spread of noxious weeds during construction, operation, and maintenance of the transmission line
- Sedimentation within wetland areas caused by construction activities
- Removal of forested wetland vegetation within the ROW during construction
- Removal of wildlife habitat within the ROW
- Fragmentation of wildlife habitat
- Temporary disturbance to wildlife from human presence and disruption to habitat
- Disturbance to aquatic habitats from construction activities
- Changes in predator-prey relationships due to habitat changes (e.g., increased predation by raptors due to the presence of transmission structures for perching)
- Impacts on special status species (ESA-listed or candidate species; USFS sensitive species; and North Dakota Species of Conservation Priority) or their habitat

A discussion of likely impacts to vegetation, wetlands, and wildlife is common to all of the alternatives is provided below.

<u>Vegetation</u>

Natural vegetation within areas of rolling topography in the Missouri Plateau and Little Missouri Badlands ecoregions consists of shortgrass prairie plants, including blue grama (*Bouteloua gracilis*), needleleaf sedge (*Carex duriuscula*), threadleaf sedge (*Carex filifolia*), needle-and-thread (*Hesperostipa comata*), wheatgrass (*Elymus smithii*), little bluestem (*Schizachyrium scoparium*), big sagebrush (*Artemisia tridentata*), buffalograss (*Bouteloua dactyloides*), and prairie sandreed (*Calamolvilfa longifolia*). Forbs include white wild onion (*Allium textile*), buffalo-bean (*Thermopsis* spp.), silverleaf (*Astragalus* spp.), moss phlox (*Phlox subulata*), white beardtongue (*Penstemon* spp.), and fringed sage (*Artemesia frigida*). Within the steeper slopes and draws of the Missouri Badlands and River Breaks ecoregions, Rocky Mountain juniper (*Juniperus scopulorum*) is common. Cottonwood (*Populus deltoides*), willow (*Salix* spp.), chokecherry (*Prunus virginiana* var. *interius*), buffaloberry (*Shepherdia* spp.), skunkbush (*Rhus aromatic* var. *trilobata*), and green ash (*Fraxinus pennsylvanica*) are found in riparian areas, which typically serve as transition areas between wetlands and uplands (Western, 2010b; Bryce et al., 1998). These areas are common along the banks of the Little Missouri River and Missouri River, and provide important wildlife habitat. Cultivated and irrigated areas within these regions include wheat, alfalfa, and sunflowers (Bryce et al., 1998).

North of the Missouri River and Lake Sakakawea, the topography of the Glaciated Dark Brown Prairie ecoregion is generally more gently sloping, with more acres of native grassland converted to cultivated cropland. Spring wheat, barley, alfalfa, lentils, peas, and silage corn are common crops in cultivated areas (Bryce et al., 1998). Land that is not cultivated is often managed for pasture or rangeland for grazing by cattle or horses. Most pasture forage is native, especially blue grama grass, western wheatgrass, big sagebrush, green needlegrass (*Nassella viridula*), and prairie junegrass (*Koeleria macrantha*) (Bryce et al., 1998).

Potential impacts on vegetation would include short- and long-term effects varying in intensity from low to moderate to high. Impacts would include localized disturbance to vegetative communities caused by construction equipment and vehicles during site preparation, including damage to vegetation from vehicle tires, excavation, grading, and soil stockpiling. Vegetative damage in the ROW due to construction equipment and vehicles would be considered a short-term, low impact in areas that are not being permanently developed.

Shrub vegetation would be cleared within the ROW where necessary, depending on height and terrain, and in areas where construction access trails are required. Clearing of shrub vegetation would have a long-term, moderate impact on vegetation. Construction through forested areas would require the removal of any trees or large shrubs that would interfere with transmission line safety, equipment access, and operation. Vegetation would be permanently removed at each structure foundation location and woody vegetation would be cleared within currently forested areas of the ROW. Clearing forested areas would have a long-term, high impact on vegetation because it results in a permanent conversion. Short-term, low impacts on vegetation are anticipated within the ROW in grassland, cropland, and hayland areas; these vegetation types would be restored within the ROW once construction is completed. Permanent impacts on vegetation would be limited to conversion of forest to non-forest habitat and any loss of vegetation resulting from permanent conversion of new, undeveloped areas, particularly for substation sites. However, Basin Electric would coordinate with NDPSC and the North Dakota Forest Service to determine appropriate mitigation for the vegetation removed. Typically for these types of projects, tree and shrub vegetation is replaced at a ratio of 2:1, reducing the overall loss over time. Mitigation measures for tree and shrub removal impacts are included in Appendix A.

During construction, off-ROW access may be necessary. Construction crews would gain access to the ROW from public roads and section line roads/trails (outside the LMNG), across private roads if access is secured, as well as from within the transmission ROW itself in areas with no public access. Access for transmission line construction would be by truck within the ROW. Structures located along section lines would be accessed from section line roads and trails where possible. For most existing access roads and trails, no additional widening, surfacing, or improvements, including culverts, would be necessary. New surface access roads are not anticipated for a majority of the line; however, temporary access trails may be required in certain areas with no access. Areas with steep or rugged terrain, particularly near the Little Missouri River and associated tributaries would likely be accessed by helicopter and would not require additional new roads. The helicopter flight paths will be coordinated with that year's known and active eagle nests (1 mile buffer) to avoid disturbances and impacts. New and existing access trails used for construction access would be rehabilitated after construction to comparable or better conditions than they were prior to construction activities. New construction access trails would be restored to the natural condition of the surrounding area. Gates would be installed where fences cross the ROW, and locks would be installed at the landowner's request.

Table 3-11 presents the potential number of acres impacted within the ROW for general landcover types along the entire route lengths of Alternatives C, D, and E, and Table 3-12 provides a more detailed breakdown of specific vegetation communities found within the ROW for Alternatives C, D, and E.[10]

Table 3-11: Vegetation/Landcover Types within the Right-of-way

Vegetation Type	Alternative C ROW Acres	Alternative D ROW Acres	Alternative E ROW Acres
Cropland	1,671.4	1,505.4	1,719.5
Pasture/hay	172.5	127.3	144.9
Grassland herbaceous	2,548.1	2,408.1	3,154.9
Woodland	183.1	119.5	189.4
Developed lands	133.1	106.2	127.2
Scrub/Shrub	187.4	135.3	193.5
Emergent wetlands	35.1	34.0	36.6
Open water	14.3	12.7	14.5
Barren	11.8	10.0	16.6
TOTAL	**4,956.8**	**4,458.5**	**5,597.1**

Source: USDA National Agricultural Statistical Service, Cropland Data Layer, 2012

[10] Vegetation community data was obtained from the North Dakota GAP Analysis Program and compared to vegetation data obtained from the National Land Cover Dataset. Because impacts on vegetation are similar between vegetation types (i.e., all wooded vegetation communities would be cleared and subject the same type of impact), National Land Cover Dataset data was used for route comparison.

Table 3-12: Vegetation Communities within the Right-of-way

Vegetation Community	Representative Species	Alt C (acres)	Alt D (acres)	Alt E (acres)
Bluff and badland	Sagebrush, rabbitbrush, saltbush	3.0	2.9	4.7
Cliff, canyon, and talus	Few if any plants	0.7	0.4	1.5
Cultivated cropland	Wheat, barley, corn, sunflowers	1,664.2	1,498.8	1,723.2
Depressional wetland	Cattail, three-square bulrush, spikerush	110.0	99.1	125.9
Floodplain and riparian	Green ash, eastern cottonwood, stinging nettle	52.0	43.7	50.2
Inter-mountain basins big sagebrush shrubland	Silver sagebrush, big Wyoming sagebrush	1.3	0.7	0.9
Inter-mountain basins big sagebrush steppe	Western wheatgrass, needleleaf sedge, big Wyoming sagebrush	1.8	1.6	1.7
Introduced upland vegetation–perennial grassland and forbland	Smooth brome, crested wheatgrass, sweet clover	25.2	31.8	33.3
Northwestern Great Plains mixed-grass prairie	Green needlegrass, blue grama, little bluestem	2,526.1	2,334.1	3,078.5
Northwestern Great Plains shrubland	Buffaloberry, silverberry, snowberry	39.0	30.2	41.8
Pasture/hay	Alfalfa, smooth brome, bluegrass	178.1	136.0	152.8
Western great plains dry bur oak forest and woodland	Bur oak, serviceberry, red cedar	19.3	19.3	34.9
Western great plains sand prairie	Prairie sandreed, blue grama, needle and thread	28.6	28.8	47.4
Western great plains wooded draw and ravine	Green ash, chokecherry, snowberry	123.8	81.3	130.0
	TOTAL	**4,773.1**	**4,308.7**	**5,426.8**

Source: Strong, et al., 2005

The proposed 345-kV substations/switchyard would require the permanent removal of all vegetation within the fenced area of the sites (approximately 12 acres each for the Judson, Tande, Red, and White substations and the Killdeer South switchyard, and 25 acres for the Blue Substation) because the sites would be converted to utility use (85 acres total). These sites would be located in grassland or cropland areas to avoid clearing woodland vegetation. Impacts on vegetation within the substation boundaries would be long term and moderate. Removal of vegetation in these areas is not expected to negatively impact local plant populations or population range-wide stability.

Short-term impacts associated with the construction of the project would include the disturbance of herbaceous vegetation along temporary construction access trails, as well as temporary disturbance of vegetation within the ROW boundary for access during construction. Grassland vegetation comprises the most acreage within the ROW for each alternative, although very little of this area would actually be subject to disturbance during construction. Grassland vegetation would be temporarily impacted during construction, but because it is short, removal would be minimal within the ROW except at structure locations, and grassland vegetation would be expected to recover in full once the construction and revegetation efforts are complete. In addition, vegetation used for pasture or hayland would be temporarily impacted, primarily during structure erection and pulling of conductors. In agricultural areas, cropland would be temporarily disturbed within the ROW during construction, but would be re-planted when construction is completed. Long-term grassland vegetation impacts associated with the project would primarily be confined to the removal of vegetation at each structure foundation location, resulting in a permanent loss of vegetation of approximately 1.4, 1.3, and 1.6 acres for Alternatives C, D, and E, respectively over the length of the route, assuming 38.5 square feet per structure and 1,625 structures for Alternative C, 1,465 structures for Alternative D, and 1,832 structures for Alternative E.

Approximately 183, 120, and 189 acres of woodland is located within the proposed ROW for Alternatives C, D, and E, respectively. Typically, trees would be cleared to maintain access to the ROW and appropriate clearance for the safe and reliable operation of the transmission line. For this project, much of the woodland vegetation is associated with deep draws and canyons in badland areas and around drainages. It is likely that many of these areas would be spanned so that the trees would pose no hazard to the transmission line and clearing would be unnecessary. Thus, while the three alternatives contain approximately 120 to 189 acres of woodland, considerably less woodland would likely actually require clearing. Depending on the vegetation adjacent to these wooded areas, cleared woodland areas would likely be converted to grassland or pasture similar to other grassland or pastures found throughout the project area. In addition, though not categorized as woodland, numerous treed windbreaks, shelterbelts, and fencerows would be crossed by the proposed project. Trees within the ROW at these locations would be cleared, and the areas converted to vegetative cover similar to adjacent cleared areas.

The North Dakota Natural Heritage Inventory database indicates that a significant ecological community of western little bluestem prairie is located within 1,000 feet of the centerline for the Red to Charlie Creek segment for Alternatives C, D, and E in Dunn County (North Dakota Parks and Recreation Department, 2011a). It is anticipated that the construction and operation of Alternative C would avoid this sensitive area, since it is not within the ROW. However, if this area would be affected based on the final route alignment for Alternative C, Basin Electric would coordinate closely with the Natural Heritage Inventory and NDGFD to avoid, minimize, or mitigate any adverse impacts to this area. Periodic tree-trimming of the ROW would be anticipated to keep the transmission line clear of any vegetation obstructions during line operation and accessible for maintenance. Herbicides may be used periodically within the ROW to prevent the growth and spread of noxious weeds, control woody vegetation, and prevent stump sprouting. These activities are not anticipated to have any permanent impacts on vegetation outside of the transmission ROW along the length of the route; they would be used according to label specifications by certified applicators within the ROW only. However, it may occasionally be necessary to trim or remove trees adjacent to the ROW that pose a hazard to the safe and reliable operation of the transmission line (danger trees). Management of danger trees would be infrequent, and would have little if any effect on adjacent vegetative communities.

North Dakota state law requires all landowners to make every effort to control the spread of noxious weeds on their property. Federal agencies are also directed to prevent the introduction of invasive species and ensure that its actions are not likely to cause or promote the introduction or spread of invasive species (USDA, 2011). Noxious weeds can be detrimental for a number of reasons. They threaten wildlife by replacing natural vegetation and nesting habitat, threaten native plant species, and reduce crop productivity and increase soil erosion (NDDOA, 2012b).

North Dakota's noxious weed list includes 11 species: absinth wormwood (*Artemisia absinthium*), Canada thistle (*Cirsium arvense*), diffuse knapweed (*Centaurea diffusa*), leafy spurge (*Euphorbia esula*), musk thistle (*Carduus nutans*), purple loosestrife (*Lythrum salicaria*), Russian knapweed (*Acroptilon repens*), spotted knapweed (*Centaurea maculosa*), yellow toadflax (*Linaria vulgaris*), dalmatian toadflax (*Linaria dalmatica*), and saltcedar (*Tamarix* spp.) (NDDOA, 2012b). North Dakota's cities and counties have the option to add weeds to their list whose eradication is enforced only within the city or county's jurisdiction. Near the study area, only Billings, McKenzie, and Mountrail counties have added their own county-specific noxious weeds: black henbane (*Hyoscyamus niger*), common burdock (*Arctium minus*), hoary cress (*Cardaria draba*), and houndstongue (*Cynoglossum officinale*) in Billings County, and common tansy (*Tanacetum vulgare*) and houndstongue in Mountrail County (NDDOA, 2012a).

The introduction and spread of noxious weeds as a result of construction of the proposed project would be possible through ground disturbance and transfer by equipment. BMPs during construction and reclamation would be followed to prevent the introduction and spread of noxious weeds, including revegetation of disturbed areas using certified seed and mulch that contains no viable noxious weed seeds and other standard BMPs related to construction and re-vegetation practices within disturbed areas. Basin Electric would also develop a plan for post-construction noxious weed management for the life of the transmission line.

<u>Wetlands</u>

Wetlands are scattered throughout much of northwestern North Dakota, and occur in the study area. These natural communities provide filtration of sediments and pollutants from surface water runoff, flood water retention, erosion control, resting, foraging, and nesting habitat for waterfowl and mammals, fish spawning and nursery, and amphibian habitat.

Wetlands are defined, for regulatory purposes, in the CWA. This definition is used by USEPA and USACE to administer the permit program outlined in Section 404 of the CWA. Wetlands under USACE jurisdiction are defined as follows:

> "Wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions (Environmental Laboratory, 1987). Wetlands generally include swamps, bogs and similar areas (40 CFR 230.3 and 33 CFR 328.3)."

Table 3-13 shows the types of wetlands found within the ROW of each alternative according to the USFWS National Wetlands Inventory (NWI) database.

Table 3-13: National Wetlands Inventory-Identified Wetland Acres within the Right-of-way

Wetland Type	Alternative C (acres)	Alternative D (acres)	Alternative E (acres)
Palustrine emergent	13.0	13.4	15.1
Palustrine scrub/shrub	4.0	3.6	8.4
Palustrine forested	0.02	0.02	0.02
Lake	11.1	11.1	11.1
Pond	1.2	1.7	2.6
Riverine	3.7	1.5	2.6
TOTAL	**33.1**	**31.3**	**39.9**

Source: USFWS, 2012b

Palustrine wetlands of various types are the most common wetlands within the ROW of all three alternatives. Within these wetlands, the dominant vegetation varies. Palustrine emergent wetlands include wet meadows, prairie potholes, and aquatic-bed wetlands (USFWS, n.d.). Species likely to occur in these wetlands would include reed canarygrass (*Phalaris arundinacea*), prairie cordgrass (*Spartina pectinata*), bald spikerush (*Eleocharis erythropoda*), American vetch (*Vicia americana*), quill sedge (*Carex tenera*), Sartwell's sedge (*Carex sartwellii*), broadleaf cattail (*Typha latifolia*), bog yellowcress (*Rorippa palustris*), and smooth horsetail (*Equisetum laevigatum*) (NRCS, 2011a). Scrub-shrub wetlands are characterized by woody vegetation (such as shrubs and small trees) that are less than 20 feet in height and comprise at least 30 percent or more of a wetland's area (Cowardin et al., 1979). Common scrub-shrub species that would be likely to occur with the ROW of the three alternatives would include Bebb willow (*Salix bebbiana*), Missouri River willow, saltcedar (*Tamarix ramosissima*), prairie willow (*Salix humilis*), Russian olive (*Elaeagnus angustifolia*), silverberry, and skunkbush sumac (*Rhus trilobata*) (NRCS, 2011a). Palustrine wetlands are considered forested if they are characterized by woody vegetation that is greater than 20 feet tall and comprise at least 30 percent or more of a wetland's area (Cowardin et al., 1979). The trees that would most likely be found in forested wetlands within the study area are eastern cottonwood, Missouri River willow (*Salix eriocephala*), American elm (*Ulmus americana*), balsam poplar (*Populus balsamifera*), water birch (*Betula occidentalis*), and boxelder (*Acer negundo*) (NRCS, 2011a).

Lacustrine wetlands are those wetlands that occur in depressions (lakes or ponds) and have deep-water habitat (Cowardin et al., 1979). Riverine wetlands are those wetlands that occur in channels of flowing water. These channels could be either artificial or natural. Wetlands plants that would be most likely to occur in riverine and lacustrine wetlands within the ROW of the three alternatives would include milfoils (*Myriophyllum* spp.), naiads (*Najas* spp.), lilies (*Nuphar* spp.), and other submerged aquatic plants that typically occur in North Dakota (NRCS, 2011a).

NRCS oversees the Wetlands Reserve Program, which is a voluntary program that provides financial incentives and technical assistance for landowners who wish to protect, restore, and enhance wetlands on their property while helping to achieve the national goal of no net loss of wetlands. Landowners participating in the program either sell a conservation easement (30 years) or enter into a cost-share restoration agreement (10 years) with NRCS to protect and restore wetlands (NRCS, 2011c). The Wetlands Reserve Program is gaining popularity with landowners in North Dakota; this program consisted of 109 easements totaling 24,726 acres in North Dakota in 2009, increasing to 205 easements totaling 33,625 acres in North Dakota in 2010 (NRCS, 2011b). Within the study area, McKenzie County has 1,464 acres enrolled in Wetlands Reserve Program, Mountrail County has 621 acres enrolled, Mercer County has 48.2 acres enrolled, and Dunn County has no acres enrolled in the program (Hagel, 2011). However, there are no NRCS Wetlands Reserve Program easements within 1,000 feet of either side of the alternatives' ROWs (USFWS, 2012f).

Wetland and grassland easements administered by USFWS also occur within the study area. Wetland and grassland easements are part of the National Wildlife Refuge System and are managed to protect wetlands and the grass uplands around wetlands. The only USFWS easement known to occur within 1,000 feet of the ROW of the alternatives is a 59.3-acre portion of a 311.8-acre easement in Dunn County (USFWS, 2012f).

Executive Order 11990, Protection of Wetlands, requires federal agencies to minimize the destruction, loss, or degradation of wetlands when providing federally undertaken, financed, or assisted construction and improvements, as well as other activities. Each agency shall avoid new construction located in wetlands unless "the agency finds (1) that there is no practicable alternative to such construction, and (2) that the Proposal includes all practicable measures to minimize harm to wetlands which may result from such use."

Impacts on wetland areas within the project area are expected to be minimal, as Basin Electric would attempt to avoid impacting wetlands when practicable. Table 3-13 provides a comparison of potential vegetated wetland types and acreages within the ROW for Alternative C, D, and E as identified on NWI maps. There are approximately 33.1, 31.3, and 39.9 acres of potential wetlands in the ROWs of Alternatives C, D, and E, respectively. Alternative E potentially has slightly greater acreages of palustrine emergent and palustrine shrub-scrub, and riverine wetland types than Alternatives C and D. When impacts on wetlands cannot be avoided, they would be minimized to the extent possible. Any impacts on jurisdictional wetlands would be permitted and mitigated as appropriate in consultation with USACE.

After the final route, substation, and switchyard locations are chosen, wetland mapping or delineations would be conducted to identify wetlands. No NWI-identified wetlands are located within the boundaries of the substation/switchyard sites, and no wetlands would need to be crossed for access to the sites. Therefore, no impacts on wetlands are expected from the construction of the proposed 345-kV substations or switchyard.

Short-term, low-intensity impacts on wetland vegetation may occur if construction crews need to access ROW areas through wetlands. When construction is completed, any disturbance to wetlands would cease, and these areas would be restored. Long-term, moderate to high intensity impacts on wetlands would only be expected to forested wetlands because trees and other woody vegetation would need to be removed within the ROW. Impacts to non-forested wetlands would be short term and of low intensity. Several areas of open water wetlands (ponds, lakes, riverine) were identified on the NWI maps, but it is expected that these would be spanned and not impacted by transmission line construction. However, any unavoidable impacts on potentially jurisdictional wetlands, whether temporary or permanent, would be discussed with USACE prior to construction to determine the permitting requirements and conditions necessary for construction involving wetlands within the proposed project ROW. Where impacts on wetland or riparian areas are unavoidable, impacts would be minimized and mitigated. BMPs, as described in Appendix A, would be employed to minimize impacts on wetlands within the ROW during construction. Specific mitigation measures would be approved by USACE during the NWP12 permitting process.

Wildlife

The study area lies within the Great Plains-Palouse Dry Steppe Province and the Great Plains Steppe Province, which are similar to the physiographic ecoregions discussed at the beginning of this section, but includes biological characteristics (Bailey, 1995). These regions are characterized by rolling plains, valleys, canyons, and buttes, but gently rolling plains are more likely to be found north of the Missouri River and Lake Sakakawea. Therefore, these diverse landscapes are home to many species of wildlife (Appendix F). The primary habitat types observed in the counties within the study area during field investigations in October 2011 were short and mixed-grass prairie, badland areas, shelterbelt woodland areas, agricultural lands (rangeland and cropland), wetlands, and riparian areas (Thornhill and Beemer, 2011).

The alternatives would each cross a variety of different habitat areas used by a diverse assemblage of wildlife species. Although construction would result in minor changes in habitat composition for lands within the ROW, project-related impacts would largely be short term, of low to moderate intensity, and typically limited to the construction period and times when workers and equipment are regularly present; except in cases of permanent conversion of habitat to a substation or switchyard or from one habitat type to another (e.g., forest to grassland). Potential impacts on wildlife during the construction and operation phases of the proposed project may include the following:

- Temporary disturbance to wildlife within and near the transmission ROW during construction and transmission line maintenance due to human intrusion, noise (including helicopters), and construction activity
- Disturbance or removal of vegetation that is used as food, shelter, or cover for wildlife species during ROW clearing
- Permanent loss of habitat, particularly wooded areas, shelterbelts, windbreaks, and fencerows
- Loss of forested wetland habitat through permanent conversion to emergent wetlands via clearing
- Habitat fragmentation
- Introduction of sediment into aquatic ecosystems during construction
- Changes in predator-prey relationships due to habitat changes (e.g., increased predation by raptors due to the presence of transmission structures for perching)
- Impacts on special status species (ESA-listed or candidate species; USFS sensitive species; and North Dakota Species of Conservation Priority) or their habitat
- Potential exposure to contaminants such as fuels and chemicals used during construction

Potential impacts, both short and long term, are discussed for specific wildlife types in the following sections.

<u>Special Status Species</u>

The project area contains habitat for or have known occurrences of USFWS federally endangered, threatened, and candidate species (Appendix G and Appendix H); USFS sensitive species and Management Indicator Species (MIS) (Appendix I); and North Dakota Species of Conservation Priority (Appendix J). These species are cumulatively referred to in this report as special status species. Basin Electric has prepared, in consultation with RUS and Western, a biological assessment (BA) addressing federally endangered, threatened, and candidate species.

Upon review of the BA, USFWS determined the project may affect, but is not likely to adversely affect, federally-listed special status species. In addition, Basin Electric has also prepared a biological evaluation (BE) for USFS sensitive and MIS and determined the proposed project would not adversely affect any of these species. The following summarizes the evaluation and findings of these reports.

USFWS reports five federally listed endangered species (whooping crane, interior least tern, pallid sturgeon, black-footed ferret, and gray wolf); one federally listed threatened species (piping plover); one candidate species (Sprague's pipit); and three proposed species (Dakota skipper, rufa red knot, and the northern long-eared bat) from the counties crossed by the project (USFWS, 2014a). No federally listed, endangered, or threatened plant species are known to occur in the project area. However, the ROW for Alternatives C, D, and E cross designated critical habitat for piping plovers and suitable habitat for other special status species.

USFS has identified 19 sensitive animal species in North Dakota that are known to occur in the Dakota Plains National Grasslands, which includes the LMNG (Appendix I). These include eight birds (Baird's sparrow, bald eagle, burrowing owl, greater prairie chicken, greater sage-grouse, loggerhead shrike, long-billed curlew, and Sprague's pipit); three mammals (black-tailed prairie dog, bighorn sheep, and the northern long-eared bat); and nine species of butterfly (Arogos skipper, broad-winged skipper, Dakota skipper, mulberry wing, Ottoe skipper, Powesheik skipper, regal fritillary, and tawny crescent). USFS has also identified 38 sensitive/watch plant species in the LMNG. In addition, USFS has requested that the EIS address two MIS for LMNG: the black-tailed prairie dog and the plains sharp-tailed grouse.

Basin Electric completed a habitat assessment according to the Guidelines for Biological Survey Reports–U.S. Army Corps of Engineers, Garrison Project in June 2010. This assessment will fully discuss the biological resources found within the project ROW located across USACE lands. Surveys for this report are being conducted in the spring 2014. Special status vegetation and survey requirements are discussed in Appendix K. Reports will be submitted and approved by USACE prior to commencement of construction activities on USACE lands.

Table 3-14 provides project considerations for federally listed species, and Table 3-15 shows the counties where these federally listed species are located and which species have designated critical habitat. Table 3-16 includes USFS sensitive and MIS animal species for Alternatives C, D, and E. Based on the BE (Basin Electric and USFS, 2013) and the surveys conducted in May and June 2013, none of the USFS sensitive and MIS species were observed within the ROW; however, suitable habitat for these species may be impacted within the ROW. In addition, 70 North Dakota Species of Conservation Priority have the potential to occur in the ROW. All three lists of species are further discussed below.

Table 3-14: Potential Project Considerations for Federally Listed Candidate, Threatened, or Endangered Species

Species	Alternative C	Alternative D	Alternative E	Potential Impacts	Mitigation	Effect Determination
Black-footed ferret	None.	None.	None.	The closest population in Sioux County, North Dakota, is 75 miles south. Also no prairie dog towns are present in the project area (Western, 2014). No direct or indirect impacts are anticipated to black-footed ferrets.	None.	The proposed project will have no effect on the black-footed ferret (Western, 2014).
Dakota skipper (also a USFS sensitive species)	Approximately 2,548 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Approximately 2,408 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Approximately 3,155 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Potential direct effects include direct mortality of adults, the removal or destruction of eggs or larvae, and the loss of habitat due to construction of the proposed transmission line and associated infrastructure if construction occurs within occupied habitat. Indirect effects are not expected.	Grassland habitat would be re-established when construction is completed.	The proposed project may affect, but is not likely to adversely affect Dakota skipper Western, 2014)
Gray wolf	None.	None.	None.	No populations are known to exist within the study area. Transient individuals may occur in the area because of dispersal from populations in the Rocky Mountains, Canada, or Minnesota	None.	The proposed project will have no effect on the gray wolf (Western, 2014).

Species	Alternative C	Alternative D	Alternative E	Potential Impacts	Mitigation	Effect Determination
				(Western, 2014). The only potential direct effect to the species would be during construction when a vehicle may strike a transient animal, but occurrence of a wolf in the region is highly unlikely. Requiring slow driving speeds for construction vehicles on rough terrain would further reduce the potential risk of collision.		
Interior least tern	Sandbar habitat used by terns would not be affected by transmission line construction or operation.	Sandbar habitat used by terns would not be affected by transmission line construction or operation.	Sandbar habitat used by terns would not be affected by transmission line construction or operation.	Least terns may pass through the project area during migrations, but are not known to currently nest within or near the project area, including the Missouri River (Western, 2014).	Construction would occur either outside of the nesting period (April 1 through August 31) or a qualified biologist would search for nesting least terns within potential nesting habitat prior to construction activities within the project area at the Missouri River crossing. If occupied by least terns, no construction would occur within 0.5 mile of the nesting area until all adults and young have departed. If least terns fly through the area during migration, the risk of line collision would be reduced by installation of visual line	With implementation of the visible line marking and construction outside of suitable habitat, the proposed project may affect, but is not likely to adversely affect the interior least tern (Western, 2014).

Species	Alternative C	Alternative D	Alternative E	Potential Impacts	Mitigation	Effect Determination
					marking devices on the static wires of the new transmission line.	
Northern long-eared bat	Approximately 183 acres of forest habitat would be impacted by this alternative.	Approximately 120 acres of forest habitat would be impacted by this alternative.	Approximately 189 acres of forest habitat would be impacted by this alternative.	No hibernacula is known within North Dakota; (Western, 2014).	Possible hibernacula may be identified through survey work and would be avoided (Western, 2014).	This bat species prefers caves and mine as preferred hibernacula, none of which have been identified in North Dakota. During the summer, this bat species may also use old growth forests. However, impacts to forest habitats will be kept to a minimum, therefore the proposed project may affect, but is not likely to adversely affect the northern long-eared bat (Western, 2014).
Pallid sturgeon	None.	None.	None.	The proposed project would not directly impact the Missouri River or other habitat for pallid sturgeon (Western, 2013). No structures would be placed directly in the Missouri River and no boats would be used to cross the river during construction or operation of the proposed project. No direct impacts to pallid sturgeon due to the proposed project are anticipated. While mitigation	By following all the erosion control, fueling, and other BMPs, the potential for sediment and other contaminates would be avoided or greatly minimized from reaching the Missouri River or other waterbody.	The proposed project will have no effect on the pallid sturgeon (Western, 2014).

Species	Alternative C	Alternative D	Alternative E	Potential Impacts	Mitigation	Effect Determination
				measures would minimize indirect impacts to the pallid sturgeon, some minor impacts may occur from increased sedimentation if these measures are not 100 percent effective.		
Piping plover	19 perennial streams are crossed by this alternative.	17 perennial streams are crossed by this alternative.	20 perennial streams are crossed by this alternative.	No piping plovers have been documented nesting in the proposed project area. The closest nesting was approximately 4 miles downstream of the U.S. Highway 85 bridge in 1994 (Western, 2014). No work would occur directly within the Missouri River, at primary constituent elements of habitat for piping plovers at the river crossing, or other wetland areas; therefore, no direct effects to the species would occur during construction. No direct effect to the primary constituent elements of likely habitat (e.g., bare sandbars and open water) are anticipated. Indirect effects on piping plovers could occur if	Construction would occur either outside of the nesting period (April 1 through August 31) or a qualified biologist would search for nesting piping plover within suitable nesting habitat prior to construction activities within the area evaluated in the BA at the Missouri River crossing or at basins greater than 3 hectares within the project area. If the areas are occupied by piping plovers, no construction would occur within 0.5 mile of the nesting area until all adults and young have departed. The risk of collision, either during local foraging flights or migration, will be reduced by installation of visual line marking devices on the static wires of the proposed new transmission line.	With implementation of the visible line marking, construction outside the breeding period, and surveys to confirm no breeding birds are present if construction occurs during the nesting period, the proposed project may affect, but is not likely to adversely affect the piping plover (Western, 2014).

Species	Alternative C	Alternative D	Alternative E	Potential Impacts	Mitigation	Effect Determination
				plovers are nesting near construction activities.		
Piping plover—critical habitat	Approximately 64.8 acres of designated critical habitat within the ROW.	Approximately 64.8 acres of designated critical habitat within the ROW.	Approximately 64.8 acres of designated critical habitat within the ROW.	No work would occur directly within the Missouri River, at primary constituent elements of habitat for piping plovers at the river crossing, or other wetland areas; therefore, no direct effects to the species would occur during construction. The proposed project crosses over designated critical habitat for piping plovers at the Missouri River. No direct effect to the primary constituent elements of critical habitat (e.g., bare sandbars and open water) are anticipated. Indirect effects on piping plovers could occur if plovers are nesting near construction activities.	Construction would occur either outside of the nesting period (April 1 through August 31) and critical habitat. If the critical habitat areas are occupied by piping plovers, no construction would occur within 0.5 mile of the nesting area until all adults and young have departed. The risk of collision, either during local foraging flights or migration, will be reduced by installation of visual line marking devices on the static wires of the proposed new transmission line.	With the proposed line spanning the drainages, and surveys to confirm no breeding birds are present if construction occurs during the nesting period, the proposed project may affect, but is not likely to adversely affect the piping plover's critical habitat (Western, 2014).

Species	Alternative C	Alternative D	Alternative E	Potential Impacts	Mitigation	Effect Determination
Rufa red knot	19 perennial streams are crossed by this alternative.	17 perennial streams are crossed by this alternative.	20 perennial streams are crossed by this alternative.	No work would occur directly within the Missouri River, at primary constituent elements of habitat for rufa red knots at the river crossing, or other wetland areas; therefore, no direct effects to the species would occur during construction.	The risk of collision, either during local foraging flights or migration, will be reduced by installation of visual line marking devices on the static wires of the proposed new transmission line.	With the proposed line spanning the drainages, and surveys to confirm no breeding birds are present if construction occurs during the nesting period, the proposed project may affect, but is not likely to adversely affect the rufa red knot (Western, 2014).
Sprague's pipit (also a USFS sensitive species)	Approximately 2,548 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Approximately 2,408 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Approximately 3,155 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Potential direct effects include collision with the overhead wires, permanent loss of habitat through placement of structures within grasslands, and disturbance of nests, eggs, and adults during construction (Western, 2014). Potential indirect effects include auditory disruption to breeding calls from males from the audible noise produced from the transmission line corona and helicopters, and habitat fragmentation.	Grassland habitat would be re-established when construction is completed. To avoid direct impacts on Sprague's pipit during construction, proposed activities within grasslands larger than 72 acres would be limited outside of the April 15 to August 1 time period. If construction is not limited to this time period, surveys would be done prior to construction to determine occupancy of the ROW within grasslands larger than 72 acres. If the area contains Sprague's pipit occurrence, no proposed construction would occur within 958 feet of the occupied parcel except if the construction is on the	the proposed project may affect, but is not likely to adversely affect Sprague's pipit (Western, 2014).

Species	Alternative C	Alternative D	Alternative E	Potential Impacts	Mitigation	Effect Determination
					opposite side of a current disturbance (e.g., road). The risk of collision, either during local foraging flights or migration will be reduced by installation of visual line marking devices on the static wires of the proposed new transmission line.	
Whooping crane	Entire length of route of new line within migration corridor; approximately 4,881 acres of NWI-identified wetlands within 1 mile of route.	Entire length of route of new line within migration corridor; approximately 4,734 acres of NWI-identified wetlands within 1 mile of route.	Entire length of route of new line within migration corridor; approximately 4,746 acres of NWI-identified wetlands within 1 mile of route.	No on-the-ground whooping crane use has been documented within the area evaluated in the BA, but whooping cranes will migrate over the proposed project (Western, 2014) each spring and fall. Suitable habitat is crossed by the proposed project.	The risk of line collision would be reduced by installation of visual line marking devices on the static wires of the new transmission line. The line marking plan is outlined in the BA for this project.	Based on the determination to mark the proposed project except for approximately 21.6 miles, it is determined that the proposed project may affect, but is not likely to adversely affect the whooping crane (Western, 2014).

Table 3-15 displays which counties the five endangered species and one threatened species listed under the ESA and candidate species, and three proposed species may be found within the project area (USFWS, 2014). All of these species are animals; no ESA special status plant species are known to exist within the project area (USFWS, 2014). Table 3-15 also discusses that critical habitat for the piping plover is found in Billings, Dunn, McKenzie, Mercer, and Mountrail counties, primarily along the Missouri River, which is crossed near Williston, North Dakota. Critical habitat is defined under the ESA as:

> (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of this Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and
>
> (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of this Act, upon a determination by the Secretary that such areas are essential for the conservation of the species.

Black-footed Ferret—Black-footed ferrets are a federally listed endangered species that depend on prairie dog (*Cynomys* spp.) colonies as a source of food and shelter (USFWS, 1989). The black-footed ferret historically inhabited black-tail and white-tailed prairie dog colonies throughout the Great Plains, but was thought to be extirpated in the wild from 1987 until 1991. In 1991, 49 captive animals were reintroduced into the wild in Wyoming. Since then, ferrets have been reintroduced into Montana, South Dakota, Colorado, and Arizona and are reproducing in the wild. Unconfirmed sightings from other areas continue to be reported. In North Dakota, the majority of the reports come from the southwest part of the state (USFWS, 2011c).

The black-footed ferret inhabits short grass prairies, always within close proximity to prairie dog towns. Black-footed ferrets are sexually mature at 1 year of age, and breeding usually takes place between March and May, with three to four young per litter. Juvenile male ferret mortality rates are high as a result of their dispersing to new areas. Life expectancies for black-footed ferrets are considered to be less than 5 years. Prairie dogs comprise 90 percent of the diet of black-footed ferrets. Ferrets also utilize prairie dog burrows for shelter and raising young (USFWS, 2011c).

Black-footed ferrets are 20 to 24 inches long and weigh up to 2.5 pounds. They have a yellowish, brown body with a distinctive black mask across the face, black on the feet and the tip of the tail. The decline of black-footed ferrets has been linked to the eradication of prairie dogs, which now occupy less than 1 percent of their historic range. Black-footed ferrets are also susceptible to predation by golden eagles, great-horned owls, and coyotes (USFWS, 2011c).

Table 3-15: County of Occurrence of Federally Listed Threatened, Endangered, and Candidate Species and Designated Critical Habitat in the Project Area

Common Name	Scientific Name	Status	County of Occurrence	Counties with Designated Critical Habitat
Black-footed ferret	*Mustela nigripes*	Endangered	Billings, Dunn, McKenzie, Mercer	
Dakota skipper	*Hesperia dacotae*	Proposed Threatened	Dunn, McKenzie, Mountrail	McKenzie
Gray wolf	*Canis lupus*	Endangered	Billings, Dunn, McKenzie, Mercer, Mountrail, Williams	
Interior least tern	*Sternula antillarum*	Endangered	Dunn, McKenzie. Mercer, Mountrail, Williams	
Northern long-eared bat	*Myotis septentrionalis*	Proposed	Dunn, McKenzie. Mercer, Mountrail, Williams	
Pallid sturgeon	*Scaphirhynchus albus*	Endangered	Dunn, McKenzie, Mercer, Mountrail, Williams	
Piping plover	*Charadrius melodus*	Threatened	Dunn, McKenzie, Mercer, Mountrail, Williams	Dunn, McKenzie, Mercer, Mountrail, Williams*
Rufa red knot	*Calidris canutus rufa*	Proposed	<Migrant through North Dakota. Counties currently undetermined.>	
Sprague's pipit	*Anthus spragueii*	Candidate	Billings, Dunn, McKenzie, Mercer, Mountrail, Williams	
Whooping crane	*Grus americana*	Endangered	Billings, Dunn, McKenzie, Mercer, Mountrail, Williams	

Source: USFWS, 2014a

*Piping Plover Critical Habitat Units 2, 3, and 11 (USFWS, 2012c).

Dakota Skipper—The Dakota skipper is a small butterfly with a 1-inch wingspan. Dakota skippers historically range from southern Saskatchewan, across the Dakotas and Minnesota to Iowa and Illinois. Dakota skippers now occur no further east than western Minnesota and are believed to be extirpated in Illinois and Iowa. They occur in scattered remnants of native prairie, with their population distribution straddling the border between tall-grass prairie ecoregions to the east and mixed-grass prairie ecoregions to the west. The most significant remaining populations of Dakota skippers occur in western Minnesota, northeastern South Dakota, and north-central and southeastern North Dakota (USFWS, 2012e). Despite native prairie conservation efforts, the species still faces many threats to its habitat including over-grazing, conversion to cultivated agriculture, inappropriate fire management and herbicide use, woody plant invasion, road construction, gravel mining, invasive plant species, and in some areas, historically high water levels (USFWS, 2012e). The Dakota skipper is a proposed threatened species for listing under the ESA, and has critical habitat listed in McKenzie County. Review of the listing petition for the Dakota Skipper has been ongoing since 2003 (USFWS, 2011f). USFWS revised its *Dakota Skipper Conservation Guidelines* in January 2014 (USFWS, 2014b).

Dakota skippers have four basic life stages: egg, larva, pupa, and adult. During the brief adult period in June and July, female Dakota skippers lay eggs on the underside of leaves close to the ground. These eggs take about 10 days to hatch into larvae. The larvae build shelters at or below the ground surface and emerge at night to feed on grass until late summer or early fall when they become dormant. They overwinter as mid-stage larvae in shelters at or just below ground level, typically in the bases of native bunchgrasses. The larvae emerge the following spring and continue development. Pupation occurs primarily in June and takes about 10 days. Males emerge as adults about 5 days before females. The maximum life span as adults is about 3 weeks and represents the entire reproductive period of the individual (USFWS, 2012e).

The Dakota skipper occurs in two types of habitat. The first is relatively flat and moist native bluestem prairie in which three species of wildflowers are usually present and in flower when Dakota skippers are in their adult (flight) stage: wood lily (*Lilium philadelphicum*), harebell (*Campanula rotundifolia*), and smooth camas (*Zygadenus elegans*). The second habitat type is upland (dry) prairie that is often on ridges and hillsides. Bluestem grasses and needlegrasses dominate these habitats and three wildflowers are typically present: pale purple (*Echinacea pallida*), upright (*E. angustifolia*) coneflowers, and blanketflower (*Gaillardia sp.*) (USFWS, 2002). Of the 38 existing or possibly existing sites in North Dakota, 19 occur within two complexes: Towner-Karlsruhe in McHenry County (13 sites) and Sheyenne Grasslands (6 sites) in Ransom County, over 100 miles to the southeast of AVS. The other 19 sites that are presumed existing are isolated. The largest complex in North Dakota is located within McHenry County (USFWS, 2002), approximately 70 miles west of the Tande and Neset substations. According to USFWS, Dakota skipper may be found within Dunn, McKenzie, and Mountrail counties.

Gray Wolf—Historically, the gray wolf occurred throughout the lower 48 states except for the Southeast and the deserts of the Southwest (USFWS, 2011d). Today, sustainable populations can be found in habitats with low road and human densities in the following states: Minnesota, Michigan, Wisconsin, Idaho, Montana, and Wyoming (USFWS, 2011d). The gray wolf was listed as endangered on March 9, 1978, in the lower 48 states (except Minnesota) (USFWS, 1987). In North Dakota, the gray wolf has been recently de-listed in the region east of the Missouri River from the South Dakota border to Lake Sakakawea and east of the center line of U.S. Highway 83 to the Canadian border. Gray wolves west of this line however are still federally endangered (USFWS, 2012d). The closest wolf pack to North Dakota is in northwestern Minnesota (Licht and Fritts, 1998). Wolves seen in North Dakota are likely animals dispersing from established populations in Minnesota and Canada (USFWS, 2012d).

Gray wolves live in packs consisting of a breeding pair, their young, and other non-breeding adults. The average size litter of five pups is born in late spring and young reach adult size in 8 months. Once reaching sexual maturity in 2 to 3 years, young wolves may leave the pack in search of a mate to establish a new pack. The average life span of the gray wolf is 10 years (USFWS, 2011d). The diet of the gray wolf consists mainly of large ungulates such as deer and elk. However, they are opportunistic and will take smaller animals and domestic livestock. They usually hunt in packs but can make kills of large prey on their own (Montana Natural Heritage Program and Montana Fish, Wildlife and Parks, n.d.).

Due to the lack of a known breeding population in North Dakota, it is unlikely that gray wolves would be encountered in the project area. Although dispersing gray wolves may be spotted anywhere in North Dakota, and therefore in the project area, they would mostly likely be seen in the forested areas of north-central (Turtle Mountains) and northeast North Dakota as these areas provide better cover and hunting (Pembina Hills) (USFWS, 2012d).

Interior Least Tern—Historically, the least tern was found on the Atlantic, Gulf of Mexico, and California coasts and on the Mississippi, Missouri, and Rio Grande River systems. It was found throughout the Missouri River system in North Dakota. The interior population of the least tern presently breeds in the Mississippi, Missouri, and Rio Grande river systems. The birds usually stay in close proximity to the rivers. Decline of the interior population of the least tern is due to loss of habitat from dam construction and river channelization on major rivers throughout the Mississippi, Missouri, and Rio Grande River systems. Dams allow for river flows to be managed in a fashion that is not conducive to the creation and maintenance of sandbars with sparse vegetation, which is needed by the interior least tern for nesting (USFWS, 2011e).

The interior population of least terns was listed as endangered on June 27, 1985 (USFWS, 1990). The population estimate for the interior tern at that time was approximately 5,000 individuals (USFWS, 1990). Almost 17,600 adult least terns were recorded during a 2005 range-wide census of the interior least tern population (Lott, 2006). The majority (11,281) of individuals were observed on the lower Mississippi River, while 2,044 individuals were recorded on the Missouri River (Lott, 2006). USFWS states that approximately 100 pairs breed in North Dakota (USFWS, 2012a).

Nesting least terns mainly utilize sandbars within the free flowing sections of the Missouri and Yellowstone rivers in North Dakota, and to a lesser extent islands and shorelines of both Missouri River reservoirs (Lake Sakakawea and Lake Oahe) in North Dakota (USFWS, 1990, 2012). Nests are built on the ground on a sand or small rocky substrate that is devoid of vegetation (USFWS, 1990, 2012a). Breeding least terns will utilize the river and wetlands adjacent to the nest for foraging (USFWS, 2012a).

Interior least terns begin arriving at nesting sites as early as late April with peak nesting occurring from mid-June to mid-July (USFWS, 1990, 2012a). Least terns are colonial to semi-colonial nesters, and may be found at times with piping plovers, with their nests being shallow depressions in sandy/pebbly substrate. Habitat for this species would be limited to the area of the crossing of the Missouri River west of Williston. It is not known if interior least terns have previously utilized this area for nesting.

Northern Long-eared Bat—The northern long-eared bat is a medium-sized (3-inch long) bat with a 9.5-inch wingspan. This bat has a dark brown dorsal fur and pale-brown ventral fur. It has some of the longest ears of this bat family, which typically has mouse-like smaller ears. In the winter, northern long-eared bats typically use large caves or mines with large passages, constant temperatures, and very high humidity with no air currents as hibernacula. During summer months, northern long-eared bats roost under tree bark (in both alive and dead trees), or in tree cavities or crevices, but rarely in man-made structures. The species is found in 39 states (including North Dakota) and all Canadian provinces; however, it is in danger of extinction due to the white-nose syndrome, impacts to hibernacula and summer habitats, and wind farms (USFWS, 2014c).

Pallid Sturgeon—The historic range of the pallid sturgeon included the Missouri River from Fort Benton, Montana, to St. Louis, Missouri; the Mississippi River from above St. Louis to the Gulf; the lower reaches of other large tributaries, such as the Yellowstone, Platte, Kansas, Ohio, Arkansas, Red, and Sunflower; and the first 60 miles of the Atchafalaya River (USFWS, 2011b). The pallid sturgeon was considered uncommon and historic population estimates on the upper Missouri River were unknown (USFWS, 1993). The pallid sturgeon was listed as endangered on September 6, 1990 (USFWS, 1993). In 2004, there was estimated to be 158 wild adult pallid sturgeons in the Fork Peck and Yellowstone reaches of the species' range (Klungle and Baxter, 2005). Due to ongoing stocking efforts, populations have been increasing on the lower Missouri River (Missouri River Recovery Program, 2010).

Adult pallid sturgeon typically utilizes the bottom of large, turbid, fast flowing rivers. However, their life-cycle requires a wide array of aquatic habitats from floodplain backwaters to main river channels (USFWS, 1993). Pallid sturgeon is a long lived species (up to 40 years), with estimated sexual maturity reached in 7 to 9 years for males and 15 to 20 years for females (USFWS, 1993). Females may spawn only every 3 to 10 years (USFWS, 1993). Overall, the life history of pallid sturgeon is not well understood. Spawning is thought to occur between June and August and historically in the upper reaches of the range coinciding with an increase in river flow from mountain runoff. The feeding ecology of pallid sturgeon is not well understood. It is thought that the diet of young fish is mainly aquatic invertebrates with an increase in small fish consumption as pallid sturgeon age (USFWS, 1993). Habitat for this species is limited to the crossing of the Missouri River west of Williston in areas of open water in the main channel and floodplain backwaters. Impacts on sturgeon habitat are not anticipated because the project is not anticipated to impact surface water habitats or the flooding characteristics of the Missouri River and the adjacent floodplain.

Piping Plover—The piping plover is small shorebird that historically was widely distributed across the Great Plains. The piping plover was listed as threatened across its range in 1985, except in the Great Lakes region where it is listed as endangered (50 *Federal Register* 50733). In the Great Plains, piping plovers inhabit barren sand and gravel shores of rivers and lakes and the shores of alkali wetlands and lakes. Plovers avoid dense vegetation. Habitat destruction and poor breeding success are major reasons for the population decline (USFWS, 2012c).

North Dakota is the most important state in the Great Plains region for nesting piping plovers. The state's population of piping plovers was 496 breeding pairs in 1991 and 399 breeding pairs in 1996. More than three-fourths of piping plovers in North Dakota nest on prairie alkali lakes, while the remainder uses the Missouri River. Almost all natural lakes used by piping plovers in North Dakota are alkaline and have salt-encrusted, white beaches with sparse vegetation. Beaches used by piping plovers generally are 10 to 40 yards wide.

Piping plover habitat on alkali lakes includes more that the beach areas. Designated piping plover critical habitat on alkali lakes and wetlands includes: (1) shallow, seasonally to permanently flooded, mixosaline to hypersaline wetlands with sandy to gravelly, sparsely vegetated beaches, salt-encrusted mud flats, and/or gravelly salt flats; (2) springs and fens along edges of alkali lakes and wetlands; and (3) adjacent uplands 200 feet (61 meters) above the high water mark of the alkali lake or wetland. The entire Missouri River system in North Dakota including the main river and associated reservoirs have been designated as piping plover critical habitat. Critical habitat on the Missouri River includes sparsely vegetated channel sandbars, sand and gravel beaches on islands, temporary pools on sandbars and islands, and the interface with the river. Critical habitat on Lake Sakakawea includes sparsely vegetated shoreline beaches, peninsulas, islands composed of sand, gravel, or shale, and their interface with the water. Piping plovers also use barren river sandbars. In North Dakota, barren river sand bars are found on the Missouri and Yellowstone rivers (USFWS, 2012c).

The breeding season in North Dakota extends from mid-April through August. Pairs are territorial and defend their nest area from other piping plovers. A 4-egg clutch is laid in a shallow depression in open, sand/gravel substrate. Both sexes share in incubation, which lasts about 28 days. Plover chicks can walk and feed within hours of hatching and can fly in about 21 days. Piping plovers feed in open beach areas on insects and crustaceans (USFWS, 2012c).

Habitat for this species would include the area of the crossing of the Missouri River west of Williston and any beach areas associated with alkaline lakes. The area of the Missouri River west of U.S. Highway 85 has been designated critical habitat for the piping plover by USFWS.

Alternatives C, D, and E each contain 64.8 acres of critical habitat[11] within the ROW for piping plovers. Critical habitat crossed by the project for piping plovers includes the banks of the Missouri River and its associated islands, and sandbars and floodplains of the Missouri River near Williston. Potential impacts on piping plover habitat would include the disturbance to birds and nesting areas and placement of structures within areas of potential nesting habitat. Basin Electric would coordinate with USFWS regarding permitting requirements and construction conditions. At a minimum, it is expected that USFWS would prohibit construction in designated critical habitat during the piping plover nesting season (April 1 to August 31). Impacts on piping plovers cannot be fully identified and quantified until the final engineering analysis has determined the actual location of the structures.

Rufa Red Knot—The rufa subspecies of the red knot is a medium-sized molluscivore shorebird (9 to 11 inches long). This species is a long-distance migrant that winters as far south as coastal Argentina, but breeds in the Canadian Arctic. Red knots occur mainly along ocean coasts during migration, but have been documented in most U.S. states, though little information on non-coastal habitats is available. Based on energy requirements of this long-distance migratory bird species, it would seem likely that any red knot stopover areas would contain abundant food resources. The rufa red knot is proposed for federal listing as threatened (Western, 2014).

Sprague's Pipit—The Sprague's pipit is a small, grassland bird. It migrates from breeding grounds in the northern prairies of southern Canada and northern United States to the wintering grounds in southern United States and northern Mexico. The Sprague's pipit was designated as a candidate for listing under the ESA on September 15, 2010 (75 *Federal Register* 56028). Historically, Sprague's pipit was found throughout the native prairie grasslands of North

[11] Piping plover critical habitat information was obtained from USFWS maps. Acreage of piping plover critical habitat was determined by measuring the amount of critical habitat occurring within the proposed project ROW.

America; now they are only common in large remnant grassland patches in the northern mixed-grass native prairie of North America.

Native grassland is used extensively by Sprague's pipits throughout their life cycle. Typical nest sites are dominated by native grasses and sedges with forbs and shrubs, litter, and bare ground present in lesser amounts. Larger tracts of native grassland in landscapes dominated by grasslands are thought to influence the abundance of Sprague's pipits on their breeding grounds. Sprague's pipits have not been documented nesting in Conservation Reserve Program grasslands, dense nesting cover (waterfowl nesting habitat), or cropland (USFWS, 2010a). Large tracts of grassland are also preferred habitat for wintering Sprague's pipits, but they may use non-native grasslands to a greater extent. Little if any data is available for habitat preferences during migration.

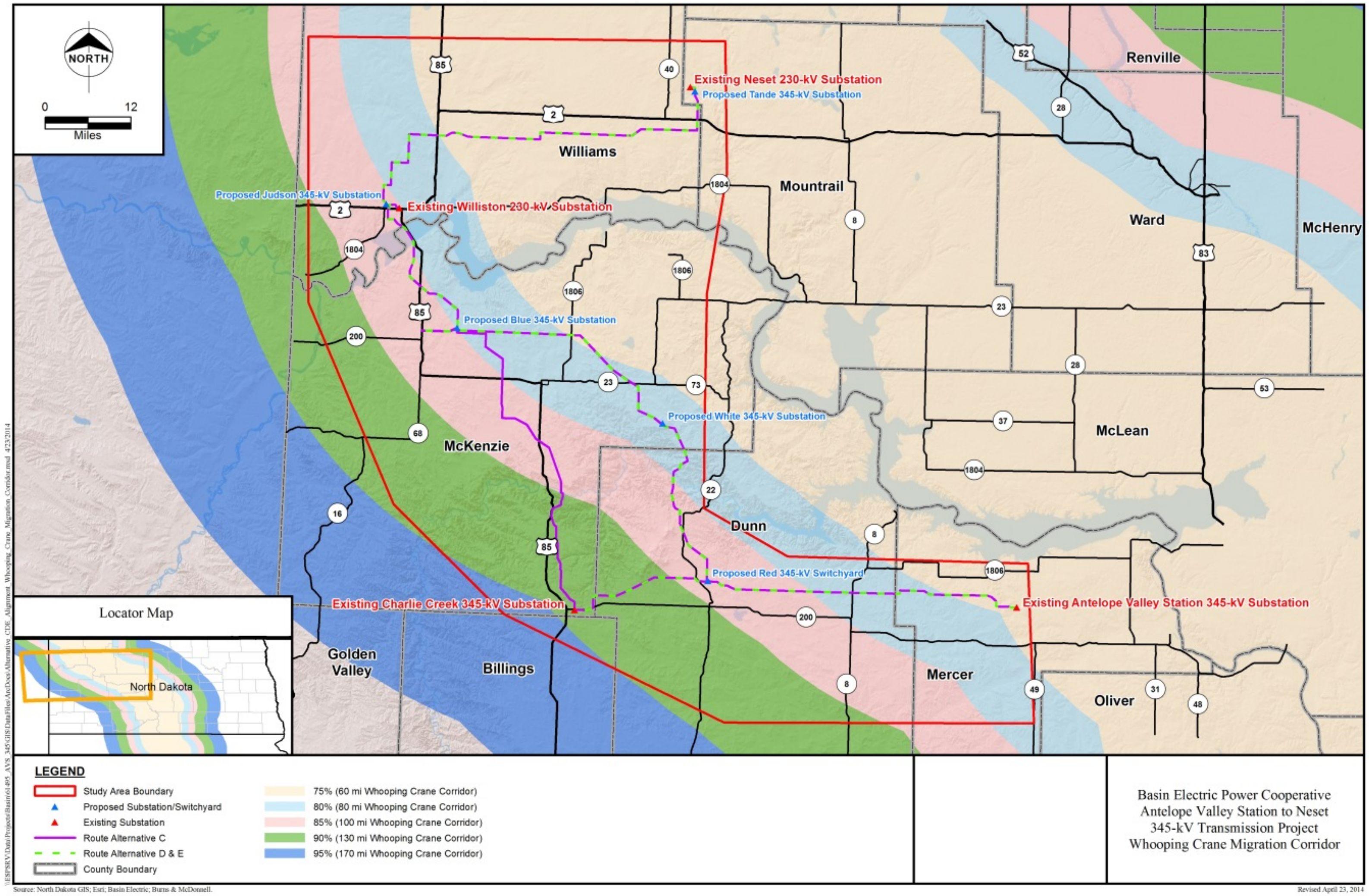
Sprague's pipits breed in the historic prairie regions of the northern United States, including central and western North Dakota, and Canada and winter from central Texas south into central Mexico. They arrive on the breeding grounds from mid-April to mid-May with nest initiation anywhere from the second week of May to early August. Four to five eggs are laid on the ground in a cup-shaped nest made of grass. The nest may also be covered with a grass canopy. Incubation is usually 12 to 14 days and mostly done by the female. Generally, Sprague's pipits leave the breeding grounds in late September and arrive on their wintering grounds by early November. The diet of Sprague's pipits consists mostly of arthropods (Jones, 2010). Habitat for Sprague's pipit occurs within the study area in areas of native grasslands. In addition to being a candidate for listing under the ESA and a USFS sensitive species, Sprague's pipit is also a ND Level I Species of Conservation Priority (NDGFD, 2010e; Appendix J).

Whooping Crane—Whooping cranes are the tallest North American bird. They are omnivorous, nest in marshes, and make long winter and spring migrations from their breeding areas in and around Wood Buffalo National Park in Canada and their winter grounds in and around the Aransas National Wildlife Refuge (USFWS, 2007b). They were listed as "threatened with extinction" in 1967 and "endangered" in 1970, then listed as federally endangered after the ESA was passed. They are also listed as endangered in Canada. The natural population of whooping cranes came to an all-time low of 15 individuals in 1941. Since then, the wild population of whooping cranes (of which only one is known to exist) has grown steadily to 279 individuals in 2011 (USFWS, 2012g). The total population of wild and captive whooping cranes, as of 2011, was 437 (USFWS, 2012g).

Although critical habitat for whooping crane has not been designated within North Dakota, much of the project area is within the whooping crane migration corridor, as defined by USFWS, and contains habitat types that whooping cranes use for foraging (e.g., cropfields) and roosting (e.g., wetlands). This migration corridor provides the area within which whooping cranes could be expected to occur during spring and fall migration periods. The centerline of the corridor represents the core of the area followed by the cranes. The wider the migration corridor, the more likely cranes will occur within the corridor area considered. However, as the migration corridor widens out, the likelihood of crane occurrence decreases with distance from the migration corridor centerline. While the potential for crane occurrence at any particular location within the migration corridor would vary from year to year based on weather conditions and associated availability of water, wetlands, and crop stages, over time, the greatest crane occurrence and use would trend toward the centerline of the migration corridor. Figure 3-27 depicts Alternatives C, D, and E in relation to the whooping crane migration corridor.

Whooping cranes are highly dependent on wetlands during migration for roosting, resting, and feeding and have been known to use wetland areas within the project area. Wetland acres within 1 mile of the proposed route may also provide an indication of the likelihood of whooping cranes using the project area. Alternatives C, D, and E would be located within 1 mile of approximately 4,881, 4,734, and 4,746 acres, respectively of NWI–identified wetlands for the length of the route.

Figure 3-27: Whooping Crane Migration Corridor



Source: Tacha et al., 2008

Surveys for Protected Species under U.S. Fish and Wildlife Jurisdiction

A final BA was submitted to USFWS for review in January; Western is expecting concurrence from USFWS for the project in spring 2014. As a result of this coordination and in preparation of the BA, desktop reviews and field surveys occurred in the fall 2012 and spring and summer 2013 for the following species.

Migratory Birds—If construction occurs between April 15 and August 1, areas of grassland, forest, and shrubland would be searched for nesting birds protected under the Migratory Bird Treaty Act. Also, the USFWS recommended to RUS in a November 23, 2011 technical services comment letter, that conservation measures related to transmission lines should be discussed.

Piping Plover—Beginning in fall 2012, an analysis of piping plover habitat was conducted by reviewing aerial photography and NWI data to determine wetland locations within a 2,000-foot survey corridor (1,000 feet on each side of the centerline). A field survey was conducted in July 2013 and no habitat was present within 0.5 mile of the Missouri River crossing area. A presence survey for piping plover would be conducted prior to initiating construction activities in areas identified as habitat for the species, if construction occurs during nesting season (April 1 through August 31).

Raptor Nest Surveys—An occupancy survey for raptor nests within a 2-mile-wide survey corridor (1 mile on either side of the centerline for the southern loop of Alternative C) occurred in spring 2013. A subsequent survey of nest occupancy of the remainder of Alternative C and all of Alternatives D and E for raptor nests will be conducted in winter/early spring before trees leaf out and obscure nests in 2014.

Sprague’s Pipit—Beginning in fall 2012, an analysis of Sprague’s pipit habitat was conducted by reviewing aerial photography to determine native prairie grasslands locations within a 2,000-foot survey corridor (1,000 feet on each side of the centerline). An occupancy survey for Sprague’s pipit would be conducted prior to construction activities in areas identified as habitat for the species if construction is proposed to occur between April 15 and August 1. Further, to reduce inherent observer and detection bias which can limit the usefulness of surveys for rare species, multiple surveys would be conducted, as multiple surveys are more effective for occupancy determinations. Survey’s for Sprague’s pipit would be conducted between the third week in April and the third week in May and then between mid-June and early July.

Whooping Crane—The initial determination of whooping crane habitat within the project study area was determined using the Resource Selection Function methodology discussed with USFWS. This methodology provides a quantitative means by which areas crossed by the proposed project can be compared to areas at different distances from the project. The Resource Selection Function methodology also helps inform plans for marking the proposed project with avian bird diverters. Line markers would be installed along the length of the transmission line in areas with suitable stopover habitat, except in areas where the line is greater than 0.25-mile from cropland and/or the line is 0.25-mile or greater from a wetland that is not within a steep-side ravine. These areas were determined to be unsuitable habitat for whooping cranes, and the Resource Selection Function analysis rates these areas low in potential use. Basin Electric would place PREFORMED Line Products' (or equivalent) spiral yellow bird-flight diverters (Model: BFD-MS-3341 and BFD-MS-3164 or equivalent) or equivalent along both shield wires in areas of suitable habitat. The Avian Power Line Interaction Committee (APLIC, 2012) indicates that marking the center of 60 percent of the spans is effective in reducing strikes because birds see the towers/poles when closer. The visual marking devices would be spaced 50 feet apart, starting 150 feet away from each structure so that the area representing more than 60 percent of the center span would be marked. The visual marking devices would be spaced 100 feet apart, but markers would be staggered with each other to give the appearance, looking from the side, that they are 50 feet apart and to make the shield wires more visible in a horizontal plane. The visual marking devices would be installed on the new transmission line in the 95 percent whooping crane migration corridor (Figure 3-27) within 1 mile of suitable stopover habitat. The Resource Selection Function analysis and the line marking plan are discussed and mapped in greater detail in the BA, specifically, 253.4 miles of the transmission line (91 percent of the total line). Also, Basin Electric has a system-wide Avian Protection Plan that it would implement for this project. No surveys would be required for other species under the jurisdiction of USFWS.

U.S. Forest Service Sensitive and Management Indicator Species

There are 20 animal species known to occur in the Dakota Prairie National Grasslands (Little Missouri, Sheyenne, Cedar River, and Grand River National Grasslands) that are considered by USFS to be sensitive species in North Dakota (Appendix I). In addition, there are 38 sensitive/watch plant species identified for LMNG (Appendix K). Range, habitat, and life history information for the 20 sensitive animal species is presented below in Table 3-16. Habitat information for the sensitive/watch plant species is contained in Appendix K. The plains sharp-tailed grouse (*Tympanuchus phasianellus jamesii*) is identified as an MIS in the *Land and Resource Management Plan for the Dakota Prairie National Grasslands Northern Region 2001* (USFS, 2001) and is addressed in this EIS at the request of USFS (USFS, 2012a).

Table 3-16: Potential Project Considerations for U.S. Forest Service Sensitive and Management Indicator Species (Animals Only) on U.S. Forest Service Lands

Species	Alternative C	Alternative D	Alternative E	Potential Impacts	Mitigation	Effect Determination
BIRDS						
Baird's sparrow	Approximately 2,548 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Approximately 2,408 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Approximately 3,155 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Potential temporary disturbance to native grassland habitat within the ROW during construction of the project.	Grassland habitat would be re-established when construction is completed. Direct impacts on Baird's sparrow would be avoided during construction by searching for nesting birds ahead of ground-disturbing equipment if construction occurs between April 15 and August 1; occupied nests would avoided.	Habitat for Baird's sparrow is likely present on the LMNG parcels crossed by the proposed project; therefore, the proposed project may impact individuals or their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (Basin Electric and USFS, 2013).
Bald eagle	No known nests within 1 mile of the centerline of the southern loop of Alternative C, which was surveyed in spring 2013. The remainder of the route will be surveyed in 2014.	Raptor nest surveys to be conducted in 2014.	Raptor nest surveys to be conducted in 2014.	The proposed project would cross the Missouri River; therefore, nesting bald eagles and their habitat could be impacted. Migratory bald eagles could be impacted at any of the locations where the proposed project crosses LMNG parcels. Impacts might include injury or death resulting from collisions with the transmission lines or towers, or avoidance of nests or other habitat features due to construction or presence of the proposed transmission line. (Surveys were completed 1 mile in each direction from the centerline for a portion of Alternative C.)	Basin Electric would follow Dakota Prairie Grasslands standards and guidelines related to bald eagles (USFS, 2001). No noise or activities (including helicopters) within 1 mile of a bald eagle nest on USFS lands from February 1 to July 31. No noise or activities within 1 mile of a bald eagle winter roost from November 15 to March 1 on USFS lands. Basin Electric would develop an Avian Protection Plan for operation of the line and associated facilities and the majority of the proposed project would have line markers installed in minimize potential for line collisions.	The proposed project may impact individual breeding or migratory bald eagles or their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (Basin Electric and USFS, 2013).

Species	Alternative C	Alternative D	Alternative E	Potential Impacts	Mitigation	Effect Determination
Burrowing owl	Approximately 2,548 acres of grassland within the proposed ROW (Table 3-11).	Approximately 2,408 acres of grassland within the proposed ROW (Table 3-11).	Approximately 3,155 acres of grassland within the proposed ROW (Table 3-11).	Although no prairie dog colonies were found in the project area during field visits in May and June 2013, burrowing owls could use other mammal burrows. Presence-absence surveys would be conducted and the impacts to this species' habitat would be quantified once the final design and location of facilities is determined.	Grassland habitat would be re-established when construction is completed. Surveys for burrowing owls would be conducted prior to construction if construction occurs between April 1 and August 1.	The proposed project may impact individual burrowing owls or their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (Basin Electric and USFS, 2013).
Greater prairie chicken	None.	None.	None.	No populations known to exist within the project area.	None.	The greater prairie chicken is not known from the LMNG, nor is habitat available in the LMNG portion of the Dakota Prairie Grasslands for this species. Therefore, the proposed project will have no impact on this species at this time (Basin Electric and USFS, 2013).
Greater sage-grouse	Approximately 1.3 acres of sagebrush habitat within the proposed ROW (Strong, et al., 2005).	Approximately 0.7 acre of sagebrush habitat within the proposed ROW (Strong, et al., 2005).	Approximately 0.9 acre of sagebrush habitat within the proposed ROW (Strong, et al., 2005).	Potential disturbance to sagebrush habitat within ROW. Sage grouse are not reported from the project area, but are reported from adjacent counties.	Basin Electric would coordinate with USFWS, USFS, and NDGFD regarding greater sage-grouse habitat. Structures would not be placed within 0.25 mile of active lek sites on USFS lands. Basin Electric would consult with	The known distribution of greater sage-grouse in North Dakota does not include the study area, and since they are largely non-migratory, they are unlikely to be found there even incidentally. Therefore, the proposed project will have

Species	Alternative C	Alternative D	Alternative E	Potential Impacts	Mitigation	Effect Determination
					USFWS, USFS, and NDGFD prior to construction within a 2-mile radius of an active lek on USFS lands during the period March 1 through June 15. Sagebrush habitat would be re-established when construction is completed; project-specific mitigation measures would be developed in consultation with USFS and included as conditions in the SUP.	no impact on this species on the LMNG at this time (Basin Electric and USFS, 2013). Presence-absence surveys will be conducted and the impacts to this species' habitat will be quantified once the final design and location of facilities is determined.
Loggerhead shrike	Approximately 2,548 acres of grassland within the proposed ROW (Table 3-11). Approximately 1.3 acres of sage brush habitat within the proposed ROW (Strong, et al., 2005).	Approximately 2,408 acres of grassland within the proposed ROW (Table 3-11). Approximately 0.7 acre of sage brush habitat within the proposed ROW (Strong, et al., 2005).	Approximately 3,155 acres of grassland within the proposed ROW (Table 3-11). Approximately 0.9 acre of sage brush habitat within the proposed ROW (Strong, et al., 2005).	Disturbance to loggerhead shrike habitat might occur on LMNG parcels when shrubs and trees at structure locations are cleared between structures for driving within the ROW.	Sage brush and grassland habitat would be re-established when construction is completed. Direct impacts to loggerhead shrike would be avoided during construction by searching for nesting birds ahead of ground disturbing equipment if construction occurs between April 15 and August 1; occupied nests would be avoided.	Habitat for loggerhead shrike is likely present on the LMNG parcels crossed by the proposed project; therefore, the proposed project may impact individual loggerhead shrike or their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (Basin Electric and USFS, 2013).

Species	Alternative C	Alternative D	Alternative E	Potential Impacts	Mitigation	Effect Determination
Long-billed curlew	Approximately 2,548 acres of grassland within the proposed ROW (Table 3-11). Approximately 1,671 acres of cropland within the proposed ROW (Table 3-11).	Approximately 2,408 acres of grassland within the proposed ROW (Table 3-11). Approximately 1,505 acres of cropland within the proposed ROW (Table 3-11).	Approximately 3,155 acres of grassland within the proposed ROW (Table 3-11). Approximately 1,720 acres of cropland within the proposed ROW (Table 3-11).	Potential temporary disturbance to grassland habitat and cropland within the ROW through construction of the project (e.g., driving between structures and placement of structures).	Grassland habitat to be re-established when construction is completed. Direct impacts on the curlew would be avoided during construction by searching for nesting birds ahead of ground disturbing equipment if construction occurs between April 15 and August 1; occupied nests would be avoided.	Habitat for long-billed curlew is likely present on the LMNG parcels crossed by the proposed project; therefore, the proposed project may impact individual long-billed curlew or their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (Basin Electric and USFS, 2013).
Plains sharp-tailed grouse	Approximately 2,548 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Approximately 2,408 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Approximately 3,155 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Potential temporary disturbance to native grassland habitat within the ROW. Sharp-tailed grouse are a common year-round resident throughout North Dakota (Basin Electric and USFS, 2013).	Grassland habitat would be re-established when construction is completed. Basin Electric would coordinate with USFS and NDGFD regarding sharp-tailed grouse habitat. Structures would generally not be placed within 0.25 mile of active lek sites on USFS lands. Basin Electric would consult with these agencies prior to construction within a 1-mile radius of an active lek during the period of March 1 through June 15 on USFS lands. If construction is expected to occur within 1 mile of any historic lek during this time period, surveys would be done prior to construction to determine lek use.	Given the overall distance of leks from the proposed project and the commitment to limit disturbance to outside of the lekking period or to certain times of the day during the lekking period, the project may impact sharp-tailed grouse or their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (Basin Electric and USFS, 2013).

Species	Alternative C	Alternative D	Alternative E	Potential Impacts	Mitigation	Effect Determination
			MAMMALS			
Black-tailed prairie dog (also a MIS for the LMNG)	Approximately 2,548 acres of grassland within the proposed ROW (Table 3-11).	Approximately 2,408 acres of grassland within the proposed ROW (Table 3-11).	Approximately 3,155 acres of grassland within the proposed ROW (Table 3-11).	Potential temporary disturbance to native and non-native grassland habitat within ROW. No known prairie dog towns exist near the ROW, based on USFS and NDGFD data, field surveys, and aerial photography. However, grassland habitat exists on some of the LMNG parcels that could be occupied by black-tailed prairie dogs should they expand into the project area.	Grassland habitat would be re-established when construction is completed.	The proposed project may impact black-tailed prairie dog habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (Basin Electric and USFS, 2013).
Bighorn sheep	Approximately 0.7 acre of cliff, canyon, and talus habitat within the proposed ROW (Table 3-12).	Approximately 0.4 acre of cliff, canyon, and talus habitat within the proposed ROW (Table 3-12).	Approximately 1.5 acres of cliff, canyon, and talus habitat within the proposed ROW (Table 3-12).	Potential impacts to foraging, wintering, and lambing habitat. The northern-most LMNG parcel that would be crossed by the proposed transmission line is near, but not within, the Bighorn Sheep management area (3.51) or within Rangelands with Diverse Natural Appearing Landscapes (3.65) concurrent with bighorn sheep. The area where the transmission line would cross this parcel does not contain preferred habitat for bighorn sheep and is close to U.S. Highway 85, but incidental use could occur. Bighorn sheep are likely to avoid the activity and noise associated with construction (including helicopters).	Basin Electric has committed to coordinate with USFS and NDGFD to avoid construction during bighorn sheep lambing season (April 1 through July 1) in the Little Missouri Badlands area and LMNG.	Because the proposed transmission line does not occur in a bighorn sheep management area, does not contain preferred habitat, and construction will not occur during lambing season, the proposed project would have no impact on bighorn sheep (Basin Electric and USFS, 2013).

Species	Alternative C	Alternative D	Alternative E	Potential Impacts	Mitigation	Effect Determination
Northern long-eared bat	Approximately 183 acres of woodland habitat within the proposed ROW. No known hibernacula in the ROW.	Approximately 120 acres of woodland habitat within the proposed ROW. No known hibernacula in the ROW.	Approximately 189 acres of woodland habitat within the proposed ROW. No known hibernacula in the ROW.	Potential direct effects from the proposed project include collision with the overhead wires, and permanent loss of habitat through placement of structures in sites that are in close proximity to potential hibernacula, forested areas, and water sources. Possible indirect effects to include auditory disruption (from the audible noise produced from the corona generated by the transmission line and helicopters).	To decrease direct impacts on the species during construction, proposed construction activities within 1,000 feet of suitable hibernacula would be avoided during the winter hibernation period (roughly late fall to early spring). In addition to avoiding hibernacula during construction, all mature, dead, or dying trees would be left intact, where they do not pose a safety concern for line reliability.	The proposed project may affect, but is not likely to adversely affect the northern long-eared bat (Basin Electric and USFS, 2013).
FISH						
Northern Redbelly Dace	None.	None.	None.	In western North Dakota, the northern redbelly dace has been recorded from the upper reaches of the Knife River, Heart River, and Cannonball River drainages (Morey and Berry, 2004). The upper reaches of these rivers extend into Billings and Slope counties, but not McKenzie County.	None.	Because this species does not occur near the proposed project, the project will have no impact on the northern redbelly dace (Basin Electric and USFS, 2013).
INSECTS						
Arogos skipper	Approximately 2,548 acres of grassland habitat potentially containing areas of suitable native grassland	Approximately 2,408 acres of grassland habitat potentially containing areas of suitable native grassland	Approximately 3,155 acres of grassland habitat potentially containing areas of suitable native grassland	Potential temporary disturbance to native grassland habitat within the ROW.	Grassland habitat would be re-established when construction is completed.	Habitat for Arogos skipper may be present on the LMNG parcels crossed by the proposed project, but there are no records of Arogos skipper in McKenzie or adjacent counties; therefore, the proposed project may impact Arogos

Species	Alternative C	Alternative D	Alternative E	Potential Impacts	Mitigation	Effect Determination
	within the proposed ROW (Table 3-11).	within the proposed ROW (Table 3-11).	within the proposed ROW (Table 3-11).			skipper habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. Since the proposed project will not result in conversion of large tracks of native prairie to other uses, impacts on Arogos skipper habitat will not constitute a primary threat to the species (Basin Electric and USFS, 2013).
Broad-winged skipper	None.	None.	None.	Habitat for broad-winged skipper may be present on the LMNG parcels crossed by the proposed project, but no transmission structures would be placed within wetland boundaries.	None.	Since the broad-winged skipper is not known to occur in western North Dakota, including the LMNG, and habitat for the species, if present, would not be impacted by the proposed project, the project will have no impact on the broad-winged skipper (Basin Electric and USFS, 2013).
Dion skipper	None.	None.	None.	No populations are known to exist in the project area. The species has only been reported from eastern North Dakota. Habitat for Dion skipper may be present on the LMNG parcels crossed by the proposed project, but no transmission structures would be placed within wetland boundaries.	None.	Since the Dion skipper is not known to occur in western North Dakota, including the LMNG, and habitat for the species, if present, would not be impacted by the proposed project, the project will have no impact on the Dion skipper (Basin Electric and USFS, 2013).
Mulberry wing	None.	None.	None.	No populations are known to exist in the project area. The species has only been	None.	Since the mulberry wing is not known to occur in western North Dakota,

Species	Alternative C	Alternative D	Alternative E	Potential Impacts	Mitigation	Effect Determination
				reported from eastern North Dakota. Habitat for mulberry wing may be present on the LMNG parcels crossed by the proposed project, but no transmission structures would be placed within wetland boundaries.		including the LMNG, and habitat for the species, if present, would not be impacted by the proposed project, the project will have no impact on the mulberry wing (Basin Electric and USFS, 2013).
Ottoe skipper	Approximately 2,548 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Approximately 2,408 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Approximately 3,155 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Populations known to exist in western North Dakota (USFWS, 2011d). Potential temporary disturbance to native grassland habitat within the ROW.	Grassland habitat would be re-established when construction is completed.	Habitat for Ottoe skipper might be present on the LMNG parcels crossed by the proposed project and the species has been recorded in McKenzie County; therefore, the proposed project may impact individuals or their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (Basin Electric and USFS, 2013).
Powesheik skipper	None.	None.	None.	No populations are known to exist in the project area. The species has only been reported from eastern North Dakota.	None.	Tallgrass prairie habitat for powesheik skipper is not found on the LMNG parcels crossed by the proposed project and this species has not been recorded in western North Dakota; therefore, the proposed project will have no impact on the powesheik skipper (Basin Electric and USFS, 2013).

Species	Alternative C	Alternative D	Alternative E	Potential Impacts	Mitigation	Effect Determination
Regal fritillary	Approximately 2,548 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Approximately 2,408 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Approximately 3,155 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11).	Populations are known to exist in western North Dakota. Potential temporary disturbance to native grassland habitat within the ROW. Although tallgrass prairie habitat does not occur on the LMNG parcels crossed by the proposed project, other habitats used by regal fritillary such as damp meadows, marshes, wet fields might occur. However, no transmission structures would be placed within these habitats (i.e., within any wetland boundaries).	Grassland habitat would be re-established when construction is completed.	Habitat for this species will not be affected by the proposed project; therefore, the proposed project will have **no impact** on the regal fritillary, if present (Basin Electric and USFS, 2013).
Tawny crescent	Approximately 2,548 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11). Approximately 0.02 acre of forested wetland in the proposed ROW (Table 3-13).	Approximately 2,408 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11). Approximately 0.02 acre of forested wetland in the proposed ROW (Table 3-13).	Approximately 3,155 acres of grassland habitat potentially containing areas of suitable native grassland within the proposed ROW (Table 3-11). Approximately 0.02 acre of forested wetland in the proposed ROW (Table 3-13).	Populations are known to exist in western North Dakota. Potential temporary disturbance to native grassland habitat within the ROW.	Grassland habitat would be re-established when construction is completed.	Habitat for tawny crescent butterfly might be present on the LMNG parcels crossed by the proposed project and the species has been recorded in McKenzie County; therefore, the proposed project **may impact** individuals or their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (Basin Electric and USFS, 2013).

U.S. Forest Service Sensitive and Management Indicator Species

Coordination with the USFS Dakota Prairie Grasslands office (USFS, 2012b) resulted in USFS providing a list of sensitive wildlife species. USFS's Region 1 Regional Office prepared this list and identified several species as being of special conservation concern in the grasslands areas across Montana, Idaho, North Dakota, and South Dakota. The list is included in Appendix I. USFS also asked that the EIS address two MIS species for the Dakota Prairie National Grasslands: the sharp-tailed grouse and the black-tailed prairie dog (USFS, 2012a). To issue a SUP to cross USFS lands, USFS requested that a BE be prepared and that field surveys be conducted for sensitive plant species that have been identified on USFS lands. These surveys took place during May and June 2013, and the results are included in the BE (Basin Electric and USFS, 2013). All surveys were conducted in compliance with USFS protocols for the LMNG. No individuals of these species were found during the survey efforts. Although no individuals were found, the proposed project may impact habitat for these species, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. BMPs should be implemented during construction and operations to limit impacts on these species. Disturbance of as little habitat as possible would decrease any direct, indirect, and cumulative impacts on these species. Species descriptions, survey findings, and impact determinations for the sensitive species identified on USFS lands are presented in the BE (Basin Electric and USFS, 2013). This data for plant species is summarized in Table 3-17 and discussed briefly for animal species below.

Table 3-17: Potential Project Considerations for U.S. Forest Service Sensitive Plant Species

Plant Species	Status in LMNG	Survey Data for Project Area in LMNG	Impact Determinations
Alkali sacaton *Sporobolus airoides*	Documented on secondary succession on clay outwashes, tolerant of the saline conditions; also been documented on dry to moist sandy or gravelly soil.	Limited habitat found, but clay outwashes do occur. No alkali sacaton was observed.	Given the low level of direct impact in these areas, general low amounts of potential habitat, application of standard BMPs, and lack of documented occurrence, the proposed project will have **no impact** on alkali sacaton (Basin Electric and USFS, 2013).
Alyssum-leaved phlox *Phlox alyssifolia*	Documented on sandy or gravelly soils on and around Bullion Butte; also reported on clay banks and limestone ridges of open prairies.	No alyssum-leaved phlox were found, but habitat does occur in the project area.	Given the low level of direct impact within the USFS Grasslands from the project, the significant distance of known populations from the project, application of standard BMPs, and lack of documented occurrence, the proposed project will have **no impact** on alyssum-leaved phlox (Basin Electric and USFS, 2013).
Blue lips *Collinsia parviflora*	Documented in woody understories, including green ash/elm draws, Rocky Mountain juniper, mesic shrub communities, and occasional xeric shrub communities.	No blue lips were found, but habitat does occur in the project area.	Given the low level of direct impact within the USFS Grasslands from the project, no known populations near the project, no impacts to wetland areas, application of standard BMPs, and lack of documented occurrence, the proposed project will have **no impact** on blue lips (Basin Electric and USFS, 2013).
Dakota buckwheat *Eriogonum visheri*	Documented on relatively exposed clay/silt substrates with low plant cover such as outwash zones around eroding buttes, saddles, steep convex slopes, and erosional breaks on prairie slopes. Occasional populations documented among dense saltgrass communities.	Limited habitat for Dakota buckwheat was found, but exposed clay/silt outwashes do occur. No Dakota buckwheat was observed.	Given the low level of direct impact within the USFS Grasslands from the project, no known populations near the project, application of BMPs, and lack of documented occurrence, the proposed project will have **no impact** on Dakota buckwheat (Basin Electric and USFS, 2013).

Plant Species	Status in LMNG	Survey Data for Project Area in LMNG	Impact Determinations
Dwarf Mentzelia *Mentzelia pumila*	Documented on scoria exposures and colluviums with low plant cover; also reported on slopes and sandy plains and occasionally on hard clays and rocky soils.	Limited habitat for the species was found, but dry slopes and sandy plains do occur. No dwarf mentzelia was observed.	Given the low level of direct impact within the USFS Grasslands from the project, no known populations near the project, application of standard BMPs, and lack of documented occurrence, the proposed project will have **no impact** on dwarf mentzelia. (Basin Electric and USFS, 2013)
Easter daisy *Townsendia exscapa*	Documented on dry plains and hillsides, often with loamy or increased soil development and increased plant cover relative to Hooker's townsendia.	No Easter daisies were found, but habitat does occur in the project area and the species is known to occur in the general area of the project.	May impact Easter daisy habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (Basin Electric and USFS, 2013).
Hooker's Townsendia *Townsendia hookeri*	Documented on dry plains, hillsides, gravelly benches, and weather scoria with low to moderate plant cover, but often clay matrix subsoil.	No Hooker's townsendia were found, but habitat does occur in the project area and the species is known to occur in the general area of the project.	May impact Hooker's townsendia habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (Basin Electric and USFS, 2013).
Lance-leaf cottonwood *Populus* x *accuminata*	Documented in mesic woody draws, often with springs/seeps, and occasionally near springs on open hillsides; also coulees, floodplains, and stream banks.	No lance-leaf cottonwood were found, but habitat does occur in the project area within riparian areas and other treed areas that may need to be cleared of trees.	May impact lance-leaf cottonwood habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (Basin Electric and USFS, 2013).
Limber pine *Pinus flexilis*	Limited to the Limber Pines Research Natural Area. According to the USFS, this species is thought to have been planted in the region specific to the Limber Pines Research Natural Area by Native Americans. As such, it is not expected to be found elsewhere in North Dakota (Basin Electric and USFS, 2013).	No limber pines were found, but habitat for the species does occur.	Given that the species is thought to be transplanted to the area and has never been found outside of the Limber Pines Research Natural Area, **no impacts** to the species are anticipated from the proposed project (Basin Electric and USFS, 2013).

Plant Species	Status in LMNG	Survey Data for Project Area in LMNG	Impact Determinations
Missouri pincushion cactus *Escobaria missouriensis*	Documented on prairie slopes and plains, stony to loamy to clayey short-grass to mixed-grass prairie; also reported in woodlands of ponderosa pine (*Pinus ponderosa*) and oak (*Quercus* spp).	Pincushion cacti were found in the project area during the May survey but the species could not be confirmed because they were not yet flowering. These locations were revisited in June with the LMNG botanist who confirmed the pincushion cacti found were <u>not</u> Missouri pincushion cactus.	May impact Missouri pincushion cactus habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (Basin Electric and USFS, 2013).
Nodding wild buckwheat *Eriogonum cernuum*	Documented on exposed sand substrates with low plant cover in grasslands, hillsides, and sandstone outcrops	No individuals were found.	Given the low level of direct impact within the USFS Grasslands from the project, no known populations near the project, application of standard BMPs, and lack of documented occurrence, the proposed project will have **no impact** on nodding buckwheat (Basin Electric and USFS, 2013).
Sand lily *Leucocrinum montanum*	Documented generally in shortgrass communities with fine textured substrates; also found in crested wheatgrass communities	No sand lilies were found.	Given the low level of direct impact within the USFS Grasslands from the project, the fact that there are no known populations near the project, only one location for the species is known, application of standard BMPs, and lack of documented occurrence, the proposed project will have **no impact** on sand lily.
Slimleaf goosefoot *Chenopodium subglabrum*	Documented on sandbars, terraces, and dune complexes along rivers and creeks; also documented on exposed sandy substrates in uplands, blowouts, outcrops, colluvium, etc.	No individuals were found, but limited habitat does occur.	Given the low level of direct impact within the USFS Grasslands from the project, avoidance of wetland impacts (not that this is a wetland species, but near wetlands), application of standard BMPs, and lack of documented occurrence, the proposed project will have **no impact** on slimleaf goosefoot (Basin Electric and USFS, 2013).

Plant Species	Status in LMNG	Survey Data for Project Area in LMNG	Impact Determinations
Torrey's Cryptantha *Cryptantha torreyana*	Documented on dry plains, rock outcrops, escarpments, and pine slopes.	No individuals were found.	Given the low level of direct impact within the USFS Grasslands from the project, the fact that no known populations have been identified near the project, application of standard BMPs, and the lack of documented occurrence, the proposed project will have **no impact** on Torrey's cryptantha (Basin Electric and USFS, 2013).

Baird's Sparrow—Baird's sparrow (*Ammodramus bairdii*) is a smallish bird that lives almost exclusively in native prairie areas within the northern Great Plains. Baird's sparrows prefer native prairie and forbs that is relatively clear of grass litter and heavy brush. They spend summers in the Great Plains region of North Dakota, Montana and the Canadian provinces of Saskatchewan, Alberta and Manitoba. Winters are spent in Arizona and Mexico, with birds arriving in October and November. Females lay one brood a year of 3 to 6 eggs that they incubate for 11 to 12 days. Young will stay in the nest for 8 to 10 days before leaving the nest (while still flightless) to forage. Young Baird's sparrows eat only spiders and insects, while adults feed on seeds and insects. Baird's sparrow numbers have declined due to loss or degradation of prairie habitat. However, portions of North Dakota continue to provide good habitat for Baird's sparrows, including the northwestern and the east-central parts of the state (Missouri Coteau) (USFWS, 2012h). Baird's sparrows can also be found nesting east of the Lake Sakakawea/Missouri River area. In addition to being a USFS sensitive species, Baird's sparrow is also a ND Level 1 Species of Conservation Priority (NDGFD, 2010e; Appendix J).

Bald Eagle—Bald eagles historically occurred throughout the United States and Canada but experienced a dramatic population decline between the 1870s and the 1970s. Populations have since rebounded and there are breeding populations in all of the lower 48 states and Alaska. Bald eagles are capable of breeding at 4 or 5 years of age, but in healthy populations they may not start breeding until much older. Breeding bald eagles occupy "territories" that they will typically defend against intrusion by other eagles. In addition to the active nest, a territory may include one or more alternate nests (nests built or maintained by the eagles but not used for nesting in a given year). Bald eagles generally nest near coastlines, rivers, large lakes or streams that support an adequate food supply. They often nest in mature or old-growth trees; snags (dead trees); cliffs; rock promontories; rarely on the ground; and with increasing frequency on manmade structures such as power poles and communication towers. In forested areas, bald eagles often select the tallest trees with limbs strong enough to support a nest that can weigh more than 1,000 pounds. Nesting activity begins several months before egg-laying. Egg-laying dates vary throughout the United States, ranging from October in Florida, to late April or even early May in the northern United States. Incubation typically lasts 33 to 35 days, but can be as long as 40 days. Eaglets make their first flights about 10 to 12 weeks after hatching, and fledge within a few days after the first flight. However, young birds usually remain in the vicinity of the nest for several weeks after fledging because they are almost completely dependent on their parents for food until they disperse from the nesting territory approximately 6 weeks later (USFWS, 2007c).

The bald eagle is also a ND Level II Species of Conservation Priority (NDGFD, 2010e; Appendix J) and was formerly listed under the ESA. The first bald eagle nest in North Dakota since 1975 was documented along the Missouri River in 1988. At the time of delisting in 2007, at least 20 active bald eagle nests were located in various parts of the state (USFWS, 2012k). No active or inactive bald eagle nests were observed during the 2013 survey (Basin Electric, 2013b).

Burrowing Owl—The burrowing owl (*Athene cunicularia hypugaea*) is a grassland specialist distributed throughout western North America, primarily in open areas with short vegetation and bare ground in desert, grassland, and shrub-steppe environments. Burrowing owls are dependent on the presence of fossorial mammals (prairie dogs, ground squirrels), and tortoises primarily, whose burrows are used for nesting and roosting. Burrowing owls historically bred from south central and southwest Canada southward through the Great Plains and western U.S. and south to central Mexico. Courtship and pair formation occur in March and April in most areas. Incubation lasts 28 to 30 days and is performed by the female. The young begin feathering out at 2 weeks of age, run and forage by 4 weeks of age, and are capable of sustained flight by 6 weeks. Burrowing owl families often switch burrows every 10 to 15 days when the young are 3 to 4 weeks old and remain as a loose-knit group until early fall when the young may begin to disperse to nearby burrows. Burrowing owls are opportunistic feeders, primarily taking insects, small mammals, birds, amphibians and reptiles. Foraging occurs in a variety of habitats, including cropland, pasture, prairie dog colonies, fallow fields, and sparsely vegetated areas. Populations of burrowing owls are believed to have declined in several large regions, notably in the Great Plains and Canada. Primary threats across the North American range of the burrowing owl are habitat loss due to land conversions for agricultural and urban development, and habitat degradation and loss due to reductions of burrowing mammal populations (USFWS, 2003).

The burrowing owl is also a ND Level II Species of Conservation Priority (NDGFD, 2010e; Appendix J and is known to occur in the LMNG (USFS, 2002).

Greater Prairie-chicken—Greater prairie-chickens (*Tympanuchus cupido*) are endemic to the grassland habitats of the central and eastern United States. Prior to settlement by Europeans, populations inhabited the tallgrass prairies of the eastern states, with the core of the distribution centered near the intersection of Missouri, Illinois, and Iowa. Range expansion of greater prairie-chickens to the north and west during the 1800s shifted the distribution into suitable grasslands as far north as central Alberta, and westward to northeastern Colorado. Greater prairie-chickens are currently distributed in remnant tallgrass prairie in the eastern portions of their range, and in mixed, mid-tallgrass prairies in the western portions. Greater prairie-chickens have a lek mating system, which includes a booming display by males. Several behaviors are performed to produce the booming display; males extend their eye combs, lower their head, erect pinnae feathers on their neck, point their tail somewhat forward, stamp their feet on the ground, click their tail, stiffen, shake, and drop their wings until the tips of the primaries touch the ground, expand their esophageal air sacs, and produce a booming vocalization. Male greater prairie-chickens generally display on leks from early March to June, with peak display activity occurring from April to mid-May. Lek sites are considered to be traditional as they are often used by birds year after year. Leks are typically located on elevated sites in open areas where the vegetation is short and sparse. Female greater prairie-chickens construct shallow, bowl-shaped depressions in the substrate for nests then line their nests with small amounts of dried grass, leaves, and feathers. The average clutch size for greater prairie-chickens is 11 to 12 eggs, with females incubating clutches for 23 to 25 days. Hatching of the clutch may take 1 to 2 days, and broods leave the nest within 24 hours following hatching. Chicks become more solitary and scattered during late August and early September, and dispersal is generally completed in September and October. Composition of greater prairie-chicken diet varies among regions, seasons, and age classes, but is primarily comprised of cultivated grains, leaves, seeds, buds, and insects. Greater prairie-chicken population declines are attributed to habitat loss (USFS, 2005a).

In addition to being a USFS sensitive species, the greater prairie-chicken is also a ND Level II Species of Conservation Priority (NDGFD, 2010e; Appendix J). Breeding populations of greater prairie chicken are known from Grand Forks County and Sheyenne National Grasslands in North Dakota (USFWS, 2012i).

Greater Sage-grouse—The greater sage-grouse (*Centrocercus urophasianus*) is a large, ground-dwelling bird. Sage-grouse depend on a variety of shrub steppe habitats throughout their life cycle, and are considered obligate users of several species of sagebrush (e.g., Wyoming big sagebrush, mountain big sagebrush [*Artemisia tridentata* ssp. *vaseyana*], and basin big sagebrush). Locally important sagebrush species, such as low sagebrush (*Artemisia arbuscula*), black sagebrush *(Artemisia nova*), fringed sagebrush (*Artemisia frigida*), and silver sagebrush can also be used by sage-grouse. Sage-grouse exhibit strong site fidelity to breeding, nesting, brood rearing, and wintering areas. Adult sage-grouse rarely move from these habitats once they have been selected, which limits their ability to adapt to change. During the spring breeding season, male sage-grouse gather together to perform courtship displays on leks, which are relatively bare areas surrounded by greater shrub steppe cover, which is used for escape, nesting and feeding cover. The proximity, configuration, and abundance of nesting habitat are key factors influencing lek location. High-quality nesting areas are typically characterized by sagebrush with an understory of native grasses and forbs, with horizontal and vertical structural diversity that provides an insect prey base, herbaceous forage for pre-laying and nesting hens, and cover for the incubating hen. Hens lay an average clutch of seven eggs. Hens and chicks use shrub and grass cover for concealment and forbs and insects are an essential dietary component for chicks. Most sage-grouse gradually move from sagebrush uplands to more mesic (moist) areas, such as streambeds or wet meadows), during the late brood-rearing period (3 weeks post-hatch) as vegetation dries out in the summer. Summer use areas can include sagebrush habitats as well as riparian areas, wet meadows and alfalfa fields. As vegetation continues to dry out and die off through the late summer and fall, sage-grouse shift their diet entirely to sagebrush, eventually depending entirely on sagebrush throughout the winter for both food and cover. Many populations of sage-grouse migrate between seasonal ranges in response to habitat distribution. Migration can occur between winter and breeding and summer areas, between breeding, summer and winter areas, or not at all. Estimating an "average" home range for sage-grouse is difficult due to the large variation in sage-grouse movements both within and among populations related to the spatial availability of seasonal habitats. Annual recorded home ranges for sage-grouse have varied from 4 to 615 square kilometers (1.5 to 237.5 square miles) (USFWS, 2012l).

Prior to European settlement in the 19th century, sage-grouse inhabited 13 western states and three Canadian provinces. Sage-grouse have declined across their range and now occupy 56 percent of their historic range. They currently occur in 11 states and two Canadian provinces.

Factors implicated in sage-grouse population decline include loss of habitat due to increased surface disturbance and general fragmentation of the landscape, and the spread of the West Nile Virus. On March 23, 2010, USFWS determined that the greater sage-grouse warranted the protections of the ESA. However, USFWS also found that listing was precluded due to other higher priority actions, thereby making the sage-grouse a candidate under the ESA. Subsequently, USFWS entered into a court-approved settlement agreement with environmental groups that set a schedule for making listing determinations on over 200 candidate species nationwide, including the sage-grouse. The schedule indicated that a decision (proposed listing rule or withdrawal) on the sage-grouse range-wide was due by September 2015 (USFWS, 2012l).

USFWS does not report the sage-grouse as occurring in Billings, Dunn, McKenzie, Mercer, Mountrail, and Williams counties (USFWS, 2014). Sage-grouse is only known or believed to occur in North Dakota in Bowman, Golden Valley, and Slope counties in North Dakota, but it is not reported from any of the counties crossed by the project (USFWS, 2012j). The greater sage-grouse is also a ND Level II Species of Conservation Concern (NDGFD, 2010e; Appendix J).

Loggerhead Shrike—Loggerhead shrikes breed throughout a large portion of central and southern North America. Although historically common in most areas of their range, shrike abundance has declined nearly continent-wide. Loggerhead shrikes winter throughout the southern portion of the United States, with the northern limits being in California, Nevada, Utah, Colorado (primarily west and south), southern Kansas, Arkansas, Tennessee, and Virginia. The migratory behavior of loggerhead shrikes has not been well studied. Some southern shrike populations are resident, while other breeding populations are migratory. Loggerhead shrikes breed in a wide variety of open habitats including native and non-native grasslands, sage scrub, and other areas with a sparse coverage of bushes and trees and bare ground. The presence of thorny trees/bushes or barbed-wire fences for impaling prey is also thought to be an important component of nesting habitat. Nests are typically placed in trees or thick shrubs within pastures and grasslands, with isolated trees or shrubs being preferred. Loggerhead shrikes lay one egg per day, with a typical clutch of five to seven eggs. Females incubate the eggs for an average of 16 days and then brood the nestling for 4 to 5 days. Fledglings typically remain in loose company. Loggerhead shrikes feed primarily on insects and small vertebrates. The availability of suitable perches is an important component of foraging habitat as shrikes are sit-and-wait predators, and thus spend the majority of their foraging time perched. Factors limiting loggerhead shrike population growth include habitat loss and degradation; lack of good nesting sites; mortality of adults and recently fledged young due to collisions with motor vehicles; and low survival on wintering grounds (USFS, 2005b).

The loggerhead shrike is also a ND Level II Species of Conservation Concern (NDGFD, 2010e; Appendix J). It is known to breed throughout North Dakota and is fairly common throughout the state, except in the Red River Valley (USGS, 1995).

Long-billed Curlew—The long-billed curlew (*Numenius americanus*) is the largest North American shorebird. The historical breeding range of the long-billed curlew was the western U.S. and the southern Canadian Prairie Provinces from California north to British Columbia and east to southern Manitoba and Wisconsin, northern Iowa and eastern Kansas. This breeding distribution has contracted and long-billed curlews have lost about 30 percent of their historical range. The eastern edge of the current breeding range is the western Great Plains from the Texas panhandle north throughout southwestern and south central Saskatchewan. Long-billed curlews currently winter along the southwestern U.S. coast from central California, southern Texas and Louisiana south along both of Mexico’s coasts to Guatemala, and are casual along the Atlantic coast north to New Brunswick, the southeastern South Carolina and Florida coasts, and the West Indies. Nesting long-billed curlews typically avoid trees, tall weedy vegetation, and tall dense shrubs during the breeding season, and nest on the ground in the simplest, most open habitat available. Water availability, minimum block size, vegetation height, density, and structure and species composition are characteristics whose importance has been debated. Spring and summer crop fields are typically used during brood rearing, while coastal sandy beaches, intertidal mudflats, salt marshes, coastal and inland pastures and farmlands, freshwater wetlands, salt ponds, and agricultural pastures are used by wintering long-billed curlews (USFWS, 2009a). Wintering curlews forage on earthworms, marine worms, and shrimp, while summering curlews feed on grasshoppers, beetles, spiders, and caterpillars. Females usually lay four beige or light green eggs, densely marked with brown or purple. Both parents incubate the eggs for about

28 days. Long-billed curlew chicks are precocial and within a few hours they leave the nest for denser, taller grasses, and begin to feed themselves within a day. Both parents defend chicks from crows, coyotes, hawks, and people until the young curlews fledge in 38 to 45 days (National Audubon Society, 2012). Initial long-billed curlew population declines were attributed to over-hunting and plowing of the native prairies for agriculture. Current range-wide threats include habitat loss and destruction due to urban and energy development, grassland conversion for agricultural purposes, changes in the natural fire regime, and the spread of exotic invasive plants (USFWS, 2009a).

In addition to being a USFS sensitive species, the long-billed curlew is also a ND Level I Species of Conservation Concern (NDGFD, 2010e; Appendix J). The long-billed curlew is known to breed in southwestern North Dakota, but is considered uncommon (USGS, 2006a).

Plains Sharp-tailed Grouse—Sharp-tailed grouse closely resemble prairie chickens, except that sharp-tails have a pointed tail, and the air sacs on the neck of the male are purple. They are resident from Alaska east to Hudson Bay and south to Utah, northeastern New Mexico and Michigan. During the breeding season in March to June, sharp-tailed males congregate on dancing grounds or leks in the early morning to impress nearby female grouse. The male performs a dance in which the wings are extended, the tail is raised vertically, the head is lowered and the entire body is horizontal to the ground. The bird’s feet move rapidly and the tail feathers make a clicking noise. As an invitation to the females, the sharp-tailed mail cackles loudly and jumps 3 to 4 feet in the air rapidly beating its wings. This display is called the flutter-jump. Female plains sharp-tailed grouse typically lay 10 to 13 buff-brown eggs in a grass-lined depression in tall grass or brush. The diet of plains sharp-tailed grouse includes a variety of forbs, grasses and insects. In winter, sharp-tailed grouse also feed on buds, catkins, or berries of deciduous trees and shrubs.

The plains sharp-tailed grouse is a MIS for high-structure grasslands in the LMNG. High structure grasslands contain scattered shrubs and diverse vegetative structure. High-structure vegetation, such as shrubs, provide nesting cover for plains sharp-tailed grouse and other bird species. High-structure vegetation also provides brood escape cover and winter food sources (buds and fruits of buffaloberry, rose, snowberry, and juniper) (USFS, 2001).

In addition to being a MIS for LMNG, the plains sharp-tailed grouse is also a ND Level II Species of Conservation Priority (NDGFD, 2010e; Appendix J).

Black-tailed Prairie Dog—The black-tailed prairie dog (*Cynomys ludovicianus*) is a small, stout ground squirrel with a characteristic black tail. Black-tailed prairie dogs are diurnal, burrowing animals that do not hibernate like other prairie dog species. The historic range of the black-tailed prairie dog included portions of 11 States, Canada, and Mexico. Today it occurs from extreme south-central Canada to northeastern Mexico and from approximate the 98th meridian west to the Rocky Mountains. The species is currently present in Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming. A range-wide estimate of historically occupied habitat for the black-tailed prairie dog is 80 to 100 million acres, while current occupied habitat is estimated to be 2.1 million acres. Factors influencing black-tailed prairie dog populations range-wide include conversion of prairie grasslands to croplands, large-scale poisoning, recreational shooting, and sylvatic plague. The black-footed ferret is a federally listed endangered species that depends upon prairie dogs as a source of food and uses its burrows for shelter. Other species such as the swift fox, mountain plover, ferruginous hawk, and burrowing owl are dependent on prairie dogs to varying degrees (USFWS, 2011h).

Black-tailed prairie dogs are highly social animals. They live in colonies or towns, which cover from 1 acre to thousands of acres of grassland habitat. A family group is made up of an adult male, one to four breeding females and their offspring younger than 2 years of age. Breeding season varies with latitude, starting in January in the southern parts of its range and continuing into April in the northern part. Females normally have one litter per year that ranges in size from one to eight young. Due to mortalities, on the average, only three individuals survive and come above ground. Pups emerge at about 41 days and stay with their family group for a minimum of 2 years. Black-tailed prairie dogs are herbivores and feed on a variety of grasses and forbs, and to a lesser extent seeds and insects (USFWS, 2009b).

In addition to being a USFS sensitive species in North Dakota, the black-tailed prairie dog is also a MIS for low structure grasslands in the LMNG Northern Region (USFS, 2001), and a ND Level I Species of Conservation Priority (NDGFD, 2010e; Appendix J). Black-tailed prairie dogs are known from southwest North Dakota, including the project counties of Billings, Dunn, and McKenzie (NDGFD, 2008).

Bighorn Sheep—The bighorn sheep is one of two species of wild sheep in North America with large horns, the other being the Dall sheep (*Ovis dalli*). Bighorn sheep are actually three distinct species: Rocky Mountain bighorn sheep (*O. canadensis canadensis*); Sierra Nevada bighorn sheep (*O. canadensis sierrae*); and Desert bighorn sheep (*O. canadensis nelsonii).* Bighorn sheep live in the western mountainous regions of North America, ranging from southern Canada to Mexico. Most populations undergo seasonal movements, generally using larger upland areas in the summer and concentrating in sheltered valleys during the winter (National Wildlife Federation, 2012). The breeding season generally extends from August to November for desert bighorn sheep and October to January for Rocky Mountain and California bighorn sheep. Bighorn sheep have an approximately 6 month gestation period and most ewes give birth to one lamb per year. Lambing seasons vary by location and year. Desert bighorn lambs are usually born in January to June, with the majority of births in February-April. The lambing season for bighorn sheep in colder climates is more concentrated and most births occur in April to June. Prior to giving birth, adult ewes isolate themselves in steep rocky areas. Newborn lambs can walk within hours after birth; however they are dependent upon steep terrain for protection from predators. Lambs follow their mothers for the first year of life to learn their home range and behavior (Bighorn Institute, 2012).

Bighorn sheep are found in western North Dakota. They are a big game animal in North Dakota with a regulated hunting season. North Dakota's bighorn sheep hunting season opens October 26 and continues through November 8. In 2012, NDGFD reduced the number of sheep licenses from six to four, due to a declining number of mature rams (NDGFD, 2012). The lambing season for bighorn sheep in the study area is April 1 through July 1 of each year (NDGFD, 2010b).

Insects—USFS lists nine species of butterflies as sensitive in North Dakota: Arogos skipper (*Atryone arogos iowa*); broad-winged skipper (*Poanes viator*); Dakota skipper; Dion skipper (*Euphyes dion*); mulberry wing (*Poanes massasoit*); Ottoe skipper (*Hesperia ottoe*); Powesheik skipper (*Oarisma powesheik*); regal fritillary (*Speyeria idalia*); and tawny crescent (*Phycoides batessi).* The broad-winged skipper, Dion skipper, and the mulberry wing are associated with wetland habitats (Butterflies and Moths of North America, 2012). The Arogos skipper, Dakota skipper, Ottoe skipper, Powesheik skipper, regal fritillary are associated with prairie and grassland habitats (Shepherd, 2005; USGS, 2006b; USFWS, 2011i; Vaughan and Shepherd, 2005). The tawny crescent is found in wetland woods and prairie adjacent to woodlands (USGS, 2006b; Butterflies and Moths of North America, 2012).

The broad-winged skipper, Dion skipper, mulberry wing, and Powesheik skipper are known from eastern North Dakota. The Ottoe skipper, Arogos skipper, regal fritillary, Dakota skipper, and tawny crescent are known from western North Dakota (USGS, 2006c).

The Dakota skipper is a candidate for listing under the ESA and is reported to occur in Dunn and McKenzie counties in North Dakota (USFWS, 2012m). The Powesheik skipper (also known as the Powesheik skipperling) is also a candidate for listing under the ESA, but it is not reported from any of the counties crossed by the project (USFWS, 2014). Population declines for these species are attributed primarily to habitat loss and fragmentation.

<u>North Dakota's Species of Conservation Priority</u>

The state of North Dakota does not have its own state-based endangered species law. However, in 2005 NDGFD published a Wildlife Action Plan that includes a list of 100 "species of conservation priority." This list describes the bird, mammal, fish, reptile, amphibian, and mussel species that the state has deemed to be of conservation concern (NDGFD, 2010e). The range information given for each species (NDGFD, 2010e) suggests that the majority of them (70 out of the 100 listed) have the potential to occur in the ROW. See Table 3-18 and Appendix J.

Table 3-18: North Dakota's Species of Conservation Priority within the Study Area

Taxonomic Group	Species of Conservation Priority	Species With the Potential to Occur in the ROW
Birds	45	42
Reptiles and Amphibians	11	7
Mammals	15	12
Fishes	22	8
Mussels	7	1

Source: NDGFD, 2010e

Big Game

Species such as mule and white-tailed deer, elk, pronghorn antelope, and bighorn sheep would experience a potential loss of foraging and woodland cover habitat due to the clearing and disturbance of vegetation within the proposed ROW. This impact would be considered short term and of low intensity. In most instances, this temporary loss of foraging habitat would be insignificant; available foraging habitat adjacent to the ROW would be sufficient to sustain these species until construction was completed and vegetation within the ROW became re-established. Clearing of woody vegetation and maintenance of a cleared ROW would reduce woodland cover. However, the minimal clearing necessary and the relatively narrow ROW cleared would not permanently displace big game from the area or create a barrier to movement from one area to another across the ROW.

Approximately 4,957, 4,459, and 5,597 acres of land would be incorporated into the ROW as part of Alternatives C, D, and E, respectively. The majority of this area provides some type of habitat for big game. Once construction is completed, approximately 257 acres of habitat (foraging and woodland cover) would be permanently lost as part of Alternative C, while approximately 206 acres would be permanently lost as part of Alternative D, and approximately 276 acres would be lost as part of Alternative E. These acreages include the area occupied by transmission structures and substations, as well as the maximum estimate of forest clearing for each route. Forest clearing would result in a loss of woodland cover, but cleared forest areas would become available foraging habitat once construction is completed. The vast majority of the ROW, once construction is completed and the area restored, would again be available as wildlife habitat. Impacts related to woodland clearing in the ROW are considered long term and of low intensity.

Increased human activity and noise associated with the construction of the proposed project is likely to temporarily displace big game species in the area; however, during breaks in the construction efforts (such as between structure placement and conductor stringing) and when construction is completed, these species would move back into the ROW and adjacent area.

Specific, sensitive areas used by certain big game species, such as lambing areas for bighorn sheep, are located within areas of the Little Missouri River Badlands within or near the LMNG. These areas would be crossed by Alternative C. Bighorn sheep could potentially be affected if the project is constructed through or near these areas during the lambing season. Alternative C crosses approximately 153 acres of the LMNG, while Alternatives D and E each cross approximately 57 acres of the LMNG. LMNG lands crossed by Alternatives D and E are also crossed by Alternative C along segments common to all three alternatives. Impacts related to human activity and noise are considered short term and of low to moderate intensity due to displacement and possible impacts during critical periods for some species. However, Basin Electric would coordinate with NDGFD and USFS to avoid construction during bighorn sheep lambing season (April 1 through July 1; and other important times for game species) in the Little Missouri River Badlands area and the LMNG to reduce impacts on big game species (see Appendix A).

Although not as sensitive, elk calving in these areas could also be affected depending on the timing of construction. However, with the implementation of appropriate mitigation measures, big game calving and lambing activities would not be adversely impacted by construction. Following construction, the ROW would provide foraging habitat not dissimilar to that currently present in the area and within existing utility ROWs. No long-term changes in big game use of the area would be anticipated.

Based on NDGFD's (2010b) range maps for big game, the following species would occur within the study area: white-tailed deer (*Odocoileus virginianus*), mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), bighorn sheep, and elk. Of these, white-tailed deer are the most common, and have the largest range. They are found throughout the state (NDGFD, 2010b). Mule deer have a much smaller range, and are found mostly in McKenzie County within the study area (NDGFD, 2010b). Pronghorn are found in McKenzie County, and in some of the study area portion of Mercer, Billings and Dunn counties. Open prairie is their preferred habitat, with the wintering range occurring primarily south and west of the study area. The pronghorn hunting season has been closed since the 2010 hunting season due to declining populations as a result of recent harsh winters (NDGFD, 2010b). Bighorn sheep are found mostly in McKenzie County in the study area, and prefer isolated, undisturbed badland areas as habitat. They are sensitive to human disturbance during the lambing season, April 1 through July 1 of each year (NDGFD, 2010b). Elk use similar badlands habitat in McKenzie and Dunn counties (NDGFD, 2010b).

<u>Non-game Species</u>

Potential impacts on nongame species such as small mammals, reptiles, and amphibians resulting from construction of the project would include temporary loss of habitat within the ROW in grassland and agricultural areas until revegetation is completed. This impact would be short term and of low to moderate intensity due to the availability of grasslands and agricultural areas in close proximity to the ROW. Permanent impacts on habitat would occur in areas where forest would be cleared within the ROW (conversion from one type of habitat to a different habitat type) and where habitat is converted to a substation or switchyard. These impacts would be long term and of moderate to high intensity. Long-term impacts on non-game species habitat would be limited to forest clearing, estimated to be a maximum of approximately 183, 120, and 189 acres for Alternatives C, D, and E, respectively. These impacts include those associated with substation and switchyard construction.

Although some nongame species would be temporarily displaced during construction of the transmission line, permanent displacement of these species is not anticipated, except potentially in cleared forest areas that may provide habitat for forest-dwelling species and in areas of permanent conversion to substations or a switchyard. Forest habitat would be available in other areas near or adjacent to the proposed project ROW and any loss of woodland would be minimal, with adjacent woodland areas still available along the line for refuge during construction and as habitat during project operation. Habitat fragmentation is also not anticipated, due to the relatively open terrain and limited large-tract forested areas. Impacts on non-game species as a result of temporary displacement would be short term and of low to moderate intensity.

Additionally, some minimal mortality of less-mobile or burrowing species may occur from construction vehicles or equipment within the ROW during construction. Impacts on non-game species as a result of construction vehicles would be short term and of low to moderate intensity.

Mammals

Coyote (*Canis latrans*), mountain lion (*Felis concolor*), porcupine (*Erethizon dorsatum*), badger (*Taxidea taxus*), striped skunk (*Mephitis mephitis*), and bobcat (*Felis rufus*) are some of the larger mammals known to occur within the study area. These mammals use a variety of habitats including mixed-grass prairie, pastureland, forested areas, and riparian areas (USGS-NPWRC, 2006). Mountain lions are generally found in more isolated areas, mainly within the badland areas associated with the Little Missouri River, Missouri River, and TRNP, although they have been found throughout the study area. Many smaller mammals, including several species of mice, voles, squirrels, bats, and rabbits are found within the study area (see Appendix F).

Migratory and Resident Birds

USFWS and its partner agencies manage for migratory birds based on specific migratory route paths (flyways) within North America (Atlantic, Mississippi, Central, and Pacific) (USFWS, 2012a). Waterfowl and other migratory birds use these flyways to travel between nesting and wintering grounds. The study area is located within the Central Flyway, which includes Montana, Wyoming, Colorado, New Mexico, Texas, Oklahoma, Kansas, Nebraska, South

Dakota, and North Dakota, and the Canadian provinces of Alberta, Saskatchewan and the Northwest Territories (USFWS, 2012a).

The Migratory Bird Treaty Act (16 U.S.C. 703-712) makes it unlawful to take, kill, or possess migratory birds covered by the Act. The Act provides that it is unlawful to "pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or eggs of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof." Habitat disturbance or alteration, human disturbance, and collisions with transmission lines would result in impacts on migratory bird species.

During ROW clearing and preparation, habitat loss may occur for grassland and forest bird species, causing temporary displacement of local populations. When construction is completed, grassland species would be expected to return to the area as grassland is restored and construction disturbances cease. Therefore, impacts related to temporary habitat loss and displacement for grassland species would be short term and of low to moderate intensity. Forest-dwelling species would likely move into neighboring forested areas adjacent to the ROW during construction and operation of the transmission line. Species dependent on woodland habitat would experience a permanent loss of habitat within the ROW. However, mitigation requirements for tree and shrub replacement would offset some if not all this habitat loss over the long term. Impacts related to permanent loss of forest habitat would be long term and of moderate intensity.

Forest fragmentation occurs when linear corridors are cleared through large contiguous tracts of woodland habitat. Woodland species, particularly interior woodland nesting birds, may experience a loss of habitat or nesting success in these edge areas because they may result in altered vegetation characteristics, availability of preferred food sources, or increased nest competition or predation with other species more adapted to edge habitats. Edge areas occur anywhere one habitat type meets another, such as woodland adjacent to cropland or native grassland, or when large contiguous tracts of woodland are cleared for a utility ROW. Overall, the proposed project would have few if any impacts on forest-dwelling birds from forest fragmentation. The area of western North Dakota where the proposed project would pass does not contain large contiguous tracts of woodland habitat. The largest identified contiguous tract of woodland is a narrow band of woodland of approximately 180 acres. Typical woodland areas include narrow windbreaks, fencerows, riparian corridors, and that are surrounded or interspersed with pasture, grassland, and cropland. Few if any woodlands large enough to not already be affected by edge habitats occur along the proposed alternative routes. The most wooded areas occur in the canyons and draws adjacent to the Little Missouri River. These woodlands occur in fingers along drainages, canyons and draws, many of which would be spanned and not be cleared.

Typical migrant bird species that may occur within the study area include western meadowlark (*Sturnella neglecta*), yellow warbler (*Dendroica petechial*), black-headed grosbeak (*Pheucticus melanocephalus*), chipping sparrow (*Spizella passerine*), grasshopper sparrow (*Ammodramus savannarum*), northern oriole (*Icterus galbula*), loggerhead shrike (*Lanius ludovicianus*), brown thrasher (*Toxostoma rufum*), bobolink (*Dolichonyx oryziv*), upland sandpiper (*Bartramia longicauda*), western kingbird (*Tyrannus verticalis*), American robin (*Turdus migratorius*), and mourning dove (*Zenaida macroura*). Resident bird species that may occur within the study area include horned lark (*Eremophila alpestris*), black-capped chickadee (*Parus atricapillus*), white-breasted nuthatch (*Sitta carolinensis*), blue jay (*Cyanocitta cristata*), American crow (*Corvus brachyrhynchos*), and American goldfinch (*Carduelis tristis*) (NDGFD, 2010c).

Raptors, waterfowl, and other bird species may be impacted by the construction and operation of the proposed project. Potential temporary impacts on raptors and waterfowl species may occur during construction of the proposed project. Foraging areas for these species would be temporarily disturbed during ROW clearing and general construction activities. Impacts on foraging areas from construction activities would be short term and of low to moderate intensity.

<u>Raptors</u>

Raptor species that may occur within the study area include bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparvenius*), prairie falcon (*Falco mexicanus*), great horned owl (*Bubo virginianus*), northern harrier (*Circus cyaneus*), Swainson's hawk (*Buteo swainsoni*), and sharpshinned hawk (*Accipiter striatus*), as well as other raptor-like birds including the turkey vulture (*Cathartes aura*) (NDGFD, 2011a). These species occur throughout the study area and range over large areas when foraging for food. Nests for many of these species also occur within the study area. Although raptor nests occur throughout the study area, data provided by NDGFD did not show any known raptor nests within a 1,000-foot buffer of the alternative routes (NDGFD, 2011a).

Golden eagles, protected under the Bald and Golden Eagle Protection Act, commonly use native grassland for foraging and badland areas for nesting within the project area. Bald eagles may be found migrating throughout western North Dakota but nesting is largely limited to the Missouri River and other large waterbodies. According to data from NDGFD, no known golden eagle nest locations occur within 1,000 feet of the corridors for Alternatives C, D, or E (NDGFD, 2011a). During the 2013 raptor nest survey, four inactive and historic nests were observed, and the survey could not locate five other historic golden eagle nests (Basin Electric, 2013b). The selected alternative will be surveyed in 2014 prior to construction.

Operation of the proposed project would present the potential for avian collisions with the transmission line, particularly for larger, less maneuverable species and in areas of dense bird congregations, such as migrating waterfowl staging areas in the Missouri River crossing area (APLIC, 2012). Under high wind, fog, or poor light conditions, avian collisions with the line (generally the overhead shield wire, which is smaller and less visible than the actual conductor) may occur. Migratory waterfowl would be especially susceptible to transmission line collisions where the proposed transmission line would be located near migration staging areas (areas where large concentrations of birds stopover and rest during migration) and at the Little Missouri River and Missouri River crossings; these waterways would tend to concentrate waterfowl and provide natural flight corridors. Impacts on birds related to line collisions during project operation would be long term and of low intensity. Alternatives C, D, and E are located entirely within the whooping crane migration corridor, with lengths of 278, 251, and 314 miles, respectively through the migration corridor. Specific impacts on whooping cranes are discussed further in the special status species section and in the BA for the project. A line-marking plan has been outlined in the BA for the project, which would reduce the risk of collision with lines for whooping cranes and other avian species.

Electrocutions of large avian species, particularly raptors, have been known to occur from contact with energized lines. Electrocutions are primarily due to the close vertical or horizontal separation of conductors and other equipment often found in distribution lines. APLIC (2006) states that transmission lines rarely electrocute birds because of the larger separation distance. The phase-to-phase and phase-to-ground separation is adequate to prevent electrocution of avian species. APLIC (2006) also recommends a separation of 60 inches on distribution and transmission lines (see Figures 2-6 through 2-11). Electrocution impacts from operation of the line would be long term and of low intensity as a result of the avian protection elements that would be incorporated in the design of the line and transmission structures.

The presence of the utility line structures may also impact raptor predator-prey relationships by providing additional locations from which raptors can hunt (perches). Changes to raptor predator-prey relationships are expected to be long term and of moderate intensity.

As part of project implementation, USFWS and NDGFD would be consulted to develop and implement a plan to protect any identified nests from adverse effects during construction. Raptors and other birds may use the transmission line structures and switchyard and substation equipment for perching and nesting after construction. Basin Electric has developed a system-wide Avian Protection Plan that would apply to the operation of the line and associated facilities and would address, among other things, nest removal and protection, line collisions, electrocution, and predation effects.

Gamebirds, Waterfowl, and Shorebirds

Common upland game birds found within the study area include ring-necked pheasant (*Phasianus colchicus*), gray partridge (*Perdix perdix*), plains sharp-tailed grouse, and wild turkey (*Meleagris gallopavo*). Many species of waterfowl can also be found during the breeding season within the study area; these species include mallard (*Anas platyrhynchos*), gadwall (*Anas strepera*), Canada goose (*Branta canadensis*), northern shoveler (*Anas clypeata*), and blue-winged teal (*Anas discors*), among others. In addition, various species of shorebirds are found near wetland areas and riparian corridors within the study area (NDGFD, 2010c). Some common shorebirds include great blue heron (*Ardea herodias*), American bittern (*Botaurus lentiginosus*), American coot (*Fulica americana*), killdeer (*Charadrius vociferous*), common tern (*Sterna hirundo*), and spotted sandpiper (*Actitis macularia*) (see Appendix F).

Reptiles and Amphibians

Several species of reptiles and amphibians can be found within the project area. Lizards and snakes are found in various habitats in the region, while amphibians are more likely to be found in wetland areas or near riparian corridors associated with rivers, lakes, and streams. Reptiles and amphibians that may be found within the study area include common garter snake (*Thamnophis sirtalis*), plains garter snake (*Thamnophis radix*), smooth green snake (*Opheodrys vernalis*), sagebrush lizard (*Sceloporus graciosus*), short-horned lizard (*Phrynosoma douglassi*), common snapping turtle (*Chelydra serpentina*), bullsnake (*Pituophis catenifer*), prairie rattlesnake (*Crotalus viridis*), plains spadefoot toad (*Scaphiopus bombifrons*), northern leopard frog (*Rana pipiens*), and tiger salamander (*Ambystoma tigrinum*) (Hoberg and Gause, 2006).

Aquatic Species

Construction-related impacts on fish and other aquatic species are not likely to occur. Placement of transmission structures in any body of water along the course of Alternatives C, D, or E is not proposed. BMPs (in Appendix A) would be employed during construction and maintenance activities to prevent soil erosion and runoff, sedimentation, water quality changes, and contamination of water from herbicides, fuels, and other spills.

Where necessary, temporary low-water crossings or culverts would be installed at ditches, streams, or other watercourses to provide access to the ROW for construction vehicles. Installation of low-water crossings or culverts may require a permit from USACE and/or the state of North Dakota. Basin Electric would coordinate with these entities prior to installing low-water crossings or culverts regarding permitting requirements and construction conditions. Structures would be designed and installed so as not to inhibit fish passage, or create upstream or downstream habitat changes. Impacts related to installation of these structures would be short term and of low intensity as a result of their design and installation. Alternatives C, D, and E would cross an estimated 19, 17, and 20 perennial streams, respectively. As part of project design and constructability, these stream crossings would be evaluated to determine if culverts would be appropriate for equipment crossings. It is anticipated that numerous streams would be too large for culvert installation and would be bypassed by construction. All streams would be spanned and equipment would cross only at designated locations. Clearing of vegetation along stream banks (riparian vegetation) may cause a local increase in water temperature from increased levels of sunlight warming the water, potentially changing the aquatic habitat in these areas. Areas of riparian vegetation may be considered wetlands under the jurisdiction of USACE and may require a permit for disturbance or clearing. Removal of woody riparian vegetation is considered a long-term impact of low to high intensity depending on the location and amount of removal. The majority of woody riparian vegetation occurs within the Missouri River and Little Missouri River valleys. Where Alternatives C, D, and E cross the Missouri River Valley, woody vegetation consists only of a few randomly-scattered trees along the existing U.S. Highway 85 and Western 230-kV line corridor. Woody vegetation at the Little Missouri River crossing would generally be limited to a few acres within a narrow band immediately adjacent to the river, depending on the exact location of the crossing.

Proposed Substations/Switchyard

Construction of the proposed 345-kV substations/switchyard would require the removal of all vegetation within the fenced boundary of the sites. The proposed substation sites (Judson, Tande, Red, and White) and the switchyard (Killdeer South site would a total of 85 acres. The substation/switchyard locations would consist of grassland or cropland habitat. Loss of vegetation in these fenced areas would be permanent, and any available wildlife habitat would be converted to utility use. Impacts on wildlife during construction of the substations and switchyard would be similar to those incurred during construction of the transmission line. Exact impacts on available habitat would be determined upon acquisition of a site. Wildlife species using any available habitat on the proposed substation and switchyard sites would be displaced to available habitat adjacent to these sites. No special status species or habitat for these species is known to occur within the site boundaries for the substations or switchyard. Impacts on special status species resulting from construction and operation of these sites would not occur.

Below is a discussion of the no-action and Alternatives C, D, and E. These discussions focuses on differences between the alternatives that are not common for all the them.

No-action Alternative

Under the no-action alternative, the proposed project would not be constructed, and there would be no new impacts on biological resources (vegetation, wetlands, and wildlife).

Alternative C

Vegetation

As discussed above in Table 3-11, grassland herbaceous and cropland are the most dominant vegetation/land cover types along the length of this alternative. Likewise in Table 3-12, the most dominant vegetation communities within this alternative's ROW are Northwestern Great Plains mixed-grass prairie and cultivated cropland (wheat, barley, corn, and sunflowers).

For the proposed substations, there will be 1,625 structures, which assuming 28.5 square feet per structure equals 1.4 acres of permanent vegetation loss. Also approximately 183 acres of woodlands would be cleared in this alternative.

Wetlands

As discussed above in Table 3-13 and based on NWI mapping, 33.1 acres of mostly palustrine emergent wetlands and lakes have been identified within this alternative's ROW.

Wildlife

As discussed above, approximately 4,957 acres of land would be incorporated into the ROW as part of this alternative. Also, 257 acres of habitat (foraging and woodland cover) would be permanently lost as part of Alternative C. This alternative crosses approximately 153 acres of the LMNG. Long-term impacts on non-game species habitat would be limited to forest clearing, which is estimated to be a maximum of approximately 183 acres for Alternative C.

Nest surveys for golden eagles and other raptors were conducted in a 1 mile area on both sides of the centerline for the western loop of Alternative C during spring 2013. No active golden or bald eagle nests were found. Four historic and inactive golden eagle nests were observed during the 2013 raptor nests survey, and five other historic golden eagle nests were not located. In addition, 88 raptor nests representing 5 species were documented during the 2013 raptor nest survey (Basin Electric, 2013b). Of these nests, 3 nests were identified as occupied great-horned owl (*Bubo virginianus*) nests, 17 as occupied red-tailed hawk (*Buteo jamaicensis*) nests, 1 nest was occupied by a Canada goose (*Branta canadensis*), 1 was an occupied unknown raptor nest, and 67 were unoccupied, inactive raptor nests.

Alternative C is 278 miles long and is located within the whooping crane migration corridor. Also, this alternative would be within 1 mile of approximately 4,881 acres of NWI-identified wetlands (preferred whooping crane habitat).

Alternative C impacts approximately 2,548 acres of grasslands, which could be potential habitat for the following species: Baird's sparrow, burrowing owl, plains sharp-tailed grouse, Sprague's pipit, black-tailed prairie dog, Argos skipper, Dakota skipper habitat, Ottoe skipper, and Regal fritillary. Also, Alternative C would impact approximately 1.3 acres of sagebrush, which could be potential greater sage-grouse habitat. Alternative C impacts approximately 2,549.3 acres of grasslands and sagebrush, which could be potential loggerhead shrike habitat. This alternative would impact 4,219 acres of grasslands and croplands, which could be potential long-billed curlew habitat. Alternative C would impact 0.7 acre of cliff, canyon, and talus habitat, which could be potential bighorn sheep habitat. This alternative would impact approximately 183 acres of woodlands, which could be potential northern long-eared bat habitat. Alternative C impacts approximately 2,548 acres of grasslands and forested wetlands (less than 1 acre), which could be potential Tawny crescent butterfly habitat. Alternative C impacts approximately 257 acres of big game habitat (foraging and woodland cover). This alternative would remove approximately 183 acres of forest habitat.

Alternative C would cross approximately 153 acres of the LMNG.

Alternative C would cross an estimated 19 perennial streams, which could impact fish and other aquatic species. While all of these streams will be spanned, secondary impacts from sedimentation and water quality changes could occur and negatively impact these species.

Alternative D

<u>Vegetation</u>

Similar to Alternative C, grassland herbaceous and cropland are the most dominant vegetation/land cover types along the length of this alternative. Also, the most dominant vegetation communities within this alternative's ROW are Northwestern Great Plains mixed-grass prairie and cultivated cropland (wheat, barley, corn, and sunflowers).

For the proposed substations, there will be 1,465 structures, which assuming 28.5 square feet per structure equals 1.3 acres of permanent vegetation loss. Also approximately 120 acres of forest would be cleared in this alternative.

<u>Wetlands</u>

As discussed above in Table 3-13 and based on NWI mapping, 31.3 acres of mostly palustrine emergent wetlands and lakes have been identified within this alternative's ROW.

<u>Wildlife</u>

As discussed above, approximately 4,459 acres of land would be incorporated into the ROW as part of this alternative. Also, 206 acres of habitat (foraging and woodland cover) would be permanently lost as part of Alternative D. This alternative crosses approximately 57 acres of the LMNG. Long-term impacts on non-game species habitat would be limited to forest clearing, which is estimated to be a maximum of approximately 120 acres for Alternative D.

Alternative D has a length of 251 miles located within the whooping crane migration corridor. Also, this alternative would be within 1 mile of approximately 4,734 acres of NWI-identified wetlands (preferred whooping crane habitat).

Alternative D impacts approximately 2,408 acres of grasslands, which could be potential habitat for the following species: Baird's sparrow, burrowing owl, plains sharp-tailed grouse, Sprague's pipit, black-tailed prairie dog, Argos skipper, Dakota skipper habitat, Ottoe skipper, and Regal fritillary. Also, Alternative D would impact approximately 0.7 acre of sagebrush, which could be potential greater sage-grouse habitat. Alternative D impacts approximately 2,408.7 acres of grasslands and sagebrush, which could be potential loggerhead shrike habitat. This alternative would impact 3,913 acres of grasslands and croplands, which could be potential long-billed curlew habitat. Alternative D would impact 0.4 acre of cliff, canyon, and talus habitat, which could be potential bighorn sheep habitat. This alternative would impact approximately 120 acres of woodlands, which could be potential northern long-eared bat habitat. Alternative D impacts approximately 2,408 acres of grasslands and forested wetlands (less than 1 acre), which could be potential Tawny crescent butterfly habitat. Alternative D permanently impacts approximately 257 acres of big game habitat (foraging and woodland cover). This alternative would remove approximately 183 acres of forests, which would have a higher permanent impact to wildlife using this type habitat than Alternative C.

Alternative D would cross approximately 153 acres of the LMNG.

Alternative D would cross an estimated 17 perennial streams, which could impact fish and other aquatic species. While most (if not all) of these streams will be spanned, secondary impacts from sedimentation and water quality changes could occur and negatively impact these species.

Alternative E

<u>Vegetation</u>

Similar to Alternatives C and D, grassland herbaceous and cropland are the most dominant vegetation/land cover types along the length of this alternative. Also, the most dominant vegetation communities within this alternative's ROW are Northwestern Great Plains Mixed-Grass Prairie and Cultivated Cropland (wheat, barley, corn, and sunflowers).

For the proposed substations, there will be 1,832 structures, which assuming 28.5 square feet per structure equals 1.6 acres of permanent vegetation loss. Also approximately 189 acres of forest would be cleared in this alternative.

<u>Wetlands</u>

As discussed above in Table 3-13 and based on NWI mapping, 39.9 acres of mostly palustrine emergent wetlands and lakes have been identified within this alternative's ROW.

Wildlife

As discussed above, approximately 5,597 acres of land would be incorporated into the ROW as part of this alternative. Also, 276 acres of habitat (foraging and woodland cover) would be permanently lost as part of Alternative E. This alternative crosses approximately 57 acres of the LMNG. Long-term impacts on non-game species habitat would be limited to forest clearing, which is estimated to be a maximum of approximately 189 acres for Alternative E.

Alternative E has a length of 314 miles and located within the whooping crane migration corridor. Also, this alternative would be within 1 mile of approximately 4,746 acres of NWI-identified wetlands (preferred whooping crane habitat).

Alternative E impacts approximately 3,155 acres of grasslands, which could be potential habitat for the following species: Baird's sparrow, burrowing owl, plains sharp-tailed grouse, Sprague's pipit, black-tailed prairie dog, Argos skipper, Dakota skipper habitat, Ottoe skipper, and Regal fritillary. Also, Alternative E would impact approximately 0.9 acres of sagebrush, which could be potential greater sage-grouse habitat. Alternative E impacts approximately 3,115.9 acres of grasslands and sagebrush, which could be potential loggerhead shrike habitat. This alternative would impact 4,875 acres of grasslands and croplands, which could be potential long-billed curlew habitat. Alternative E would impact 1.5 acres of cliff, canyon, and talus habitat, which could be potential bighorn sheep habitat. This alternative would impact approximately 189 acres of woodlands, which could be potential northern long-eared bat habitat. Alternative E impacts approximately 3,155 acres of grasslands and forested wetlands (less than 1 acre), which could be potential Tawny crescent butterfly habitat. Alternative E permanently removes approximately 257 acres of big game habitat (foraging and woodland cover). This alternative would clear approximately 183 acres of forest habitat.

Alternative E would cross approximately 153 acres of the LMNG.

Alternative E would cross an estimated 20 perennial streams, which could impact fish and other aquatic species. While all of these streams will be spanned, secondary impacts from sedimentation and water quality changes could occur and negatively impact these species.

3.6 CULTURAL RESOURCES

This section describes cultural resources that have been identified to date. Although there is no legal or uniformly accepted definition of "cultural resources" within the federal government, the term typically refers to historic, aesthetic, and cultural aspects of the human environment. Under NEPA, the human environment includes the natural and physical environment (e.g., buildings), and the relationships of people to that environment. Accordingly, a NEPA analysis should address the human (social and cultural) and natural aspects of the environment as well as the relationships between them. In fulfilling its obligations as the lead agency for NEPA, RUS will consider the impact of federal actions on the human environment, including "cultural resources."

Those cultural resources that qualify for listing in the National Register of Historic Places (NRHP) are considered "historic properties." Under NHPA, as amended (16 U.S.C. 470), the term "historic property" refers to "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the NRHP, including artifacts, records, and material remains related to such a property or resource" (16 U.S.C. 470w).

The NRHP is a commemorative listing of those districts, sites (typically archeological sites), buildings, structures, and objects significant to the American past. To qualify for listing, such resources must meet one or more of the following criteria for evaluation:

- Criterion A—associated with events that have made a significant contribution to the broad patterns of our history; or
- Criterion B—associated with the lives of persons significant in our past; or
- Criterion C—embody the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D—has yielded, or may be likely to yield, information important in prehistory or history (NPS, 1997).

In addition to meeting one or more of the criteria, a building, structure, site, district, or object must possess integrity, which is defined as the ability to convey its significance. The following seven qualities or aspects define integrity—location, design, workmanship, materials, setting, feeling and association—and, as such, enable a historic property to convey its significance. However, all seven of these aspects of integrity usually do not apply in every instance.

Pursuant to 36 CFR 800.8(a), federal agencies are encouraged to coordinate compliance with Section 106 and its implementing procedures with the steps taken to meet the requirements of NEPA. As such, studies and analyses conducted to comply with NEPA, including this FEIS, have been used and expanded, as needed, by RUS, Western, and USFS to meet the requirements of Section 106. Furthermore, in accordance with 36 CFR 800.2(d)(3), Western has relied on implementation of the RUS NEPA procedures to meet the agencies' collective requirements for public involvement in Section 106 review.

Section 106 Review

In accordance with Section 106 of the NHPA and its implementing regulations "Protection of Historic Properties" (36 CFR 800), the federal agencies—RUS, Western, and USFS—must take into account the effect of their "undertakings" on "historic properties," and provide ACHP a reasonable opportunity to comment on that effect. Basin Electric intends to seek financial assistance from RUS for construction of the AVS to Neset Transmission Project. Additionally, Basin Electric has requested that Western authorize an interconnection between the Williston Substation and the Williston to Charlie Creek 230-kV transmission line, and USFS is considering a request by Basin Electric to cross USFS-managed lands. As a result, the three federal agencies have determined that the individual federal actions that each may take make the AVS to Neset Transmission Project an undertaking subject to review under Section 106.[12] RUS and USFS have agreed, pursuant to 36 CFR 800.2(a)(2), to designate Western as the lead federal agency for fulfilling their collective responsibilities under Section 106.

Section 106 consultation began with the participation of the North Dakota SHPO in one of the November 2011 NEPA scoping meetings. Then, by letter dated January 31, 2012, Western invited the following Indian tribes to participate in Section 106 consultation for the project:

- Flandreau Santee Sioux
- Santee Sioux Nation
- Fort Peck Assiniboine and Sioux Tribes
- Spirit Lake Tribe
- Fort Belknap Indian Community
- SRST
- Leech Lake Band of Ojibwe
- Three Affiliated Tribes
- Lower Sioux Indian Community
- Turtle Mountain Band of Chippewa
- Minnesota Chippewa Tribe
- Upper Sioux Indian Community
- Prairie Island Indian Community
- White Earth Nation

The Leech Lake Band declined Western's invitation. The White Earth Band also declined, but asked that Western keep the tribe informed of the progress of Section 106 review. Accordingly, project documents have been provided to the tribe. Because of the proximity of the Fort Berthold reservation to the project, Western has and will continue to attempt to engage the Three Affiliated Tribes. In a letter dated October 26, 2012, USFS independently invited the Three

[12] The federal actions of each agency are discussed in more detail in Section 1.4.

Affiliated Tribes and SRST to participate in Section 106 review. None of the commenters on the DEIS (issued in December 2012) expressed concerns about impacts to any cultural resources.

In February 2013, probably in response to the USFS invitation to participate in consultation, SRST submitted correspondence to each of the federal agencies requesting clarification about its roles and responsibilities for the AVS to Neset Transmission Project, and the status of Section 106 review. This response was followed by a request to become a consulting party. In its response, Western recognized SRST as a consulting party, providing it with a copy of *Basin Electric Power Cooperative's Antelope Valley Station to Neset 345 kV Transmission Line: A Class II and Class III Cultural Resource Inventory in Dunn, McKenzie, Mercer, Mountrail, and Williams Counties, North Dakota* (Basin Electric, 2013c), and requested a meeting with the tribe. At that meeting held in June 2013, Western, Basin Electric, and SRST attempted to resolve differences regarding the level of effort needed to identify cultural resources important to the tribe. Eventually, these differences were resolved in a September 2013 consultation meeting in which SWO also participated.

Programmatic Agreement

The project consists of a large corridor where, in some cases, access to private property is necessary to identify historic properties. Therefore, Western determined it appropriate to phase the identification and evaluation of historic properties, and the application of the criteria of adverse effects in accordance with 36 CFR 800.4(b)(2) and 36 CFR 800.5(a)(3), respectively. Because Section 106 review will be phased, identifying historic properties and assessing the project's effect to them cannot be completed by Western prior to project approval. Accordingly, pursuant to 36 CFR 800.14(b)(1)(ii), Western, RUS, and USFS plan to execute a PA with the North Dakota SHPO and ACHP. This PA establishes how affected historic properties will be identified and treated prior to initiating construction of each project phase. In this manner, consultation regarding the identification of historic properties and the mitigation of adverse effects will continue until all project construction has been completed.

RUS agreed to assist Western with the preparation of the PA and its attendant consultation. RUS prepared a first draft of the PA, which it submitted to the consulting parties in March 2014 with a schedule of the Section 106 milestones (meetings, reviews, and proposed date for execution). In addition, pursuant to 36 CFR 800.6(a)(1)(i)(C), RUS invited ACHP to participate in consultation. ACHP provided RUS with an informal affirmative response on April 10, 2014, and responded formally on May 6, 2014, to Western as the lead agency for Section 106 review. The most current draft of the PA is provided in Appendix L. RUS will ensure that the PA is fully executed, thus concluding Section 106 review prior to the issuance of the Record of Decision. It is anticipated that the PA will be executed in mid- to early June.

3.6.1 Affected Environment

Geographic Scope

The analysis of cultural resources for the project has been conducted on various geographical scales, starting with the largest scale defined as the study area. The study area for the entire project is defined as the area inclusive of all or parts of five counties in North Dakota where the transmission line may be located.[13] A Class I survey was completed on a 6-mile corridor that included a variety of alignments for the transmission line. The results of the Class I study were used in part to define the area of potential effect (APE), which includes a 150-foot-wide ROW (see discussion below). Western has also defined a visual APE for historic resources in general as the area within 0.5 mile of the centerline of the ROW. It is noted in this section, where the geographic scope for cultural resources varies from these definitions.

Area of Potential Effects

As defined in 36 CFR 800.16(d), the APE is the geographic area or areas within which the project may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE should be adjusted for the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

Western has determined that the APE for direct effects for this project is a 150-foot-wide ROW situated within the 1,000-foot-wide corridor of the preferred alternative (Alternative C) as well as all project-related access roads, associated appurtenances, substations and ancillary facilities, and temporary construction work and staging areas that may be located outside of the ROW and may not be contiguous. Western also must consider indirect, or in this case visual, effects. Given the height of the proposed transmission structures and the requirement to maintain a ROW cleared of vegetation, the project could alter a historic property's integrity by diminishing its setting or feeling. Accordingly, Western has established an APE for visual effects that extends 0.5 mile on either side of the ROW centerline.

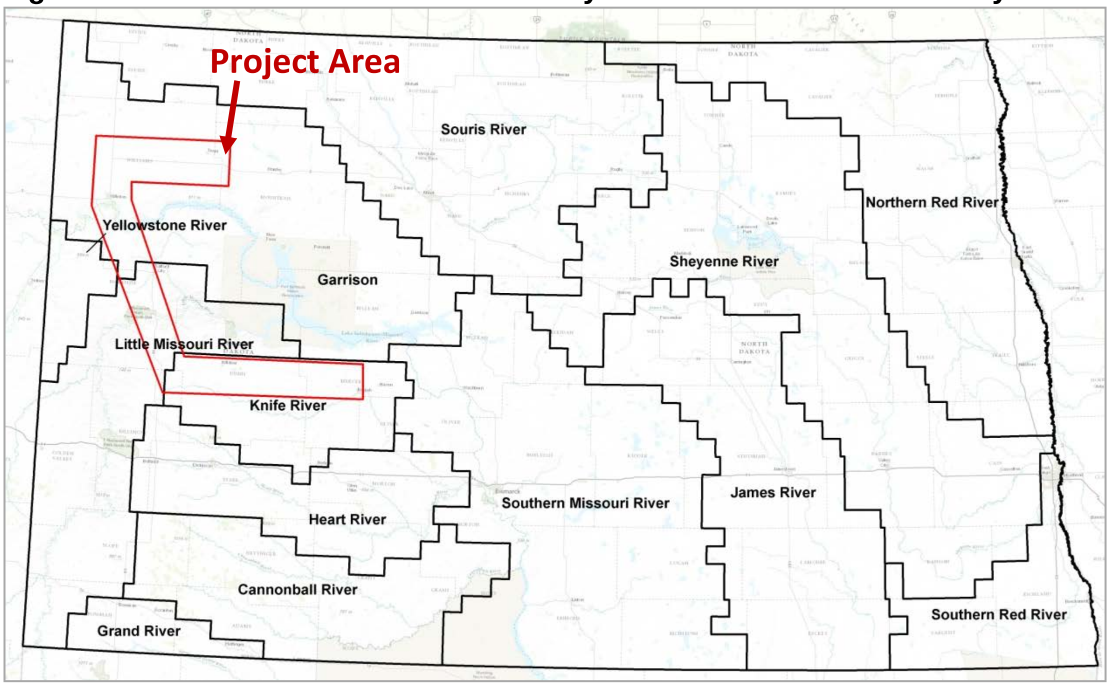
Cultural History

The North Dakota *Comprehensive Plan for Historic Preservation: Archeological Component,* (State Historical Society of North Dakota [SHSND], 2008) divides the state into a series of study units centered on the major drainages in the state (Figure 3-28). The plan summarizes the archeological record for each study unit and the investigations that have occurred, and provides a comprehensive and concise overview of the cultural resources in each. The plan also is a tool whereby the level of inventory within a study unit can be evaluated. The preferred alternative, Alternative C, crosses the following three study units: the Little Missouri Study Unit (#1), the

[13] The study area has been defined as encompassing parts of Mercer, Dunn, McKenzie, Williams, and Mountrail counties in North Dakota.

Knife River Study Unit (#3), and the Garrison Study Unit (#6). Of these, the Little Missouri and Garrison study units have been the subject to more cultural resource investigations than the Knife River Study Unit probably because they also include areas of focus for oil development.

Figure 3-28: General Location of the Study Area in Relation to the Study Units



Note: As defined by SHSND, North Dakota SHPO.

The prehistory and history of the three study units can be divided into six chronological periods or traditions: Paleo-Indian, Plains Archaic, Plains Woodland, Plains Village, Equestrian Nomad, and Euro-American Settlement. The descriptor "Plains" intimates that developments in the period more closely resembled those further west and south, than east. The following discussion is based primarily on *The North Dakota Comprehensive Plan for Historic Preservation: Archeological Component* (SHSND, 2008); *Archeological and Bioarcheological Resources of the Northern Plains* (Frison and Mainfort, 1996); *Introduction to Middle Missouri Archaeology* (Lehmer, 1971); *Prehistoric Hunter-Gatherers of the High Plains and Rockies* (Kornfeld, et al., 2010), and *Archaeology of the Great Plains* (Wood, 1998).

In the three study units, the major drainages—the Little Missouri, Knife River, and Missouri—were the focus of both prehistoric and historic occupation and utilization. The Knife River Study Unit also is distinguished by the presence of the Knife River flint quarries. These quarries were arguably the most important source in the Northern Plains of suitable lithic material for making stone tools. Archeological evidence indicates that Paleo-Indians first used these quarries and use extended up into the early historic period. The Crowley Flint Quarry near Golden Valley in Mercer County is a State Historic Site (Snortland, 2002). The Lynch Knife River Flint Quarry

National Historic Landmark was dedicated in 2012. This 690-acre National Historic Landmark near Dunn Center, North Dakota is 2 miles south of the Alternative C APE and is distinguished by the presence of numerous pits that were dug to extract lithic material (Hiemsta, 2008).

<u>Paleo-Indian Tradition (11,500–7,500 Years Before Present [B.P.])</u>

The first evidence of humans occupying North America, including North Dakota, which is referred to as the Paleo-Indian Tradition, is divided into a series of complexes, each temporally distinct and distinguished by distinctive projectile points. Claims have been made for earlier populations, often referred to as Pre-Clovis (Lepper and Bonnichsen, 2004), but the evidence has generally been considered inconclusive.

Geoarcheological studies indicate that western North Dakota was ice-free and suitable for human occupation as early as 11,500 years B.P. The first appearance of humans in North Dakota is associated with the Clovis Complex, which is distinguished by a distinctive basally fluted projectile point and highly developed bone and ivory technology. Evidence suggests that these early Paleo-Indians were highly mobile; they followed movements of and exploited now extinct Late Pleistocene megafauna, such as mammoth, mastodon, bison, and camel along with locally available resources. Early Paleo-Indian sites are rare in North Dakota and no Clovis sites have been documented in the study area. A Clovis projectile point made on Knife River flint was identified at a site near Beaver Creek in the Garrison Study Unit.

The Goshen Complex follows and dates to around 11,200 years B.P. Goshen style projectile points have been identified near the Knife River flint main quarry source area in Dunn County. One of the best known sites associated with this source area is located outside of Halliday.

The Folsom complex dates between 10,800 and 10,300 years B.P. Folsom points are distinguished by flutes made by removing a long channel flake that runs from the base of the point to well past the midline. Folsom people appear to have exploited now extinct species of bison along with deer, rabbit, pronghorn, and other smaller mammals. In North Dakota, Folsom components have been identified at sites on the Missouri River in Mountrail County. These types of sites also have been identified in Dunn County at Lake Ilo, within the Knife River flint quarry, which is part of the proposed (but never nominated) Knife River Flint Quarry National Historic District (Loendorf, Ahler, and Davidson 1984).

Evidence for later Paleo-Indian complexes is more common throughout North Dakota. These complexes are differentiated by distinctive lanceolate projectile points, typically exhibiting parallel flaking, such as Agate Basin, Hell Gap, Alberta, and Cody. These Paleo-Indian complexes are typically associated with extinct forms of bison. Evidence of Paleo-Indians in the study area consists only of surface finds of their projectile points. The one exception is the Knife River flint quarry region where intact deposits have been found. However, no evidence indicative of Paleo-Indian occupations has been found in any of the sites within or adjacent to Alternative C.

Plains Archaic Tradition (7,500–2,400 Years B.P.)

By 9,000 years ago, the climate began to dry. This warm/dry period, called the Altithermal, lasted for several thousand years and peaked around 7,000 years ago. The Altithermal caused the glaciers to retreat and resulted in the extinction of 31 genera of large mammals. These changes caused a shift in human subsistence patterns toward increasing reliance on smaller mammals and plant foods. With this subsistence shift there were changes in material culture that marked the onset of the Archaic Tradition. Excavation of deeply stratified sites has aided researchers conducting research on past climatic conditions in the northern plains. Early Archaic peoples hunted a now extinct form of bison smaller than the late Paleo-Indian form, but by the end of the Late Archaic, all hunted species were essentially in their modern forms. Evidence suggests that the bow and arrow was in use at least by the Late Archaic period in North Dakota, but did not supplant the atlatl (spear thrower) until Middle Plains Woodland. Late Archaic populations may also have practiced incipient horticulture. The use of tipis, marked by the presence of stone circles, often called “tepee rings” may have appeared during this period.

The Plains Archaic Tradition is often divided into three periods: Early, Middle, and Late, based on changes in material culture. Evidence for Early Archaic occupations in North Dakota is more common than for the Paleo-Indian, but is still rare in comparison to subsequent periods. Archaic sites in the study area typically consist of cultural material scatters with artifacts including chipped stone tools and flaking debris, fire cracked rock, and possibly bone fragments. Some Early Archaic projectile points, like Simonsen, can be misidentified as late prehistoric Prairie Side-notched points because they are relatively small and morphologically similar. Thus, some Early Archaic occupations may have been misidentified as later occupations. The Oxbow complex, defined by the Oxbow Side-notched projectile point seems to fall between the Early and the Middle Archaic, but is typically grouped with the Early Archaic period. The Middle Archaic is most often identified by the presence of McKean, Duncan, or Hanna points. These three projectile point types are frequently found in association with one another (e.g., at the Gant site in South Dakota). The Late Archaic in North Dakota is most often identified by the presence of Pelican Lake points. Other unnamed Late Archaic corner-notched points are similar to corner-notched points of the Early Plains Woodland so that sites containing such points, but lacking pottery, can easily be misidentified as Late Archaic.

The Archaic Tradition is well represented in the three study units crossed by the alternatives. Two sites shared by Alternative C, D, and E contain diagnostic Archaic artifacts. Two additional sites on Alternative C, D, and E also appear to date to the Archaic Tradition.

Plains Woodland Tradition (2,400 Years B.P.–A.D. 1000)

The Plains Woodland Tradition also is typically divided into the Early, Middle, and Late Plains Woodland periods. The appearance of ceramics and the replacement of the atlatl with the bow and arrow are hallmarks of the tradition. The Middle Woodland Sonota complex is known for mortuary mounds, and the Late Woodland is marked by the first fortified villages—the most well-known is the Menoken Village, a National Historic Landmark, located near Bismarck, North Dakota. Gardening appears to have been a minor, but integral aspect of subsistence by the Late Woodland period. Bison hunting and foraging were major aspects of the subsistence strategy. Archeological evidence indicates that the Late Woodland Tradition can be linked with cultural developments elsewhere in the Upper Midwest, although the extent of the influence is poorly understood.

Projectile point styles and settlement-subsistence patterns of the Early Woodland are similar to those of the Late Archaic. Projectile points antecedent to Besant and ceramic variants, such as Black Duck, are hallmarks of the Early Woodland. Vessels are generally thick-walled conchoidal forms with grit temper. The exteriors, and sometimes the interiors, are often cord roughened with decorations (if present) consisting of cord marking, embossing, and trailing over cord roughened surfaces.

The Middle Plains Woodland is well represented in the three study units and across the rest of North Dakota. The material culture is referred to as the Sonota-Besant and includes Besant Side-notched points, small Samantha Side-notched points, corner-notched points that resemble Pelican Lake, and ceramics that include conchoidal-shaped vessels with cord roughened exteriors, occasionally smoothed, and decorative bosses or punctuates along the rims. Middle Woodland populations participated in interregional trade with Hopewell groups in Ohio. Many of the stone circle sites and cairns are thought to be associated with Sonota-Besant camp sites.

The Late Plains Woodland period is represented by finely crafted side-notched arrow heads including Prairie Side-notched, Plains Side-notched, and Avonlea. Avonlea pottery is more conical in shape, often with net impressions, although cord roughened pottery is still dominant. Use of conical mortuary mounds began in the Middle Plains Woodland and were still in use during the Late Plains Woodland, but linear and effigy mounds also appear, most notably east of the Missouri River.

Plains Woodland sites are expected in the study area because of the proximity of the Knife River flint source area. More than 75 percent of the lithic artifacts recovered from the Early Woodland Naze site located along the James River were made from Knife River flint. This frequency most likely indicates direct procurement of the material rather than acquisition through trade. Several sites located within Alternatives C, D, and E appear to have Woodland components. Most sites will consist of cultural material scatters and sites with stone features, such as rings and cairns, and possibly mounds.

Plains Village Period (A.D. 1000–1780)

The Plains Village tradition is represented by semi-sedentary, hunter-gatherer-horticulturalists who lived in permanent villages for at least part of the year. The largest and most permanent of these villages were along the Middle Missouri River. The villagers practiced a mixed subsistence strategy that involved horticulture, hunting, and foraging. Hunting focused on bison augmented by other game. Horticulture involved corns, beans, squash, and tobacco.

Stone tools available during this period include Plains and Prairie Side-notched projectile points along with unnotched triangular points, bifacially flaked end scrapers, and heavy-duty bifacial cutting tools. Another hallmark is the diversity of bone tools such as the buffalo scapula hoe, which was integral to daily gardening activities. Pottery included globular jars with straight, out-curved or braced rims and grit, as well as sand or shell temper. The exterior surfaces included smooth and unsmoothed cord, roughened or check stamps. Decorative elements like trailed lines, tool impressions, and cord wrapped tool impressions were often added to each vessel. Trade is indicated by the appearance of non-local items such as obsidian, Gulf and Pacific coast marine shells, and catlinite.

As the Northern Plains became warmer, droughts plagued the region between A.D. 1250 and 1500. This climate significantly reduced the amount of arable land, resulting in food shortages and increased warfare. These social upheavals continued on into the 1700s, and are evidenced by the appearance of fortification palisades and defensive ditches around village sites such as at Molander Village and Double Ditch, two state historic sites north of Bismarck (Snortland, 2002).

Plains Village sites can be expected within the study area because such sites have been identified in each of the three study units. Excavations at these sites have yielded ceramics dating between the 17th and 18th centuries A.D., chronologically important paleosols, and a stone circle containing temporally and culturally diagnostic artifacts. Conical timber lodges were apparently being constructed in the badlands during this time period.

Of the Plains Village sites that have been recorded in the study area, most appear to represent temporary hunting and foraging sites, and include cultural material scatters and/or stone features that include rings and/or cairns. Large village sites will most likely not be encountered in the direct effects APE, except possibly where Alternative C crosses the Missouri River. Areas away from the Missouri River and other drainages were mainly visited only during hunting and/or foraging forays. Sites within Alternatives C, D, and E may have Plains Village components.

Equestrian Period (A.D. 1780–1880)

The Equestrian Period, sometimes referred to as the Fur Trade Period, was a time of great change among Native American peoples and their way of life. The beginning of the period is marked by the introduction of horses, followed by the rise of the Great Plains Equestrian Tradition, and culminating with the confinement of Native Americans on reservations. During this period, tribes like the Dakota Sioux who had been living to the east moved onto the Great Plains because of the encroachment of Euro-American settlements. This immigration created internal conflicts with tribes already present and later with Euro-Americans who were moving into the area.

Tribes that have historic ties to the study area and whose presence can be traced to different times within this period include the Mandan, Hidatsa, Arikara, Crow, Assiniboine, Plains Cree, Chippewa, and the Lakota and Dakota Sioux (Royce, 1889; Schneider, 2002). The Sioux, Plains Cree, and Chippewa originated farther east and appeared later in the region. In contrast, the Mandan, Hidatsa, Crow, and Assiniboine appear to have been present at the time of the earliest Euro-Americans. The presence of these Indian tribes is based largely on ethnographic accounts, oral history, and military records.

Double Ditch, occupied from about A.D. 1490 to 1785, was one of seven to nine Mandan villages occupied simultaneously near the confluence of the Heart and Missouri rivers east of the study area. The three primary Hidatsa villages were located farther north, closer to the study area, at the confluence of the Knife and Missouri rivers. The largest of the three villages was established around A.D. 1600.

The Sioux Nation is composed of seven Council fires: the four Santee or Dakota (Eastern) bands (Mdewakanton, Wahpeton, Wahpekute and Sisseton); the two Middle or Nakota bands (Yankton and Yanktonai); and the Lakota (Teton) or Western band, which includes sub-bands such as the Oglala, Brule, Hunkpapa and Sihaspa (Blackfeet). In the late 17th and early 18th centuries, European settlement in the east pushed the Ojibwa, who had experience with European traders and possessed guns, to the west. The Ojibwa and Cree encroachment upon the territory of the Dakota led to tensions between the two tribes. By about the 1750s, the Middle Sioux had settled in the area along the Missouri River while the Tetons had pushed to the Black Hills and beyond. By the end of the century, it is believed that the study area was occupied by the Teton or Lakota, possibly the Hunkpapa sub-band. However, as part of the Fort Laramie Treaty of 1851 the study area was located in the aboriginal lands identified with the Three Affiliated Tribes, specifically the Hidatsa.

Archeologically, it is often difficult to identify the cultural affiliation of a particular site from this period. Typically sites of this period can only be identified through the presence of Euro-American trade goods, especially metal objects and trade beads. Metal artifacts can rust away quickly and trade beads are generally tiny and easily overlooked during pedestrian inventory. There is only one site that may date to this period and it is shared by all alternatives.

<u>Euro-American/Settlement</u>

Early Euro-American exploration in what eventually would become the state of North Dakota was limited. Pierre La Verendrye and his sons traveled through the Red River area in the 1730s and journeyed along parts of the Souris and Missouri rivers in 1742–1744. In about 1738, La Verendrye, who is believed to have been the first European in the Missouri River area, visited the Mandan. The Mandan villages played a key role in the limited trade that followed because of their location at the northern reaches of the Missouri River. Eventually, the Mandan and Hidatsa along with the Arikara, who occupied the Missouri River farther to the south, were decimated by a series of smallpox epidemics starting in 1772 and continuing through the early 19th century, losing up to three-quarters of their population.

Because of the trappers and traders working for the Northwest and Hudson Bay companies along the Red River by 1779, the area to the west soon became well-known to trappers and traders working out of such fur trade posts as Fort Garry, Manitoba (present day Winnipeg, Canada). At that time, the study area would have been a part of the Louisiana Purchase acquired by the United States from France in the early 19th century. While Lewis and Clark traveled up stream and back downstream along the Missouri River in 1804–1806, there is no evidence of an archeological site associated with that exploration located within the APE. The construction of Fort Snelling in 1819 at the confluence of the Mississippi and Minnesota rivers established the first permanent U.S. military presence west of the Mississippi River. This was followed by more permanent manifestation of the economic relationship between fur traders and Indian tribes extending even farther west beyond the study area. Several 19th century fur trade posts have been identified in western North Dakota, including Fort Clark, a state historic site on the west bank of the Missouri River at the confluence of Chardon and Clark's creeks (Snortland, 2002), and Fort Union Trading Post, a National Historic Site southwest of Williston. Fort Clark was built in 1830 and 1831. The first steamboat to visit the Upper Missouri River reached Fort Clark in 1832. Fort Union Trading Post was built in 1828 near the confluence of the Missouri and Yellowstone rivers.

Fort Laramie, in what would become eastern Wyoming, began in 1834 as a private trading post. Over the next 15 years it served as the primary stopping point on the Oregon Trail heading northwest with separate branches becoming the California and Mormon trails. In 1849, the fort was purchased by the U.S. Army to protect the ever-increasing numbers of settlers heading west, especially after the discovery of gold in California. After its establishment that same year, the Minnesota Territory stretched all the way to the east bank of the Missouri River. By 1861, the region west of the Red River, including the study area, had become part of the Dakota Territory.

During this period, there were numerous treaties signed to achieve stability and establish peace with and among the various Indian tribes inhabiting the Northern Great Plains. However, none was truly successful, largely because of the federal government's failure to live up to its treaty promises. Because of this failure, the Dakota, who by the summer of 1862 occupied a limited area in southwestern Minnesota, were starving. Crops had failed the year before and the previous winter had been especially difficult. Indian agents had food, but refused to extend any additional credit to the Dakota.

Fueled by years of distrust, misunderstanding, poor communication, and failures to live up to the promises, the Dakota went to war in August 1862, killing possibly as many as 200 people the first day. While not really part of it, the Dakota War of 1862, which has been called the largest Indian War in American history, had an impact on the Civil War. Because the Union heavily depended on the Upper Midwest both for food and military manpower, agriculture, commerce, and recruiting declined with little prospect for improvement until settlers felt safe. Fort Abercrombie, which had been established in the Red River Valley south of Fargo, North Dakota in 1858, was attacked. Therefore, this was no longer an uprising restricted to Minnesota, but one whose panic spread all the way into Canada and west into the Dakota Territory. In response to a demand for action on September 6, 1862, President Lincoln created the new Army Department of the Northwest to protect the states of Wisconsin, Minnesota, and Iowa as well as the Dakota and Nebraska territories. In the last and largest battle of the Dakota War of 1862, the Battle of Wood Lake, U.S. Army troops prevailed. Some of the defeated Santee fled into Canada, but others went west into the Dakota Territory.

Then began the process to identify and punish any Dakota who had participated in the uprising. In December 1862 in the largest mass such action in U.S. history, 38 Dakota were executed for their alleged role in this war. However, still believing homesteads to be at risk, in October 1862 the U.S. Army conducted the first of several punitive expeditions against the Sioux deep into Dakota Territory. That year using this search and destroy tactic, the U.S. Army returned with more than 1000 Sioux women, children, and elders. Many did not survive the winter in Minnesota at Fort Snelling.

The following year in April, Congress enacted a law providing for the forcible expulsion of the Sioux and Winnebago from Minnesota. However, this campaign of expulsion did not stop with Minnesota, but followed the tribes west into Dakota Territory. The Department of the Northwest sent expeditions to Dakota Territory in 1863, 1864, and 1865, and established a series of forts to protect frontier settlements and traffic along the Missouri River. The 1863 major campaign against the Dakota began with the Big Mound Battle on July 24th and ended with the Massacre at Whitestone Hill in September. The day following that engagement, the U.S. Army burned all remaining Dakota property—dried buffalo meat, tipis and winter supplies—an action that would be repeated elsewhere.

During the winter of 1863–1864, Major General John Pope formulated a plan that he believed would end difficulties with the Sioux. He ordered a force of about 2,500 men into to the field to find and engage the Sioux. In addition, an infantry force would follow the main force establishing outposts to provide security, advance warning, and quick interception of any Dakota trying to enter Minnesota. After setting out on June 30, 1864, this force established Fort Rice at the confluence of the Cannonball and Missouri rivers. On July 28, 1864, the U.S. Army attacked the Sioux camped at Killdeer Mountain. In the report titled, *Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields, State of North Dakota*

(American Battlefield Protection Program [ABPP], 2010), NPS defined preliminary boundaries for the Killdeer Mountain Battlefield (KMB) study and core areas. A more detailed discussion of this engagement is found below. In truth the Dakota War of 1862 did not end with the Battle of Wood Lake nor did punitive expeditions end with Killdeer Mountain. Rather these conflicts were part of a ruthless and tragic conflagration which lasted through the Civil War and for the next 25 years.

Just as the Civil War did not stop conflicts between the U.S. Army and Indian tribes, it also did not halt western migration. The first county in North Dakota was Pembina County, organized in 1867. The county at that time included nine present day counties. In the 1880s, the counties were split up once again into roughly the present configuration. The Homestead Act, which passed Congress in May 1862, granted 160 acres of public land to anyone who got to it first, filed a claim, and worked the land for the next 5 years. Railroads brought in the first substantial waves of settlers into eastern North Dakota in the early 1870s. Settlers acquired land from the railroads or through the Homestead Act, and the Timber Culture Act of the 1870s. By 1883, practically all of the arable land in central and eastern North Dakota had been claimed.

North Dakota gained statehood in 1889 with Bismarck established as the state capital. The railroad industry boomed from 1898 to 1915, leading to the rise in small towns across the state. Agricultural settlement followed a cyclical boom and bust pattern and in the 1930s, the Great Depression made it impossible for smaller farms to succeed. Agriculture has always been the top economic force in North Dakota. The state has continued to boom and bust based on world wars, the Great Depression, and a growing dependence on federal aid. The situation has not changed appreciably in subsequent years. Recently, the state has seen a significant rise in its economy from oil exploration and alternative energy research and development.

Sites associated with Euro-American settlement are the most visible cultural resource in the study area. Site types likely to be encountered within the APE include farms, trash dumps, railroad crossings, town sites, churches, forts, Western transmission lines, irrigation ditches, bridges, abandoned mines, and cultural material scatters.

Cultural Resource Investigations

At the request of Western, Basin Electric engaged Metcalf Archaeological Consultants, Inc. to conduct a Class I cultural resources file search of the 6-mile-wide corridor for the proposed AVS to Neset Transmission Project in late 2011 and early 2012 (France, 2012). The Class I search involved a search of North Dakota SHPO site and manuscript files at SHSND for the corridor to identify known cultural resources, particularly *historic properties* (that is buildings, structures, sites, objects, or districts listed in or determined eligible for listing in the NRHP), including those of traditional religious and cultural importance to Indian tribes listed in SHSND records, and those that might meet NRHP criteria. The Class I file search also was designed to identify those cultural resource investigations that have been conducted within the study area (France, 2012).

In September 2012, Basin Electric initiated and will continue to implement, as appropriate for each project phase, Class II (Reconnaissance) and Class III (pedestrian) cultural resources surveys of the ROW, reroutes, access roads, substations, and laydown areas wherever access has been granted by the private landowner. As of the date of this publication, 60 percent of the alignment has been surveyed and 40 percent of the alignment remains to be surveyed prior to construction. Western submitted an interim report, *Basin Electric Cooperative's Antelope Valley Station to Neset 345-kV Transmission Line: A Class II and Class III Cultural Resource Inventory in Dunn, McKenzie, Mercer, Mountrail and Williams Counties, North Dakota Interim Report* (Basin, 2013c), describing the results of the 2012 field survey results to the North Dakota SHPO, USFS, RUS, SRST, the Three Affiliated Tribes, and the White Earth Band. Upon becoming a consulting party, SWO received a copy of this interim report for review in September 2013.

At their first consultation meeting with Western, SRST requested that project construction avoid impacts to all stone circle sites around Williston, and that a 100 percent survey of the APE be performed by its preferred tribal cultural specialist. Western disagreed with the recommendation for a 100 percent survey because experience has demonstrated that disturbance from agricultural activities has diminished the preservation of tribal cultural resources. On September 26, 2013, Western RUS, USFS, SRST, SWO, and Basin Electric met to resolve the disagreement regarding the level of effort for the tribal resources survey to be conducted by the SRST preferred contractor. Eventually, it was agreed that to identify possibly affected tribal cultural resources, Basin Electric would conduct a pedestrian survey of approximately 117 miles of uncultivated lands in the APE and approximately 80 miles of cultivated lands where significant tribal cultural resources might be located as determined by a visual examination. In October 2013, Basin Electric initiated the tribal cultural resources survey. By November 2013, the preferred tribal cultural specialist had completed study of the project segment between AVS and the Missouri River wherever permission to access had been granted. On March 28, 2014, Western, RUS, and USFS met with Basin Electric and SRST to resolve issues related to the scope and resumption of the tribal resources survey, and to discuss the need for a PA.

Following the September 2013 recommendation of the North Dakota SHPO, Basin Electric conducted a geophysical survey (metal detection inventory) of 8 miles of the ROW centerline that crosses the KMB study area, as defined by ABPP in 2010. This survey was designed to determine if surface or subsurface evidence of the battle exists within the ROW that would assist in better defining the boundaries of this conflict. The findings of Basin Electric's geophysical survey are presented in *Basin Electric Power Cooperative's Antelope Valley State To Neset 345 kV Transmission Line: 2013 Supplemental Investigations Through The Killdeer Mountain Battlefield Study Area in Dunn County North Dakota* (Engel, 2014).

The draft PA currently under consideration by RUS, Western, USFS, and the consulting parties requires that this survey be completed, and avoidance or treatment measures implemented prior to the start of every phase of construction of the AVS to Neset Transmission Project.

Furthermore, to meet the terms of the PA as proposed, Western will provide the results of these surveys to the other federal agencies, the North Dakota SHPO, SWO, and SRST, and, as appropriate, to the other consulting parties for their review and recommendations. Basin Electric will combine all the interim/draft reports into a final Class II and Class III cultural resources inventory report.

Killdeer Mountains (Taĥċa Wakutėpi) and Medicine Hole

Several Native American tribes attach a spiritual significance to both the Medicine Hole and the Killdeer Mountains. The Mandan call South Killdeer Mountain *Bah-Eesh*, or “the mountain that sings,” because of the wind currents that sometimes emanate from the Medicine Hole. This place was where many Earth-naming ceremonies were conducted; ceremonies that have since been lost (Goodhouse, 2013). According to Mandan tradition, the first buffalo emerged through the Medicine Hole. The Tribe also told the story, during their *Okipa* ceremony, of how the spirits who were responsible for killing Little Foolish One hid here to escape the wrath of his father (Bowers, 2004).

According to Lakota tradition, members of the Sioux bands escaped the KMB by making their way into the Medicine Hole to follow its narrow pathway to the west exit, heading toward the Badlands. The western exit is now blocked by a landslide, and while some have attempted spelunking the cave, it has proven largely non-navigable (Goodhouse, 2013; Scott and Kempcke, 2000). To this day, Medicine Hole remains a place that is revered by the tribes that possess a historical connection to it.

Killdeer Mountain Battlefield

Following the Dakota uprising of 1862, many Eastern Sioux fled from Minnesota to the Dakota Territory. In response, Brigadier General Alfred Sully led a U.S. Army expedition against the Teton, Yanktonai, and Dakota (Sioux) Indians that culminated in the Killdeer Mountain Battle on July 28, 1864 (SHSND, n.d.; Clodfelter, 1998; Beck 2013). This expedition was only one in a series of punitive engagements conducted against the Sioux in 1863, 1864, and 1865.

The KMB State Historic Site, located against the Killdeer Mountains approximately 8.5 miles from the town of Killdeer in Dunn County, commemorates this engagement (SHSND, n.d.; Snortland, 2002) with a sandstone slab monument, flagpole marker, and headstones for the two U.S. soldiers killed during the battle. Currently, the only official geographic delineation of the KMB is 32DU1094, which encompasses the state historic site, and is believed to mark the approximate location of the Sioux bands’ encampment. The Sioux were encamped at this location because it was an important hunting group and a place where young warriors came for vision quests. As noted in the 2014 draft report, “the terrain also had defensive advantages, as it had a good view to the south and east, and the ground was uneven and rose into ridges and buttes between 400 and 800 feet in height above the surrounding plains” (Engel, 2014).

After departing from Fort Rice on July 19, 1864, Sully learned of a large encampment of Sioux on or near the Knife River. He departed his camp on July 26th with 2,200 men heading northwest toward this encampment. Later that day, his scouts skirmished with a party of Sioux warriors returning to their camp, ruining any chances for Sully to mount a surprise attack (Engel, 2014). Based on figures given by Sully and his officers in their official reports, the action began 2 days later at least 6 miles from the Sioux camp and continued up to the camp itself. However, other than Sully's statement that the direction was "west of north," the route of the soldiers' march is not clearly described in the official reports. The most likely approach seems to be the traditional one, on the north side of and up Gumbo Creek from the southeast. The 2014 draft report (Engel, 2014) presents a reconstruction of the battle with an illustrated interpretation of the movements of the combatants based on the work of Walt Bailey, formerly with the North Dakota SHPO. While this has proven to be a helpful illustration, the report cautions that "exact troop movements remain conjectural because primary source data (i.e., historical accounts) are incomplete and merely refer to a general northward advance" (Engel, 2014).

The Army column, which would have been at least 200-yards wide, was shadowed by the Sioux from a considerable distance beyond rifle range and often out of sight beyond hills (War Department, 1880–1906). According to the 2014 draft report, after the first shots were fired, the Sioux warriors "*intimidated the soldiers by massing and charging downhill at full speed*" (Engel, 2014). However, this tactic was abandoned because the Sioux weapons, old muskets with sparse ammunition and bow and arrow, could not compare with the firepower and accuracy of the soldiers' weapons. As a result, the Sioux "became reluctant to get too close to the soldiers," but would form "small clusters, charge" and the fall back. Indeed, it is believed that "the artillery, which few [Sioux] warriors had encountered before, was the deciding factor in the battle" (Engel, 2014).

As the Army approached the camps, the Sioux retreated up into the Killdeer Mountains. It is reported that cannon "*continued firing until nightfall, by which time most Sioux had fled*" (Engel, 2014). Most of the bands that were present had no part in the Minnesota uprising, but Sully attacked nonetheless, killing between 100 and 150 Sioux, while the rest abandoned their camps and fled (Clodfelter, 1998; Beck, 2013). During and following this punitive action, the Dakota used a sacred cave at the top of a plateau in the Killdeer Mountains, known as the Medicine Hole, as a refuge. The next day Sully unsuccessfully pursued the Sioux while another body of troops destroyed and burned everything in the camp (tipis, dogs, dried buffalo meat, tanned hides), and killed any survivors they found. As noted in the 2014 draft report, "Sully had first implemented this 'scorched earth' policy following" the Massacre at Whitestone Hill (Engel, 2014).

When the KMB State Historic Site, which lies approximately 0.5 mile outside of the APE, was formally designated in 1993, the full extent of the engagement's boundaries had not been defined. Since then, an ABPP study (2010) has identified the KMB as a Priority III Civil War

Battle, and revised the 1993 boundaries for core and study areas on the basis of historical research, field documentation, and condition assessments conducted in 2008. Recently, the North Dakota SHPO designated the 2010 ABPP KMB study area as site lead[14] 32DUX1120.

According to ABPP, a "study area" represents the historical extent of the battle as it unfolded across the landscape, while a "core area" defines the locations where actual fighting occurred. ABPP has preliminarily identified a study area for the KMB that encompasses approximately 17,340 acres or approximately 36-square miles. The core area defined by ABPP encompasses the location of the Sioux camps and an area stretching toward the southeast, 5 miles long and 1.4 miles wide and centered on Gumbo Creek. This area represents a preliminary interpretation of the area of maneuvering and fighting (Snortland, 2002). However, with the award of two grants to the ABPP[15] in July 2013, it essentially acknowledged that the 2010 KMB study and core area boundaries need to be field verified and confirmed through archeological and additional historical investigation. At this time, it is doubtful if either study will be completed before publication of the FEIS, especially since several landowners within the ABPP KMB study area have refused access to conduct archeological field studies (Maus & Nordsven, P.C., 2013).

Figure 3-29 shows the KMB State Historic Site, KMB study and core areas as defined in 2010, and the location of the Alternative C 150-foot-wide ROW.

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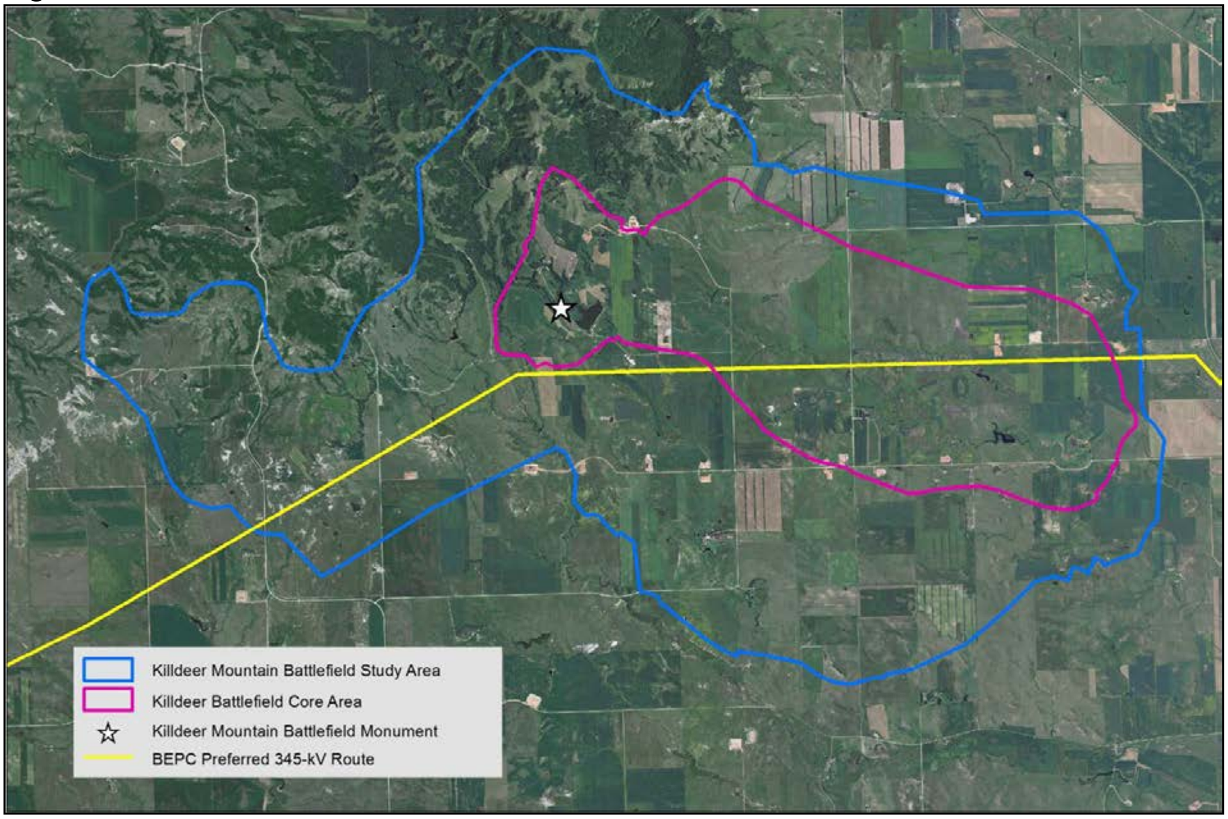
[14] A site lead is defined as "…a location reported by a landowner or other nonprofessional as containing cultural resources. These locations are identified as site leads until such time as a qualified archaeologist or architectural historian can determine whether cultural resources exist in the area and, if so, whether the location is a site or an isolated find." The term also can be used to characterize a location "with five or fewer surface visible artifacts which may, in the professional judgment of the archaeologist(s), be only a limited surface expression of a former occupation area where most of the artifacts are not visible (i.e., still buried).

[15] The first ABPP grant funds historical research, archeological surveys, and digital mapping of various sites associated with the 1862 Dakota War and its aftermath through 1864 in Dakota Territory, including the KMB. The second ABPP grant will support a more concentrated study of the KMB.

Figure 3-29: Killdeer Mountain Battlefield



3.6.2 Direct and Indirect Effects

In Section 106 review, pursuant to 36 CFR 800.5(a)(1), an adverse effect, be it direct indirect or cumulative occurs

> "…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."

In assessing adverse effects to historic properties, federal agencies are required to consider "reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative." ACHP, however, provides no further direction in identifying and assessing adverse cumulative effects. The authority to make a finding of adverse effect resides solely with Western, RUS, and USFS and is contingent on the alteration of a historic property's qualifying characteristics in a manner that would diminish those aspects of integrity that apply. Through the relocation of structures and associated facilities, the goal for this project is to avoid adverse effects to historic properties.

Impact of the Project on Killdeer Mountain Battlefield NRHP Eligibility

The engagement at Killdeer Mountain on July 28-29, 1864, was a significant action in the context of the Dakota War of 1862 and its aftermath. Not only was it instrumental in restoring security in Minnesota and Iowa settlements and the Dakota Territory, but it also has been described by SRST as the largest battle fought between the Lakota and Dakota and the U.S. Army under Brigadier General Sully. In recognition of its role in the larger context of the 1862 Dakota War and the punitive expeditions that it caused, ABPP (2010) designated the KMB as a Class C battle, i.e., as "having an observable influence on the outcome of a campaign." The battle at Killdeer Mountain and associated actions restored agricultural and commercial productivity so that the region could resume its support for the Union effort during the Civil War. Accordingly, RUS, Western, and USFS believe that this battle is significant at the local and state levels, if not at the national level because of its association with the Civil War, chronologically and through the value of its contributions to the Union effort.

Because of the significance of this battle to the history of the region, including the Dakota Territory, the state, RUS, Western, and USFS believe that part of the 2010 ABPP KMB study area is eligible for listing in the NRHP under Criterion A. Furthermore, as noted by some commenters on the Supplemental DEIS, the participation of Chief Inkpaduta and Sitting Bull along with Brigadier General Sully is probably sufficient to also qualify the KMB as NRHP-eligible under Criterion B. The SWO Tribal Historic Preservation Office may have suggested that this battle also is important because it affected the later tactics of Sioux. Although artifacts have been collected for decades by private landowners,[16] important archeological information about the Sioux encampment and the battle probably still remain to qualify at least some portion of the 2010 ABPP KMB study area as eligible for the NRHP under Criterion D.

As noted above, to be eligible for the NRHP, a property must possess integrity, which is defined as its ability to convey its significance. There are seven aspects of integrity—location, workmanship, setting, feeling, association, and design materials. However, all seven need not be applicable for a property to possess integrity. According to NPS, the aspects of integrity most often associated with battlefields are location, setting, feeling, and association (NPS, 1999). That is also true for KMB where workmanship, design, and materials would not apply because there are no surviving battle period built resources.

A basic test of integrity important for the association of a battlefield with an event (Criterion A) or person (Criterion B) "is whether a participant in the battle would recognize the property as it exists today" (NPS, 1999). Killdeer Mountain is the most prominent landform within the 2010 ABPP KMB study area and its location has not changed since 1864. Therefore, it is quite likely

[16] Alick Dvirnak, owner of the Diamond C Ranch at the foot of Killdeer Mountain, loaned his extensive artifact collection to Dickinson State University Theodore Roosevelt Center in June 2008.

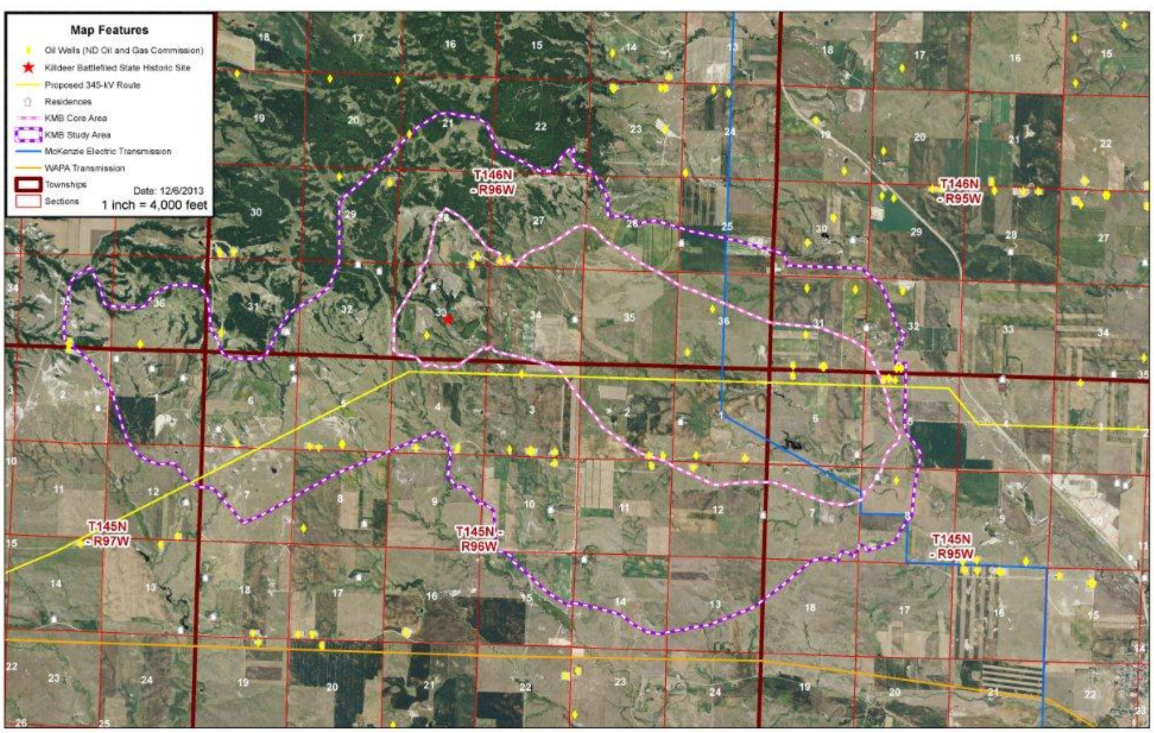
that participants in the battle would recognize this landform from miles away and use it to broadly orient themselves to the battlefield. Although commenters on the Supplemental DEIS recommended that a military terrain analysis be conducted, RUS, Western, and USFS did not conduct the analysis (Key Terrain/Decisive Terrain Observation and Fields of Fire Concealment and Cover Obstacles Avenues of Approach/Withdrawal). After application of the factors identified in 36 CFR 800.4(b)(1), RUS, Western, and USFS determined that conducting such a study exceeded the reasonable and good faith effort regulatory standard because of landowner concerns about NRHP nomination (Maus & Nordsven, P.C., 2013), costs, likely effects given existing modern industrial intrusions, and the potential delay to the project schedule. Given modern land use patterns, it appears that the terrain immediately surrounding Killdeer Mountain has changed little since 1864. However, the addition of four oil wells at the base of the mountain is a significant modern intrusion within the viewshed, one that is symptomatic of a more extensive change evident throughout a significant portion of the KMB study area landscape.

Killdeer Mountain and its immediate surrounding terrain are critical in assessing the degree of integrity of the battlefield because there are no surviving battle period built resources. The battle reconstruction presented in the 2014 draft report suggests that the Sioux controlled and used the high ground and uneven terrain surrounding Killdeer Mountain to their advantage (Engel, 2014). Eventually, however, they were outgunned by the artillery and had to retreat. While the relationship between terrain features probably has experienced little change, land use is significantly different now than in 1864. At that time, the KMB was the frontier, but today ranches and their associated outbuildings and supporting infrastructure, such as distribution and transmission lines (one 115-kV and one 230-kV transmission line) now characterize the 2010 ABPP KMB study area landscape.

While these modern features intrude upon the character of the battlefield setting, seen alone they do not significantly diminish the ability of this landscape to visually communicate an authentic sense of the sweep of the battle. However, the addition of 21 active oil wells and 5 dry wells along with telecommunications towers situated on Killdeer Mountain itself significantly diminish the setting in a certain area of the KMB study area, most notably in the immediate vicinity of the APE. Figures 3-30 and 3-31 show the location of oil wells and related facilities in and surrounding the battlefield study area.

Figure 3-30: Oil Field Development Near Killdeer Mountain Battlefield Study Area

Figure 3-31: Location of Oils Wells and Related Facilities



These modern industrial intrusions are so out of character with the 1864 landscape that RUS, Western, and USFS believe the feeling, i.e., "the battlefield's expression of the historic sense of a particular period of time" (NPS, 1999) in that portion of the KMB study area that will be crossed by the project has been significantly diminished. The potential impact of industrial development on the KMB study area was in fact anticipated by ABPP, which observed that

> "the rocky hills and surrounding plains of the Killdeer Mountain have changed little since the Civil War, but increasing interest in sub-surface resource extraction represents a significant threat to the historic landscape. Although exploratory drilling has had a negligible impact on the topography so far, any full-scale effort to extract sub-surface resources from this area will devastate the battlefield's integrity" (2010 ABPP).

Accordingly, after additional analysis subsequent to issuance of the Supplemental DEIS, RUS, Western, and USFS determined that it would be inappropriate to treat the 2010 ABPP KMB study area in its entirety as if it were eligible for listing in the NRHP. Rather, they believe that, for the purposes of Section 106 review of the AVS to Neset Transmission Project, a more limited portion of the KMB core area centered on Killdeer Mountain and its immediate surrounding terrain retains sufficient integrity to be considered a historic property. Restricting the geographic extent of the KMB historic property in this manner also appears to be consistent with the areas of most importance to the tribes, and may define the area of the most intense engagement.

In light of United Tribes of North Dakota Resolution 9-13-10, the likelihood that remains of Lakota and Dakota killed during this battle would be located within the APE seems very limited (United Tribes of North Dakota, 2013). In this document the United Tribes state that Tetons who escaped the battle buried the bodies of their dead relatives in a long line along the hills where they were killed. This description most likely refers to the hills immediately surrounding Killdeer Mountain, an area outside of the APE, but within what RUS, Western, and USFS would consider as the KMB historic property. If this interpretation is correct, the presence of such burials only enhances Killdeer Mountain's religious and cultural importance to Indian tribes.

Archeological testing, including metal detection and shovel testing, within the APE where it crosses the 2010 ABPP KMB study area did not yield any archeological resources that could be unequivocally tied with the battle. Because they cannot be precisely dated, the association of the two lead round balls, two lead "Minnie balls," and one copper cartridge with the battle is only speculative.

NPS advises that a battlefield boundary should include "all locations where opposing forces before, during or after the battle took actions based on their assumptions of being in the presence of the enemy" (NPS, 1999). Application of this guidance would be appropriate if the intent was to nominate the KMB historic property for listing in the NRHP. However, pursuant to 36 CFR 800.4(b)(1), RUS, Western, and USFS are required to identify a level of effort that is reasonable, developed from a good faith effort, and responsive to the public interest. Similar to the recommendation for the military terrain analysis, RUS, Western, and USFS have determined that the level of effort needed to delineate and confirm a boundary for the KMB historic property exceeds the reasonable and good faith effort regulatory threshold for several reasons. Implementing such a study would not be in the public interest, especially given landowner concerns and likely costs. Furthermore, execution of such an investigation would significantly delay the ability of the AVS to Neset Transmission Project to meet its purpose and need, resulting in diminished regional electrical reliability. RUS, Western, and USFS find these consequences unacceptable when compared with the likely effect of the project on the KMB historic property.

Effects of the Project on the Killdeer Mountain Battlefield

During the September 2013 NDPSC hearing on Basin Electric's Route Permit Application for Alternative A (originally proposed in the DEIS), several members of the public, including tribal members, expressed concern about the possible direct, indirect, and cumulative impacts of project construction on the Killdeer Mountain and the 2010 ABPP defined KMB. These concerns prompted the Killdeer Mountain Alliance and SWO to request, and be granted, consulting party status from Western.

On September 6, 2013, the United Tribes of North Dakota, composed of the Three Affiliated Tribes, SWO, SRST, Spirit Lake Nation, and Turtle Mountain Band of Chippewa, passed resolution 9-13-10 titled "Support for preservation of the Killdeer Mountains Civil War Battlefield at which an undetermined number of Lakota men, women and children were killed on July 28, 1864" (United Tribes of North Dakota, 2013). These tribes oppose "further development that would disturb the Killdeer Mountains Battlefield or that would disturb the remains of the many Teton Native Americans killed at the site." However, the United Tribes of North Dakota did acknowledge that the KMB is privately owned, and that state and federal agencies have little authority with which to protect this site.

The Three Affiliated Tribes, the Spirit Lake Nation, and the Turtle Mountain Band of Chippewa did not respond to the January 2012 invitation from Western to consult, and did not request to participate in Section 106 review as consulting parties following issuance of this resolution. Western, however, will continue to provide project documentation to the Three Affiliated Tribes because of the proximity of their reservation to the APE.

The November 2012 DEIS recognized the geographic relationship between the project and the 1-acre KMB State Historic Site located in the foothills of the mountain. The DEIS, however, did not explicitly acknowledge the presence of a more extensive scope for the KMB as estimated by ABPP in its *Update to the Civil War Sites Commission, Report on the Nation's Civil War Battlefields, State of North Dakota* (ABPP, 2010). Information about the 2010 ABPP-defined KMB was not available in files at SHSND, and before mid-2013, neither members of the public nor state agencies had identified this oversight. In light of the concerns expressed at the NDPSC hearing and in the tribal resolution, the Supplemental DEIS, which was issued in December 2013, was revised by RUS and the cooperating agencies to reflect the geographic relationship between the Alternative C APE and the KMB, as it had been preliminarily defined in the 2010 ABPP study, and to identify and analyze possible project impacts to this cultural resource and Medicine Hole, a place of tribal importance in Killdeer Mountain. At this time, RUS, Western, and USFS did not recognize the significance of Killdeer Mountain itself to Indian tribes. However, subsequent investigations and consultation with SRST and SWO have demonstrated that importance.

In addition to making these changes, RUS, Western, and USFS also agreed to implement recommendations proposed by the North Dakota SHPO in a September 3, 2013, letter, including: (1) remove the proposed electrical substation out of the 2010 ABPP KMB study area; (2) conduct a geophysical study of the 8 miles of ROW that crosses through the 2010 ABPP KMB study area to identify battle-related artifacts; (3) conduct archeological field testing at transmission line structure locations; and (4) analyze possible visual impacts of the project on the 1-acre KMB state historic site and Medicine Hole in Killdeer Mountain.

Then, in accordance with 7 CFR 1794, in January 2014, RUS with the cooperating agencies hosted a public meeting to provide the concerned public with an opportunity to make written and oral comments on the Supplemental DEIS. The comments submitted reflect the importance of Killdeer Mountain and the KMB to commenters, and document their specific concerns about the impact of the project on these cultural resources. Using these comments on the Supplemental DEIS, RUS, Western, and USFS identified additional parties who might wish to participate in Section 106 review. Accordingly, Western invited ABPP, Mr. and Mrs. Craig Dvirnak (who own a substantial amount of property within the 2010 ABPP KMB study area), and the North Dakota State University Center for Heritage Renewal to participate in consultation. These parties and the existing consulting parties received a copy of the 2014 draft report (Engel, 2014). All of the above-mentioned parties accepted Western’s invitation.

On April 16, 2014, RUS with the assistance of Western and USFS hosted a consultation meeting in Killdeer, North Dakota, to consider the possible effects of the project on historic properties and the terms of the draft PA. The following consulting parties participated either in person or on the telephone: ACHP, ABPP, North Dakota SHPO, the Killdeer Mountain Alliance, Basin Electric, Mr. and Mrs. Craig Dvirnak, and the North Dakota State University Center for Heritage Renewal. The primary issues discussed were the level of effort needed to reasonably understand the nature and geographic scope of the KMB, and the possible impact, especially cumulative of the project on it. At the close of the meeting, RUS asked the consulting parties to submit written comments on the draft PA because there had been so little discussion of it, and agreed to more carefully review and consider the significance of the KMB and the potential effects of the project on it using NPS Bulletin #40, and other applicable guidance. A transcript of that meeting prepared by a court reporter is posted on the RUS website at: http://www.rurdev.usda.gov/uwp-avs-neset.html.

Because of the unique government-to-government relationship between Indian tribes and the federal government, the next day RUS and the other agencies hosted a separate consultation meeting attended by SRST and SWO. In addition to discussing the status of the tribal cultural resources survey, the tribes provided the federal agencies with a better understanding of the importance of Killdeer Mountain and a sense of the tribal perspective on the engagement that took place at KMB. Although they had previously been provided, these tribes requested the opportunity to review and submit comments on *Basin Electric Power Cooperative's Antelope Valley Station to Neset 345 kV Transmission Line: A Class II and Class III Cultural Resource Inventory in Dunn, McKenzie, Mercer, Mountrail, and Williams Counties, North Dakota* and the 2014 draft report. RUS also requested that the tribes share their comments on the draft PA.

RUS revised the PA based on comments received from ACHP, SRST, the Killdeer Mountain Alliance, Mr. and Mrs. Dvirnak, Basin Electric, and the North Dakota State University Center for Heritage Renewal, and submitted it to consulting parties on May 5, 2014. In the Supplemental DEIS, RUS, Western, and USFS proposed treating the KMB study area, as defined by the 2010 ABPP, as eligible for listing in the NRHP for the purpose of Section 106 review. However, with further investigation into the context and nature of this conflict, RUS, Western, and USFS believe that the boundaries of the historic property should be significantly reduced from what was proposed as the 2010 ABPP KMB study area. In the Supplemental DEIS, the agencies propose that a finding of no adverse effect on the KMB is appropriate. After analysis of Bulletin #40 and additional guidance provided by ABPP, RUS, Western, and USFS still believe that a finding of no adverse effect is appropriate.

At a meeting held May 9, 2014, in Bismarck, North Dakota, RUS and the participating consulting parties[17] discussed the proposed finding of no adverse effect and the revised terms of the PA. Consultation on the agreement was very constructive and resulted in some meaningful improvement to the PA. As currently drafted, the PA establishes procedures for the identification of affected historic properties and the treatment of adverse effects to them prior to the initiation of each phase of construction of the project, to consider effects to historic properties of any design changes, and to address the treatment of unanticipated discoveries. Treatment is focused primarily on the avoidance of adverse effects to historic properties, especially important tribal cultural resources during construction and operation, while at the same time protecting

[17] The North Dakota State University Center for Heritage Renewal notified RUS that it had provided its comments and would participate further in the development of the PA. Because of scheduling conflicts, the SRST and SWO Tribal Historic Preservation Offices were unable to participate in the discussion. ABPP had not previously submitted comments on the PA and did not participate in this meeting.

confidential information about their nature and location. Protection of confidential information, especially about the nature and location of tribal cultural resources on private land, is of particular importance to SRST and SWO.

RUS revised the PA to address consulting parties' recommendations and submitted it for their review on May 15, 2014. Because consultation regarding the PA has been very positive, RUS believes it likely that concurrence among the signatories on the terms of the PA can be reached by early June 2014. However, RUS, Western, USFS, and the consulting parties are not in agreement regarding the proposed finding of effect. Under the terms of the PA, RUS, Western, and USFS would proceed with a finding of no adverse effect in accordance with 36 CFR 800.5(c)(2) and (3). Reliance on the regulatory procedures affords consulting parties the opportunity to file a timely objection, which then requires RUS, Western, and USFS to reconsider their proposed finding of effect. In the event this reconsideration results in a finding of adverse effect, the PA establishes procedures for the identification and implementation of appropriate treatment.

Impacts of Alternatives on Cultural Resources

<u>No-action Alternative</u>

The no-action alternative would not impact existing cultural resources either directly or indirectly, or cause adverse effects to identified historic properties. This alternative would allow for existing conditions to remain as they currently are. Cultural resources, including historic properties, would neither be preserved in another manner nor damaged under the no-action alternative.

<u>Alternative C</u>

A total of 286 cultural resources have been previously identified and recorded within or immediately adjacent to the 1,000-foot preliminary APE. These cultural resources include 4 multicomponent archeological sites, 123 archeological sites, 86 archeological isolated finds, 9 archeological site leads, 26 historic sites, 2 historic isolated finds, 18 historic site leads, 16 architectural resources, and 1 architectural site lead.

As established in the PA, the avoidance of adverse effects to historic properties is the preferred treatment by RUS, Western, and USFS. However, if avoidance is not possible, then under the terms of the PA, Western, RUS, and USFS would consult with the North Dakota SHPO, SRST, SWO, and other consulting parties to identify treatment that is reasonable and in the public interest. If the agencies and consulting parties cannot agree on treatment, the PA establishes procedures for the resolution of that dispute.

Western may determine that a study to identify built resources, primarily those residential, recreational, commercial, and industrial buildings in the APE that are listed or eligible for listing on the NRHP and may experience indirect (visual) effects from the proposed project, needs to be conducted following selection of the preferred alternative. The need for such a study is based on the possibility that the height of the proposed project structures and their form and color may diminish the integrity of a historic property by altering its setting and feeling in those cases where these aspects of integrity are applicable. In determining the level of effort for this study, Western, in accordance with the terms of the PA, would take into account the consulting parties' recommendations and existing modern intrusions to the viewshed that may have already compromised the integrity of a built historic property. The possible indirect effect of the project would be minimized through the use of single pole, rather than the more conventional H-frame or lattice and galvanized steel structures. Because no buildings can be located in the project ROW, direct impacts to such resources are unlikely.

<u>Alternatives D and E</u>

A total of 88 sites have been recorded within or immediately adjacent to the 1,000-foot preliminary APE of Alternatives D and E, including 2 multicomponent archeological sites, 54 archeological sites, 13 archeological isolate finds, 4 archeological site leads, 5 historic sites, 7 historic site leads, and 3 architectural resources. Similar to Alternative C, it is possible that the height of the proposed project for Alternatives D and E may diminish the integrity of a historic property by altering its setting and feeling.

Direct Effects to Killdeer Mountain Battlefield and Medicine Hole

Alternatives C, D, and E are identical in the vicinity of the Killdeer Mountains, Medicine Hole, and the KMB historic property. Therefore, the impacts, as described below, are the same for all three alternatives. None of these alternatives would be constructed within the Killdeer Mountains or Medicine Hole. Accordingly, there would be no direct effect on these historic properties resulting from construction of the project.

There is an 8-mile segment of the alternatives that passes through the 2010 ABPP KMB study area. RUS, Western, and USFS have determined, however, that the modern intrusions associated with this 8-mile corridor, especially the oil wells and their ancillary facilities, have compromised the integrity of the KMB in this location. Accordingly, RUS, Western, and USFS have not included this corridor within KMB historic property. Because these 8 miles are not part of the KMB historic property, RUS, Western, and USFS have determined that the KMB historic property would not be directly affected by construction of the project. Furthermore, the metal detection survey and archeological testing within the 8-mile corridor (Engel, 2014) did not identify any artifacts that could be unequivocally associated with the battle. The lack of such an association, while not absolute, suggests that even if this corridor were considered part of the KMB historic property, there would be no change in the assessment of direct effects.

Indirect Impacts to Killdeer Mountain Battlefield and Medicine Hole

Alternatives C, D, and E are identical in the vicinity of the Killdeer Mountains, Medicine Hole, and the KMB historic property. Therefore, the impacts, as described below, are the same for all three alternatives. None of these alternatives would be constructed within the Killdeer Mountains or Medicine Hole, but they would be visible from these historic properties.

At the request of the North Dakota SHPO, Western, RUS, and USFS have expanded the visual analysis from the state historic site to the battlefield as defined by the 2010 ABPP KMB study area. Portions of the transmission line would be visible in the distance from the Killdeer Mountain Battlefield State Historic Site and, at a greater distance, from Medicine Hole. At its closest points, the line would be 0.55 mile south of the state historic site and approximately 2 miles south of Medicine Hole. Figure 3-32, prepared for the visual impact analysis, simulates the visual effect of the transmission line as seen from the closest vantage point at the state historic site. However, because the transmission line crosses the battlefield, it would be directly visible within it.

Figure 3-32: View of the Transmission Line from Killdeer Mountain Battlefield State Historic Site

As illustrated in Figure 3-33, for Medicine Hole and the state historic site, the line itself would not dominate the view, although portions of the line would be visible to observers within the project area. No features of the line would be visible in the foreground or middle ground to observers located at either the state historic site or Medicine Hole. Only long-distance views of the line would be available at these key observation points. The same is not true when looking at the battlefield as a whole. The transmission line would be visible both at close range and at long distance depending on where one was standing within the battlefield. However, this transmission line would not be the first to be constructed in or near the battlefield. Currently, a 230-kV transmission line is located just south beyond the 2010 ABPP KMB study area. Another 115-kV transmission line crosses the eastern portion of the battlefield through the study and core areas from the southeast to the north (Figures 3-34 and 3-35).

Figure 3-33: View of Transmission Line from Medicine Hole

Figure 3-34: 115-kV Transmission Line in the Killdeer Mountain Battlefield Study Area

Note: View is looking northwest towards the Killdeer Mountains

Figure 3-35: View Looking West Towards Killdeer Mountains from ND State Highway 22

In addition to this existing infrastructure, the setting and feeling of both Killdeer Mountain Battlefield and Medicine Hole have been further compromised by the construction of oil production facilities, such as wells, tanks, gas and oil gathering lines, electrical distribution lines, and access roads. In addition to those that already exist, additional wells and their associated infrastructure continue to be constructed. Therefore, the nature of the landscape is being transformed from agricultural to industrial uses.

The most notable features of the proposed transmission line would be the 70- to 145-foot-high structures that would rise at regular 650- to 1,100-foot intervals. The use of galvanized steel single pole structures would reduce the intensity of any visual intrusion. Therefore, while construction of the proposed transmission line would introduce a new element to the setting, the intensity of its impact would be minimized both by the intensity of existing intrusions and the nature of the structures to be used.

The area today primarily consists of agricultural fields; little native prairie remains. Farmsteads and facilities and infrastructure associated with and needed by oil production are visible from both Medicine Hole and throughout the battlefield (Figure 3-36). Given the undulating terrain and the manner in which oil extraction has altered the rural landscape and the setting and feeling of the historic properties, the transmission line would not present a distinct and major visual intrusion on the surrounding landscape and would blend with the existing linear elements such as roads and fences that characterize the area. Compared with other modern intrusions, visual impacts would be minimal.

Figure 3-36: Typical Land Use Near Killdeer Mountain Battlefield Study Area

The agencies have determined that the section of the 2010 ABPP KMB study area that the alternatives cross, lacks integrity because of the nature and intensity of existing development, including but not limited to existing oil production facilities (wells, tanks, gas and oil gathering lines, electrical transmission and distribution lines, and access roads). Even though this portion of the transmission line would be closest to and visible from the KMB historic property as defined by RUS, Western, and USFS, modern development has already compromised the setting and viewshed looking south from this historic property. Looking north from the proposed ROW, modern intrusions are less intense and, given the terrain, less obvious. Accordingly, the setting and feeling, while not pristine, is more intact than to the south.

For these reasons, RUS, Western, and USFS determined that the construction of the project would have no adverse effect on the KMB historic property. Following execution of the PA, Western will propose this finding to ACHP, North Dakota SHPO, and other consulting parties pursuant to 36 CFR 800.5(b) and (c). In this manner, any consulting party objections to this finding of effect will be resolved in accordance with the regulatory requirements of 36 CFR 800.

3.7 LAND USE

3.7.1 Affected Environment

Regional Setting

The proposed project area includes portions of five counties in northwestern North Dakota - Dunn, McKenzie, Mercer, Mountrail, Williams, and a very small section of Billings County. The region surrounding the proposed project contains large expanses of rural, undeveloped land characterized by rolling prairies, steep and rough terrain, grassland, rangeland, and shrub/scrub environments, with smaller areas of woodland and cropland near river drainages and lakes. Land use in the project area is primarily dominated by agricultural uses, such as pasture or cropland along with nearby farmsteads. Lake Sakakawea, a large impoundment of the Missouri River, is located in the northeastern portion of the project area. The lake provides irrigation, flood damage reduction, municipal and industrial water supply, and hydropower for the area.

Existing Land Use

Based on the 2007 Census of Agriculture, 89.8 percent (39,674,586 acres) of the total land area in the state of North Dakota is farmland, with an average farm size of 1,241 acres (USDA, 2009b). Compared to the state as a whole, the counties surrounding the project area have either a similar or slightly lower percentage of land in farms. Developed infrastructure in the vicinity of the proposed project includes federal, state, county, and township roads; utility ROWs; airports; railroads; and a growing number of oil and gas wells.

Williston, with a population of approximately 15,000 (U.S. Census Bureau, 2010a) is the largest city in the project area. Small towns and unincorporated communities are scattered throughout the project area. Killdeer, Watford City, Arnegard, Epping, and Ray are the only communities whose city limits may fall within the boundaries of the project area (Burns & McDonnell Engineering Company, Inc., 2011). The communities of Williston and Tioga are close to the project area boundary. The project area is located west of the Fort Berthold Indian Reservation.

Land ownership and jurisdiction within the project area includes predominantly private lands used for grazing and crop cultivation, interspersed with lands administered by the Bureau of Land Management (BLM), USACE, USFS, USFWS, NPS, and the state of North Dakota. Federal and state lands within proximity to the proposed project include the LMNG, TRNP, National Wildlife Refuge lands, BLM lands, and USACE lands surrounding Lake Sakakawea, in addition to state parks, wildlife management areas (WMA), and school trust lands.

Land cover within the project area is summarized in Table 3-19.

Table 3-19: Land Use within the Project Area

Land Use	Alternative C (acres)	Alternative D (acres)	Alternative E (acres)
Grassland	2,548.1	2,408.1	3,154.9
Cultivated Cropland	1,671.4	1,505.4	1,719.5
Pasture/Hay	172.5	127.3	144.9
Developed Lands	133.1	106.2	127.2
Other Lands*	431.8	311.4	450.6
TOTAL	4,956.8	4,458.6	5,597.3

*includes woodland, shrub/scrub, wetlands, barren lands, open water.
Acres were calculated using available National Land Cover Dataset information.

Comprehensive Plans and Zoning Ordinances

The Dunn County Comprehensive Plan, adopted October 12, 2011, establishes a vision for future development of the county and includes general goals and objectives for land use, transportation, housing, economic development, public services, infrastructure, natural resources, intergovernmental cooperation, and planning (Dunn County Planning Commission, 2011a). The Williams County Comprehensive Plan was adopted December 4, 2012, in light of the boom in oil and gas development in the county and associated steep population growth (Williams County, 2012). The plan sets goals and objectives for accommodating future growth in the community, including housing, commercial, and industrial development. The McKenzie County Comprehensive Plan, adopted March 18, 2013, provides goals, objectives, and implementation strategies for the county, as it confronts growth and development issues in the agriculture and energy sectors (McKenzie County, 2013). Areas addressed by the plan include economic development, government, natural resources, land use, public facilities and services, transportation, recreation, and housing. Mountrail County has a comprehensive plan; however, it has not been updated since its adoption in 1982. Mercer County does not currently have a comprehensive plan.

McKenzie, Dunn (Dunn County Planning Commission, 2011b), Mercer (Board of Mercer County Commissioners, 2009), Mountrail, and Williams counties have county-wide zoning ordinances in place. In addition, a few of the organized townships within McKenzie County have zoning codes. All of the alternatives would extend through county and municipal jurisdictions, and would cross lands located in zoning districts where transmission line ROW development is not prohibited. Under the applicable zoning ordinances and comprehensive plans, transmission lines are either a permitted or conditional use in all jurisdictions traversed by the proposed ROW. All applicable zoning and land use approvals would need to be obtained prior to construction.

<u>Private Lands</u>

Most of the land in the project area is privately owned and used for agricultural activities. As a whole, the types of agricultural use taking place within the project area are generally compatible with the presence of transmission line ROWs and would largely be allowed to continue in the long term.

<u>U.S. Forest Service Lands</u>

USFS administers 1,026,000 acres of publicly-owned lands on the LMNG. Within the project vicinity, portions of LMNG are located throughout McKenzie County. In addition to providing recreational opportunities, these lands also support livestock grazing and oil and gas production. The LMNG is managed as a unit of the Dakota Prairie National Grasslands under its 2001 Resource Management Plan (USFS, 2001).

<u>U.S. Fish and Wildlife Service Lands</u>

Lake Ilo National Wildlife Refuge is located near Dunn Center in the southern part of the project area. Lake Ilo National Wildlife Refuge is an approximately 4,000 acre complex consisting of Lake Ilo itself, along with prairie, grassland, and numerous other wetland areas. It is located near Dunn Center in McKenzie County, along ND State Highway 200 (USFWS, 2011a). This area is a popular wildlife viewing area, with waterfowl, shorebirds, and other wildlife using the area at various times throughout the year. Upland areas on the refuge include native prairie, cropland, and tree plantings, and these areas serve also as important wildlife habitat.

Four Waterfowl Production Areas are scattered throughout the project area in Williams County. Waterfowl Production Areas, which are part of the National Wildlife Refuge System, are lands owned by USFWS and managed to preserve high quality wetlands and protect waterfowl breeding and nesting habitat. All Waterfowl Production Areas are open to the public and provide recreational opportunities, such as hunting, bird watching, and hiking (USFWS, 2007a).

<u>National Park Service Lands</u>

TRNP-North Unit, managed by NPS, is located in McKenzie County, south of Watford City along U.S. Highway 85 in the southwestern portion of the project area. This national park provides numerous outdoor activities such as camping, canoeing, fishing, horseback riding, and hiking (NPS, 2011). A variety of wildlife species occur within the park, making it a popular wildlife viewing area.

Bureau of Land Management

Within North Dakota, the BLM North Dakota Field Office manages approximately 58,000 acres of public land, the majority of which is located in Dunn and Bowman counties. BLM also manages more than 4.1 million acres of subsurface mineral estate, located in the western third of the state (BLM, 2011). Lands managed by BLM within the project area are located primarily in northwestern Dunn County, with scattered tracts in the other counties. These lands are leased for oil and gas production as well as grazing, and are also open to recreational opportunities such as hunting. BLM lands in the project vicinity are managed under the 1986 BLM North Dakota Resource Management Plan, which does not contain any provisions expressly prohibiting the development of utility ROWs.

U.S. Army Corps of Engineers Lands

USACE oversees management of Lake Sakakawea and the public lands surrounding it. In addition, USACE partners with federal, tribal, state, and local entities for management of various parks and recreational facilities and WMAs on these lands (USACE, 2007).

North Dakota Game and Fish Department

State WMAs are located throughout the state; public use regulations for state WMAs are authorized by Chapter 20.1-11 of the North Dakota Century Code and established in Chapter 30-04-02 of the North Dakota Administrative Code. Several USACE lands in and around the project area include WMAs managed for fish and wildlife habitat by NDGFD. Additional NDGFD WMAs in the project area include Killdeer Mountains WMA in Dunn County; Neu's Point WMA, Och's Point WMA, and Overlook WMA in McKenzie County; Sullivan WMA in McKenzie County; Golden Valley WMA in Mercer County; White Earth Valley WMA in Mountrail County; and Blacktail Dam WMA in Williams County (NDGFD, 2010a).

State Parks

North Dakota state parks found within the project vicinity include Lewis and Clark State Park, located along Lake Sakakawea in Williams County, and Little Missouri State Park located north of Dunn Center in Dunn County. Recreational opportunities at Lewis and Clark State Park include fishing, swimming, and boating in Lake Sakakawea. Little Missouri State Park is primarily a primitive park offering backpacking and horseback riding throughout the park's 47 miles of trails (North Dakota Parks and Recreation Department, 2011b).

Easements

USFWS grassland and wetland easements and NRCS Conservation Reserve Program and Conservation Reserve Enhancement Program easements are present in the project area. These areas serve as wildlife habitat to protect rare natural features or to preserve water quality, and have been assigned various levels of legal protection, which generally prohibit development.

The majority of wetland and grassland easements in the vicinity of the proposed project are located in Williams and Mountrail counties in the prairie pothole region. The easements in Williams County are managed by the Crosby Wetland Management District, and the easements in Mountrail County are managed by the Lostwood Wetland Management District. There are also a few scattered easements located in Dunn, McKenzie, and Mercer counties, which are managed by the Audubon Wetland Management District.

Lands with USFWS and NRCS easements typically remain in private ownership and are generally considered confidential by these agencies. As such, information about the specific location and scope of potential impacts to these resources is limited.

3.7.2 Direct and Indirect Effects

This section discusses potential impacts on land use within the region as a direct result of the construction and operation of the proposed project, including the no-action alternative. Definitions for duration and intensity of project impacts to land use developed for this project are described in Table 3-1.

No-action Alternative

Under the no-action alternative the proposed project would not be constructed, and there would be no impacts on land use as a result of the project.

Alternative C

<u>Private Lands</u>

Approximately 4,543.7 acres of private lands are contained within the transmission line ROW under Alternative C. Impacts on private lands resulting from Alternative C would include temporary loss of use for landowners within the ROW during construction, and the permanent loss of uses that are incompatible with the ROW, such as the location and development of new oil and gas wells. Disturbance from heavy equipment may result in some crop loss within the ROW during construction. Existing agricultural activities taking place within the transmission line ROW, including grazing and crop cultivation, are likely to experience temporary and localized interruptions during construction. Additionally, cattle would need to be restricted from grazing within the ROW after construction is completed until grass is re-established within the ROW. Indirect impacts on agriculture as a result of the proposed project could include interference with certain agricultural activities, such as the movement of machinery and equipment, obstacles for aerial spraying, or interference with the movement of cattle or other livestock for grazing. At the proposed Judson, Tande, Red, White, and Blue substations sites, a total of approximately 73 acres of private agricultural land would be permanently converted to utility use. Noise, dust, and emissions from vehicles and equipment during construction of the substations would have temporary impacts on agricultural uses on adjacent land. The proposed project would require ROW easements from private property owners for transmission lines, which could encumber the ROW area with land use restrictions. Each transmission line easement would specify the present and future right to clear the ROW and to keep it clear of all trees, whether natural or cultivated; all structure-supported crops; other structures; brush; vegetation; and fire and electrical hazards, with the exception of non-structure supported agricultural crops less than 10 feet tall. Substation areas would be acquired in fee and converted to utility use.

The relatively small amount of acreage needed for the transmission line ROW and substations would have a long-term, low impact on agricultural productivity because of the significant acreages of agricultural land in the project area and throughout the state. Basin Electric would coordinate with landowners regarding routing the proposed transmission line ROW, and would incorporate appropriate mitigation measures. As a result, the short- or long-term impacts on land use for Alternative C would be low.

<u>U.S. Forest Service Lands</u>

Development of utility ROWs is generally consistent with the stated management goals and objectives for the LMNG under the 2001 Resource Management Plan (USFS, 2001), as long as proper permits are obtained. Alternative C would incorporate approximately 152.9 acres of the LMNG into the utility ROW. These 152.9 acres consist of 102.8 acres of grassland, 19.2 acres of woodland, 12.5 acres of shrub/scrub, 14.7 developed acres, 2.6 acres of pasture/hayland, 0.5 acre of cultivated crops, and 0.6 acre of barren land. Alternative C would not be located within any management areas designated as Roadless. Direct impacts would include the acquisition of ROW and potential clearing of woodland area. Grassland areas within the LMNG would be relatively unaffected by the proposed project. These areas would be restricted from public access during construction but would continue to be accessible to the public following construction and ROW restoration. Woodland areas within the LMNG may be cleared and converted to ROW, which, although a permanent change in the land cover within the easement ROW, would not be inconsistent with land use and management of the LMNG. Should LMNG property crossed by the proposed project be leased for grazing, cattle may need to be relocated or otherwise restricted from the immediate construction activity area within the ROW. Given the relatively limited amount of LMNG lands traversed by the proposed ROW, the presence of existing utilities in this corridor, and the identification of this corridor for future utility development, it is expected that with the incorporation of mitigation measures, Alternative C would have low impacts on land use on the LMNG. Basin Electric would be required to obtain an SUP under the Federal Land Policy Management Act for any portions of the proposed project that cross lands within the LMNG.

U.S. Fish and Wildlife Service Lands

Alternative C would pass within approximately 2 miles of Lake Ilo National Wildlife Refuge in Dunn County at the closest point. In addition, Alternative C would be situated adjacent to a USFWS conservation easement located in Dunn County that is protected as grassland/pasture. Since Alternative C would not directly cross lands managed or owned by USFWS, there would be no land use impacts on these lands.

National Park Service Lands

Under Alternative C, the western segment of the proposed transmission line would be constructed east of TRNP-North Unit. At its closest point, the transmission line ROW would be approximately 1.5 miles from the park. Due to its height, the proposed transmission line may be visible from areas of TRNP; however, Alternative C would have no direct impacts on existing land uses in the TRNP.

Bureau of Land Management Lands

The proposed transmission line ROW would not directly cross BLM lands. The western segment of the ROW would be located within approximately 200 feet of one BLM parcel. Alternative C would therefore have no land use impacts on BLM lands.

U.S. Army Corps of Engineers Lands

Alternative C would cross approximately 57.9 acres of USACE property in the area of the proposed crossing of the Lewis and Clark WMA managed by NDGFD. Proposed ROW acres on property owned by USACE include 18.2 acres of cultivated crops, 15.9 acres of wetlands, 12.0 acres of grasslands, 5.8 acres of woodlands, 4.0 acres of pasture/hay, 1.5 acres of open water, and 0.5 acre shrub/scrub. Because these lands are in the Missouri River floodplain, during infrequent hydrological events the entire floodplain has been inundated by waters of the Missouri River for short periods of time. Although there may be some land use and access restrictions during construction of the project, Alternative C would have low to no long-term impacts on land use on these lands because the line is immediately parallel to the existing U.S. Highway 85 crossing within a utility corridor containing an existing Western transmission line and a rural water pipeline. Basin Electric would be required to obtain an outgrant easement from USACE for that portion of the proposed project that would cross USACE lands. Basin Electric has submitted an outgrant application to USACE for the necessary easement across USACE lands. Basin Electric will also be completing a detailed habitat assessment of resources within the easement area on USACE lands in spring 2014 for submittal as part of the outgrant application.

North Dakota Game and Fish Department Lands

As discussed above, Alternative C would cross approximately 57.9 acres of USACE-owned property in the area of the proposed crossing of the Lewis and Clark WMA managed by NDGFD. Although there may be some land use and access restrictions during construction of the project, Alternative C would have low to no long-term land use impacts on these lands because the line is immediately parallel to the U.S. Highway 85 crossing.

State Parks

Little Missouri State Park is the park closest to the project area. The eastern segment of Alternative C would be located more than 4 miles from Little Missouri State Park. Alternative C would have no land use impacts on Little Missouri State Park.

School Trust Lands

Alternative C would cross 31 school trust land parcels, for a total of approximately 202.5 acres within the ROW. Of the 202.5 acres, 176.1 acres are grassland, 3.0 acres are developed, 9.5 acres are cultivated crops, 3.3 acres are shrub/scrub, 4.6 acres is woodland, 4.4 acres are wetland, and 1.7 acres are barren land. Therefore, Alternative C would have low to no land use impacts on school trust lands.

Alternative D

Private Lands

Impacts on private lands resulting from Alternative D would be similar to those described for Alternative C above. These would include temporary loss of use for landowners within the ROW during construction, and the permanent loss of uses that are incompatible with the ROW, such as the location and development of new oil and gas wells. Disturbance from heavy equipment may result in some crop loss within the ROW during construction of the transmission line, and increased noise, dust, and emissions on adjacent agricultural lands during construction of the substations and switchyard. At the proposed Judson, Tande, Red, White, and Blue substations and Killdeer South Switchyard, a total of approximately 85 acres of private agricultural land would be permanently converted to utility use. Since Alternative D would require fewer miles of ROW but slightly more acres for development of substations and switchyard, it would impact approximately 4,212.2 acres of private land, 331.5 fewer acres of private land than Alternative C.

U.S. Forest Service Lands

Alternative D would incorporate approximately 57 acres of the LMNG into the ROW. The area within the ROW consists of 47 acres of grassland, 3.9 acres of woodland, 4.4 acres of shrub/scrub, 0.5 acre of cultivated crops, and 1.3 acres of developed land. Alternative D would not be located within any management areas designated as Roadless. Given the relatively limited amount of lands traversed by the Alternative D, and the absence of any special resource management direction for lands within the ROW, it is expected that with the incorporation of mitigation measures, Alternative D would have low to no impacts on land use on the LMNG.

U.S. Fish and Wildlife Service Lands

Alternative D would pass within approximately 2 miles of Lake Ilo National Wildlife Refuge in Dunn County at the closest point. In addition, Alternative D would be situated adjacent to a USFWS conservation easement located in Dunn County that is protected as grassland/pasture. Since Alternative D would not directly cross lands managed or owned by USFWS, there would be no land use impacts on these lands.

National Park Service Lands

Under Alternative D, the proposed transmission line would be located more than 17 miles east of the TRNP at its closest point. Therefore, Alternative D would therefore impacts to land use in the TRNP.

Bureau of Land Management Lands

Alternative D would not cross or pass within close proximity to BLM lands, and therefore would have no land use impacts on BLM lands.

U.S. Army Corps of Engineers Lands

Alternative D has the same alignment as Alternative C across USACE lands. The impacts on USACE lands would be identical to those described for Alternative C above.

North Dakota Game and Fish Department Lands

Alternative D would cross the same 57.9 acres of USACE land managed by NDGFD that are crossed by Alternative C. Therefore, the impacts on lands managed by NDGFD would be identical to those described for Alternative C above.

State Parks

Little Missouri State Park is the park closest to the project area. Alternative D would be located more than 4 miles away from Little Missouri State Park. Therefore, Alternative D would have no land use impacts on Little Missouri State Park or any state park lands.

School Trust Lands

Alternative D would cross approximately 23 school trust land parcels for a total of approximately 143.9 acres within the ROW, which is slightly less than Alternative C. Of the 143.9 acres, 128.1 acres are grassland, 6.3 acres are cultivated crops, 2.1 acres are developed, 1.7 acres are barren land, 0.6 acre is shrub/scrub, 4.4 acres are wetland, and 0.8 acre is woodland. With the incorporation of mitigation measures, Alternative D would have low to no land use impacts on school trust lands.

Alternative E

Private Lands

Impacts on private lands resulting from Alternative E would be similar to those described for Alternatives C and D above. However, Alternative E would require additional ROW mileage to accommodate 63 total miles of parallel 345-kV transmission line from the Red Substation to the White Substation and from the White Substation to the Blue Substation. It would therefore impact approximately 5,284.5 acres of private land, 740.8 more acres of private land than Alternative C and 1,072.3 more acres of private land than Alternative D.

U.S. Forest Service Lands

Alternative E would incorporate approximately 57 acres of the LMNG into the ROW. The area of the LMNG within the Alternative E ROW is identical to that traversed by Alternative D, and it is expected that with the incorporation of mitigation measures, the impacts of Alternative E on the LMNG would be identical to those described for Alternative D. Alternative E would have low to no land use impacts on the LMNG.

U.S. Fish and Wildlife Service Lands

Similar to Alternative D, Alternative E would pass within approximately 2 miles of Lake Ilo National Wildlife Refuge in Dunn County and would be situated adjacent to a USFWS conservation easement located in Dunn County. Since the impacts from Alternative E relative to USFWS lands would be identical to those described for Alternative D above, there would be no land use impacts on those lands.

National Park Service Lands

Similar to Alternative D, Alternative E would be located more than 17 miles east of TRNP at its closest point. Alternative E would therefore have no land use impacts in the TRNP.

Bureau of Land Management Lands

Alternative E would not cross or pass within close proximity to BLM lands, and therefore would have no land use impacts on BLM lands.

U.S. Army Corps of Engineers Lands

Alternative E would cross the same 57.9 acres of USACE property traversed by Alternatives C and D. Therefore, the impacts from Alternative E on USACE lands would be identical to those described above.

North Dakota Game and Fish Department Lands

Alternative E would cross the same 57.9 acres of USACE property managed by NDGFD that are traversed by Alternatives C and D. Therefore, the impacts from Alternative E on these lands would be identical to those described above.

State Parks

Little Missouri State Park is the park closest to the project area. Alternative E, similar to Alternative D, would be located more than 4 miles away from Little Missouri State Park and would have no land use impacts on Little Missouri State Park or any state park lands.

School Trust Lands

Alternative E would cross approximately 33 school trust land parcels for a total of approximately 209.9 acres within the ROW, which is slightly more than the area traversed by either Alternatives C or D. Of the 209.9 acres, 189.5 acres are grassland, 6.6 acres are cultivated crops, 3.6 acres are developed, 2.7 acres are barren land, 0.8 acre is shrub/scrub, 4.8 acres are wetland, and 1.8 acres are woodland. Therefore, Alternative E would have low to no land use impacts on school trust lands.

3.8 SOCIOECONOMIC RESOURCES

3.8.1 Affected Environment

Regional Setting

The oil development boom in the Bakken region has heavily influenced socioeconomic trends in the region over the past several years. Oil and gas development activities have occurred in the region since the 1950s. After a brief boom in the 1970s, the region's oil and gas activity decreased dramatically. The Bakken Formation has seen relatively recent rapid development due to the implementation of hydraulic fracturing processes that can access this previously-untapped oil bearing feature in the region. As a result, after losing population between 1990 and 2000, the region experienced population growth between 2000 and 2010, especially between 2008 and the present. Additional socioeconomic effects of the rapid oil development are described in the Economic Conditions section below.

Agriculture also continues to be an important activity and component of western North Dakota's economy. Approximately 79 percent of the land area in the project area counties is in farms. Across the project area, farm employment comprises 24, 11, and 10 percent of total county employment in Dunn, Mountrail, and McKenzie counties, respectively.

The study area is consistent with the project area, extending through five counties in northwestern North Dakota, including Dunn, McKenzie, Mercer, Mountrail, and Williams counties. Socioeconomic information on the study area and the state are provided in this section.

Demographic Characteristics

Population

These counties are predominantly rural with small populations located in towns and communities across the study area. Williams County has the largest population of all the study area counties, hosting the largest town in the study area, Williston.

The population of all the study area counties declined between 1990 and 2000, while the population of North Dakota as a whole remained relatively constant. As a result of the oil and gas development boom in recent years, population growth trends in the study area counties have reversed. McKenzie, Mountrail, and Williams counties experienced increased rates of growth between 2000 and 2010, especially since 2008, and Dunn and Mercer counties experienced slower rates of population decline compared to the previous decade. The populations of these counties are shown in Table 3-20.

Table 3-20: Population of Study Area Counties

	1990 Population	2000 Population	2010 Population	% change 1990-2000	% change 2000-2010
North Dakota	638,800	642,200	672,591	0.5%	4.7%
Dunn	4,005	3,600	3,536	-10.1%	-1.8%
McKenzie	6,383	5,737	6,360	-10.1%	10.9%
Mercer	9,808	8,644	8,424	-11.9%	-2.5%
Mountrail	7,021	6,631	7,673	-5.6%	15.7%
Williams	21,129	19,761	22,398	-6.5%	13.3%
Study Area Counties	48,346	44,373	48,391	-8%	9%

Source: U.S. Census Bureau, 1990, 2000, and 2010a

There are several communities within the study area. The populations of communities within and near the study area are shown in Table 3-21. The largest town is Williston, followed by Beulah, Watford City, and Tioga. The remaining towns all have populations of less than 1,000.

Table 3-21: Populations of Towns within Study Area

Town	County	2010 Population
Alexander	McKenzie	223
Arnegard	McKenzie	115
Beulah	Mercer	3,121
Dodge	Dunn	87
Dunn Center	Dunn	146
Epping	Williams	100
Golden Valley	Mercer	182
Halliday	Dunn	188
Killdeer	Dunn	751
Ray	Williams	592
Springbrook	Williams	27
Tioga	Williams	1,230
Watford City	McKenzie	1,744
White Earth	Mountrail	80
Williston	Williams	14,716
Zap	Mercer	237

Source: U.S. Census Bureau, 2010a

It is expected that the population in the Bakken region will continue to rapidly increase in the future, concurrent with the continued expansion of oil and gas development activities. Estimates indicate that the population of the state of North Dakota increased by 11,341 people between 2010 and 2011 (U.S. Census Bureau, 2011). In addition to the permanent population of the study area counties, the region also has a high transient population, which primarily includes drilling rig, well service workers, and construction workers. Official population estimates likely do not include these temporary workers who consider their home residence in another state. The increasing numbers of temporary workers moving to the region has heavily impacted the region's cities and towns, such as Williston and Watford City located within the study area. Including the transient population, the current population of Williston is likely closer to 17,000, and the current population of Watford City is likely closer to 6,500 (Smith, 2011; Ruggles, 2011). Estimates indicate that the population of Williston could reach 25,000 by 2015 and as high as 50,000 by 2030 (City of Williston, 2011).

The Fort Berthold Reservation is also located just outside of the study area boundary the northwest part of McLean County. The population of the Fort Berthold Reservation is 6,341 (U.S. Census Bureau, 2010a).

Income and Poverty

Between 2000 and 2010, median household incomes increased considerably in all the study area counties and in the state as a whole (Table 3-22). While poverty rates increased slightly in North Dakota over this period, poverty rates in the study area counties fell, with Dunn and McKenzie counties experiencing the most significant reductions in the populations living below the poverty threshold. Poverty rates in Mountrail County remained higher than the state rate in 2010.

Table 3-22: Income and Poverty in the Study Area

	Median Household Income (2000)	Median Household Income (2010)	Percent below Poverty (2000)	Percent below Poverty (2010)
North Dakota	$34,604	$46,781	11.9%	12.3%
Dunn	$30,015	$48,707	17.5%	8.6%
McKenzie	$29,342	$48,480	17.2%	10.0%
Mercer	$42,269	$60,191	7.5%	6.2%
Mountrail	$27,098	$53,912	19.3%	16.5%
Williams	$31,491	$55,396	11.9%	8.7%

Source: U.S. Census Bureau, 2000, 2010a, and 2010b
Note: Household income values are shown in current or nominal dollars.

Earnings and Cost of Living

With the influx of workers into western North Dakota counties, both resident and transient populations have been rapidly increasing, and available resources, such as housing, retail grocery stores, and food and beverage establishments, have been slow to meet the rapid increase in demand. As a result, the region is experiencing considerable price and cost increases, consistent with an inflationary economy. Although average earnings are also increasing, so are the costs of goods and services. Prices of basic goods are also increasing, with one person noting that a gallon of milk costs $7 (McChesney, 2011). With shortages of most goods, merchants are able to charge higher prices.

Average earnings have increased by 82 and 56 percent in Mountrail and McKenzie counties, respectively between 2006 and 2010. Between May 2010 and May 2011, wages in the 11 western counties that comprise the far west non-metropolitan area, including Dunn, Williams, and McKenzie counties, grew by 16 percent (U.S. Bureau of Labor Statistics, 2012). Average earnings are summarized in Table 3-23.

Table 3-23: Average Earnings in the Study Area (Current Dollars)

	2006	2007	2008	2009	2010	% Change 2007-2010
North Dakota	$30,530	$32,827	$36,787	$35,724	$39,123	28%
Dunn	$34,623	$33,360	$31,682	$41,836	$50,222	45%
McKenzie	$28,151	$29,355	$30,948	$35,642	$44,006	56%
Mercer	$34,766	$35,141	$34,789	$38,665	$40,966	18%
Mountrail	$31,049	$36,329	$45,499	$49,406	$56,473	82%
Williams	$32,762	$36,272	$37,570	$37,969	$44,606	36%

Source: U.S. Department of Commerce, Bureau of Economic Analysis, 2012a

Racial and Ethnic Characteristics

In the state of North Dakota as a whole, the majority of the population is white (Table 3-24). The largest minority group in the state is American Indian. Compared to the state, Mercer and Williams counties have higher percentages of white residents and smaller percentages of American Indian residents. In contrast, Dunn, McKenzie, and Mountrail counties have smaller percentages of white residents compared to the state and higher percentages of American Indian residents. Segments of the Fort Berthold Reservation lie in parts of McKenzie, Dunn, Mountrail Counties and to a smaller extent Mercer County, which could be a reason for the higher percentages of American Indian residents. Other minority groups, including Asian, Hawaiian or Pacific Islander, and Hispanic comprise similar percentages of the population in all of the study area counties as compared to the state as a whole.

Table 3-24: Racial Characteristics in the Study Area Counties

	2010 Population	White, not Hispanic or Latino	Black	American Indian or Alaskan Native	Asian	Hawaiian/ Pacific Islander	Other	Two or more races	Hispanic
North Dakota	672,591	90.7%	1.2%	5.4%	1.0%	0.05%	0.5%	1.8%	2.0%
Dunn	3,536	85.3%	0.2%	12.7%	0.3%	0.0	0.2%	1.7%	1.1%
McKenzie	6,360	76.3%	0.1%	22.2%	0.3%	0.03%	0.4%	1.6%	2.2%
Mercer	8,424	96.3%	0.2%	2.3%	0.3%	0.1%	0.4%	1.1%	1.4%
Mountrail	7,673	66.8%	0.2%	30.6%	0.2%	0.01%	0.8%	2.6%	3.7%
Williams	22,398	92.7%	0.3%	4.0%	0.4%	0.02%	0.3%	2.9%	1.9%

Source: U.S. Census Bureau, 2010a

Economic Conditions

Employment

The labor force in the state of North Dakota increased slightly each year between 2001 and 2010. In the study area counties, the size of the labor force fluctuated over this time period. However, between 2009 and 2010, the size of the labor force increased dramatically in Dunn, McKenzie, Mountrail, and Williams counties, increasing by 17.4, 19.1, 25.6, and 18.0 percent, respectively. Mercer County experienced a decline in the size of its labor force between 2009 and 2010.

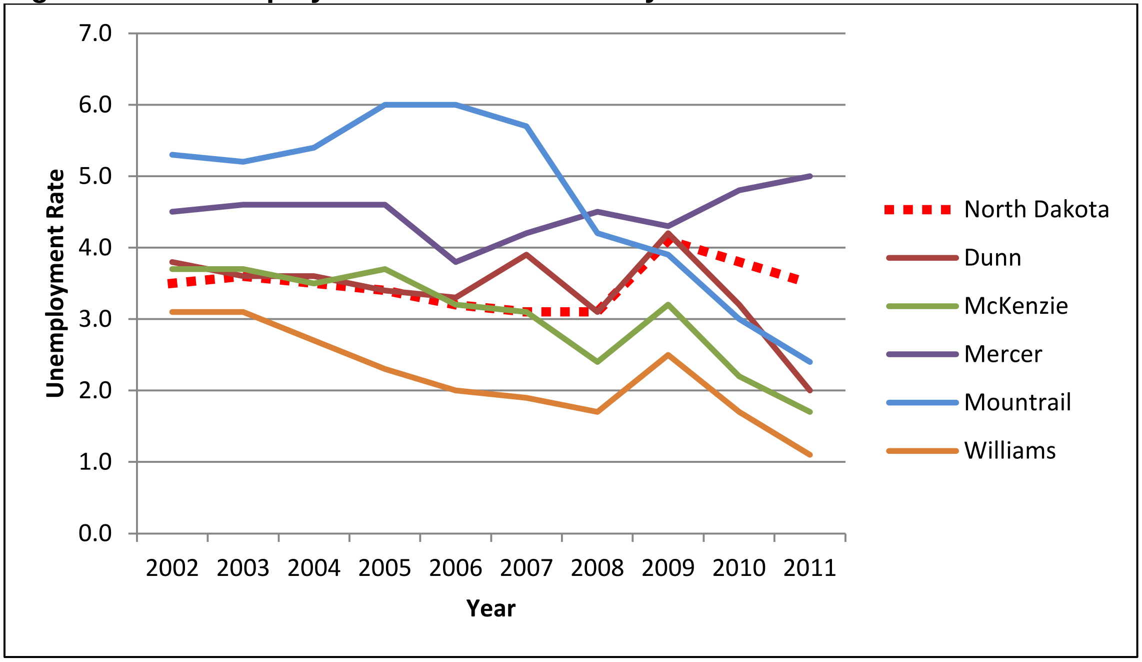
Unemployment rates in North Dakota and within the study area counties were relatively low between 2001 and 2010. The state's annual unemployment rate was below 4 percent for all years except 2009, as was also the case for Dunn County. In McKenzie County, the unemployment rate was below 4 percent for all years, and in Mercer County, it was below 5 percent for all years except 2010. Mountrail County had the highest annual unemployment rates, peaking at 6 percent in 2005 and 2006, but dropping to a low of 2.9 percent in 2010. Williams County had the lowest unemployment rates of all the study area counties, with a high of 3.1 percent in 2002 and 2003, and reaching a low of 1.7 percent in 2008 and 2010. Study area labor force and unemployment rates are summarized in Table 3-25. Unemployment rate trends are shown in Figure 3-37.

Table 3-25: Study Area Unemployment Rates (Labor Force/Annual Unemployment Rate)

Year	North Dakota		Dunn		McKenzie		Mercer		Mountrail		Williams	
2001	345,820	2.8%	1,739	3.2%	2,708	2.6%	4,525	3.9%	2,981	4.0%	10,939	2.3%
2002	345,836	3.5%	1,775	3.8%	2,692	3.7%	4,670	4.5%	2,960	5.3%	11,042	3.1%
2003	348,929	3.6%	1,818	3.6%	2,747	3.7%	4,748	4.6%	3,014	5.2%	11,047	3.1%
2004	351,801	3.5%	1,712	3.6%	2,739	3.5%	4,738	4.6%	3,095	5.4%	11,086	2.7%
2005	355,874	3.4%	1,732	3.4%	2,694	3.7%	4,582	4.6%	2,995	6.0%	11,715	2.3%
2006	360,913	3.2%	1,730	3.3%	2,809	3.2%	4,764	3.8%	2,903	6.0%	12,634	2.0%
2007	364,573	3.1%	1,678	3.8%	2,907	3.1%	4,718	4.1%	2,950	5.7%	12,987	1.9%
2008	367,048	3.1%	1,734	3.2%	3,079	2.4%	4,789	4.5%	2,957	4.1%	14,521	1.7%
2009	368,696	4.3%	1,780	4.3%	2,910	3.4%	5,129	4.4%	3,706	4.1%	14,751	2.6%
2010	370,224	3.9%	2,089	3.4%	3,466	2.2%	4,531	5.1%	4,655	2.9%	17,402	1.7%
2011	382,944	3.5%	2,914	2.0%	4,433	1.7%	4,426	5.0%	5,500	2.4%	24,848	1.1%

Source: U.S. Bureau of Labor Statistics, 2011

Figure 3-37: Unemployment Rates in the Study Area and in the State



Source: U.S. Bureau of Labor Statistics, 2011

In conjunction with the increased oil and gas development activities in the region, monthly unemployment rates over the last year continued to drop in the study area counties (Table 3-26).

Table 3-26: Recent Monthly Unemployment Rates in the Study Area

Month	North Dakota	Dunn County	McKenzie County	Mercer County	Mountrail County	Williams County
Feb 2011	4.2%	2.8%	2.1%	6.4%	2.8%	1.4%
March 2011	4.1%	2.8%	2.1%	5.9%	3.0%	1.2%
April 2011	3.5%	2.0%	1.6%	4.3%	2.6%	1.0%
May 2011	3.2%	1.9%	1.6%	3.8%	2.5%	1.1%
June 2011	4.0%	2.6%	2.2%	5.9%	3.0%	1.4%
July 2011	3.4%	1.7%	1.5%	4.9%	2.6%	1.0%
Aug 2011	3.5%	1.6%	1.5%	4.5%	2.3%	1.0%
Sept 2011	2.9%	1.5%	1.4%	3.5%	2.0%	1.0%
Oct 2011	2.7%	1.5%	1.4%	3.6%	1.8%	0.9%
Nov 2011	2.9%	1.4%	1.4%	4.7%	1.9%	0.9%
Dec 2011	3.3%	1.4%	1.6%	5.6%	2.0%	0.9%
Jan 2012	3.8%	1.6%	1.5%	6.7%	2.1%	0.8%
Feb 2012	3.9%	1.6%	1.7%	6.6%	2.3%	0.9%

Source: U.S. Bureau of Labor Statistics, 2011

For the state, the top three sectors in terms of employment in 2010 were government and government enterprises; health care; and retail trade. In contrast, McKenzie and Williams counties had a large portion of mining, which includes oil and gas employment; in fact, in Williams County almost 25 percent of the employment was in this industry. Oil and gas employment in Dunn, Mercer and Mountrail counties was not disclosed due to proprietary nature of the information. Other important employing sectors in the study area counties include construction, retail trade, government, and farming. The utilities sector in Mercer County accounts for 21 percent of the employment in the county. Table 3-27 summarizes the employment by industry for the study area.

Table 3-27: 2010 Study Area Employment by Industry

Industry	North Dakota	Dunn	McKenzie	Mercer	Mountrail	Williams
Farm employment	6.3%	24.1%	9.9%	6.4%	11.4%	3.9%
Forestry, fishing, and related activities	0.8%	N/A	N/A	N/A	N/A	0.6%
Mining	2.5%	N/A	11.7%	N/A	N/A	24.9%
Utilities	0.7%	N/A	N/A	20.7%	N/A	0.4%
Construction	6.0%	N/A	9.6%	8.7%	N/A	5.9%
Manufacturing	4.8%	N/A	1.3%	N/A	N/A	1.8%
Wholesale trade	4.4%	N/A	3.0%	1.7%	4.2%	7.0%
Retail trade	10.8%	7.3%	N/A	8.6%	7.6%	9.0%
Transportation and warehousing	3.3%	6.1%	8.2%	1.1%	N/A	4.9%
Information	1.6%	N/A	0.5%	1.6%	2.2%	0.9%
Finance and insurance	5.0%	N/A	2.3%	3.0%	3.9%	2.5%
Real estate and rental and leasing	3.1%	N/A	2.2%	2.2%	1.5%	3.9%
Professional, scientific, and technical services	3.8%	N/A	2.3%	1.8%	2.2%	2.9%
Management of companies and enterprises	0.9%	0.0%	N/A	0.0%	0.0%	N/A
Administrative and waste management services	3.3%	1.1%	N/A	3.8%	1.5%	N/A
Educational services	1.1%	0.9%	1.0%	N/A	0.5%	N/A
Health care and social assistance	11.9%	N/A	4.8%	N/A	6.3%	N/A
Arts, entertainment, and recreation	1.4%	N/A	1.0%	1.0%	0.7%	0.8%
Accommodation and food services	6.6%	N/A	3.7%	4.9%	4.3%	5.5%
Other services, except public administration	5.0%	3.5%	3.1%	4.0%	2.6%	4.2%

Industry	North Dakota	Dunn	McKenzie	Mercer	Mountrail	Williams
Government and government enterprises	16.9%	12.1%	27.2%	9.6%	14.7%	9.5%
Federal, civilian	2.0%	1.0%	1.1%	0.8%	1.2%	0.5%
Military	2.3%	1.1%	0.8%	0.9%	1.1%	0.8%
State and local	12.5%	9.9%	25.3%	7.8%	12.4%	8.2%
Total employment	**502,780**	**2,316**	**5,593**	**6,507**	**5,346**	**20,279**

Source: U.S. Department of Commerce, Bureau of Economic Analysis, 2012b, 2012c
Note: Some employment information is not available due to the proprietary nature of this data.

Oil and Gas

After a stagnant oil production period between 1990 and 2000, the region again experienced an increase in oil and gas production in the mid-2000s, as oil companies began to take advantage of newly-developed technology advances in drilling and extraction techniques. According to the North Dakota Petroleum Council (2011), there are 17 oil-producing counties in North Dakota, all of which are located in the western third of the state. North Dakota currently is the 2nd largest oil producing state in the United States. Top-producing counties within North Dakota for 2010 were Mountrail, McKenzie, Dunn, and Williams, all of which are within the study area. Oil production in North Dakota increased from 62.8 million barrels of oil in 2008 to 79.7 million barrels in 2009 and 113 million barrels in 2010 (North Dakota Petroleum Council, 2011). Additionally, 114 billion cubic feet of natural gas was produced in 2010 in North Dakota, with 80 billion cubic feet being processed within the state.

Across the state, the number of producing wells has more than doubled since 2004, while Dunn, Mountrail, and Williams counties have experienced even higher growth in the number of wells in their respective counties. Mountrail County has added more than 1,700 producing wells in the past 10 years. In 2014, the five-county study area accounts for 68 percent of the producing wells in North Dakota. Production is expected to continue to increase in the region with an estimated 1,100 to 2,700 new wells expected per year and 26,000 new wells expected over the next 10 to 20 years (North Dakota Department of Mineral Resources [NDDMR], 2011). The number of producing wells between 2004 and 2014 is shown in Table 3-28.

In rural areas and communities, oil booms bring considerable opportunities and difficulties. The oil and gas industry has provided increasing employment opportunities, and as a result, unemployment rates have been very low, or less than 4 percent in four of the study area counties. Consistent with decreasing unemployment, poverty rates, which were close to 20 percent for several of the study area counties in 2000, dropped below 10 percent in 2010. Increasing oil production also brings fiscal revenues to state and local governments, which are imperative as cities and counties try to accommodate the growth with increasing demands for local services and infrastructure.

Table 3-28: Number of Producing Wells in the Study Area

	2000	2004	2008	2010	2012	2014	% Change 2004-2014
North Dakota	3,153	3,450	3,871	4,655	6,726	10,186	223%
Dunn	95	101	181	390	728	1,298	1,266%
McKenzie	619	707	765	844	1,292	2,286	269%
Mercer	0	0	0	1	1	0	0%
Mountrail	49	58	106	530	1,154	1,816	3,606%
Williams	323	355	416	454	845	1,489	361%

Source: North Dakota Industrial Commission, 2012
Note: Data is provided for February of each year.

Local town and county government expenditures and budgets have been increasing as these communities struggle to provide housing, public services, and infrastructure to meet the booming population driven by oil development and extraction. Municipal and county services, including public service provisions such as education, road repair and construction, police and law enforcement, judicial facilities and services, medical services and facilities, emergency services, and other social services can all be expected to increase driven by the growing workforce and population. With a rapid influx of skilled oil rig and service workers, wages and earnings are driven higher across the area, affecting the service sectors and other local jobs as they compete with typically higher-paying oil industry salaries. With the influx of population and workforce, often there are not sufficient restaurants, grocery stores, gas stations, and other retail establishments to meet the demand, so establishments can increase local prices.

The oil boom brings temporary and permanent workers to the area seeking housing and temporary accommodations, driving up housing costs, and the lack of availability makes it difficult for both seasonal oil and supporting sector workers (e.g., teachers, gas station attendants, waitresses) to move to the area. In 2010, the majority of housing consisted of owner-occupied, single family residences, although many of the study area counties have a relatively higher portion of mobile homes, reflective of the larger transient population in the region in recent years.

School enrollment is growing in the region, including seasonal demand for educational services, as both the resident and transient population swells. Williston and other smaller communities are experiencing traffic, vehicle congestion, and road construction, which can lower the quality of life for those residents and groups who value remote and less congested lifestyles. Community stability and connectedness can also be affected by the oil boom as increasing numbers of nonresidential temporary workers migrate to the area, bringing differing value systems and ways of life. Crime and substance abuse can also increase in rural areas experiencing the oil boom.

Solid Mineral Resources

Several mineral resources are mined within the study area. Bedrock clays can be found from silty clay in the lower part of the Golden Valley Formation near Hebron. Salts in the study area consist of three main types of deposits within the Williston Basin of North Dakota: halite, potash, and Glauber salt or mirabolite. Sand and gravel is the third largest mineral industry found within the study area, trailing only oil and gas and lignite (NDGS, 2011).

The largest single deposit of lignite known in the world is found in western North Dakota within the study area, at an estimated 351 billion tons. North Dakota also contains an estimated 25 billion tons of economically mineable coal found within the lower Fort Union Group in western and central North Dakota. Currently, there are six operations that mine approximately 32 million tons of coal annually within western North Dakota. Four of these operations mine coal to feed electric generating plants in North Dakota, and two operations mine lignite that is used in soil stabilization and as drilling fluid additive (NDGS, 2011).

Agriculture

Based on the 2007 Census of Agriculture, 89.8 percent (39,674,586 acres) of the total land area in North Dakota is farmland, with an average farm size of 1,241 acres (USDA, 2009b). North Dakota ranked 18th in the United States in total value of agricultural products sold ($6.1 billion), with crop sales accounting for 83 percent and livestock sales accounting for the remaining 17 percent of value. The top crops in terms of acreage in the state include wheat (8,428,462 acres), soybeans (3,073,981 acres), forage (2,525,213 acres), and corn (2,348,171 acres). The top livestock items in terms of inventory in the state include cattle and calves (1.8 million), turkeys (444,274), colonies of bees (390,421), hogs and pigs (181,679), and layers (109,344).

Compared to the state as a whole, the study area counties have either a similar or slightly lower percentage of land in farms, with McKenzie County having the lowest percentage of farmland. Average farm sizes in the study area counties were larger than the state average in all counties except Mercer County. In terms of the total value of agricultural products sold, Williams County had the highest value and Mercer County had the lowest value. In the state as a whole, crop sales comprise a majority of the total value of agricultural products sold, except in Dunn County, where crops sales accounts for 46 percent of the agricultural value. Williams County had the highest percentage of crop sales, while Dunn County had the highest percentage of livestock sales. These figures are summarized in Table 3-29.

Wheat was the top crop in terms of acreage in all the study area as well as in the state as a whole. Forage, peas, and barley were also top crops in several of the study area counties. The top livestock inventory item included cattle and calves in all study area counties and the state. The study area differed from the state in that horses and ponies were a top livestock inventory item in the study area but not in the state as a whole.

Table 3-29: Characteristics of Agriculture in Study Area Counties

	Dunn	McKenzie	Mercer	Mountrail	Williams
Land area in farms (percentage of total land area in county)	1,043,932 acres (81.2%)	1,074,656 acres (60.8%)	509,552 acres (76.3%)	1,036,572 acres (88.7%)	1,144,868 acres (86.1%)
Average farm size	1,854 acres	1,937 acres	1,120 acres	1,573 acres	1,336 acres
Total value of agricultural products sold (crop sales / livestock sales)	$68,712,000 (46% / 54%)	$78,120,000 (64% / 36%)	$40,068,000 (61% / 39%)	$108,002,000 (86% / 14%)	$127,333,000 (91% / 9%)
Top crops in terms of acreage	wheat (135,485) forage (128,388) barley (13,005) corn (8,891)	wheat (175,989) forage (83,135) barley (20,540) peas (16,844)	wheat (81,964) forage (68,287) barley (14,612) canola (7,003)	wheat (291,590) forage (60,393) peas (56,409) canola (55,224)	wheat (379,685) peas (52,527) lentils (52,401) forage (47,181)

Source: USDA, 2009b

Housing Characteristics

The total number of housing units within the study area and the state of North Dakota as a whole are displayed in Table 3-30 along with various characteristics of the housing in the study area. The percent of housing that is owner-occupied is higher in the study area compared to the state, with Dunn and Mercer counties having the highest rates. Vacancy rates are relatively low throughout the study area and the state as a whole, with the lowest rates occurring in McKenzie and Williams counties. Housing is of similar age throughout the study area and the state.

Single family housing accounts for the majority of housing in North Dakota as well as the study area, with McKenzie County having the highest percentage of single family housing. There is a higher percentage of multi-family housing in the state as a whole compared to the study area. Conversely, mobile homes comprise a smaller percentage of housing units in the state as compared to the study area. In addition to permanent housing in the study area, an increasing amount of transient housing has been constructed/utilized in the region in the last several years. Transient housing may include man camps, RV parks, informal RV parking, and hotels. Housing construction in the region has increased in the past several years as communities struggle to keep up with demand.

Table 3-30: 2010 Housing Characteristics in the Study Area

	North Dakota	Dunn	McKenzie	Mercer	Mountrail	Williams
Number Housing Units	317,498	2,132	3,090	4,450	4,119	10,464
Percent Owner-Occupied	65.4%	78.3%	69.8%	80.4%	70.7%	69.3%
Vacancy Rate (homeowner/rental)	1.4%/6.5%	1.5%/9.5%	0.4%/0.0%	0.5%/11.2%	1.0%/7.1%	0.3%/1.7%
Median Year Built	1973	1972	1974	1977	1967	1972
Percent Single Family	66.5%	72.1%	81.7%	71.1%	66.4%	70.8%
Percent Multi-Family	25.9%	4.5%	7.4%	16.6%	7.7%	18.7%
Percent Mobile Homes	7.6%	23.4%	11.0%	12.3%	25.8%	10.3%
Median Value	$111,300	$73,000	$86,600	$96,100	$66,900	$93,800
Median Rent	$555	$401	$481	$398	$523	$515

Source: U.S. Census Bureau, 2010a, 2010b

Housing values are lower on average in the study area compared to the state, with median values lowest in Mountrail County and highest in Mercer and Williams counties. Rents are also lower in the study area than in the state as a whole, with the lowest median rent in Dunn County and the highest in Mountrail County. As communities within the region struggle to keep up with housing demand in recent years, however, rents have been increasing, and affordability has become an issue in heavily impacted communities, such as Williston, Tioga, and Watford City (Ondracek et al., 2010). A state report summarizing the findings of a tour of the region reports that community leaders from Williston to Bowman are voicing concerns regarding rising rents and home values, which are creating a significant shortage for low to moderate income residents (North Dakota Governor's Office, 2012).

Property Valuation and Taxation

Local and state governments generate a portion of their tax revenues by assessing and taxing certain categories of property. In North Dakota, property taxes are levied on real property owned by a corporation, partnership, individual, estate, or trust. Taxation is based on the value of the object that is taxed. Williams County provided the highest tax revenue of all of the counties in the study area, followed by Mercer County (Fong, 2010), as noted in Table 3-31.

Table 3-31: Property Tax Revenue in the Study Area and in North Dakota, Payable 2006-2010.

County	Total Property Tax Revenue, 2006	Total Property Tax Revenue, 2007	Total Property Tax Revenue, 2008	Total Property Tax Revenue, 2009	Total Property Tax Revenue, 2010
Dunn	$4,163,603	$4,213,242	$4,257,953	$4,273,671	$3,587,498
McKenzie	$3,750,757	$3,913,769	$3,808,607	$4,002,063	$3,310,266
Mercer	$6,556,798	$6,815,946	$6,992,218	$7,342,704	$6,161,729
Mountrail	$5,477,741	$6,054,008	$6,210,285	$6,281,791	$5,880,367
Williams	$16,460,801	$17,622,072	$18,263,736	$19,383,080	$17,347,646
Study Area Total	$36,409,700	$38,619,037	$39,532,799	$41,283,309	$36,287,506
North Dakota	$659,789,374	$706,427,621	$740,540,738	$776,398,475	$678,749,378

Source: Fong, 2010

Taxation is based on the value of the object taxed. The primary laws that determine how transmission lines are taxed in North Dakota are in Chapter 57-33.2 and 57-06-17.3 of North Dakota's Century Code. Chapter 57-33.2 applies only to lines whose voltage is 40.6 kV or more, and 57-06-17.3 applies only to lines whose voltage is 230 kV or more. Transmission lines that are taxable under 57-33.2 pay a rate ranging from $50 to $600 per mile, depending on the voltage of the line. However, if the line was placed in service after January 1, 2009, it is exempt from taxes during its first year. Its taxes are reduced by 75 percent the second year, 50 percent the third year, and 25 percent the fourth year, after which the standard rates are applied. Transmission lines that are not taxable under Chapter 57-33.2, if they were placed in service after October 1, 2002, and are of 230 kV or greater, are taxable under Chapter 57-06-17.3, at a rate of $300 per mile. These lines also are exempt from taxes during their first year, followed by a 75 percent reduction in their second, 50 percent in their third, and 25 percent in their fourth years of operation.

Transmission line tax revenues accounted for less than 1 percent of the total property tax revenue in North Dakota in 2011. Total property tax revenues levied in 2010 (payable in 2011) were $816,215,633, of which electric generation, distribution, and transmission taxes statewide accounted for 0.86 percent of this total, or $7,036,194 (Fong, 2011). The share of this figure accounted for specifically by transmission lines was not available for the taxes levied in 2010. However, this share was available for the taxes levied in 2009 (payable in 2010). In 2009, transmission line taxes accounted for $1,328,339 of $7,065,609 of total electric generation, distribution, and transmission taxes levied, or approximately 18.8 percent (Fong, 2010, 2011). Due to the similarity of the total revenue generated in each year, it is likely that transmission line taxes levied in 2010 accounted for a similar share of the total electric generation, distribution, and transmission tax revenue for that year.

Public Services

Education Services

School enrollment is growing in the region, including seasonal demand for educational services, as both the resident and transient population swells. Across the study area, there are 44 schools with total enrollment of 7,006. Williams County has the largest number of schools and had the highest total enrollment during the 2009/2010 school year, the latest year for which data was available (see Table 3-32). The schools in the study area include elementary, junior high, high, and special schools (National Center for Education Statistics, 2012).

Table 3-32: Schools in the Study Area Counties

County	Number of Schools	Total 2009/2010 Student Enrollment
Dunn County	4	401
McKenzie County	6	620
Mercer County	7	1,270
Mountrail County	8	1,478
Williams County	19	3,237
Total Study Area	44	7,006

Source: National Center for Education Statistics, 2012

Law Enforcement

Public safety within the study area is provided by local law enforcement or emergency response agencies located in nearby communities. The Mercer County Sheriff's Office provides law enforcement for Mercer County. The Killdeer Police Department and the Dunn County Sheriff's Office provide law enforcement services to the portions of Dunn County that are within the study area. The McKenzie County Sheriff's Office and the Watford City Police Department are the law enforcement agencies located within the study area in McKenzie County. Law enforcement services for the study area within Williams County are provided by the Williston Police Department, Tioga Police Department, and the Williams County Sheriff's Office. The portion of Mountrail County within the study area is served by the Mountrail County Sheriff's Office.

The increase in oil development activities in the area has brought an influx of people to the region, resulting in the need for increased law enforcement presence in the area. With the influx of people there has been an increase in local crime rates. In 2010 the police chief in Watford City, in McKenzie County, requested the hiring of two new full-time officers, and the Williams County Sheriff asked for a substantial increase in staff to help patrol Williams County (Caldwell, 2010). The city of Williston hired five additional officers in 2010, and plans to hire six more in 2012 to help keep up with the increasing number of calls.

In 2009, Williston police received between 6,000 and 7,000 calls for police assistance, and this number increased to more than 16,000 in 2010. In 2011, 911 calls tripled in volume compared to calls received in 2010. Additionally, outlying areas of Williams County, patrolled by the Williams County Sheriff's Department, have seen an increase in the number of calls coming from all over the county, sometimes requiring up to 40 minutes for a deputy to respond (Domaskin, 2011).

Within the study area, crimes such as oil site thefts, burglary, alcohol-related offenses, prostitution, and assault are rising. In Williston, thefts at residences and retail shops have risen steadily, with police responding to approximately 40 percent more burglar alarms in 2011 compared to 2010. Assault and battery charges increased by 171 percent in Williston in a year's time, and police departments in many of the towns within the study area are encountering increases in night club violence and domestic violence (Domaskin, 2011; Ellis, 2011).

Fire Protection Services

Fire services within the study area are provided by city and community fire departments, volunteer fire departments, rural fire departments, and fire protection districts. There are a total of 33 fire stations in the study area. All of these stations are staffed by volunteer firefighters, except for the Williston Fire Department of Williams County, which is staffed by volunteers as well as by career firefighters (U.S. Fire Administration, 2012). The total number of firefighters (including volunteer, career, and other firefighters) in the study area counties is 904 (U.S. Fire Administration, 2012). The oil related activity has required the fire departments to expand their staffing and services provided. These figures are summarized in Table 3-33.

Ambulance Districts

Seven ambulance districts serve the study area. These districts provide ground-based life support services and include: Halliday Ambulance Service, Killdeer Area Ambulance Service, McKenzie County Ambulance Service, Ray Community Ambulance District, Tioga Ambulance Service, and Williston Ambulance Service (NDDOH, 2005). The increase in the oil-related activity has required the ambulance districts to expand their staffing and level of services (Burns & McDonnell Engineering Company, Inc., 2012). The majority of the ambulance districts operate on a voluntary or part-time basis.

Table 3-33: 2012 Fire Protection Services in the Study Area Counties

County	District Name	Number of Stations	Total Number of Firefighters (career, volunteer, civilian, active, on-call)
Dunn	Halliday Rural Fire Protection District	1	19
	West Dunn Fire District	2	67
McKenzie	Alexander Volunteer Fire Department	1	29
	Grassy Butte Fire Protection District	1	50
	McKenzie County Rural Fire Protection District	2	70
	Sioux-Yellowstone Rural Fire Protection District	1	5
	Watford City Volunteer Fire Department	1	25
Mercer	Beulah Rural Fire Protection District	1	30
	Golden Valley Rural Fire Department	1	20
	Hazen Fire and Rescue	1	34
	Pick City Fire Department	1	13
	Stanton Rural Fire Protection Department	1	25
	Zap Rural Fire Protection District	1	20
Mountrail	Parshall Rural Fire Protection District	1	23
	Plaza Fire Protection District	1	31
	Stanley Fire Department	1	25
	Three Affiliated Tribes-Fire Department	4	80
Williams	Alamo Rural Fire Protection District	2	45
	Epping Rural Fire Protection District	2	43
	Grenora Rural Fire Protection District	1	18
	Ray Fire Protection District	1	30
	Tioga City Fire Department	1	55
	Tioga Rural Fire Department	1	44
	Wildrose Fire Protection District	1	27
	Williston Fire Department	1	54
	Williston Rural Fire Protection District-Ambulance	1	22

Source: U.S. Fire Administration, 2012

Medical Facilities and Hospitals

Hospitals located within the study area include the McKenzie County Memorial Hospital and Healthcare Systems, located in Watford City; Mercy Medical Center located in Williston; and Tioga Medical Center located in Tioga. McKenzie County Memorial Hospital, Tioga Medical

Center, and Mercy Medical Center house 24, 25, 87 beds, respectively. Mercy Medical Center also provides a Level IV Trauma Center (UCompareHealthCare, 2011). The Mountrail County Health Center, a hospital in Stanley, Mountrail County, is the only hospital in the study area that is located outside of the study area itself. The larger cities of Dickinson, Bismarck, and Minot, located outside the study area, offer more and larger healthcare facilities.

3.8.2 Direct and Indirect Effects

Impacts on socioeconomic resources include how the proposed project could potentially affect elements of the human environment such as population, employment, income, cost of living, property values, housing, and public services. The effects from the proposed project on many of these factors are not limited to the ROW, but would result in impacts across the wider geographic area, affecting the five-county project area. However, some effects, such as property values, would likely only affect residences within proximity to the proposed project. The majority of potential project-induced impacts on social and economic conditions would occur during the construction stage of the project, and therefore, are generally short term and low when compared to all the activities distributed across the larger regional area.

This section discusses the potential effects of the proposed project on the various social and economic characteristics throughout the project area. Economic impacts include impacts that individuals, groups, properties, and businesses would experience from a change in business and economic activity as a result of the proposed project alternatives. Social impacts are borne by individuals or groups who could experience a change in their social structure and context.

Intensity thresholds of impacts on socioeconomic conditions are presented in Table 3-1.

No-action Alternative

Under the no-action alternative, the project would not be constructed. The regional economy of northwest North Dakota and adjoining areas of Montana is currently heavily influenced by the rapid and widespread oil and gas development associated with the Bakken oil shale fields. The level of oil and gas development that has occurred and is planned for the Bakken region is bringing a considerable number of new jobs and businesses to the area. The introduction of new economic activity requires additional infrastructure, housing, retail stores, and public services. As population and businesses increase across the region, increased amounts of electrical power as well as electrical transmission capacity and reliability are necessary. There would be no change in socioeconomic conditions due to the project under the no-action alternative because direct and indirect revenues from construction of the project would not be realized (construction wages, spending in the communities, and property taxes, among others).

Under the no-action alternative, projected electricity demands in western North Dakota would not be met. This could lead to an increase in the cost of energy and continued dependence on a system at capacity. Additionally, without the proposed project to strengthen the electrical system, reliability of the electrical system could be jeopardized and could result in power outages. In this way, the no-action alternative would indirectly impact existing socioeconomic conditions because local communities and the region would not benefit from the improved electric reliability and capacity anticipated from the project.

Electricity capacity shortfalls would likely limit future development activities needed to accommodate the considerable population, housing, and business growth in the area associated with the current oil and gas boom. Residential, commercial, and industrial growth and development across the region could experience declines in electricity service reliability as early as 2015 (see Section 1.4, Purpose and Need, Load Forecast). Should the load forecast be greater than what is anticipated, service reliability would be affected earlier. Declines in service reliability could lead to lost productivity, and declines in commercial and industrial growth. If the proposed project is not constructed, the load growth would be capped at the projected 2015 load level, no new load growth could be accommodated, and transmission system reliability would decrease.

Alternative C

Construction and operation of Alternative C would result in socioeconomic impacts, including:

- Improved electric reliability and increased capacity for existing and future customers
- Temporary increase in population as a result of the influx of construction workers
- Temporary increase in demand for temporary lodging facilities as a result of the influx of construction workers
- Temporary increase in demand associated with spending on local goods, services, and construction materials
- Potential changes to property values
- Minimal reductions in agricultural production from loss of land for structure placement
- Restriction on the placement of new oil and gas facilities in proximity to the proposed project facilities, although the project would provide for reliable source of electricity for oil and gas operations

As discussed in Section 3.8.1, the regional economy of northwest North Dakota and adjoining areas of Montana is currently heavily influenced by the rapid and widespread oil and gas development associated with the Bakken oil shale fields. The level of oil and gas development that has occurred and is planned for the Bakken region is bringing a considerable number of jobs and businesses to the area. The introduction of new economic activity requires additional supporting infrastructure, housing, retail stores, and public services. As population and businesses increase across the region, increased amounts of electrical power as well as electrical transmission capacity and reliability are necessary. The continued reliability of electric service to the region is necessary to serve the needs of businesses, housing, and infrastructure to allow the economy of the area to continue to develop.

Approximately 200 annual construction jobs would occur over the 2-year life of construction activity, providing a short-term influx of income to the area (Basin Electric, 2012a). The majority of transmission line construction contractors and workers would temporarily relocate to the project area because transmission construction requires specialized expertise and workforce. A small number of local construction workers could be retained for more general activities. However, due to the tight labor market in the region and low unemployment rates, it is anticipated that most of the construction workforce would come from outside the region. Few workers would be hired locally and permanent jobs are not anticipated to be introduced to the area as a result of the operation of the proposed project (Basin Electric, 2012a).

Although construction would occur over 2 years, individual crews may be required for only a few months in a particular construction area before moving to another area on a subsequent phase of the project. Additionally, construction would not be confined to one area or community. Workers would be spread out over nearly 278 miles in four crews of approximately 50 workers each, for a total of 200 workers. Earnings of 200 construction workers would be about $12.5 million annually, based on average earnings for construction jobs in project area counties (U.S. Department of Commerce, Bureau of Economic Analysis, 2012b, 2012c, 2012d).[18] These earnings represent 0.5 percent of the earnings within project area counties, which were $2.3 billion in 2010 (U.S. Department of Commerce, Bureau of Economic Analysis, 2012d).

As construction workers spend their money in the local area, revenues would likely increase for some local businesses, such as hotels, restaurants, gas stations, and grocery stores, supporting jobs and incomes for these businesses and their employees. Because construction workers are not anticipated to be permanent residents of the project area, induced spending would be considerably less than locally-residing employees because construction workers will send a portion of their earnings to their home area. Overall, the spending would be short term and is likely to have low socioeconomic impacts on the overall region. There would be increased pressure on the already tight temporary housing market.

Alternative C would result in increasing transmission capacity and reliability. Additional capacity would provide electricity for the expanding Bakken oil and gas development activities

[18] Average earnings for construction workers of $62,667 in 2010 was based on data available for McKenzie, Mercer, and Williams counties. Construction earnings or employment was not disclosed for Mountrail and Dunn counties.

and other future potential development activities in the region. A reliable supply of electricity would continue to support the expanding regional economy as well as existing and new jobs in the project area.

The study area has seen a dramatic increase in population over the past several years as a result of the economic activity and availability of jobs in the area. Between 2000 and 2010, the project area added more than 4,000 new permanent residents, a 9 percent increase (U.S. Census 2000; 2010a). Over the 2 year construction period, there would be a temporarily population increase of 200 people in the project area.

Larger municipalities such as Williston, Beulah, Watford City, and Tioga would likely be impacted the most by the temporary population increase as workers would seek to take advantage of amenities offered in these towns. Temporary population changes in local communities would be low, particularly compared to the current growth in the area.

During construction activities, short-term impacts on nearby residents as a result of the proposed project would include increased noise, visual presence of construction equipment, and potential traffic resulting from the movement of heavy material haul trucks that would likely slow vehicular movements, and lane and road closures during conductor stringing. Long-term impacts on nearby residents as a result of operation of the proposed project would include minor, infrequent disturbance during maintenance or repair activities. Impacts on property values are discussed below.

New ROWs for the construction and maintenance of Alternative C would be required to support the proposed project. Existing construction access trails would be used where possible; however, additional easements for these construction access trails would be needed. Basin Electric would pay market value to non-federal landowners, as established through the appraisal process, for any new land rights necessary to support Alternative C. The appraisal process considers all factors affecting land value, including the impact of transmission lines on property value. The appraisals may reference studies conducted on similar properties to support their conclusions. The strength of any appraisal depends on the individual analysis of the property, using neighborhood-specific market data in order to determine market value.

The impact of introducing a new ROW for transmission structures and lines can vary dramatically depending on the placement of the ROW in relation to the property's size, shape, and location of existing structures. A transmission line may diminish the utility of a portion of property if the line effectively severs this area from the remaining property and subsequently alters existing land use patterns. These factors as well as any other elements unique to the property are taken into consideration to determine any loss in value within the easement area, as well as outside the easement area in cases of severance.

Whenever land use changes, the concern is often raised about the effect the change may have on property values nearby. The question of whether nearby transmission lines can affect residential property values has been studied extensively in the United States and Canada over the last 20 years or so, with mixed results. In general, the impacts are difficult to measure, vary among individual properties, and are influenced by a number of interplaying factors, including:

- Proximity of residential properties to transmission line structures
- Type and size of high-voltage transmission line structures
- Appearance of easement landscaping
- Surrounding topography (Jackson and Pitts, 2010)

Pitts and Jackson (2007) summarize the following conclusions on the impacts of high-voltage transmission lines.

- When negative impacts are present, studies report an average decline of prices from 1 to 10 percent.
- Value diminution is attributable to the visual unattractiveness of the lines, potential health hazards, disturbing sounds, and safety concerns.
- Where property value impacts were present, the effect dissipated with time and distance.
- Property value impacts diminish as the distance between the high-voltage transmission lines and the affected properties increase, and generally disappear completely at a distance of 200 feet from the lines.
- Where views of transmission lines and towers are completely unobstructed, negative impacts can extend up to 0.25 mile.
- If high-voltage transmission-line structures are at least partially screened from view by trees, landscaping, or topography, any negative effects are reduced considerably.
- Value diminution attributed to high-voltage transmission-line proximity is temporary and usually decreases over time, disappearing completely in 4 to 10 years.

A recent study of sales of rural land parcels in central Wisconsin between 2002 and 2008 found small, but not statistically significant negative price effects on the sale of properties encumbered by a transmission line easement (Jackson, 2010). A study by J.A. Chalmers, Ph.D. analyzed nearly 600 miles of a 500-kV transmission line stretching across Montana running from Colstrip in the southeast corner, west to the state border near Taft (Chalmers, 2012a, 2012b, 2012c). Chalmers' research reports on sale dynamics involving properties within 500 feet of the centerline of the Colstrip-Bonneville Power Administration line sold between 2000 and 2010.

With regard to the circumstances that may affect vulnerability to transmission line impacts in rural settings, Chalmers suggests three general principles based on the study of this line:

- When a property's sole use is residential, its vulnerability to price impacts from a transmission line increases.
- As property size increases, vulnerability to negative market impacts from a transmission line decreases.
- If substitutes are available, vulnerability to price impacts and marketing delays can increase.

Although the extent varies, price impacts and market delays associated with the 500-kV line on small rural residential parcels are clearly noted in the Chalmers study. The same report did not find evidence of transmission line impact on sales involving production agricultural properties. A small number of case studies found no impact on the sales of recreationally-influenced agricultural lands due to the presence of the Colstrip-Bonneville Power Administration line.

Studies of impacts during periods of physical change, such as new transmission line construction or structural rebuilds, generally reveal greater short-term impacts than long-term effects. However, most studies have concluded that other factors (e.g., general location, size of property or structure, improvements, irrigation potential, condition, amenities, and supply and demand factors in a specific market area) are far more important criteria than the presence or absence of transmission lines in determining the value of residential real estate.

Some impacts on property values (and salability) might occur on an individual basis as a result of the new transmission line. There are an estimated six residences within 500 feet (1/10th of a mile), and an estimated 52 residences within 0.25 mile of Alternative C. As a result, the introduction of the proposed project is anticipated to result in low adverse effects on property values. These impacts would be highly variable, individualized, and unpredictable. Additionally, reductions in property values associated with reduced agricultural production would be mitigated with compensation for fair market value losses. The majority of these losses would be temporary in nature because property value effects tend to dissipate with time.

The construction, operation, and maintenance of the proposed project would generate additional property tax revenues to counties where the transmission line would be sited. There are approximately 278 miles of transmission lines associated with Alternative C. Table 3-34 summarizes these tax receipts to local governments that would be associated with the transmission line component of the proposed project. There would also be property taxes collected from the substation properties.

The construction and operation of Alternative C would result in both short- and long-term impacts on agricultural land. During construction, potential short-term impacts within the ROW would include crop damage (depending on the time of year for construction across specific fields), soil disturbance, and potential loss of production for one growing season as a result of construction activities and the transport of construction equipment and vehicles restricting or preventing planting of lands within or adjacent to the ROW. Approximately 1,671 acres of cultivated cropland would be incorporated into the ROW under Alternative C. However, it is unlikely that impacts would occur across the entire 1,671 acres; the majority of impacts would be short term and occur during construction activities. The ROW for Alternative C contains approximately 2,548 acres of grassland and construction activities are expected to have a short-term impact on cattle grazing activities. Cattle may need to be moved during construction activities in areas where the ROW would cross grassland or pasture.

Table 3-34: Property Tax Revenues to Project Area Counties Associated with Alternative C

	Miles	Year 2	Year 3	Year 4	Years 5-45 (Annual)
Dunn	65	$4,883	$9,765	$14,648	$19,530
McKenzie	125	$9,360	$18,720	$28,080	$37,440
Mercer	19	$1,388	$2,775	$4,163	$5,550
Mountrail	3	$210	$420	$630	$840
Williams	66	$4,943	$9,885	$14,828	$19,770
Project area counties	278	$20,783	$41,565	$62,348	$83,130

Source: Staff calculations based on North Dakota Title 57, Taxation, n.d.

Long-term, direct loss of agricultural land would occur as a result of transmission line structure placement. Lands lost due to the siting of these structures would be approximately 1.4 acres. Therefore, permanent loss of agricultural lands, including cropland, would be less than 1.4 acres. The remaining acreage within the ROW would be allowed to return to cropland once construction is complete. Basin Electric has a policy of allowing agricultural practices within its ROW as long as they do not interfere with or jeopardize the operation of its lines.

Rapid oil and gas development is currently occurring in western North Dakota with an estimated 1,100 to 2,700 new wells expected per year, and 26,000 new wells expected over the next 10 to 20 years (NDDMR, 2011). Alternative C would support this development by providing electric power that will help accommodate increasing population, businesses, housing, infrastructure, retail stores, and public services. The location of the development of new wells would be constrained by the ROW, although the impacts would be low since the extraction of oil and gas can usually occur from multiple locations within and above the oil reserves through the use of directional/horizontal drilling.

Impacts associated with the construction of Alternative C are anticipated to be short term, and would cease once the line is in service. Existing public health and safety services such as police, fire, ambulance, and hospital services are already experiencing some deficiencies and personnel shortages due to rapid growth across the region, particularly in smaller communities that have not experienced significant population growth in recent years. This coupled with the inherent potential for accidents and injuries associated with industrial development has added to the increased need for health services. Additional workers moving into the region during construction of the proposed project, if only temporarily, may increase the burden on some or all of the existing public service providers and rental housing. Impacts on emergency services would be expected to be low with the introduction of an additional 200 people temporarily in the area to support construction of the proposed project. However, with the current deficiencies, the impacts could be higher.

Because of the temporary nature of construction activities, few to no families are expected to accompany construction workers to the project area. As a result, there would be negligible impacts on schools and enrollment.

Alternative C would provide an increase in the load-serving capacity to accommodate the long-term electrical needs of the northwest North Dakota region. Projected load growth would be accommodated and the reliability of the regional transmission system would be maintained, continuing to serve the electricity needs of the area and make the region attractive for additional growth and development opportunities.

Capital expenditures for improvements to electric-utility infrastructure are investments made to serve customers. Basin Electric’s customers primarily include 134 member rural electric systems, located in nine states: Colorado, Iowa, Minnesota, Montana, Nebraska, New Mexico, North Dakota, South Dakota, and Wyoming. Capital expenditures can be passed on to customers in the form of increased rates. However, as a regulated utility, Basin Electric can increase rates only on approval by state utility commissions or FERC. FERC and state utility commissions must approve rates for sale of wholesale electricity and review rates set by the federal Power Marketing Administrations. Such rate-increase requests are subjected to rigorous analysis by regulators and others as well as a public process. At this time, not all costs for development of the proposed project are known; therefore, Basin Electric cannot project what the rate increase may be as a result of this project.

In addition to electrical support for the area, project construction would itself generate a certain amount of economic activity. While minimal when compared to the current sales throughout the region, the presence of approximately 200 construction workers over a 2-year period would generate additional sales of food, fuel, lodging, and services (primarily vehicle and equipment repairs). Construction activity would also require concrete, aggregate, lumber, and hardware items. Many of these materials would likely be purchased locally, contributing further to local sales. Most materials for the transmission structures and conductors would be shipped from manufacturers outside the region. However, many of these materials would be subject to sales and subsequent property taxes payable to local jurisdictions that would benefit local programs such as roads and schools.

Alternative C would not influence long-term employment in the project area. Non-resident construction workers would spend a portion of their earnings in the project area, contributing to jobs and income across the region. Because these workers will only be in the area temporarily and are likely to be primarily from outside the region, induced employment and income is expected to be short term and low. No long-term employment would be necessary to support the operation of the proposed project. The local population would increase temporarily, with low and short-term impacts on socioeconomic conditions, and there would be added pressure to an already tight housing and rental market.

Alternative D

Under Alternative D, potential socioeconomic impacts on the regional economy and employment would be similar to those described under Alternative C. However, there would be some small differences, which are discussed below.

Approximately 150 annual construction jobs would occur over the 2-year life of construction activities, providing a short-term influx of income to the area (Basin Electric, 2012a). This is fewer than the 200 annual workers necessary to support the construction of Alternative C. Under Alternative D, there would be three crews of 50 workers. Because the construction of transmission lines requires specialized expertise and workforce, it is anticipated that the majority of transmission line construction contractors and workers would temporarily relocate to the project area. A small number of local construction workers could be used for more general activities. However, it is anticipated that all of the construction workforce would come from outside of the region. Few workers would be hired locally and permanent jobs are not anticipated to be introduced to the area. No additional employment from the operation of the proposed project is anticipated (Basin Electric, 2012a).

Although construction would occur over 2 years, individual crews may be required for only a few months in a particular construction area before moving to another area on a subsequent phase of the project. Given the length of the proposed project, construction activities would not be confined to one area or community. Workers would be spread out over approximately 251 miles in three crews of approximately 50 workers each, for a total of 150 workers. Earnings of 150 construction workers would be approximately $9.4 million annually, based on average earnings for construction jobs in project area counties (U.S. Department of Commerce, Bureau of

Economic Analysis, 2012b, 2012c, 2012d).[19] These earnings represent 0.4 percent of the earnings within project area counties, which were $2.3 billion in 2010 (U.S. Department of Commerce, Bureau of Economic Analysis, 2012d).

Some impacts on property values (and salability) might occur on an individual basis as a result of the new transmission line. There are an estimated five residences within 500 feet (1/10th of a mile), and an estimated 44 residences within 0.25 mile of Alternative D. Therefore, low adverse effects to property values associated with the proposed project are anticipated. These impacts would be highly variable, individualized, and unpredictable. Additionally, reductions in property values associated with reduced agricultural production would be mitigated with compensation for fair market value losses. The majority of these losses would be short-term because most property value effects tend to dissipate with time.

The construction, operation, and maintenance of the proposed project would generate additional property taxes to counties where the line would be sited. There are approximately 251 miles of transmission lines associated with Alternative D. Table 3-35 summarizes the tax receipts to local governments associated with the transmission line. Property tax revenues would also be collected from the substation properties.

Table 3-35: Property Tax Revenues to Project Area Counties Associated with Alternative D

	Miles	Year 2	Year 3	Year 4	Years 5-45 (Annual)
Dunn	89	**$6,660**	**$13,320**	**$19,980**	**$26,640**
McKenzie	74	$5,528	$11,055	$16,583	$22,110
Mercer	19	$1,388	$2,775	$4,163	$5,550
Mountrail	3	$210	$420	$630	$840
Williams	66	$4,943	$9,885	$14,828	$19,770
Project area counties	251	**$18,728**	**$37,455**	**$56,183**	**$74,910**

Source: Staff calculations based on North Dakota Title 57, Taxation, n.d.

Construction and operation of Alternative D would result in both short- and long-term impacts on agricultural land. During construction, potential temporary impacts within the ROW would include crop damage (depending on the time of year of construction across specific parcels), soil disturbance, and potential loss of production for one growing season as a result of construction

[19] Average earnings for construction workers of $62,667 in 2010 was based on data available for McKenzie, Mercer, and Williams counties. Construction earnings or employment was not disclosed for Mountrail and Dunn counties.

activities and the transport of construction equipment and vehicles restricting or preventing planting of lands within or adjacent to the ROW. Approximately 1,505 acres of cultivated cropland would be incorporated into the ROW under Alternative D. However, it is not anticipated that impacts would occur across the entire 1,505 acres. The majority of impacts would be short term, occurring during construction activities. Approximately 2,408 acres of grassland occur within the ROW for Alternative D and construction activities are expected to have a temporary impact on cattle grazing activities. Cattle may need to be moved temporarily during construction in areas where the ROW would cross grassland or pasture.

Long-term, direct loss of agricultural land would occur as a result of transmission line structure placement. Lands lost for the structure locations necessary for Alternative D would be approximately 1.3 acres. Therefore, permanent loss of agricultural lands, including cropland, would be less than 1.3 acres. The remaining acreage within the ROW would be allowed to return to cropland when construction is completed. Basin Electric has a policy of allowing agricultural practices within its ROW as long as they do not interfere with, or jeopardize, the operation of its lines.

Similar to Alternative C, Alternative D would not influence resident employment in the project area, and no long-term employees would be needed for the operation of the transmission line. The local population would increase temporarily, with low and short-term impacts on socioeconomic conditions and there would be added pressure to an already tight housing and rental market.

Alternative E

Similar to Alternative D, 150 annual construction jobs would occur over the life of construction activities, providing a short-term influx of income to the area (Basin Electric, 2012a). Because this alternative includes the construction of two parallel transmission lines, it is anticipated that the three crews of 50 workers would construct both lines at the same time. As a result, the construction period at specific locations along the line may be longer than under Alternative D. Economic benefits that would be recognized from this short-term increase in employment and income are further discussed under Alternative D.

Some impacts on property values (and salability) might occur on an individual basis as a result of the new transmission line. There are an estimated six residences within 500 feet (1/10th of a mile), and an estimated 45 residences within 0.25 mile of Alternative E. Therefore, low adverse effects to property values associated with the proposed project are anticipated. These impacts would be highly variable, individualized, and unpredictable. Additionally, reductions in property values associated with reduced agricultural production would be mitigated with compensation for fair market value losses. The majority of these losses would be short-term because property value effects tend to dissipate with time.

The construction, operation, and maintenance of the proposed project would generate additional property taxes to counties where the line would be sited. There are approximately 314 miles of transmission lines associated with Alternative E. Table 3-36 summarizes the tax receipts to local governments associated with the transmission line. Property tax revenues would also be collected from the substation properties.

Construction and operation of Alternative E would result in both short- and long-term impacts on agricultural land. During construction, potential temporary impacts within the ROW would include crop damage (depending on the time of year of construction across specific parcels), soil disturbance, and potential loss of production for one growing season as a result of construction activities and the transport of construction equipment and vehicles restricting or preventing planting of lands within or adjacent to the ROW. Approximately 1,720 acres of cultivated cropland would be incorporated into the ROW under Alternative E. However, it is not anticipated that impacts would occur across the entire 1,720 acres. The majority of impacts would be short term, occurring during construction activities. Approximately 3,155 acres of grassland occur within the ROW for Alternative E and construction activities are expected to have a temporary impact on cattle grazing activities. Cattle may need to be moved temporarily during construction in areas where the ROW would cross grassland or pasture.

Table 3-36: Property Tax Revenues to Project Area Counties Associated with Alternative E

	Miles	Year 2	Year 3	Year 4	Years 5-45 (Annual)
Dunn	111	**$8,303**	**$16,605**	**$24,908**	**$33,210**
McKenzie	115	$8,573	$17,145	$25,718	$34,290
Mercer	19	$1,388	$2,775	$4,163	$5,550
Mountrail	3	$210	$420	$630	$840
Williams	66	$4,943	$9,885	$14,828	$19,770
Project Area Counties	314	**$23,415**	**$46,830**	**$70,245**	**$93,660**

Source: Staff calculations based on North Dakota Title 57, Taxation, n.d.

Long-term, direct loss of agricultural land would occur as a result of transmission line structure placement. Lands lost for the structure locations necessary for Alternative E would be approximately 1.6 acres. Therefore, permanent loss of agricultural lands, including cropland, would be less than 1.6 acres. The remaining acreage within the ROW would be allowed to return to cropland when construction is completed. Basin Electric has a policy of allowing agricultural practices within its ROW as long as they do not interfere with, or jeopardize, the operation of its lines.

Similar to Alternatives C and D, Alternative E would not influence residential employment in the project area, and no long-term employees would be needed for the operation of the transmission line. The local population would increase temporarily, with low and short-term impacts on socioeconomic conditions and there would be added pressure to an already tight housing and rental market.

3.9 ENVIRONMENTAL JUSTICE

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires each federal agency to make the achievement of environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low income populations. The Executive Order further stipulates that the agencies conduct their programs and activities in a manner that does not have the effect of excluding persons from participation in, denying persons the benefits of, or subjecting persons to discrimination because of their race, color, or national origin.

Evaluating whether a proposed action has the potential to have disproportionately high and adverse impacts on minority and/or low income populations typically involves: (1) identifying any potential high and adverse environmental or human health impacts, (2) identifying any minority or low income communities within the potential high and adverse impact areas, and (3) examining the spatial distribution of any minority or low income communities to determine if they would be disproportionately affected by these impacts.

Guidelines provided by CEQ (1997) and USEPA (1998) indicate that a minority community may be defined where either: 1) the minority population comprises more than 50 percent of the total population, or 2) the minority population of the affected area is meaningfully greater than the minority population in the general population of an appropriate benchmark region used for comparison. Minority communities may consist of a group of individuals living in geographic proximity to one another, or a geographically dispersed set of individuals who experience common conditions of environmental effect. Further, a minority population exists if there is "more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds" (CEQ, 1997). For the purposes of this analysis, the threshold for consideration of an area as an Environmental Justice minority area would be if the minority population comprises more than 50 percent of the total population within the evaluated area or the minority population percentage is more than 10 percent greater than the benchmark or reference region; in this case, the reference or benchmark geographic area is the county and the state.

CEQ and USEPA guidelines indicate that low income populations should be identified based on the annual statistical poverty thresholds established by the U.S. Census Bureau. Like minority populations, low income communities may consist of individuals living in geographic proximity to one another, or a geographically dispersed set of individuals who would be similarly affected by the proposed action or program. The U.S. Census Bureau defines a poverty area as a census tract or other area where at least 20 percent of residents are below the poverty level (U.S. Census Bureau, 2012).

3.9.1 Affected Environment

Presence of Minority Environmental Justice Populations

The environmental justice assessment was undertaken at both the census block and census tract levels. The presence of minority populations was evaluated on the block level, the smallest geographic area for which census information is available in 2010. The study area for the environmental justice assessment includes all those blocks for minority populations within 0.5 mile of the proposed transmission line routes.

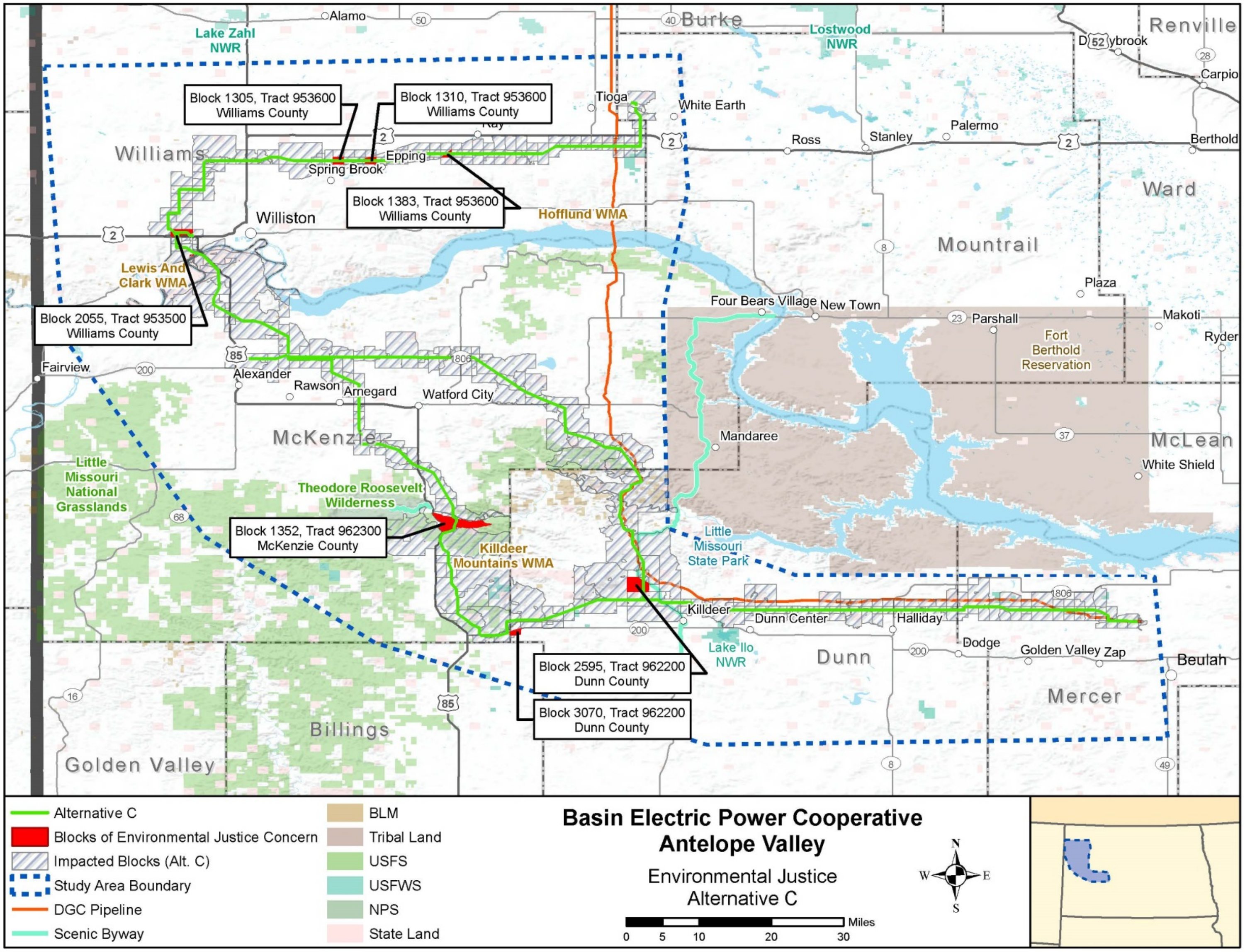
The county and/or state in which each affected census block is located was used as the reference area to determine the presence of minority and/or low-income populations, whichever has the lower threshold level. Racial, ethnic, and poverty data have been retrieved from the U.S. Census for 2010.

Within the study area, there are six blocks that have a higher percentage of minority residents (10 percent) as compared to the counties or the state in which they reside. There are four census blocks in Williams County, one in Dunn County, and one in McKenzie County. A total of 58 people live in these six census blocks. Major minority groups within these blocks include American Indians, and those who identify as two or more races. Many of the other study area blocks have small (less than 20 percent) percentages of minority residents. Figure 3-38 shows the location of these blocks in the study area.

Presence of Poverty Environmental Justice Populations

For 2010, the smallest geographic area for which the presence of low-income populations is identified is the census tract level. Census tracts were identified that are located within 0.5 mile of the proposed transmission line routes. There are no census tracts within the study area that constitute communities of environmental justice concern on the basis of poverty. The majority of the study area has a low percentage of residents living below the poverty level.

Figure 3-38: Blocks of Environmental Justice Concern



3.9.2 Direct and Indirect Effects

For purposes of this analysis, the threshold for an environmental justice minority area is that the area under analysis comprises minority populations more than 10 percent greater than the benchmark or reference region; in this case, the reference or benchmark geographic area is the county and the state. The presence of minority populations is identified on the census block, the smallest geographic area for which the U.S. Census Bureau reports data. Definitions for duration and intensity of impacts to environmental justice communities established for this project are described in Table 3-1.

The U.S. Census Bureau defines a poverty area as a census tract or other area where at least 20 percent of residents are below the poverty level (U.S. Census Bureau, 2010a).

No-action Alternative

Under the no-action alternative, the proposed project would not be constructed, and there would be no impacts on minority and/or low-income populations as a result of the proposed project.

Alternative C

Minority populations have been identified in the project area in ten census blocks within 0.5 miles from Alternative C. However, low-income populations have not been identified in census tracks adjacent to the proposed project. Because potential environmental justice populations of concern exist, it is necessary to (1) identify any impacts of the project and (2) examine the spatial distribution of any impact areas to determine if these impacts are likely to fall disproportionately on the minority populations.

There are an estimated 52 residences located within 0.25 mile of Alternative C, of which 7 are located in census blocks that have been identified as having relatively higher proportions of minority residents. Six of the residences are in Williams County; two are 3 miles north of Springbrook, and four are west of Williston. An additional house is located in McKenzie County approximately 12 miles north of the community of Grassy Butte.

Alternative C is expected to contribute positively to potential environmental justice communities through additional fiscal receipts to counties. However, these populations also could be adversely affected by potential project-induced impacts on additional resource areas (e.g., traffic, air quality, visual resources, and agricultural land uses). Air quality and traffic impacts are anticipated to be short term with air emission dispersion limited to the vicinity of construction activities. Following construction, impacts would primarily be limited to land use restrictions within the ROW and the presence of the transmission line and structures on properties. It is possible these residents may experience adverse visual impacts; however, there are 45 additional residences within a 0.25-mile buffer that also would experience some adverse effects. Therefore, these potential environmental justice populations are not anticipated to be disproportionately affected by these impacts.

It is likely that environmental justice populations are currently being adversely affected by the tight housing market and rising cost of living. Alternative C would temporary put additional strain on the already limited housing resources in the region, which would have some impacts on environmental justice populations as well as other residents and those seeking housing in the region. However, Alternative C's impact on housing and cost of living would be short-term.

The vast majority of land use within the ROW is rangeland and cultivated croplands. There may be some minor impacts on agricultural activities, although these are primarily short-term effects and are not anticipated to fall disproportionately on environmental justice populations. Additionally, there would be negligible to minimal effects on property values, because only six residential structures fall within 0.1 mile (approximately 500 feet) of the transmission line route within the census blocks identified as having relatively higher proportions of minority residents.

Alternative C would not have any disproportionate adverse impacts on minority and low-income communities.

Alternative D

Minority populations have been identified in the project area in eight census blocks within 0.5 mile from Alternative D. However, low-income populations have not been identified in census tracks adjacent to Alternative D. Because potential environmental justice populations of concern exist, it is necessary to (1) identify any impacts of the project and (2) examine the spatial distribution of any impact areas to determine if these impacts are likely to fall disproportionately on the minority populations.

There are an estimated 44 residences located within 0.25 mile of Alternative D; 6 of which are located in census blocks that have been identified as a potential minority environmental justice population. All of the residences are in Williams County; two are 3 miles north of Springbrook, and four are west of Williston.

Similar to Alternative C, Alternative D is anticipated to contribute positively to potential environmental justice communities through additional fiscal receipts to counties. However, these populations also could be adversely affected by the potential project-induced impacts on additional resource areas (e.g., traffic, air quality, visual resources, and agricultural land uses). Air quality and traffic impacts are anticipated to be short term with air emission dispersion limited to the vicinity of construction activities. Once construction is complete, impacts would be primarily limited to land use restrictions within the ROW and the presence of the transmission line and structures on properties. It is possible these residents may experience adverse visual impacts; however, there are 38 additional residences within 0.25 mile of the proposed transmission line centerline that also would experience some adverse effects. Therefore, potential environmental justice populations in the project area are not expected to be disproportionately affected by these impacts.

Similar to Alternative C, the tight housing market and rising cost of living is likely to adversely affect environmental justice populations under Alternative D. However, environmental justice populations would not be disproportionately affected by these impacts, and the impacts would be temporary in nature.

The majority of land use within the ROW is rangeland and cultivated croplands. There may be some minor impacts on agricultural activities, although these are primarily short-term and are not anticipated to fall disproportionately on environmental justice populations. Additionally, there would be negligible to minimal effects on property values, because only five residential structures fall within 0.1 mile (approximately 500 feet) of the transmission line route and within census blocks identified as having relatively higher proportions of minority residents.

Alternative D would not have any disproportionate adverse impacts on minority and/or low-income communities.

Alternative E

Minority populations have been identified in the project area in eight census blocks within 0.5 mile from Alternative E. However, low-income populations have not been identified in census tracks adjacent to Alternative E. Because potential environmental justice populations of concern exist, it is necessary to (1) identify any impacts of the project and (2) examine the spatial distribution of any impact areas to determine if these impacts are likely to fall disproportionately on the minority populations.

There are an estimated 45 residences located within 0.25 mile of Alternative E; 6 of which are located in census blocks that have been identified as a potential minority environmental justice population. All of the residences are in Williams County; two are 3 miles north of Springbrook, and four are west of Williston.

Similar to Alternatives C and D, Alternative E is anticipated to contribute positively to potential environmental justice communities through additional fiscal receipts to counties. However, these populations also could be adversely affected by the potential project-induced impacts on additional resource areas (e.g., traffic, air quality, visual resources, and agricultural land uses). Air quality and traffic impacts are anticipated to be short term with air emission dispersion limited to the vicinity of construction activities. Once construction is complete, impacts would be primarily limited to land use restrictions within the ROW and the presence of the transmission line and structures on properties. It is possible these residents may experience adverse visual impacts; however, there are 39 additional residences within 0.25 miles of the proposed transmission line centerline that also would experience some adverse effects. Therefore, potential environmental justice populations in the project area are not expected to be disproportionately affected by these impacts.

Similar to Alternatives C and D, the tight housing market and rising cost of living is likely to adversely affect environmental justice populations under Alternative E. However, environmental justice populations would not be disproportionately affected by these impacts, and the impacts would be temporary in nature.

The majority of land use within the ROW is rangeland and cultivated croplands. There may be some minor impacts on agricultural activities, although these are primarily short-term and are not anticipated to fall disproportionately on environmental justice populations. Additionally, there would be negligible to minimal effects on property values as only six residential structure falls within 0.1 mile (approximately 500 feet) of the transmission line route and within census blocks identified with high concentrations of minority residents.

Alternative E would not have any disproportionate adverse impacts on minority and/or low-income communities.

3.10 RECREATION AND TOURISM

3.10.1 Affected Environment

Regional Setting

The project area is characterized by rolling prairies, agricultural lands, steep and rough terrain, lakes, rivers, and streams. Various developed and undeveloped outdoor recreational facilities exist within the vicinity of the proposed project.

Outdoor recreational opportunities such as hunting and fishing are popular in the counties surrounding the project area, and provide a substantial source of revenue for these counties. Prior to recent oil and gas development activities, hunting and fishing was a significant, if not primary, source of income for many residents of the area. Many out-of-state hunters and fishermen visit western North Dakota every year to take advantage of hunting and fishing seasons, and local communities benefit financially from these sportsmen. In 2006, there were 128,000 resident and nonresident hunters in North Dakota and these hunters spent nearly $130,000,000 related to hunting (USFWS, 2008).

Species such as deer, pronghorn[20], and elk are found within the project area and provide big game hunting opportunities. Hunting for various species of waterfowl is also popular for resident and nonresident hunters alike. Pheasant hunting is also popular throughout the area, attracting numerous non-resident hunters and providing an additional source of revenue for many landowners during the pheasant hunting season each year.

[20] Although hunted in the past, pronghorn season remains closed due to declining herd size.

Fishing is also a popular outdoor recreational activity within the project area and provides revenue for the six counties in the project vicinity as well as the state of North Dakota. In 2006, 106,000 resident and non-resident anglers spent nearly $94,000,000 on fishing within the state. Lake Sakakawea provides opportunities for fishing for numerous species of gamefish, such as northern pike, walleye, smallmouth bass, yellow perch, and lake trout (NDGFD, 2010d). In Williams County, several small, public lakes are available to anglers. The Missouri, Little Missouri, Knife, and Little Muddy rivers also provide opportunities for fishing, as do numerous smaller lakes, ponds, and streams located throughout the region. Several of the WMAs managed by NDGFD provide opportunities for fishing as well, as do many ponds and streams located on private lands throughout the region surrounding the project.

Study Area

Lake Sakakawea

Lake Sakakawea is a large, manmade impoundment of the Missouri River located partly within the northwest portion of the project area. USACE oversees the management of the public lands and water of Lake Sakakawea, which is 178 miles long with 1,884 miles of shoreline at normal pool elevation. Lake Sakakawea is 14 miles wide at its widest point, with a normal pool storage capacity of nearly 23,000,000 acre-feet of water (USACE, 2011).

Lake Sakakawea and its surrounding public lands, which are predominantly operated by USACE, provide the public with fishing, boating, hunting, and camping opportunities. Thirty-five recreational areas are located around Lake Sakakawea to provide these outdoor recreational opportunities. Many of these recreational areas offer campsites, water, restroom facilities, boat ramps, and electricity hookups. The lake also provides irrigation, flood damage reduction, municipal and industrial water supply, and hydropower for the area. The proposed project crosses the Missouri River at the upper portion of Lake Sakakawea near the town of Williston.

Theodore Roosevelt National Park

TRNP-North Unit, managed by NPS, is located in McKenzie County, south of Watford City and west of U.S. Highway 85. TRNP-North Unit encompasses roughly 24,000 acres, of which 19,410 acres are wilderness, and provides numerous outdoor activities such as camping, canoeing, fishing, horseback riding, and hiking (NPS, 2011). A variety of wildlife species occur within the park boundaries, making it a popular wildlife viewing area.

Little Missouri National Grasslands

Another popular outdoor recreational area within the vicinity of the proposed project is the LMNG, which is composed of numerous blocks of natural grasslands in McKenzie County. The LMNG is administered by USFS and consists of over a million acres of grassland, making it the largest public grassland in the United States. The LMNG provides opportunities for hiking, hunting, wildlife viewing, camping, and horseback riding (USFS, 2010). The LMNG's many tracts are broken up into smaller management planning units that are managed for a particular emphasis. These management planning areas can consist of very small to very large acreages, each containing specific guidelines and standards. Each management area is assigned a rating from one of six categories, with a Category 1 rating being the most land-use restrictive and generally assigned to Wilderness areas and backcountry settings. Category 6 ratings are the least restrictive and are managed to meet a variety of ecological and human needs (USFS, 2001).

Two sensitive LMNG management planning areas are located within the vicinity of the proposed project – the Long X Divide Area and the Lone Butte Area. The Long X Divide Area, which encompasses roughly 10,100 acres, is located immediately south of TRNP, and is listed as being suitable for recommendation for Wilderness designation. The Lone Butte Area consists of approximately 11,400 acres and is located immediately east of the Long X Divide Area, across U.S. Highway 85. This area is designated as a Roadless Area, meaning vehicular traffic is prohibited within this area of the LMNG.

<u>U.S. Fish and Wildlife Service</u>

Lake Ilo National Wildlife Refuge is an approximately 4,000-acre complex of prairie, grassland, and wetlands located near Dunn Center in McKenzie County, along ND State Highway 200 (USFWS, 2011a). This area is managed by USFWS and is a popular wildlife viewing area.

<u>Bureau of Land Management</u>

Tracts of land managed by BLM are open to the public for hunting and fishing opportunities. Several tracts of BLM land that are available to sportsmen for hunting occur within the general vicinity of the proposed project in Dunn County.

<u>Little Missouri River</u>

Outdoor recreational opportunities such as fishing, boating, hunting, and camping exist on and near the Little Missouri River. The Little Missouri River passes through private and public lands in the project area in McKenzie and Dunn counties and empties into Lake Sakakawea.

<u>State Parks</u>

Two state parks in the project vicinity, one in Dunn County and one in Williams County, provide recreational opportunities similar to those provided by TRNP and LMNG. State parks are managed by the North Dakota Parks and Recreation Department.

The Little Missouri State Park is approximately 4,600 acres and is located approximately 17 miles north of Killdeer in Dunn County, near the Little Missouri River. This state park is primitive in nature, with few amenities; however, horseback riding, wildlife viewing, and camping opportunities are available. Lewis and Clark State Park encompasses 490 acres and is located approximately 19 miles southeast of Williston in Williams County. This state park is located on the banks of Lake Sakakawea, and offers boating, fishing, swimming, and wildlife viewing opportunities (North Dakota Parks and Recreation Department, 2011b).

<u>Wildlife Management Areas</u>

Much of the hunting within the project vicinity takes place on private tracts of land, although numerous WMAs within the project area provide opportunities for hunting and fishing on public land. WMAs are managed by NDGFD and are generally managed for hunting, fishing, and nature viewing.

WMAs in the vicinity of the project include Killdeer Mountains WMA in Dunn County; Lewis and Clark WMA, Neu's Point WMA, Och's Point WMA, and Overlook WMA in McKenzie County; Sullivan WMA in McKenzie County; Golden Valley WMA in Mercer County; White Earth Valley WMA in Mountrail County; and Blacktail Dam WMA in Williams County (NDGFD, 2010a).

<u>Private Lands Open to the Public</u>

In addition to public WMAs, NDGFD manages many privately owned tracts of land open to public hunting under the PLOTS (Private Land Open to Sportsmen) program. Several of these tracts of privately-owned land occur within the general vicinity of the proposed project, and serve as walk-in hunting areas for sportsmen (NDGFD, 2011b).

<u>Other Facilities</u>

Other recreational opportunities exist in and around the project area. Many nearby communities offer recreational and cultural opportunities such as golfing, shopping, and dining. In addition, many of these communities maintain city parks that provide outdoor recreational opportunities, and also maintain complexes to host leagues for team sports such as softball, baseball, football, and soccer.

3.10.2 Direct and Indirect Effects

This section discusses potential impacts, their duration, and intensity on recreation and tourism resulting from construction and operation of the proposed project, including the no-action alternative. Definitions for duration and intensity are described in Table 3-1.

No-action Alternative

Under the no-action alternative the proposed project would not be constructed, and there would be no impacts on recreation or tourism as a result of the project.

Alternative C

The majority of the land crossed by Alternative C is privately owned. Possible impacts on recreational users on private lands would include noise from construction, construction vehicles, equipment and workers, dust from construction activities, access restrictions, and wildlife disruption. However, because of the length of construction-related disturbances, Alternative C would have short-term, low impacts on recreational opportunities such as hunting, fishing, boating, hiking, off-highway vehicle use, and camping on private lands. In the long term, conversion of 73 acres of private land for the substations and the switchyard would remove it from further land use, including recreation. Given the relatively small area of land to be occupied by the substation and switchyard facilities, there would be no overall impacts on these recreational opportunities.

Alternative C would span the Missouri River at the head of Lake Sakakawea near Williston. The crossing would be adjacent to the existing U.S. Highway 85 within a utility corridor containing an existing Western transmission line and a rural water pipeline, which currently results in generally limited use of these lands for recreation. The Missouri River crossing would be located approximately 20 miles west of Lewis and Clark State Park, and would have no impacts on recreation associated with the park. Alternative C would pass within approximately 2 miles of Lake Ilo National Wildlife Refuge in Dunn County at its closest point and would be expected to have no impact on the refuge.

Alternative C would cross approximately 57.9 acres of USACE property in the area of the proposed Missouri River crossing, which is part of the Lewis and Clark WMA managed by NDGFD. This is the only WMA that is directly crossed by the Alternative C. Possible impacts on recreational users would include noise from construction, construction vehicles, equipment and workers, dust from construction activities, access restrictions, and wildlife disruption. As discussed above, low to no impacts to the WMA would be expected because the line would be immediately parallel to U.S. Highway 85 in an area not heavily used for recreation.

The ROW for Alternative C would not cross BLM lands. The western segment of the ROW would be located within approximately 200 feet of one BLM parcel but would have no impacts on recreation on BLM lands.

The western segment of Alternative C would be constructed east of the TRNP-North Unit. At its closest point, the transmission line ROW would be about 1.5 miles from the park. Potential impacts on recreational users accessing the TRNP-North Unit would include traffic delays or temporary road closures related to construction activity; however, these impacts would be short term, localized, and limited to the construction phase of the project. Alternative C would have no direct impacts on recreational use the TRNP-North Unit in either the short or long term.

The western segment would incorporate approximately 152.9 acres of the LMNG into the utility ROW (See Section 3.7, Land Use). During construction, these lands may have temporary access restrictions for LMNG users to provide for public safety. The western segment of Alternative C would not be located within any management areas designated as Roadless, but would immediately parallel the western edge of the Lone Butte Management Area and would lie within approximately 500 feet of the Long X Divide Management Area. The western segment would cross the Lewis and Clark National Historic Trail in the vicinity of U.S. Highway 85 and would also pass within approximately 0.5 mile of one USFS campground (Summit Campground), located adjacent to U.S. Highway 85 approximately 3.5 miles south of TRNP. Noise from construction, construction vehicles, equipment and workers, and dust from construction activities could potentially disturb recreational users at the USFS Summit Campground. The construction of the proposed transmission line could result in temporary traffic delays and road closures along U.S. Highway 85 that would temporarily diminish access to the campground. Overall, project construction would have short-term, low impacts on recreational facilities in the LMNG. Following any construction-related disturbance, access to recreational facilities would return to normal. Construction-related noise could also disrupt dispersed recreational activities such as hunting in the short term. Similar to recreational facilities as described above, access to dispersed recreational opportunities would be expected to return to pre-project conditions following completion of construction. No other impacts on recreation on the LMNG are expected. The western segment of Alternative C would cross the Little Missouri River in McKenzie County, in the vicinity of the U.S. Highway 85 crossing approximately 19 miles west of Little Missouri State Park. The river would continue to be available for recreation at the transmission line crossing.

The eastern segment of Alternative C would be located more than 17 miles east of TRNP at its closest point. This segment of the ROW would incorporate approximately 57.9 acres of the LMNG into utility ROW (see Section 3.7, Land Use). During construction, these lands may have temporary access restrictions for LMNG users to provide for the safety of the public. The eastern segment of Alternative C would not be located within any management areas designated as Roadless, nor would it pass within close proximity to any public recreational facilities. Alternative C would therefore have no impacts on recreation on LMNG lands. It would cross the Little Missouri River in Dunn County, north of Killdeer and approximately 5 miles west of Little Missouri State Park.

Alternative D

Similar to Alternative C, the majority of the land crossed by Alternative D is privately owned and possible impacts on recreational users on private lands would include noise from construction, construction vehicles, equipment and workers, dust from construction activities, and wildlife disruption. Impacts from Alternative D would be low in the short term. In the long term, conversion of 85 acres of private land for the substations and the switchyard would remove it from further land use, including recreational use. However, given the relatively small area of land to be occupied by the substation and switchyard facilities, there would be no overall long-term impacts on recreation on private lands.

Under Alternative D, the proposed transmission line would be located more than 17 miles east of TRNP at its closest point. It would incorporate approximately 57 acres of the LMNG into utility ROW (see Section 3.7, Land Use). Alternative D would not be located within any management areas designated as Roadless, nor would it pass within close proximity to any campgrounds or other developed recreational facilities on the LMNG. Construction phase impacts associated with Alternative D would be similar to those described for Alternative C and would be low. Alternative D would have no long-term impacts on recreation on LMNG lands.

Under Alternative D, the proposed transmission line would not cross or pass near BLM lands. Alternative D would therefore have no impacts on recreation on BLM lands. Alternative D would cross the Little Missouri River in Dunn County, north of Killdeer and approximately 5 miles west of Little Missouri State Park. Similar to Alternative C, Alternative D would cross the Lewis and Clark National Historic Trail in the vicinity of U.S. Highway 85, and would span the Missouri River at the head of Lake Sakakawea near Williston. The crossing would be adjacent to the existing U.S. Highway 85 within a utility corridor containing an existing Western transmission line and a rural water pipeline, which currently results in generally limited use of these lands for recreation. No impacts on recreation would thus be expected at the Missouri River crossing. The crossing is approximately 20 miles west of Lewis and Clark State Park and therefore would have no impacts on recreational facilities or use associated with the park.

Alternative E

Similar to Alternatives C and D, the majority of the land crossed by Alternative E is privately owned and therefore recreational users on private lands would experience similar impacts to those described above. Impacts from Alternative E would be low in the short term. In the long term, conversion of 85 acres of private land for the substations and switchyard would remove it from further land use, including recreational use. However, given the relatively small area of land to be occupied by the substation and switchyard facilities, there would be no overall long-term impacts on recreation on private lands.

Under Alternative E, as with Alternative D, the proposed transmission line would be located more than 17 miles east of TRNP at its closest point. It would incorporate approximately 57 acres of the LMNG into utility ROW (see Section 3.7, Land Use). Alternative E would not be located within any management areas designated as Roadless, nor would it pass within close proximity to any campgrounds or other developed recreational facilities on LMNG. Impacts from Alternative E on LMNG lands would be identical to those described for Alternative D.

Under Alternative E, the proposed transmission line would not cross or pass near BLM lands, and would therefore have no impacts on recreation on BLM lands. Alternative E would cross the

Little Missouri River in Dunn County, north of Killdeer and approximately 5 miles west of Little Missouri State Park. Similar to both Alternatives C and D, Alternative E would cross the Lewis and Clark National Historic Trail in the vicinity of U.S. Highway 85 and would span the Missouri River at the head of Lake Sakakawea near Williston adjacent to the existing U.S. Highway No impacts to recreation would thus be expected at the Missouri River crossing. The crossing is approximately 20 miles west of Lewis and Clark State Park and therefore would have no impacts on recreational facilities or use associated with the park.

3.11 INFRASTRUCTURE AND TRANSPORTATION

This section provides an overview of utility and transportation infrastructure found in the vicinity of the proposed project. This includes pipelines; water supply facilities; existing transmission lines and substations; federal, state, and county roadways; railroads; and airports and airstrips.

3.11.1 Affected Environment

The affected environment for this analysis varies by infrastructure feature and the potential for them to be affected by the proposed project. In many cases, the affected environment provides an overview of infrastructure found either in the project area counties or within 6 miles of the proposed project. The airport and airstrip analysis includes those public and private airfields within 10 miles of the proposed project.

Regional Setting

The rapid growth of the oil and gas industry in northwestern North Dakota has placed additional demand on the infrastructure and transportation networks in rural areas. Until recently, population in the region was steady or declining, and no new infrastructure was necessary.

As the oil and gas industry continues to grow, additional infrastructure, such as pipelines and transmission and distribution lines, is necessary to support planned growth. The transportation network has also experienced a notable increase in vehicular volumes, both private vehicles and heavy trucks, over the past 10 years.

Existing infrastructure and transportation networks found in the project area are further discussed below. Potential impacts that would result under both the no-action and action alternatives are identified later in this section.

Utility Infrastructure

<u>Pipelines</u>

The following provides an overview of pipelines located within 1,000 feet of the centerline of the proposed project. These pipelines are located in the project area and also extend well beyond the boundaries of the project area serving a larger geographic area. Each of the following pipelines traverses one or all of the proposed alternative routes.

In addition to existing pipelines, numerous additional pipelines are planned to support the growing oil and gas industry. The following information was retrieved from the ND GIS (2011).

Natural Gas—These pipelines typically consist of a network of lines that gather gas from the fields and transport it to refining plants. Natural gas pipelines transport treated natural gas to markets both within and out of state. The following natural gas pipelines are located within 1,000 feet of the centerline of the proposed project:

- Northern Border—This natural gas pipeline enters North Dakota in southwestern Williams County and travels southeast leaving the state in McIntosh County. The pipeline traverses parts of the project area in both McKenzie and Dunn counties.
- Williston Basin—This natural gas pipeline intersects the project area near Williston and runs through portions of Mountrail, McKenzie, and Dunn counties.

CO_2 Pipeline—A CO_2 pipeline generally starts at the source of capture and travels directly to a storage site. Pipelines can transport CO_2 in a gaseous, liquid, or solid state; however, they generally transport CO_2 in its gaseous state.

- The CO_2 pipeline in North Dakota extends from the Canadian border south through the eastern portion of Williams and McKenzie counties. It continues south through north central Dunn County and east into Mercer County.

Crude Oil and Refined Products Pipelines—Crude oil, which is transported from oilfields to refiners, is converted to products such as gasoline, home heating oil, jet fuel, diesel, lubricants, and the raw materials for fertilizer, chemicals, and pharmaceuticals.

- Owned by Cenex Pipeline LLC, this refined products pipeline crosses North Dakota from Cass County to the east to McKenzie County to the west. The pipeline crosses the project area in McKenzie County.
- Tesoro and Enbridge Pipelines—These crude oil pipelines cross the project area in Dunn, McKenzie, Williams, and Mountrail counties.

In addition to the numerous pipelines associated with increasing oil and gas activity, there are water and sewer pipelines in the project area. Many of these pipelines are used by smaller municipalities in the project area. Additional water lines in the project area are associated with agricultural uses such as center-pivot irrigation systems.

<u>Electrical Transmission Lines</u>

The project area for this portion of the analysis includes those areas within 6 miles of the proposed project. Many of the below-mentioned transmission lines are present in areas outside the project area providing service to areas both within and outside the project area. Electrical transmission lines in the project area are presented in Figure 1-1. The increase in the oil and gas industry (and the increase in population that has accompanied it) has resulted in the need for additional distribution lines to accommodate such activities.

Basin Electric's existing Charlie Creek to AVS 345-kV transmission line and the Charlie Creek-Squaw Gap 115-kV line are in the southern portion of the project area. Basin Electric also owns and maintains the Williston to Tioga, Logan to Tioga, and Tioga to Canadian Border 230-kV transmission lines, located in the northern part of the project area north and east of Williston.

Western also owns and maintains transmission lines in the project area. These lines include the Culbertson to Williston and Charlie Creek to Williston 115-kV transmission lines. Western's 115-kV line from Charlie Creek to Williston was recently upgraded to support 230-kV. The line was energized in August 2012 (Basin Electric, 2012b).

Montana-Dakota Utilities' Williston to Grenora and Williston to Tioga 115-kV lines, owned and maintained by Montana-Dakota Utilities, are also located in the project area.

There are numerous smaller transmission and distribution lines located throughout the project area, such as McKenzie Electric Cooperative, Roughrider Electric Cooperative, and MWEC's 115-kV projects and smaller distribution system, which provides electrical service to communities, rural residences, and commercial establishments. These lines are generally located along the local road network. Transmission lines often extend cross country following section, quarter-section, or fence lines (ND GIS, 2011).

<u>Electrical Substations</u>

To support existing transmission lines, several electrical substations are located in the project area. These substations transform voltage from higher to lower, and increase or decrease current levels depending on the type of transformers installed within the substation. Substations located in the project area include: Basin Electric's existing AVS 345-kV Substation, Charlie Creek 345-kV Substation, Neset 230-kV Substation, and Williston 230-kV Substation (ND GIS, 2011).

<u>Power Supply/Generation</u>

Basin Electric's AVS is located in the southeastern portion of the project area. The facility is located approximately 7 miles northwest of Beulah. It has two units, each rates at 450 MW and began operation in the 1980s. It is located adjacent to The Coteau Properties Company's Freedom Mine, a lignite coal mine. Because of its location, AVS is often referred to as the "mine-mouth" facility. AVS is part of a $4-billion energy complex that includes the Great Plains Synfuels Plant, a coal gasification facility, and the Freedom Mine. Energy produced at AVS is delivered to the IS transmission system (Basin Electric, n.d.).

AM and FM Towers

There are currently eight AM and FM towers located within 6 miles of the proposed project alternatives. Five of these are located in Williston, two are located in Tioga, and one is located in Watford City. None of these towers are located within the proposed project ROW or within 75 feet of the ROW (ND GIS, 2011).

Water Supply and Treatment

Much of rural northwestern North Dakota, including the project area, relies primarily on groundwater for its water supply either through wells or rural water districts. There are three rural water associations in the project area. The McKenzie County Resource District is located in the northern portion of McKenzie County and extends from east to west across the 6-mile project area. The Southwest Water Pipeline Authority serves the areas southwest of Lake Sakakawea. The Williams Rural Water District is located in the southern portion of Williams County, just north of the McKenzie County Resource District.

Communities located near the Missouri River and Lake Sakakawea appropriate surface water to support their needs. Table 3-37 provides a listing of municipal and industrial water treatment plants in Dunn, Mercer, McKenzie, Mountrail, and Williams counties.

As the oil and gas industry continues to grow in northwest North Dakota, more water will be needed to support drilling efforts and the projected population and employment increases. There are currently a number of projects underway to help support this growth. The following three entities are known to be expanding their water treatment plants and/or distribution systems to support the increased demand:

- Southwest Water Authority—The latest phase of the Southwest Pipeline Project includes the Oliver, Mercer, North Dunn Regional Service Area. This includes a new water treatment plant near New Hradec, North Dakota (Southwest Water Authority, 2010).
- Western Area Water Supply—The Western Area Water Supply Project is a domestic water project using water from the Missouri River to meet municipal, rural, and industrial needs for all or part of McKenzie, Williams, Divide, Burke, and Mountrail counties. Cities in the project area that receive water from Western Area Water Supply include Williston, Watford City, Ray, and Tioga. Western Area Water Supply has three service areas that provide water to various parts of the project area. These include the McKenzie Rural Service Area, R & T Service Area, and Williams Rural Service Area (Western Area Water Supply, 2012).

- City of Williston—The city of Williston is currently expanding its water treatment plant capacity to serve the Western Area Water Supply expansion. Work began on this project in 2001 (City of Williston, 2012).

Table 3-37: Municipal and Industrial Water Treatment Plants

COUNTY	PWSNAME	CONTACT	ADDRESS 1	ADDRESS 2	CITY	STATE	ZIP
DUNN (ND)	DUNN COUNTY LODGE	KELLEY, TRAVIS	13589 57TH ST		WILLISTON	ND	58801
DUNN (ND)	KILLDEER CITY OF	MARQUARDT, DAWN	165 RR ST SE	PO BOX 270	KILLDEER	ND	58640-0270
MCKENZIE (ND)	ALEXANDER CITY OF	MRACHEK, ANNE	112 MANNING AVE W	PO BOX 336	ALEXANDER	ND	58831-0336
MCKENZIE (ND)	BADLANDS POWER FUELS TC	JORE, RICK	3711 4TH AVE NE		WATFORD CITY	ND	58854
MCKENZIE (ND)	JUNIPER CAMPGROUND	HEISER, LYNN	315 2ND AVE	PO BOX 7	MEDORA	ND	58645
MCKENZIE (ND)	LONG X SALOON	CARR, JEROME	504 MAIN ST	PO BOX 96	GRASSY BUTTE	ND	58634-0096
MCKENZIE (ND)	MCKENZIE COUNTY RURAL WATER	ROLES, KRISTY	201 5TH ST NW, SUITE 1456		WATFORD CITY	ND	58854
MCKENZIE (ND)	PRAIRIE VIEW ESTATES	KASKI, RYAN	1935 SAMCO RD STE 102		RAPID CITY	SD	57702
MCKENZIE (ND)	RIDGEVIEW PARK	KASKI, RYAN	1935 SAMCO RD STE 102		RAPID CITY	SD	57702
MCKENZIE (ND)	T ROOSEVELT NATL PK-NORTH	HEISER, LYNN	315 2ND AVE	PO BOX 7	MEDORA	ND	58645
MCKENZIE (ND)	WATFORD CITY CITY OF	ANDERSON, LAURA	213 2ND ST NE	PO BOX 494	WATFORD CITY	ND	58854
MCKENZIE (ND)	WATFORD CITY CITY OF	ANDERSON, LAURA	213 2ND ST NE	PO BOX 494	WATFORD CITY	ND	58854
MERCER (ND)	ANTELOPE VALLEY STATION	CHICK, TED	294 COUNTY ROAD 15		BEULAH	ND	58523
MERCER (ND)	BEULAH CITY OF	NEUBERGER, GARY	120 N CENTRAL	PO BOX 910	BEULAH	ND	58523
MERCER (ND)	BEULAH CITY OF	NEUBERGER, GARY	120 N CENTRAL	PO BOX 910	BEULAH	ND	58523
MERCER (ND)	COYOTE STATION	ZIMMERMAN, BRAD	6240 13TH ST SW		BEULAH	ND	58523
MERCER (ND)	DAKOTA GASIFICATION CO	NELSON, RICHARD A	420 COUNTY RD 26		BEULAH	ND	58523
MERCER (ND)	GREAT RIVER ENERGY - STANTON STATION	JOHNSON, ROBERT	4001 HIGHWAY 200A		STANTON	ND	58571
MERCER (ND)	HAZEN CITY OF	BOHRER, SANDY	146 EAST MAIN	PO BOX 717	HAZEN	ND	58545-0717
MERCER (ND)	KNIFE RIVER INDIAN VILLAGE	BUTLER, KEITH		PO BOX 7	MEDORA	ND	58645
MERCER (ND)	LELAND OLDS STATION	ALLERY, LES	3901 HIGHWAY 200A	BASIN ELECTRIC POWER COOP	STANTON	ND	58571
MERCER (ND)	STANTON CITY OF	HONEYMAN, RICHARD	109 HARMON AVE	PO BOX 156	STANTON	ND	58571-0156
MOUNTRAIL (ND)	MBI ENERGY SERVICES, INC.	WENTZ, WENDELL		PO BOX 26	ROSS	ND	58776
MOUNTRAIL (ND)	NEW TOWN CITY OF	BURNETT, KAYLA	301 SOO PLACE	PO BOX 309	NEW TOWN	ND	58763-0309
MOUNTRAIL (ND)	NEW TOWN EMPLOYEE MHP	CARTER, BEN		PO BOX 140	BAINVILLE	MT	59212
MOUNTRAIL (ND)	OMAR FARMS TC	DAVIS, BILL		PO BOX 88	RIFLE	CO	81650
MOUNTRAIL (ND)	PARSHALL CITY OF	ZIEMAN, LARRY	213 4TH ST SW	PO BOX 159	PARSHALL	ND	58770-0159
MOUNTRAIL (ND)	PARSHALL CITY OF	ZIEMAN, LARRY	213 4TH ST SW	PO BOX 159	PARSHALL	ND	58770-0159
MOUNTRAIL (ND)	PLAZA CITY OF	PROCK, DEBORAH S.	501 BERTHOLD ST	PO BOX 188	PLAZA	ND	58771-0096
MOUNTRAIL (ND)	ROSS CITY OF	SEIBEL, DIANE	2 CENTRAL AVE WEST	PO BOX 4	ROSS	ND	58776-0004
MOUNTRAIL (ND)	WHITING OIL & GAS	WURM, BRIAN	4498 HWY 8		NEW TOWN	ND	58763
WILLIAMS (ND)	GRENORA CITY OF	SCHENSTAD, JANE	#1 MAIN ST	PO BOX 296	GRENORA	ND	58845
WILLIAMS (ND)	R & T WATER SYSTEM	SUHR, LIZ	6392 114TH AVE NW	PO BOX 126	RAY	ND	58849-0126
WILLIAMS (ND)	WILLISTON CITY OF	KAUTZMAN, JOHN		PO BOX 1306	WILLISTON	ND	58801

Source: Burns & McDonnell Engineering Company, Inc., 2012

Wastewater Treatment and Disposal

Wastewater treatment and disposal in northwestern North Dakota consists of both individual disposal systems (septic tanks) and wastewater treatment plants. Rural developments, such as farms, typically use individual disposal systems. Larger communities and industries use wastewater treatment plants, which are present in different sizes and use different technologies for treating water.

Because there is a shortage of bodies of water to dispose of the treated effluent, some wastewater treatment plants are classified as zero-dischargers, in which the effluent is either evaporated or reused. Table 3-38 provides a listing of all municipal and industrial wastewater treatment plants within Dunn, Mercer, McKenzie, Mountrail and Williams counties. The table also provides information on the type of treatment at each plant facility. Both municipal publicly-owned treatment works and industrial facilities are presented.

Table 3-38: Wastewater Treatment Facilities

Facility Name	Facility Address	Facility City	Facility Zip	Facility Type	Treatment Type	County Name	Contact Company Name
Alexander City Of	Highway 85	Alexander	58831	POTW	Facultative Lagoon	McKenzie	
Arnegard City Of	Main Street	Arnegard	58835	POTW	Facultative Lagoon	McKenzie	Arnegard City Of
Basin Electric Power An Val St		Beulah	58523	Non POTW	Settling Pond	Mercer	Basin Electric Power Cooperative
Basin Electric Power Lolds	3901 Hwy 200A	Stanton	58571	Non POTW	Mech. Act. Sludge, Pretreatment, Settling Pond	Mercer	Basin Electric Power Cooperative
Beulah City Of	120 Central Ave W	Beulah	58523	POTW	Aeration Pond, Facultative Lagoon, Storage Pon	Mercer	Beulah City Of
Calfrac Well Services Corp	14049 Hwy 2	Williston	58802	Non POTW	Facultative Lagoon	Williams	Calfrac Well Services Corp
Coteau Properties Co	204 Co Rd 15	Beulah	58523	Non POTW	Facultative Lagoon, Settling pond	Mercer	Coteau Properties Co
Dakota Gasification Co	420 County Rd 26	Beulah	58523	Non POTW	Settling Pond	Mercer	Dakota Gasification Company
Dakota Trout Ranch North	3846 County Rd 18	Stanton	58571	Non POTW	Settling Pond	Mercer	Dakota Trout Ranch North
Dakota Westmoreland Corp		Beulah	58523	Non POTW	Runoff Pond	Mercer	
Dodge City Of		Dodge	58625	POTW	Facultative Lagoon	Dunn	Dodge City Of
Dunn Center City Of		Dunn Center	58626	POTW	Facultative Lagoon	Dunn	
East Fairview City Of		Fairview	59221	POTW	Facultative Lagoon	McKenzie	East Fairview City Of
Epping City Of		Epping	58843	POTW	Facultative Lagoon	Williams	Epping City Of
Fairview Mt City Of		Fairview	59221	POTW	Facultative Lagoon	McKenzie	Fairview Mt City Of
Golden Valley City Of	110 1st Ave SW	Golden Valley	58541	POTW	Facultative Lagoon	Mercer	
Great River Energy - Stanton Station	4001 Hwy 200A	Stanton	58571	Non POTW	Runoff Pond, Settling Pond	Mercer	Great River Energy
Grenora City Of	1 Main St	Grenora	58845	POTW	Facultative Lagoon	Williams	Grenora City Of
Halliday City Of		Halliday	58636	POTW	Facultative Lagoon	Dunn	
Hazen City Of		Hazen	58545	POTW	Facultative Lagoon	Mercer	Hazen City Of
Hess Corporation	10340 68th St NW	Tioga	58852	Non POTW	Settling Pond	Williams	Hess Corporation
Kaski Homes-Dore	Twp 151, R104 Sect 8	Dore	59221	Non POTW	Facultative Lagoon	McKenzie	Kaski Homes, Inc.
Kaski Homes-Watford City	Twp 150, R99 Sect 25	Watford City	57702	Non POTW	Facultative Lagoon	McKenzie	Kaski Homes, Inc.
Killdeer City Of		Killdeer	58640	POTW	Facultative Lagoon	Dunn	Killdeer City Of
Leonardite Products LLC	1415 W Dakota Pkwy	Williston	58801	Non POTW	Settling Pond	Williams	Leonardite Products, LLC
Long X MHP Badlands Development	ND Highway 23 A	Watford City	58854	Non POTW	Facultative Lagoon	McKenzie	Power Fuels
ND DOT Panger Rest Area	Highway 85 S	Williston	58801	Non POTW	Facultative Lagoon	McKenzie	ND DOT Panger Rest Area
ND DOT White Earth Rest Area	9750 62nd St NW	White Earth	58794	Non POTW	Facultative Lagoon	Mountrail	ND DOT White Earth Rest Area
ND Water Commission OMND WTP	County Road 13	Zap	58580	Non POTW	NULL	Mercer	ND State Water Commission
New Town City Of	103 Soo Place	New Town	58763	POTW	Facultative Lagoon	Mountrail	New Town City Of
New Town WTP	103 Soo Place	New Town	58763	Non POTW	Settling Pond	Mountrail	
Otter Tail Power Co	6240 13th St SW	Beulah	58523	Non POTW	Cooling Tower Blowdown, Settling Pond	Mercer	OtterTail Power Company
Parshall City Of	25 N Main	Parshall	58770	POTW	Facultative Lagoon	Mountrail	Parshall City Of
Pick City City Of	18 1st Ln SE	Pick City		POTW	Facultative Lagoon	Mercer	Pick City City of
Plaza City Of	3rd Ave	Plaza	58771	POTW	Facultative Lagoon	Mountrail	Plaza City Of
Ray City Of	101 Main St	Ray	58849	POTW	Facultative Lagoon	Williams	Ray City Of
Stanley City Of	221 S Main	Stanley	58784	POTW	Facultative Lagoon	Mountrail	Stanley City Of
Stanton City Of		Stanton	58571	POTW	Facultative Lagoon	Mercer	Stanton City Of
Susag Sand & Gravel Williston	115 10th St	Williston	58801	Non POTW	Settling Pond	Williams	Susag Sand & Gravel Inc
Tioga City Of	12 1st St NE	Tioga	58852	POTW	Facultative Lagoon	Williams	Tioga City Of
Trenton Water Users Assoc	407 3rd Ave	Trenton	58853	Non POTW	Facultative Lagoon, Wetland Area	Williams	
Watford City City Of	213 2nd Street NE	Watford City	58854	POTW	Facultative Lagoon	McKenzie	
Wildrose City Of	104 1st Ave E	Wildrose	58795	POTW	Facultative Lagoon	Williams	Wildrose City Of
Williston City Of	809 5th St. E	Williston	58802	POTW	Aeration Pond; Facultative Lagoon	Williams	Williston City Of
Williston WTP	4806 Hwy 85	Williston	58802	Non POTW	Settling Pond	Williams	Williston WTP
Zap City Of		Zap	58580	POTW	Facultative Lagoon	Mercer	Zap City Of

Source: Burns & McDonnell Engineering Company, Inc., 2012

Transportation Infrastructure

Roadways

The rapid expansion of the oil and gas industry in the region has introduced a notable amount of new vehicular traffic, including private vehicles and heavy trucks. Much of this traffic is concentrated on primary and secondary roadways in the project area; however, smaller, more rural roadways have also experienced an increase in vehicular traffic. This section provides an overview of primary and secondary roadways within 6 miles of the proposed project. As shown in Figure 3-39, many of these roadways are located relatively close to the proposed project. Additional information is provided for roadways that are more rural in nature.

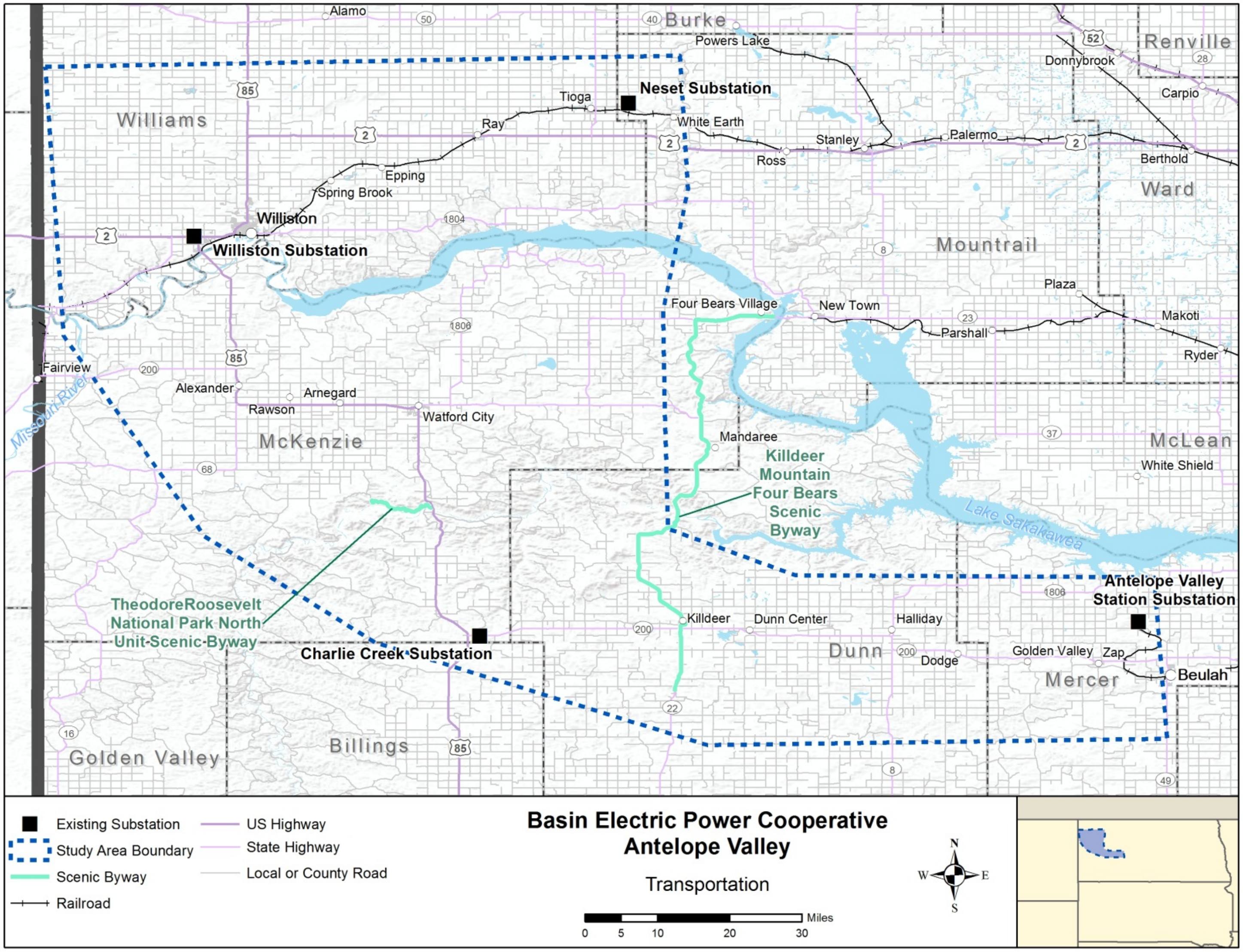
Primary roadways within the project area include U.S. Route 2 and U.S. Route 85. U.S. Route 2 generally runs west-east in the northern portion of the project area. It runs through Williston where it then runs north along the U.S. Route 85 corridor. The route then splits and continues west-east through Ray, areas south of Tioga, and east of the project area. The existing Williston Substation is located near U.S. Route 2 and the proposed Judson 345-kV Substation would also be near U.S. Route 2 just west of Williston. U.S. Route 2 runs south of the existing Neset Substation and the proposed Tande 345-kV Substation.

U.S. Route 85 generally runs north-south through the project area. U.S. Routes 85 and 2 run along the same corridor for approximately 20 miles in the northern portion of the project area. Where U.S. Route 2 splits to the west-east in Williston, U.S. Route 85 continues south through Alexander. The route then travels west-east to Watford City, where it travels north-south through the southern portion of the project area.

State highways in the study area that would be crossed by the proposed project include ND State Highways 200, 22, 23, 8, 73, 1804, and 1806. The following provides a summary of these routes as they cross the project area.

- ND State Highway 200—This route traverses the southern portion of the project area in a west-east direction. It runs through the cities of Killdeer, Dunn Center, Halliday, Dodge, and Golden Valley. The proposed project would be located north of ND State Highway 200 at the eastern edge of the project area.
- ND State Highway 22—This route enters the project area from the east and travels north-south from its entry to the project area through Killdeer and exits the project area just south of Killdeer. From Manning (south of Killdeer) to New Town, this route is designated as a scenic byway. It also provides access to recreational areas such as Little Missouri State Park. The designated portion of this roadway is approximately 64 miles long (U.S. Department of Transportation, n.d.).
- ND State Highway 23—This route runs west-east through the central portion of the project area. The western terminus of the route is located in Watford City where it meets U.S. Route 85. It meets ND State Highway 73 where it splits north towards ND State Highway 1806, west of Fort Berthold.
- ND State Highway 73—This route travels west-east between ND State Highways 22 and 23 in the central eastern portion of the project area.
- ND State Highways 1804 and 1806—Both roadways are part of the Lewis and Clark Trail. They run along the northeast and southwest sides of the Missouri River (North Dakota Highways, 2004). ND State Highway 1804 runs from Williston to the western boundary of the project area. ND State Highway 1806 runs north-south along the eastern edge of the project area. The route ends where it meets ND State Highway 23.

Figure 3-39: Project Area Roadways



In addition to these roadways, there are a number of paved county roads and lesser used paved and unpaved roadways in the project area. Access roads to support the oil and gas industry are also present in the project area. These roadways are often private, dead-end gravel roads that terminate at an oil well or drill rig. Many areas near the proposed project, particularly areas near the Little Missouri River and Lake Sakakawea, are remote and have little to no access via public roads (Burns & McDonnell Engineering Company, Inc., 2012).

Traffic Volumes

The following provides an overview of traffic volumes in the project area. Information is presented for primary and secondary corridors in the project area, where available. This information has been retrieved from the North Dakota Department of Transportation. Average annual daily traffic for rural roads is not currently available on this scale and is therefore presented for the county as a whole. This information has been retrieved from a study prepared by the Upper Great Plains Transportation Institute (UGPTI).

North Dakota Department of Transportation publishes annual traffic counts for all state-maintained highways. Historical average annual daily traffic for these routes is shown below in Table 3-39. All routes have experienced a significant increase in traffic since 2001; however, the volume of each of these selected routes is still below the capacity of these roadways.

UGPTI released a report in late 2010 highlighting additional roadway investments that may be necessary to support the increase in oil and gas production in north-central and north-western North Dakota, particularly the Williston area. These recommendations are based on the notable increase in vehicular traffic, particularly trucks, since 2005 when the number of drill rigs in operation began to grow (UGPTI, 2010). Information presented in the study is based on three main data sources: oil production forecasts; traffic data; and county road surveys. The study includes those roads owned or maintained by counties or municipalities but not state-owned or maintained roads. The information presented below provides an overview of existing traffic conditions on rural roads in study area counties.

Table 3-39: Average Annual Daily Traffic and Percent of Commercial Vehicles on U.S. and State Routes between 2001 and 2013

Year	U.S. 85 (Between Route 200 and U.S. 2)	U.S. 85 (Between U.S. 2 and State Route 50)	U.S.- (Between State Route 1804 and U.S. 85)	U.S. 2 (East of U.S.-85)	U.S. 85 (Between Route 23 and Route 200)	U.S. 85 (South of Route 200)	Route 200 (Between U.S. 85 and Route 22)	Route 200 (Between Route 22 and Route 8)
2001	1,550	1,225	3,800	1,925	2,250	1,000	550	1,025
2002	1,550	1,100	3,900	2,250	2,250	1,000	550	1,025
2003	1,525	1,100	3,900	2,250	2,075	925	550	750
2004	1,525	1,100	3,900	2,250	2,075	925	550	750
2005	1,525	1,325	4,350	2,200	2,075	925	550	750
2006	2,600	1,325	4,350	2,200	2,700	1,300	600	850
2007	2,600	1,325	4,350	2,200	2,700	1,300	600	850
2008	2,600	1,260	4,795	3,740	2,700	1,300	600	850
2009	2,670	1,435	4,450	4,235	3,295	1,310	1,340	1,320
2010	2,670	1,915	4,450	5,630	3,205	1,530	1,340	1,320
2011	6,290	2,990	9,410	8,110	7,025	2,445	2,575	2,670
2012	11,875	4,300	13,390	14,965	14,960	4,030	3,715	3,395
2013	8,585	3,625	11,545	9,935	14,960	4,030	3,405	3,395
% of Trucks on U.S. and State Routes								
2001	17%	9%	12%	14%	23%	25%	33%	15%
2002	26%	13%	11%	15%	23%	25%	33%	15%
2003	24%	13%	11%	15%	17%	26%	17%	13%
2004	24%	13%	11%	15%	17%	26%	17%	13%
2005	26%	17%	11%	16%	17%	26%	17%	13%
2006	22%	17%	11%	16%	16%	21%	18%	10%
2007	22%	19%	29%	16%	16%	20%	18%	10%
2008	22%	21%	14%	20%	16%	37%	18%	10%
2009	25%	17%	14%	19%	16%	36%	37%	17%
2010	25%	17%	14%	38%	22%	39%	37%	17%
2011	31%	43%	25%	35%	28%	43%	45%	38%
2012	35%	40%	26%	25%	19%	37%	42%	40%
2013	41%	38%	20%	30%	19%	37%	35%	40%

Source: North Dakota Department of Transportation, 2013b

At the onset of the study, county managers were asked to identify high-volume roadways across their area of jurisdiction. One hundred locations in 15 of the 17 study area counties were identified. Traffic counts were then conducted at these locations. Average daily traffic (ADT) from collection locations for study area counties are presented in Table 3-40. As illustrated below, major county roads in Williams County have an average of 133 vehicles per day with approximately 51.1 percent of those vehicles classified as trucks. Williams County has the highest percent of average daily trucks of counties in the study area. This percent is slightly higher than Billings and McKenzie counties. Under maximum daily traffic counts, Billings County, which has one of the lowest ADT of study area counties, has the highest percentage of daily truck traffic. McKenzie, Mountrail, and Williams counties report between 50.9 percent and 56.3 percent of daily traffic on major roads is associated with truck traffic.

Table 3-40: 2010 Average Daily Traffic and Percent of Truck Traffic on Major County Roads

County	N	Minimum		Mean		Maximum	
		Total Vehicles	% Trucks	Total Vehicles	% Trucks	Total Vehicles	% Trucks
Billings	9	9	44.4%	63	49.2%	135	59.3%
Mercer	3	18	5.6%	23	13.0%	28	21.4%
Dunn	10	29	41.4%	133	45.9%	491	40.3%
McKenzie	12	44	31.8%	191	50.8%	449	56.3%
Mountrail	12	40	30.0%	134	48.5%	475	53.1%
Williams	11	23	43.5%	133	51.1%	613	50.9%

Source: UGPTI, 2010

N = number of locations where counts were conducted

It is important to note that 78 of the 100 locations where traffic data was collected are classified as graveled or unpaved roads. On graveled or unpaved roads, the mean ADT was 113 with approximately 46 percent of this attributable to trucks. Paved roads demonstrated a mean ADT of 268 vehicles with about 36.9 percent of this attributable to truck traffic (UGPTI, 2010).

The rural collector network of the North Dakota state highway system was used as a benchmark for comparison to major county roads in oil and gas-producing counties to evaluate ADT and truck volumes. ADT counts for all state collectors are estimated at 277 vehicles per day with an average of 11 percent (31 trucks) attributable to truck traffic. Study area county roads sampled for the abovementioned study report an overall ADT of 113 with approximately 54.2 percent attributable to truck traffic. While ADT is notably lower in the study area, it includes a significantly higher share of truck traffic than North Dakota state highway collectors overall (UGPTI, 2010).

UGPTI conducted a survey in 2008 to determine the extent to which oil and gas production was contributing to increased traffic, particularly truck traffic, in those counties included in the abovementioned report. The survey found that the weighted-average percent of truck traffic on collector roads in oil-producing counties that responded to the survey was 18 percent. In 2010, this percent had increased to 39 percent in the same counties (UGPTI, 2010).

Accident Data

Accident data has been compiled from the North Dakota 2012 Crash Summary prepared by the North Dakota Department of Transportation. The state uses this information as a critical consideration when planning for traffic safety and other network improvements. Data available from the report is primarily presented at the county and state level. Because information is not generally available for smaller geographic areas and county statistics are presented where available, it should be noted that areas not considered as part of the project area may also be included in these figures.

Table 3-41 provides an overview of the fatality rate for the state of North Dakota and the United States as a whole over the past 10 years. These rates are based on fatalities per 100 million vehicle miles traveled. As demonstrated below, the fatality rate in North Dakota has historically been higher than the nation overall. In 2012, there were 170 fatalities in North Dakota from traffic accidents, an increase of 22 fatalities or 14.9 percent from 2011.

Table 3-41: Fatal Accident Rates for North Dakota and the United States between 2002 and 2012

Year	North Dakota	United States
2002	1.37	1.51
2003	1.44	1.48
2004	1.34	1.44
2005	1.65	1.46
2006	1.45	1.42
2007	1.44	1.36
2008	1.37	1.26
2009	1.76	1.15
2010	1.26	1.11
2011	1.61	1.10
2012	1.68	1.16

Source: North Dakota Department of Transportation, 2012

Table 3-42 provides a summary of fatal crashes, total fatalities, injury crashes, and property damage only crashes for project area counties in 2012. Also presented is the percent that each county represents as part of the statewide total. In 2012, there were 52 fatal crashes that resulted in 56 fatalities in project area counties. Williams County had the greatest number of fatalities while Billings County experienced one fatal accident during the same period.

Table 3-42: 2012 Traffic Accident Totals for Study Area Counties

Crash Type and Percent of Statewide Total	County					
	Billings	Dunn	McKenzie	Mercer	Mountrail	Williams
# of Property Damage Only Crashes	41	145	373	156	227	1,349
% of North Dakota Total	0.3	1.0	2.6	1.1	1.6	9.3
# of Injury Crashes	16	49	187	30	87	323
% of North Dakota Total	0.4	1.3	5.0	0.8	2.3	8.7
# of Fatal Crashes	1	2	18	2	5	24
% of North Dakota Total	0.7	1.4	12.2	1.4	3.4	16.3
# of Total Fatalities	1	2	19	2	5	27
% of North Dakota Total	0.6	1.2	11.2	1.2	2.9	15.9

Source: North Dakota Department of Transportation, 2012

In 2012, there were 3,729 total injury crashes in North Dakota, a slight increase from the 2011 figure of 3,548 injury crashes. As demonstrated in Table 3-42, approximately 692 injury crashes or 18.6 percent of all North Dakota injury crashes occurred in project area counties. Project area counties individually represent less than 2.5 percent of all statewide injury crashes with the exception of McKenzie County (5.0 percent) and Williams County (8.7 percent). Property damage-only crashes were higher in McKenzie and Williams counties than other counties in the project area.

The North Dakota accident rate, which is based on all accident types (fatal, injury, and property damage only) and vehicle miles traveled in 2012 was 1.82. Project area counties with the exception of Williams County have a rate lower than the statewide average. Williams County has an average rate of 2.10.

<u>Railroads</u>

There are four rail lines in the project area—two are active and two are no longer in service. Both active rail lines are owned and maintained by BNSF Railway Company (BNSF).

The first active rail line generally runs west to east across the northern portion of the project area, passing through the cities of Williston and Tioga. This rail line provides the only passenger rail service in North Dakota (Amtrak's Empire Builder). It travels from Chicago, Illinois to Seattle, Washington and Portland, Oregon. In North Dakota, the Empire Builder operates on the BNSF main line from Fargo to Grand Forks and Fort Buford. The train makes stops in Devils Lake, Fargo, Rugby, Minot, Stanley, and Williston. Between 2001 and 2010, annual ridership at the Williston Amtrak station increased by approximately 50.6 percent from 16,320 passengers to 24,586 passengers (UGPTI, 2007). BNSF also runs freight trains along this track.

The other BNSF rail line extends from the eastern edge of the project area and terminates at AVS, northwest of Beulah. This rail line moves freight through and in the project area.

The two abandoned rail lines in the project area are part of the former Burlington Northern network. The first extends from the eastern portion of the project area to Killdeer and the other crosses the western portion of the project area to Watford City (ND GIS, 2011).

<u>Airports and Airstrips</u>

There are numerous public and private airports and airstrips located in the project area. Because there are some airports in the area that accommodate larger aircrafts, the study area for this portion of the analysis includes those areas within 10 miles of the proposed project.

Commercial airports are defined as publically owned airports that have at least 2,500 passenger boardings per calendar year and receive scheduled passenger service. General aviation airports include privately owned and public use airports that enplane 2,500 or more passengers annually and receive scheduled airline service (Federal Aviation Administration [FAA], 2010). There are five public use airports located in the project area (FAA, 2011), including:

- Tioga Municipal Airport in Tioga, Williams County
- Weydahl Field in Killdeer, Dunn County
- Sloulin Field International Airport in Williston, Williams County
- Watford City Municipal Airport in Watford City, McKenzie County
- Beulah Airport, west of Beulah, Mercer County

An Airport Master Plan currently being prepared for the city of Williston was initiated to better understand community needs and desires regarding improvements to Sloulin Field International Airport. The study, which is ongoing, announced findings to date as of February 2012, and determined two possible options: expand the current site to accommodate larger aircraft or relocate the airport. The city of Williston and its partners in this study are currently evaluating land in the region that may be suitable for a new airport location (Sloulin Field International Airport, 2012). As of September 2012, three possible sites for the relocation of the airport have been identified. The sites are located in municipalities adjacent to Williston. It is anticipated that the FAA study and accompanying environmental assessment will be completed in late 2014 (Fricke, 2014), and a decision will be made regarding whether the airport will be expanded or relocated. In late July 2012, a public hearing was held to update residents on the plan and provide information about the ongoing environmental assessment (Williston Herald, 2012).

Many, but not all, public airports publish instrument approach procedures. These procedures often identify how flights should approach runways. Three airports with instrument approach procedures are located within 10 nautical miles of Alternative C: Tioga Municipal Airport; Sloulin Field International Airport; and Watford City Municipal Airport.

The final approach for flights generally begins at points located within 50,000 feet from the instrument approach procedures' runway end and must begin within 10 nautical miles or 60,070 feet of the runway end. This may be shorter depending on the type of plane used, i.e., smaller planes do not generally fly at such heights or need as great a distance to land safely. Only the portion of the final approach area that is between the final approach fix and the runway need to be considered as the final approach segment for obstacle clearance purposes. The minimum required obstacle clearance in the final approach area is 250 feet. The minimum descent altitude established for the final approach area is designed to ensure that no obstacles penetrate the 7:1 transitional surfaces (FAA, 1976).

Private airstrips are those not open to the public. These facilities tend to be smaller in scale and accommodate private planes. There are 10 private airstrips located in the project area (FAA, 2011), including:

- Tachenko Strip in the unincorporated community of Grassy Butte, Billings County
- Fredericks Ranch in Halliday, Dunn County
- Frei Private Airport also in Halliday, Dunn County
- Pete's Port Airport in Killdeer, Dunn County
- Gajewski Field in Alexander, McKenzie County
- Brecht Strip in Golden Valley, Mercer County
- Lindvig Airstrip Airport in Williston, Williams County
- Ring Rock Ranch Airport in Williston, Williams County
- Wright Field in Williston, Williams County
- Moen Airport in Epping, Williams County

3.11.2 Direct and Indirect Effects

This section discusses potential impacts, their duration, and intensity on infrastructure and transportation resulting from the construction and operation of the proposed project alternatives, including the no-action alternative. Definitions for duration and intensity developed for this project are described in Table 3-1.

No-action Alternative

Utility Infrastructure

Under the no-action alternative, no new transmission infrastructure would be constructed. Based on previous studies, the existing transmission network in the project area is not capable of handling anticipated future load projections. The IS report *Eastern Montana/Western North Dakota Load Serving Study Facilities Additions Justification* (IS, 2011) estimates that if improvements are not made to the existing electrical system and with the significant and projected further increase of the oil and gas industry, significant system failures, including considerable voltage drops or even voltage collapse, could occur. This would potentially result in adverse impacts, such as brownouts and other related issues.

Transportation Infrastructure

No construction activities would be associated with the no-action alternative and the proposed project would not occur. However, traffic volumes are anticipated to continue to increase in areas where the oil and gas industry is growing. Without construction of the proposed project, electrical equipment used for oil and gas production, such as compressors and pumps for transmission of oil and gas through supply pipelines, could be limited by lack of reliable electrical service. If these transmission pipelines are not used, oil and gas would need to be transported by truck from the area, increasing heavy truck volumes on local and regional roadways or railroad. Additional truck volumes, particularly those of considerable weight, such as those vehicles moving oil and gas, would lead to increased wear on roads, slow traffic, and/or result in increased safety concerns for motorists.

Roadway improvements, both directly and indirectly associated with the projected increase in the oil and gas industry planned for project area counties, are discussed in more detail in Chapter 4.

Alternative C

Utility Infrastructure

Alternative C would cross a variety of other utility infrastructure in the project area, including oil, gas, water, and other electric facilities. Prior to construction activities, Basin Electric would identify all utilities that Alternative C would cross and work with other utility companies and affected municipalities to ensure protection of these facilities during the construction period. It may be necessary to take existing utility facilities, particularly electric lines, out of service when construction of the proposed project would traverse supporting infrastructure. However, any service outages would be closely coordinated with the owning utility to ensure continued customer service and safety. Should any interruptions in service occur, they would be short term and timed to create minimal inconvenience, such as during cooler periods when residents and businesses are less likely to be using air conditioning. No long-term impacts on existing utility infrastructure are anticipated.

Transportation Infrastructure

During the construction of Alternative C, short-term impacts on the transportation network may result. The movement of heavy material haul trucks and greater vehicular volumes would increase wear on affected roadways. Basin Electric would be responsible for any improvements or repairs to damaged roads as a result of construction activities. As Alternative C is further refined, Basin Electric would work with the appropriate entities and municipal officials to minimize potential adverse impacts by identifying material haul routes, limitations, and improvements associated with the road network.

Long-term impacts on roadways, railroads, and airports and airstrips in the project area are not anticipated as a result of Alternative C. All crossings of linear infrastructure would be in compliance with NESC clearance requirements. Basin Electric would coordinate with and obtain all necessary permits and/or approvals from FAA and for road and rail line crossings. Once in operation, there would be periodic maintenance of the transmission line and supporting facilities; however, such activities are not anticipated to adversely affect roadway traffic patterns or volumes. No long-term impacts on railroads or airports or airstrips are anticipated.

Roadways

The alignment of Alternative C diverges into two segments between Killdeer and Watford City and the Charlie Creek Substation and Watford City. Potential short-term impacts on traffic patterns in those areas where Alternative C is located, generally east of the Charlie Creek Substation and north and west of Watford City, are presented below. In this portion of the project area, Alternative C would cross or come near primary roadways, including:

- ND State Highway 8, just south of where it meets ND State Highway 1806
- ND State Highway 22, north of Killdeer
- ND State Highway 200, east of the U.S. Highway 85 intersection near Charlie Creek Substation
- U.S. Highway 85, two locations south of Williston
- U.S. Highway 2, west where it meets U.S. Highway 85 in Williston
- U.S. Highway 85, north of U.S. Highway 2 and northeast of Williston
- U.S. Highway 2, north of Williston
- ND State Highway 1806, just south of U.S. Highway 2 and south of Tioga

Alternative C would also cross numerous collector roads; some of which are unpaved or graveled and have already experienced notable increases in traffic volumes as a result of growth in the oil and gas industry.

Construction activities associated with Alternative C would result in short-term impacts on the roadway network in areas where road and lane closures and traffic detours may be necessary during specified periods. The extent of these impacts would depend on the location of road and lane closures, traffic detours, and their duration.

As described in the affected environment, some roadways in the project area have experienced a significant increase in vehicular volumes, particularly heavy trucks, with the growth of the oil and gas industry. Because of high truck volumes and private vehicle trips on certain roadways, any temporary disturbance to traffic patterns would be experienced beyond areas where construction activities are taking place. As Alternative C is further refined, Basin Electric would work to ensure that closures and detours are minimized to the greatest extent possible. Basin Electric would coordinate with affected municipalities and appropriate entities (i.e., North Dakota Department of Transportation) to develop a construction action plan to minimize short-term, adverse effects.

Closures and detours may be necessary to string transmission lines across roads. Temporary traffic delays may occur as a result of the movement of heavy material haul trucks. Longer traffic delays would occur on higher volume roadways. Roadway closures would be planned in advance and timed during off-peak travel times to minimize adverse effects. Appropriate notification would be posted in and around affected areas to inform motorists of planned closures and detours. However, moderate to high short-term impacts on traffic patterns are anticipated during this time.

Maintenance activities associated with the transmission line would occur primarily within the proposed project ROW and avoid disrupting traffic patterns. While maintenance vehicles would need to access locations where repairs or other activities are necessary, the movement of these vehicles would not occur on a regular basis and are not anticipated to adversely affect traffic patterns over the long term.

Along the West Segment, the proposed project alignment would run from the Charlie Creek Substation in the south to the proposed Blue Substation, northwest of Watford City. Roadways that the West Segment would cross or come within immediate proximity to and potentially affect vehicular movements include:

- U.S. Highway 85, just south of the Little Missouri River crossing
- U.S. Highway 85, south of Watford City
- ND State Highway 23, west of U.S. Highway 85 and Watford City

Collector roads, some of which are unpaved or graveled, may be crossed by the West Segment. Potential short- and long-term impacts from road and lane closures and traffic detours would be the same as those described above. Similar mitigation measures would apply.

The East Segment would travel north from the proposed Red Substation in Killdeer to meet the West Segment at the proposed Blue Substation, northwest of Watford City. Between these locations, the East Segment would cross or come relatively near the following primary roadways:

- ND State Highway 22 at two locations south of Little Missouri State Park and north of ND State Highway 200
- ND State Highways 23 and 73, east of ND State Highway 1806
- ND State Highway 1806, north of ND State Highway 23

Collector roads, some of which are unpaved or graveled, may be crossed by the East Segment. Potential short- and long-term impacts from road and lane closures and detours would be the same as those described above. Similar mitigation measures would apply.

Railroads

Existing active railroad tracks are located in the northern and southern portion of the project area where Alternative C would run along one alignment. Alternative C would cross over active railroad tracks in three locations in the northern portion of the project area. These crossings would be located near Williston, Ray, and Tioga.

BNSF has developed a utility accommodation policy that addresses new utility installations that parallel or cross BNSF railroad lines. According to this policy, utility lines should be located to avoid or minimize the need for adjustments for future railroad improvements and to permit access to the utility lines for their maintenance with minimum interference to railroad traffic.

Authorization from BNSF would be required should construction activities enter the BNSF ROW. In areas where construction of Alternative C would cross BNSF track, rail traffic may need to be temporarily stopped or rerouted resulting in a disruption to BNSF freight movements or Amtrak trains that use these tracks. Because this would occur at few locations and construction activities could likely be timed to avoid train movements, no short-term impacts are anticipated. Basin Electric would coordinate such activities with BNSF and Amtrak.

As Alternative C is further refined, Basin Electric would work to ensure that project design and construction activities minimize or avoid electrical interference with the railroad. These activities would be conducted in accordance with BNSF's Utility Accommodation Policy (Engineering Services, 2011).

Once in operation, maintenance activities associated with Alternative C would be timed to avoid rail traffic. The project would be designed to encompass adequate structure heights at railroad crossings to minimize potential impacts on railroad maintenance activities. Railroad maintenance crews would need to conduct such activities with caution to avoid contact with the transmission line. It may be necessary to require additional safety precautions and/or employee training, in addition to those that may already be in place, to ensure worker safety. No long-term impacts on railroad operations are anticipated.

The American Railway Engineering and Maintenance-of-Way Association has specifications in place for steady and rail-to-ground and equipment-to-ground voltage levels to ensure the safety of railroad operating personnel and the public. Such specifications would be followed to avoid electrical interference from capacitive, electric and magnetic, and conductive effects (American Railway Engineering and Maintenance-of-Way Association, 2012).

<u>Airports and Airstrips</u>

The proposed project would be located within close proximity to airports and airstrips located in the project area. According to FAA regulations, any proposed structure that does not exceed the obstacle reference line will not be classified as an obstacle. If the proposed structure would penetrate airspace above the obstacle reference line, it would be classified as an obstruction. Should the proposed structure be classified as an obstruction in accordance with provisions set forth in Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace of Title 14 of the CFR, a review would be required to determine if it would constitute a hazard to airspace (FAA, 1993). Requirements and application procedures for making this determination are summarized in the abovementioned regulations. All applications must be submitted at least 45 days prior to the start of construction or alteration activities or the date an application for a construction permit is filed, whichever is earliest (14 CFR 77). CFR 77.19, Civil Airport Imaginary Surfaces, identifies the required obstacle clearances for airports.

The siting of the proposed project would result in an air space obstruction in the vicinity of Sloulin Field International Airport in the city of Williston. Basin Electric would work with the FAA to obtain the necessary approvals to site the proposed project in this area. Additionally, an ongoing study and environmental assessment, which is anticipated to be complete in late 2014 (Fricke, 2014), may result in the airport being relocated to an area nearby to accommodate the significant increase in air traffic, which is largely a result of increased oil and gas production in the area. Should the airport be relocated, no obstruction would result from the proposed project (see Chapter 4, Infrastructure and Transportation). Obstructions at other airports in the study area are not anticipated. Coordination would be initiated as project design progresses.

Alternative D

Alternative D generally follows the same alignment as Alternative C with the exception of the West Segment, which would not be included as part of this alternative. All roadways identified under Alternative C in the northern and southern extremes of the proposed project alignment and the East Segment would also be included under Alternative D. Under Alternative D, the proposed project alignment would cross or come relatively near the following primary roadways:

- ND State Highway 8, just south of where it meets ND State Highway 1806
- ND State Highway 22, north of Killdeer
- ND State Highway 200, east of U.S. Highway 85 intersection near Charlie Creek Substation
- U.S. Highway 85, two locations south of Williston
- U.S. Highway 2, west where it meets U.S. Highway 85 in Williston
- U.S. Highway 85, north of U.S. Highway 2 and northeast of Williston
- U.S. Highway 2, north of Williston
- ND State Highway 1806, just south of U.S. Highway 2 and south of Tioga
- ND State Highway 22, at two locations south of Little Missouri State Park and north of ND State Highway 200
- ND State Highways 23 and 73, east of ND State Highway 1806
- ND State Highway 1806, north of ND State Highway 23

Collector roads, some of which are unpaved or graveled, would be crossed by Alternative D. Potential short- and long-term impacts from road and lane closures and detours would be the same as those described under Alternative C. Similar mitigation measures would apply.

<u>Railroads</u>

Existing active railroad tracks are located in the northern and southern portion of the project area where Alternatives C and D are the same. In the northern portion of the project area, Alternative D would cross over active railroad tracks at the same three locations as Alternative C, near Williston, Ray, and Tioga. The same policies, protocols, and authorizations that apply for crossing active railroad tracks under Alternative C would also be true under Alternative D.

<u>Airports and Airstrips</u>

Similar to Alternative C, the location of the proposed project under Alternative D could result in an air space obstruction in the vicinity of Sloulin Field International Airport in the city of

Williston. Basin Electric would work with FAA to obtain the necessary approvals to site the proposed project in this area. Additionally, an ongoing study and environmental assessment, which is anticipated to be complete in late 2014 (Fricke, 2014), may result in the airport being relocated to an area nearby to accommodate the significant increase in air traffic, which is largely a result of increased oil and gas production in the area. Should the airport be relocated, no obstruction would result from the proposed project (see Chapter 4, Infrastructure and Transportation). Obstructions at other airports in the study area are not anticipated. Coordination would be initiated as project design is further refined. FAA regulations identified under Alternative C would also be implemented under Alternative D.

Alternative E

Because Alternative E would follow the same alignment as Alternative D, but with an increased ROW, potential short- and long-term impacts introduced as a result of the proposed project would be similar to those presented above. No additional impacts beyond those discussed under Alternative D would be anticipated.

3.12 PUBLIC HEALTH AND SAFETY

This section provides an overview of elements of the proposed project that may result in public health and safety impacts.

3.12.1 Affected Environment

This section provides a summary of electric and magnetic fields (EMFs) and an overview of public health and safety impacts that may result from an increase in EMFs in the project area.

Regional Setting

As mentioned in Section 1.4, Purpose and Need for Action, there are existing transmission lines within the immediate vicinity of the proposed project. The proposed project is necessary to support projected future loads and provide continuous electric service to nearby homes and businesses as well as to the oil and gas industry, which is expanding rapidly. Potential public health and safety impacts that may result from the construction and operation of the proposed project would likely occur in those areas immediately adjacent to the proposed alternatives. The study area for this discussion includes those areas within the proposed ROW or 1,000 feet of either side of the alignment centerline. However, as demonstrated below, potential human health and safety impacts should they result would be limited to those areas within immediate proximity to the proposed project alignment.

Electric and Magnetic Fields

The following overview of EMFs has been retrieved from the National Institute of Environmental Health Sciences' (NIEHS) Electric and Magnetic Fields Associated with the Use of Electric Power manual (NIEHS, 2002).

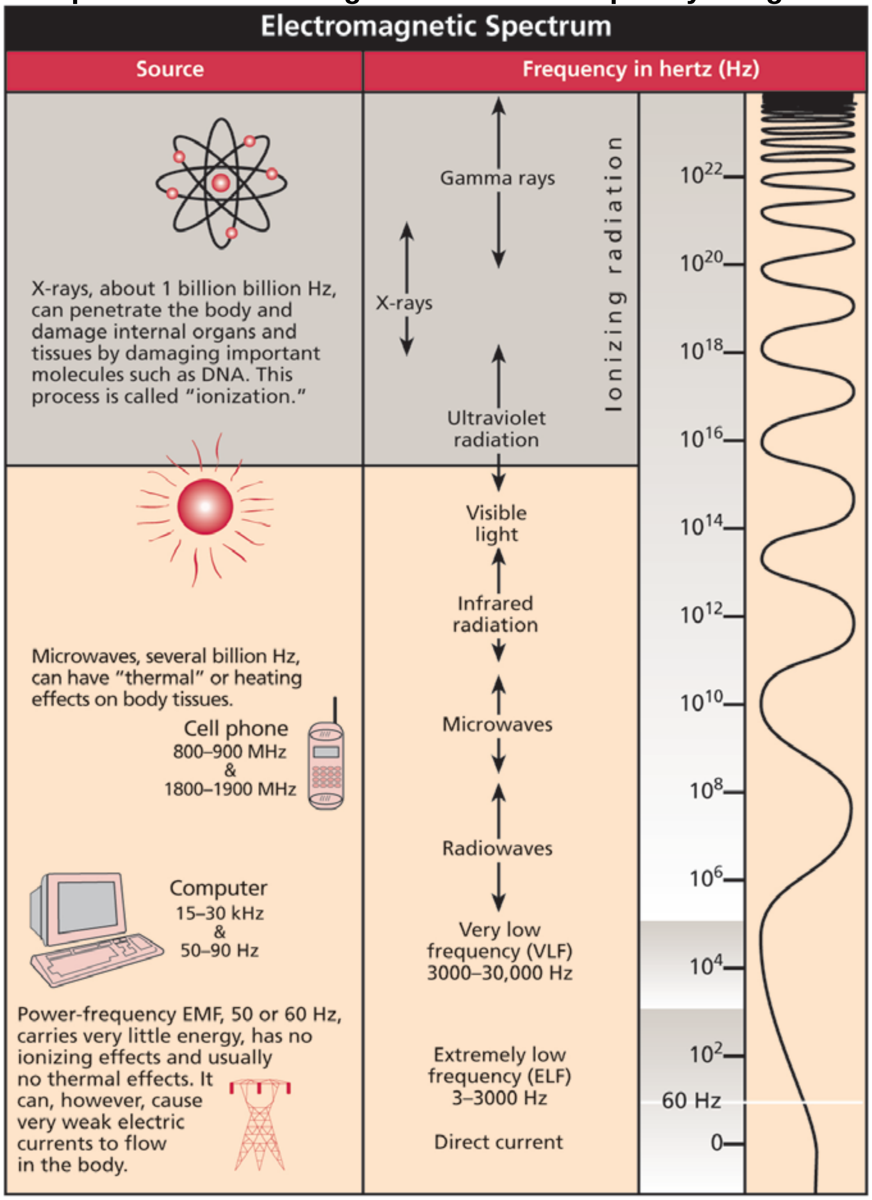
EMFs are generated whenever electricity is generated, transmitted, or used. They are the direct effect of the presence and/or motion of electric charges. EMFs are invisible lines of force that surround any electrical device including power lines, electrical wiring, and electrical equipment. The majority of electrical equipment needs to be turned on for a magnetic field to be produced; however, electric fields are often present even when equipment is turned off as long as it is plugged into a power source. Additional sources of EMFs include x-rays, visible light, microwaves, and radio waves, as illustrated in Figure 3-40.

The difference between electric fields and magnetic fields is provided below. Similar to both however is that they decrease rapidly as they move away from the source generator.

Electric Fields

Electric fields are produced by voltage, and increase in strength as the voltage increases. The intensity of an electric field is proportional to the voltage of the transmission line. They can be easily shielded or weakened by materials that conduct electricity or even materials that conduct poorly such as trees and buildings. Electric field strength is measured in volts per meter or in kilovolts per meter (kV/m). One kV is equal to 1,000 volts.

Figure 3-40: Examples of EMF Emitting Sources and Frequency Range



The wavy line at the right illustrates the concept that the higher the frequency, the more rapidly the field varies. The fields do not vary at 0 Hz (direct current) and vary trillions of times per second near the top of the spectrum. Note that 10^4 means 10 x 10 x 10 x 10 or 10,000 Hz. 1 kilohertz (kHz) = 1,000 Hz. 1 megahertz (MHz) = 1,000,000 Hz.

Source: NIEHS, 2002

Magnetic Fields

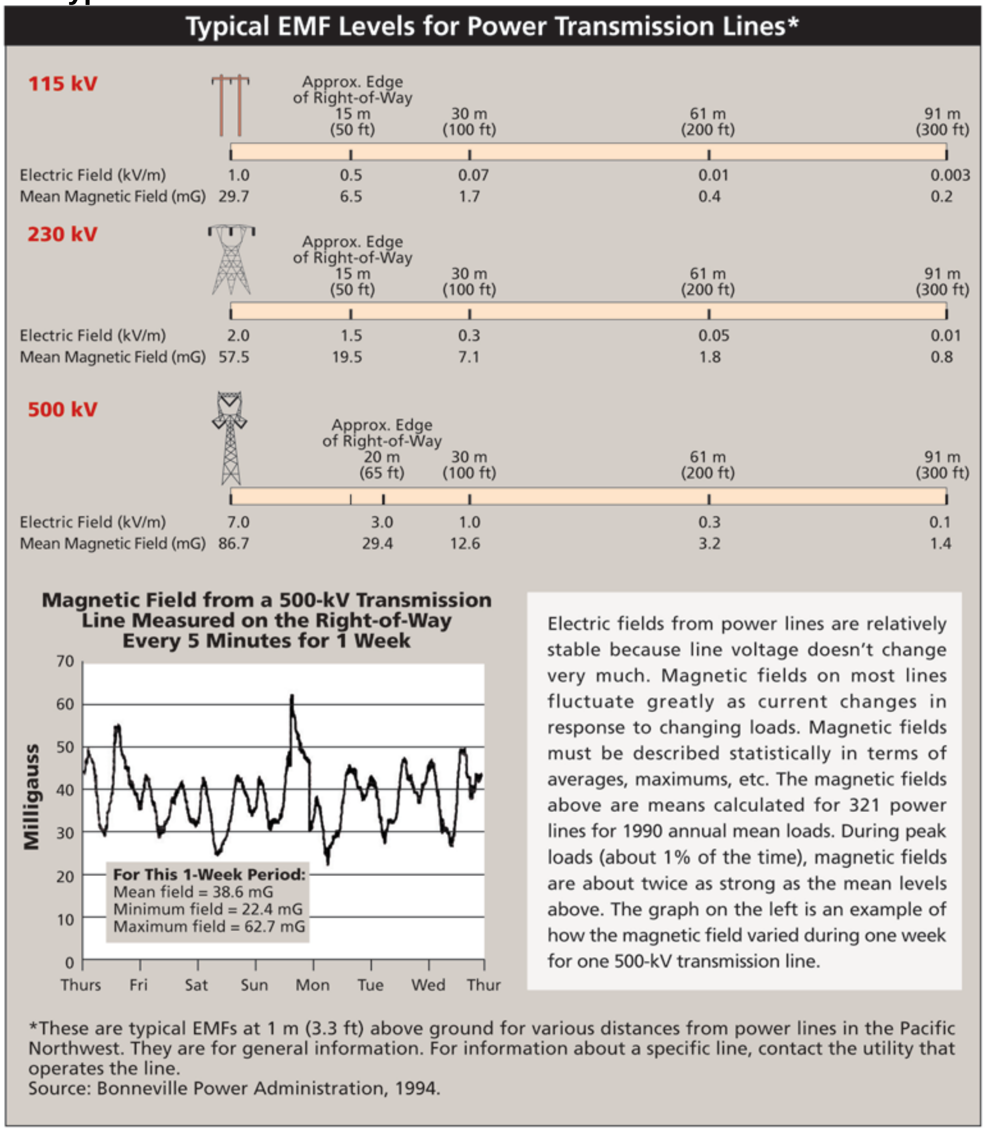
Magnetic fields result from the flow of current through wires or electrical devices and are proportional to current flow. Unlike electric fields, they pass through most materials and are therefore difficult to shield. For this reason, the majority of research on EMFs focuses on magnetic fields.

Magnetic fields are measured in units of gauss or Tesla. Gauss is the unit most commonly used in the United States. Tesla is the internationally accepted scientific term and the conversion between the two is 1 Tesla = 10,000 Gauss. Because most environmental EMF exposures involve magnetic fields that are only a fraction of a Tesla or a gauss, they are commonly measured in units of microtesla (μT) or milligauss (mG). A microtesla is 1/1,000,000 of a Tesla while a milligauss is 1/1,000 of a gauss. Therefore, 1 Tesla = 1,000,000 μT and 1 Gauss = 1,000 mG. To convert a measurement from microtesla to milligauss, multiply by 10 (NIEHS, 2002).

Electrical energy is often supplied as an alternating current where the electricity flows in one direction and then in the other to complete a cycle. EMFs are characterized by their wavelength, frequency, and amplitude (strength). At a distance of approximately 300 feet and at times of average electricity demand, magnetic fields from many transmission lines can be similar to typical background levels found in most homes. Figure 3-41 shows typical EMF levels for kV lines and structures and the decrease of EMFs as the distance from the structure increases.

In general, the strongest EMFs are concentrated in areas outside of a substation where transmission lines enter and leave the substation. EMFs emitted from substation equipment, such as transformers, reactors, and capacitor banks decrease at a rapid rate when moving away from source generators. Such effects are typically indistinguishable beyond the immediate range of such facilities (NIEHS, 2002).

Figure 3-41: Typical EMF Levels for Power Transmission Lines



Source: NIEHS, 2002

Regulatory Framework

Currently there are no federal or North Dakota regulations in place that dictate the permitted strength of electrical fields beneath high voltage transmission lines. Public and occupational magnetic-field exposure guidelines that do exist are based on studies evaluating the impacts of short-term exposure to EMFs. The Institute of Electrical and Electronics Engineers' International Committee on Electromagnetic Safety on Non-Ionizing Radiation (ICES) has established public exposure guidelines of 9,040 mG for magnetic fields (ICES, 2002). The International Commission on Non-Ionizing Radiation Protection's (ICNIRP) Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields (1 hertz to 100 kilohertz) also recommends limits for both occupational and general public exposure to time-varying fields. At 60 hertz, ICNIRP electric field reference level is 4.2 kV/m and magnetic field reference level is 2,000 mG for public exposure (ICNIRP, 2010).

Public Health Effects of Electromagnetic Fields

There has been concern that prolonged exposure to EMFs can be a contributor to cancer, leukemia, and other diseases. Since the 1970s, numerous epidemiological studies have been conducted to assess the potential effect of magnetic fields on the risks of cancer and other diseases. While there have been many studies done regarding the health effects of transmission lines, the results are inclusive at this time.

The World Health Organization (2012) reports that:

> "Based on a recent in-depth review of the scientific literature, the World Health Organization concluded that current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields…Despite many studies, the evidence for any effect remains highly controversial. However, it is clear that if electromagnetic fields do have an effect on cancer, then any increase in risk will be extremely small. The results to date contain many inconsistencies, but no large increases in risk have been found for any cancer in children or adults."

USEPA states that:

> "Much of the research about power lines and potential health effects is inconclusive. Despite more than two decades of research to determine whether elevated EMF exposure, principally to magnetic fields, is related to an increased risk of childhood leukemia, there is still no definitive answer. The general scientific consensus is that, thus far, the evidence available is weak and is "not sufficient to establish a definitive cause-effect relationship"

While many findings are still inclusive at this time, USEPA reports:

> "In 1998, an expert working group, organized by the National Institute of Environmental Health Sciences, assessed the health effects from exposure to extremely-low frequency EMF, like those you would find in a home with power lines close by. Based on studies about childhood leukemia that involved a large number of households, they found that power line frequency magnetic fields are a possible cause of cancer. The National Institute of Environmental Health Sciences working group also concluded that the results of EMF animal, cellular, and mechanistic studies do not confirm or refute the finding of the human studies" (USEPA, 2006c).

Implantable Medical Devices

Pacemakers are used to treat arrhythmias, which are problems associated with the rate or rhythm of the heartbeat. During an arrhythmia, the heart can beat too fast, too slow, or with an irregular rhythm. When this happens, the heart may not be able to pump enough blood through the body. A pacemaker can relieve some arrhythmia symptoms and are designed to detect abnormal heart rhythms (U.S. Department of Health and Human Services, 2012).

Pacemakers and other cardiac electronic devices rely on complex micro-circuitry and use electromagnetic waves for their communication with the programmers. As a result, they are susceptible to interference from the surrounding electromagnetic fields. Electromagnetic interference can be defined as any signal, biological or not, that falls within a frequency spectrum that is being detected by the sensing circuitry of the pacemaker. This can interfere with the devices optimal function and is often a concern for patients (Lakshmanadoss et al., 2004).

At present, there is no standardized guidance regarding acceptable levels of EMF for pacemakers. However, the American Conference of Governmental Industrial Hygienists has prepared recommendations for occupational exposures including EMFs. These guidelines are designed to identify levels that nearly all workers may be exposed to repeatedly without adverse effect. For EMF, the recommendations suggest that persons with pacemakers or similar devices limit their exposure to electric fields to 1 kV/m and magnetic fields to 1,000 mG (American Conference of Governmental Industrial Hygienists, 2011).

3.12.2 Direct and Indirect Effects

This section discusses potential impacts, their duration, and intensity on public health and safety resulting from the construction and operation of the proposed project, including the no-action alternative. Definitions for duration and intensity associated with public health and safety developed for this project are described in Table 3-1.

Potential public health and safety impacts that may result under the proposed project alternatives are provided below. The discussion includes potential effects associated with construction activities, increased exposure to EMFs in areas within proximity to the proposed project, and operational risks.

No-action Alternative

Under the no-action alternative, the proposed transmission line would not be constructed. As a result, no adverse impacts on public health and safety would result from construction or operational activities or increased exposure to EMFs. Current EMF levels would remain relatively similar to current conditions due to the presence of existing transmission lines and other devices that emit EMFs in the project area.

Alternative C

During construction of the proposed project, heavy equipment would be required and ground surfaces would be disturbed. The use of heavy equipment and other construction-related materials would likely include the use of oil and gas for fueling as well as other potentially hazardous materials. While it is not anticipated at this time, the disturbance of ground materials may reveal the presence of hazardous or potentially hazardous materials.

Direct contact between an object on the ground and an energized conductor poses the most serious risk of injury or death from a high-voltage transmission line. During construction of the proposed project, there would be multiple crossings of existing energized lines, both transmission and distribution, in addition to upgrades to existing substations; however, it is not anticipated that direct contact with energized lines would occur. Additionally, guard structures and matting would be used at crossing locations to protect existing facilities and worker safety. Prior to construction activities, Basin Electric would work with utility owners to coordinate line outages or other mitigation measures to ensure the safe implementation of the proposed project.

Prior to the onset of construction activities, a construction action plan would be prepared. The plan would be prepared in accordance with NESC and the Occupational Safety and Health Administration’s regulations, as required by federal law. Additionally, the plan would include prevention and response procedures such as those required in a spill prevention control and countermeasure plan and a stormwater pollution prevention plan under state and federal law.

Workers would be knowledgeable of the protocols in place and required to follow all procedures during construction activities. However, the potential does exist for minor and major injuries to occur during the construction of the proposed project. Such potential exists for all activities where construction and heavy equipment are used.

In order to assess potential impacts associated with an increase in EMFs as a result of the proposed project, the Corona and Field Effects Program was used to calculate and approximate future EMF levels. This model was developed by the Bonneville Power Administration (Bonneville Power Administration, undated). The output from these calculations was used to plot the EMF profiles across distances from the centerline of Alternative C. The ROW is 75 feet from the centerline of the proposed Alternative C. Outputs from the model for Alternative C can be found in Appendix M.

Under Alternative C, electric fields 75 feet from the proposed project alignment would be 0.214 kV/m, well below the ICNIRP identified level of 4.2 kV/m required to protect the public (ICNIRP, 2010). Magnetic fields at the same distance measured 94mG, also well below the ICNIRP identified level of 2,000 mG necessary to protect the public. These levels are also below those necessary to ensure the continued function of pacemakers and other implantable devices. Therefore, the operation of Alternative C would not result in adverse impacts on public health and safety as a result of the slight increase in EMF levels.

Once in operation, Alternative C has the potential to cause stray voltage. This can occur from a maintenance issue or improperly grounded equipment under the transmission line or at electric service entrances to structures from distribution lines. Transmission lines can induce stray voltage on distribution lines in circumstances where the transmission line is parallel to and directly over the distribution line. If such configurations are created, some farm equipment (barns, fences, gates, etc.) may be subject to developing small electric charges that could be transferred to humans or livestock upon contact with equipment, structures, or facilities. Basin Electric would work to ensure that proper measures are implemented to avoid this to the greatest extent possible. Additionally, should stray voltage concerns be identified following construction activities, Basin Electric would correct the circumstances creating the stray voltage. As a result, no long-term impacts are anticipated.

High-voltage transmission lines are designed to automatically trip or become de-energized should they fall or come into contact with trees. They typically only fall during severe weather events, such as excessive ice or tornados, or if they are struck by a large vehicle. Should Alternative C be located within the vicinity of distribution lines and should a line fall, then the risk of an energized distribution line on the ground would result presenting a safety hazard. Basin Electric would work to ensure that all safety precautions are taken to safely and quickly address any such incidents.

Alternative C includes the installation of several hundred structures to support the current-carrying conductors. Many of these structures would be located in or adjacent to agricultural lands and may create an obstacle for equipment. The operation of farm equipment near proposed structures could result in unnecessary contact and/or damage to machinery and/or operators. As Alternative C is further refined, Basin Electric would work with affected property owners to locate structures in areas that would avoid or have reduced concern for potential impacts on farming and ranching operations.

Over the long term, adverse impacts from the operation of Alternative C are anticipated to be negligible to minor.

Alternative D

Potential public health and safety impacts associated with the construction and operation of Alternative D would be similar to those identified under Alternative C. Similar measures to ensure the safety of construction workers, area residents, and animals under Alternative C, such as the implementation of a construction action plan, coordination with utility owners, and maintenance activities, would also be implemented under Alternative D.

The Corona and Field Effects Program was used to calculate and approximate future EMF levels that would result from the operation of Alternative D. Additional discussion of this model is presented under Alternative C; outputs for Alternative D are shown in Appendix M.

The ROW is 75 feet from the centerline of the proposed project alignment. Under Alternative D, electric fields 75 feet from the proposed project alignment would be 0.268 kV/m, well below the ICNIRP identified level of 4.2 kV/m required to protect the public. Magnetic fields at the same distance measured between 34.24 and 36.97 mG, also well below the ICNIRP identified level of 2,000 mG necessary to protect the public. These levels are also below those necessary to ensure the continued function of pacemakers and other implantable devices. Therefore, the operation of Alternative D would not result in adverse impacts on public health and safety as a result of the slight increase in EMF levels.

Over the long term, adverse impacts from the operation of Alternative D are anticipated to be negligible to minor.

Alternative E

Potential public health and safety impacts associated with the construction and operation of Alternative E would be similar to those identified under Alternative C. Similar measures to ensure the safety of construction workers, area residents, and animals under Alternative C, such as the implementation of a construction action plan, coordination with utility owners, and maintenance activities, would also be implemented under Alternative E.

The Corona and Field Effects Program was used to calculate and approximate future EMF levels that would result from the operation of Alternative E. Additional discussion of this model is presented under Alternative C; outputs for Alternative E are shown in Appendix M.

Because Alternative E includes two transmission lines that would run parallel to each other, the ROW would be larger than under Alternatives C and D—a combined 300 feet. Under Alternative E, electric fields 150 feet from the proposed project alignment would range from between .760 kV/m to 1.396 kV/m, well below the ICNIRP identified level of 4.2 kV/m required to protect the public. Magnetic fields at the same distance measured from between 52.72 mG to 87.43 mG, also well below the ICNIRP identified level of 2,000 mG necessary to protect the public. These levels are also below those necessary to ensure the continued function of pacemakers and other implantable devices. Therefore, the operation of any of the alternatives would not result in adverse impacts on public health and safety as a result of the slight increase in EMF levels.

Over the long term, adverse impacts from the operation of Alternative E are anticipated to be negligible to minor.

3.13 NOISE

3.13.1 Affected Environment

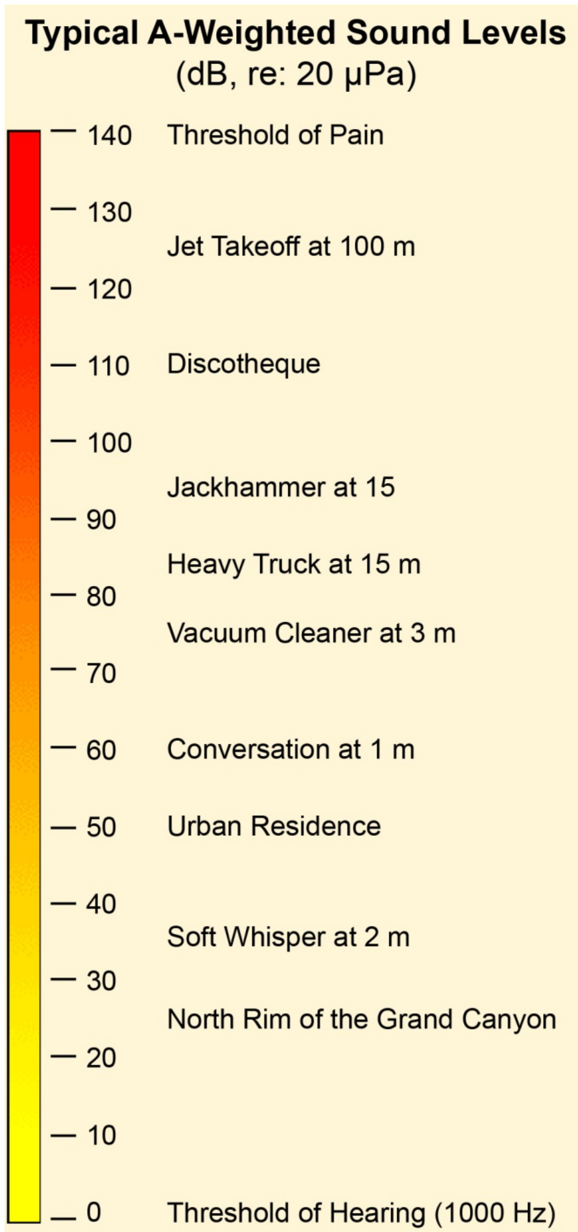
Noise is generally defined as unwanted sound. Sound is all around us; it becomes noise when it interferes with normal activities such as speech, concentration, or sleep. Noise associated with transmission lines is a factor during construction and operation of both the lines and substations. Noise emanates from vehicular traffic and crews associated with construction and maintenance of transmission lines and substations and noise coming from the transmission line itself once operational. Ambient noise (the existing background noise environment) can be generated by a number of noise sources, including mobile sources, such as automobiles and trucks; and stationary sources such as construction sites, machinery, or industrial operations. In addition, there is an existing and variable level of natural ambient noise from sources such as wind, streams and rivers, wildlife, and other sources.

The standard measurement unit of noise is the decibel (dB), which represents the acoustical energy present. Noise levels are measured in A-weighted decibels (dBA), a logarithmic scale that approaches the sensitivity of the human ear across the frequency spectrum. The human ear responds to noise in the audible frequencies in a similar way in most individuals. A 3 to 5-dBA increase is equivalent to doubling the sound pressure level, but is barely perceptible to the human ear. A 6-dBA is a readily perceptible change and a 10-dBA is doubling of the apparent loudness. Figure 3-42 provides examples of sound levels of typical noise sources and noise environments.

In addition to changes in dB levels there are also objective factors to consider when determining the noise and how people have the potential to be affected by the noise. Noise in the environment is constantly changing and fluctuates based on a number of external forces including when a car drives by, a dog barks, or a plane passes overhead. To understand and quantify these fluctuations, noise metrics have been established. These metrics include the exceedance sound level (L_x). The L_x is the sound level exceeded by a certain percent (x) of the sampling period and is referred to as a statistical sound level. The most common L_x values are L_{eq}, L_{90}, L_{50}, and L_{10}. L_{eq} is the level of a constant sound over a specific time period that has the same sound energy as the actual sound over the same period. L_{dn} is another common noise metric, which applies a 10-dB penalty to nighttime noise levels.

Noise associated with the operation of transmission line includes corona, insulator, and Aeolian noise. Corona noise is the most common noise associated with transmission lines and is heard as a crackling or hissing sound. This type of noise varies with both weather and voltage of the line, and most frequently occurs in conditions of rain or high humidity. The noise comes from a breakdown of air into charged particles caused by the electrical field at the surface of conductors. Corona noise typically results in continuous noise levels of 40 to 50 dBA in close proximity to the transmission line and during wet or high-humidity conditions can range from 50 to 60-dBA. Corona noise levels are not consistent from location to location because conductor surface defects, damage, dust, and other inconsistencies can influence the noise levels. Insulator noise is similar to corona noise, but is not dependent on weather and is typically caused by dirty, nicked, or cracked insulators. Aeolian noise is caused by wind blowing through the conductors and/or structures and is usually infrequent and depends on wind velocity and vibration. Aeolian noise typically occurs when wind is steady and perpendicular to the lines, which sets up an Aeolian vibration that can produce resonance if the frequency on the vibration matches the natural frequency (Aspen Environmental Group, n.d.).

Figure 3-42: Typical Noise Levels



Source: Occupational Health and Safety Administration, 2012

Ambient Noise Levels and Sources in Project Area

Ambient sound levels in the project area are highly variable and are based on sound sources and disturbances in the immediate area. For much of the project area, which is mostly open fields, agricultural, and rural residential areas, sound levels would typically vary between 40 and 45 dBA (Noise Polluting Criteria, n.d.). Communities located in the project area would experience higher sound levels from increased human activities. In addition, areas adjacent to roadways such as the U.S. Highway 2, U.S. Highway 85, several North Dakota state highways, and county and local roads would have higher noise levels, due to human activity and vehicle traffic. Conversely, the project area contains TRNP, USFS land, and several state parks all of which have restricted access and in general would have sound levels similar to those in open fields and agricultural areas and have the potential to be quieter than the general project area. In recent years, the development of numerous oil wells and associated human activity have increased isolated pockets of noise from construction, operation of the facilities, and human activity.

There are no county-specific regulations for noise in the project area.

3.13.2 Direct and Indirect Effects

Construction activities associated with the alternatives would generate noise in the project area. Noise levels also may periodically increase during operation and maintenance of the proposed project. This noise would have the potential to affect nearby residences, recreational users, wildlife, and other sensitive receptors.

This section discusses potential impacts, their duration, and intensity on sensitive receptors to noise resulting from construction and operation of the proposed project, including the no-action alternative. Definitions for duration and intensity developed for this project are described in Table 3-1.

No-action Alternative

Under the no-action alternative, the proposed project would not occur and no construction or construction activities would take place, leading to no impacts on noise.

Alternative C

Noise impacts associated with Alternative C would stem from construction activities and operation and maintenance of the proposed transmission line and associated structures. Construction activities would create intermittent and short-term noise occurring only when such activities are ongoing. Potential sources of noise from construction activities include: construction of foundations at each transmission structure site; transmission structure site preparation; erection of structures at individual tower sites; helicopter assistance during transmission structure erections and stringing of conductors; material and staff vehicle transportation; and construction staff interactions and activities. The structure and site preparation would be completed using conventional construction equipment. Table 3-43 lists equipment likely to be used during construction activities and summarizes noise levels produced by this equipment. Data presented in this table uses L_{eq}, a statistical descriptor that depicts the average sound level for environmental noise and accounts for fluctuating sound levels.

Table 3-43: Typical Construction Equipment Noise Levels

Type of Equipment	Maximum Level (dBA) at 50 Feet
Road grader	85
Bulldozer	85
Heavy truck	88
Backhoe	80
Pneumatic tools	85
Crane	85
Combined equipment	89

Source: Thalheimer, 1996

At a distance of 50 feet, the overall combined noise estimate generated by conventional equipment that would likely be used during construction of the proposed project is 89 dBA L_{eq}. Noise produced by construction activities would decrease with distance at a rate of 6 dBA per doubling distance from the site. Table 3-44 shows estimated construction noise levels at various distances from construction activities based on this rate of decrease.

Table 3-44: Construction Noise in the Vicinity of a Representative Construction Site

Distance from Construction Site (feet)	Hourly Leq (dBA)
25	95
50	89
100	83
200	77
400	71
800	65
1600	59

Note: The following assumptions were used:

Equipment used: (1) each- grader, bulldozer, heavy truck, backhoe, Pneumatic tools, concrete pump, crane. Reference noise level: 89 dBA (L_{eq}). Distance for the reference noise level: 50 feet. Noise attenuation rate: 6 dBA/doubling. This calculation does not include the effects, if any, of local shielding or atmospheric attenuation.

Noise stemming from construction-related activities would occur at various locations along the proposed Alternative C alignment, but would be primarily limited to those areas where workers are conducting construction activities. However, any increase in noise would only be a concern if sensitive noise receptors (residences, schools, religious institutions, libraries, or other community resources) are located near the proposed project and construction activities to experience increases in noise. The majority of land use in the area is open range, undeveloped land, and agricultural areas, with only four sensitive noise receptors (all residences) located within 500 feet of the West Segment. There are no sensitive noise receptors within 500 feet of the East Segment from the proposed Red Substation to the proposed Blue Substation.

Ambient noise levels typically vary between 40 and 45 dBA, quantified as quiet, with noise levels being slightly increased in the presence of communities and roadways. Based on these existing conditions, an increase in noise levels exceeding 50 dBA would be considered moderate and all noise increases below 50 dBA would be considered low.

Construction activities in all areas without sensitive noise receptors would be temporary and highly localized, and impacts would be short term and low based on the lack of population in the area. For sensitive noise receptors, noise impacts would be experienced when construction is occurring at the localized area. Noise would increase during ROW clearing, erection of transmission structures, stringing of conductors, and the movement of heavy material haul trucks and workers. When combined, the construction of these towers would have low impacts on sensitive noise receptors due to the limited number of sensitive receptors and their general distance from the alignment, with the highest impact potentially coming from helicopter use to assist with tower erection. However, few if any sensitive noise receptors are along the line in areas where helicopter use may be required. All construction impacts would be short term and only occur when construction activities are ongoing.

A helicopter may be used to assist with tower installation and potentially to help with stringing the line. A loaded cargo helicopter flying 250 feet away produces about 95 dBA, which is the same amount of noise produced by a diesel locomotive 100 feet away (Helicopter Association International, 2009). If a helicopter is used, towers would be preassembled at one or more central staging areas and then transferred by helicopter to tower sites. The helicopter would hover at central staging areas on average from a few to several minutes per tower as it picked up each tower section, and would then hover at each tower site from a few to several minutes during a 1-hour period while the tower is placed on the foundation. Helicopters may also be used to move heavy equipment and materials into areas that are inaccessible by roads.

In addition to construction of the transmission line, increases in noise levels would result from the construction of the proposed Judson, Tande, Red, White, and Blue substations and the Killdeer South Switchyard. Impacts from construction of these facilities would be similar to those presented for the transmission line, with noise from construction equipment and vehicles and construction labor. Impacts from construction would be limited to the construction period and would be localized to the proposed substation/switchyard areas. While, the construction period of the substations may be longer in the localized area, it would still occur over a relatively short time period with overall impacts from construction being short term and low.

Noise impacts during operation and maintenance of the proposed project are expected to be negligible. Noise attributed to maintenance would occur when and if maintenance needs arise, with field vehicles used to access trouble spots and from the actual maintenance activity. These impacts would be short term and would typically be of low intensity. The operation of the proposed transmission line would result primarily in corona-generated noise, occurring in the atmosphere near the conductor. Changes to local atmospheric pressure may result in a hissing or cracking sound that may be heard directly under the transmission line or within a few feet of the ROW depending on weather, altitude, and system voltage, with the level of corona noise receding with distance. Maximum noise levels associated with corona noise typically do not exceed 50 dBA as heard from the edge of the ROW, during extreme weather events, and noise levels typically do not exceed 25 dBA during fair weather events—less than the ambient sound levels of a library (USEPA, 1974). None of the sensitive noise receptors are close enough to the transmission line to have their noise levels affected; therefore, impacts on noise would be short term and low.

At the site of the proposed substations/switchyard, noise from operations would occur from substation equipment, with substation transformers as the primary source. Sounds commonly associated with a transformer are described as a hum. This hum is created by the expansion and contraction of the core when the transformer is energized and occurs approximately twice per alternating cycle. Noise from substation/switchyard equipment and transmission lines would be the primary source of environmental noise in the area; however, because of the distance to sensitive noise receptors, there would be no adverse increase in noise levels to these areas and increases would be short term and low to all individuals present in these areas.

In addition to noise associated with the operation of the transformers, each transformer would have cooling fans that would create noise while in operation. Noise from these fans would come from either the motor's mechanical noise or through the blades disrupting the air. Of the eight sensitive noise receptors in the area of the transmission line and substations, none are within 500 feet of either of the proposed substations. One residence is located approximately 550 feet from the Judson 345-kV Substation and one residence has the potential to be located within 800 feet of the Tande 345-kV Substation. The Judson 345-kV Substation residence has the potential to recognize increased noise levels; however, it would be expected that all increases to noise levels would be well within an acceptable range and all impacts would similarly be low. Based on the distance to the Tande 345-kV Substation, impacts on the residence are expected to be low.

Alternative D

Impacts from the construction and operation of the proposed transmission line would be the same under Alternative D as those for Alternative C. There are seven sensitive noise areas located within the project area of Alternative D; four of which are located within 500-feet of the proposed transmission line, resulting in low impacts on these areas. Construction and operations impacts associated with the substations for Alternative D are the same as for Alternative C, with overall impacts on noise being low.

Alternative E

Impacts from the construction and operation of the proposed transmission line would be the same under Alternative E as those for Alternative C. There are seven sensitive noise areas located within the project area of Alternative E; five of which are located within 500-feet of the proposed transmission line, resulting in low impacts on these areas. Construction and operations impacts associated with the substations for Alternative E are the same as for Alternative C, with overall impacts on noise being low.

4 CUMULATIVE IMPACTS

Cumulative impacts are defined as the "impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Based on the policy guidance and methodology originally developed by CEQ in 1997 and an analysis of current case law, a process based on four primary steps is employed.

Step 1—Identify Resources Affected. In this step, each resource affected by any of the alternatives is identified. These are the same resources described in the affected resources section. If there are no impacts to the resource as a result of the alternatives being considered, then there is no cumulative impact.

Step 2—Establish Boundaries. In identifying past, present, and reasonably foreseeable actions to consider in the cumulative impact analysis, affected resource-specific spatial and temporal boundaries are identified. The spatial boundary is the area where past, present, and reasonably foreseeable future actions have taken place, are taking place, or could take place and result in cumulative impacts to the affected resource when combined with the impacts of the alternatives being considered. This boundary is defined by the affected resource and may be a different size than the proposed project area. For example, impacts to water quality of a stream may include the watershed as the appropriate boundary for the cumulative impact analysis; whereas the analysis boundary for GHG emissions may be global. CEQ guidance suggests that analysis on natural systems should use natural ecological boundaries where practical. In this analysis, the delineated natural ecological boundaries are large; however, most of the Bakken oil and gas activity takes place in the five county-area crossed by the transmission line, and these have been used for the cumulative impacts analysis on terrestrial resources.

The temporal boundary describes how far into the past and forward into the future actions should be considered in the impact analysis. Appropriate spatial and temporal boundaries may vary for each resource. The temporal boundary is guided by CEQ guidance on considering past action and a rule of reason for identifying future actions.

Step 3—Identify Cumulative Action Scenario. In this step, the past, present, and reasonably foreseeable future actions to be included in the impact analysis for each specific affected resource are identified. These actions fall within the spatial and temporal boundaries established in Step 2. These actions are identified considering guidance from CEQ, such as a document entitled "Guidance on Consideration of Past Actions in Cumulative Effects Analysis" and current case law, such as Ecology Center v. Castaneda, 574 F.3d 652, 667 (9th Cir. 2009), where the court gave deference to CEQ's interpretation of NEPA and stated that, as it relates to past actions, NEPA requires that an aggregated cumulative effects analysis that includes relevant past projects is sufficient. The agency need not catalog effects that are not truly significant to the area in question.

Step 4—Cumulative Impact Analysis. This final step involves the analysis of the impacts of the actions identified in Step 3 in addition to the impacts of the proposed action and its alternatives. This will result in the total cumulative impact for each resource.

The completion of this process and its corresponding analyses result in a meaningful, defensible, and reasonable cumulative impact analysis.

4.1 CUMULATIVE EFFECT BOUNDARIES

In identifying past, present, and reasonably foreseeable actions to consider in the cumulative impact analysis, affected resource-specific spatial and temporal boundaries are identified. The spatial boundary is the area where past, present, and reasonably future actions have taken place, are taking place, or could take place and result in cumulative impacts on the affected resource when combined with the impacts of the alternatives being considered. This boundary is defined by the affected resource and may be a different size than the proposed project area. Table 4-1 provides a summary of cumulative impact boundaries by resource area. A detailed assessment of cumulative effect boundaries for each resource considered, including both spatial and temporal boundaries, are described further in the cumulative effects analysis section of this chapter.

Table 4-1: Cumulative Impact Boundaries by Resource Area

Affected Resource	Spatial Boundary	Temporal Boundary
Aesthetic and Visual Resources	The area that is visible from the project. The background is typically defined as 4 miles beyond the horizon line. For the purposes of the project, the spatial boundary will be 10 miles around the proposed route in Williams, McKenzie, Dunn, Mountrail and Mercer counties.	Life of the project; visual impacts will continue unless the transmission line is decommissioned and removed
Air Quality	The spatial boundary is limited to the airshed in which the proposed action will occur, as project-related impacts could affect air quality within this airshed.	Life of the project (50 years), because some cumulative impacts could be expected to occur throughout this timeframe
Greenhouse Gases	Given the nature and extent of GHG emissions, the appropriate spatial boundary is global as GHGs have been and are continuing to accumulate in the atmosphere.	Life of the project (50 years)
Geology and Soils	Project ROW	1 to 5 years: short term 5+ years: long term
Surface Water	Upper Missouri River/Lake Sakakawea, Knife River, Little Missouri River, and Little Muddy River sub-basins	Life of the transmission line (50 years)

Affected Resource	Spatial Boundary	Temporal Boundary
Floodplains	Floodplains located within the project ROW, primarily the Missouri and Little Missouri River floodplains upstream from Lake Sakakawea	Life of the transmission line (50 years)
Vegetation	5-county area including Dunn, McKenzie, Mercer, Mountrail, and Williams counties	Life of the transmission line (50 years)
Wildlife	5-county area including Dunn, McKenzie, Mercer, Mountrail, and Williams counties	Life of the transmission line (50 years)
Wetlands	5-county area including Dunn, McKenzie, Mercer, Mountrail, and Williams counties	Life of the transmission line (50 years)
Special Status Species	5-county area including Dunn, McKenzie, Mercer, Mountrail, and Williams counties	Life of the transmission line (50 years)
Cultural Resources	APE	Life of the transmission line (50 years)
Land Use	5-county area including Dunn, McKenzie, Mercer, Mountrail, and Williams counties	Life of the transmission line (50 years)
Socioeconomics	5-county area including Dunn, McKenzie, Mercer, Mountrail, and Williams counties	Any cumulative actions that would overlap with the 2-year construction timeline are considered
Environmental Justice Populations	The census blocks and census tracks within or intersecting the project area	Any cumulative actions that would overlap with the 2-year construction timeline are considered
Recreation and Tourism	1 mile of the transmission line; and/or extent of visual, air quality, water quality, traffic, and noise impacts	Life of the transmission line (50 years)
Utility Infrastructure	Project area counties with a focus on those areas within 1 mile of the proposed project.	Impacts would be primarily limited to construction of the proposed project. The analysis will identify known projects that are anticipated to extend 10 to 20 years into the future.
Transportation Infrastructure	Within 6 miles of the proposed project alternatives	Impacts would be primarily limited to construction of the proposed project. The cumulative impacts analysis will include those projects that are reasonably foreseeable within the next 10 years.
Electric and Magnetic Fields	Within 500 feet of the proposed project	Life of the transmission line (50 years)
Construction Equipment and Activities	Within 500 feet of the proposed project	Short-term only. Limited to construction activities

Affected Resource	Spatial Boundary	Temporal Boundary
Noise	The spatial boundary is contained to all areas within hearing distance of the proposed action.	Life of the project (50 years); however, most of the potential cumulative impacts associated with the proposed project are expected to be short-term and limited to the construction phase of the project.

4.2 CUMULATIVE ACTION SCENARIO

Table 4-2 identifies actions that could cumulatively impact specific affected resources within the project area. The table identifies each resource considered and provides an accounting of past, present, and reasonably foreseeable future actions that could contribute to cumulative impacts.

Table 4-2: Activities Related to Cumulative Impacts

Affected Resource	Past Actions	Present Actions	Reasonably Foreseeable Future Actions
Aesthetics and Visual Resources			
Natural features	Clearing of forests and tall grasslands (natural screening) for agricultural and oil and gas activities.	Same as past actions.	Same as present actions.
Built features	Agricultural activities; construction and operation of existing transmission lines and substations; oil and gas activities; commercial and residential development.	Same as past actions.	Same as present actions.
Air Quality and GHG Emissions			
Air quality conditions	Oil and natural gas development, electricity generation, transportation activities, and all agriculture and community development activities.	Same as past actions.	Same as present actions.
Geology and Soils			
Topography	Oil and natural gas activities, transportation activities, and agricultural activities.	Same as past actions.	Same as present actions.
Geology	Oil and natural gas activities.	Same as past actions.	Same as present actions.
Soils	Oil and natural gas activities, transportation activities, water infrastructure activities, agriculture and community development activities.	Same as past actions.	Same as present actions.

Affected Resource	Past Actions	Present Actions	Reasonably Foreseeable Future Actions
Water Resources			
Surface water	Oil and natural gas activities, electric utility activities, transportation activities, water infrastructure activities, agriculture and community development activities.	Same as past actions.	Same as present actions.
Floodplains	Oil and natural gas activities, electric utility activities, transportation activities, water infrastructure activities, agriculture and community development activities.	Same as past actions.	Same as present actions.
Biological Resources			
Vegetation	Clearing of vegetation (including permanent conversion to a non-natural land use) for oil and natural gas activities, mining activities, electric utility activities, transportation activities, water infrastructure activities, agriculture, and community development activities. Introduction of noxious weeds as a result of increased traffic from vehicles/equipment coming from other parts of the country.	Same as past actions.	Same as present actions.
Wildlife	Habitat loss or fragmentation due to oil and natural gas activities, mining activities, electric utility activities, transportation activities, water infrastructure activities, agriculture, and community development activities. Habitat alteration through introduction of noxious weeds as a result of increased traffic from vehicles/equipment coming from other parts of the country. Displacement (temporary and permanent) of species due to increased human activity and increased vehicular related mortality. Increased avian mortality	Same as past actions.	Same as present actions.

Affected Resource	Past Actions	Present Actions	Reasonably Foreseeable Future Actions
	from electrical transmission and distribution structures, oil and gas structures, and uncovered oil pits.		
Wetlands	Draining (dredging) or filling of wetlands due to oil and natural gas activities, mining activities, electric utility activities, transportation activities, water infrastructure activities, agriculture, and community development activities. Introduction of noxious weeds as a result of increased traffic from vehicles/equipment coming from other parts of the country.	Same as past actions.	Same as present actions.
Special status species	Habitat loss or fragmentation due to oil and natural gas activities, mining activities, electric utility activities, transportation activities, water infrastructure activities, agriculture, and community development activities. Habitat alteration through introduction of noxious weeds as a result of increased traffic from vehicles/equipment coming from other parts of the country. Displacement (temporary and permanent) of species due to increased human activity and increased vehicular related mortality. Increased avian mortality from electrical transmission and distribution structures, oil and gas structures, and uncovered oil pits.	Same as past actions.	Same as present actions.
Cultural Resources			
Recorded cultural resources	Oil and natural gas activities, electric utility activities, transportation activities, water infrastructure activities.	Same as past actions.	Same as present actions.

Affected Resource	Past Actions	Present Actions	Reasonably Foreseeable Future Actions
Land Use			
Existing land use	Oil, natural gas development; electric utility activities (construction of power generation and transmission infrastructure); transportation activities (construction of existing roadway, railroad, and airport infrastructure); water infrastructure activities (construction of irrigation and hydropower infrastructure); agriculture and community development activities.	Same as past actions.	Same as present actions.
State and federal properties	Establishment of parks and conservation areas; oil and gas development; federal water development projects; electric utility activities (construction of power generation and transmission infrastructure); transportation activities (construction of existing roadway, railroad, and airport infrastructure); recreational activities.	Same as past actions.	Same as present actions.
Socioeconomics			
Demographic, economic, housing and property values, public services and fiscal conditions	Oil and natural gas activities, electric utility activities, transportation activities, water infrastructure activities, and community development activities.	Same as past actions.	Same as present actions.
Environmental Justice			
Environmental justice populations	Oil and natural gas activities, electric utility activities, transportation activities, water infrastructure activities, agriculture and community development activities.	Same as past actions.	Same as present actions.

Affected Resource	Past Actions	Present Actions	Reasonably Foreseeable Future Actions
Recreation and Tourism			
Dispersed recreational activities	Oil and natural gas activities, electric utility activities, transportation activities, water infrastructure activities, agriculture and community development activities.	Same as past actions.	Same as present actions.
Developed recreational activities	Oil and natural gas activities, electric utility activities, transportation activities, water infrastructure activities, agriculture and community development activities. Establishment of developed recreational facilities.	Same as past actions.	Same as present actions.
Infrastructure and Transportation			
Utility infrastructure	Oil and natural gas activities, electric utility activities, and water infrastructure activities.	Same as past actions.	Same as present actions.
Transportation infrastructure	Oil and natural gas activities, transportation activities.	Same as past actions.	Same as present actions.
Public Health and Safety			
Electric and magnetic fields	Oil and natural gas activities, electric utility activities.	Same as past actions.	Same as present actions.
Noise			
Ambient noise levels	Oil and natural gas activities, electricity generation activities, transportation activities and agriculture and community development activities.	Same as past actions.	Same as present actions.

4.3 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

The following section provides an overview of past, present, and reasonably foreseeable future actions that have affected, are affecting, or have the potential to affect, the resources analyzed in the cumulative effects analysis.

Oil and gas development and production has been and will continue to be a major activity in western North Dakota over the next several years. The focus of much of the recent development has been on the Bakken-Three Forks Formation. The number of new wells drilled and completed has continued to increase over the last several years. Table 4-3 shows the number of wells completed for each county within the project area between 2008 and 2011. In addition, more than 1,000 wells have been permitted for drilling during the first 6 months of 2012 (North Dakota Industrial Commission, 2013).

Table 4-3: Total Wells Completed in Select Counties in North Dakota

	2009	2010	2011	2012	2013
Dunn	105	132	202	292	337
McKenzie	72	145	275	507	693
Mercer	1	0	0	1	1
Mountrail	236	293	316	384	400
Williams	32	116	256	431	328
Total	446	686	1,049	1,615	1759

Source: North Dakota Industrial Commission, 2013

The intensive oil development can lead to other impacts on land, air, and water resources. For instance, an estimate of the land area needed to support the oil development was made by applying an average acreage needed to drill and operate each well by the number of wells completed each year. Assuming approximately 5 to 7 acres typically needed per well drilled, the average land area utilized in the development ranged from 2,500 acres in 2008 to 6,300 acres in 2011 for counties within the project area.

Table 4-4 summarizes NDDMR's estimated future development potential for the Bakken Formation in western North Dakota. This table shows the estimated number of wells for select areas in or near the project area. This includes the number of wells to be drilled per year and the number of years the development will take to complete. Using an assumption that each well will require 5 to 7 acres for development, the total land area needed to support the future activity is estimated to range from 7,700 to 9,700 acres per year.

Table 4-4: Estimated Future Oil Development in Select Areas in Western North Dakota

	Number of Wells Predicted	Development Years
Ray-Tioga	430 - 540	11 to 14
Watford City - Keene	250 -310	5 to 7
Killdeer	235 - 290	6 to 8
Parshall	375 - 470	7 to 8

Source: NDDMR, 2011

Specific projects associated with oil development and other projects considered in the cumulative impact analysis are summarized in Table 4-5. In accordance with CEQ guidance, this list primarily includes present and reasonably foreseeable future actions in the five-county cumulative impact assessment area.

Table 4-5: Past, Present, and Reasonably Foreseeable Future Activity

Activity	Type of Activity	Description	Locations within the Project Area
Oil and Natural Gas Activities			
BakkenLink Pipeline LLC	Oil pipeline	Present activity (in-service date of June 2013)—Line would transport crude oil 132 miles to a rail-loading point in Fryburg, about 30 miles west of Dickinson. Receipt points would be Trenton, Ray, and Beaver Lodge in Williams County; Stanley and New Town in Mountrail County; Alexander, Keene, and Watford City in McKenzie County; and Dunn Center in Dunn County.	Williams, Mountrail, McKenzie, and Dunn counties
Bear Den Project of CenterPoint Energy Bakken Crude Services LLC	Gathering lines	Future activity—A system of gathering lines would be constructed in northwestern Dunn and southeastern McKenzie Counties to collect oil from the Little Missouri River area and transport it to a collection point on U.S. Route 85 south of Watford City.	Dunn, McKenzie counties
Bear Paw Energy LLC	Proposed gas plant and pipeline for natural gas, gasoline, and other natural gas liquids	Future activity—The Garden Creek Gas Plant is proposed to be located near Watford City and would operate on 80 acres, producing natural gas and gasoline with other natural gas liquids. A proposed pipeline would transport the product 54 miles west to Sidney. Two additional facilities designated Stateline I and Stateline II, are proposed near Williston. A pipeline would also be constructed from these facilities to Sidney, but the route has not been proposed at this time.	McKenzie County
Belle Fourche Pipeline	Oil pipeline	Future activity—The pipeline would transport crude oil from Alexander southward to a receipt point in Baker, Montana.	McKenzie County
Bridger Pipeline LLC	Oil pipeline	Present activity—The Four Bears Pipeline delivers oil from McKenzie and Dunn counties, beginning at ND State Highway 23 near Hawkeye and extending south through Dunn County to Fryburg in Billings County, a distance of 77 miles.	McKenzie and Dunn counties
Enbridge Pipelines LLC, Sanish Pipeline	Oil pipeline	Future activity—A 42-mile crude oil pipeline would be constructed from Johnsons Corner in eastern McKenzie County north to Beaver Lodge near Tioga in Williams County.	McKenzie, Williams counties

Activity	Type of Activity	Description	Locations within the Project Area
EOG Resources	Crude oil-to-railroad loading facility	Present activity—A crude oil-to-railroad loading facility operates in Stanley, North Dakota, transporting oil by rail to Stroud, Oklahoma. Up to one unit train per day with a maximum capacity of 60,000 gross barrels of oil per train is shipped.	Mountrail County
Hess Corporation	Natural gas plant and rail loading facility	Present activity—Expansion of existing Tioga natural gas plant from 100 to 250 million cubic feet of natural gas per day. Operation of a rail loading facility.	Williams County
Hess Hawkeye Pipeline System	Natural gas liquids, gas, and oil pipelines	Future activity—The proposed pipelines would transport oil, natural gas, and natural gas liquids from the existing Hawkeye Central Station through a transfer point at the existing North Charlson Compressor Station located south of Lake Sakakawea. The system would use existing pipelines to transport product beneath Lake Sakakawea to the North River Crossing Compressor Station located on the north side of Lake Sakakawea. The pipeline would continue north to either the existing Hess Ramberg truck facility or the Silurian Compressor Station located approximately 8 and 7 miles respectively south of Tioga North Dakota.	McKenzie, Williams counties
Hiland Partners	Gas processing plant and gathering system	Present and future activity—Expansion of a gas processing plant at Cartwright on the Yellowstone River to process 85 million cubic feet per day. The company also operates the Norse Gathering System in northern Williams and also in Divide and Burke counties.	McKenzie and Williams counties
Inergy Midstream LP	Crude oil loading terminal and pipeline	Future activity—Proposed development of a crude oil loading terminal in Epping, North Dakota to serve as a marketing hub and a proposed connector pipeline to the Tioga area; a 20-mile pipeline would connect Tioga to Epping.	Williams County
ONEOK	Pipeline	Future activity—Proposed Bakken Pipeline would transport natural gas liquids from natural gas processing plants in the Bakken shale to the Overland Pass Pipeline and would extend from Sidney, Montana, southward to Weld County, Colorado.	McKenzie and Williams counties
Rangeland Energy	Crude oil loading terminal	Future activity—Proposed development of a crude oil loading terminal in Epping, North Dakota to serve as a marketing hub and a proposed connector pipeline to the Tioga area.	Williams County
Plains Pipeline LP	Crude oil pipelines	Future activity—Construction of 17 miles of pipeline from east of Stanley to Ross; construction of 103-mile pipeline from Trenton northwest to Raymond, Montana and on to Regina, Saskatchewan.	Mountrail, Williams counties

Activity	Type of Activity	Description	Locations within the Project Area
Saddle Butte Pipeline, LLC	Pipeline	Future activity—The proposed High Prairie Pipeline would extend 450 miles from Alexander, North Dakota to Clearbrook Minnesota, including across northern McKenzie and southern Mountrail counties. A 17-mile lateral would extend from Charlson south to Johnsons Corner in McKenzie County.	McKenzie and Mountrail counties
Saddle Butte Pipeline, LLC	Oil and gas pipelines and natural gas processing facility Gathering system with lateral pipelines and trunklines	Present and future activity—Oil and gas gathering pipelines are located south of Watford City, with terminals or receipt points in Alexander, Midway, Johnsons Corner, Charlson, and Antelope. A natural gas processing facility is 7 miles south of Watford City, processing 25 million cubic feet per day. The proposed Grasslands Gathering System would involve 80 miles of lateral pipelines and 100 miles of trunklines. The Saddle Butte Pipeline extends into Dunn County.	McKenzie and Dunn counties
Savage Services	Rail terminal	Future activity—Planned multi-user rail terminal in Trenton, North Dakota to load and ship unit trains of crude oil and other oil-field related materials.	Williams County
TransCanada	Natural gas facility and receipt facilities	Past and present activity—The Northern Border Pipeline is a natural gas facility that extends northwest to southeast across the region of influence. It receives gas from Williston processing plants and synthetic gas from the Dakota Gasification Plant. There are receipt facilities at Buford, Charbonneau, and Watford City.	Williams, McKenzie, Dunn, and Mercer counties
Vantage Pipeline US LP	Ethane pipeline	Future activity—Construction of a pipeline from Tioga north to Empress, Alberta.	Williams County
Williston Basin Interstate Pipeline	Natural gas facility and pipelines Natural gas pipelines	Past and present activity—This natural gas facility has lines from Watford City to Williston and Williston to Tioga, then north to Canada and east to Minot. Other natural gas lines connect natural gas plants in Billings County with the Northern Border Pipeline in Dunn County.	McKenzie, Williams, and Dunn counties
Continental Resources	Oil and gas development	Future activity—Development of a mega-pad near Williston to support horizontally drilled wells.	Williams County
Electrical Utility Activities			
Charlie Creek to Antelope Valley 345-kV	Electric transmission line	Existing transmission lines.	Mercer, Dunn, and McKenzie counties
Charlie Creek-Squaw Gap 115-kV	Electric transmission line	Existing transmission lines.	McKenzie County
Williston to Tioga 230-kV	Electric transmission line	Existing transmission lines.	Williams and Mountrail counties

Activity	Type of Activity	Description	Locations within the Project Area
Logan to Tioga 230-kV	Electric transmission line	Existing transmission lines.	Ward and Mountrail counties
Tioga to Canada 230-kV	Electric transmission line	Existing transmission lines.	Mountrail and Burke counties
Culbertson to Williston 115-kV	Electric transmission line	Existing transmission lines.	Williams County, North Dakota and Roosevelt County, Montana
Williston to Genora 115-kV	Electric transmission line	Existing transmission lines.	Williams County
Williston to Tioga 115-kV	Electric transmission line	Existing transmission lines.	Williams and Mountrail counties
AVS, Beulah	Lignite-fired units	Past, present, and future activity—Two 450-MW lignite-fired units.	Mercer County
Central Power Electric Cooperative	Electrical grid expansion	Future activity—Major expansions to electrical grid to provide electricity to oil and gas industry related infrastructure and to private, and commercial and industrial businesses in their service territory. New Minot Southwest Substation. Expansion of the Berthold Tap. New Kenaston Tap. All located to the east of the cumulative effects analysis area in Minot, North Dakota.	Ward, and McLean counties
Charlie Creek to Williston (Western)	Transmission line upgrade	Present activity—Upgrade from 115-kV to 230-kV completed and currently in service.	McKenzie and Williams counties
Coteau Properties Company, Freedom Mine	Lignite coal mining	Past, present, and future activity—700 to 1,000 acres per year mined for lignite coal in Beulah, North Dakota.	Mercer County
Dakota Gasification Company	Natural gas production plant	Past, present, and future activity—Production of natural gas for Northern Border Pipeline.	Mercer County
Lonesome Creek Station	Natural gas peaking facility	Present and future activity—Natural gas peaking facility between Alexander and Watford City, North Dakota. Connected by a 115-kV transmission line to McKenzie Electric Power Cooperative's existing Hay Butte Substation.	McKenzie County
McKenzie Electric Power Cooperative	Electrical grid expansion	Present and future activity—Major expansions to electrical grid in Watford City, North Dakota.	McKenzie County

Activity	Type of Activity	Description	Locations within the Project Area
Mountrail-Williams Electric Cooperative	Electrical grid expansion Substations	Present and future activity—Major expansions to electrical grid in Williston, North Dakota. The Wheelock Substation is in Williams County and a new Blaisdell Substation is in Mountrail County. Proposed 45-MW natural gas peaking facility connected by a 115-kV transmission line to the MWEC existing Stateline Substation (2012).	Williams and Mountrail counties
Pioneer Generation Station	Natural gas peaking facility	Present and future activity—Natural gas peaking facility in Williston, North Dakota. Connected by a 115-kV transmission line to the MWEC existing Stateline Substation.	Williams County
Telecommunications			
Telecomunication Towers	Infrastructure	Two telecommunication towers were constructed on top of the Killdeer Mountains.	Dunn County
Transportation Activities			
Williston Roadway Improvements	Road	Future activities—East Williston Truck Route. Will reduce traffic on East Dakota Parkway. Northwest Bypass. Will bypass the city of Williston allowing traffic to flow without interference from local traffic and reducing congestion within the city. 32nd Avenue West. Will provide north/south connection between Highway 2/85 and 53rd Street NW. Williston Truck Reliever Route. Temporary route involving upgrades to Williams County Route 1 (145th Avenue NW) and CR 6 (57th Street NW).	Williams County
New Town Truck Reliever Route	Road	Future activities—New Town Truck Reliever Route. A temporary route around the north side of New Town, from 1.5 miles east of New Town to 1 mile west of New Town.	Mountrail County
Watford City Truck Reliever Route	Road	Present and Future activity—Watford City Truck Reliever Route will provide a southwest bypass around Watford City. Currently under construction with expected completion date of fall 2014.	McKenzie County
Killdeer Truck Reliever Route	Road	Future activity—Killdeer Truck Reliever Route. Location unknown.	Dunn County
U.S. Highway 85 Reconstruction	Road	Future activity—U.S. Highway 85 reconstruction from Arnegard to Williston. Priority is on rebuilding U.S. Highway 85 bypassing Alexander.	McKenzie and Williams counties
ND State Highway 200 Reconstruction	Road	Future activity—ND State Highway 200 reconstruction from U.S. Highway 85 to Beulah.	Dunn and McKenzie counties
Expansion of Williston Airport	Airport	Future activity—Expansion of Williston Airport to accommodate the increase in passenger traffic due to North Dakota's oil development.	Williams County

Activity	Type of Activity	Description	Locations within the Project Area
Water Infrastructure Activities			
Lake Sakakawea	General development	Past activity—Change in environment from a large new flatwater lake. Recreation facilities and some rural residential development.	Dunn, McKenzie, Mercer, Mountrail, and Williams counties
Southwest Pipeline Project	Water pipeline and supporting infrastructure	Future activity—Withdrawal of water from Lake Sakakawea to support regional water supply. Includes water treatment, main water transmission, and rural distribution.	Dunn and Mercer counties
Western Area Water Supply Project	Water supply infrastructure	The Western Area Water Supply Project is a domestic water project that utilizes Missouri River water and groundwater to meet the municipal, rural, and industrial water needs for all or parts of Burke, Divide, McKenzie, Mountrail, and Williams Counties. Phases I of the project is complete with Phase II expected to be complete by the end of 2014.	McKenzie, Mountrail, and Williams counties
Agriculture and Community Development Activities			
Extraterritorial Area Expansion	Expansion of extraterritorial area	Present activity—Expansion of Williston, North Dakota's extraterritorial area from 1 to 2 miles to allow additional zoning control of development.	Williams County
Housing Clusters	Housing development	Present activity—New temporary and permanent housing clusters on the outskirts of existing communities, increasing the suburban character of some of the area.	
North Dakota Department of Trust Lands Energy Impact Office	Infrastructure expansion	Future activity—The North Dakota Department of Trust Lands Energy Impact Office provides grants to extend city streets, expand sewer systems, expand landfills, and provide other public infrastructure upgrades.	
Flex PACE Affordable Housing Program	Housing development	Future activity—The Bank of North Dakota, under its Flex PACE Affordable Housing Program, provides low-interest loans for the construction of multi-family housing projects in oil producing counties. This is a new program announced in 2012 and it is projected that a minimum of ten affordable housing projects will be financed by the $3 million available for interest rate buy downs.	
North Dakota Housing Finance Agency Tax Credits	Housing development	Present and future activity—The North Dakota Housing Finance Agency provides tax credits for developers of low- and moderate-income housing. Currently 286 affordable housing units are under construction and $42 million in residential housing projects are under construction.	
Grazing	Livestock grazing	Past and present activity—Livestock grazing has caused stream impairment in Knife, Little Missouri, and Little Muddy rivers.	
Treatment of Noxious Weeds	Land disturbance	Past, present, and future activity—Land disturbance due to expansion of noxious weed-infested areas. LMNG has an active program to treat noxious weed areas.	

4.4 CUMULATIVE EFFECTS ANALYSIS

This section analyzes the impacts of the actions identified above in addition to the impacts of the proposed action and its alternatives. This will result in the total cumulative impact for each resource.

4.4.1 Aesthetics and Visual Resources

Past actions that have affected visual resources in the project area include several oil and natural gas development and production projects, electrical utility construction, transportation improvements, and agricultural development. Present and ongoing activities that alter the landscape include agricultural activities (mainly crop production and livestock grazing), oil and mining operations, and operation of existing power lines.

Landscapes within the project area vary based on the location. The southern portion of the project area is a mosaic of agricultural fields and rolling prairie, with areas of grazing along steeper slopes. Rural homesteads and cleared well sites are the most common interruption to the landscape. The central portion of the project area consists of deep, highly eroded canyons and badlands with heavily wooded draws, as well as portions of national grasslands and a national park. The landscape in this portion of the project area is largely natural, with few human influences along ridges. However, the valleys consist of cleared well sites and agricultural areas. The northern portion of the project area is predominately agricultural, with large oil and gas operations dominating the built environment. Past and present actions have resulted in changes to the natural landscape and visual resources particularly in the northern portion of the project area. Agricultural conversion, oil and gas extraction, and pipelines and transmission line construction have all altered the landscapes.

Past actions have constructed linear features (transmission line, pipelines, roads, and railroads) across some visually sensitive areas. For this project, alternatives were sited wherever possible to follow existing linear infrastructure to mitigate visual impacts in sensitive areas. All alternatives cross the Missouri River, the Little Missouri River and the Lewis and Clark National Historic Trail in the vicinity of U.S. Highway 85 and/or adjacent to existing linear features. Alternative C would result in changes to the visual landscape within or near recreational areas and historical sites such as the KMB site. Alternative C also crosses a portion of the LMNG, following U.S. Highway 85 and an existing transmission line corridor. This alternative would create a new crossing of the scenic byway, in between three other existing transmission line crossings within a 20-mile stretch of road. Alternatives D and E would not cross the national grasslands or national park lands, but would cross the scenic byway along an existing transmission line and gas pipeline. Placing the potential transmission line adjacent to an existing transmission line would help to mitigate cumulative visual impacts, by reducing the number of times a motorist or visitor would pass under a transmission line. Alternative E would involve the additional construction of a second 345-kV line north of Killdeer for 61 miles and the addition of the Red, White, and Blue substations as noted in Alternative C. The placement of two lines would result in a higher degree of visual contrast on the landscape compared to that of a single line.

Given ongoing industrial and energy development in the area, it is likely that additional electrical infrastructure (transmission and distribution lines and substation expansions) will be built in the future. Standard transmission siting practices state that when siting a new transmission line, efforts should be made to parallel existing linear features. If, at some time in the future, an additional transmission line is proposed within the project area, it is likely that the current project would be seen as an opportunity site for the construction of additional transmission features. Since characteristics of the landscape have previously changed and will continue to change over time, Alternatives C, D, and E would contribute to long-term, low to moderate intensity cumulative impacts.

4.4.2 Air Quality

The proposed project would construct and operate a transmission line, substations, and potentially a switchyard. The construction of these components would emit regulated amounts of criteria pollutants; however, this project, which would only create temporary particulate emissions, would not add to those NO_x and other pollutant levels. Construction of the components would add temporary fugitive dust and exhaust emissions to the airshed in the area and would add to GHG emissions. This would occur primarily during construction and during maintenance activities, once the project is in operation. The proposed project, when added to other past, present, and proposed projects, would not contribute to an overall violation of air quality standards and as a stand-alone project would not significantly contribute to adverse cumulative effects on air quality or GHG emissions.

The northwest region of North Dakota is experiencing rapid development because of recent gas and oil activities. As a result of these activities, there is a dynamic, continuing, and growing need for more power to be delivered to the area. A study conducted by the IS evaluated the power supply and power delivery in the region to determine the adequacy of the existing transmission system from both a system delivery and reliability perspective (IS, 2011). The AVS to Neset Transmission Project is one of the projects identified in the study to deliver additional power to this region. But the power delivered by the AVS to Neset Transmission Project would come from a variety of generation resources on the IS, of which the AVS generation unit is only one. In fact, AVS Units 1 and 2, both of which commenced commercial operation in the mid-1980s, have operated at near-capacity for a couple decades, and do not have additional power to supply.

New generation built to serve the growing load on the IS since 2000 has been almost exclusively wind and natural gas, including (1) more than 700 MW of new wind generation capacity owned or purchased through power-purchase contracts by Basin Electric, (2) approximately 300 MW of natural-gas-combined-cycle generation owned and operated by Basin Electric that began commercial operation in August 2012 near White, South Dakota, and (3) approximately 380 MW of natural-gas-combustion-turbine generation owned and operated by Basin Electric near Groton, South Dakota, and Culbertson, Montana. As described below, an additional 270 MW of natural-gas-combustion-turbine generation is being permitted and constructed for voltage support and power in the Bakken region at two locations near Williston (the Pioneer Generating Station) and Watford City (the Lonesome Creek Station), North Dakota, prior to completion of the AVS to Neset Transmission Project. Once the AVS to Neset Transmission Project is completed, new additional natural-gas-peaking power would become more readily available to all IS customers, not just the customers in the Bakken region of northwest North Dakota.

Finally, much of the new additional load that the AVS to Neset Transmission Project would serve is related to new natural gas processing facilities processing and compressing gas from the new production wells in the Bakken Formation. This domestically-produced natural gas will supply a clean, lower-carbon-intensive fossil fuel that will displace higher-carbon-intensive coal and oil. The high-grade oil produced from the Bakken Formation is also displacing imports of foreign oil, and is low in sulfur and easily distillable—factors that make it less carbon-intensive than foreign oil, with less of an environmental impact from transportation to the refinery and from processing at the refinery.

In the event that the proposed transmission line is not pursued or constructed, the use of generators to provide electricity for continued oil and gas development, primarily at well sites, could occur. In the event that generators are used because of a lack of adequate power in the area, localized adverse impacts to air quality would occur during their operation as a result of fossil fuel burning.

Air Emissions from Electricity Generation

As noted above, AVS has been operating at capacity or near-capacity for several decades. Consequently, there will not be any additional air emissions from AVS as a result of producing additional electricity for the new proposed AVS to Neset Transmission Project. AVS injects its power into the IS, and the power to serve the additional load in northwest North Dakota is drawn from the entire IS, not just AVS. The new generation resources Basin Electric has added to serve the IS and other east-side-grid customers since 2000 have been almost exclusively wind and natural gas, and the approximately 270 MW of new natural-gas-combustion-turbine resources currently being permitted and added in northwest North Dakota will have new-source-performance-standard and best-available-control-technology level review and controls for all regulated pollutants, including GHGs.

The results of the study (IS, 2011) indicate that between 2012 and 2016 several local distribution transmission line projects will be required to correct deficiencies at specific locations. In addition, the study notes that voltage support will be required at strategic locations to prevent any interruptions of service on the existing transmission lines that result from the increased thermal loading because of voltage or current flow fluctuations on the lines due to the increasing electrical demand. In response to those studies, Basin Electric is developing the Pioneer Generation Station, near Williston and the Lonesome Creek Station, near Alexander to provide the necessary voltage support during periods of peak demand in the region.

Phase I of both projects will include a 45-MW simple cycle combustion turbine. Both Phase I projects were in operation by the end of 2013. Pioneer Generating Station Phase II and Lonesome Creek Station Phase II projects consist of placing two additional 45-MW simple cycle combustion turbines at each location. The Pioneer Generating Station Phase II project was completed in January 2014, and the Lonesome Creek Station Phase II Project is scheduled to be completed in early 2015. These projects, when completed consist of approximately 270 MW of capacity, are needed to protect the reliability of power delivery and load-serving capacity of the region independent in utility and timeline of the proposed AVS to Neset Transmission Project. Further, since they are intermediate and peaking resources that can chase load, they are ideal for addressing the immediate power needs in this area, but will provide reliable peaking power for the whole IS once the AVS to Neset Transmission Project is completed, and will be an ideal complementary form of generation to any additional wind resource added to the IS in the future. Since most of the new load in the Bakken Formation is of a 24-hour-a-day, 7-days-a-week, 365-days-a-year variety, wind by itself is not an available option to supply this new load. But once natural-gas-combustion-turbine generation is available, wind becomes an option as a complementary generation resource as baseload generation needs increase. The addition of these resources will avoid and mitigate additional impacts from generation to serve load in the Bakken Formation.

Further, this new generation will avoid and displace portable generation and combustion-engine-driven oil and gas extraction engines at the wells. It will also hasten the capture of more of the natural gas at the well-heads, and avoid both the flaring and release of natural gas during the oil extraction process.

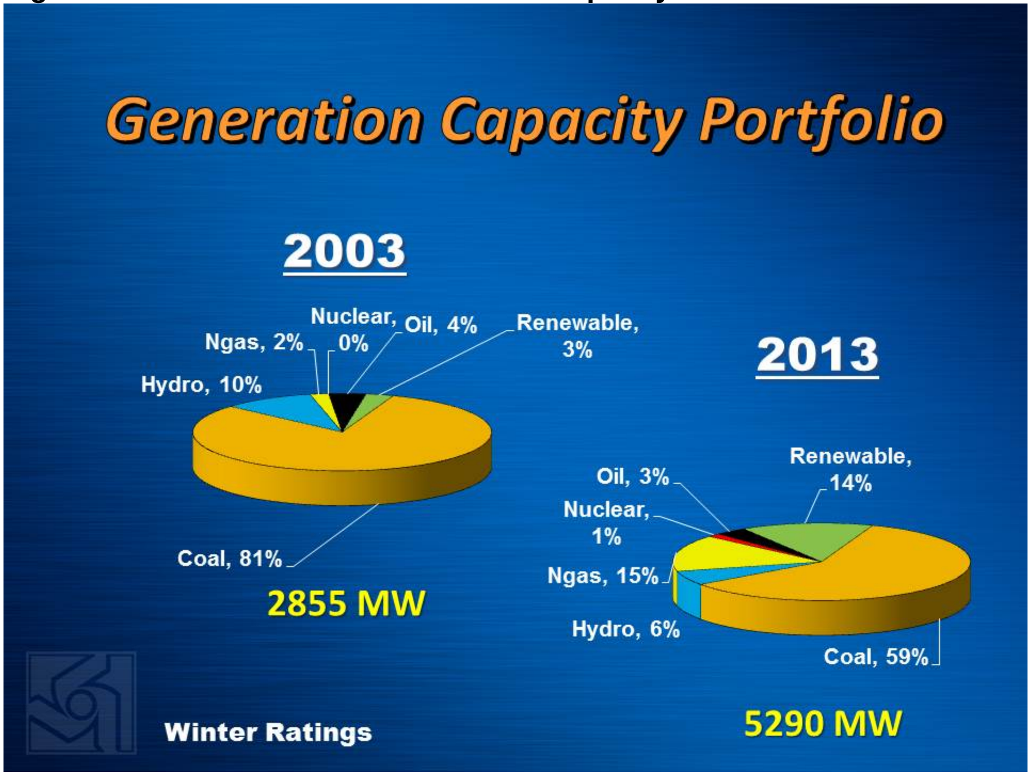
The purpose of the AVS to Neset Transmission Project is to increase high voltage transmission line system reliability and the transmission load-serving capacity in the region. The project would allow electricity currently being produced by Basin Electric and the other generation facilities interconnected to the IS to be effectively delivered to northwest North Dakota.

Western continually evaluates the IS and determines the necessary requirements to continue the efficient and reliable operation of the transmission system. As a result of the growth in the northwest North Dakota region, it is reasonably foreseeable that additional power generation facilities may be necessary to provide voltage support for the reliable operation of the transmission system. For practical reasons, any additional facilities would be anticipated to be natural gas-fired electrical generation and located in areas that would not be environmentally sensitive. All additional facilities would be evaluated through the North Dakota state siting process. Any additional generation requirements and their locations, although likely, cannot be identified at this time. The contribution of these future facilities to the cumulative impacts throughout the region, while anticipated to be similar to those discussed previously for the Pioneer and Lonesome Creek facilities, are unknown at this time.

The AVS 345-kV Substation, located at the AVS generation facility, near Beulah, North Dakota has developed over the years as a hub for the flow of electricity into the northwest North Dakota region. The AVS 345-kV Substation is electrically interconnected with multiple generation resources that are owned by the various owners of generation resources within the IS system. These multiple generation sources of electrical power include natural gas, coal- and oil-fired generation, hydroelectric facilities, and renewable generation sources such as wind and waste heat recovery. These regional power generation resources will be managed by the IS in such a way to provide reliable power from the IS transmission system to the proposed new AVS to Neset Transmission Project.

In sum, the AVS to Neset Transmission Project's interconnection to the AVS 345-kV Substation would not increase additional air emissions from the AVS generation facility because the AVS generation facility operates near full capacity and does not have operating reserves to generate more power from either a capacity or availability perspective. Historically, the two units at the AVS generation facility typically operate at their full available output, in full compliance with their operating permits. Further, there could be a minor increase in air emissions from the existing power generation facilities operated by Basin Electric, of which AVS is a part, or from the other generation facilities interconnected with the IS transmission system that currently support the existing loads and to serve the projected load growth in Basin Electric's service territory. As noted in Figure 4-1, between 2003 and 2012, as demand for power continued to increase in Basin Electric's service area, Basin Electric modified its mix of power generation production to include a higher percentage of generation from renewables (primarily wind), nuclear, and natural gas, as opposed to coal, to reduce GHG emission sources.

Figure 4-1: Basin Electric Generation Capacity Sources 2003 Versus 2013



Source: Basin Electric, 2014

Air Emissions from Bakken Oil and Gas Development

As noted above, the northwest region of North Dakota has seen rapid oil and gas growth in recent years and as such emissions of criteria pollutants and GHGs are occurring from oil and gas development, especially where there is methane flaring. Primary emissions associated with this oil and gas development come from the operation of drilling rigs and associated flaring and vehicle emissions leading to the increase in the discharge of CO_2, NO_2, and particulates. Although impacts from flaring are occurring, there are also efforts to reduce the extent of impacts. To control emissions associated with this development and to curb potential impacts associated with the construction and operation of drilling rigs and vehicle transit, the North Dakota State Department of Health and Consolidated Laboratories adopted rules specific to the oil and gas production industry as detailed in "Control of Emissions from Oil and Gas Production Facilities", Chapter 33-15-20, of the North Dakota Air Pollution Control Rules (Story, undated). These regulations allow for natural gas produced from an oil well to be flared for a one-year period from the date of first production on the well. Flaring may continue on these wells past the one-year period but requires either the payment of royalties or the granting of an exemption based on proof that gathering and collecting the natural gas is economically infeasible or that a market for the natural gas does not exist. In addition to regulations, incentives are also in place for oil and gas producers to use gas capturing infrastructure as opposed to flaring. As a result, development of natural gas gathering and processing infrastructure is ongoing with more than $4 billion either being expended or committed by the oil and gas industry leading to the increase in the percentage of natural gas captured to 85 percent, from 70 percent in the next two years (North Dakota Pipeline Authority, undated; North Dakota Petroleum Council, 2014). In the event that flaring of gas wells ceases and gas is then collected, impacts to air quality as a result of oil and gas development would shift and occur as a result of electrical generation as opposed to flaring; while impacts would still occur they would be greatly reduced. In addition to rules and regulations put in place to minimize impacts, air quality in the region is generally considered good and there are no nearby non-attainment areas in the vicinity of the oil and gas development. Therefore while oil and gas development in northwest North Dakota has led to an increase in the release of criteria pollutants, it currently has not led to a violation of NAAQS or other applicable air quality standards. Continued oil and gas development and flaring are anticipated to occur and potentially could increase with the availability of new infrastructure. This continued development would continue to lead to adverse impacts to air quality in the region. However, it is anticipated that with current regulations in place, impacts would not reach a significant level and would not lead to a violation of NAAQS. While overall combined construction activities of the proposed project and further construction and operational activities associated with oil and gas production would increase the level of exhaust emissions, fugitive dust, and other construction-related emissions above the current levels, it is not anticipated that the construction and operation of the project would appreciably affect the area's overall air quality and would be an incremental minor contributor when compared to the emissions associated with oil and gas production. Therefore, the proposed project would not cause adverse cumulative effects to air quality nor would it have a noticeable impact on global GHG emissions.

4.4.3 Geology and Soils

The spatial boundary for cumulative impacts on geology and soils includes the area within the proposed 150-foot utility line ROW and additional areas of land disturbance associated with the substations. The temporal boundary for cumulative impacts on geology and soils is 50 years, taking into account the anticipated continued development of the Bakken field.

The various pipeline and transmission line projects would result in temporary disturbances to soils with intensities in excess of disturbances associated with normal agricultural activities. Following the construction period, soils within the majority of the ROW would still be available for the same agricultural or grazing uses that occurred prior to construction. Permanent conversion would occur in the area of substations, natural gas processing plants, transmission towers, and road projects. The proposed project would contribute to a minor amount of soil disturbance in the ROW and would cause permanent conversion at the locations of transmission towers. However, the amount of permanent soil disturbance for construction of the transmission line is estimated to be minimal. Permanent disturbances would be as follows: 1.4 acres for Alternative C, 1.3 acres for Alternative D, and 1.6 acres for Alternative E. For the substations, the amount of permanent soil disturbance is estimated to be 73 acres under Alternative C and

85 acres under Alternatives D or E. Taken within the cumulative context of impacts on geology and soils occurring within the entire ROW, these amounts would not contribute to adverse cumulative effects on soils and would contribute only incrementally to prime farmland conversion in the region.

4.4.4 Water Resources

Groundwater

Cumulative impact boundaries are not applicable to groundwater resources for the following reasons.

The numerous drilling activities occurring in and around the project area, in addition to the associated development activities, are affecting groundwater supply and quality. As long as the Bakken field continues to develop, these impacts will occur regardless of whether the transmission line is built. Since the construction of the project does not have any direct impacts on groundwater resources, it also does not contribute to direct cumulative impacts on groundwater resources.

Cumulative impacts on groundwater quality from spills are expected to be negligible due to the comprehensive and immediate clean-up requirements for industry. However, since the project would support further development activities within the Bakken field, indirect cumulative impacts on groundwater supply and quality may exist but the project’s contribution to these impacts is expected to be minimal.

Surface Water

The spatial boundary for cumulative impacts on surface water resources includes surface waters in the Upper Missouri River/Lake Sakakawea, Knife River, Little Missouri River, and Little Muddy River sub-basins. The temporal boundary for cumulative impacts on is 50 years taking into account the anticipated continued development of the Bakken field.

Pipeline and associated facility construction projects and private agricultural activities in the project area have contributed to negative impacts on surface water resources. These impacts have occurred primarily through erosion and sedimentation related to crop cultivation and road construction, runoff from agricultural areas, and wastewater pollution. Construction of the transmission line would use onsite erosion and sedimentation controls to prevent any direct cumulative effects on surface water quality.

Existing commercial and industrial development projects have affected the surface water supply primarily through drinking water and sewage water treatment, but also through the use of surface water in industrial activities. As long as the Bakken field continues to develop, these impacts will occur regardless of whether or not the proposed project is built. The transmission line alone would not create new demands for water, and therefore would not contribute to direct cumulative impacts on surface water supply.

Because the project would support further development activities within the Bakken field, indirect cumulative impacts on surface water supply and quality may exist but the project's contribution to these impacts is expected to be minimal.

Floodplains

The spatial boundary for the cumulative impacts on surface water resources includes all floodplains within the project area. The temporal boundary for cumulative impacts on surface water resources is 50 years, taking into account the anticipated continued development of the Bakken field.

Construction activities in floodplains within the project area occur primarily as linear facilities (pipelines, transmission lines, and roads). As long as the Bakken field continues to develop, impacts resulting from these activities will occur regardless of whether the proposed project is built. The transmission line construction would span floodplains where possible, which would not facilitate floodplain development. Therefore, direct cumulative effects would be minimal.

Since the project would support further development activities within the Bakken field, indirect cumulative impacts on floodplains may exist but the project's contribution to these impacts is expected to be minimal.

4.4.5 Biological Resources

Vegetation

While most natural vegetation has been converted to agricultural lands, extensive areas of the study area, including the Missouri Plateau, Little Missouri Badlands, and River Breaks ecological subregions retain their native vegetation. Most of the Glaciated Dark Brown Prairie, Missouri Coteau Slope, and Northern Missouri Coteau Slope have been converted to agriculture. Non-agricultural related vegetation disturbance in the study area is due mainly to oil and gas development activities, and the associated residential/community development; transportation; and utility development activities. Development and production of oil, particularly from the Bakken and Three Forks formations, has rapidly elevated North Dakota to one of the nation's leaders in oil production. Recent and planned projects in the region are discussed in Section 4.3.

Most of these development activities permanently convert vegetated acreage to non-vegetated residential or industrial land uses. Transmission lines and pipelines are the exceptions; they retain vegetative cover or revegetate after disturbance. However, to maintain and ensure the safety and reliability of these structures, forested areas or areas of dense shrubby vegetation are cleared and converted to grasslands. Increased traffic in the study area has also increased the number of noxious weeds found and their coverage. Increases in oil and gas development activities and the associated residential/community development, transportation, and power development activities are expected to occur in the study area for the foreseeable future.

The proposed project would result in short-term impacts on vegetation that is temporarily disturbed during the construction phase, including construction access trails. Long-term impacts on vegetation would be limited to the permanent conversion of vegetated lands to utility land uses (transmission structures, substations, and switchyards), conversion of forested or wooded vegetated cover to herbaceous cover, and disturbance related to maintenance activities (mowing, herbicide application, tree trimming, and danger tree removal).

Alternative C is expected to result in temporary disturbance of up to approximately 4,957 acres of vegetation during construction, permanent conversion of up to approximately 183 acres of forested vegetation to herbaceous vegetation, and permanent conversion of up to approximately 75 acres of vegetated land to transmission structure sites, substation sites, and a switchyard. Alternative D is expected to result in temporary disturbance of up to approximately 4,459 acres of vegetation during construction, permanent conversion of up to approximately 120 acres of forested vegetation to herbaceous vegetation, and permanent conversion of up to approximately 86 acres of vegetated land to transmission structure sites, substation sites, and a switchyard. Alternative E is expected to result in temporary disturbance of up to approximately 5,597 acres of vegetation during construction, permanent conversion of up to approximately 189 acres of forested vegetation to herbaceous vegetation, and permanent conversion of up to approximately 88 acres of vegetated land to transmission structure sites, substation sites, and a switchyard.

Given that the majority of the impacts on vegetation from the proposed project are short term, the contribution to direct cumulative effects on vegetation is minimal given the magnitude of permanent land conversion associated with oil and gas, residential, community, and transportation development activities. Construction BMPs would be implemented to avoid the spread of noxious weeds in the ROW; therefore, the project is not expected to have a direct cumulative effect on the spread of noxious weeds. Because the proposed project would support further development in the study area, indirect cumulative impacts on vegetation are likely to occur; however, the project's contribution to these impacts is expected to be minimal.

Wetlands

About half of the 5 million acres of wetlands originally present in North Dakota have been lost. Most of these wetlands were in the prairie pothole area. In the study area, prairie potholes are not common but are most likely to occur in the Northwestern Glaciated Plains (Northern Missouri Coteau and Glaciated Dark Brown Prairie ecoregions). Most historic wetland loss in this region was due to draining and conversion for crop production. Current and future wetland loss in the study area is primarily associated with oil and gas, residential, community, and transportation development. However, the high cost of permitting and mitigating impacts on wetlands and other waterbodies under the CWA often provides an incentive to avoid or minimize impacts on these areas. The CWA permitting process considers the effect of cumulative impacts and, in most cases, requires mitigation for impacts on wetlands or other waterbodies.

Under Alternatives C, D, and E there is an anticipated impact to an estimated 0.02-acre of forested wetland, which would result in conversion from a forested wetland to an herbaceous wetland. It is not known how many, if any, low-water crossings or culverts would be needed for each alternative. However, culverts and water crossings would only be installed for construction and would be removed when construction is completed. No permanent fill of wetlands is anticipated as part of construction for the project. Wetland and stream crossings would only be allowed during dry periods or at designated crossing locations. The impacts on wetlands and other waterbodies would not be known for certain until a jurisdictional wetland delineation identifies wetlands and other waterbodies regulated under the CWA and there is a final design for the transmission line. However, the proposed project would avoid wetlands impacts when possible and minimize impacts when they are unavoidable. Wetland impacts associated with the project would be minimal, if they occur at all, and would not measurably add to the cumulative effects on wetlands. Because the proposed project would support further development in the study area, indirect cumulative impacts on wetlands are likely to occur; however, the project's contribution to these impacts is expected to be minimal.

Wildlife

Alternatives C, D, and E have the potential to affect undisturbed badland habitat. The less common wildlife species in this area, including elk, bighorn sheep, and mountain lion are associated with the Little Missouri Badlands. The proposed project crosses this ecoregion east of TRNP near the U.S. Highway 85 corridor. Disturbance to sensitive mammals can be minimized by using an existing corridor in this area and restricting activity from April 1 to July 1 when big horn sheep are giving birth.

These species are currently experiencing negative impacts from oil and gas development in North Dakota. Elk have been shown to avoid active oil and gas development areas (NDGFD 2011c). In 2010 approximately 296 and 548 acres within bighorn primary and secondary range, respectively, had been lost from the construction of well pads, an increase of 72 and 81 percent respectively, since 1995 (NDGFD, 2011c). NDDMR projects that up to 5,990 new wells will be drilled in oil fields encompassing bighorn range within the next 10 years (NDGFD, 2011c), which includes all infrastructure development at the Bakken Field. This transmission line, plus other oil and gas development would continue to fragment wildlife habitats.

The areas along the Missouri River, Little Missouri River, and Lake Sakakawea are a primary golden eagle habitat area. By crossing the far upper end of this Missouri River habitat, the proposed project would avoid contributing to cumulative impacts on this species. Golden eagle electrocution rates are twice as frequent as bald eagles because of their propensity to perch on utility poles situated in grassland (NDGFD, 2011c). Additional distribution lines in the eagle range would increase the likelihood of eagle electrocutions; however, appropriate avian protection measures could be installed on distribution lines to mitigate potential impacts. Avian protection design features would be incorporated into the design of the transmission line and associated facilities to minimize impacts on golden eagles, other raptors, and other types of birds. These features along with other avian BMPs would be described in Basin Electric's Avian Protection Plan.

Alternative C is expected to result in temporary disturbances of up to approximately 4,957 acres of vegetation during construction, permanent conversion of up to approximately 183 acres of forested vegetation to herbaceous vegetation, and permanent conversion of up to approximately 75 acres of vegetated land to transmission structure sites, substation sites, and a switchyard. Alternative D is expected to result in temporary disturbances of up to approximately 4,459 acres of vegetation during construction, permanent conversion of up to approximately 120 acres of forested vegetation to herbaceous vegetation, and permanent conversion of up to approximately 86 acres of vegetated land to transmission structure sites, substation sites, and a switchyard. Alternative E is expected to result in temporary disturbances of up to approximately 5,597 acres of vegetation during construction, permanent conversion of up to approximately 189 acres of forested vegetation to herbaceous vegetation, and permanent conversion of up to approximately 88 acres of vegetated land to transmission structure sites, substation sites, and a switchyard.

The proposed project would cause an increase in habitat fragmentation and edge effects, but this increase is expected to be slight due to the overall homogeneity of the ROW and lack of maintained roads between structures. The proposed project would cause some temporary and permanent displacement of wildlife into adjacent habitats and may result in an increase in vehicular-related mortality during the construction period. However, the proposed project is not expected to contribute significantly to the cumulative effects on wildlife given the scale of other development activities and the mitigation measures proposed for this project. Because the proposed project would support further development in the study area, indirect cumulative impacts on wildlife are likely to occur from additional development in the area; however, the project's contribution to these impacts is expected to be minimal.

Special Status Species

Black-footed Ferret—Black-footed ferrets are a federally listed endangered species that depend on prairie dog colonies as a source of food and shelter (USFWS, 1989). The black-footed ferret was thought to be extirpated in the wild from 1987 until 1991, when 49 captive animals were reintroduced into the wild in Wyoming. Since then, ferrets have been reintroduced into Montana, South Dakota, Colorado, and Arizona and are reproducing in the wild. The majority of unconfirmed sightings from North Dakota come from the southwest part of the state (USFWS, 2011c). There are no confirmed reports of black-footed ferrets in North Dakota and there are no known prairie dog towns (primary habitat for the species) near the proposed project; therefore, impacts of any kind are not expected. The proposed project is not expected to have direct cumulative effects on the black-footed ferret. Because the proposed project would support further development in the study area, it would not impact any adjacent prairie dog towns, which would make the future reintroduction of black-footed ferrets in this region of North Dakota non-viable.

Dakota Skipper—No known populations of Dakota skipper or suitable or critical habitats occur within the area evaluated in the BA.[21] The proposed project is not expected to add further cumulative stressors to the species during its implementation as a result of increased noise, direct impacts, or other factors that may impact the species. Because the proposed project would support further development in the study area, direct cumulative impacts on Dakota skipper may occur; however, the project's contribution to these impacts may affect this species, but it is not likely to adversely affect the Dakota skipper.

Gray Wolf—Historically, the gray wolf occurred throughout the lower 48 U.S. states except for the southeast and the deserts of the southwest (USFWS, 2011d). The gray wolf was listed as endangered on March 9, 1978, in the lower 48 U.S. states (except Minnesota) (USFWS, 1987). In North Dakota, the gray wolf has been recently de-listed in the region east of the Missouri River from the South Dakota border to Lake Sakakawea and east of the center line of U.S. Highway 83 to the Canadian border. There are no known wolf packs or breeding groups in North Dakota. Wolves seen in North Dakota are likely animals dispersing from established populations in Minnesota and Canada (USFWS, 2012d). Wolves from these areas would have crossed under hundreds of overhead transmission lines of different sizes and configurations if they were to be found within the area evaluated in the BA; therefore, it appears that there are no known limitations to movement from transmission lines on wolves. No direct, indirect, or cumulative effects to wolves are anticipated.

Interior Least Tern—Historically, the least tern was found on the Atlantic, Gulf of Mexico, and California coasts and on the Mississippi, Missouri, and Rio Grande river systems. It was found throughout the Missouri River system in North Dakota. The interior population of the least tern presently breeds in the Mississippi, Missouri, and Rio Grande river systems. The interior population of least terns was listed as endangered on June 27, 1985 (50 *Federal Register* 21784 21792). Nesting least terns mainly use sandbars within the free-flowing sections of the Missouri and Yellowstone rivers in North Dakota and to a lesser extent, islands and shorelines of both Missouri River reservoirs (Lake Sakakawea and Lake Oahe) in North Dakota (USFWS, 1990, 2011e). Habitat for this species in the proposed ROW would be limited to the area that crosses

[21] The Biological Assessment evaluates impacts to different species within a specified "action area." The size of these action areas are specific to each species, but in general are similar to the area encompassing the ROW. For more information on the action area evaluated for each species, please refer to Biological Assessment for the AVS to Neset Transmission Project.

the Missouri River west of Williston, which is also designated critical habitat for the piping plover. The proposed project crosses the Missouri River, the only suitable habitat for the species along the route, just upstream of the U.S. Highway 85 bridge crossing and an existing transmission line crossing. The bridge, as currently built, can act as a dam and pool water behind it during high flows. In addition, the bridge funnels water through one set opening and prevents the river from naturally migrating and forming sandbars and side channels. Regular car and truck traffic over the bridge contribute to the current ambient noise levels and other human impacts. The proposed project would have line markings at the river crossing, minimizing any further potential for collision risk to the species when compared to what is already in place from the existing line crossing. The proposed project area does not currently have any potential nesting structure (i.e., bare sand islands) near it and the closest nesting recently was in 1994, approximately 5 miles downstream (Basin Electric and USFS, 2013). While the proposed project may affect this species, it is not likely to adversely affect the least tern because further impacts to the channel configuration and flow, noise levels, or other human impacts to the species would not occur. No significant direct cumulative effects to the least tern are anticipated. Conditions and mitigation measures imposed by USFWS, such as restricting construction during the nesting season would eliminate or substantially reduce any potential direct cumulative effects on this species. Therefore, no indirect or significant cumulative impacts on interior least tern are anticipated to occur from development in the area.

Pallid Sturgeon—Alternatives C, D, and E cross the Missouri River, known habitat for the pallid sturgeon, while paralleling U.S. Highway 85 near Williston. Habitat for the pallid sturgeon within the study area includes the upper reaches of the Missouri River and backwater floodplain areas. Impacts on sturgeon habitat are expected to be minimal and limited to sedimentation not controlled by implementation of BMPs. Therefore, the proposed project is expected to have no direct cumulative effects on pallid sturgeon. However, because the proposed project would support further development in the study area, indirect cumulative impacts on pallid sturgeon may occur, but the project's contribution to these impacts is expected to be minimal.

Piping Plover—The proposed project crosses the Missouri River just upstream of the U.S. Highway 85 bridge crossing and an existing transmission line crossing. This is the main area of suitable piping plover habitat crossed by the proposed project, but other wetland areas greater than 3 hectares are also crossed or within the area evaluated in the BA that could be suitable habitat under various water regimes (e.g., during dry years when bare beach/bar is exposed). The bridge as currently built can act as a dam and pool water behind it during high flows. In addition, the bridge funnels water through one set opening and prevents the river from naturally migrating and forming sandbars and side channels. Regular car and truck traffic over the bridge contributes to the current ambient noise levels and other human impacts. The proposed project would not place any poles within wetlands or the Missouri River or other river, minimizing potential direct impacts on piping plovers. The proposed project would have line markings near all wetland areas, minimizing any potential for collision risk to the species when compared to what is already in place from the existing line crossing over the Missouri River and other lines in the region. The proposed project area does not currently contain any potential nesting structures (i.e., bare sand islands) at the Missouri River crossing and there has been no known nesting near the line in other locations. The proposed project would not result in further impacts on the channel configuration at the Missouri River, would not place structures in wetlands, and would not contribute to increased noise levels or other human impacts on the species. While this project may directly affect this species, it is not likely to adversely affect the piping plover. Also, no indirect or significant cumulative effects to the piping plover are anticipated.

Alternatives C, D, and E each contain 64.8 acres of critical habitat within the ROW for the piping plover. The proposed Project crosses the Missouri River, an area of designated critical habitat, just upstream of the U.S. Highway 85 bridge crossing and an existing transmission line crossing. While the project is within the overall boundary of designated critical habitat for the piping plover, no structures will be placed in any of the primary constituent elements of critical habitat. As currently delineated, the critical habitat for the Missouri River includes all areas within the floodplain, including trees, farms, roads, and other areas of "non-habitat". Given the location of the proposed Project in relation to the U.S. Highway 85 bridge, the river through this area is largely confined to the current channels, and while a sandbar may form within the current open water channel it is unlikely that the river will migrate extensively. The proposed project will not result in further impacts to the floodplain in this area. No other areas of critical habitat are near the area evaluated in the BA. While this project may directly affect this species, it is not likely to adversely affect piping plover designated critical habitat. Also, no indirect or significant cumulative effects are anticipated to piping plover critical habitat.

Rufa red knot—Suitable habitat for the rufa red knot may occur within the proposed ROW in areas of perennial streams (e.g., the Missouri River). The proposed project's alternatives are expected to increase the potential risk of collision for this species during their local foraging or migration flights. However, these impacts are mitigated by the installation of visual line marking devices on the static wires of the proposed new transmission line. Therefore, this project may affect, but is not likely to adversely affect the rufa red knot.

Sprague's Pipit—Suitable habitat for the Sprague's pipit may occur within the proposed ROW in areas of native prairie. The Sprague's pipit population has been declining throughout their range, but more so in Canada than in the United States. Within the proposed project region (western North Dakota) and within the area evaluated in the BA, significant oil and gas development, infrastructure to advance this development, and agriculture have historically and currently impacted suitable habitat for the species. Sprague's pipits are most susceptible to habitat fragmentation. While it is unknown if transmission line poles cause displacement, the wide spacing and overall small footprint of each structure would minimize the potential for displacement impacts. No established road would be maintained between structures, and any temporary impacts would be returned to their native state quickly through natural seed bank and sod maintenance. The addition of corona should not add considerably to the natural sound levels when pipits are actively calling and establishing territories given most corona noise occurs during rain/snow conditions.

The addition of the proposed project would result in one additional hazard to the Sprague's pipit population during their nesting period in North Dakota and spring and fall migrations, but with implementation of the line marking, this cumulative effect would be minimized. Conditions and mitigation measures imposed by USFWS and USFS or outlined in Basin Electric's Avian Protection Plan would eliminate or substantially reduce any direct cumulative effects on this species. Because the proposed project would support further development in the study area, indirect cumulative impacts on Sprague's pipit may occur; however, the project's contribution to these impacts is expected to be minimal, but is not likely to adversely affect this species.

Whooping Crane—The Aransas-Wood Buffalo population of whooping cranes has been steadily increasing since a low of 15 in the 1940s to a population of nearly 300 in 2011 (Basin Electric and USFS, 2013). However, even with this increase the population is far below the population level needed for recovery (Western, 2014). This increase in population occurred under the current conditions of existing transmission lines and distribution lines and other hazards within the species migratory corridor. Although critical habitat for the whooping crane has not been designated in North Dakota; all of the study area is within the whooping crane migration corridor and contains habitat types that whooping cranes use for foraging and roosting. This migration corridor provides the area within which whooping cranes can be expected to occur during spring and fall migration periods. While crane occurrence at any particular location within the corridor would vary from year to year based on weather conditions and associated availability of water, wetlands, and crop stages, over time, the greatest crane occurrence and use would trend toward the core of the migration corridor. Approximately 278, 251, and 314 miles of Alternatives C, D, and E, respectively, lie within the migration corridor. The greatest potential for interaction with the proposed project would occur where areas identified as wetland stop-over habitat (staging areas) are located between the transmission line and agricultural lands used as foraging areas. Existing transmission lines in Williams County, especially in the Missouri Coteau Slope Ecoregion on the edge of the prairie pothole region, may be having effects on the whooping crane. The addition of the proposed project would result in one additional hazard to the whooping crane population during their spring and fall migrations, but with implementation of line marking, this cumulative effect would be minimized. Conservation and minimization measures imposed by USFWS would eliminate or substantially reduce any direct cumulative effects on this species. Because the proposed project would support further development in the study area, indirect cumulative impacts on whooping cranes may occur, which may affect this species. However, the project's contribution to these impacts is expected to be minimal and this project not likely to adversely affect whopping cranes.

Northern Long-eared Bat—This medium-sized bat (3 to 3.7 inches long) is insectivorous and uses different roost sites during different seasons. In winter, the northern long-eared bat typically hibernates in caves and mines. In the summer months, this bat relies less on caves and more on old growth and late successional forests for roosts and reproduction, because it roosts under the bark of dead and dying trees. Old and mature forests provide habitat (decaying trees, loose bark, tree snags, and stumps) for roosting, feeding, and maternity colonies of northern long-eared bats. In addition, the northern long-eared bat is also known to roost in buildings (NatureServe, 2013; USFWS, 2013). The northern long-eared bat is a generalist predator of aerial invertebrates (Center for Biological Diversity, 2010; NatureServe, 2013). It forages at night in forested areas, riparian zones, along forest edges, and in clearings. In the Badlands region of South Dakota, this species is known to forage in wooded riparian zones in lower elevations and in dense forest at higher elevations (Center for Biological Diversity, 2010). To decrease direct impacts on the species during construction, proposed construction activities within 1,000 feet of suitable hibernacula would be avoided during the winter hibernation period (roughly late fall to early spring). Suitable hibernacula include caves and mines meeting the typical description given in the proposed listing (i.e., large caves or mines with large passages and entrances; constant temperatures; and high humidity with no air currents [USFWS 2013]). In addition to avoiding hibernacula during construction, all mature, dead, or dying trees would be left intact, where not a safety concern for line reliability. This may help to protect foraging, roosting, and maternity sites. Within the proposed project region (North Dakota), significant coal, oil, and gas development; infrastructure to advance this development; and agriculture have historically and currently impacted the forested and riparian habitat that the northern long-eared bat uses for foraging and roosting. North Dakota has no known hibernacula to date, but in other areas of the country, human disturbance of hibernacula and hibernating bats also continue to threaten populations. Such disturbance occurs in the form of cave commercialization, recreational caving, vandalism, and research-related activities. The species is also susceptible to White-nose Syndrome. Climate change is also expected to impact the northern long-eared bat, although these effects are not well understood. Climate change models have been used to investigate the range expansion of the little brown bat; such range shifts could also be used to predict the range shifts of other bat species (Humphries et al., 2002). While it is unknown if transmission line poles cause displacement, the proper siting of each structure, away from foraging, roosting, and hibernacula sites would minimize the potential for displacement impacts. The addition of corona should not add considerably to the natural sound levels when bats are flying, because most corona effect noise occurs during rain/snow. Since the proposed project would support further development in the study area, indirect cumulative impacts on northern long-eared bat may affect this species. However, this project is not likely to adversely affect the northern long-eared bat.

Baird's Sparrow—Baird's sparrow is a small bird that lives almost exclusively in native prairie areas within the northern Great Plains. Habitat for Baird's sparrows is found in the northwestern and the east-central parts of the North Dakota (Missouri Coteau). Baird's sparrows can also be found nesting east of the Lake Sakakawea/Missouri River area (USFWS, 2012h). Suitable habitat for Baird's sparrow may occur within the proposed ROW in areas of native prairie in the LMNG. It is expected that conditions and mitigation measures imposed by USFS in the SUP and outlined in Basin Electric's Avian Protection Plan will eliminate or substantially reduce any direct cumulative effects on this species. The proposed project, in combination with other development projects in the region, increases the potential for loss of individuals of sensitive bird species due to the increased risk of collision with the proposed transmission line and other development structures on the LMNG and in the region. To minimize the potential for loss, Basin Electric has designed the proposed project to meet the requirements for the protection of avian species from electrocution and line strikes according to the guidelines in APLIC's "Reducing Avian Collisions with Power Lines: The State of the Art in 2012" (APLIC, 2012). In addition, sensitive species that have been threatened by loss of grassland habitat, including Baird's sparrow, would continue to lose habitat in the region as a result of the various development projects; however, the contribution of the proposed project to grassland habitat loss on the LMNG would be minimal. It is expected that conditions and mitigation measures imposed by USFS in the SUP and outlined in Basin Electric's Avian Protection Plan will eliminate or substantially reduce any direct cumulative effects on this species. Because the proposed project would support further development in the study area, indirect cumulative impacts on Baird's sparrow may occur; however, the project's contribution to these impacts is expected to be minimal.

Bald Eagle—Bald eagles historically occurred throughout the United States and Canada, but experienced a dramatic population decline between the 1870s and the 1970s. Populations have since rebounded and there are breeding populations in all of the lower 48 states and Alaska (USFWS, 2007c). Nesting and foraging habitat may exist for the bald eagle within the proposed ROW, especially in the vicinity of the Missouri River crossing. The proposed project, in combination with other development projects in the region, increases the potential for loss of individuals due to the increase risk of collision with the proposed transmission line and other development structures on the LMNG and in the region. To minimize the potential for loss, Basin Electric has designed the proposed project to meet the requirements for the protection of avian species from electrocution and line strikes according to the APLIC guidelines (APLIC, 2006). In addition, sensitive species that have been threatened by loss of grassland habitat, including the bald eagle, would continue to lose habitat in the region as a result of the various development projects; however, the contribution of the proposed project to grassland habitat loss on the LMNG would be minimal. It is expected that conditions and mitigation measures imposed by USFS in the SUP and outlined in Basin Electric's Avian Protection Plan will eliminate or substantially reduce any direct cumulative effects on this species. Because the proposed project would support further development in the study area, indirect cumulative impacts on bald eagles may occur; however, the project's contribution to these impacts is expected to be minimal.

Burrowing Owl—The burrowing owl is a grassland specialist distributed throughout western North America, primarily in open areas with short vegetation. It is known to occur in the LMNG and could occur in native and non-native grasslands in the proposed ROW (USFS, 2002). It is expected that conditions and mitigation measures imposed by USFS in the SUP and outlined in Basin Electric's Avian Protection Plan will eliminate or substantially reduce any direct cumulative effects on this species from the proposed project. Sensitive species that have been threatened by loss of grassland habitat, including the burrowing owl, would continue to lose habitat in the region as a result of the various development projects; however, the contribution of the proposed project to grassland habitat loss on the LMNG would be minimal. Because the proposed project would support further development in the study area, indirect cumulative impacts on burrowing owl may occur; however, the project's contribution to these impacts is expected to be minimal.

Greater Prairie-chicken—Greater prairie-chickens are endemic to the grassland habitats of the central and eastern United States. Breeding populations of greater prairie chicken are known from Grand Forks County and Sheyenne National Grasslands in North Dakota (USFWS, 2012i). Since the greater prairie-chicken is not known from the project counties, no direct or indirect cumulative effects are expected. However, it is expected that conditions and mitigation measures imposed by USFS in the SUP and outlined in Basin Electric's Avian Protection Plan will eliminate or substantially reduce any direct cumulative effects on this species if it is present in the proposed ROW. Because the proposed project would support further development in the study area, indirect cumulative impacts on greater prairie-chicken may occur; however, the project's contribution to these impacts is expected to be minimal.

Plains Sharp-tailed Grouse—Sharp-tailed grouse inhabit high-structure grasslands from Alaska east to Hudson Bay and south to Utah, northeastern New Mexico, and Michigan. The plains sharp-tailed grouse is a MIS for high-structure grasslands in the LMNG in the northern region and may occur in grasslands within the proposed ROW (USFS, 2001). It is expected that conditions and mitigation measures imposed by USFS in the SUP and outlined in Basin Electric's Avian Protection Plan would eliminate or substantially reduce any direct cumulative effects on this species from the proposed project. Sensitive species that have been threatened by loss of grassland habitat, including the plains sharp-tailed grouse, would continue to lose habitat in the region as a result of the various development projects; however, the contribution of the proposed project to grassland habitat loss on the LMNG would be minimal. Currently NDGFD is conducting a research study to understand the impacts of oil and gas development on the ecology of sharp-tailed grouse, to ensure the future of grouse populations in North Dakota (NDGFD, 2011c). Additional negative effects impacting grouse include increased loss of the Conservation Reserve Program, conversion of native grasslands, potential impacts of wind development, and over-utilization of grasslands by livestock producers (NDGFD, 2011c). Because the proposed project would support further development in the study area, indirect cumulative impacts on plains sharp-tailed grouse may occur; however, the project's contribution to these impacts is expected to be minimal.

Greater Sage-grouse—The greater sage-grouse is an obligate user of several species of sagebrush. Sage-grouse is only known or believed to occur in North Dakota in Bowman, Golden Valley, and Slope counties (USFWS, 2012j). Therefore, no direct or indirect effects on sage-grouse are expected. However, conditions and mitigation measures imposed by USFWS and USFS, and outlined in Basin Electric's Avian Protection Plan would eliminate or substantially reduce any direct cumulative effects on this species if it is present in the proposed ROW. Because the proposed project would support further development in the study area, indirect cumulative impacts on greater sage-grouse may occur; however, the project's contribution to these impacts is expected to be minimal.

Loggerhead Shrike—Loggerhead shrikes occupy a wide variety of open habitats including native and non-native grasslands, sage scrub, and other areas with a sparse coverage of bushes and trees and bare ground. Loggerhead shrikes are known to breed throughout North Dakota and are fairly common throughout the state, except in the Red River Valley (USGS-NPWRC, 1995). The proposed project, in combination with other development projects in the region, would increase the potential for loss of individuals of sensitive bird species due to the increased risk of collision with the proposed transmission line and other development structures on the LMNG and in the region. To minimize the potential for loss, Basin Electric has designed the proposed project to meet the requirements for the protection of avian species from electrocution and line strikes according to the APLIC guidelines (APLIC, 2006, 2012). In addition, sensitive species that have been threatened by loss of grassland habitat, including the loggerhead shrike, would continue to lose habitat in the region as a result of the various development projects; however, the contribution of the proposed project to grassland habitat loss on the LMNG would be minimal. Conditions and mitigation measures imposed by USFS in the SUP and outlined in Basin Electric's Avian Protection Plan would eliminate or substantially reduce any direct cumulative effects on this species. Because the proposed project would support further development in the study area, indirect cumulative impacts on loggerhead shrike may occur; however, the project's contribution to these impacts is expected to be minimal.

Long-billed Curlew—The long-billed curlew is the largest North American shorebird. It is known to breed in southwestern North Dakota, but is considered uncommon (USGS-NPWRC, 2006a). The proposed project, in combination with other development projects in the region, would increase the potential for loss of individuals of sensitive bird species due to the increased risk of collision with the proposed transmission line and other development structures on the LMNG and in the region. To minimize the potential for loss, Basin Electric has designed the proposed project to meet the requirements for the protection of avian species from electrocution and line strikes according to APLIC guidelines (APLIC, 2006, 2012). In addition, sensitive species that have been threatened by loss of grassland habitat, including the long-billed curlew, would continue to lose habitat in the region as a result of the various development projects; however, the contribution of the proposed project to grassland habitat loss on the LMNG would be minimal. Conditions and mitigation measures imposed by USFS in the SUP and outlined in Basin Electric's Avian Protection Plan would eliminate or substantially reduce any direct cumulative effects on this species. Because the proposed project would support further development in the study area, indirect cumulative impacts on loggerhead shrike may occur; however, the project's contribution to these impacts is expected to be minimal.

Black-tailed Prairie Dog—The black-tailed prairie dog is a small, stout ground squirrel that several species, including the endangered black-footed ferret, depend on to varying degrees for food and shelter. The black-tailed prairie dog is a MIS for low-structure grasslands in the LMNG Northern Region and may occur in grasslands within the proposed ROW (USFS, 2001). Sensitive species that have been threatened by loss of grassland habitat, including the black-tailed prairie dog, would continue to lose habitat in the region as a result of the various development projects; however, the contribution of the proposed project to grassland habitat loss on the LMNG would be minimal. Conditions and mitigation measures imposed by USFS in the SUP would eliminate or substantially reduce any direct cumulative effects on this species. Because the proposed project would support further development in the study area, indirect cumulative impacts on black-tailed prairie dog may occur; however, the project's contribution to these impacts is expected to be minimal.

Bighorn Sheep—Bighorn sheep are found in the badlands area of North Dakota and within the LMNG. Conditions and mitigation measures imposed by NDGFD or USFS in the SUP would eliminate or substantially reduce any direct cumulative effects on this species. Additional negative influences on bighorn sheep include fire suppression, forest encroachment, home development, recreational trail construction, disease from domestic sheep and goats, predation, and competition with livestock, as well as an increasing human population, due in part to oil and gas development (NDGFD, 2011c). Because the proposed project would support further development in the study area, indirect cumulative impacts on bighorn sheep may occur; however, the project's contribution to these impacts is expected to be minimal.

Arogos Skipper—The Arogos skipper is known to occur in Ward County in western North Dakota and Ransom and Richland counties in eastern North Dakota (USGS-NPWRC, 2006c). It is not known to occur in the project counties; therefore, no direct or indirect cumulative effects are expected. However, conditions and mitigation measures imposed by USFS in the SUP would eliminate or substantially reduce any direct cumulative effects on this species if it is present in the proposed ROW. Sensitive species that have been threatened by loss of grassland habitat, including the Arogos skipper, would continue to lose habitat in the region as a result of the various development projects; however, the contribution of the proposed project to grassland habitat loss on the LMNG would be minimal. Because the proposed project would support further development in the study area, indirect cumulative impacts on Arogos skipper may occur; however, the project's contribution to these impacts is expected to be minimal.

Broad-winged Skipper—The broad-winged skipper is known to occur in Ransom and Richland Counties in eastern North Dakota (USGS-NPWRC, 2006c). It is not known to occur in the project counties; therefore, no direct or indirect cumulative effects are expected. However, conditions and mitigation measures imposed by USFS in the SUP would eliminate or substantially reduce any direct cumulative effects on this species if it is present in the proposed ROW. Because the proposed project would support further development in the study area, indirect cumulative impacts on broad-winged skipper may occur; however, the project's contribution to these impacts is expected to be minimal.

Dion Skipper—The Dion skipper is known to occur in Ransom and Richland counties in eastern North Dakota (USGS-NPWRC, 2006c). It is not known to occur in the project counties; therefore, no direct or indirect cumulative effects are expected. However, conditions and mitigation measures imposed by USFS in the SUP would eliminate or substantially reduce any direct cumulative effects on this species if it is present in the proposed ROW. Because the proposed project would support further development in the study area, indirect cumulative impacts on Dion skipper may occur; however, the project's contribution to these impacts is expected to be minimal.

Mulberry Wing—The mulberry wing is known to occur in Cass, Ransom, Richland, and Sargent counties in eastern North Dakota (USGS-NPWRC, 2006c). It is not known to occur in the project counties; therefore, no direct or indirect cumulative effects are expected. However, conditions and mitigation measures imposed by USFS in the SUP would eliminate or substantially reduce any direct cumulative effects on this species if it is present in the proposed ROW. Because the proposed project would support further development in the study area, indirect cumulative impacts on mulberry wing may occur; however, the project's contribution to these impacts is expected to be minimal.

Ottoe Skipper—The Ottoe skipper is known to occur in Williams, McKenzie, Billings, Beach, Slope, Dunn, Ward, and Oliver counties in western North Dakota (USGS-NPWRC, 2006c). It is expected that conditions and mitigation measures imposed by USFS in the SUP would eliminate or substantially reduce direct cumulative effects on this species. Sensitive species that have been threatened by loss of grassland habitat, including the Ottoe skipper, would continue to lose habitat in the region as a result of the various development projects; however, the contribution of the proposed project to grassland habitat loss on the LMNG would be minimal. Because the proposed project would support further development in the study area, indirect cumulative impacts on Ottoe skipper may occur; however, the project's contribution to these impacts is expected to be minimal.

Powesheik Skipper—In North Dakota, the Powesheik skipper is only known from the eastern portion of the state (USFWS, 2010b). Therefore, no direct or indirect cumulative effects on the Powesheik skipper are anticipated. However, conditions and mitigation measures imposed by USFWS and USFS would eliminate or substantially reduce any direct cumulative effects on this species if it is present in the proposed ROW. Because the proposed project would support further development in the study area, indirect cumulative impacts on Powesheik skipper may occur; however, the project's contribution to these impacts is expected to be minimal.

Regal Fritillary—The regal fritillary is known in North Dakota from mostly southern counties, but is not known from the project counties (USGS-NPWRC, 2006b). Therefore, no direct or indirect cumulative effects on the regal fritillary are anticipated. However, conditions and mitigation measures imposed by USFS in the SUP would eliminate or substantially reduce any direct cumulative effects on this species if it is present in the proposed ROW. Because the proposed project would support further development in the study area, indirect cumulative impacts on regal fritillary may occur; however, the project's contribution to these impacts is expected to be minimal.

Tawny Crescent—The tawny crescent is known from several eastern, northern, and western counties in North Dakota, including the project counties of Dunn and McKenzie (USGS-NPWRC, 2006c). Conditions and mitigation measures imposed by USFS in the SUP would eliminate or substantially reduce any direct cumulative effects on this species. Sensitive species that have been threatened by loss of grassland habitat, including the tawny crescent, would continue to lose habitat in the region as a result of the various development projects; however, the contribution of the proposed project to grassland habitat loss on the LMNG would be minimal. Because the proposed project would support further development in the study area, indirect cumulative impacts on tawny crescent may occur; however, the project's contribution to these impacts is expected to be minimal.

Basin Electric has prepared a BA and BE (both available in the project record) that evaluated sensitive species and did not identify any adverse impacts. Basin Electric will also prepare a habitat evaluation report for the portion of the project that crosses USACE lands. In conclusion, the proposed project has avoided and minimized potential impacts to the greatest extent possible and mitigation would be provided for those impacts that are unavoidable.

4.4.6 Cultural Resources

The construction of the proposed project transmission line facilities could affect recorded and currently unknown cultural resources within the study area. For example, construction of the transmission line structures and new substations has the potential to disturb archeological sites; alter the setting and feeling of historic landscapes, including battlefields, or traditional cultural properties; or obstruct access to traditional tribal cultural resources. Due to the localized impact on cultural resources caused by siting of the transmission line structures and substations, the spatial boundary for the cumulative effects analysis is the APE, as defined in Section 3.6.1. As described in table 4-1, the temporal boundary for the cumulative effects analysis for cultural resources is defined as the lifetime of the project.

In addition to the potential impacts of the AVS to Neset Transmission Project, the principal types of impacts that past projects have had and reasonably foreseeable projects could have on cultural resources include, for example physical destruction or damage caused by pipeline trenching; related excavations or boring; introduction of visual, atmospheric, or audible elements during construction that diminish the integrity of the property's significant historic features by short-term pipeline construction or construction of aboveground appurtenant facilities and roads; and change of the character of the property's use or of physical features within the property's setting that contribute to its significance. Table 4-2 identifies the broad types of activities that could contribute to cumulative impacts, while Table 4-5 primarily includes present and reasonably foreseeable future actions in the five-county cumulative impact assessment area where the APE is contained.

Impacts to cultural resources, including NRHP-listed and eligible buildings, structures, and archeological sites, and traditional cultural properties, are considered significant if they are determined to be adverse. The KMB historic property is the only affected cultural resource that has been identified in the APE to date. However that effect of the present project (preferred Alternative C) is considered by the agencies not to be adverse because past activities already have significantly altered the character, setting, and feeling of the historic property.

As noted above, it is standard practice when siting a new transmission line to make an effort to parallel existing linear features, including other transmission lines. Therefore, if another transmission line is proposed in the future, the current project would be seen as an opportunity for paralleling. In this case, however, a project of that nature has not been identified among the reasonably foreseeable actions.

It is more likely that a future transmission project would request an interconnection at one of the AVS to Neset new substations. In September 2013, when the geographic relationship between the 2010 ABPP KMB study area and the APE was identified, the North Dakota SHPO requested that Basin Electric remove an electrical substation from the KMB study area. The removal of this substation from the study area means that there will be no future interconnections in the KMB study area.

The AVS to Neset Transmission Project will not encourage future development other than paralleling or interconnection. Accordingly, all of the reasonably foreseeable future actions listed in Table 4-5 will be constructed regardless of the fate of this transmission line. The numerous oil wells and associated facilities that have been constructed adjacent to and near the APE have already altered the character of the landscape, and construction of the additional wells that have been predicted will continue to alter the character of the landscape and only intensify whether this transmission line is constructed or not. Therefore, while this transmission line is expected to contribute to incremental long-term, low to moderate intensity change, the character of the KMB study area has already been detrimentally impacted.

For the AVS to Neset Transmission Project, not all affected cultural resources have been identified yet. Studies to identify archeological sites and tribal cultural resources that might be affected by this transmission project are ongoing and will be directed by the PA to be executed to conclude review under Section 106 of NHPA. Cumulative loss of cultural resources would occur if archeological sites or tribal cultural resources are disturbed on multiple sites. This is unlikely because the project seeks to successfully avoid affecting such cultural resources, especially those that are listed or eligible resources. The Section 106 PA identifies avoidance as the preferred treatment. However, if avoidance is not possible, other treatment measures would be identified and implemented to mitigate or offset the loss.

4.4.7 Land Use

Alternative C would avoid all USFWS easements and would not contribute to cumulative effects to those properties. A major land use concern of the federal agencies is the protection of TRNP-North Unit, and the Lone Butte Management Area of the LMNG. Alternative C would be located outside of TRNP-North Unit. The Lone Butte Management Area is southeast of the national park and east of the USFS Summit Campground and Trailhead Park on U.S. Highway 85. Lone Butte was not allocated to Management Area 1.2, Suitable for Wilderness, in the 2002 Land and Resource Management Plan for the Dakota Prairie National Grasslands. However, based on scoping comments the proposed Alternative C has been modified to be outside of the Lone Butte Management Area. Alternative C avoids the Long X Divide Management Area west of U.S. Highway 85 and south of TRNP, which was allocated to Management Area 1.2 in the Land and Resource Management Plan.

In addition to the transmission line, the BakkenLink pipeline follows the U.S. Highway 85 corridor. Thus, Alternative C has the potential to cumulatively affect resources in the area along U.S. Highway 85. About 147 acres of transmission line ROW would be added to other pipeline and transmission line ROW commitments at the LMNG. The eastern segment of Alternative C would cross the Little Missouri River in the same general area as the Northern Border Pipeline and McKenzie Electric Power Cooperative's 115-kV transmission line. As a result, the western segment of Alternative C would create a new corridor across the Little Missouri River, while the eastern segment would cumulatively affect land resources where it crosses the Little Missouri River.

Similar to Alternative C, Alternative D would avoid all USFWS easements and would not contribute to cumulative effects to those properties. Alternative D would avoid the two LMNG grassland management units, but would traverse the same general area as the Northern Border Pipeline and McKenzie Electric Power Cooperative's 115-kV transmission line near the Little

Missouri River crossing. Thus, Alternative D would not create a new corridor across the Little Missouri River; however, it would cumulatively affect land resources in that area.

Alternative E would follow generally the same route as Alternative D. The major difference between these two alternatives would be the construction of two parallel 345/345-kV lines north of Killdeer for 63 miles under Alternative E. The cumulative impacts on land use from Alternative E would therefore be identical to those described for Alternative D, above.

The BakkenLink Pipeline, Bear Paw Energy natural gas liquids pipeline, and Western's Charlie Creek-Williston transmission line also cross the LMNG. The cumulative effect of these three linear projects, along with the proposed project, on national forest system lands would be about 500 acres. Increased development in the area of cities, including new housing construction, is likely contributing to increased conversion of undeveloped land and associated impacts on terrestrial habitat and farmland. Similarly, the increased oil and gas development and processing plants are converting terrestrial habitat and farmland. The proposed project would be built to respond to this additional development and would not by itself contribute to adverse cumulative land use impacts. The cities and industrial developers would likely find another source of electric power, such as self-generation, if the proposed action were not built. Overall cumulative impacts on land use from Alternatives C, D, and E are expected to be low.

4.4.8 Socioeconomics

Cumulative impacts would be the same under Alternatives C, D, and E.

Continued rapid oil and gas development in the area (1,500 new wells per year), as well as development and/or upgrading of pipelines, gathering systems, gas processing facilities, rail terminals, power plants, water and transportation infrastructure, transmission lines, and community developments will all require construction workforce in the project area. These employment opportunities would help keep unemployment rates and poverty levels relatively low and contribute to increased average earnings. Increasing oil and gas production also brings fiscal revenues to state and local governments, which are imperative as municipalities and counties try to accommodate this growth with increasing demands for local services and infrastructure. Workers spending their earnings in the region also support sales tax receipts for local governments. The cumulative impact of the proposed project associated with unemployment and fiscal receipts would be low, short term, and beneficial.

The number of construction workers needed for all of these cumulative projects, along with those required for the proposed project, would add to stresses on services and infrastructure, notably housing, road maintenance, public services, and service industries (e.g., retail, food and beverage, gas stations, etc.). However, some community development, particularly those that provide affordable housing, would help alleviate some of these shortages. Municipal and county services, including public service provisions such as education, road maintenance and construction, law enforcement, judicial facilities and services, medical services and facilities, emergency services, and other social services can all be expected to increase driven by the growing workforce and population, even if it is temporary in nature. Additionally, with average earnings being driven up by higher-paying oil industry jobs, service sectors and other local salaries also rise to compete with the oil sector salaries often causing financial stresses for small businesses. With the influx of population and workforce, often there are not sufficient supplies to meet demand in stores, gas pumps, and restaurants, among others, so establishments can increase local prices affecting the cost of living in the area.

Construction jobs associated with the proposed project would result in a short-term impact on communities in and near where construction activities are ongoing. Permanent residential increases in these areas are not expected to directly result from the proposed project. However, during the construction period, cumulative impacts associated with the proposed project on infrastructure, public services, cost of living, and housing are expected to be short term and adverse and could be moderate to major.

Property values could be adversely affected by development of other transmission lines, oil and gas wells, and other transportation and industrial facilities. However, royalties from oil and gas production could also increase property values. In addition, housing development and availability could also have an effect on property values. Because there would be low adverse effects expected to property values associated with the transmission line, cumulative impacts would also be low, with variable, individualized, and unpredictable impacts on property values.

The proposed project would bring electrical power and reliability to northwestern North Dakota to support needed infrastructure and business construction and development associated with the rapid oil and gas boom in the project area. Without the proposed project to strengthen the electrical system, electricity capacity shortfall would likely impact the existing system and limit future development activities needed to accommodate the considerable population and business growth in the area. The proposed project would provide electricity needs, with beneficial, long-term cumulative impacts on the economic development of the region.

4.4.9 Environmental Justice

There would be cumulative adverse impacts to environmental justice populations associated with the tight housing market, rising housing costs, rising costs of living, construction traffic, and air quality. However, it is expected that the project would contribute minimal adverse and short-term impacts to these populations. Additionally, the demand for labor and increasing wages in the region may help off-set some of the adverse impacts environmental justice populations may have previously experienced.

4.4.10 Recreation and Tourism

Under Alternatives C, D, and E, the proposed project would avoid the TRNP and the Lone Butte and Long X Divide management areas of the LMNG. Therefore, it would not be expected to have any cumulative impacts on recreational use of those areas. The proposed project also would not displace any developed recreational or park uses. Alternative C would pass within about 0.5 mile of one USFS campground (Summit Campground), located adjacent to U.S. Highway 85 about 3.5 miles south of TRNP, and construction noise and dust could temporarily create cumulative impacts to campground use. Temporary construction workers may use public RV parks during the construction period. The proposed project would only temporarily affect recreational uses such as hunting, hiking, and wildlife observation on private lands.

All three of the alternatives would involve crossing the Little Missouri River and the Missouri River, which could have cumulative impacts on recreation. Alternatives D and E and the eastern segment of Alternative C would each cross the Little Missouri River in the same general area as the Northern Border Pipeline and McKenzie Electric Power Cooperative's 115-kV transmission line. While impacts would occur during construction, it is anticipated that in the long term, recreational access and use of the river would return to pre-construction levels. The major area with potential for cumulative recreational impacts would be the crossing of the Missouri River, in the Lewis and Clark WMA, where additional lands would be added to ROW adjacent to U.S. Highway 85. Since the crossing would be adjacent to the existing U.S. Highway 85 crossing, within a utility corridor containing the existing Western transmission line and a rural water pipeline, the usability of these lands for recreation is limited. Impacts would likely be temporary, and the area would be available for use after construction. Thus, no adverse cumulative effects on recreation are anticipated as a result of this project under Alternatives C, D, or E.

4.4.11 Utility and Transportation Infrastructure

Potential cumulative impacts would be similar for each alternative.

The increase in oil and gas-related activity in and around the project area has placed additional demand on both utility and transportation infrastructure. The ability for the oil and gas industry to grow is directly linked to an infrastructure network that is capable of accommodating this demand. There are numerous upgrades and improvements to utilities, such as transmission lines and pipelines, in and around the project area that are either planned or proposed to help support projected growth.

During construction of the proposed project, Basin Electric would work with municipal officials and other utility service providers to ensure, to the greatest extent possible, that power outages and brownouts do not occur. Such effects would temporarily interrupt the delivery of electric service to some residents and businesses. Basin Electric would work to repair any such effects as quickly as possible. Therefore, should adverse cumulative effects result, they would be of relatively short duration; the extent to which they would be borne is not known at this time. However, it is not anticipated that construction activities associated with the proposed project will result in adverse cumulative impacts to the continued delivery of utility services.

The potential for power outages and brownouts that would result from the failure to implement identified upgrades and improvements would increase. The proposed project in combination with other planned or proposed upgrades and improvements would help support the increase in oil and gas activity and also protect nearby residents and businesses from adverse effects should power outages occur. As a result, the proposed project would not contribute to adverse cumulative impacts to utility services.

The proposed project is not anticipated to have an effect on the continued delivery of other utility services such as water supply and treatment and wastewater disposal. Therefore, the proposed project would not contribute to cumulative impacts that may be borne by these resources from other projects in the area.

The increase in oil and gas production as well as population growth, either directly or indirectly related to the oil and gas industry, has placed additional demands on the transportation network (see Section 3.11.1). During construction of the proposed project, heavy material haul trucks and road closures would result in the temporary disruption of traffic patterns. Such effects would be of relatively short duration and would be timed to the greatest extent possible to avoid peak travel periods. As a result, construction of the proposed project would result in temporary and localized adverse cumulative impacts to the transportation network.

The North Dakota Department of Transportation reports that truck volumes in project area counties have increased considerably over the past ten years (see Table 3-39). While the national fatal accident rate has been steadily decreasing over the past 11 years (with the exception of 2012), the rate in North Dakota has fluctuated but remains consistently higher than that of the nation overall. In 2012, the fatal accident rate for the nation as a whole was 1.16. This number increased to 1.68 for North Dakota. Fatalities and traffic accidents have increased notably across project area counties over the past few years. Project area counties demonstrated an increase in the share of North Dakota accidents in almost every category between 2010 and 2012, as illustrated in Table 4-6. In Williams County, all classifications of traffic accidents (property damage only, injury, and fatality crashes) as a share of the North Dakota total increased notably.

In a 2010 study, UGPTI identified improvements to roadways maintained by either county or municipal governments that would be needed to support continued growth in the oil and gas industry (UGPTI, 2010). The North Dakota Department of Transportation in its 5 year transportation improvement plan identified a number of roadway improvements in the project area that are necessary. These projects may or may not be directly attributable to the oil and gas industry. One project being undertaken to support the growth of the oil and gas industry is the widening of U.S. Highway 85 from Watford City to Williston to a four-lane roadway. This project began earlier in 2013 (North Dakota Department of Transportation, 2013a). Such improvements are independent of the proposed project, but would improve travel patterns in areas experiencing a decreasing level of service. Because the proposed project would not introduce new vehicles to the roadway network with the exception of periodic maintenance vehicles serving various locations along the proposed project alignment, it would not contribute to adverse cumulative impacts to the transportation network. The ongoing study to determine whether the Sloulin Field International Airport in the city of Williston will be expanded or relocated to accommodate increased traffic is expected to be complete in 2014 (Fricke, 2014). However, it is anticipated that the airport would be relocated. Should the airport remain in its current location, the introduction of the proposed project in areas adjacent to the airport would result in an obstruction as defined by FAA. Approval from FAA would be required to site the proposed project adjacent to the airport. Should the airport be relocated, there would be no obstruction as a result of the proposed project. A Determination of No Hazard to Air Navigation would be made.

Table 4-6: Traffic Accident Totals for Project Area Counties, 2010 and 2012

Crash Type and Percent of Statewide Total	County					
	Billings	Dunn	McKenzie	Mercer	Mountrail	Williams
2010						
# of Property Damage Only Crashes	36	126	165	146	189	701
% of North Dakota Total	0.3	0.9	1.2	1.1	1.4	5.1
# of Injury Crashes	4	16	49	29	62	179
% of North Dakota Total	0.1	0.5	1.5	0.9	1.9	5.4
# of Fatal Crashes	0	3	7	2	4	3
% of North Dakota Total	0	3.3	7.6	2.2	4.6	3.7
# of Total Fatalities	0	5	8	2	5	3
% of North Dakota Total	0	4.8	7.6	1.9	4.7	2.9
2012						
# of Property Damage Only Crashes	41	145	373	156	227	1,349
% of North Dakota Total	0.3	1.0	2.6	1.1	1.6	9.3
# of Injury Crashes	16	49	187	30	87	323
% of North Dakota Total	0.4	1.3	5.0	0.8	2.3	8.7
# of Fatal Crashes	1	2	18	2	5	24
% of North Dakota Total	0.7	1.4	12.2	1.4	3.4	16.3
# of Total Fatalities	1	2	19	2	5	27
% of North Dakota Total	0.6	1.2	11.2	1.2	2.9	15.9

Source: North Dakota Department of Transportation, 2012

The proposed project would not contribute to cumulative effects that may be borne by railroad facilities as a result of other activities or projects in the area.

4.4.12 Public Health and Safety

Vehicular volumes associated with the oil and gas industry and population growth directly and indirectly related to this activity has increased notably over the past 10 years. As demonstrated in Section 3.11.1, accident rates have also increased. The construction of the proposed project would result in temporary disruptions to travel patterns associated with the movement of heavy material haul trucks and roadway closures. As a result, the proposed project has the potential to contribute to short-term, adverse cumulative impacts associated with travel patterns during construction. Basin Electric would work with appropriate agencies to design and implement a construction action plan that informs motorists of temporary changes in travel patterns and roadway signage necessary to minimize the potential for accidents to occur. Because the operation of the proposed project would result in the introduction of periodic maintenance vehicles to the roadway network and would not result in permanent road closures, it is not anticipated to contribute to adverse cumulative impacts that may result in public health and safety effects associated with accident rates.

As the proposed project is further refined, a construction action plan would be developed to protect the health and safety of both workers and others in the vicinity from the stringing of the transmission line and the disturbance and removal of hazardous materials should any be identified during construction activities. Any such effects are anticipated to be localized and would not contribute to cumulative public health and safety effects. Additionally, the proposed project would not contribute to adverse public health and safety impacts that may result from activities associated with the oil and gas industry or projects in the area such as chemical spills or pipeline failure.

The operation of the proposed project would introduce new EMF sources to the project area. As demonstrated in Sections 3.12.1 and Section 3.12.2, EMFs resulting from the operation of the proposed project alternatives would be well below impact thresholds. Additionally, EMF levels would be reduced to negligible at a distance of 75 feet from the centerline of Alternatives C and D and 150 feet from the centerline of Alternative E, the extent of the ROW under each alternative. As a result, the proposed project alternatives would not contribute to adverse cumulative impacts associated with EMFs in the area. Because the proposed project alternatives would help support increased electrical demand, it would help ensure public health and safety by reducing the potential for power outages and brownouts.

4.4.13 Noise

Agriculture and community development activities have occurred and continue to occur in the project area, with the level of noise being localized and dependent on the activity and not significant in scale. Oil and gas development, gas processing plants, and new power plant development are contributing to community noise in rural areas where it has not been present in the past. Increased truck traffic associated with these developments is contributing to increased traffic noise in both rural and urban locations, with associated noise being localized. Impacts to noise as a result of oil and gas development and associated activities would likely continue to occur independent of this proposed project because oil and gas development is likely to continue in the vicinity of the project area. Based on the relatively minimal nature of operational noise, the proposed project would only temporarily contribute to these ongoing cumulative effects for a short time during construction and during routine maintenance activities; there would be no long-term cumulative noise impacts.

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5 COMPARISON OF ALTERNATIVES

5.1 COMPARATIVE IMPACTS OF ALTERNATIVES

Three alternatives (C, D, and E) and a no-action alternative were carried forward for analysis in this FEIS. Comparative impacts for the alternatives are summarized in Table 5-1.

5.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible commitment of resources refers to the loss of future options for resource development or management, especially of nonrenewable resources such as cultural resources. Construction and operation of the proposed project under the preferred alternative (Alternative C) would require the permanent conversion of 1.4 acres for the transmission line structures and 73 acres for new substations. This would include federal, state, and private lands. Most of these areas are in agricultural production. The introduction of new transmission lines would permanently change the visual landscape in some areas. The construction of the project would require the irretrievable commitment of non-recyclable building materials and fuel consumed by construction equipment.

5.3 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

NEPA legislation requires that an EIS describe “the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity.” Construction of the project would have short-term impacts on environmental resources associated with construction of the transmission line, including installation of structures, conductors, use of construction laydown areas, and use of the area as a transmission line ROW during the life span of the transmission line and its associated facilities. As indicated in the discussions of individual resource areas, the small permanent footprint of the transmission line and limited resource impacts indicate that operation of the facility would not likely affect regional natural resources to any significant degree. However, the land occupied by transmission structures would be an impact for the life of the transmission line, possibly exceeding 50 years. The proposed project would require development of 1.4 acres of land for the footprint of the transmission line structures and 73 acres to accommodate the five new proposed substations. Additional land would be needed for transmission ROW and access trails.

Temporary impacts from construction activities are discussed in Chapter 3 and Table 5-2 (at the end of this chapter). The high voltage transmission line permit would require Basin Electric to restore the ROW, temporary work spaces, construction access trails, abandoned ROW, and other lands affected by construction of the project. During the restoration process, Basin Electric would work with landowners, NDGFD, USFS, and local wildlife management programs.

The estimated impacts on resources within the 150-foot ROW of the various alternatives are show in Table 5-1. While the total acreage within the ROW for the selected alternative would be 4,957 acres, much of this area would be returned to its original productivity (croplands and grasslands) once the transmission line is constructed and operational, because most of the project includes land uses that are compatible with a transmission line ROW. A minimal number of acres across the entire line would be permanently removed from productivity due to the placement of structures and facilities.

Table 5-1: Estimated Resources within the 150-foot Right-of-Way and Related Facilities

Resource	Alternative C	Alternative D	Alternative E
ROW (acres)	4,957	4,459	5,597
Croplands (acres)	1,671	1,505	1,719
Grasslands (acres)	2,548	2,408	3,155
Soils and/or rock (cubic feet)	2.4 million	2.2 million	2.7 million
LMNG (acres)	153	57	57

Construction and operation of the project would result in long-term impacts on vegetation, but these would be limited to the permanent conversion of vegetated lands to utility land uses (transmission structures, substations, and switchyards), conversion of forested or wooded vegetated cover to herbaceous cover, and disturbance related to maintenance activities (mowing, herbicide application, tree trimming, and dangerous tree removal). Long-term (permanent) impacts would also accrue to prime and important farmland soils where transmission line structures are placed within the proposed ROW. However, these losses would constitute a small fraction of total lands within the proposed project ROW and those available throughout the project area. These resources would not return to productive, pre-disturbance conditions until the transmission line and associated facilities are removed. Although wetlands would be largely avoided, if conversion is necessary, impacts could be mitigated through reclamation, restoration, permanently protecting other wetlands, or creation of additional wetlands for an offset of wetland losses. For all other resource areas identified in this EIS, long-term impacts beyond the project lifetime of 50 years are either not anticipated or expected to be avoided through mitigation measures.

Table 5-2: Comparative Impacts of Alternatives

Resource	Alternative C		Alternative D		Alternative E		
Impact	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**No-action Alternative**
Land Use	Approximately 4,956.8 acres of ROW would be required and would be restricted from some types of future development. ROW would include 413.3 acres of state and federal properties. ROW would include approximately 152.9 acres of LMNG, 57.9 acres of USACE property, approximately 202 acres of school trust land, and cross within approximately 200 feet of BLM land. A SUP would be obtained from USFS for crossing the LMNG. Outgrant would be obtained from USACE for crossing USACE lands. Approximately 1.4 acres would be occupied by transmission line structures and 73 acres would be permanently converted from agriculture use to utility use for the five new substations.	Loss of use for landowners within ROW on private lands during construction. Access restrictions and/or loss of use within ROW during construction on state or federal properties. Disturbance from heavy equipment may result in some crop loss during construction Substation construction-related impacts such as increased noise and dust on surrounding agricultural lands.	Approximately 4,458.6 acres of ROW would be required and would be restricted from some types of future development. ROW would include 258.8 acres of state and federal properties. ROW would include approximately 57.0 acres of LMNG, 57.9 acres of USACE property, approximately 143.9 acres of school trust land, and cross within approximately 200 feet of BLM land. A SUP would be obtained from USFS for crossing the LMNG. Outgrant would be obtained from USACE for crossing USACE lands. Approximately 1.3 acres would be occupied by transmission line structures and 85 acres would be permanently converted from agriculture use to utility use for the six new substations/switchyards.	Loss of use for landowners within ROW on private lands during construction. Access restrictions and/or loss of use within ROW during construction on state or federal properties. Disturbance from heavy equipment may result in some crop loss during construction Substation/switchyard construction-related impacts such as increased noise and dust on surrounding agricultural lands.	Approximately 5,597.3 acres of ROW would be required and would be restricted from some types of future development. ROW would include 324.8 acres of state and federal properties. ROW would include approximately 57.0 acres of LMNG, 57.9 acres of USACE property, approximately 209.9 acres of school trust land, and cross within approximately 200 feet of BLM land. A SUP would be obtained from USFS for crossing the LMNG. Outgrant would be obtained from USACE for crossing USACE lands. Approximately 1.6 acres would be occupied by transmission line structures and 85 acres would be permanently converted from agriculture use to utility use for the six new substations/switchyards.	Loss of use for landowners within ROW on private lands during construction. Access restrictions and/or loss of use within ROW during construction on state or federal properties. Disturbance from heavy equipment may result in some crop loss during construction Substation/switchyard construction-related impacts such as increased noise and dust on surrounding agricultural lands.	No direct effect; indirect effect if future land uses were impeded by lack of increased electrical supply necessary to meet demands of development.
Socioeconomic Resources	Economic benefit to businesses and surrounding communities from increased electrical capacity and reliability. Potential changes in property values with six residences within 500 feet of the route. Property tax revenues of about $83,130 annually to study area counties.	Economic benefit to local communities during construction as a result of construction crews generating local revenue.	Economic benefit to businesses and surrounding communities from increased electrical capacity and reliability. Potential changes in property values with five residences within 500 feet of the route. Property tax revenues of about $74,900 annually to study area counties.	Economic benefit to local communities during construction as a result of construction crews generating local revenue.	Economic benefit to businesses and surrounding communities from increased electrical capacity and reliability. Potential changes in property values with six residences within 500 feet of the route. Property tax revenues of about $93,660 annually to study area counties.	Economic benefit to local communities during construction as a result of construction crews generating local revenue.	No direct effect; indirect effect if no improved electric reliability and capacity. This would harm local communities by limiting future development opportunities.
Environmental Justice	No disproportionate and adverse impacts to environmental justice populations are anticipated.	No disproportionate and adverse impacts to environmental justice populations are anticipated.	No disproportionate and adverse impacts to environmental justice populations are anticipated.	No disproportionate and adverse impacts to environmental justice populations are anticipated.	No disproportionate and adverse impacts to environmental justice populations are anticipated.	No disproportionate and adverse impacts to environmental justice populations are anticipated.	No impacts to environmental justice populations are anticipated.

Resource	Alternative C		Alternative D		Alternative E		
Impact	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**No-action Alternative**
Recreation and Tourism	Approximately 413.3 acres of state or federal land potentially open to dispersed recreational activities such as hunting would be located within the ROW. One USFS campground (Summit Campground) would be located within 0.5 mile of the ROW. Conversion of 1.4 acres of land for transmission line structures and 73 acres of land for the five substations would remove it from further land use, including recreational use.	Increased noise, dust, and traffic congestion in recreational areas. Temporary access restrictions during construction on public use areas. Increased noise, ground disturbance, access restrictions, and human activity may impede hunting activities around the substation sites.	Approximately 258.8 acres of state or federal land potentially open to dispersed recreational activities such as hunting would be located within the ROW. Conversion of 1.3 acres of land for transmission line structures and 85 acres of land for the six substations/switchyards would remove it from further land use, including recreational use.	Increased noise, dust, and traffic congestion in recreational areas. Temporary access restrictions during construction on public use areas. Increased noise, ground disturbance, access restrictions, and human activity may impede hunting activities around the substation/switchyard sites.	Approximately 324.8 acres of state or federal land potentially open to dispersed recreational activities such as hunting would be located within the ROW. Conversion of 1.6 acres of land for transmission line structures and 85 acres of land for the six substations/switchyards would remove it from further land use, including recreational use.	Increased noise, dust, and traffic congestion in recreational areas. Temporary access restrictions during construction on public use areas. Increased noise, ground disturbance, access restrictions, and human activity may impede hunting activities around the substation/switchyard sites.	No effect.
Utility Infrastructure and Transportation	No long-term effects on utility infrastructure are anticipated. No long-term effects on transportation are anticipated. An air space obstruction would result in the vicinity of the Sloulin Field International Airport in the city of Williston. Approvals would be necessary from FAA. No obstruction would result if the airport is relocated as proposed. Basin Electric would coordinate with BNSF to minimize or avoid potential impacts on railroads in areas where the transmission line would be strung over existing railroad tracks.	Existing utility infrastructure would be traversed during construction activities and may be temporarily taken out of service. During substation/switchyard construction, short-term interruption of existing transmission lines would be coordinated to avoid any service outages. The movement of heavy material haul trucks and road closures during construction activities, both of the transmission line and substations, may result in short-term adverse impacts. Basin Electric would also coordinate with BNSF to string the transmission line over existing railroad tracks.	No long-term effects on utility infrastructure are anticipated. No long-term effects on transportation are anticipated. An air space obstruction would result in the vicinity of the Sloulin Field International Airport in the city of Williston. Approvals would be necessary from FAA. No obstruction would result if the airport is relocated as proposed. Basin Electric would coordinate with BNSF to minimize or avoid potential impacts on railroads in areas where the transmission line would be strung over existing railroad tracks.	Existing utility infrastructure would be traversed during construction activities and may be temporarily taken out of service. During substation/switchyard construction, short-term interruption of existing transmission lines would be coordinated to avoid any service outages. The movement of heavy material haul trucks and road closures during construction activities, both of the transmission line and substations, may result in short-term adverse impacts. Basin Electric would also coordinate with BNSF in order to string the transmission line over existing railroad tracks.	No long-term effects on utility infrastructure are anticipated. No long-term effects on transportation are anticipated. Air space obstruction would result in the vicinity of the Sloulin Field International Airport in the city of Williston. Approvals would be necessary from FAA. No obstruction would result if the airport is relocated as proposed. Basin Electric would coordinate with BNSF to minimize or avoid potential impacts on railroads in areas where the transmission line would be strung over existing railroad tracks.	Existing utility infrastructure would be traversed during construction activities and may be temporarily taken out of service. During substation/switchyard construction, short-term interruption of existing transmission lines would be coordinated to avoid any service outages. The movement of heavy material haul trucks and road closures during construction activities, both of the transmission line and substations, may result in short-term adverse impacts. Basin Electric would also coordinate with BNSF in order to string the transmission line over existing railroad tracks.	Significant utility system failures and damage if capacity is not increased and demand increases, as projected. Electrical equipment used for oil and gas pipelines could be limited by reliability thereby causing more distribution via truck, causing road damage.
Geology and Landforms	Displacement of 2.4 million cubic feet of soil and rock during construction.	Potential for erosion on steeper slopes during construction.	Displacement of 2.2 million cubic feet of soil and rock during construction.	Potential for erosion on steeper slopes during construction.	Displacement of 2.7 million cubic feet of soil and rock during construction.	Potential for erosion on steeper slopes during construction.	No effect.

Resource	Alternative C		Alternative D		Alternative E		
Impact	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**No-action Alternative**
Soils and Farmland	Approximately 1.4 acres of soil surface (0.0009-acre per structure) would be permanently removed from production. Farmland for crop production permanently impacted only at structure locations. Any farmland within the five substation sites (73 acres total) would be permanently converted to utility use.	Approximately 1,754 acres of temporary soil disturbance to prime farmland and farmland of statewide importance during construction within the ROW, with temporary loss of crop production.	Approximately 1.3 acres of soil surface (0.0009-acre per structure) would be permanently removed from production. Farmland for crop production permanently impacted only at structure locations. Any farmland within the six substation/switchyard sites (85 acres total) would be permanently converted to utility use.	Approximately 1,737 acres of temporary soil disturbance to prime farmland and farmland of statewide importance during construction within the ROW, with temporary loss of crop production.	Approximately 1.6 acres of soil surface (0.0009-acre per structure) would be permanently removed from production. Farmland for crop production permanently impacted only at structure locations. Any farmland within the six substation/switchyard sites (85 acres total) would be permanently converted to utility use.	Approximately 1,900 acres of temporary soil disturbance to prime farmland and farmland of statewide importance during construction within the ROW, with temporary loss of crop production.	No effect.
Water Resources	No effects anticipated. Approximately 14.3 acres of open water occur within the ROW; 19 perennial waterways and 16.5 acres of FEMA floodplain would be crossed, but all would be spanned. A Section 10 permit would be obtained from USACE for crossing the Missouri River.	Potential sedimentation and runoff caused by construction.	No effects anticipated. Approximately 12.7 acres of open water occur within the ROW; 17 perennial waterways and 16.5 acres of FEMA floodplain would be crossed, but all would be spanned. A Section 10 permit would be obtained from USACE for crossing the Missouri River.	Potential sedimentation and runoff caused by construction.	No effects anticipated. Approximately 14.5 acres of open water occur within the ROW; 20 perennial waterways and 16.5 acres of FEMA floodplain would be crossed, but all would be spanned. A Section 10 permit would be obtained from USACE for crossing the Missouri River.	Potential sedimentation and runoff caused by construction.	No effect.
Vegetation	Approximately 183 acres of woodland potentially removed within ROW, depending on slope. Approximately 1.4 new acres of vegetation permanently removed within ROW at structure locations. Potential introduction of noxious weeds within ROW to be avoided by weed mitigation measures. Approximately 73 acres of vegetation removed from the five substation sites and converted to utility use.	Disturbance of vegetation within the ROW and along construction access trails during construction. Natural Heritage Inventory sensitive ecological community potentially impacted.	Approximately 120 acres of woodland potentially removed within ROW, depending on slope. Approximately 1.3 acres of vegetation permanently removed within ROW at structure locations. Potential introduction of noxious weeds within ROW to be avoided by weed mitigation measures. Approximately 85 acres of vegetation removed from the six substation/switchyard sites and converted to utility use.	Disturbance of vegetation within the ROW and along construction access trails during construction. Natural Heritage Inventory sensitive ecological community potentially impacted.	Approximately 189 acres of woodland potentially removed within ROW, depending on slope. Approximately 1.6 acres of vegetation permanently removed within ROW at structure locations. Potential introduction of noxious weeds within ROW to be avoided by weed mitigation measures. Approximately 85 acres of vegetation removed from the six substation/switchyard sites and converted to utility use.	Disturbance of vegetation within the ROW and along construction access trails during construction. Natural Heritage Inventory sensitive ecological community potentially impacted.	No effect.
Wildlife	Loss of forested habitat as a result of the removal of up to 183 acres of woodland within the ROW. Some mortality of small, less-mobile species. Potential avian species collisions with power lines. Loss of 73 acres of habitat within the five substation sites.	Disturbance within and near the ROW during construction due to human intrusion, noise, and construction activity. Temporary loss of habitat due to vegetation clearing and disturbance within ROW during construction. Disturbance to nearby species due to construction activities at the five substation sites.	Loss of forested habitat as a result of the removal of up to 120 acres of woodland within the ROW. Some mortality of small, less-mobile species. Potential avian species collisions with power lines. Loss of 85 acres of habitat within the six substation/switchyard sites.	Disturbance within and near the ROW during construction due to human intrusion, noise, and construction activity. Temporary loss of habitat due to vegetation clearing and disturbance within ROW during construction. Disturbance to nearby species due to construction activities at the six substation sites.	Loss of forested habitat as a result of the removal of up to 189 acres of woodland within the ROW. Some mortality of small, less-mobile species. Potential avian species collisions with power lines. Loss of 85 acres of habitat within the six substation/switchyard sites.	Disturbance within and near the ROW during construction due to human intrusion, noise, and construction activity. Temporary loss of habitat due to vegetation clearing and disturbance within ROW during construction. Disturbance to nearby species due to construction activities at the six substation/switchyard sites.	No effect.

Resource	Alternative C		Alternative D		Alternative E		
Impact	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**No-action Alternative**
Aquatic Resources	Change in local aquatic habitats in areas where vegetation would be cleared along shoreline.	Potential for sedimentation, runoff, and spills during construction; to be avoided by use of BMPs.	Change in local aquatic habitats in areas where vegetation would be cleared along shoreline.	Potential for sedimentation, runoff, and spills during construction; to be avoided by use of BMPs.	Change in local aquatic habitats in areas where vegetation would be cleared along shoreline.	Potential for sedimentation, runoff, and spills during construction; to be avoided by use of BMPs.	No effect.
Special Status Species	Will not affect the gray wolf, pallid sturgeon, or the black-footed ferret. This proposed project may affect, but is not likely to adversely affect the Sprague's pipit, piping plover, critical habitat for the piping plover, interior least tern, whooping crane, northern long-eared bat, Dakota skipper, or the rufa red knot. This effects determination is pending the outcome of consultation with USFWS and USFS.	Potential impacts on grassland habitat within ROW during construction may result in temporary habitat loss for Sprague's pipit.	Will not affect the gray wolf, pallid sturgeon, or the black-footed ferret. This proposed project may affect, but is not likely to adversely affect the Sprague's pipit, piping plover, critical habitat for the piping plover, interior least tern, whooping crane, northern long-eared bat, Dakota skipper, or the rufa red knot. This effects determination is pending the outcome of consultation with USFWS and USFS.	Potential impacts on grassland habitat within ROW during construction	Will not affect the gray wolf, pallid sturgeon, or the black-footed ferret. This proposed project may affect, but is not likely to adversely affect the Sprague's pipit, piping plover, critical habitat for the piping plover, interior least tern, whooping crane, northern long-eared bat, Dakota skipper, or the rufa red knot. This effects determination is pending the outcome of consultation with USFWS and USFS.	Potential impacts on grassland habitat within ROW during construction	No effect.
Wetlands	Approximately 33 acres of wetland within ROW. Wetlands would be spanned and no structures would be placed in wetlands where practicable. NWP 12 would be obtained from USACE for any wetland impacts.	Potential sedimentation and runoff caused by construction near wetlands.	Approximately 31 acres of wetland within ROW. Wetlands would be spanned and no structures would be placed in wetlands where practicable. NWP 12 would be obtained from USACE for any wetland impacts.	Potential sedimentation and runoff caused by construction near wetlands.	Approximately 40 acres of wetland within ROW. Wetlands would be spanned and no structures would be placed in wetlands where practicable. NWP 12 would be obtained from USACE for any wetland impacts.	Potential sedimentation and runoff caused by construction near wetlands.	No effect.
Aesthetics and Visual Resources	Change in the visual characteristics and viewshed within project area and for residents located near the transmission line (six residences within 500 feet). Additional visual element added to the landscape at the five substation sites.	Visibility of construction vehicles and equipment along ROW. Disturbance to vegetation and soil surfaces, would be restored when construction is completed.	Change in the visual characteristics and viewshed within project area and for residents located near the transmission line (five residences within 500 feet). Additional visual element added to the landscape at the six substation/switchyard sites.	Visibility of construction vehicles and equipment along ROW. Disturbance to vegetation and soil surfaces would be restored when construction is completed.	Change in the visual characteristics and viewshed within project area and for residents located near the transmission line (six residences within 500 feet). Additional visual element added to the landscape at the six substation/switchyard sites.	Visibility of construction vehicles and equipment along ROW. Disturbance to vegetation and soil surfaces would be restored when construction is completed	No effect.

Resource	Alternative C		Alternative D		Alternative E		
Impact	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**No-action Alternative**
Cultural Resources	286 cultural resources have been identified within or immediately adjacent to the 1,000-foot preliminary APE. Studies to identify archeological sites and tribal cultural resources are ongoing and will be directed by the PA to be executed to conclude review under Section 106 of NHPA. Cumulative losses of cultural resources are unlikely because the project seeks to successfully avoid affecting such cultural resources, especially those that are listed or eligible resources. The KMB is the only affected historic property that has been identified to date in the APE. The project would have less than adverse impacts because past activities already have significantly altered the character, setting, and feeling of the historic property.	Temporary impacts to cultural resources are unlikely because the project seeks to successfully avoid affecting such cultural resources, especially those that are listed or eligible resources.	88 cultural resources have been identified within or immediately adjacent to the 1,000-foot preliminary APE. Cumulative loss of cultural resources is unlikely because the project seeks to successfully avoid affecting such cultural resources, especially those that are listed or eligible resources. The KMB is the only affected historic property that has been identified to date in the APE. The project would have less than adverse impacts because past activities already have significantly altered the character, setting, and feeling of the historic property.	Temporary impacts to cultural resources are unlikely because the project seeks to successfully avoid affecting such cultural resources, especially those that are listed or eligible resources.	88 cultural resources have been identified within or immediately adjacent to the 1,000-foot preliminary APE. Cumulative loss of cultural resources is unlikely because the project seeks to successfully avoid affecting such cultural resources, especially those that are listed or eligible resources. The KMB is the only affected historic property that has been identified to date in the APE. The project would have less than adverse impacts because past activities already have significantly altered the character, setting, and feeling of the historic property.	Temporary impacts to cultural resources are unlikely because the project seeks to successfully avoid affecting such cultural resources, especially those that are listed or eligible resources.	No effect.
Noise	No effect.	Increases in noise levels along the ROW from construction vehicles and equipment. Increases in noise levels for nearby residences during construction of the five substations.	No effect.	Increases in noise levels along the ROW from construction vehicles and equipment. Increases in noise levels for nearby residences during construction of the six substations/switchyards.	No effect.	Increases in noise levels along the ROW from construction vehicles and equipment. Increases in noise levels for nearby residences during construction of the six substations/switchyards.	No effect.
Air Quality and Greenhouse Gas (GHG) Emissions	Minimal increase in GHG levels as a result of maintenance activities during operation of the transmission line and substations.	Increases in fugitive dust caused by construction activity, vehicles, and equipment. Increased emissions, including GHG levels, from construction vehicles and equipment.	Minimal increase in GHG levels as a result of maintenance activities during operation of transmission line and substations/switchyards.	Increases in fugitive dust caused by construction activity, vehicles, and equipment. Increased emissions, including GHG levels, from construction vehicles and equipment.	Minimal increase in GHG levels as a result of maintenance activities during operation of the transmission line and substations/switchyards.	Increases in fugitive dust caused by construction activity, vehicles, and equipment. Increased emissions, including GHG levels, from construction vehicles and equipment.	No effect.

Resource	Alternative C		Alternative D		Alternative E		
Impact	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**Permanent**	**Temporary**	**No-action Alternative**
Public Health and Safety	Long-term adverse effects are anticipated to be negligible to minor. EMFs would be well below identified thresholds to protect the public. Standard operating and safety procedures would be employed to ensure the safe delivery of services. The operation of farm equipment near proposed structures could result in unnecessary contact and/or damage to machinery and/or operators.	Hazardous and/or potentially hazardous materials may be encountered during construction, or exposure to energized transmission lines. These impacts are likely to be minor with the implementation of construction action plans that ensure worker safety, proper handling of hazardous materials, and spill cleanup.	Long-term adverse effects are anticipated to be negligible to minor. EMFs would be well below identified thresholds to protect the public. Standard operating and safety procedures would be employed to ensure the safe delivery of services. The operation of farm equipment near proposed structures could result in unnecessary contact and/or damage to machinery and/or operators.	Hazardous and/or potentially hazardous materials may be encountered during construction, or exposure to energized transmission lines. These impacts are likely to be minor with the implementation of construction action plans that ensure worker safety, proper handling of hazardous materials, and spill cleanup.	Long-term adverse effects are anticipated to be negligible to minor. EMFs would be well below identified thresholds to protect the public. Standard operating and safety procedures would be employed to ensure the safe delivery of services. The operation of farm equipment near proposed structures could result in unnecessary contact and/or damage to machinery and/or operators.	Hazardous and/or potentially hazardous materials may be encountered during construction, or exposure to energized transmission lines. These impacts are likely to be minor with the implementation of construction action plans that ensure worker safety, proper handling of hazardous materials, and spill cleanup.	No effect.

6 REGULATORY AND PERMIT REQUIREMENTS

Table 6-1 describes potential project requirements that should be considered. This includes permits, approvals, and consultation, etc. required for the project. Basin Electric would obtain necessary permits from counties and/or municipalities along the route (such as permits for road, highway, and flood channel encroachment and crossings; and temporary use and occupancy permits). Basin Electric would also obtain any necessary pipeline and utility crossing permits for crossings of natural gas pipelines and electrical transmission lines.

Table 6-1: Potential Project Requirements

Requirement	Citation	Description
Potential Federal Requirements		
Archaeological Resources Protection Act	16 U.S.C. 470aa-470mm; Public Law 96-95 and amendments	This Act exists to secure, for the present and future benefit of the American people, the protection of archeological resources and sites which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, the professional archeological community, and private individuals.
Bald and Golden Eagle Protection Act	16 U.S.C 668-668d	The Act prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald or golden eagles, including their parts, nests, or eggs. A permitting program was established by the USFWS Division of Migratory Bird Management. If activities require the removal or relocation of an eagle nest, a permit is required from the Regional Bird Permitting office.
Clean Air Act	42 U.S.C. 7401	Under the Act, USEPA establishes National Ambient Air Quality Standards for certain pervasive pollutants. It establishes limitations on sulfur dioxide and NO_x emissions and sets permitting requirements. Authority for implementation of the permitting program is delegated to NDDOH, Division of Air Quality.
Clean Water Act	32 U.S.C. 1251	The Act contains standards to address the causes of pollution and poor water quality, including municipal and industrial wastewater discharges, polluted runoff from urban and rural areas, and habitat destruction. USEPA has delegated authority to the NDDOH, Division of Water Quality.
		Section 401 – Water Quality Certification for Wetlands. Requires certification for any permit or license issued by a federal agency for any activity that may result in a discharge into waters of the state to ensure that the proposed project will not violate state water standards. Permits are issued by the NDDOH, Division of Water Quality.
		Section 404 – Permits for Dredged or Fill Material. Regulates the discharge of dredged or fill material in the jurisdictional wetlands and waters of the United States. Permits are issued by USACE, with cooperation from USFWS and USEPA.
Determination of No Hazard to Air Navigation	14 C.F.R. Part 77	Requires that FAA issue a determination stating whether the proposed construction or alteration would be a hazard to air navigation, and will advise all known interested persons.

Requirement	Citation	Description
Easements for Rights-of-Way	10 U.S.C. 2668	Easement will be required to cross lands owned and managed by USACE located near the Missouri River.
Endangered Species Act	16 U.S.C. 1531 et seq.	Section 7 of the Act requires any federal agency authorizing, funding, or carrying out any action to ensure that the action is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat of such species. The federal action agency (RUS) will initiate consultation with USFWS, to ensure it has the most recent list of threatened and endangered species. If the project is determined to have an activity that “may affect” threatened or endangered species, RUS will initiate formal consultation with USFWS by preparing a biological assessment and requesting an Incidental Take Permit. Should RUS demonstrate that efforts have been made to avoid the threatened or endangered species and its habitat to the greatest extent possible, USFWS will issue RUS a Biological Opinion and Incidental Take Permit.
Farmland Protection Policy Act	7 U.S.C. 4201 et seq.	The Act requires federal agencies to identify and quantify adverse impacts of federal programs on farmlands to minimize the number of federal programs that contribute to the unnecessary and irreversible conversion of agricultural land to non-agricultural uses. The Act designates farmland as prime, unique, of statewide importance, and of local importance. The Act is overseen by NRCS.
Federal Highway Administration Encroachment Permits		The Department of Transportation’s Federal Highway Administration requires encroachment permits for crossing federally funded highways.
Federal Land Policy Management Act	7 U.S.C. 2801 et seq.	Requires that each federal land-managing agency have a program in place for controlling undesirable plant species and must implement cooperative agreements with the State. Requires that any environmental assessments or impact statements that may be required to implement plant control agreements must be completed within 1 year of the time the need for the document was established. Additionally this act allows for the use of public lands. Under this authority USFS may issue SUPs.
Federal Power Act	16 U.S.C. Chapter 12	Requires federal agencies to provide transmission service on a non-discriminatory basis through compliance with established tariffs.
Fish and Wildlife Conservation Act	16 U.S.C. 2901 et seq.	The Act encourages federal agencies to conserve and promote conservation of non-game fish and wildlife species and their habitats. Mitigation methods should be designed to conserve wildlife and their habitats.
Fish and Wildlife Coordination Act	16 U.S.C. 661 et seq.	The Act requires federal agencies to consult with USFWS and the state agency responsible (NDGFD) for fish and wildlife resources if the project affects water resources.

Requirement	Citation	Description
Migratory Bird Treaty Act	16 U.S.C. 703 et seq.	The Act protects birds that have common migration patterns between the United States and Canada. Under the Act, taking, killing or possessing migratory birds or their eggs or nests is unlawful. The Act requires a Special Purpose Permit when an applicant demonstrates a legitimate purpose to violate the Act. As authorized by the MBTA, USFWS issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, conservation education, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal.
Multiple-Use Sustained-Yield Act	Public Law 86-517 as amended by, P.L. 104–333	The Multiple-Use Sustained-Yield Act authorizes and directs the Secretary of Agriculture to develop and administer the renewable resources of timber, range, water, recreation, and wildlife on the national forests for multiple use and sustained yield of the products and services.
National Environmental Policy Act	42 U.S.C. 4321-4347	The Act requires agencies of the federal government to study the possible environmental impacts of major federal actions significantly affecting the quality of the human environment.
National Forest Management Act	16 U.S.C. 1600-1614	The Act requires the Secretary of Agriculture to assess forest lands, develop a management program based on multiple-use, sustained-yield principles, and implement a resource management plan for each unit of the National Forest System. It is the primary statute governing the administration of national forests.
National Historic Preservation Act	16 U.S.C. 470 et seq.	Section 106 of the Act requires the federal agency to take into account the effects of its undertakings on properties listed in or eligible for listing in the NRHP, including prehistoric or historic sites, and districts, buildings, structures, objects, or properties of traditional religious or cultural importance. The NHPA also requires the federal agency to afford ACHP an opportunity to comment on the undertaking. SHSND must also provide consultation.
National Trails System Act	16 U.S.C. 1241-1251	The Act and its subsequent amendments authorized a nationwide system of scenic, historic, and recreation trails. National historic trails shall have as their purpose the identification and protection of the historic route and its historic remnants and artifacts for public use and enjoyment.
Noise Control Act	42 U.S.C. 4901-4918	The Act directs federal agencies to carry out programs in their jurisdictions “to the fullest extent within their authority” and in a manner that furthers a national policy of promoting an environment free from noise that jeopardizes health and welfare.
Occupational Safety and Health Act	29 U.S.C. 651 et seq.	The Act established regulations for the protection of worker health and safety. The applicant would be subject to Occupational Health and Safety Administration general industry standards and construction standards.
Pollution Prevention Act	42 U.S.C. 13101 et seq.	The Act establishes a national policy for waste management and pollution control.

Requirement	Citation	Description
Rural Utilities Service Environmental Policies and Procedures	7 C.F.R. Part 1794	RUS must make decisions that are based on an understanding of environmental consequences, and take actions that protect, restore, and enhance the environment. In assessing the potential environmental impacts of its actions, RUS will consult early with appropriate federal, state, and local agencies and other organizations to provide decision-makers with information on the issues that are significant to the action in question. The applicant is responsible for ensuring that proposed actions are in compliance with all appropriate RUS requirements. Environmental documents submitted by the applicant shall be prepared under the oversight and guidance of RUS. RUS will evaluate and be responsible for the accuracy of all information contained therein.
River and Harbors Act	33 U.S.C. 403	Section 10 of the Act prohibits the unauthorized obstruction or alteration of any navigable water of the United States. This section provides that the construction of any structure in or over any navigable water of the United States, or the accomplishment of any other work affecting the course, location, condition, or physical capacity of such waters is unlawful unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of the Army, which has been delegated to the Chief of Engineers. A SUP is required to cross lands owned and managed by USACE located near the Missouri River.
Potential Executive Orders		
Executive Order 11593 Enhancement, Protection, and Management of the Cultural Environment		This executive order directs state and local historic preservation officials to inventory historic and prehistoric sites and to act as steward to nation's heritage resources.
Executive Order 11988 Floodplain Management		The executive order directs federal agencies to establish procedures to ensure that they consider potential effects of flood hazards and floodplain management for any action undertaken. Agencies are to avoid impacts to floodplains to the extent practical.
Executive Order 11990 Protection of Wetlands		The executive order directs federal agencies to avoid short- and long-term impacts to wetlands if a practical alternative exists.
Executive Order 12898 Environmental Justice		The executive order directs federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.
Executive Order 13007 Indian Sacred Sites		The executive order directs federal agencies, to the extent permitted by law and consistent with agency missions, to avoid adverse effects to sacred sites and to provide access to those sites to Native Americans for religious practices.
Executive Order 13112 Invasive Species		The executive order directs federal agencies to prevent the introduction or to monitor and control invasive non-native species and provide for restoration of native species.
Executive Order 13175 Consultation and Coordination with Indian Tribal Governments		The executive order directs federal agencies to establish meaningful consultation and collaboration with tribal governments to strengthen United States government to government relationships with Native American tribes.

Requirement	Citation	Description
Executive Order 13186 Responsibilities of Federal Agencies to Protect Migratory Birds		The executive order directs federal agencies to avoid or minimize the negative impacts of their actions on migratory birds, and to take active steps to protect birds and their habitats.
Executive Order 13212		The executive order calls on federal agencies to expedite their review of permits for energy-related projects while maintaining safety, public health, and environmental protections.
Potential State Requirements		
Little Missouri Scenic River Act	ND Century Code 61-29	The Act aims to preserve the Little Missouri River as nearly as possible in its present state.
North Dakota Indian Burial Laws	ND Century Code 55-03 and 23-06-27	If prehistoric and historic human burials, human remains and burial goods are inadvertently discovered on state, local and private lands, all activities must cease until SHSND completes an initial examination of the site.
North Dakota Department of Health Requirements	ND Century Code 61-28	In accordance with the North Dakota Water Pollution Control Act, the applicant must obtain authorization under the North Dakota Pollutant Discharge Elimination Systems from NDDOH, Division of Water Quality. This authorization requires the applicant to have a stormwater pollution prevention plan.
State Road Crossing Permits		The applicant must obtain permits from the North Dakota Department of Transportation.
State Highway Access Permits		The applicant must obtain permits from the North Dakota Department of Transportation.
State Utility Occupancy Permits		The applicant must obtain permits from the North Dakota Department of Transportation.
Permits to Cross State Wildlife Management Areas		The applicant must obtain permits from NDGFD.
Consultation/Approval regarding State-Listed Species of Concern		The applicant must obtain permits from NDGFD.
Consultation regarding Noxious Weeds		The applicant must obtain permits from NDGFD.
Consultation regarding Killdeer Mountain Four Bears Scenic Byway		The applicant must obtain permits from the North Dakota Parks and Recreation Department.
North Dakota Energy Conversion and Transmission Facility Siting Act		The applicant must obtain certificate of Corridor Compatibility and a Route Permit from NDPSC.
Permits for Crossing Trust Lands		The applicant must obtain permits from the North Dakota State Land Department.
Construction Permits		The applicant must obtain construction permits for crossing navigable waterways from the North Dakota State Water Commission.
Potential Departmental Requirements		
Viewshed Impact Consultation		NPS should provide the applicant with consultation regarding potential viewshed impacts to TRNP.

Requirement	Citation	Description
Conservation Reserve Program Consultation		The applicant must consult with the USDA Farm Services Agency, North Dakota Office regarding crossing lands enrolled in the Conservation Reserve Program.
Farmland Conversion Impact Rating		The applicant must obtain a Farmland Conversion Impact Rating from the NRCS.
Tribal Requirements		
Tribal Consultations		The following tribes may seek consultation on the project: Flandreau Santee Sioux, Santee Sioux Nation, Fort Peck Assiniboine & Sioux Tribes, Spirit Lake Tribe, Fort Belknap Indian Community, Standing Rock Sioux, Leech Lake Band of Ojibwe, Three Affiliated Tribes, Lower Sioux Indian Community, Turtle Mountain Chippewa, Minnesota Chippewa Tribe, Upper Sioux Indian Community, Prairie Island Indian Community, and White Earth Nation.
Other Potential Requirements		
Permits for County Road Encroachment		The applicant must obtain County Permits from Dunn, McKenzie, Mercer, Mountrail, and Williams counties.
County Conditional Use Permits		The applicant must obtain County Permits from Dunn, McKenzie, Mercer, Mountrail, and Williams counties.
Permits for County Floodplain Encroachment		The applicant must obtain County Permits from Dunn, McKenzie, Mercer, Mountrail, and Williams counties.
Authorization for Crossing Railroads		The applicant must obtain a permit from BNSF to cross railroads.
Non-recreation Outgrant		The applicant must submit a general outgrant application to USACE for an easement.

7 AGENCIES AND TRIBES CONTACTED

Consultation with tribes, federal, and state agencies has been ongoing. Various federal and state interagency meetings were contacted to share project information and determine the scope of the EIS and throughout the development of the EIS.

7.1 COOPERATING AGENCIES

U.S. Department of Agriculture, Rural Utilities Service (lead agency) was assisted by the U.S. Department of Agriculture, Forest Service and the U.S. Department of Energy, Western Area Power Administration as cooperating agencies in preparing this EIS.

7.2 FEDERAL AGENCIES CONTACTED

- Federal Aviation Administration
- U.S. Army Corps of Engineers
- U.S. Department of Agriculture, Natural Resources Conservation Service
- U.S. Department of the Interior, Fish and Wildlife Service
- U.S. Department of the Interior, National Park Service
- U.S. Environmental Protection Agency

7.3 NORTH DAKOTA AGENCIES CONTACTED

- North Dakota Department of Health
- North Dakota State Department of Trust Lands
- North Dakota Transmission Authority
- State Historical Society of North Dakota

7.4 TRIBES CONTACTED

- Flandreau Santee Sioux
- Fort Belknap Indian Community
- Fort Peck Assiniboine and Sioux Tribes
- Leech Lake Band of Ojibwe
- Lower Sioux Indian Community
- Minnesota Chippewa Tribe
- Prairie Island Indian Community
- Santee Sioux Nation
- Sisseton Wahpeton Oyate

- Spirit Lake Tribe
- Standing Rock Sioux
- Three Affiliated Tribes
- Turtle Mountain Chippewa
- Upper Sioux Indian Community
- White Earth Nation

8 DISTRIBUTION LIST

8.1 FEDERAL AGENCIES

- Advisory Council on Historic Preservation
- Chief of Naval Operations, Energy and Environmental Readiness Division
- Federal Aviation Administration
- Federal Emergency Management Agency
- Federal Energy Regulatory Commission
- Federal Highway Administration
- National Agricultural Library
- National Oceanic and Atmospheric Administration, Office of Policy and Strategic Planning
- National Park Service, Theodore Roosevelt National Park
- U.S. Coast Guard, Department of Environmental Management
- U.S. Army Corps of Engineers
- U.S. Department of Agriculture, Natural Resource Conservation Service
- U.S. Department of Agriculture, Animal and Plant Health Inspection Service
- U.S. Department of Energy
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- U.S. Department of the Interior, Bureau of Indian Affairs
- U.S. Department of the Interior, Bureau of Land Management
- U.S. Department of the Interior, Office of Environmental Policy and Compliance
- U.S. Geological Survey
- U.S. Coast Guard, Department of Environmental Management

8.2 TRIBAL GOVERNMENTS AND AGENCIES

- Crow Tribal Council
- Fort Peck Tribes
- Oglala Sioux Tribal Council
- Northern Arapaho Tribe

- Northern Cheyenne Tribal Council
- Rosebud Sioux Tribe of Indians
- Shoshone Business Council
- Standing Rock Sioux Tribe
- Sisseton Wahpeton Oyate
- Three Affiliated Tribes

8.3 NORTH DAKOTA STATE AGENCIES

- North Dakota Aeronautics Commission
- North Dakota Department of Agriculture
- North Dakota Attorney General
- North Dakota Department of Career and Technical Education
- North Dakota Department of Commerce
- North Dakota Energy Development Impact Office/Energy Infrastructure and Impact Office
- North Dakota Department of Health
- North Dakota Department of Transportation
- North Dakota Farm Bureau
- North Dakota Forest Service
- North Dakota Game and Fish Department
- North Dakota Geological Survey
- North Dakota Department of Human Services
- North Dakota Indian Affairs Commission
- North Dakota Industrial Commission
- North Dakota Department of Labor
- North Dakota Pipeline Authority
- North Dakota Parks and Recreation Department
- North Dakota Public Service Commission
- North Dakota Heritage Center
- North Dakota State Land Department
- North Dakota State Legislature

- North Dakota State Soil Conservation Committee
- North Dakota State University Extension Service
- North Dakota Transmission Authority
- North Dakota Department of Trust Lands
- North Dakota Water Commission
- State Historical Society of North Dakota

8.4 LOCAL UNITS OF GOVERNMENT

- City of Beulah
- City of Kildeer
- City of Ray
- City of Stanley
- City of Tioga
- City of Watford City
- Dunn County
- McKenzie County
- Mercer County
- Mountrail County
- Town of Alexander
- Town of Arnegard
- Town of Dodge
- Town of Dunn Center
- Town of Epping
- Town of Golden Valley
- Town of Halliday
- Town of Rawson
- Town of Springbrook
- Town of Zap
- Williams County
- Williston City Commission

8.5 LOCAL LIBRARIES

- Beulah Public Library
- Bismarck Public Library
- Fort Berthold Community College Library
- Killdeer School & Public Library
- McKenzie County Library
- Stanley Public Library
- Williston Community Library
- United Tribes Technical College Library

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Antelope Valley Station to Neset Transmission Project

Final Environmental Impact Statement

Appendices | May 2014

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Appendix A—Standard Mitigation/Conservation Measures and Best Management Practices (BMPs) to be Used by Basin Electric for the Proposed AVS to Neset Transmission Project

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Appendix A—Standard Mitigation/Conservation Measures and Best Management Practices (BMPs) to be Used by Basin Electric for the Proposed AVS to Neset Transmission Project

General	
Gen-1	The requirements of all applicable federal, state, and local environmental laws, executive orders, and regulations will be met during construction and operation of the proposed project.
Gen-2	All permit conditions required by federal, state, and local agencies will be adhered to for construction and operation of the proposed project.
Gen-3	Prior to construction, all construction personnel and heavy equipment operators will be instructed on the protection of cultural, paleontological, and ecological resources, and all applicable permit requirements. Construction contracts will address: • Federal, state, and local laws regarding antiquities, fossils, plants, and wildlife, including collection/removal • The importance and necessity of protecting such resources • All applicable permit requirements
Air Quality	
Air-1	The emission of dust into the atmosphere during construction will be minimized to the extent practical during the excavation and transport of material, site grading, and movement of equipment. Methods and equipment will be used as necessary to suppress or prevent dust during these operations such as use of water trucks, covers on truck beds, attentiveness to dust creation on local gravel roads, or other dust management strategies.
Air-2	All construction equipment and vehicles will be maintained in efficient operating condition and comply with applicable state and federal emission standards. Engine idling time will be limited and equipment will be shut down when not in use. Vehicles and equipment that show excessive emissions or other inefficient conditions will not be operated until repairs or adjustments are made.
Air-3	All waste materials shall be disposed of at permitted waste disposal areas or landfills. Burning or burying waste materials on the right-of-way (ROW) would not be permitted. Tree and grubbing residue may be buried on site or in the ROW with landowner approval.
Air-4	Nuisance to persons, dwellings, or crops resulting from dust originating from construction will be minimized. Oil and other petroleum derivatives will not be used for dust control. Speed limits on local gravel roads will be enforced to reduce dust.

Water Resources	
Water-1	Construction activities will comply with the requirements of North Dakota permits for stormwater discharges for construction activities, which specify appropriate best management practices (BMPs), erosion and sediment control measures, and disposal practices. BMPs will be included in a Stormwater Pollution Prevention Plan. Construction activities adjacent to or encroaching on streams or waterways, including work within ROWs, construction of access roads on hillsides, and dewatering work for structure foundations, or earthwork operations will be conducted to prevent disturbed soils, muddy water, and eroded materials from entering streams or waterways by construction of intercepting ditches, bypass channels, barriers, settling ponds, or by other approved means.
Water-2	Construction activities will be conducted to prevent the accidental spillage of solid matter contaminants, debris, hazardous liquids, or other pollutants into streams, waterways, lakes, land, and underground aquifers. Such pollutants and waste include, but are not restricted to, refuse, garbage, cement, concrete, sanitary waste, industrial waste, oil, and other petroleum products, aggregate processing tailing, and mineral salts. A hazardous materials management and spill prevention plan will be developed for construction that addresses storage, use, transportation, and disposal of hazardous materials, and an emergency response plan will be in place in the event of an accidental spill.
Water-3	Excavated material or construction materials will not be stockpiled or deposited near or on stream banks, lake shorelines, or other waterway perimeters unless protected from high water or storm runoff or encroachment upon the actual waterway itself.
Water-4	Wastewater discharge from any construction operations will not enter streams, waterways, or other surface waters without the appropriate permit(s).
Water-5	Equipment washing, storage of petroleum products, lubricants, solvents and hazardous materials, structure sites, and other disturbed areas will be located at least 100 feet, where practical, from rivers, streams (including ephemeral streams), ponds, lakes, and reservoirs. This includes construction vehicles and heavy equipment when parked overnight or longer.
Water-6	ROW access roads will be located at least 100 feet, where practical, from rivers, ponds, lakes, and reservoirs.

Water-7	All stream crossings considered jurisdictional by the U.S. Army Corps of Engineers (USACE) will be crossed by permit only. Where required, culverts of adequate size to accommodate the estimated peak flow of the stream will be installed. Disturbance of the stream banks and beds during construction will be minimized and temporary during the construction period. Disturbed areas will be revegetated in accordance with mitigation measures listed for soil/vegetation resources and USACE policy regarding the removal of vegetation.
Water-8	If the banks of ephemeral stream crossings are sufficiently high and steep that breaking them down for a crossing will cause excessive disturbance, culverts will be installed using the same measures as for culverts on perennial streams.
Water-9	Heavy equipment movement near streams and other surface waters will be minimized, to the extent practical.
Water-10	Narrow flood-prone areas will be spanned.
Geology and Minerals, Paleontology, and Soils	
Geo-1	Removed topsoil will be used as engineered fill, as appropriate, or stockpiled and re-spread subsequent to construction where allowed.
Geo-2	Access roads will generally follow the contour of the land to the greatest extent practical rather than a straight line along the ROW where steep features will result in a higher erosion potential.
Geo-3	To the extent practical, excavated areas will be re-contoured so that large volumes of water will not collect and stand therein. Before being abandoned, the sides of excavations will be brought to stable slopes, giving a natural appearance, and revegetated. Waste soil piles will be shaped to provide a natural appearance.
Biological Resources	
Bio-1	Prior to construction, potentially-impacted wetland areas will be identified and marked. Wetland and riparian areas will be avoided to the extent practical by spanning of the wetlands and the placement of structures outside of wetland areas. If wetland or riparian areas are unavoidable, impacts will be minimized or mitigated. Jurisdictional waters that are impacted as a result of implementing the proposed project will be mitigated in accordance with USACE requirements.
Bio-2	Care will be used in preserving the natural landscape and vegetation. Construction operations will be conducted to prevent, to the extent practical, any unnecessary destruction, scarring, or defacing of the natural surroundings, vegetation, trees, and native shrubbery in the vicinity of the work. Vegetation will be replaced at landowner's request, provided mitigation complies with North American Electric Reliability Council (NERC) requirements.

Bio-3	Basin Electric Power Cooperative (Basin Electric) will implement BMPs to address the potential spread of noxious weeds during construction activities. Example measures will include the washing of construction vehicles prior to use at construction work sites, revegetation with a native seed mix, and control of noxious weeds during ROW maintenance activities.
Bio-4	Upon completion of work, all non-agricultural disturbed areas and construction staging areas not needed for maintenance access will be re-graded so that all surfaces drain naturally, blend with the natural terrain, and are reseeded to blend with native vegetation with a seed mixture certified as free of noxious or invasive weeds. All destruction, scarring, damage, or defacing of the landscape resulting from construction will be repaired as appropriate.
Bio-5	Construction staging areas will be located and arranged in a manner to preserve trees and vegetation to the maximum practicable extent. Unless otherwise agreed upon by the landowner, all storage and construction materials and debris will be removed from the construction staging areas once construction is complete, and the areas returned to original use or re-graded and seeded as for nonagricultural disturbed areas.
Bio-6	Native shrubs that will not interfere with access or the safe operation of the transmission line will be allowed to reestablish in the ROW. Areas with native shrubs that are disturbed will be replanted with regionally-native species following the disturbance.
Bio-7	Trees and shrubs anticipated to be cleared, including those that are considered invasive species or noxious weeds, will be inventoried before cutting. The inventory will record the location, number, and species of trees and shrubs. In windbreaks, shelterbelts, and other planted areas, trees or shrubs anticipated to be cleared, regardless of size, will be inventoried for replacement. In native growth areas, trees anticipated to be cleared that are 1-inch diameter at breast height (dbh) or greater will be inventoried for replacement, as well as all shrubs in the permanent ROW.
Bio-8	In native growth areas outside the permanent ROW, shrubs will be cut flush with the surface of the ground, taking care to leave the naturally occurring seed bank and root stock intact. If soil disturbance is necessary, the native topsoil will be preserved and replaced after construction is completed. Shrubs will be allowed to regenerate naturally where native topsoil is preserved and replaced. Where native topsoil is not preserved and replaced, shrubs anticipated to be cleared will be inventoried for replacement.
Bio-9	In native growth areas, trees and shrubs will be replaced according to Basin Electric's Tree Management Plan. This plan, filed and approved with the North Dakota Public Service Commission (NDPSC), provides for the identification and re-establishment of appropriate numbers and types of trees and shrubs removed as part of ROW clearing and maintenance.

Bio-10	Trees and shrubs will be selectively cleared, leaving mature trees and shrubs intact where practical. The width of clear cuts through windbreaks, shelterbelts and all other wooded areas will be limited to 50 feet or less unless otherwise approved by NDPSC. If the area of trees or shrubs actually cleared differs from the area inventoried, the difference in number of trees and shrubs to be replaced will be noted on the inventory.
Bio-11	Prior to replacement, documentation identifying the number and variety of trees removed as well as the mitigation plan for the proposed number, variety, type, location and date of replacement plantings will be filed with NDPSC for approval. Replanting will use native tree species for the local area, and planting replacement trees in existing areas of native prairie will be avoided. Tree replacement will be on a 2 to 1 basis with 2-year-old saplings. Shrub replacement will be on a 2 to 1 basis with stem cuttings. Trees and shrubs will be replaced by the same species or similar species, except in the case of invasive species or noxious weeds, suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service.
Bio-12	Landowners will be given the option of having replacement trees or shrubs planted off the ROW on the landowner's property or waiving that requirement in writing and allowing those replacement trees or shrubs to be planted at alternative locations.
Bio-13	At the conclusion of the project, documentation identifying the actual number, variety, type, location, and date of the replacement plantings will be filed with NDPSC. Tree and shrub replacements will be inspected once a year for three years, on or about the anniversary of the plantings, and, on or shortly before October 1 of each year, a report will be submitted to the Commission documenting the condition of replacement planting and any woodlands work completed. If after 3 years from the anniversary of the plantings the survival rate is less than 75 percent, NDPSC may order additional planting(s).
Bio-14	Basin Electric's system-wide Avian Protection Plan will be implemented to minimize impacts on nesting birds, as well as to minimize the electrocution and collision of migratory and resident bird species. The Avian Protection Plan includes design provisions for adequate distance between conductors and distances between conductors and grounded surfaces to minimize electrocution risk. It also includes methods for minimizing bird collisions, such as line marking techniques, developed in accordance with recommendations contained in the most recent Avian Power Line Interaction Committee publication "Reducing Avian Collisions with Power Lines, State of Art in 2012". The Avian Protection Plan follows guidelines described at www.aplic.org.
Bio-15	Holes drilled or excavated for pole placement or foundation construction and left unattended overnight will be marked and secured with temporary fencing to reduce the potential for livestock and wildlife to enter the holes, and for public safety.

Cultural Resources	
CR-1	In accordance with 36 CFR Section 800.14(6)(1), the Agencies will execute a Programmatic Agreement that establishes procedures for the identification of historic properties and the assessment and mitigation of adverse effects. Thus, mitigation of impacts of the AVS to Neset Transmission Project on historic properties will be governed by the Programmatic Agreement.
CR-2	To prevent damage to cultural resources, a professional archeologist will flag and monitor areas of potential disturbance to cultural resources during construction of the AVS-Neset Transmission Project components. In addition, all sites identified during construction will be marked as a sensitive location on operation and maintenance maps.
CR-3	During construction, if any paleontological resources are discovered on federal lands, work will cease within a 50-foot radius of the discovery. Any fossils discovered will not be disturbed, and U.S. Department of Agriculture (USDA), Rural Utilities Service, USDA Western Area Power Administration, the U.S. Forest Service, and NDSHPO will be notified of the discovery immediately. Appropriate action to avoid or minimize any impact to the discovery will be identified and implemented.
Land Use	
Land-1	The minimum area necessary will be used for access roads during project construction.
Land-2	When practical, transmission structures will be located and designed to conform to the terrain. Leveling and benching of the structure sites will be the minimum necessary to allow structure assembly and erection.
Land-3	Transmission structures will be located, where practical, to span sensitive land uses. Where practical, construction access roads will be located to avoid sensitive conditions.
Land-4	The precise location of all structure sites, ROW, and other disturbed areas will be determined with landowners' or land management agencies' input.
Land-5	The movement of crews and equipment will be limited to the ROW and areas surveyed for cultural, historical, and biological resources, including access routes. To the extent practicable, the contractor will limit movement on the ROW to minimize damage to grazing land, crops, or property and will avoid marring the land.
Land-6	Where practical, construction activities will be scheduled during periods when agricultural activities will be minimally affected or the landowner will be compensated accordingly.

Land-7	Fences, gates, and similar improvements that are removed or damaged will be promptly repaired or replaced.
Land-8	Transmission structure design and placement will be selected to reduce potential conflicts with agricultural practices and to reduce the amount of land required for transmission lines.
Land-9	ROW will be purchased through negotiations with each landowner affected by the proposed project. Payment will be made of full value for crop damages or other property damage during construction or maintenance.
Land-10	Any ruts will be leveled, filled, and graded, or otherwise eliminated in an approved manner. Ruts, scars, and compacted soils from construction activities in productive hay or crop lands will be loosened and leveled by scarifying, harrowing, disking, or other appropriate methods. Damage to ditches, tile drains, terraces, roads, and other land features will be corrected. Land contours and facilities will be restored as nearly as practical to their original conditions.
Public Health and Safety	
PH-1	When appropriate, pilot vehicles will accompany the movement of heavy equipment. Traffic control barriers and warning devices will be used when appropriate.
PH-2	All necessary provisions will be made to conform to safety requirements for maintaining the flow of public traffic and avoiding congestion at critical locations. Construction operations will be conducted to offer the least possible obstruction and inconvenience to public traffic, such as by the use of pilot cars to accompany trucks with oversized loads and slow-moving vehicles, scheduling heavy equipment transport to avoid high traffic periods, and where feasible, use of existing rail facilities. Construction workers will be encouraged to carpool to the construction site.
PH-3	Design will include reasonable mitigation measures to reduce problems of induced currents into conductive objects within the ROW. Problems of induced currents during construction and operation will be resolved, to the mutual satisfaction of the parties involved.
PH-4	Complaints of radio or television interference generated by the transmission line will be investigated and appropriate mitigation measures will be implemented.
PH-5	Audible noise from construction and operation of the proposed project will be addressed as necessary on a case-by-case basis.
PH-6	Transmission line materials will be designed to minimize corona. Tension will be maintained on all insulator assemblies to assure positive contact between insulators, thereby avoiding sparking. Caution will be exercised during construction to avoid nicking the conductor surface, which may provide points for corona to occur.

PH-7	The construction contractor will establish a health and safety program that incorporates Occupational Safety and Health Administration standards such as requirements for hearing protection, personal protective equipment, site access, chemical exposure limits, safe work practices, training program, and emergency procedures. The program will be reviewed with fire department personnel and emergency services personnel to reduce risk of construction and operation activities interfering with emergency response or evacuation plans and procedures.
PH-8	At the end of every work day, contractors will secure all construction areas to protect equipment and materials and discourage public access. Fueling of vehicles will be conducted in compliance with established procedures designed to minimize fire risks and fuel spills.
Visual Resources	
Vis-1	Structure types (designs) will be uniform, to the extent practical.
Vis-2	Structures will be setback from roadways an appropriate distance to reduce potential visual impacts at highway and trail crossings while still enabling over-road clearances to be maintained.
Vis-3	Construction areas will be maintained in a neat and orderly manner, free of trash and debris.
Noise	
Noise-1	An adequate buffer will be maintained around the proposed substation sites to minimize construction and operational noise impacts on area residents.
Noise-2	Power lines will be designed to minimize noise from energized conductors.
Noise-3	To avoid nuisance noise conditions, transmission line construction within 1,000 feet of a residence will be limited to daytime hours whenever practical.
Noise-4	To avoid nuisance conditions due to construction noise, all internal combustion engines used in connection with construction activity will be fitted with an approved muffler and spark arrester.

In addition to the mitigation/conservation measures discussed above, other more specific measures are being implemented for the AVS to Nest Transmission Project. These measures are designed to minimize impacts of the project as identified in the Final Environmental Impact Statement (FEIS). Further measures may be identified after publication of this this document.

Biological Resources	
	Prohibit construction in designated critical habitat for piping plover during the nesting season (mid-April to mid-August).
	Conduct a presence survey for piping plover prior to initiating construction activities in areas identified as habitat for the species, if construction occurs during nesting season (April 1 through August 31).
	Conduct an occupancy survey for Sprague's pipit prior to construction activities in areas identified as habitat for the species if construction is proposed to occur between April 15 and August 1.
	Coordinate with USFS and North Dakota Game and Fish Department (NDGFD) to avoid construction during bighorn sheep lambing season (April 1 through July 1) in the Little Missouri Badlands area and Little Missouri National Grasslands.
	Selectively clear trees and shrubs leaving mature trees and shrubs less than 8 feet tall intact where practical, in areas where the ROW crosses lands managed by USACE near the Missouri River. This action will support the wildlife migration corridor in this area.
	Generally do not place structures within 0.25 mile of active greater sage-grouse and plains sharp-tailed grouse lek sites. In addition, Basin Electric will consult with the agencies prior to construction within a 1-mile radius of an active lek during the period of March 1 through June 15. If construction will occur within 1 mile of any historic lek during this time period, surveys will be done prior to construction to determine use of the lek.
	Avoid construction activities within 1,000 feet of suitable hibernacula during the winter hibernation period (roughly late fall to early spring), to decrease direct impacts on the long-eared bat during construction. In addition to avoiding hibernacula during construction, all mature, dead, or dying trees will be left intact, where they do not pose a safety concern for line reliability.

	Prepare a complete habitat assessment according to the *Guidelines for Biological Survey Reports – U.S. Army Corps of Engineers, Garrison Project, June 2010*. This assessment will fully discuss the biological resources found within the project ROW located across USACE lands. Surveys for this report will be conducted in spring 2014. Reports will be submitted and approved by USACE prior to commencement of construction activities on USACE lands.
	Survey the selected alternative for eagle and other raptor nests in 2014 prior to construction. Following surveys, 1-mile buffers will be established between February 1 and July 31, and construction activity (including helicopter flights) will be prohibited within this area during this time period.
Land Use	
	Restrict cattle from grazing within the ROW after construction is completed until grass is re-established within the ROW.
	The North Dakota Natural Heritage Inventory database indicates that a significant ecological community of western little bluestem prairie is located within 1,000 feet of the centerline for the Red to Charlie Creek segment for of the preferred alternative. It is anticipated that the construction and operation of line will avoid this sensitive area, since it is not within the ROW. However, if this area will be affected based on the final route alignment Basin Electric will coordinate closely with the Natural Heritage Inventory and NDGFD to avoid, minimize, or mitigate any adverse impacts to this area.
Transportation and Infrastructure	
	Follow the American Railway Engineering and Maintenance-of-Way Association specifications for steady and rail-to-ground and equipment-to-ground voltage levels to avoid electrical interference from capacitive, electric and magnetic, and conductive effects.
	Provide appropriate as-built drawings to USACE, following completion of construction.
Visual Resources	
	Construct structures of weathering steel (compared to galvanized steel construction) to reduce visual contrast to the surrounding landscape in the areas at the Little Missouri and Missouri River crossings.
Construction Plans	

	Submit a construction work plan to USACE prior to the commencement of construction activities on portions of the ROW managed by USACE. Following completion of construction, Basin Electric will provide appropriate as-built drawings to USACE.

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Appendix B—Comments on Draft Environmental Impact Statement

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United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Denver Federal Center, Building 67, Room 118
Post Office Box 25007 (D-108)
Denver, Colorado 80225-0007

TAKE PRIDE IN AMERICA

January 15, 2013

9043.1
ER12/872

Mr. Mark Plank
Director, Engineering and Environmental Staff
Rural Utilities Service
1400 Independence Avenue, SW
Stop 1571, Room 2244
Washington, DC 20250-1571

RE: Draft Environmental Impact Statement (Draft EIS) for the proposed Antelope Valley Station to Neset 345kV Transmission Line Project; Mercer, Dunn, Billings, Williams, McKenzie, and Mountrail Counties, North Dakota

Dear Mr. Plank:

The Department of the Interior has reviewed the subject draft environmental document notice by the Department of Agriculture, Rural Utilities Service (RUS). The U.S. Fish and Wildlife Service (USFWS) and the National Park Service (NPS) provide the following comments for your consideration.

COMMENTS OF NATIONAL PARK SERVICE

F-001-001

Lewis and Clark National Historic Trail -- Potential visual impacts from the proposed Project to the Lewis and Clark National Historic Trail (Trail) and auto route are considered in the Draft Environmental Impact Statement (DEIS). The proposed routes for both of the action alternatives would cross the historic trail at the Missouri River near an existing transmission line. Careful consideration should be given to tower placement, design, and materials in order to reduce cumulative visual impacts to the Trail at this location. Table ES-3 of the DEIS outlines general mitigation measures for aesthetics and visual resources. In addition to these proposed measures, where the Project parallels an existing line the NPS recommends locating new structures adjacent to or at the same spacing as the existing structures.

For inquiries regarding the Lewis and Clark National Historic Trail, please contact Chief of Resources Stewardship Dan Wiley at 402-661-1830, or Dan_Wiley@nps.gov.

F-001-001

Visual impacts of the project are discussed in Section 3.1 of the FEIS. Mitigation measures that will be used to minimize these impacts as discussed in Appendix A of the FEIS.

United States Department of the Interior
National Park Service
Theodore Roosevelt National Park
Post Office Box 7
Medora, North Dakota 58645
Submitted Electronically
No hard copy to follow

IN REPLY REFER TO
N1629

January 21, 2013

Mr. Dennis Rankin, Environmental Protection Specialist
USDA, Rural Utilities Service
1400 Independence Avenue SW., Stop 1571
Washington, DC 20250–1571

Dear Mr. Rankin:

We submit the following comments on the Draft Environmental Impact Statement (EIS) on the AVS to Neset 345-kV Transmission Project in North Dakota as it relates to Theodore Roosevelt National Park.

With the explosion of energy development in the North Dakota badlands, we must remain vigilant to protect the ecological integrity and scenic views of all three units of Theodore Roosevelt National Park. This treasured national park is extremely significant to the nation, to North Dakota, and to more than 600,000 visitors who enjoy it annually. We are also concerned about the Lone Butte Inventoried Roadless Area and the Long X Divide Suitable for Wilderness Area on U.S. Forest Service lands that adjoin the North Unit of the park. These areas are very important to the visual integrity and habitat continuity of the North Unit and the Theodore Roosevelt Wilderness.

The cumulative impacts from the Bakken oil boom are numerous. Although they are well documented in the EIS, documenting them does not prevent them from having a serious negative effect. Each piece of industrial infrastructure that is added to the mix further degrades the integrity of the national park and surrounding landscape.

F-002-001

Alternative A would have visual and habitat fragmentation impact on the North Unit of Theodore Roosevelt National Park and the surrounding scenic badlands. We support Alternative B, as it has no direct impact on Theodore Roosevelt National Park and does not add to the increasing amount of industrial infrastructure around the National Park and throughout the scenic badlands. In the long run, Alternative B is the better alternative as it will not have irreversible effects on the park and badlands.

Mitigation measures are well-outlined in Table 2-3 of the EIS. We ask that those extensive mitigation measures be implemented in their totality for any build alternative.

Sincerely,

Valerie J. Naylor

Valerie J. Naylor
Superintendent

F-002-001

Visual impacts of the transmission line are discussed in Section 3.1 of the FEIS. Mitigation measures that will be used to minimize these impacts are discussed in Appendix A of the FEIS. Impacts to wildlife habitat including potential for fragmentation are discussed in Section 3.5.

Theodore Roosevelt National Park (Park) -- Staff of the Park has identified potential impacts to park resources from at least one of the proposed build alternatives. The public meetings scheduled for the proposed transmission line project will occur after the due date for their comments to be internally processed, and the Park will therefore submit comments directly to the Rural Utilities Service at a later date. The Park's comments will be developed as a result of the information concerning the alternatives that their staff receives at the public meetings.

GENERAL COMMENTS OF THE U.S. FISH AND WILDLIFE SERVICE

F-003-015

Golden Eagles -- The routes of the proposed alternatives traverse important golden eagle (*Aquila chrysaetos*) nesting areas. The final EIS should provide a more thorough discussion of the project's potential to expose golden eagles to stressors such as nesting habitat loss, disturbance, electrocution, or line strikes and the effectiveness of any proposed measures to avoid, minimize, and mitigate potential impacts to golden eagles.

The Bald and Golden Eagle Act (Eagle Act) includes provisions not included in the Migratory Bird Treaty Act (MBTA), such as the protection of unoccupied nests and a prohibition on disturbing eagles. Specifically, the Eagle Act prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagle or their body parts, nests, chicks or eggs, which includes collection, possession, molestation, disturbance, or killing. The term "disturb" is defined as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (50 CFR 22.3).

Please contact the USFWS' Ecological Services Field Office (USFWS Field Office) in Bismarck, North Dakota if you anticipate the "take" of any eagle as defined above. In certain limited situations, the Eagle Act provides for the USFWS to issue permits to "take" eagles.

F-003-016

Avian Protection Plan -- In scoping comments provided in its letter to RUS dated November 23, 2011, the USFWS stated that an Avian Protection Plan (APP) should be developed to provide a structured way to reduce avian mortality (e.g. collisions and electrocutions). Although the Draft EIS states that an APP will be developed in coordination with the USFWS, as of the date of this letter USFWS has not been contacted to discuss APP development. We recommend that RUS and/or Basin Electric contact the USFWS Field Office to begin APP development.

F-003-031

Whooping Crane – In its scoping comments provided in its letter to RUS dated November 23, 2011, the USFWS recommended that the EIS address the potential for whooping crane (*Grus americana*) collisions with the proposed transmission line. The USFWS recommended that avoidance measures include: (1) burying the new electrical transmission line or (2) if burying the new line is not feasible, install and maintain visual marking devices on the new transmission line in the 95-percent whooping crane migration corridor on all new line within one mile of suitable whooping crane stopover habitat. Because line marking is not always 100 percent effective at eliminating whooping crane line strikes, the USWS recommended that an additional, equal, length of existing transmission/distribution line be marked and maintained within one mile of

F-003-015

Impacts to golden eagles are discussed under Section 3.5 of the FEIS.

F-003-016

See response to comment F-003-009.

F-003-031

Use of marking devices are discussed in the BA for the project and summarized in Section 3.6 of the FEIS.

suitable whooping crane stopover habitat in the whooping crane migration corridor (preferably in the 75-percent migration corridor, but at a minimum within the 95-percent migration corridor).

F-003-025 Neither of the alternatives proposed by USFWS to reduce whooping cranes collisions is discussed in the Draft EIS. We request that those recommendations be considered and addressed in the final EIS.

SPECIFIC COMMENTS OF THE U.S. FISH AND WILDLIFE SERVICE

F-003-010

1. Pg. ES-4, Endangered Species Act (Act), third and fourth sentences - If Western's determines in their Biological Assessment (BA) that threatened or endangered species would be adversely affected by the project, Western would need to request formal consultation with the USFWS. The USFWS would review the information in the BA and develop their Biological Opinion (BO) as to whether or not the proposed project would result in Jeopardy to the species adversely affected. An incidental take statement would be included in the BO if their determination is that this meets the requirements for federal agencies pursuant to section 7(a)2 of the Act.

F-003-011

2. Pg. ES-14, Table ES-2: Comparison of Alternatives, Special Status Species – The statement there will be no adverse effect on listed species pending outcome of consultation with the USFWS and USFS is pre-decisional without a final BA. Further, the USFWS recommends that effects to species classified as "Special Status Species" be addressed pursuant to each federal law(s) that triggered the classification as "Special Status Species."

F-003-013

3. Pg. ES-19, Table ES-3: Summary of Mitigation Measures, Biological Resources, fourth bullet – We recommend that replanting use native tree species for the local area, and that planting replacement trees in existing areas of native prairie be avoided. Trees planted in prairies where historically there were no trees can be used as hunting perches by avian predators, which has the potential to adversely impact other local wildlife populations.

F-003-012

4. Pg. ES-19, Table ES-3: Summary of Mitigation Measures, Biological Resources, tenth bullet – The referenced publication was developed to principally address avian electrocution issues. We recommend that the project be developed in accordance with the recommendations contained in the most recent Avian Power Line Interaction Committee publication "Reducing Avian Collisions with Power Lines, State of the Art in 2012," to address potential avian power line collision risk.

F-003-014

5. Pg. ES-19, Table ES-3: Summary of Mitigation Measures, Biological Resources, twelfth bullet – We recommend that no construction take place in designated piping plover (*Charadrius melodus*) critical habitat at any time. The breeding season for least terns (*Sternula antillarum*) and/or piping plovers in North Dakota extends from April 1 through August 31.

F-003-002

6. Pg. 1-12, 1.2.2 Rural Utilities Service Purpose and Need, last bullet – We agree that all RUS environmental policies and procedures should be satisfied before taking a federal action. The

F-003-002

See response to comment F-003-001

F-003-010

Comment noted; changes made to Executive Summary.

F-003-011

Comment noted; results of BA are integrated into FEIS in Section 3.5.

F-003-012

Basin will consider the most recent Avian Power Line Interaction Committee publication regarding avoidance of avian electrocution in the design of the AVS transmission line. Changes were made to the executive summary.

F-003-013

Comment noted. Changes will be made to the Executive Summary.

F-003-014

See response to comment F-003-007

F-003-025

Comment noted; impacts to whooping cranes are discussed in Section 3.6 of the FEIS. Mitigation measures are discussed in Appendix A of the FEIS.

USFWS recommends that RUS complete section 7 consultation before a decision document is signed.

7. Pg. 1-13, Table 1-2: Permits, Regulations or Consultations Needed for Listed Agencies and Required Actions Necessary for the Project, Rural Utilities Service, RUS Environmental Policies and Procedures – See comment #6.

F-003-001

8. Pg. 1-14, Table 1-2: Permits, Regulations or Consultations Needed for Listed Agencies and Required Actions Necessary for the Project, Western Area Power Administration, Endangered Species Act, Section 7, fourth bullet – We recommend revising the statement to read "If Western determines that the project may adversely affect endangered or threatened species, Western will contact the USFWS to request formal consultation."

F-003-003

9. Pg. 1-15, Table 1-2: Permits, Regulations or Consultations Needed for Listed Agencies and Required Actions Necessary for the Project, U.S. Fish and Wildlife Service, Endangered Species Act, Section 7, first bullet – This is not a USFWS action, delete first bullet. The USFWS's role in the section 7 process is to provide technical assistance to the federal action agency. The USFWS often provides recommendations to avoid, minimize, and mitigate effects to listed species, but the federal agency responsible for the action makes the decision whether or not they implement the USFWS' recommendations.

F-003-004

10. Pg. 1-15, Table 1-2: Permits, Regulations or Consultations Needed for Listed Agencies and Required Actions Necessary for the Project, U.S. Fish and Wildlife Service, Endangered Species Act, Section 7, fifth bullet – Delete or modify this bullet to reflect that the USFWS does not provide incidental take permits (ITP) to federal action agencies during ESA section 7 consultation. ITPs are issued to non-federal applicants under section 10(a)(1)(B) of the Act. If incidental take is anticipated, the federal action agency must receive an exemption for the incidental take from the USFWS via a biological opinion.

F-003-005

11. Pg. 1-15, Table 1-2: Permits, Regulations or Consultations Needed for Listed Agencies and Required Actions Necessary for the Project, U.S. Fish and Wildlife Service, Migratory Bird Treaty Act, first bullet – Delete or modify this bullet to reflect that the USFWS provides recommendations to the action agency and the applicant to avoid, minimize, and mitigate project impacts to migratory birds and their habitats; however it is the federal action agency's and the applicant's decision whether or not they implement those recommendations.

F-003-006

12. Pg. 1-15, Table 1-2: Permits, Regulations or Consultations Needed for Listed Agencies and Required Actions Necessary for the Project, U.S. Fish and Wildlife Service, Migratory Bird Treaty Act, second bullet – Modify this bullet to reflect the type of special purpose permit that would be necessary for the proposed project. As authorized by the MBTA, the USFWS issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, conservation education, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal.

F-003-001

Comment noted. Changes were made to Table 1-2 which is now located in Section 6 of the FEIS.

F-003-003

See response to comment F-003-001

F-003-004

See response to comment F-003-001

F-003-005

See response to comment F-003-001

F-003-006

See response to comment F-003-001

F-003-007

13. Pg. 2-27, Table 2-3: Summary of Mitigation Measures, Biological Resources, fifth bullet – We recommend avoiding construction in designated piping plover critical habitat. Construction activities that occur in designated critical habitat that may cause the destruction or removal of the physical or biological features determined as essential to the conservation of the species (referred to as primary constituent elements) are prohibited unless an exemption is received from the USFWS.

F-003-008

14. Pg. 2-27, Table 2-3: Summary of Mitigation Measures, Biological Resources, seventh bullet – See comment #6 above.

F-003-017

15. Pg. 3-73, Endangered Species Act Species and Critical Habitat, third sentence – Delete Billings County from the list of counties included in piping plover critical habitat designation.

F-003-018

16. Pg. 3-74, Table 3-15: Federally listed Threatened, Endangered, and Candidate Species and Designated Critical Habitat in the Project Area, Gray Wolf – Add Williams County to the list of counties where gray wolves could be found.

F-003-019

17. Pg. 3-74, Table 3-15: Federally listed Threatened, Endangered, and Candidate Species and Designated Critical Habitat in the Project Area, Interior Least Tern – Change the scientific name from *Sterna* to *Sternula*.

F-003-020

18. Pg. 3-79, Piping Plover, first and second sentences – The description of potential habitat for the piping plover in the Draft EIS should be expanded as follows:

> Piping plover habitat on alkali lakes includes more that the beach areas. Designated piping plover critical habitat on alkali lakes and wetlands includes: (1) shallow, seasonally to permanently flooded, mixosaline to hypersaline wetlands with sandy to gravelly, sparsely vegetated beaches, salt-encrusted mud flats, and/or gravelly salt flats; (2) springs and fens along edges of alkali lakes and wetlands; and (3) adjacent uplands 200 feet (61 meters) above the high water mark of the alkali lake or wetland. The entire Missouri River system in North Dakota including the main river and associated reservoirs have been designated as piping plover critical habitat. Critical habitat on the Missouri River includes sparsely vegetated channel sandbars, sand and gravel beaches on islands, temporary pools on sandbars and islands, and the interface with the river. Critical habitat on Lake Sakakawea includes sparsely vegetated shoreline beaches, peninsulas, islands composed of sand, gravel, or shale, and their interface with the water.

F-003-009

19. Pg. 3-101, Birds, third paragraph, last sentence – As of the date of these comments, Basin Electric has not initiated contact with USFWS to coordinate development of an Avian Protection Plan for the Antelope Valley to Neset transmission line project.

F-003-021

20. Pg. 3-105, Table 3-22, Potential Project Considerations for Federally Listed, U.S. Forest Service Sensitive and MIS Species (Animal Only), Whooping crane, comment – Delete the parenthetical phrase: *(except in the badlands area which USFWS indicated does not need to be reviewed for habitat)*. The USFWS has never indicated that the area in the badlands

F-003-007

Mitigation measures have been revised and are summarized in Appendix A of the FEIS.

F-003-008

See response to comment F-003-007

F-003-009

Basin Electric has a system-wide APP which will be implemented on this project. The project will be designed in compliance with the Avian Power Line Interaction Committee (APLIC) Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Additionally, as discussed in the BA, Section 1.4, line marking will be implemented to comply with the USFWS recommendations as developed through the Section 7 consultation process. This marking includes the Missouri River crossing. Additional discussion is provided in Section 3.5.2 of the FEIS.

F-003-017

Comment noted; changes were incorporated into section 3.6 of the FEIS.

F-003-018

Comment noted; changes were incorporated into section 3.6 of the FEIS.

F-003-019

Comment noted; changes were incorporated into section 3.6 of the FEIS.

F-003-020

Comment noted; changes were incorporated into section 3.6 of the FEIS.

F-003-021

Comment noted; changes were incorporated into section 3.6 of the FEIS.

would not need to be evaluated for potentially suitable whooping crane habitat. (In an October 10, 2012, email from Kevin Shelley (USFWS) to Misti Shriner (WAPA), Shelley commented to correct similar statements contained in meeting notes provided by Western for a July 11, 2012, meeting between the USFWS, Western, and Basin Electric.)

F-003-022

21. Pg. 3-110, Surveys for Species under U.S. Forest Service Jurisdiction – Based on the text following the section title it appears that this title should be changed to "Surveys for Species under U.S. Fish and Wildlife Service Jurisdiction."

F-003-024

22. Pg. 3-110, Surveys for Species under U.S. Forest Service Jurisdiction, Whooping Crane, first sentence – The USFWS has not approved or disapproved development or use of habitat model incorporating the Resource Selection Function (RSF) methodology "for the initial determination of whooping crane habitat within the project study area." In an October 10, 2012, email from Kevin Shelley to Misti Shriner, Shelley provided USFWS comments on Western's draft notes from the July11 meeting stating that using RSF methodology is generally not acceptable to the USFWS to define whether or not a particular block of habitat is suitable stopover habitat for whooping cranes. At this time, the USFWS does not support, nor have they "approved," use of RSF methodology to define habitat as suitable for whooping crane stopovers. Please modify the final EIS to reflect the above comment.

F-003-023

23. Pg. 3-110, Surveys for Species under U.S. Forest Service Jurisdiction, Whooping Crane, second sentence – The USFWS recommends that the entire study area be evaluated for potentially suitable whooping crane stopover habitat. See comment #20 above.

F-003-026

24. Pg. 3-110, Surveys for Species under U.S. Forest Service Jurisdiction, Sprague's Pipit, last sentence – The "presence" surveys for Sprague's pipit and the survey methods that will be employed need to be described in the final EIS and reviewed by the USFWS. The EIS should include a discussion of the inherent observer and detection bias that can limit the usefulness of presence surveys for rare species. Surveys for Sprague's pipits should be conducted between the third week in April and the third week in May and then between mid-June and early July. The USFWS further recommends use of multiple surveys, as multiple surveys are more effective for occupancy determinations. Finally, the USFWS recommends refraining from the use of the term "presence" to describe these surveys; the correct term is "occupancy" surveys.

F-003-027

25. Pg. 3-110, Surveys for Species under U.S. Forest Service Jurisdiction, Piping Plover, last sentence – The USFWS requests that the survey methods proposed for piping plover occupancy determinations be presented in the Draft EIS. Include a discussion of the inherent observer and detection bias that can limit the usefulness of occupancy surveys for rare species. The USFWS recommends that occupancy surveys for piping plovers be conducted between May 15 and June 30.

F-003-028

26. Pg. 3-110, Surveys for Species under U.S. Forest Service Jurisdiction, Raptor Nest Surveys – The survey to identify potential raptor nests should be conducted in winter/early spring before trees leaf out and obscure nests. It is not clear if the two surveys will be conducted

F-003-022
Comment noted; changes were incorporated into section 3.6 of the FEIS.

F-003-023
Comment noted.

F-003-024
This issue is addressed in the Biological Assessment for the project.

F-003-026
Comment noted.

F-003-027
Comment noted.

F-003-028
The results of the rapture surveys are discussed in Section 3.6 of the FEIS.

simultaneously (Spring 2013) and when or how the second raptor nest survey will determine nest occupancy.

F-003-029

27. Pg. 6-2, Table 6-1: Potential Project Requirements, Endangered Species Act, second sentence – Same as Comment #10.

F-003-030

28. Pg. 6-2, Table 6-1: Potential Project Requirements, Migratory Bird Treaty Act, second sentence – Same as comment #12.

If you have any questions regarding USFWS comments, please contact Mr. Terry Ellsworth in the USFWS' Ecological Services Field Office, in Bismarck, North Dakota, at telephone (701) 355-8513.

Sincerely,

Robert F. Stewart

Robert F. Stewart
Regional Environmental Officer

cc: Dennis Rankin, Project Manager
Rod O'Sullivan, NEPA Document Manager

F-003-029

Revision incorporated into Section 6 of the FEIS.

F-003-030

See response to comment F-003-029.

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
NORTH DAKOTA REGULATORY OFFICE
1513 SOUTH 12TH STREET
BISMARCK ND 58504-6640

December 17, 2012

North Dakota Regulatory Office [NWO-2012-2869-BIS]

Mr. Dennis Rankin
Environmental Protection Specialist
USDA, Rural Utilities Service
1400 Independence Avenue SW, Stop 1571
Washington, DC 20250-1571

Dear Mr. Rankin:

This letter is in reply to your December 3, 2012, request for comments concerning the Rural Utilities Service (RUS) preparation of an environmental impact statement (EIS) for Basin Electric Power Cooperative's proposed Antelope Valley Station to Neset 345-kV Transmission Project located in portions of Billings, Dunn, McKenzie, Mercer, Mountrail and Williams County, North Dakota.

The US Army Corps of Engineers (Corps) administers Section 10 of the Rivers and Harbors Act (Section 10) and Section 404 of the Clean Water Act (Section 404). Section 10 regulates work impacting navigable waters. Section 10 waters identified within the proposed project area includes the Missouri River (and Lake Sakakawea). Work over, in, or under the these waters is considered to have an effect on the navigable attributes of the system. Section 404 of the Clean Water Act regulates the discharge of dredged or fill material (temporarily or permanently) in waters of the United States (WOUS). Waters of the United States may include, but are not limited to, rivers, streams, ditches, coulees, lakes, ponds, and their adjacent wetlands.

The EIS describes the water resources present within the studied alternatives. The alternatives identified in Chapter 5 would result in no permanent fill into any water resources. The construction of temporary access roads; however, may require a regulated discharge of fill material into waters of the US. Such activities require prior authorization from the Corps. Nationwide Permit No. 12 was issued in March 2012, and may be applicable to the proposed project (enclosed).

All water resources along the permanent infrastructure corridor would be spanned or avoided. Alternative B, while not requiring a discharge of fill material, would convert 0.02 acre of forested wetland to an herbaceous wetland due to clearing of vegetation. Based upon the information provided in the EIS, all crossings, pole placements and substations/switchyards would be designed to avoid discharges of dredged or fill material into aquatic resources. As such, there would be no requirements for Section 404 authorization where these waters are spanned or avoided.

The EIS indicates that both project alternatives would cross the Missouri River at Williston. The Missouri River is subject to Section 10; therefore, Department of the Army (DA) authorization would be required from the Corps for this crossing of the river. In addition, this segment would cross Corps property and requires review and approval from the Lake Sakakawea Project Office. Contact information for the Project is Mr. Ryan Newman, US Army Corps of Engineers, Lake Sakakawea Project Office, 201 1st Street, Riverdale, North Dakota 58565. A copy of this letter is being sent to Mr. Newman.

F-004-001

Lastly, the Corps acknowledges that RUS is the lead federal agency in the preparation of the EIS. In order for this office to issue or verify a DA permit, we will request documentation that the project complies with the National Historic Preservation Act and Endangered Species Act. Such documentation would include the respective effects determinations and consultation outcomes where necessary.

For your convenience and reference, we have enclosed a DA permit application (ENG FORM 4345). Electronic application forms, Nationwide Permits and other information concerning our Regulatory Program can be found on our website at: http://www.nwo.usace.army.mil/Missions/RegulatoryProgram/NorthDakota.aspx.

Please do not hesitate to contact Matt Mikulecky, of this office by letter or telephone at (701) 255-0015 if we can be of further assistance. Please reference Corps identification Number NWO-2012-2869-BIS in all future correspondence relating to this matter.

Sincerely,

Daniel E. Cimarosti

Daniel E. Cimarosti
Regulatory Program Manager
North Dakota

Enclosures

F-004-001

RUS will provide documentation of compliance with the NHPA and ESA and incorporate all necessary information into the effects analysis on historic resources in section 3.6 and endangered and threatened species in section 3.5 of the FEIS.

From: Davis, Jeffrey [mailto:Jeffrey.Davis@bia.gov]
Sent: Wednesday, January 16, 2013 12:25 PM
To: Rankin, Dennis - RD, Washington, DC
Subject: Antelope Valley Station to Neset Transmission Project, Draft Envrionmental Impact Statement Volume I/November 2012 Review

Dear Mr. Rankin:

In reviewing the Draft EIS document for the Antelope Valley Station to Neset 345 kV Transmission Project, I offer the following comment.

F-005-001 In Appendix H & I of the draft EIS document; Class I Survey Recorded Cultural Resources and Inventories and Cultural resources for the Two Alternative Routes. The legal description with township, range, and section should be removed. If you have any questions please call our office.

Thank you,

Jeffrey Davis, Environmental Protection Specialist
Division of Environmental, Safety and Cultural Resource Management
Bureau of Indian Affairs, MC 208
115 4th Ave. SE, Suite 400
Aberdeen, SD 57401
Phone: 605-226-7656
Fax: 605-226-7658

F-005-001

Appendix H & I were removed from the SDEIS and FEIS.

U.S. Department of Transportation
Federal Aviation Administration

Air Traffic Organization
Central Service Center

2601 Meacham Blvd.
Fort Worth, TX 76137

JAN 17 2013

Dennis Rankin, Project Manager
US Department of Agriculture
Rural Utilities Service
1400 Independence Ave. SW
Stop 1571, Room 2244
Washington, DC 20250-1571

Dear Mr. Rankin:

Thank you for your correspondence regarding Antelope Valley Station to Neset Transmission Project, Draft Environmental Impact Statement. We normally participate in, and comment on, other federal agency environmental documents only from the perspective of the Federal Aviation Administration s (FAA) areas of responsibility; that is, whether the proposal will have effects on aviation and the national airspace system. We generally do not provide comments from an environmental standpoint.

F-006-001

From a regulatory perspective, you may need to consider if notice to FAA is required for the effect of the proposed actions on airspace. We encourage you to coordinate with the FAA's Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) office so that we can review the alternatives to provide you with the possible impacts. For information on the requirements for notifying the FAA, instructions for completing the forms, or other information regarding the airspace notification process, please visit the OE/AAA web site at: https://oeaaa.faa.gov/oeaaaEXT/portal.jsp .

You will need to determine if formal notice to FAA is required for the effect of the proposal on airspace. The requirements for this notice may be found in Title 14 of the Code of Federal Regulations, Part 77, Objects Affecting Navigable Airspace. If any part of the project exceeds notification criteria under FAR Part 77, notice to the FAA is required at least 30 days prior to the proposed construction date. More information may be obtained at the OE/AAA web site.

Sincerely,

David P. Medina

David P. Medina
Manager, Operations Support Group
ATO Central Service Center

F-006-001

Comment noted.

F-007-001
Comment noted.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
http://www.epa.gov/region08

JAN 17 2013

Ref: EPR/N

Mr. Dennis Rankin
U.S. Department of Agriculture
Rural Utilities Service
1400 Independence Avenue SW, Stop 1571
Washington, D.C. 20250-1571

Re: Antelope Valley Station to Neset Transmission Project
Draft Environmental Impact Statement
CEQ #20120377

Dear Mr. Rankin:

The U.S. Environmental Protection Agency (EPA) Region 8 has reviewed the Antelope Valley Station to Neset Transmission Project Draft Environmental Impact Statement (DEIS) prepared by the U.S Department of Agriculture Rural Utilities Service (RUS). Our comments are provided for your consideration pursuant to our responsibilities and authority under Section 102(2)(C) of the National Environmental Policy Act (NEPA), 42 U.S.C. Section 4332(2)(C), and Section 309 of the Clean Air Act, 42 U.S.C. Section 7609. It is the EPA's responsibility to provide an independent review and evaluation of the potential environmental impacts of this project, which includes a rating of the environmental impact of the proposed action and the adequacy of the NEPA document.

F-007-001

Based on the EPA's procedures for evaluating potential environmental impacts on proposed actions and the adequacy of the information present, the EPA is rating the two action alternatives LO (Lack of Objections). Because a preferred alternative was not identified in the DEIS, we are rating the DEIS based on the two action alternatives; we do not rate the no action alternative. A full description of the EPA's rating system is included as an enclosure.

PROJECT DESCRIPTION

Basin Electric Power Cooperative (Basin Electric) is proposing to construct, operate and maintain approximately 190 miles of new 345-kilovolt (kV) single pole transmission lines, several miles of 230-kV transmission lines to connect the 345-kV line into the existing system, two new substations – Judson near Williston and Tande near Tioga, a 345-kV switchyard and maintenance access roads. During construction there will be temporary access roads and staging sites. The project is located in portions of Billings, Dunn, McKenzie, Mercer, Mountrail and Williams counties in western North Dakota. Most of the land is privately owned and used for grazing and crop cultivation, interspersed with lands administered by federal agencies. The RUS is the lead federal agency for the EIS and Western Area Power Administration and the U.S. Forest Service are cooperating agencies.

T-001-001

TRIBAL HISTORIC PRESERVATION OFFICE
STANDING ROCK SIOUX TRIBE

Administrative Service Center
North Standing Rock Avenue
Fort Yates, N.D. 58538
Tel: (701) 854-2120
Fax: (701) 854-2138

February 5, 2013

Dennis Rankin, Environmental Protection Specialist
USDA, Rural Utilities Service
1400 Independence Ave, SW, Stop 1571
Washington, DC 20250-1571

Re: Proposed Antelope Valley Station to Neset 345-kV Transmission Project THPO file 12-180

Dear Mr. Rankin:

I am contacting you regarding the proposed Antelope Valley Station to Neset 345-kV Transmission Project and your responsibilities to conduct consultation pursuant to Section 106 of the National Historic Preservation Act regarding the project's potential to adversely affect cultural resources.

Standing Rock Sioux Tribe attaches religious and cultural significance to lands within the proposed project area. The Tribal Historic Preservation Office hereby requests to be a consulting party for this project as provided by CFR 36 800.3(c)(f) so that the project can be planned in such a way as to avoid adversely impacting cultural resources of significance to us.

Our recent review of the DEIS raises concerns regarding how your agency is conducting Section 106 consultations for this project.

The Cultural Resources of the DEIS states that: "As the lead federal agency RUS is coordinating compliance through Western between the Section 106 procedures and the steps taken to meet NEPA requirements." It then goes on to state, "It is anticipated that Basin Electric will notify and invite the ND SHPO, Indian tribes, federal and state permitting agencies and other yet to be identified agencies and organizations to participate in Section 106 consultation" (DEIS 3-115).

Besides there being no mechanism in the regulations to allow the lead federal agency to delegate responsibilities to another agency, such an approach is confusing for consulting parties as it becomes unclear whom we are to direct our communication to or expect correspondence from.

However it is the second statement that is more concerning for a few reasons. First, section 106 responsibilities rest with the lead federal agency and not the applicant and so it is the federal agency, in this case RUS, who should be notifying and inviting participation and not Basin Electric.

T-001-001

In response to this letter, Western recognized the SRST as a consulting party and provided a copy of the interim report titled, Basin Electric Power Cooperative's Antelope Valley Station to Neset 345 kV Transmission Line: A Class II and Class III Cultural Resource Inventory in Dunn, McKenzie, Mercer, Mountrail, and Williams Counties, North Dakota (April 2013), and requested a meeting with the tribe. At that meeting held in June 2013, Western, Basin Electric and the SRST attempted to resolve differences among them about the level of effort needed to identify cultural resources important to the tribe. In September of 2013 Sisseton Wahpeton Oyate (SWO) was also granted consulting party status. The agencies have been consulting with the SRST and SWO Tribal Historic Preservation Officers in regards to the project. In addition, in accordance with 36 CFR Section 800.14(b)(1)(ii), the agencies will execute a Programmatic Agreement which establishes procedures for the identification of historic properties and the assessment and mitigation of adverse effects to them prior to construction of the project.

Secondly, this statement makes it sound like consultation has yet to be initiated which is a bit concerning given that agencies are encouraged to consider their section 106 responsibilities as early in the NEPA process as possible and yet by the time of the release of the DEIS, project planning is well underway. Yet it becomes even more concerning to go on to read in the following paragraph that a meeting was already held over a year ago (November 14, 2011) to assist the agency in determining the appropriate level of effort needed to identify and evaluate historic properties and that "the SHPO letter of May 3rd 2012" describes in detail the survey work that is to be completed once an alternative has been selected.

The only contact that we have received from RUS regarding this project has been the generic letter sent out December 3rd, 2012 soliciting comments on the DEIS. We have not received any correspondence from Western regarding this project. Taken together with the overview presented in the DEIS, this indicate that Section 106 consultations have actually begun with *some* of the parties but thatTribes are being brought into consultations later in the process than some of the other key decision makers.

Whether this is a deliberate tactic or just the effect of having the applicant take charge of what are actually agency responsibilities, it needs to be corrected. As stated above, because of the project's location, we would like to be involved in these discussions. We know from past experience that archeologists and the methods they use in conducting archeological surveys are not appropriate for the identification of specific properties of significance to us and we have valuable input regarding the level of effort needed to identify tribally significance sites. This is why Tribal involvement early the planning process is of particular importance to us (and supported by the regulations at 36 CFR(800.2(c)(2)(ii)(A)) and why we feel strongly that level of effort should be determined in consultation with interested tribes. Please send us a copy of the SHPO letter of May 3, 2012 that outlines what SHPO believes is appropriate level of effort should be (referenced on p.3-116 of DEIS) as this is another topic on which we need to provide input.

Killdeer Mountains

The proposed route's proximity to the Killdeer Mountains raises particular concerns for our office. We are requesting more information regarding the potential visual impacts in that area including if needed a site visit so that we may assist in assessing potential affects and avoiding or minimizing impacts in that area.

We look forward to working with RUS and your partner's on this project.

Sincerely,

Mary S. Wilson
Section 106 Coordinator
Tribal Historic Preservation Office
mwilson@standingrock.org

North Dakota Department of Transportation

Grant Levi, P.E.
Interim Director

Jack Dalrymple
Governor

December 31, 2012

Dennis Rankin
Environmental Protection Specialist
USDA
1400 Independence Ave. SW, Stop 1571
Washington, DC 20250-1571

EIS FOR CONSTRUCTION, OPERATION, AND MAINTENANCE OF 190 MILES OF NEW 345Kv LINE, BILLINGS, DUNN, MCKENZIE, MERCER, MOUNTRAIL, AND WILLIAMS COUNTIES, NORTH DAKOTA

We have reviewed your December 3, 2012, letter.

S-001-002 This project should have no adverse effect on the North Dakota Department of Transportation highways.

S-001-001 However, if because of this project any work needs to be done on highway right of way, appropriate permits and risk management documents will need to be obtained from the Department of Transportation District Engineer, Walter Peterson at 701-774-2700.

Robert Fode
ROBERT A. FODE, P.E., DIRECTOR - OFFICE OF PROJECT DEVELOPMENT

57\raf\js
c: Walter A. Peterson, Williston District

S-001-001
Comment noted. Additional coordination will be initiated as necessary from DOT District Engineers.

S-001-002
Comment noted.

NORTH DAKOTA FOREST SERVICE
"Enhancing the Quality of Life Through Forestry"

December 27, 2012

Dennis Rankin, Environmental Protection Specialist
USDA, Rural Utilities Service
1400 Independence Avenue SW, Stop 1571
Washington, DC 20250-1571

Re: Proposed Antelope Valley Station to Neset 345-kV Transmission Project Draft Environmental Impact Statement

Dear Mr. Rankin,

The North Dakota Forest Service has reviewed the information concerning the above-referenced project with regard to possible impacts on North Dakota's forest resources. While we own no land in or adjacent to the proposed project, we understand that approximately 95 acres of woodland is located within the proposed ROW and in certain instances that woodland would need to be cleared.

North Dakota's forests provide wildlife habitat, recreational opportunities, stabilize river banks, filter water runoff from adjacent agricultural lands, provide wood products, serve as seed sources for conservation tree production, increase the botanical diversity of the state, and provide important wildlife habitat. Where woodland is removed through this project and the area converted to non-woodland use, we suggest replacement trees be planted at appropriate alternative locations at a ratio of 2:1.

S-002-001

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,

Liz Smith, ND Forest Service

Cc: Larry Kotchman, State Forester

Liz Smith, Stewardship Specialist, NDSU-ND Forest Service
Bismarck Field Office 916 E. Interstate Ave. Suite #4 Bismarck, ND 58503
701-328-9916 liz.smith@ndsu.edu www.ndsu.edu/ndfs

S-002-001

Mitigation for woodland areas is discussed in Appendix A of the FEIS.

North Dakota State Water Commission
900 EAST BOULEVARD AVENUE, DEPT 770 • BISMARCK, NORTH DAKOTA 58505-0850
701-328-2750 • TDD 701-328-2750 • FAX 701-328-3696 • INTERNET: http://swc.nd.gov

January 18, 2013

Mark Plank
USDA
1400 Independence Avenue
Washington, DC 20250

Dear Mr. Plank:

This is in response to your request for review of environmental impacts associated with the Antelope Valley Station to Neset 345-kV Transmission Project. The project will be located in portions of Billings, Dunn, McKenzie, Mercer, Mountrail, and Williams Counties, ND.

The proposed project has been reviewed by State Water Commission staff and the following comments are provided:

S-003-002

- There are floodplains identified and/or mapped where this proposed project is to take place. The areas are designated as a Zone A. North Dakota has no formal "permitting" authority as a state entity in the National Flood Insurance Program (NFIP) identified floodplain areas. The permitting is always done by the local entity, which has jurisdiction in the area in question. Please work closely with the County Floodplain Administrator. The Floodplain Administrator for Billings County – Hallie Vavelle; PO Box 247; Medora, ND 58645; 701-623-4876; emerg@medora.midstate.net. Dunn County – Tracey Dolezal; PO Box 246; Manning, ND 58642; 701-548-8068; tdozal@pioneer.state.nd.us. Mercer County – Richard Sorenson; PO Box 39; Stanton, ND 58571; 701-745-3695; rsorenso@state.nd.us. Williams County – Monte Meiers; PO Box 2437; Williston, ND 58802; 701-572-6368. McKenzie and Mountrail Counties are not enrolled in the NFIP.

S-003-003

- A Surface Drain Permit may be needed from the State Engineer if wetlands or drains are affected. The permit application form is enclosed. Please contact Dwight Comfort at 701-328-4949 if you have questions regarding the permit.

S-003-004

- The Southwest Pipeline Project and the Western Area Water Supply Project are located in the project area. Please contact Sindjuja S. Pillai-Grinolds at 701-328-4954 concerning pipeline locations.

S-003-005

- The ND State Water Commission (Commission) maintains a network of observation/monitor water wells throughout the state, and many are located in public right-of-ways. The well location information can be obtained from the Commission's website at: http://swc.nd.gov.; then click on "Map and Data Resources"; and then click on "Map Services". If water wells may be affected by your project or accidently damaged, please contact the Water Appropriations Division of the Commission at 701-328-2754.

- It is the responsibility of the project sponsor to ensure that local, state and federal agencies are contacted for any required approvals, permits, and easements.

JACK DALRYMPLE, GOVERNOR
CHAIRMAN

TODD SANDO, P.E.
SECRETARY AND STATE ENGINEER

S-003-002

Basin will coordinate with the appropriate local entity regarding permits necessary for section of the project located within floodplains.

S-003-003

Basin will coordinate with the State Engineer if any wetlands or drains are determined to be affected by the project.

S-003-004

The Southwest Pipeline and Western Area Water Supply projects are included in the projects considered in the determination of cumulative impacts in Section 4 of the FEIS.

S-003-005

The AVS project is not expected to have any impacts on monitor wells.

S-003-001

- All waste material associated with the project must be disposed of properly and not placed in identified floodway areas.

- No sole-source aquifers have been designated in ND.

There are no other concerns associated with this project that affect State Water Commission or State Engineer regulatory responsibilities.

Thank you for the opportunity to provide review comments. If you have any questions, please call me at 701-328-4967.

Sincerely,

Linda Weispfenning
Water Resource Planner

LW:dp/1570
Encls.

S-003-001

Best management practices involving proper disposal of all waste material will be employed throughout the project. BMPs are addressed in Appendix A of the FEIS.

S-004-001

The AVS project is not expected to have any impacts on Land and Water Conservation Fund project sites.

S-004-002

AVS project is not located near the Sheyenne River Valley Scenic Byway.

S-004-003

Impacts to critical habitats are discussed in section 3.6 of the FEIS. Mitigation measures are discussed in Appendix A of the FEIS and include revegetation efforts will include using native species to revegetate disturbed areas.

NORTH DAKOTA PARKS & RECREATION

Jack Dalrymple, Governor
Mark A. Zimmerman, Director

1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649
Phone 701-328-5357
Fax 701-328-5363
E-mail parkrec@nd.gov
www.parkrec.nd.gov

January 8, 2013

Mr. Dennis Rankin
USDA Rural Utilities Service
Stop 1571, Room 2244
1400 Independence Ave. SW
Washington, DC 20250-1571

Re: Antelope Valley Station to Neset Transmission Project, Draft Environmental Impact

Dear Mr. Rankin,

The North Dakota Parks and Recreation Department (the Department) has reviewed the above referenced Antelope Valley Station to Neset Transmission Project in central and western North Dakota.

S-004-001

Our agency scope of authority and expertise covers recreation and biological resources (in particular rare plants and ecological communities). The project as defined does not affect state park lands that we manage but may affect state Land and Water Conservation Fund (LWCF) project sites that we manage. A map with LWCF project locations has been attached. All LWCF sites received assistance from the federal LWCF program and are under protection of section 6(f) of the LWCF Act. Any property taken from within the 6f boundary of these sites must be replaced with property of equal market value. Should any public or private utilities need to be added or relocated on the LWCF recreational lands, the NDPRD must be consulted prior to any action taken. Please contact Kevin Stankiewicz (701-328-5364 or kstankiewicz@nd.gov if additional LWCF information is needed.

S-004-002

The Department is also responsible for coordinating the ND's Scenic Byways and Backways Program. This proposed project is along the Sheyenne River Valley Scenic Byways and as such we recommend any project development be completed with the least amount of or no visual impact to the immediate and distant views from the above mentioned Backways/Byways. Please contact Kevin Stankiewicz (701-328-5364 or kstankiewicz@nd.gov) if additional Byways and Backways information is needed.

The North Dakota Natural Heritage biological conservation database has been reviewed to determine if any current or historical plant or animal species of concern or other significant ecological communities are known to occur within an approximate one-mile radius of the project area. Based on this review, several plants, animal and significant ecological community occurrences have been identified within or adjacent to the project areas. Please see the attached spreadsheet and maps for more specific information on these species. We defer further comments regarding animal species to the North Dakota Game and Fish Department and the United States Fish and Wildlife Service.

S-004-003

Because this information is not based on a comprehensive inventory, there may be species of concern or otherwise significant ecological communities in the area that are not represented in the database. The lack of data for any project area cannot be construed to mean that no significant features are present. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. The Department recommends that the project be accomplished with minimal impacts and that all efforts be made to ensure that critical habitats not be disturbed in the project area to help secure rare species conservation in North Dakota. Regarding any reclamation efforts, we recommend that any impacted areas be revegetated with species native to the project area.

Play in our backyard!

We appreciate your commitment to rare plant, animal and ecological community conservation, management and inter-agency cooperation to date. For additional information please contact Kathy Duttenhefner (701-328-5370 or kgduttenhefner@nd.gov) of our staff. Thank you for the opportunity to comment on this proposed project.

Sincerely,

Fa Kathy Duttenhefner

Jesse Hanson, Manager
Planning and Natural Resources Division

R.USNDNHI*2013-007KD1/8/2013DL1.21.2013

NORTH DAKOTA
DEPARTMENT *of* HEALTH

ENVIRONMENTAL HEALTH SECTION
Gold Seal Center, 918 E. Divide Ave.
Bismarck, ND 58501-1947
701.328.5200 (fax)
www.ndhealth.gov

December 18, 2012

Mr. Dennis Rankin
Environmental Protection Specialist
USDA, Rural Utilities Service
1400 Independence Ave. SW, Stop 1571
Washington, DC 20250-1571

Re: Basin Electric's Proposed Antelope Valley Station to Neset 345-kV Transmission Project
Billings, Dunn, McKenzie, Mercer, Mountrail & Williams Counties in North Dakota

Dear Mr. Rankin:

This department has reviewed the information concerning the above-referenced project submitted under date of December 3, 2012, with respect to possible environmental impacts.

This department believes that environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. With respect to construction, we have the following comments:

S-005-001

1. All necessary measures must be taken to minimize fugitive dust emissions created during construction activities. Any complaints that may arise are to be dealt with in an efficient and effective manner.

S-005-003

2. Care is to be taken during construction activity near any water of the state to minimize adverse effects on a water body. This includes minimal disturbance of stream beds and banks to prevent excess siltation, and the replacement and revegetation of any disturbed area as soon as possible after work has been completed. Caution must also be taken to prevent spills of oil and grease that may reach the receiving water from equipment maintenance, and/or the handling of fuels on the site. Guidelines for minimizing degradation to waterways during construction are attached.

S-005-004

3. Projects disturbing one or more acres are required to have a permit to discharge storm water runoff until the site is stabilized by the reestablishment of vegetation or other permanent cover. Further information on the storm water permit may be obtained from the Department's website or by calling the Division of Water Quality (701-328-5210). Also, cities may impose additional requirements and/or specific best management practices for construction affecting their storm drainage system. Check with the local officials to be sure any local storm water management considerations are addressed. Storm water runoff from the project area discharges to a 303(d) listed water body (Handy Water Creek and the Little

S-005-001

Best management practices will be employed during construction to minimize fugitive dust emissions. These measures are discussed in Appendix A of the FEIS.

S-005-003

Best management practices will be employed to minimize impacts to water bodies. These measures are discussed in Appendix A of the FEIS.

S-005-004

Basin will obtain a stormwater discharge permit for the project as necessary.

S-005-002

Mr. Dennis Rankin 2. December 18, 2012

Missouri River). Extra care should be taken to ensure construction activity does not affect the water body.

4. Noise from construction activities may have adverse effects on persons who live near the construction area. Noise levels can be minimized by ensuring that construction equipment is equipped with a recommended muffler in good working order. Noise effects can also be minimized by ensuring that construction activities are not conducted during early morning or late evening hours.

The department owns no land in or adjacent to the proposed improvements, nor does it have any projects scheduled in the area. In addition, we believe the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota.

These comments are based on the information provided about the project in the above-referenced submittal. The U.S. Army Corps of Engineers may require a water quality certification from this department for the project if the project is subject to their Section 404 permitting process. Any additional information which may be required by the U.S. Army Corps of Engineers under the process will be considered by this department in our determination regarding the issuance of such a certification.

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,

L. David Glatt, P.E., Chief
Environmental Health Section

LDG:cc
Attach.

S-005-002

Noise impacts from the project are discussed in section 3.13 of the FEIS.

N-001-002
Impacts to visual resources, including Lone Butte, are discussed in Section 3.1 of the FEIS.

changed for all of us, obviously.

I realize that it's unrealistic to put my head in the sand and say, "I wish this didn't have to happen at all, that I'd like to go back," but I have some concerns about this. One big concern, and I think it's a concern that BCA as a group feels, that on -- the alternative that goes along Highway 85 passes very close to an area called Lone Butte, which is a very, very undisturbed area at this point. And in light of what's happening, the number of undisturbed areas is getting smaller and smaller. And I'm definitely concerned about the impact of -- although it's not going right through that area, the impact on the view from there, which right now doesn't have any towers or whatever. I'm hoping that something can be looked at in that regard to possibly minimize the impact there.

N-001-002

I do canoe and kayak quite a bit, and another thing that I feel with both of the routes, I have a concern about the impact of where they're crossing the Little Missouri River, whether it's the route north of Killdeer or whether it's the one that goes closer to 85, again, hoping that the impacts right in the river to -- or right close to the river could be minimized.

N-001-001

N-001-003

I do have concerns, as Bob mentioned, and I have concerns about the impact on, now, the economics for farmers and ranchers who are already dealing with a lot of fragmentation of their land due to a lot of the roads in the oil field and whatever, and I would hope that Basin would look at giving adequate compensation to these people, and I can definitely see Bob's point, and I think it is a very valid one, that this is going to have a big impact on people that are already having to deal with a lot of difficult situations.

The other concern is the impact -- that I have is impact on wildlife and especially upon raptors, and one other of the main reasons that we came here was interesting wildlife and interesting birds, especially raptors. The western part of North Dakota was an incredibly good area for raptors, and I am very concerned about what appears to be a decline in the number of raptors in the area, and I'm hoping that whatever can be done -- no matter which route is taken, hoping whatever can possibly be done to minimize any chances of electrocution. And I did speak to somebody earlier about that, that they are feeling that the -- the looks of these towers is not something that would

N-001-001
Comment noted.

N-001-003
Impacts to wildlife and habitat are discussed in Section 3.5 of the FEIS.

BADLANDS CONSERVATION ALLIANCE
A VOICE FOR WILD NORTH DAKOTA PLACES

Badlands Conservation Alliance
Field Office
801 North 10 Street
Bismarck, ND 58501
701-255-4958 badlandsconservationalliance.org

January 21, 2013

Mr. Dennis Rankin
Environmental Protection Specialist
USDA, Rural Utilities Service
1400 Independence Avenue SW, Stop 1571
Washington, DC 20250-1571

RE: Proposed Antelope Valley Station to Neset 345-kV Transmission Project Draft Environmental Impact Statement (DEIS)

Dear Mr. Rankin:

Badlands Conservation Alliance (BCA) is a western North Dakota based non-profit organization focused on public lands and public natural resources in western North Dakota, particularly Theodore Roosevelt National Park and the Little Missouri National Grassland. The majority of our members, and certainly the charter members, live in or originated in the small communities and rural landscapes surrounding these public lands. Members hold significant familiarity with these lands and value them for a host of ecological, heritage and personal reasons, frequently through multiple generations.

BCA attended the Killdeer open house for this project in Killdeer, ND on November 16, 2011 and submitted comments during the scoping period. We again had representation at the public hearing in Killdeer, ND on January 15, 2013.

At both Killdeer events, BCA members reported that informal conversation with presenters pointed to an early and pre-determined preference for the alternative route along HWY 85 and impacting the North Unit of Theodore Roosevelt National Park. We find this unacceptable.

N-002-001

BCA recommends that the Rural Utilities Service consider and fully analyze an additional alternative to satisfy the future needs for electrical generation for communities and industry in western North Dakota, and in particular northwestern North Dakota, which this project attempts to address. Distributed generation from natural gas fired power facilities near to the areas of need would completely eliminate a requirement for large new transmission lines.

A long line of legal cases has affirmed the concept that an EIS, to be adequate, must consider every reasonable alternative. In fact, an EIS is rendered inadequate by the existence of a viable, but unexamined alternative. BCA respectfully submits that the electric-generation situation has changed dramatically just within the past couple of years, and that failure to consider this opportunity located near to the areas of defined electric need, will render this EIS process invalid.

The oil and gas industry in North Dakota currently flares 30% of its produced natural gas. This is an abhorrently wasteful practice that threatens to continue due to the scope, scale and speed of ever expanding production.

N-002-001

As discussed in the FEIS, Section 2.1.6, Basin is actively developing additional natural gas-based generation in the northwest North Dakota area. This generation will provide voltage support and peaking power to the regional system and help facilitate current and future wind and other generation sources. This generation, however, is not sufficient to meet the needs of the rapidly developing industrial, commercial, and residential infrastructure throughout the area.

N-002-001

We draw special attention to *Figure 7: Electrical Load Forecast 2032* on page 10 of the *PF12 Executive Summary* and *Figure 15: Electric Load Forecast 2032* on page 32 of the full *PF12* to illustrate that projected needs largely remain north of the Little Missouri River, allowing distributed natural gas electrical generation facilities to AVOID ANY CROSSING of that North Dakota State Scenic River with the negative impacts of the proposed mega transmission line.

One of the many benefits of natural gas powered electric generating facilities is that they can be planned, permitted, built, and operational within about two years, so there is no need for attempting to size a transmission line for an assumed regional need which is still 20 years into the future.

Should currently un-contracted coal generation capabilities at Basin Electric's Antelope Valley Station be a partial motivation for this proposed project, BCA suggests that those lesser transmission needs in southwestern North Dakota as expressed in the *PF12* map references above may offer opportunity without increased mining, and without trespass of the rough terrain, and human/wildlife significance of the Little Missouri River Badlands.

The environmental footprint of distributed natural gas generation facilities sited in targeted areas of specific need would be far less than the extensive disturbance of the proposed transmission line and its associated infrastructure. The associated construction disturbance and permanent right-of way of approximately 200 miles of transmission across agricultural lands, as well as the majority of water body crossings, would not be required.

Natural gas is considered to be significantly more environmentally friendly in terms of emissions than are coal-fired power plants. Even if natural gas is more expensive up front than available coal, when considering the externalities of reduced air pollution, the balance may shift. Although North Dakota law prevents the ND Public Service Commission from considering such externalities, the federal partners in this proposed project should still consider them in making their decisions about reasonable alternatives.

Furthermore, rapidly advancing technology for well site production of electricity may dramatically alter the development scenario in the Bakken field as a whole, requiring far less transmission from afar than currently estimated. If and when that should occur, the proposed transmission line may prove over-built, leaving an under-used and intrusive infrastructure across the face of western North Dakota.

Natural gas fired power plants can be built near to the area where additional electrical demand is needed, such that short-distance transmission lines can be sited as needed. Such plants can also be individually sized to meet a particularized need. For example, natural gas can be used to power an individual well site which would never have to be connected to the electric grid. Oil companies and related service companies, as well as state and university research organizations have been considering the economics of small-scale distributed generation for remote well sites. This point brings up a flaw in the methodology of the studies that have been completed by Basin Electric and the State of North Dakota. It does not appear that either study has made any effort to quantify the amount of electric demand which may be satisfied by off-grid generation. They did not consider the very real possibility that many of the wells to be drilled may be serviced by the natural gas coming off nearby wells, and that a significant portion of the anticipated need for electricity may never translate to a need for long distance transmission.

BCA would suggest that the continued disuse and wasteful flaring of natural gas in the Bakken field of North Dakota threatens to impose financial and reputational risks on investors in any and all aspects of development. Continuing to ignore and excuse such financial and environmental deficiencies threatens the oil and gas industry's license to operate, and invites federal regulation that will be potentially punitive to the economy of North Dakota and the energy security of the nation as a whole. We offer here an alternative for your serious consideration that addresses a solution that satisfies both waste and need.

N-002-001

ND's legislatively-authorized EmPower Commission has recommended that the state's oil and gas research council give special attention to the study of value-added uses of natural gas, as a means of encouraging the reduction of flaring. Using natural gas for electric generation would be a 'win-win-win' situation for North Dakota: it would substantially reduce the incidence of flaring which is good for the environment, the value-added use for natural gas which would contribute to local economic development, and it would eliminate the need for a monstrous transmission line crossing the environmentally sensitive badlands of western North Dakota.

By April, 2012, natural gas fired electric generation represented 32 percent of electric generation nationwide, a significant increase from just a few years ago. In the meantime, coal-fired electric generation has declined nationwide to 32 percent, which is a steep decline over the past several years as old power plants go offline rather than invest in expensive upgrades to meet new and anticipated air-quality standards. (http://www.eia.gov/todayinenergy/detail.cfm?id=9450)

The North Dakota Transmission Authority recently contracted a study of future needs with Kadrmas, Lee & Jackson Inc., which was published as *Power Forecast 2012*. The Executive Summary may be found at http://www.nd.gov/ndic/ic-press/PowerES.pdf with the full report available at http://www.nd.gov/ndic/ic-press/Power2012.pdf. This report supports BCA's position that an alternative for distributed generation through use of currently wasted natural gas is a far better option than the coal generated energy in the DEIS proposed alternatives.

The alternative does not weaken Basin Electric's lead in this development. Recent Basin Electric projects including the Lonesome Creek Station and Pioneer Generating Station illustrate Basin Electric's interest and potential capabilities for natural gas production. Considering the global impacts of climate change, it is our estimation that Basin should be pursuing this transition to a cleaner, if not perfect, fuel source that is currently wasted within the Bakken field. They would be addressing electrical generation forecasts without the need for the large transmission infrastructure in either action alternative presented in the DEIS while making constructive use of a fuel source currently wasted.

The USDA Rural Utilities Service (RUS) website indicates that its utility loan and grant programs "connect rural residents to the global economy by . . . 6. Capitalizing on climate change opportunities." Presumably what they really mean is capitalizing on opportunities to reduce the incidence of climate change, to the extent that climate change may be caused by human activities. Offering a loan or grant for the purpose of developing a significant natural gas to electricity presence in ND would be a step in the right direction, in that the identified increased demand for electricity would not increase demand for more coal mining.

N-002-002

Proponents of the project may argue that this proposal would substantially increase costs because ND coal-fired power plants have excess capacity. However, North Dakotans are not used to including externalities into their benefit/cost ratios because ND law does not allow its Public Service Commission to take externalities into account. As a federal agency, the USDA RUS can and should take into account the damage to the natural environment of the proposed transmission line, the degradation of visitor experience to the Park if Alternative A were chosen, the diminution of the integrity of the Blue Buttes American Indian Traditional Use Area if Alternative B were selected, and for either corridor, the cumulative negative effect on wildlife habitat of adding yet another layer of disruption, and the negative aesthetic impact for all who live in, or visit, the area.

The cost of electricity from coal-fired power plants will necessarily increase over the next 20 years as new environmental controls come online, especially if carbon capture and sequestration is added to the mix. The cost of natural gas, on the other hand, is expected to remain flat over at least the next 10 years according to the US Department of Energy. (http://www.powerincooperation.com/EN/Pages/affordable.html)

N-002-002

Impacts to visual resources, including Blue Buttes, are discussed in Section 3.1 of the FEIS.

N-002-001

At the present time, there is a large-scale national study underway, as part of federal stimulus funding, which is analyzing the national electric transmission grid and forecasting demand nationwide. (http://naruc.org/Grants/) BCA recommends putting the EIS process for the new transmission line on hold until the major national study is completed, projected at the end of 2013, so that consideration can be given to lessons learned.

Our recommendation for a natural gas alternative having been firmly stated, we find we must also state the following. It is BCA's strongly held position that the DEIS Alternative A should be dropped from consideration for this project. Development of the Bakken shale formation in North Dakota has been hugely transformative for communities, landscapes and quality of life issues in western North Dakota. What our citizens have experienced thus far is only the tip of the iceberg when measured against the industrialization we can expect in the next 20 years. That is not to say the State and its citizens have not also seen benefits of development, but it is to emphasize the rights our current and future residents have to respectful protection of our natural landscape as recognized in Theodore Roosevelt National Park and those remaining unroaded areas of our once intact Little Missouri National Grassland.

A fully developed Bakken field is estimated to cover 15,000 square miles of western North Dakota with anywhere from 30,000 to 50,000 wells. This does not include the additional figures that will come with oil and gas development in the expanded Tyler, Spearfish and Three Forks formations.

The three units of Theodore Roosevelt National Park in total make up less than two-tenths of one-percent of the State of North Dakota. They are a precious and significant part of the State's identity and inherent wealth, and contribute equally to the identity and wealth of the Nation. Absolute protection should come without saying.

Similarly, North Dakota is home to the Nation's largest National Grassland. Managed by the US Forest Service under its multiple-use directive, 95% of the Little Missouri National Grassland is open to oil and gas development. In the early 1970s, approximately half of its 1.1 million acres was undeveloped. By the late 1970s that acreage had been cut in half. Currently, the Forest Service manages less than 40,000 acres under what the 2002 Land and Resource Management Plan identifies as "suitable for wilderness."

Badlands Conservation Alliance and its coalition partners advocate permanent protection for those parcels and citizen additions which equal a total of less than 60,000 acres in five separate parcels on the 1.1 million acre Little Missouri National Grassland. Alternative A threatens to diminish the quality of two of those areas adjacent to the Park. Given the extreme value represented in this acreage and the irreversible loss a transmission line of the proposed size and magnitude would cause, we oppose further consideration of this route.

N-002-004

Furthermore, the North Unit of Theodore Roosevelt National Park is oriented in such manner that it looks southeast into Long X Divide roadless area and Lone Butte roadless area on the National Grassland. Historically, visitors to the Park have not recognized the boundaries and limited size of the 24,070-acre North Unit. Current oil and gas development is shrinking that perception and increasingly isolating the Park.

Both Long X Divide and Lone Butte offer some level of protection for the Park viewshed. Of particular note is their wild undeveloped status that provides unfragmented wildlife habitat and wildlife corridors. Lone Butte is known for its elk, mule deer, bighorn sheep, golden eagle and even mountain lion populations, all of which are put at risk by Alternative A. The few remaining undeveloped parcels that exist are essential as havens within the broader oil field that will be western North Dakota. The Nation owes us that much for our energy contributions.

N-002-004

Impacts to visual resources, including Lone Butte, are discussed in Section 3.1 of the FEIS. Impacts to wildlife and habitat are discussed in Section 3.5 of the FEIS.

The recently reconstructed Western Area Power Authority lines have degraded the scenic integrity of the HWY 85 corridor, diminishing the character of the approach to the Park and the above mentioned roadless areas. The proposed Basin Electric line (*Table 2-2, page 2-12, DEIS*) will exceed the height of the WAPA structures again by half to nearly double. This is unacceptable.

The Scenic Integrity Classification *Figure 3-10* on page 3-18 of the *DEIS* clearly shows the route of Alternative A surrounded by a landscape of high classification. No level of mitigation is sufficient to make this acceptable.

N-002-003

In *Appendix C* of the *DEIS, Visual Simulation 2* looks to the western horizon and the proposed route of Alternative A as seen from just below the southern face of Lone Butte itself. While we agree that this is outside the boundaries of the Lone Butte management area, and while we appreciate that the DEIS has moved this proposed route outside non-motorized boundaries, we cannot express deeply enough the harm that will be experienced by users of this rare parcel of undisturbed public land. We find it particularly disingenuous that this photo was taken from the southern edge of the management area and without the added effort of ascending the namesake butte to fully assess both the area's beauty and its potential for degradation.

Additionally, the life expectancy of the Bakken oil field according to the ND Department of Mineral Resources is now estimated to surpass 70 years. That is equivalent to or exceeds three human generations. Wildlife populations will need some small haven of suitable habitat to maintain even the most limited resource for re-population once oil and gas production is abated. Without the pre-development template the Park and associated areas represent, we will have only a forgotten landscape, unequal to the task of reclamation. Wildlife habitat maps recently developed by the North Dakota Game and Fish Department should be consulted to verify the significance of the area in question. The majority of these maps are unavailable to the general public due to the sensitivity of wildlife populations, but are readily available upon agency and/or project-specific consultation.

A few short years ago, one could have stood in the North Unit of Theodore Roosevelt National Park and admired a seemingly unbounded view of a wild natural landscape. This is no longer true. The cumulative impacts of industrialization this proposed project exemplifies and encourages would not be acceptable were we speaking of the Grand Canyon or Glacier or Yellowstone or the Tetons. It is equally unacceptable here.

BCA maintains the sanctity of Theodore Roosevelt National Park and the significance that the USFS-managed, unroaded areas Lone Butte and Long X Divide bring to that Park's future, to our wildlife populations, and to the historic and future quality of life issues reflected. We urge the Rural Utilities Service to pursue an alternative to the proposed transmission line on that basis and with solidarity that a solution satisfactory to all interests may be developed.

Respectfully,

Jan Swenson

Jan Swenson, ED
Badlands Conservation Alliance

Cc: Jay Frederick, McKenzie District Ranger, Dakota Prairie Grasslands

N-002-003

Comments noted; Visual simulations updated in FEIS.

SIERRA CLUB
FOUNDED 1892

North Dakota Office
311 E Thayer Ave. STE 113
Bismarck ND 58501
701-530-9288 fax 530-9290

N-003-001
Impacts to visual resources, including Lone Butte and Long X Divide are discussed in Section 3.1 of the FEIS.

January 22, 2013

Mr. Dennis Rankin
Environmental Protection Specialist
USDA, Rural utilities Service
1400 Independence Ave. SW, Stop 1571
Washington, DC 20250-1571

RE: Antelope Valley Station to Neset 345-kv Transmission Project DEIS

Dear Mr. Rankin:

I am writing on behalf of Dacotah Chapter of Sierra Club regarding the proposed Antelope Valley Station to Neset 345-kv Transmission Project DEIS (Project). Dacotah Chapter (Chapter) members recreate in Theodore Roosevelt National Park (Park) and the surrounding Little Missouri National Grasslands (Grasslands) individually and as a group.

While the Chapter recognizes the increasing demand for electricity in western North Dakota due to the increased oil development, the National Park and National Grasslands represent some of the last remaining wild areas in North Dakota where a visitor can experience solitude and a have primitive recreational outing. They also provide important wildlife habitat for a number of prairie wildlife species. The recent level of oil and gas activity has brought with it numerous negative impacts to these public lands. This Project provides an opportunity to "do it right" by making sure the route of the proposed transmission line minimizes the visual impacts to the natural landscape.

N-003-001

The Project, as proposed in Alternative A, will have a lasting negative visual impact on the Park and Grasslands. The North Unit of Theodore Roosevelt National Park contains over 24,000 acres of congressionally designated Wilderness. The viewshed of the Park Wilderness, and therefore visitor enjoyment of the resource, will be compromised by Alternative A. The visual integrity of the Grasslands' Long X Divide Suitable for Wilderness Area and Lone Butte Backcountry Recreation Non-motorized Area are threatened by Alternative A. There is no way to mitigate the impacts to these areas. They are all that remain of a once wild North Dakota.

The Park and Grasslands are an integral part of western North Dakota's tourism industry. They are also a source of pride for North Dakotans. The industrialization of a once rural, mainly agricultural, section of our state is irreversible. We can only try to minimize the impacts of individual projects. This one project will have a greater impact on the overall "feel" of the public lands that it traverses than many other projects. When you add it to the cumulative impacts of those other projects, the Alternative A route becomes unacceptable.

Dacotah Chapter of Sierra Club respectfully requests that Alternative A not move forward as a viable alternative. We also request that any final alternative chosen does not negatively impact Theodore Roosevelt National Park or Lone Butte Backcountry Recreation Non-motorized Area.

Thank you for the opportunity to comment on this proposal.

Sincerely,

Wayde Schafer

Wayde Schafer
Conservation Organizer
Dacotah Chapter of Sierra Club
311 East Thayer #113
Bismarck, ND 58501
701-530-9288

O-001-001

UPPER MISSOURI G & T
ELECTRIC COOPERATIVE, INC.
111 2ND AVE. SW, PO BOX 1069, SIDNEY, MT 59270 BUS.: 406-433-4100 FAX: 406-433-4105

January 11, 2013

Mr. Dennis Rankin, Environmental Protection Specialist, USDA, Rural Utilities Service
1400 Independence Avenue, SW, Stop 1571
Washington, DC 20250-1571

Dear Mr. Rankin,

This letter is offered in support of the AVS to Neset 345kV Transmission Project planned by Basin Electric Power Cooperative (Basin Electric).

Upper Missouri G & T Electric Cooperative (Upper Missouri) is a Class A Member System of Basin Electric. Upper Missouri provides transmission services to ten electric cooperatives; five in Western North Dakota and five in Eastern Montana. All ten of Upper Missouri's member cooperatives are experiencing electric load growth due to oil and gas exploration, discovery and development.

The unprecedented growth is putting immense pressure on the region's electric transmission system which is reaching capacity limitations. The AVS to Neset 345kV Transmission Project is a vital infrastructure improvement which is required in order for Basin Electric, Upper Missouri and its ten member cooperatives to keep pace with development and to assure safety, comfort, security, and economic stability in the region.

We encourage expeditious action and attention to this important transmission project. Project delays would lead to severe transmission limitations, ultimately affecting the security, safety and comfort of ranchers, farmers and residents of the region.

Upper Missouri strongly supports the development and expeditious construction of this vital transmission link.

Sincerely,

Claire Vigesaa

General Manager

Upper Missouri Generation and Transmission Electric Cooperative, Inc.

A Touchstone Energy® Partner

O-001-001

Comment noted.

of the cost to do it on our own, minimizing that initial capital investment and keeping our depreciation and interest expense in check.

Rates are being held relatively stable on another front as a result of spreading our fixed costs over more and more meters.

There is no doubt about it; the growth that we are experiencing has been a good thing for McKenzie Electric Cooperative's membership.

Then there's the impact on our communities.

- Increased land and existing home values;
- New home construction;
- An influx of commercial business bringing with them jobs and a choice for people looking for work – and at a great wage;
- Quality cellular phone service;
- Drinking water you can actually drink;
- Bigger and better grocery stores and gas stations driving competition to better consumer pricing;
- Soon to be better access to quality health care...
- Goodness, we're even getting fast food in Watford City.

In short, the conveniences of the modern world that so many people outside rural America take for granted are finally coming to our little corner of one of the most sparsely populated states in the nation and all of it runs on electricity.

The Draft Environmental Impact Statement highlights the regulations and science that, on their own are enough to support and justify the construction of this 345kV transmission line and its other associated projects.

Hopefully I have touched on some social, economic and quality of life benefits that this transmission build-out is allowing to take place.

O-002-001

As you progress through your decision making process regarding the Environmental Impact Statement, I implore the Rural Utilities Service to be diligent and expeditious in its approval as a delay in the construction of these facilities would be detrimental to the load serving abilities of the electric utilities in western North Dakota and eastern Montana.

Thank you.

O-002-001

Comment noted.

O-003-001
Comment noted.

Hello my name is Roger Kudrna.

I am a landowner in Dunn County and director at Roughrider Electric Cooperative.

O-003-001 I support the Antelope Valley to Nesset transmission line. I am concerned because it is reported that without improvements, the existing powerlines will become overloaded. This could possibly lead to widespread outages.

As a land owner, electric rate payer, and member of Roughrider Electric Cooperative, I am concerned with the future reliability and availability of electricity in our area.

Basin has presented a project plan, with options, that will help alleviate the situation with the construction of a 345 thousand volt transmission line. In reading the plan summary, I see that the transmission line is not only to ship power to the Williston area, but will be interconnected along the way – providing additional support along its route.

On behalf of myself and the board of directors at Roughrider Electric Cooperative, we fully support the plan to construct the 345 KV Antelope Valley to Nesset transmission line with the hope that a route will be found that is agreeable to all.

O-004-001
Comment noted.

Hello my name is Chris Baumgartner; I am Co-Manager of Roughrider Electric Cooperative with offices in Hazen and Dickinson, ND. Roughrider Electric serves over 7,000 member-owners across the seven western North Dakota counties of Oliver, Mercer, Stark, Dunn, Billings, Golden Valley and Hettinger.

Roughrider Electric is a Class C member of Basin Electric Power Cooperative. We deliver power generated by Basin Electric from the Integrated System via contracts secured through the Upper Missouri Generation & Transmission Cooperative.

As with any major project (such as the proposed 200-mile, high-voltage transmission line), prudence requires that we study the necessity of such an endeavor. Our cooperative has seen an average annual growth of 6% in sales since 2006. We are forecasting growth at the same rate for the next 10 years. This new transmission line will not only allow for additional capacity but also serve as a backup source of power delivery to the Roughrider system.

As a member-owned cooperative, Roughrider Electric takes every effort to focus our attention on serving the needs of our customers. We are not a profit-driven organization but exist rather to ensure a high quality of life for our members with the use of dependable and affordable electricity. It is a perpetual balance of cost and system reliability with a constant awareness and respect for the environment where we live and work.

This sense of awareness is also present at Basin Electric, our power supply cooperative. It is equally important that all development and system improvements occur after the necessary actions have been taken to ensure respect for the natural environment and to all of our neighbors, friends & family that call our beautiful North Dakota home.

Basin Electric has a long history of working closely with landowners, communities and environmental groups, as well as local and state governments to identify cultural or environmentally sensitive areas and to reduce or eliminate any negative impacts. We feel that Basin Electric and its consultants have identified not only the least expensive option to construct and operate this 200-mile project but also have invested the necessary time and resources to prepare a plan to construct it in the most environmentally safe and responsible manner. As a cooperative and a member owner of Basin Electric – we will accept nothing less from our power supplier. We strongly encourage you to support this project as presented.

O-004-001

and northwestern North Dakota. We serve about 1,900 members in Daniels, Roosevelt, and Sheridan, Montana, as well as Divide in North Dakota. We have about 2,500 miles of distribution line and about 81 miles of transmission line currently.

O-005-001

The reason we're here is to say that this is a critical line for Sheridan Electric for several reasons. First of all, it ensures that our membership has the means to grow for many years to come. We're facing capacity issues right now.

Next, it will protect the integrity of our entire system by allowing the lights to stay on if a portion of the current 230-kV system is interrupted. Currently, we're at the end of the line and part of our membership could face outages without the 345-kV line.

We feel that Sheridan Electric is unique in the fact that we are seeing tremendous growth in our residential and agricultural accounts, as well as commercial and oil-related. With this being said, our need for this transmission line extends beyond the oil growth. Last year only a third of the services that we built to were for oil wells.

And thank you for your time.

MR. HOFFMAN: I don't have anyone else on

O-005-001

Comment noted.

businesses, farming and -- farming and -- and ranching. It's -- it's been pretty much right across the board.

This growth has really strained the bulk power supply coming into our system to the point where not only can we not hook up an oil and gas pumper, but if a farmer would come in and ask for a large grain dryer system, irrigation pumps, we really have to look hard at -- at connecting that load because it's -- it's marginal whether -- whether we can provide the power that they need.

So looking down the road, while the load growth may not extend out 20 years, we see the next 10 as being similar to what we've been through

O-006-001

the last 5, and this line that -- that Basin is proposing is just critical to the future load growth of the -- of the co-op, whether it's, like I said, oil and gas, farming and agriculture, or -- or Main Street businesses, or residential.

So I'd just ask that the agencies tonight look kindly towards Basin's request in an expedient fashion, and then I just thank -- thank all of them for their support. It's critical to the future of Mountrail-Williams Electric Co-op.

Thank you.

O-006-001

Comment noted.

I-001-001

To whom it may concern,

Landowners who are still living and working where the proposed Basin Electric line from Antelope Valley Station to Neset near Tioga, ND are frustrated with the fact that Basin Electric is planning to run over the landowners that live here without compensation for the future.

While my Grandfather was happy to see electricity come to the area. To this day I still work around a substation that my Grandfather sold to a local coop so that people in the area would have electricity. I feel it is grossly unfair that we are being forced to take a onetime payment for the actual value of the land, which is 2% of the cost of the line. This is terribly unfair as I hope that my son or sons will be able to live here and make a living as our families have done for generations. This will put added costs to our farming and ranching operations for all the years that this line will exist.

If we were given an annual payment for our added costs, a lot of the affected landowners would feel they were being treated fair versus being run over, as we do understand there is a need for the power to reach the area the line is going to.

To be forced to sell land, not for sale, without some cooperation from Basin Electric Cooperative is completely opposite what we were ever taught as being part of a Cooperative.

The electricity will not be used by area people but will, for the most part, be sold to the companies doing business in the oilfield.

Over one half of the money from the oil activities, in our township, does not stay in our area to help the local economy. Most of the mineral rights have been severed from the topsoil rights and that money goes out of the area and most going to out of state people.

It is unfortunate that those of us still living here and were not able to get the mineral rights with the topsoil when we bought the land will have to once again shoulder the burden of our "new" neighbors making a tremendous amount of money off of our backs.

Robert Ferebee
8447 2nd St SW
Halliday, ND 58636
701-260-4772

P.S. Basin is offering 2 percent of the cost of the line to the landowners.

I-001-001

ROW compensation is not within the scope of issues addressed in the EIS but the purview of the North Dakota Public Service Commission.

MR. HOFFMAN: And if you could make sure she knows the spelling for us.

MR. FREI: F-r-e-i.

THE COURT REPORTER: Thank you.

MR. FREI: I listened to all the testimony here and a couple things concern me. I'm -- I'm a landowner, and I -- I think this power line's going to go through our property, and we've got issues with securing a respectable easement. We have some money issues.

But I'm -- I shouldn't say "but." I'm a member of McKenzie and Roughrider both. I enjoy them good. We appreciate them. McKenzie, I've got a long, long, long track record with them. One of the -- each of your entities get up and say $130 million expansion and it grew from this to some other figure in the hundreds of millions of dollars. This power line's going to come through and they're going to pay us X amount of dollars for 99 years with an easement that just isn't very friendly to the landowner.

I-002-001

Now, with the craziness that's been going on, as landowners, we're continually being asked to do more and more and more in the near term and nothing in the long term. I haven't heard

I-002-001

See response to comment I-002-001.

Please provide any comments regarding the Antelope Valley Station to Neset Transmission Project Draft EIS below. A copy of the Draft EIS is available online at http://www.rurdev.usda.gov/UWP-AVS-Neset.html. The comment period is open through January 22, 2013.

The powerline needs to go somewhere, as a landowner I would rather it go some where else, but I'm sure it won't, so these are several concerns I have.

I-002-004

The Federal, State & local goverments as well as companies are trying to implement boundaries for industry & utility use. Basin has a CO2 pipeline from Beulah thru Tioga that goes thru our land 1½ mi. north of the Proposed powerline. This would possibly eliminate another easement taking more farmland out of production.

Local electric companies state their business has increased by hundreds of millions of dollars. Companies increase their rates over time to compensate for their expenses & value of the product. A landowner is offered a onetime payment for 99 yrs & no 20yr adjustment of increased value for loss of use of their land.

The easement should be for the lifetime of the powerline – not a 99 yr exclusive. As a landowner, we should be compensated for the use of our land taken out of production and letting pipeline or utility owners utilize or land to better their business.

This power line devalues the land. Abstracts will have to be updated at landowners expense.

I-002-002

As a pilot, I will no longer be able to fly over & check crops or hire arieal spraying or preditor control. We use 2way Radios in our farming operation

I-002-003

The power line will make them useless.

Your Name: Larry Frei

Mailing Address: 7910 Hwy 1806
Halliday ND 58636

Email address:

☐ *Please check here if you would NOT like to be on the mailing list*
☐ *Please check here if you would like your name/address kept private*

Before including your address, email address, or other personal information identifying information in your comment, please be advised that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

I-002-002
Discussed in Section 3.11 of FEIS..

I-002-003
Discussed in Section 3.11 of FEIS.

I-002-004
See response to comment I-002-001.

Rankin, Dennis - RD, Washington, DC

From: Daryl Dukart [daryldukart@ndsupernet.com]
Sent: Tuesday, January 22, 2013 8:54 AM
To: Rankin, Dennis - RD, Washington, DC
Subject: comments on Antelope Valley & Neset line

Thank you for allowing a reasonable time frame to respond.
Daryl Dukart
"It's not the strongest of the species that survives, nor the most intelligent, but the ones most responsive to change."
Charles Darwin

January 21, 2013

Comments regarding the Antelope Valley Substation to Neset transmission Project Draft EIS:

The challenge to change is hard and the change of a challenge is often harder.

After sitting and listening to the information shared at the Killdeer, North Dakota meeting I heard both side of this project. I would say and think most would agree with me that no one was opposed to the project. A few placed full supports while a few others held questions.

I-003-001

The challenge the land owners are offering Basin is to move from a 99 year type of easement to a reasonable 20 year agreement to satisfy the next generation of land owners. I heard in private talk that night from a few of the land owners (we do not necessary need an annual payment but 20 year agreements would be about right). I believe with good reasonable discussion this could and should happen. We will see PSC get challenged with this issue on many other types of transmission lines in the near future. Western North Dakota has met many of these challenges already and as we all continue to watch growth and the need for more and more transmission lines, more and more challenges will come about.

I do not think this difference is about money to either party it's about location of line, is it going to impact the environment and terms of the lease agreement.

Thank you for allow me the time to share and place my thoughts on paper.

Please consider the change in terms for our surrounding environment continues to change in Western North Dakota and we as landowners want to continue to serve as good stewards of the land for our fellow citizens.

Working relationships with this energy boom are very important. We have seen the oil side of this boom move from a come in and sit done a rig to actually sitting done and talking about location, sighting of gathering lines, well sites, roads and how to continue to work with the landowner because they are going to be here operating for many years.

Sincerely,

Daryl Dukart

470 96th Ave SW

Dunn Center, North Dakota 58626

daryldukart@ndsupernet.com

I-003-001

See response to comment I-002-001.

I-004-002

I-004-001

Please provide any comments regarding the Antelope Valley Station to Neset Transmission Project Draft EIS below. A copy of the Draft EIS is available online at http://www.rurdev.usda.gov/UWP-AVS-Neset.html. The comment period is open through January 22, 2013.

We own land that you are planning to put your electric towers on. There has not been a lot of changes on our property. We would like it to stay unchanged. We do not want the electric towers on our land. Those towers would go through pastures and spring areas. The electric company is going to make money out of these electric lines at our expense of having it on our property. The Basin Electric Company is making money every year off of the electric lines. If we have to have the electric towers on our land we should get an annual payment for 99 yrs or for as long as the lines are there. It is cutting into our lands productivity. Our lands spring areas are important to us and we do not want the towers to effect our water areas. Thank you for you time.

We received this form Saturday January 19, 2013. We put it in at our first mail day Jan. 22, 2013.

Your Name: Martin & Julie Dahlen

Mailing Address: 8717 Hwy 200
Halliday, ND 58636

Email address:

☐ *Please check here if you would NOT like to be on the mailing list*

☐ *Please check here if you would like your name/address kept private*

I-004-002

Land use impacts discussed in section 3.7 of the FEIS.

I-004-001

See response to comment I-002-001.

I-005-002

I-005-001

Please provide any comments regarding the Antelope Valley Station to Neset Transmission Project Draft EIS below. A copy of the Draft EIS is available online at http://www.rurdev.usda.gov/UWP-AVS-Neset.html. The comment period is open through January 22, 2013.

I feel that the easements are too long. They should have a yearly compensation as you have to drive around the towers five times a year, for planting, spraying harvesting ect.

I have heard reports from previous sites that they do not take care of the sites. The weeds are out of control and they leave ruts. We as farmers don't like weeds polluting our farm land.

Your Name: Larry Knudsvig

Mailing Address: 179 96th AV SW
Dunn Center ND 58626

Email address:

☒ Please check here if you would NOT like to be on the mailing list

☒ Please check here if you would like your name/address kept private

Before including your address, email address, or other personal information identifying information in your comment, please be advised that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

I-005-001

Basin would implement BMPs to control for weeds in the ROW which are discussed in Appendix A of the FEIS.

I-005-002

See response to comment I-002-001.

Appendix C—Comments on the Supplemental Draft Environmental Impact Statement

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F-001-001

Comment noted.

U.S. Department of Transportation
Federal Aviation Administration

Mission Support Services
800 Independence Avenue, SW.
Washington, DC 20591

JAN 17 2014

Mr. Dennis Rankin
Environmental Protection Specialist
USDA
Rural Utilities Service
1400 Independence Avenue, SW
Stop 1571
Washington, DC 20250

Dear Mr. Rankin:

Thank you for your December 13, 2013, letter inviting the Federal Aviation Administration to supply comments on the environmental impact statement (EIS) for Basin Electric Power Cooperative's proposed Antelope Valley Station to Neset 345-kV Transmission Project in North Dakota.

F-001-001 We reviewed the scope of the Supplemental Draft EIS and do not have comments. Thank you for your consideration in this matter.

Sincerely,

Elizabeth L. Ray
Vice President, Mission Support Services
Air Traffic Organization

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Denver Federal Center, Building 67, Room 118
Post Office Box 25007 (D-108)
Denver, Colorado 80225-0007

TAKE PRIDE IN AMERICA

February 3, 2014

9043.1
ER 13/799

Mr. Dennis Rankin, Project Manager
U.S. Department of Agriculture, Rural Utilities Service
Engineering and Environmental Staff
1400 Independence Avenue, SW
Stop 1571, Room 2244
Washington, DC 20250-1571

Dear Mr. Rankin:

As requested, the Department of the Interior (Department) has reviewed the Draft Supplemental Environmental Impact Statement (EIS) for the Antelope Valley Station to Neset Transmission Project in central and western North Dakota. The U.S. Fish and Wildlife Service (USFWS) and the National Park Service (NPS) provide the following comments for your consideration.

NATIONAL PARK SERVICE COMMENTS

Lewis and Clark National Historic Trail

The Lewis and Clark National Historic Trail (Trail) was designated by Congress as a part of the national system of trails in 1978. The National Park Service (NPS) administers the Trail and is charged with protecting the historic route, remnants, and artifacts for public use and enjoyment. There have been many changes to the landscape in the project area since the time of the Lewis and Clark Expedition. This only increases the need to protect what remains so that the Trail will continue to draw and inspire visitors for generations to come.

F-002-001

All action alternatives considered in the Supplemental Draft EIS would cross the Lewis and Clark National Historic Trail historic route at the Missouri River near an existing transmission line. As stated in our comments on the original Draft EIS, careful consideration should be given to reducing cumulative visual impacts at the river crossing by locating new structures adjacent to or at the same spacing as existing structures.

F-002-002

It is incorrectly stated in Section 3.1.2 (page 3-10) that Alternative C would cross the Trail auto tour route three times between the Antelope Valley Station and Judson substations. In fact, all currently proposed alternatives would cross the auto route at six locations. A map of the auto route was enclosed with our scoping comments submitted December 1, 2011. Special attention

F-002-001

Comment noted.

F-002-002

Text revised to read: "it is expected that impacts from this alternative would be minor because of the presence of human influence and other existing infrastructure throughout the area " in Section 3.1.2.

should be given to reducing visual impacts where the transmission line will cross or parallel the auto route.

In discussing aesthetics and visual resources in Section 3, page 3-14 states that:

F-002-003

> "Similar to Alternatives C and D, impacts from this alternative would be minimized by the presence of human influence and existing infrastructure throughout the area (in the form of transmission and distribution lines, oil and gas development, agricultural operations, and gas pipelines), use of weathering steel structures in areas of higher visual sensitivity, and the distance from federally recognized visually sensitive areas and parks."

We disagree that existing visual conditions "minimize impacts" from the proposed project. Degrading the existing visual resource condition and creating potential for additional future infrastructure contributes to cumulative impacts that may reach a tipping point of having significant impacts. The analysis of cumulative impacts to visual and aesthetic resources in Section 4.4.1 tries to address this, but appears to not fully account for the rapid pace of development in the project area since the analysis only projects low to moderate long-term cumulative impacts to visual resources. See our comments on cumulative analysis below.

Theodore Roosevelt National Park

F-002-004

With the explosion of energy development in the North Dakota badlands, we must remain vigilant to protect the ecological integrity and scenic views of all three units of the park. This treasured national park is extremely significant to the nation, to North Dakota, and to more than 600,000 visitors who enjoy it annually. We are also concerned about the Lone Butte Inventoried Roadless Area and the Long X Divide Suitable for Wilderness Area on U.S. Forest Service lands that adjoin the North Unit of the park. These areas are very important to the visual integrity and habitat continuity of the North Unit and the Theodore Roosevelt Wilderness. Our visual impact studies show that portions of the 115-foot high transmission line would be visible from up to 30 percent of the North Unit of the National Park.

F-002-005

The transmission line is just one of many infrastructure projects that will or could affect the park. Each individual project has a minor to moderate effect – but the cumulative impacts from the Bakken oil boom infrastructure development are enormous. Each piece of industrial infrastructure that is added to the mix further degrades the integrity of the national park and surrounding landscape and contributes to habitat fragmentation for the wildlife that rely on the North Unit and surrounding roadless areas for their survival.

F-002-006

Section 4.2, Cumulative Action Scenario of the Supplemental Draft EIS, outlines a large number of past, present and future activities affecting the area. Section 4.3 lists an almost incomprehensible number of current and future projects, demonstrating the rapid industrial growth around the national park. However, these cumulative impacts are generally stated to be minor or moderate because there is already other infrastructure in the area. The fact that other infrastructure exists does not mean that additional infrastructure will not have an effect, or that the combined effects of more and more infrastructure will not have major, long-term impacts on the park and adjoining areas. The point of cumulative impact analysis is to determine whether the proposed action, when added to the accumulation of all the development in the area, results

F-002-003

Text revised to read: "it is expected that impacts from this alternative would be minor because of the presence of human influence and other existing infrastructure throughout the area " in Section 3.1.2.

F-002-004

Habitat fragmentation is addressed under a separate analysis.

There would be visual impacts from the proposed action. As required under NEPA, these impacts have been fully disclosed in the analysis of alternative C. Further, NPS has conducted an analysis that shows that distant views of a length of less than one half mile of the transmission line would occur in less than 30% of the park unit. Areas contained within that 30% may not necessarily be classified as highly recreationally important and it is unknown whether these areas are easily accessible by visitors. However, it can be assumed that there would be some visual impacts where frequently travelled areas coincide with views of the transmission line.

F-002-005

The cumulative impact section (chapter 4) discusses the effects of increasing oil field and infrastructure development that is occurring in northwestern North Dakota. The analysis considers the impacts on TRNP as well as other excising public lands throughout the region.

F-002-006

The cumulative impact analysis in the FEIS has been further revised to reflect the impacts that are occurring throughout the region with the significant increase in oil development activities. However, while the development of the transmission line is in support of this activity, the development will continue to occur without or with out the proposed project. Therefore, in most cases, the contribution of the transmission line project to cumulative impacts of development is expected to be minor.

Mr. Dennis Rankin 3

in significant impacts. It seems odd that the analysis indicates that the impact of the proposed project is minor to moderate because of all the development present and the potential future development. The cumulative impacts of ever growing industrial infrastructure on the natural and agricultural environment need to be better addressed.

Killdeer Mountain Battlefield

F-002-007

Page 3-69, paragraph 2, of the Supplemental Draft EIS presents the historical extent of the battlefield. We are unclear how the Supplemental Draft EIS did not acknowledge a more extensive boundary other than the one-acre state historical site. A casual understanding of the historic record and the monument marker itself would imply a much more extensive boundary exists for the battlefield. Given the specific type of anticipated cultural resources, we would have expected experts in battlefield history, archeology and landscape to be used to test, assess and evaluate the area of potential affects.

F-002-008

On page 3-68, of over 15,000 engagements of the American Civil War, only 384 were selected for study and report to Congress (approximately the most significant 3 percent) by the NPS's American Battlefield Protection Program (Program). Within the section discussing Killdeer Mountain Battlefield (ND005) it should be noted that the site has been designated as a Priority III battlefield and has been reported to Congress since 1993. The site is not only eligible for planning grants, as noted on page 3-70, but also grants for land acquisition at a one-to-one matching ratio. Unlike the indication presented on page 3-68, the NPS has very effective and attractive tools for battlefield preservation for willing landowners. Currently the Supplemental Draft EIS should note that there is over $2 million dollars available for Civil War battlefield protection. Transactions in fee simple or a basic preservation easement are available for Killdeer Mountain Battlefield. For more information on this, please refer to: http://www.nps.gov/history/hps/abpp/grants/CWBLAGgrants.htm.

F-002-009

On page 3-69, paragraph 4, all NPS battlefield boundaries reported in 2008 and agreed to by the State Historic Preservation Officers (SHPO) were field verified by using the Program survey methodology. Historical accounts and viewsheds were examined in the field in order to use the Program military terrain analysis (Key Terrain Observation and Fields of Fire, Cover and Concealment, Obstacles, Avenues of Approach, or KOCOA). Archeological methods were not used for identification and military analysis due to the cost constraints. A copy of that survey methodology generally used by the field of battleground researchers is available from the Program.

F-002-010

On page 3-72 and 3-73, without all the survey data, we cannot agree with the findings of this Supplemental Draft EIS concerning impacts to the battlefield. Not one alternative has completed testing. Without the complete set of alternatives or the results, the conclusion that battlefield remains are not present appears to be no more than conjecture.

Moreover, the research design does not seem to have been built on contemporary battlefield archeological testing approaches. The Commonwealth of Virginia, for instance, requires the use of the Program's KOCOA military analysis as the first step of battlefield characterization in order to meet the criteria of National Register Bulletin 40 (Guidelines for Identifying, Evaluating, and Registering America's Historic Battlefields) and Section 106 of the National

F-002-007

During scoping in November of 2011, none of the parties invited including federal, state and local agencies, identified the Killdeer Mountain Battlefield as an important cultural resource in the study area. Furthermore, none of the comments from agencies and the public on the DEIS identified the omission of the Killdeer Mountain Battlefield in 2012. The agencies have made a reasonable effort to rely on analysis from professionals as both contractors and consulting parties.

F-002-008

While the grants identified are for the acquisition and preservation of threatened Civil War battlefield lands, their use for the Killdeer Mountain Battlefield site is not reasonably foreseeable and as such is not included in the FEIS.

F-002-009

The NDSHPO has not formally agreed with the 2010 NPS Study area boundary. A KOCOA analysis was not performed in 2008, but is one of the tasks to be completed by the NDSU Center for Heritage Renewal under auspices of its 2013 grant from American Battlefield Protection Program.

F-002-010

Comment noted.

F-002-011

Historic Preservation Act, as amended. No evidence of a thoughtful research design was presented. Rather, there is a rote approach using limited shovel testing and linear metal detecting. While the information on page 3-72 concerns the precise date of lead rounds found in the limited testing, there is no evidence that key defining features were targeted in the research design in order to positively identify the military resource. There is no evidence presented on exactly what artifact set would indicate the presence of the Killdeer Mountain Battlefield according to the researchers and how would they specifically test for that set of resources?

F-002-012

Most concerning, and an indication of the failure of the archeological research design, is the finding on Page 3-73 regarding the "paucity of evidence." Battlefields are not appropriate sites for density driven models. If the research design indicated the expectation for large quantities of artifacts, given the historical overview, the design was seriously flawed and did not have reasonable expectations of success. The artifact signature of battlefields is normally very light especially with a running battle. That artifact signature may be missed entirely without consideration of a military terrain testing model.

F-002-013

On page 3-73, the Supplemental Final EIS needs to include a section containing the inventory of the battlefield's cultural landscape resources with respect to the battlefield. The Supplemental Draft EIS discusses and alludes to the resources, but does not evaluate them with a contextual model of understanding using the military terrain. Nothing in the text suggests an understanding of how the topography was used historically.

F-002-014

Moreover, the need for this sort of designated analysis is clear since the Supplemental Draft EIS notes the importance of the pristine site to the Dakota War, but then it proceeds to discount the battlefield landscape as significantly compromised. Far more discussion is required to clarify the actual inventory, the acres lost, the viewsheds using a military terrain model, and the topography as it matches the National Register Bulletin 40 criteria. It is unclear if the Supplemental Draft EIS is using a presence or absence approach to the military terrain. It contains simple assertions of integrity rather than a cohesive and researched evaluation of alternatives. The Department would like to know which alternative damages the least amount of battlefield landscape features. The Supplemental Draft EIS on page 3-76 hazards a guess of "likely the most intense area of engagement" will not be severely impacted but there is no indication of the data used to reach that conclusion.

F-002-015

On page 3-74, paragraph 2, please reiterate the priority as established by Congress and agreed to by SHPO (see our note above).

F-002-016

On page 3-77, we would agree to the need to "complete a visual effects assessment" but with the further suggestion that it concentrate on a landscape identification, assessment and evaluation of resources using a military terrain model for this very important battlefield.

F-002-017

On page 3-78, as to our point immediately above, the "Visual Impacts" of the Project bisects the entire battlefield, but without a credible military terrain analysis, the only valued vantage point that is evaluated is the state historic site. No consideration is given to the observation points of command, obstacles of attack, view through the fighting from first engagement to flight, or places of concealment/cover from those viewsheds. Discounted are long-distance "key

F-002-011

The surveys that have been completed to date are sufficient to reasonably address potential impacts to historic resources from the project. Section 106 does not require that any specific level of study, including a military or landscape analysis be completed in order to address impacts to historic resources. Pursuant to 36 CFR Section 800.4(b)(i), the level of effort must be resonable and in good faith.

F-002-012

Please see response to comment F-002-011.

F-002-013

Please see the response to comment F-002-011.

F-002-014

The SDEIS does not describe the Killdeer Mountain Battlefield as a pristine site, but rather notes the existing modern features and infrastructure which compromise its integrity.

F-002-015

Comment noted.

F-002-016

The level of effort required to identify historic properties is determined by the agencies responsible pursuant to 36 CFR Section 800.4(b)(1). The agencies have applied these factors and determined this level of analysis is not reasonable.

F-002-017

Comment noted. Please refer to Section 3.6 in the FEIS for further discussion on project impacts to the Killdeer Mountain Battlefield.

F-002-018

observation points" that appear to be selected on an arbitrary basis of distance rather than the point of military objectives.

F-002-018

On page 3-79, the fact that other transmission lines exist on or near the battlefield is offered as a mitigating factor without the benefit of an analysis of how those lines impact the battlefield. Again, proximity makes sense in a two dimensional view, but battlefield landscapes require a three dimensional evaluation. And as we pointed out earlier in this letter, the position this Supplemental Draft EIS takes on cumulative impact analysis seems rather flawed. The suggestion found on page 3-81, in the first paragraph, suggests the same thinking that existing intrusions such as a farm fence somehow are equivalent in the damage to the integrity of this battlefield landscape.

F-002-019

On page 3-83, this section should include the various resources that the NPS protects for the benefit of the American people. The NPS is more than an agency providing recreation and wildlife; each park in the system has specific mandates to preserve and protect important resources for all future generations. Specifically to the battlefield, the NPS has brought both funds and technical assistance to this site and has a specific long-term investment in Killdeer Mountain Battlefield.

1. Killdeer Mountain Battlefield may be eligible for the National Register of Historic Places;

2. Killdeer Mountain Battlefield is eligible for Civil War Battlefield Land Acquisition Grants as part of Congress' specific effort to set aside special and significant battlegrounds for the benefit of the American public;

3. This site has been a Principle Civil War Battlefield Site by its inclusion in the <u>Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields</u> (1993); and

4. Killdeer Mountain Battlefield has had an investment of over $62,761 in Battlefield Preservation Planning Grants (as of 2013.) With a significant Federal investment in the local community, government and Tribes, the Program is eager to preserve and protect this Civil War Battlefield.

F-002-020

The Department has a continuing interest in working with the RUS and Western to ensure impacts to resources of concern to the Department are adequately addressed. If there are questions regarding the location of the auto route in the project area, please contact Neal Bedlan, Outdoor Recreation Planner at Lewis and Clark National Historic Trail, 601 Riverfront Drive, Omaha, Nebraska 68102, telephone 402-661-1816 or by email at Neal_Bedlan@nps.gov. For consultation with the issues concerning the Killdeer Mountain Battlefield, please contact Kristen McMasters, Archeologist, American Battlefield Protection Program, 1201 Eye Street, NW (2287), Washington , DC 20005, telephone 202-371-1961, or by email at Kristen_McMasters@nps.gov.

F-002-018

Refer to Section 3.6 for discussion of impacts of existing modern features and infrastructure on culture resources and section 4.0 for discussion of cumulative impacts.

F-002-019

Comment noted.

F-002-020

NA

Mr. Dennis Rankin 6

U.S. FISH AND WILDLIFE SERVICE COMMENTS

General Comments

F-002-021

1. The Final SEIS should include a discussion of how the U.S. Fish and Wildlife Service's (USFWS) comments provided to the Department of Agriculture, Rural Utilities Service (RUS) on the November 2012 Draft EIS for the Antelope Valley Station to Neset 345kV Transmission Line Project have been addressed and incorporated into the SEIS. Those comments are still appropriate for the project alternatives as currently proposed and it appears that the comments were not incorporated into the Draft SEIS. The USFWS recommends that a revised SEIS be prepared for the project as currently proposed that incorporates the USFWS's comments and recommendations.

F-002-022

2. The USFWS provided recommendations in their November 23, 2011, letter and their January 15, 2013, comments on the November 2012 Draft EIS to RUS on developing an Avian Protection Plan (APP) for the proposed project. The Draft SEIS states that an APP will be developed in coordination with the USFWS. As of the date of these comments there has been no contact with the USFWS to discuss the development of an APP for the proposed project.

Specific Comments

F-002-023

1. Pg. 3-41, Birds, third paragraph – The discussion of nest surveys for golden eagles and other raptor species indicates that no active bald or golden nests were found. The Bald and Golden Eagle Protection Act (BGEPA) includes provisions not included in the Migratory Bird Treaty Act (MBTA), such as the protection of unoccupied nests and a prohibition on disturbing eagles. In addition to immediate impacts, the definition of take in the BGEPA also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagles return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, feeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment. The survey results should also identify any inactive/unoccupied eagle nests that may be located near any of the proposed alternatives and the potential for the project to result in take of eagles.

F-002-024

2. Pg. 3-41, Birds, fourth paragraph – The Final SEIS should include a discussion of the potential impacts to forest dwelling bird species affected by habitat fragmentation and the increase in edge habitat that may result from Right-of-Way (ROW) clearing.

F-002-025

3. Pg. 3-43, Birds, last paragraph – The Draft SEIS states that as part of project implementation the USFWS and the North Dakota Game and Fish Department (NDGFD) would be consulted to develop and implement a plan to protect any identified nests from adverse effects during construction. Further, it states that Basin has developed a system- wide Avian Protection Plan (APP) that would apply to the operation of the line and associated facilities and would address, among other things, nest removal and protection, line collisions, electrocution, and predation effects. As of the date of these comments there has been no contact with the USFWS to discuss the development of the proposed plan.

F-002-021

Appendix B in the FEIS includes a summary responses to comments received on the DEIS.

F-002-022

See response to comment F-004-011.

F-002-023

Surveys for bald and golden eagle nests and nests of other raptors were conducted in the spring of 2013. The results of the spring 2013 nest survey included no active bald or golden eagle nests, four inactive golden eagle nests, and 22 active raptor (non-eagle) nests. The spring 2014 survey will again record both active and inactive nest locations. Should any active eagle or raptor nests be identified, appropriate measures will be implemented to protect the nest and prevent disturbance to the nesting birds. Following surveys to identify active eagle nests, 1-mile buffers will be established between February 1 and July 31 and construction activity, including helicopter flights, prohibited within this area during this time period. Similar 1-mile buffers will be established and protected for any identified eagle roost areas on USFS lands between November 15 and March 1. See Section 3.5.2 of the FEIS for additional information.

F-002-024

Overall, the proposed project will have little if any impact on forest dwelling birds as a result of forest fragmentation. The area of western North Dakota through which the proposed project passes does not contain large contiguous tracts of woodland habitat. Few if any woodlands large enough to not already be affected by edge habitats occur along the proposed alternative routes. The most wooded areas occur in the canyons and draws adjacent to the Little Missouri River. These woodlands occur in fingers along drainages, canyons and draws, many of which will be spanned over and would not be cleared. For additional discussion on this issue, please refer to Section 3.5.2 (Direct and Indirect Effects of the FEIS.

F-002-025

As outlined in the mitigation section, prior to initiation of construction, Basin Electric will conduct a variety of surveys for different species of nesting birds. These included surveys for bald and golden eagles, threatened and endangered species (such as Sprague's pipit, piping plover, interior least tern, and others), species protected under the Migratory Bird Treaty Act, and grouse lek surveys. These surveys will be conducted according to approved protocols for the individual species and any nests identified will be protected according to guidance for that species. Surveys may be repeated during the nesting season depending on the timing of construction. Basin Electric has a system-wide APP that will be implemented as part of this project, as referenced in Section 3.5.2 (Direct and Indirect Effects) of the FEIS.

F-002-026

The Biological Assessment, as submitted to the USFWS includes both species as proposed, as well as the red knot. The FEIS incorporates language from the BA concerning potential impacts to these species in Section 3.5.2.

F-002-026

4. Pg. 3-44, Special Status Species, second paragraph – The northern long-eared bat and the Dakota skipper were proposed for listing in October 2013. The Reference to the species list obtained by Western Area Power Administration (Western) in the text is (USFWS, 2011g). In 2011 the Dakota skipper was a candidate species and the northern long-eared bat had not yet been proposed for listing. If the information provided in the Draft SEIS was obtained from a more recent species list, the reference should be updated. The current accuracy of the species list needs to be verified if it is more than 90 days old and preparation of the biological assessment has yet to begin.

F-002-027

5. Pg. 3-49, Table 3-9, Piping plover, Effects Determination column – The effects analysis and effects determination for designated piping plover critical habitat should be a stand- alone analysis and not be combined with the determination for the species. Amend the table to include a separate effects determination for designated piping plover critical habitat.

F-002-028

6. Pg. 3-62, Whooping Crane – The USFWS provided recommendations in their November 23, 2011, letter and their January 2012 comments to RUS that addressed the potential for whooping crane collision with the proposed transmission line. These recommendations to reduce collision risk for whooping cranes were not presented or considered in the Draft SEIS. In addition, the line marking plan discussed in the Draft SEIS does not align with the line marking plan identified in Western's November 2013 Biological Assessment (BA). The Draft SEIS references that the details of the line marking plan can be found in the BA. The SEIS should be revised to incorporate the most up to date information as included in the BA.

F-002-029

7. Pg. 3-121, Alterative C, first paragraph – This section identifies that noise will be generated through the use of helicopter assistance during transmission structure erections and stringing of conductors. The use of helicopters in proximity to golden eagle nesting territories could disturb nesting eagles resulting in possible take. The USFWS recommends that eagle nesting territories in proximity to the route alternatives be identified and helicopter flight paths be routed to avoid impacts to eagles.

F-002-030

8. Pg. 3-121, Table 3-15: Typical Construction Equipment Noise Levels – The table should include the anticipated noise levels for helicopters used in construction activities.

F-002-031

9. Pg. 3-122, first paragraph – The Draft SEIS states that any increase in noise would only be a concern if sensitive noise receptors (residences, schools, religious institutions, libraries, or other community resources) are located near the proposed project and construction activities. Wildlife such as golden eagles that are sensitive to disturbance may also be affected by an increase in noise levels as a result of project construction activities. The Final SEIS should include a discussion of the potential impacts to sensitive wildlife species from an increase in noise above background levels.

F-002-032

10. Pg. 4-27, first paragraph – The Draft SEIS states that the proposed project would facilitate future development in the study area and that this would result in indirect cumulative impacts on wildlife, but the project's contribution to these impacts is expected to be minimal. To the extent possible, the Final SEIS should quantify the future development that would be facilitated by the proposed project to support the statement that the impacts are expected to be minimal.

F-002-027

Revisions were made to Table 3-14 in Section 3.5.2 of the FEIS.

F-002-028

Further clarification was provided in the FEIS that discloses that 253.4 miles of the transmission line will be marked, as referenced in the January 2014 BA.

F-002-029

See response to comment F-002-023.

F-002-030

Additional discussion of noise impacts from helicopters has been added to Section 3.13 (Noise) and Section 3.5 (Wildlife, and under some species in Table 3-16) of the FEIS. Based on FAA Advisory Circular-AC 36-18, noise generated from helicopter operations varies depending on type, loading, and activity (landing versus fly over). Levels vary from around 85 dBA to 99 dBA with 92 dBA providing a mid-range level for all types of helicopter operations. Considering this level, noise levels of 60 dBA, approximate daytime ambient levels, due to helicopter generated noise would occur at approximately 4,000 feet. This distance is less than the 1 mile buffer required around active eagle nests for their protection, as included as mitigation in Appendix A of the FEIS.

F-002-031

See response to comment F-002-030

F-002-032

Cumulative impacts of the proposed project are discussed in Chapter 4 of the FEIS. While the project is expected to support future developed ongoing in the area, this development is expected to occur with or without the proposed project. It is therefore concluded that the transmission project will have a minimal contribution to the cumulative impacts likely to occur with increased development.

Mr. Dennis Rankin 8

F-002-033

11. Pg. 4-27, Black-footed Ferret – The Draft SEIS states that the proposed project may have indirect effects on the black-footed ferret due to the facilitation of additional development in the study area. Western's November 2013 BA made a determination of "no effect" for the black-footed ferret. The discussion of effects in the Final SEIS and the species determinations contained in the BA should be comparable.

F-002-034

12. Pg. 4-27, Dakota Skipper – The Draft SEIS states that no suitable habitat for the Dakota skipper occurs within the area evaluated in the BA. However, the November 2013 BA indicates that 130 acres of suitable Dakota skipper habitat is within the action area and 0.05 acres of suitable habitat will be directly impacted by the proposed project. The Draft SEIS further states that the proposed project may have indirect effects on the Dakota skipper due to the facilitation of additional development in the study area. Western's November 2013 BA states that the proposed project would not be expected to have indirect effects on the Dakota skipper. The discussion of effects in the Final SEIS and the species determinations contained in the BA should be comparable.

F-002-035

13. Pg. 4-28, Gray Wolf – The Draft SEIS states that the proposed project may have indirect effects on the gray wolf due to the facilitation of additional development in the study area. Western's November 2013 BA made a determination of "no effect" for the gray wolf. The discussion of effects in the Final SEIS and the species determinations contained in the BA should be comparable.

F-002-036

14. Pg. 4-28, Interior Least Tern – The Draft SEIS states that the proposed project may have indirect effects on the interior least tern due to the facilitation of additional development in the study area. Western's November 2013 BA states that no indirect effects are anticipated to the least tern. The discussion of effects in the Final SEIS and the species determinations contained in the BA should be comparable.

F-002-037

15. Pg. 4-29, Piping Plover, second paragraph – The Draft SEIS states that the proposed project may have indirect effects on the piping plover due to the facilitation of additional development in the study area. Western's November 2013 BA states that no indirect effects are anticipated to the piping plover. The discussion of effects in the Final SEIS and the species determinations contained in the BA should be comparable.

F-002-038

16. Pg. 4-29, Piping Plover, second paragraph – The Final SEIS should have a separate section for the analysis and discussion of designated piping plover critical habitat. The Draft SEIS states that as currently delineated, the critical habitat for the Missouri River includes all areas within the floodplain, including trees, farms, roads, and other areas of "non-habitat." The September 11, 2002, Federal Register notice for the designation of critical habitat for the Northern Great Plains Breeding Population of the Piping Plover, Final Rule indicates that due to several constraints the use of Township, Range, Section was used as the minimum mapping unit to define critical habitat boundaries, therefore the USFWS was unable to exclude developed areas such as buildings, boat ramps, bank stabilization and breakwater structures, row cropped or plowed agricultural areas, roads, and other lands unlikely to contain primary constituent elements essential for northern Great Plains piping plover conservation. The primary constituent elements

F-002-033
FEIS revised to read no impacts to prairie dog towns in Section 4.4.5 in the FEIS

F-002-034
Direct impacts to Dakota Skipper revised in Section 4.4.5 of the FEIS.

F-002-035
Discussion revised to read no direct, indirect or cumulative impacts to the gray wolf in Section 4.4.5 of the FEIS.

F-002-036
Discussion revised to read no direct, indirect or cumulative impacts to the least tern in Section 4.4.5 of the FEIS.

F-002-037
Discussion revised to read no direct, indirect or cumulative impacts to the piping plover in Section 4.4.5 of the FEIS.

F-002-038
The Biological Assessment, as submitted to the USFWS, contains a separate description of piping plover critical habitat and the determination that the proposed project "may affect" but is "not likely to adversely effect" the piping plover. The FEIS summarizes this impact assessment in Table 3-14 in Section 3.5.2.

for the northern Great Palins population of piping plovers are those habitat components (physical and biological) essential for the biological needs of courtship, nesting, sheltering, brood- rearing, foraging, roosting, interspecific communication, and migration. The one overriding primary constituent element (biological) that must be present at all sites is the dynamic ecological processes that create and maintain piping plover habitat. On rivers the physical primary constituent elements include sparsely vegetated channel sandbars, sand and gravel beaches on islands, temporary pools on sandbars and islands, and the interface with the river.

F-002-039

17. Pg. 4-32, Northern Long-eared Bat, last sentence – Change northern long-nosed bat to northern long-eared bat.

F-002-040

18. Pg. 6-1: Potential Project Requirements, Endangered Species Act, Description, second sentence – It is the federal action agency's (not the applicant's) responsibility to apply for an incidental take permit if the federal action being reviewed is subject to section 7 of the Endangered Species Act. If the federal action agency determines the proposed action "may affect" listed species or designated critical habitat, formal consultation is required. No formal consultation is required if the action agency finds, with the USFWS's written concurrence, that the proposed action "may affect, but is not likely to adversely affect" listed species or critical habitat.

F-002-041

19. Pg. A-6, Bio-14 – The USFWS has not had an opportunity to review or comment on the referenced APP. Therefore, they have no way to know if this standard mitigation measure will provide adequate protection to avoid and minimize impacts to migratory birds from the construction and operation of the proposed project.

F-002-042

If you have any questions regarding USFWS comments, please contact Terry Ellsworth in the USFWS' Ecological Services Field Office, in Bismarck, North Dakota, at telephone (701) 355-8513.

Sincerely,

Robert F. Stewart
Regional Environmental Officer

F-002-039
Discussion revised in Section 4.4.5 of FEIS under Northern Long-eared Bat.

F-002-040
Comment noted. Section 7 of the ESS has been concluded.

F-002-041
See response to comment F-004-011.

F-002-042
NA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
www.epa.gov/region08

FEB - 3 2014

Ref: EPR-N

Mr. Dennis Rankin
U.S. Department of Agriculture
Rural Utilities Service
1400 Independence Avenue SW, Stop 1571
Washington, D.C. 20250-1571

Re: Antelope Valley Station to Neset
Transmission Project Supplemental
Draft Environmental Impact Statement
CEQ #20130373

Dear Mr. Rankin:

The U.S. Environmental Protection Agency (EPA) Region 8 has reviewed the Antelope Valley Station to Neset Transmission Project Supplemental Draft Environmental Impact Statement (SDEIS) prepared by the U.S Department of Agriculture Rural Utilities Service (RUS). Our comments are provided for your consideration pursuant to our responsibilities and authority under Section 102(2)(C) of the National Environmental Policy Act (NEPA), 42 U.S.C. Section 4332(2)(C), and Section 309 of the Clean Air Act, 42 U.S.C. Section 7609. It is the EPA's responsibility to provide an independent review and evaluation of the potential environmental impacts of this project, which includes a rating of the environmental impact of the proposed action and the adequacy of the NEPA document.

RUS released a DEIS for this project in November 2012. The EPA provided comments on the DEIS in a letter dated January 17, 2013, which is enclosed for reference. The EPA rated the two action alternatives as "Lack of Objections" (LO). Subsequently, the RUS developed new alternatives to add capacity to meet the increase in the electric load forecast for the Bakken region in western North Dakota. The three new action alternatives – Alternatives C, D and E – are within the original project area and follow the same alignment on both east-west segments, but vary in the middle north-south section.

Alternative C combines DEIS Alternative A with portions of DEIS Alternative B. This alternative includes 278 miles of transmission line (265 miles of new 345-kV transmission line and 13 miles of new 230-kV line), four new substations, one new switchyard, but no expansion to four existing substations. What distinguishes Alternative C from the other two action alternatives analyzed in the SDEIS is that there are two separate alignments in the middle section. Alternative D is a modification of DEIS Alternative B. This alternative would include construction of approximately 251 miles of transmission line, including 13 miles of new 230-kV line and 238 miles of new 345 k-V transmission line, of which 63 miles would be 345/345-kV double-circuit. Alternative D would also include construction of four new substations, two switchyards, but no expansion to four existing substations. Alternative E, like D, is a modification of DEIS Alternative B, but instead of double-circuit 345/345-kV line it would include two parallel 345-kV transmission lines for 63 miles. Alternative E would include construction of approximately 314 miles of transmission line – 13 miles of new 230-kV line and 301 miles of new 345-kV transmission line (126 miles would be two single-circuit 345-kV parallel lines), four new substations, two switchyards, but no expansion to four existing substations.

F-003-001

The EPA appreciates the additional mitigation measures identified in the SDEIS to further protect biological resources, restrict cattle from grazing within the right-of-way until grass is re-established after construction, comply with industry specifications regarding voltage levels and minimize visual contrast at the Little Missouri River crossing.

F-003-002

Because a preferred alternative was not identified in the SDEIS, we are rating each of the three additional action alternatives. Based on the EPA's procedures for evaluating potential environmental impacts on proposed actions and the adequacy of the information presented, the EPA is rating each of the three action alternatives as "Lack of Objections" (LO). A full description of the EPA's rating system can be found at www.epa.gov/compliance/nepa/comments/ratings.html.

Thank you for the opportunity to provide comments on the Antelope Valley Station to Neset Transmission Project SDEIS. If you have any questions or would like to discuss our comments or rating, please contact me at 303-312-6704 or Carol Anderson of my staff at 303-312-6058.

Sincerely,

David Fronczak

for Philip S. Strobel
Acting Director, NEPA Compliance and Review Program
Office of Ecosystems Protection and Remediation

Enclosures:
EPA Comment Letter on the DEIS

F-003-001
Comment Noted

F-003-002
Comment Noted

F-004-001

F-004-002

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
GARRISON PROJECT OFFICE
201 1ST STREET, PO BOX 527
RIVERDALE, NORTH DAKOTA 58565-0527

February 3, 2014

Mr. Dennis Rankin
USDA, Rural Utilities Service
1400 Independence Avenue, SW, Stop 1571
Washington, DC 20250-1571

Dear Mr. Rankin:

The U.S. Army Corps of Engineers (Corps), Garrison Project Office, has reviewed the Supplemental Draft Environmental Impact Statement (SDEIS) for Basin Electric Power Cooperative's proposed Antelope Valley Station to Neset 345-kV Transmission Project in North Dakota. Members of my staff and our real estate staff have met with representatives from Basin Electric during the planning stages of the proposed project and preparation of the original environmental impact statement.

Attached please find the Corps Non-Recreation Outgrant Policy (NROP). To ensure we have a completed application package, we need to satisfy all of the requirements of this policy. We recently held a meeting with Basin Electric to discuss the status of their application package. For the portion of the transmission facilities that cross Corps fee title public lands, our agency will need to prepare a report of availability to make the lands available for the final easement corridor and temporary construction license. At this time we anticipate tiering to your National Environmental Policy Act document to expedite the processing of the required paperwork on this end. However, to finalize this paperwork, we will need the record of decision (ROD) for the SDEIS and documentation that the project complies with the National Historic Preservation Act Endangered Species Act. Please note we will continue to process the required paperwork referenced above, concurrent with the completion of the required documentation we are requesting.

Finally, these lands are managed by the North Dakota Game & Fish Department (Department) as a Wildlife Management Area (WMA). We will continue to work closely with the Department to ensure all of their concerns are adequately addressed, specifically mitigation that will result from impacts to the WMA.

Specific comments include:

Volume I & Supplemental DEIS:

F-004-001
Comment noted.

F-004-002
Comment noted.

F-004-003 a. ES-17, Aesthetics & Visual Resources Mitigation Measures-The Corps needs to consult with the Department on a preferred structure type, specifically weathering steel or galvanized.

F-004-004 b. ES-17, Aesthetics & Visual Resources Mitigation Measures- Recommend using the 8' and less clearing requirement for clearing of ROW as an environmental commitment if they will be listed separately for each agency?

F-004-005 c. 2-18, Pre-construction Activities- Vegetation removal on Corps lands will be mitigated per Project Policy

F-004-006 d. 2-26, Biological Resources Mitigation Measures- Vegetation removal on Corps lands will be mitigated per Project Policy

F-004-007 e. 3-94, Vegetation- Vegetation removal on Corps lands will be mitigated per Project Policy

F-004-008 f. Appendix A-4, Biological Resources, Bio-2- Vegetation removal on Corps lands will be mitigated per Project Policy

F-004-009 g. Appendix A-4, Biological Resources, Bio-8- When will the inventory be completed for Corps lands?

F-004-010 h. Appendix A-4, Biological Resources, Bio-13- Recommend replacement trees/vegetation be planted in addition to the wildlife crossing planting mitigation associated with HWY 85

F-004-011 i. Appendix A-4, Biological Resources, Bio-15- Has the APP been completed? Recommend our review for the portion crossing Corps lands in the Missouri River floodplain.

Supplemental DEIS

a. ES-17, Table ES-2 Comparison of Alternatives- How did the total impact to Corps lands raise from 56.4 in the DEIS to 57.9 acres in the SDEIS?

b. 3-87, US Army Corps of Engineer Lands- Acreage of woodland rose from 5 acres in DEIS to 5.8 acres in SDEIS. Has an inventory been completed on Corps fee lands?

General Comments:

a. Can Basin overlap ROW with the WAPA line and effectively reduce the footprint of the ROW on Corps lands?

F-004-003

NA

F-004-004

In order to comply with NERC regulations, Basin Electric has established a vegetation management plan to maintain rights-of-way and control vegetation that may threaten the current or future operation of the line. For areas of the ROW that cross lands managed by the USACE, Basin will selective clear of shrubs and trees greater than 8" in height or the re-establishment of such species to the extent they will not endanger the safe and reliable operation of the line. This will support a wildlife migration corridor being established in this area.

F-004-005, F-004-006, F-004-007, F-004-008

A mitigation measure was included in the FEIS (appendix A) specific to the ROW areas that will impact lands managed by USACE which will incorporate USACE policy regarding the removal of vegetation.

F-004-009

Basin Electric will prepare a complete habitat assessment according to the Guidelines for Biological Survey Reports - U.S. Army Corps of Engineers, Garrison Project. June 2010. This assessment will fully discuss the biological resources found within the project right-of-way located across USACE lands. Surveys for this report will be conducted in the Spring of 2014. Reports will be submitted and approved by the USACE prior to commencement of construction activities on USACE lands.

F-004-010

As noted in Bio-13 in Appendix A of the FEIS, replacement of trees/vegetation will be subject to landowner preferences. To the extent Basin Electric is granted flexibility in where replacement trees may be planted, it will coordinate with the ND DOT and landowners along Highway 85 to identify areas of wildlife mitigation plantings and if additional plantings are acceptable and appropriate at those locations.

F-004-011

Basin Electric has a system-wide APP which will be implemented on this project. The project will be designed in compliance with the Avian Power Line Interaction Committee (APLIC) Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Additionally, as discussed in the BA, Section 1.4, line marking will be implemented to comply with the USFWS recommendations as developed through the Section 7 consultation process. This marking includes the Missouri River crossing. Additional discussion is provided in Section 3.5.2 of the FEIS.

a. ES-17, Aesthetics & Visual Resources Mitigation Measures-The Corps needs to consult with the Department on a preferred structure type, specifically weathering steel or galvanized.

b. ES-17, Aesthetics & Visual Resources Mitigation Measures- Recommend using the 8' and less clearing requirement for clearing of ROW as an environmental commitment if they will be listed separately for each agency?

c. 2-18, Pre-construction Activities- Vegetation removal on Corps lands will be mitigated per Project Policy

d. 2-26, Biological Resources Mitigation Measures- Vegetation removal on Corps lands will be mitigated per Project Policy

e. 3-94, Vegetation- Vegetation removal on Corps lands will be mitigated per Project Policy

f. Appendix A-4, Biological Resources, Bio-2- Vegetation removal on Corps lands will be mitigated per Project Policy

g. Appendix A-4, Biological Resources, Bio-8- When will the inventory be completed for Corps lands?

h. Appendix A-4, Biological Resources, Bio-13- Recommend replacement trees/vegetation be planted in addition to the wildlife crossing planting mitigation associated with HWY 85

i. Appendix A-4, Biological Resources, Bio-15- Has the APP been completed? Recommend our review for the portion crossing Corps lands in the Missouri River floodplain.

Supplemental DEIS

F-004-012 a. ES-17, Table ES-2 Comparison of Alternatives- How did the total impact to Corps lands raise from 56.4 in the DEIS to 57.9 acres in the SDEIS?

F-004-013 b. 3-87, US Army Corps of Engineer Lands- Acreage of woodland rose from 5 acres in DEIS to 5.8 acres in SDEIS. Has an inventory been completed on Corps fee lands?

General Comments:

F-004-014 a. Can Basin overlap ROW with the WAPA line and effectively reduce the footprint of the ROW on Corps lands?

F-004-012

As a result of continuing oil and gas development in the Missouri River area and ongoing coordination with landowners for the location of the ROW across their properties between the issuance of the DEIS and SDEIS, slight adjustments in the project alignment across the USACE lands adjacent to the Missouri River were necessary. These adjustments resulting in slightly more ROW being required across USACE property than for the DEIS. Minor adjustments to the alignment are anticipated as part of Basin Electric's ongoing coordination with the NDGFD regarding the development of a wildlife habitat crossing of Highway 85 as part of efforts to develop the highway into 4-lanes.

F-004-013

As a result of continuing oil and gas development in the Missouri River area and ongoing coordination with landowners for the location of the right-of-way across their properties between the issuance of the DEIS and SDEIS, slight adjustments in the project alignment across the USACE lands adjacent to the Missouri River were necessary. These adjustments resulting in slightly more right-of-way being required across USACE property than for the DEIS. Minor adjustments to the alignment are anticipated as part of Basin Electric's ongoing coordination with the NDGFD regarding the development of a wildlife habitat crossing of Highway 85 as part of efforts to develop the highway into 4-lanes. At this time, no detailed inventory has been completed on Corps lands. A habitat assessment will be completed in spring 2014 to provide a detailed inventory and assessment of biological resources within the project ROW on USACE lands.

F-004-014

Basin Electric's proposed alignment "shares" ROW with the rural water pipeline. NESC codes for the protection of public safety and system reliability prohibit the sharing of the existing WAPA 230-kV 125 foot ROW and the 150 foot wide ROW Basin Electric is requesting.

F-004-015

b. Complete a habitat assessment which further elaborates on the resources currently on Corps lands where the ROW is proposed. The assessment should also discuss specific temporary and permanent impacts/restrictions that will occur on Corps lands as a result of the construction and O&M of the ROW. Examples: elaborate on the types and impacts on 15.9 acres of wetlands; elaborate on the types of grasslands and impacts on 12 acres of grasslands, inventory tree/vegetation to be cut on 5.8 acres of woodlands, etc.

F-004-016

c. Will temporary construction limits be required outside of the proposed ROW?

F-004-017

d. Recommend the proponent submit a construction work plan for the portion of ROW on Corps lands. This should include any earth works; addition of fill and/or movement of dirt from higher elevations to lower elevations would require flood storage mitigation.

F-004-018

e. After completing habitat assessment and quantifying any unavoidable impacts, recommend environmental commitments be listed to mitigate these impacts (trees/vegetation, land use, etc). We can provide examples to the proponent if they'd like...

F-004-019

f. Recommend adding a 'NEPA compliance statement' at the conclusion section of the habitat assessment, which will state the proposed project has avoided and minimized potential impacts to the greatest extent possible and mitigation will be provided for those impacts which are unavoidable. As such, the project should not result in significant impacts to the Garrison Project's lands or operations.

F-004-020

g. Recommend as-built drawings be provided after the project is constructed. Drawings can be placed in the official RE file, and should comply with requirements outlined in the NROP Enclosure 4-1.a(2), and be stamped by a state certified professional engineer.

F-004-021

Should you have any questions, please contact Ms. Hattie Payne at (701) 654-7753 or for questions related to the specific comments on the SDEIS please contact William Harlon at (701) 654-7746.

Sincerely,

Todd J. Lindquist
Operations Project Manager
Garrison Project

F-004-015
See response to comment F-004-009

F-004-016
Temporary easements outside of the permanent ROW may be required at specific locations, such as conductor pulling sites, to support construction. These areas will be identified during final design of the approved alignment. Areas that will require temporary construction easements will be identified and surveyed as if they were part of the permanent ROW. Prior to establishing any temporary easement, potential sites will be reviewed and selected to minimize impacts to environmentally sensitive areas by minimizing additional clearing, avoiding wetland and cultural sites, and habitat for sensitive species. Temporary construction easements will be restored to previous condition, as practical, or in accordance with landowner preferences.

F-004-017
Basin will submit the required documentation to USACE prior to the commencement of any construction activities.

F-004-018
The FEIS, Appendix A - Standard Mitigation Measures, includes numerous environmental commitments. Many of these pertain to natural resources impacts including vegetation, wildlife, threatened and endangered species and land use. Basin Electric will continue to coordinate with the USACE as part of the preparation of a detailed habitat assessment and acquisition of an easement to cross USACE property to develop and implement appropriate mitigation measures to address unavoidable impacts.

F-004-019
Discussion revised in Section 4.4.5 of FEIS.

F-004-020
Following completion of construction, Basin Electric will provide appropriate as-built drawings to the USACE.

F-004-021
NA

I-001-001

Rankin, Dennis - RD, Washington, DC

From: Barb Baker <bjbaker@ndsupernet.com>
Sent: Tuesday, January 28, 2014 8:02 PM
To: Rankin, Dennis - RD, Washington, DC
Subject: Basin Electric Transmission Line Killdeer

Mr. Rankin, I am opposed to allowing Basin Electric to route their transmission line in an area that crosses the Killdeer Mountain Battlefield. I have been to this location a number of times and it needs to be preserved. Basin can move the line, it is just a matter of money.
Gaylon Baker
11148 47 St SW
Dickinson, ND 58601

I-001-001
Please refer to response to comment N-006-023.

Rankin, Dennis - RD, Washington, DC

From:	rdvirnak@gmail.com
Sent:	Monday, January 27, 2014 4:13 PM
To:	Rankin, Dennis - RD, Washington, DC
Subject:	Comments regarding the Antelope Valley Station to Neset Transmission Project SDEIS
Attachments:	Response to SDEIS.docx

Dear Mr. Rankin,

Please add the attached comment on the AVS to Neset Transmission Project to the Public Record.

Thank you,

Craig & Rhonda Dvirnak
Diamond C Ranch
11129 Main St. NW
Killdeer, ND 58640

I-002-001

The Dvirnak family has owned the land surrounding the Killdeer Battlefield State Historic site since 1928. We have cared for and protected it for over 80 years and our family will continue to do so.

The one acre that the state does own was donated to them by my grandfather.

From 1998 to 2001, we hosted a gathering, where descendants of those that fought and died in the battle performed the Releasing of the Spirit and the Wiping of the Tears ceremonies.

In 2008, my dad, Alick, gifted his collection of artifacts to Dickinson State University which will eventually become part of the Theodore Roosevelt Presidential Library.

In the past we have hosted local, state, national and international tours of our ranch and the area where the battle culminated.

The transmission line proposed by Basin Electric does not go through our property but lies just to the south of our property. The transmission line is over a half mile away from the state's battlefield historic site and more than a mile from the base of the mountains. Only the top part of one transmission pole will be visible from the historic site.

We see no reason that they should not receive approval for this transmission line.

I-002-002

Through my own studies from having lived on the ranch for over 50 years, there are no significant cultural reasons to move this transmission line.

It does not impact any cultural sites. Basin's archeological study did not produce any significant archeological finds in the transmission corridor. The transmission line is definitely needed by the communities it will serve and for the future growth of this state.

I-002-003

I would like to title the next part of my statement: Don't do as I do, Do as I say. This is pertaining to statements made by certain individuals that allowing Basin Electric to build this transmission line would be detrimental to cultural and historic sites. Yet in the same token, these same people allow building on and near cultural and historic sites themselves on their own property. If it is detrimental to cultural and historic sites on private lands, it is detrimental on tribal lands as well. You can't have it both ways.

Sincerely,

Craig & Rhonda Dvirnak
11129 Main St. NW
Killdeer, ND 58640

I-002-001
Comment noted.

I-002-002
Comment noted.

I-002-003
Comment noted.

Rankin, Dennis - RD, Washington, DC

From:	bdvirnak <bdvirnak.cci@midconetwork.com>
Sent:	Wednesday, January 29, 2014 12:10 PM
To:	Rankin, Dennis - RD, Washington, DC
Cc:	Rhonda Dvirnak; CINDY DVIRNAK; Dave Schultz; DWIGHT AND GAYE DVIRNAK
Subject:	SUPPORT Basin Electric's proposed transmission line
Attachments:	Basin Electric transmission line.docx

Dear Mr. Rankin:

Attached is my LETTER OF SUPPORT of Basin Electric's proposed western North Dakota transmission line.

Regards,

Bryan Dvirnak

Make it a Great Day!

Collection Center Inc
www.collectioncenterinc.com
Bryan R. Dvirnak, President
Po Box 1057
Bismarck ND 58502
701-258-7734(office)
701-400-7734(cell)
1-800-472-2246

1/29/14

Mr. Dennis Rankin
USDA

RE: Basin Electric proposed Western ND transmission line
Response to RUS on SDEIS

Dear Mr. Rankin:

My name is Bryan Dvirnak. I grew up on the Diamond C Ranch on the south slopes of the Killdeer Mountains where the Battle of the Killdeer Mountains occurred between General Alfred Sully and the Sioux Indians lead by Sitting Bull on July 28, 1864. I currently live in Bismarck, North Dakota.

I-003-001

Basin Electric's proposed transmission line DOES NOT run through the Battlefield Site but would run approximately ½ mile south of the Battlefield Site. ***The Dvirnak Family is in full support of Basin's proposed transmission line.***

I-003-002

The Diamond C Ranch controls 99.9999% of the Battlefield site, the .00001% my Family does not control is a 1 acre parcel my Grandfather, Jack Dvirnak gifted to the State of North Dakota in the 1940's or 1950's so as to protect, preserve and honor those who fought and gave their lives on July 28, 1864. The Dvirnak Family has owned the Diamond C Ranch and the Battlefield site since 1928. My Father, Alick Dvirnak operated the Diamond C Ranch until 1980 when he transferred ownership to my brother, Craig Dvirnak and his wife Rhonda who currently own and operate the Ranch.

The Dvirnak Family has and continues to be good stewards of the land and protecting the cultural and historical integrity of the Battlefield. NO ONE has done more to preserve and protect the Battlefield Site than my Father, Alick Dvirnak, and now my brother, Craig and his wife Rhonda. Over the years my Father welcomed the Native American community to the ranch.

I-003-003

In August 2001 my Father, Alick Dvirnak, and brother, Craig Dvirnak, welcomed Sioux Indians from Canada, Montana, Wyoming, South Dakota, Minnesota and North Dakota to conduct a ceremony to "properly bury" their dead from the July 1864 Battle. Dad and Craig "smoked the piece pipe" with the Indians, and allowed them to conduct their ceremony over a two day period.

I-003-004

In June 2008 my Dad, Alick Dvirnak, gifted his large Indian and military artifact collection to the North Dakota University System, which is currently on display on the campus of Dickinson State University. The artifact collection will ultimately be relocated to the TR Roosevelt Presidential Library when built.

I-003-001
Comment noted.

I-003-002
Comment noted.

I-003-003
Comment noted.

I-003-004
Comment noted.

I-003-005

Having given the above background, it is very disconcerting now to listen to the Native Community testify at the hearing in Watford City as if they "own" the Diamond C Ranch; that on an ongoing basis they "come to the Ranch to pray" (we haven't seen them since 2001); and that they have every right to influence such a vital transmission line that will serve all of western North Dakota. But when alternative routes are proposed, they are opposed to the alternative sites also.

I-003-006

When development is done on the reservation, the North Dakota public does not have an opportunity to testify in support or opposition to development on Fort Berthold or Standing Rock Sioux Reservations! Why are they allowed to testify on Basin's proposed line? Especially on a proposed transmission line that would not be on or near their Reservations. Their behavior actually is offensive!

I-003-007

My understanding is a majority of landowners, directly impacted by the transmission line, are in support of the proposed transmission line. Their support should send a very strong message to RUS to fund the transmission line. This proposed transmission line is crucial to the ranching & farming communities, the cities in western North Dakota, and to support the growth of the oil industry. I would encourage you to fund Basin Electric's proposed transmission line.

Best regards,

Bryan Dvirnak
1406 Eagles View Lane
Bismarck, ND 58503

I-003-005
Comment noted.

I-003-006
Comment noted.

I-003-007
Comment noted.

I-004-001
I-004-002
I-004-003

From: Lisa DeVille [mailto:lisadeville2013@gmail.com]
Sent: Tuesday, February 04, 2014 12:20 AM
To: Rankin, Dennis - RD, Washington, DC
Subject: mega-transmission lines construction in Killdeer Mountains

Language from the Draft EIS:
Page 3-76 "A total of **286 cultural resources** have been identified within or immediately adjacent to the 1,000-foot preliminary APE Areas of Potential environmental impact. (see Table 3-23 of the DEIS). The cultural resources include 4 multicomponent archeological sites, 123 archaeological sites, 86 archaeological isolate finds, 9 archaeological site leads, 26 historic sites, 2 historic isolate find, 18 historic site leads, 16 architectural resources, and 1 architectural site

4.4.9 Environmental Justice

"The proposed project would not have any disproportionate impacts on minority and/or low income communities, and therefore would not contribute to any disproportionate cumulative impacts"

4.4.6 Cultural Resources (see Page 4-38)
"The construction of the proposed project transmission line facilities **could affect recorded and currently unknown cultural resources within the study area.** The transmission line, with its pole installation and substation modification, has the potential to disturb archaeological sites..... For all projects involving construction or subsurface activities, which are yet to be determined, **unrecorded archaeological sites or traditional cultural properties may be disturbed**. Cumulative loss of cultural resources would occur if archaeological sites or traditional cultural properties are disturbed on multiple sites. "

Lisa DeVille
Mandaree, ND

I-004-001
Comment noted.

I-004-002
Comment noted.

I-004-003
Comment noted.

I-005-001

I-005-002

From: Theodora Bird Bear [mailto:tbb09@restel.com]
Sent: Tuesday, February 04, 2014 12:45 AM
To: Rankin, Dennis - RD, Washington, DC
Cc: joletta bird bear
Subject: Draft EIs BAsin Electric Transmission Line Comment

Dennis Rankin
US Department of Agriculture, Rural Utility Services Engineering and Environmental Staff
Antelope Valley Station to NEset Transmission Project
Supplemental Draft EIS
1400 Independence Avenue SW
Stop 1571, Room 2244
Washington DC 20250-1571

All lands within the Killdeer Mountain area upon which the proposed Basin Electric Transmission routes lay are Three Affiliated Tribes aboriginal lands as recognized by the Treaty of Fort Laramie dated September 17, 1851 and confirmed by Presidential Executive Order dated April 12, 1870. As such I object and cannot support the federally funded proposed Basin Electric transmission lines alternate choices in its entirety. These lands of the Killdeer Mountains remain a sacred site for religious use and these lands do contain the bodies of Native American tribes who did fight in battle and died and their remains must not be disturbed nor destroyed by the siting and construction of the proposed lines and towers. To tread upon their remains and plunder ancient pre-european sites is inhumane and is cultural destruction. The lead federal agency, the RUS, responsible for complying with the requirements of NEPA did fail to place a required public notice of the public hearing held in Watford City Jan 16, 2014, in the MHA Times, which is a free subscription to all elder tribal citizens in White Shield, Garrison, Parshall, Newtown, Mandaree, and Twin Buttes communities, they did fail to place public notice in Newtown News, KMHA Radio, Mandaree community monthly newsletter which is deliver to every residence in the Mandaree community. The RUS did fail to fail to provide information to libraries of Fort Berthold especially the Fort Berthold Community College and did fail to comply with the Executive Order that does require federal agencies to consult with affected tribes in their violation by requiring tribes to "opt" in this federal process: Flandreau Santee Sioux, Santee Sioux Nation, Fort Peck Assiniboine & Sioux Tribes, Spirit Lake Tribe, Fort Belknap Indian Community, Standing Rock Sioux, Leech Lake Band of Ojibwe, Three Affiliated Tribes, Lower Sioux Indian Community, Turtle Mountain Chippewa, Minnesota Chippewa, Upper Sioux Indian Community, Prairie Island Indian Community, and White Earth Nation.

Joletta Bird Bear
Three Affiliated Tribes Mandan Hidatsa tribal member
PO Box 474
Mandaree ND 58757

I-005-001
Comment noted.

I-005-002
Please refer to response to comment N-001-001.

From: theodora bb [mailto:tbb58763@yahoo.com]
Sent: Monday, February 03, 2014 10:08 PM
To: Rankin, Dennis - RD, Washington, DC
Subject: Comments on Basin Electric DEIS

February 3, 2014
Dennis Rankin
Dept of Agriculture, Rural Utility Service
Engineering and Environmental Staff
Basin Electric Mega-Transmission Lines
Supplemental Draft EIS
1400 Independence Av SW
Stop 1571, Room 2244
Washington DC 20250-1571

Re: DEIS for Basin Electric's Mega-Transmission Lines in Western ND, including the Killdeer Mountains

Sir:

I am an enrolled tribal member of the Three Affiliated Tribes and a permanent resident of Mandaree on the Fort Berthold Indian Reservation in western North Dakota. I have concerns about the adverse and permanent impacts of the construction of a proposed transmission line and towers which will only last, according to the DEIS, for just fifty (50) years.

As the lead federal agency, the RUS is failing to comply with NEPA requirements for informed public notice, historic/cultural preservation, and the environmental justice component.

As was repeatedly noted in the public testimony of tribal members, Killdeer resident, and the superintendent of the federal Roosevelt Park at the January 16, 2014 RUS public hearing, there was inadequate notice to the public that the RUS had scheduled a public hearing and further, was accepting public comments on the proposed transmission lines.

I-006-001

The limited cultural survey linked to Alternative C, (Page 3-76) identified nearly 300 "cultural resources" within or adjacent to the 1,000 foot preliminary area of potential environmental impacts. ("APE"). The limited cultural site survey for Alternative D and E reportedly identified 88 cultural

I-006-001
Comment noted.

sites within or immediately adjacent to a 1,000-foot area of potential environmental impact, damage, or destruction.

I-006-002

Traditional tribal members of Fort Berthold still maintain an active connection to the Killdeer Mountains. The attached photo shows a 1930's reproduced map drawing by Bears Arm, Hidatsa, who was then identified in documents at the time, as a tribal historian of the Three Affiliated Tribes history. (Bears Arm was 71 years old when he died in Elbowoods North Dakota on the Fort Berthold Indian Reservation in 1936. Accordingly, he would have been born in 1865). The attached map shows that the Killdeer Mountains were in the center of the Hidatsa lands used for hunting and ceremonial uses.

I-006-003

Failure to complete a full and complete cultural sites survey as required for this federally-funded project has prevented tribal members and the public from making informed comments during the Draft EIS comment period on this matter. I object to any planned "disturbances," damage, or destruction of tribal cultural sites in or near the path of the transmission line and towers in the Killdeer Mountains area, anywhere along the proposed path of the transmission line, and in the area as mapped by Bears Arm.

I-006-004

Despite the potentially-adverse impacts to just the known existing cultural sites, the incomplete cultural site survey for the transmission line and structures, and the unaccounted human remains of the Lakota in the Killdeer Battlefield area, the DEIS claims that there will be no impact to minority or low income communities, including tribes and traditional tribal members. This determination has no basis and I object to this decision made to expedite approval for this project.

I-006-005

This proposed transmission line will have a significant impact on the historic and cultural sites of tribes. Despite this, there are no tribal members nor tribal entities participating in the development of this federal document as listed in the 'List of Preparers' for the DEIS. This deficiency is a failure to comply with the federal National Environmental Protection Act (NEPA).

I-006-006

The DEIS 'List of Libraries' fails to include the Fort Berthold Community College library and all the other tribal college libraries of the thirteen (13) identified tribes who may seek consultation on the project. There is a failure to involve tribes and tribal members who will be adversely impacted

I-006-002

Comment noted.

I-006-003

n order to identify affected historical properties, a Class I Survey of the entire corridor was completed in 2012. This was followed by initiation in September 2012 of a Class II (Reconnaissance) and Class III (intensive pedestrian with some subsurface testing) survey within the corridor, including reroutes, access roads, substations and laydown areas wherever access has been granted. A tribal cultural resources survey was initialed in November of 2013. Survey of the ROW segment between AVS and the Missouri River has been completed. The remaining portions of the ROW will be surveyed in the Spring of 2014. In accordance with 800.(6)(1), the agencies are phasing the identification of historic properties and assessment of effects prior to constructions under the terms of a Programmatic Agreement. The PA provides an opportunity for consulting parties to participate in these actions.

I-006-004

Refer to section 3.6 for a discussion of project impacts on cultural resources and section 3.9 for project impacts on environmental justice populations.

I-006-005

The SRST and SWO Tribal Historic Officers are participating in the Section 106 process relevant to this project.

I-006-006

Copies of the FEIS will be posted at additional libraries throughout the area.

I-006-007
See response to comment N-006-021.

by the environmental impacts of the construction and towers for the proposed transmission line.

I-006-007 Wildlife and their critical habitation has already been seriously undermined from the Bakken drilling and fracking in western North Dakota for at least seven-eight years so far. Industry estimates say the significant industrial develop from the unconventional oil and gas will continue for possibly 30-50 years. The DEIS for Basin Electric is failing to consider the full, cumulative and adverse impacts to wildlife and endangered species in their proposed plan.

I-006-008 Page 342: I object to Basin Electic's plan to allow "avian collisions with the transmission lines, particularly for larger, less maneuverable species and in areas of dense bird congregations, such as migrating waterfowl staging areas in the Missouri River crossing…..Migratory waterfowl would be especially susceptible to transmission line collisions where the proposed transmission line would be located near migration staging areas (areas where large concentrations of birds stopover and rest during migration) and at the Little Missouri River and Missouri River crossings…"

I-006-009 Page 342: Further, objectionable is "Alternatives C, D, and E are located entirely within the whooping crane migration corridors, with lengths of 278, 251, and 314 miles, respectively through the migration corridor."

I-006-010 Page 342: Basin Electric plans to allow electrocution of large migratory birds. There's nothing specifically documented in the DEIS to assure the public that "the phase-to-phase and phase-to-ground separation is adequate to prevent electrocution of avian species". As stated in the DEIS, "Electrocution impacts from operation of the line would be long term and of low intensity. The DEIS failed to identify what is considered "low intensity."

I-006-011 In the unplanned Bakken oil and gas development, industry operators have been wasting 30% or more of natural gas by flaring in western North Dakota for many years. In a more planned approach, the wasted natural gas could have been - and still should be used - to power the Bakken drilling.
But instead of requiring that this extracted energy resource be used in a responsible manner, the federal/State of North Dakota plan is to facilitate the costly transmission of another fossil fuel energy source, coal-fired electricity, to the already wasteful oil industry.

I-006-008
Mitigation and conservation measures have been identified to reduce/minimize avian collisions.

I-006-009
Comment noted.

I-006-010
Transmission lines, especially high-voltage lines, have adequate phase-to-phase and phase-to-ground spacing.

I-006-011
Please refer to response to comment N-006-004.

I-006-012

As stated in the DEIS, this project will have a significant and cumulative impact - cost - to the environment of western North Dakota. The Obama Administration needs to revise current national energy policy and prioritize federal funding for less-harmful energy developments available through alternative energy sources. The technology is already available.

Thank you for allowing me to comment.

Theodora Bird Bear
MAILING ADDRESS: P.O. Box 616
New Town ND 58763

I-006-012
Comment is noted.

From: Sara Jumping Eagle [mailto:sjumping_eagle@hotmail.com]
Sent: Monday, February 03, 2014 11:20 AM
To: Rankin, Dennis - RD, Washington, DC
Subject: Antelope Valley Station to Neset Transmission Project" Comments

Dear Mr. Rankin, Thank you for your time in reviewing my comments. Pilamaye, Sara Jumping Eagle

I-007-001

December 2013 SDEIS "Antelope Valley Station to Neset Transmission Project" Comments

February 1, 2014

Dear Mr. Dennis Rankin,

The December 2013 "Antelope Valley Station to Neset Transmission Project" supplemental draft EIS completely ignores the facts that historical and cultural surveys have not been completed; minimizes and simplifies environmental impacts, and is completely short-sighted in ignoring the agricultural and historical heritage of North Dakota. The supplemental DEIS is a complete conflict of interest in that WAPA, Basin Electric, the entities that have written the SDEIS have of course financial interests in ignoring the negative impacts on the cultural and historical site of the Killdeer Mountain Battlefield, study area, and sacred site. The argument that industrial activities are taking place in Western North Dakota, thus the view shed and heritage of the Killdeer area are to be ignored, is completely biased. Yes, some oil industry is occurring in the specific area of Killdeer Mountain Battlefield study area, yet what areas we have to be preserved we must take care of for our future generations. These areas cannot be priced.

I-007-002

The writers of the DEIS and the supplemental DEIS, WAPA and Basin Electric, have not abided by NEPA in providing alternative routes which avoid the National Register of Historical Preservation Area of the Killdeer Mountain Battlefield and study area, an area which is still being studied, an area which is known to contain the remains of Lakota/Dakota people, and will likely contain historical artifacts still undiscovered. The cultural surveys have still not been completed. The state of North Dakota Historical Society has not yet completely studied this area; I would suspect that if there were more bones of soldiers there, the site would have been completely studied years ago. It is disrespectful to our people and legacy to even consider building on, digging into, or covering up our peoples' graves and bones.

I-007-003

Yes, a route south of the Killdeer Mountain Battlefield study area is inconvenient to WAPA and Basin Electric, possibly more costly, less of a straight tangent, and may take slightly more time – yet in the grand picture of our country, our state's history, and a peoples' legacy – what is the price put on respect and heritage? Other routes may be more difficult, less of a straight path - yet what road will we travel to preserve the sacred? What is our cultural, historical, environmental heritage worth? PRICELESS

The fact that I even have to say this to Western APA, Basin Electric, North Dakota, and RUS is concerning to me and to the Lakota/Dakota Nations. Yet, in many ways, our state of North Dakota is still young, even immature, when it comes to American Indian-State relationships. We must still fight for our peoples' bones to be respected. Sad statement.

I-007-004

Given that one of the main populations affected by any changes to this site is the Lakota/Dakota people, including the Standing Rock Sioux Tribe, there has been significant lack of discourse in obtaining more oral history regarding this area. There are real financial constraints facing our elders in attending public hearings that are a great distance from where they live. Our people face numerous challenges in dealing with governmental and business agencies that at their core, aim to disregard our way of life and to only place meaning in the price tag of worth, the measured written ownership of space. Yet our ways of life,

I-007-001
Please refer to Section 3.6 for a discussion of project impacts on cultural resources.

I-007-002
Comment noted. Please refer to Section 3.6 in FEIS for more detailed discussion of potential project impacts to the Killdeer Mountain Battlefield.

I-007-003
Comment noted.

I-007-004
The agencies are consulting with the SRST and SWO Tribal Historic Preservation Officers (THPO).

our prayers, and our beliefs must continue – we must pass them onto the next generations for our children to thrive. This is the worth of the place.

So when the SDEIS states that there are no populations impacted negatively by Environmental Justice, I will disagree. Our people, a minority in this state, quite often live in poverty, while the very counties in the Bakken make millions for often outside royalty owners who then influence our state's policies. That right there is environmental injustice. When our places of prayer, and our bones would be run over, dug up, built upon for financial interest and "development", that is environmental injustice; when our people do not have a voice or that voice is ignored – injustice; when the very changes you propose will cause more industry to come in and pollute our water, air, and land – that is injustice. So I disagree with WAPA and Basin Electric. Our community members drink water that derives from the Missouri; this water is being affected by what happens in Northwestern ND – environmental injustice.

I-007-005

Taĥċa Wakutėpi, the place we Lakota people called the place where they killed deer "Killdeer"; is a place of prayer, a sacred place equal in reverence to a church. It is a place where Lakota/Dakota people went to Hanbleciya, to stand on the hill and seek a vision. Taĥċa Wakutėpi is a place where young and old men would go to fast and pray and seek guidance, for one to several days at a time. Killdeer Mountain is also prominent in many of the Mandan, Hidatsa, Arikara traditional stories as well. This area is part of their traditional lands also, as well as belonging to the lands of the Lakota/Dakota. To put a power line through Killdeer Mountain site would be similar to putting power lines through a place of prayer and reverence such as a church or a mosque, except that Killdeer Mountain cannot be replaced.

I-007-006

The supplemental DEIS argument that because there is some industrial development taking place in the area, thus power lines and the resulting disturbance from building them would thus result in minimal difference, is simplistic – this would be comparable to saying if there is trash thrown in the Grand Canyon, then throwing more trash in the Grand Canyon would thus not make much of a change to the environment and view.

I-007-007

There are current changes taking place within the North Dakota state Industrial Commission, within the public sentiment that will result in policy changes to protect these areas from further development. Killdeer Mountain is on a list of "extraordinary places" in North Dakota. This should also serve to show the importance placed on this area to people in the state of ND. There are alternatives that would avoid this area that have not been fully studied and taken into consideration, thus violating NHPA and NEPA. Our state and heritage deserve to have these alternatives of a route that goes south of the Killdeer Mountain Battlefield, study area, and Taĥċa Wakutėpi sacred site presented. I propose that changes to this area, given that it is a sacred site for the Lakota/Dakota, Mandan, Hidatsa, and Arikara people also infringes on the American Indian Freedom of Religion Act as well.

I-007-008

It must be noted as well, that currently there is significant conflicts of interest occurring at multiple levels in our state, the ND State Historical Society and Heritage Center is preparing for the North Dakota 125 year anniversary of statehood. The ND Historical Society itself is in the process of building a new Heritage Center funded by the state at $40million and by private donors for $12 million; these are mainly oil industry donors. There are significant reasons for the Historical society to keep any conflicts

I-007-005
Comment Noted

I-007-006
Comment Noted

I-007-007
Please see response to N-002-014

I-007-008
Comment Noted

with the oil industry to a minimum during this time while they build the Heritage Center. The ND Heritage Foundation honored Mr. Hamm and is likely naming part of the Center for him. Hamm, as the owner of Continental Industries is a significant force in the Bakken oil field and in our state's politics at this point in time. Relying on the Historical Society solely for information about the Killdeer Mountain study area and site is faulty.

I-007-009

The North Dakota State University study of the Killdeer Mountain Battlefield study area should be allowed to be completed. The cultural surveys should be completed as well before any decisions are made about alternate routes for these power lines.

I-007-010

In considering alternatives, no statement has been made regarding the amount of flaring occurring in the state of North Dakota; increasing power lines will of course increase the amount of drilling that will take place in this state, and thus will increase the carbon footprint and flaring occurring in our state. As of yet the enforcement of regulations appears minimal, our state is being polluted as we speak.

I-007-011

The large mega pad that is being planned in the northwestern part of the state will be a large drain on our water sources, I see no mention of this impact on resources in the supplemental DEIS– this mega pad will be built as a direct result of increased power lines in the state as well. I am concerned for the public health and the environmental health for the people of North Dakota and further downstream of the Missouri River.

I-007-012

The flared natural gas that is being burned off and wasted could also be used to power half of this state instead of disturbing our cultural and historical sites to the detriment of this state and country. This would lend more credence to the no-action alternative until further studies are completed, and until a more southern route is determined which does not include the Killdeer Mountain Battlefield study area. I realize more power lines are needed in this area, yet it should be done in a way which respects the heritage and culture of North Dakota, not only in ways most expedient to WAPA, Basin Electric, and to the oil industry.

Sincerely,

Sara Jumping Eagle, MD

Oglala Lakota/Mdewakantonwan Dakota

Pediatrician

I-007-009

Refer to response to comment number I-006-003.

I-007-010

Chapter 4 of the FEIS - Cumulative Impacts, present a discussion of the additional and ongoing impacts, including from Bakken infrastructure development, to air quality, particularly as it relates to the proposed project.

I-007-011

The cumulative impact analysis does acknowledge the significant increase in economic activity associated with the development of the Bakken oil formation. While the mega pad referred to by this commenter is one project associated with this development, we do not believe it is being developed solely because of the development of the AVS to Neset transmission project. Development of the Bakken resource will place additional demands on water resources, the development of the transmission line is not expected to have a significant cumulative impact on water resources.

I-007-012

Please see response to comment N-006-004

I-008-001

I-008-002

I-008-003

I-008-004

I-008-005

I-008-006

From: Corey Sanders [mailto:coreyjsanders@hotmail.com]
Sent: Monday, February 03, 2014 3:21 PM
To: Rankin, Dennis - RD, Washington, DC
Subject: Basin Electric-Transmission Line IES Supplement Comment

Mr. Rankin:

I am writing to express my opposition to the proposed location of the mega-transmission line that is to run through the Killdeer Mountain area, in North Dakota. I am an enrolled member of the Three Affiliated Tribes of Fort Berthold Reservation, the Mandan, Hidatsa, and Arikara tribes. I am also a descendant of the Santee Dakota of Minnesota, as well as the Assiniboine of Fort Belknap Montana. As such, my concern for Killdeer is two-fold. One, the area known as Killdeer Mountains is a significant cultural and historical area for the Mandan and Hidatsa people, and is part of our original treaty land which we did not give away during the Fort Laramie Treaty of 1851. Even though the land was later taken from us by Executive Order, it was done so without our consent. The fact that this land is no longer in our possession does not undo the long history we have with it. Nor does it negate the significance and meaning within our belief system. It is included in our sacred stories and is and has been an integral part of our ceremonial belief system, and practice, since time immemorial. For our Hidatsa and Mandan people, our ceremonies, and associated rites, were established by very specific events, events that took place at specific physical locations that are still known to us today. The Killdeer Mountains are one such area. The retelling of these sacred events is appropriate only in certain situations, and among certain audiences.

Unfortunately, as mentioned, the reality today is that the land is no longer under our control, rightly or wrongly. Yet, since it is part of our heritage and belief system, we must speak up for it, whether our concerns are respected, or not. As such, I believe that Basin Electric, and other parties interested in this proposal, should at least wait for relevant cultural site surveys to be completed, before any further action is taken. Actually, I believe Basin Electric should consider rerouting the proposed transmission line so as to avoid direct contact with this area regardless, due to its cultural significance to our tribes. In either scenario, your agency is bound by law to consult with tribes since Basin Electric is seeking federal dollars for this endeavor. Yet, I see in your draft IES that your agency has already determined that there will be no adverse impacts to tribes. While there may not be a significant adverse to us economically, there will be a significant impact to our cultural and religious interests.

Further, as I mentioned earlier, I am a descendant of the Santees of Minnesota, some of whom fled Minnesota after the so-called Santee Uprising of 1862. Some of these who fled included my great-great grandfather and his sister. While my grandfather fled to Canada at some point, his sister was part of a group of Santees that joined with other Lakota and Dakota bands that were involved in what is now known as the Battle of Killdeer Mountains. This woman is a grandmother to me, according to our kinship systems. To my knowledge, it was at the top of Killdeer Mountain where this grandmother was killed by soldiers during this conflict. In later years, after marrying into the Three Affiliated Tribes, my great-grandmother went to this site specifically to pray and honor her aunt, who lost her life there in the Battle of Killdeer Mountains. In our culture, we do not talk about our deceased ancestors lightly, especially to outsiders, or people outside of our family groups. The places they are buried are held sacred and we have no reason to disrupt their final resting places. Hence, I have had some misgivings

I-008-001
Comment Noted

I-008-002
Refer to response to comment number I-006-003.

I-008-003
Please see response to comment N-006-023.

I-008-004
The agencies are consulting with SRST and SWO tribal historic preservation officers.

I-008-005
Comment noted.

I-008-006
Comment noted.

about providing as much information as I have in this letter. Unfortunately, the proposed action by Basin Electric compels me to speak up for my ancestors.

I-008-007 As it is, since the Killdeer Mountains are no longer within our tribal boundaries, and it is a challenge to go to this site to conduct any of our ceremonial activities as we did in the past. Today, we must ask the private "landowners" for their "permission" to access certain parts of the land. Imagine having to ask for the permission of other people to enter your own church, or to visit the grave or burial sites of your own ancestors. Who else in America has to do this but us? Would modern Americans allow me, or some organization I represent, to place such a structure through their cemeteries or churches? I don't think so. Because our graves are unmarked, and we don't have a paper trail indicating our lineage that far back, our rights to protect the sacred places of our ancestors are not important enough, in the view of American society. Of course, we, and our rights, are in the mindset of many, just an abstract concept; a story in a history book, or some "regulation" that has to be checked off on a checklist before land can be torn up in the interest of economic benefit.

I-008-008 Our feelings for the land - in this instance Killdeer Mountains - may be difficult for non-Natives to understand, given that they do not have the history, or belief system, that we do. For the non-Native population the land is a commodity meant to be bought and sold; it is not a source of medicine, history, culture, and everyday spiritual or religious practice like it is for many of our Native people yet. I understand that these concepts are difficult for the non-Native population to grasp, as evidenced by what goes on every day in this country. Supposedly we live in a society where we each have equal rights, including the right of worship. For Native people, it seems we have to struggle to assert these so-called "equal rights" as we are doing here. In effect, the free exercise of our "rights" are dependent upon getting the "permission" of either individuals or government entities who do not always see things the way we do.

I-008-009 It can be said that we do not utilize the Killdeer Mountain area to the degree that we once did. This is only because it was taken away from us, and not because we gave it away. We now have to be considerate of the people who live there, and their "property rights" and so forth. Nonetheless, the value of Killdeer Mountains has not changed. Up until the current dilemma we at least took some comfort in knowing that the area was fairly undisturbed, at least the hilly area. From our perspective, the ideal situation would involve no work in or around the area in question. Yet, we are not asking for the entire transmission line to be scrapped, only that it be moved away from the areas in question.

I-008-010 We understand that we are part of the modern world, and as long as we have to be a part of that world we too are dependent on electricity, and other sources of energy, for our everyday lives. Still, given the choice of rerouting the proposed transmission line in light of the significance of Killdeer Mountains, we would easily choose to do so, but that choice no longer lies with us.

I-008-011 I hope your agency will live up to its obligations under Executive Order 13007, regarding sacred Indigenous sites, and our access to them.

Sincerely,

Corey Sanders
Mandaree, North Dakota

I-008-007
Comment noted.

I-008-008
Comment noted.

I-008-009
Comment noted.

I-008-010
Comment Noted

I-008-011
EO 13007 applies only to federal or tribal lands and the proposed route only crosses private lands within the 2010 NPS defined Killdeer Mountain Battlefield Study Area.

From: Vance Gillette [mailto:v.gillette4@icloud.com]
Sent: Sunday, February 02, 2014 7:04 PM
To: Rankin, Dennis - RD, Washington, DC
Subject: comment on draft EIS

I oppose the power line running thru the historic Kill Deer mountains area in North Dakota

The reasons include the following -

I-009-001

l. the area has historic and cultural importance to Native Americans in North Dakota and elsewhere.

I-009-002

2. The and area was originally part of the Ft Berthold Indian Resrvation - home of the Three Aff. Tribes of New Town, ND. The tribes should have primary say on how the land is used.

I-009-003

3. The heavy electric power going thru the area will have a negative impact on the wildlife and eagles that live in the area.

I-009-004

4. There are other routes that can be used, which will not impact the historic killdeer mountain battle site.

Vance Gillette
Box 1461
New Town, ND 58763
Member of the Three Aff. Tribes

Dated Feb. 2, 2014

I-009-001
Comment Noted

I-009-002
Comment Noted

I-009-003
The proposed ROW does not run through the Killdeer Mountains.

I-009-004
Please see response to comment N-006-023.

I-010-001
Comment Noted

From: Donna hall [mailto:nativedesignz@comcast.net]
Sent: Sunday, February 02, 2014 12:31 AM
To: Rankin, Dennis - RD, Washington, DC
Subject: Sacred site

I-010-001

Email voicing my plea to save our sacred sites in North Dakota! NO to Basin Electric

Donna Hall

I-011-001

I-011-002

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January 31, 2014

VIA EMAIL
dennis.rankin@wdc.usda.gov

Dennis Rankin
Environmental Protection Specialist
USDA, Rural Utilities Service
1400 Independence Avenue, SW, Stop 1571
Washington, DC 20250-1571

Re: Comments to Supplemental Draft Environmental Impact Statement for the Proposed Antelope Valley Station to Neset 345-kV Transmission Project

Dear Mr. Rankin:

On behalf of Nevin Dahl, we submit these comments in response to the *Notice of Availability of EIS No. 20130373 Draft Supplement for Antelope Valley Station to Neset Transmission Project*, as published at 78 Fed. Reg. 77121 on December 20, 2013. Mr. Dahl appreciates the opportunity to participate the agency's process of considering the impacts of Basin Electric's proposed transmission line (the "Project").

Mr. Dahl and his wife live on and own property in McKenzie County, North Dakota, which Basin Electric proposes to cross in Alternative C. Mr. Dahl has raised numerous issues with Basin Electric, who has failed to substantively engage on the issues; therefore, Mr. Dahl raises the relevant issues with you as a part of the environmental review process that are not thoroughly addressed in the Supplemental Draft Environmental Impact Statement ("SDEIS") as direct or cumulative impacts of the Project. Mr. Dahl opposes Alternative C, and desires routing either by Alternatives D or E, or an alternate route that will not cut through his family's homestead. One proposal Mr. Dahl has raised to Basin Electric is to move the transmission line approximately one mile to the west, to parallel the existing Western Area Power Association's 230kV transmission line. Basin Electric has rebuffed Mr. Dahl's offers of assistance to explore that alternative, and the SDEIS does not consider it.

Property as a Homestead

First, one impact not addressed in the SDEIS is the impact the Project will have on families like Mr. Dahl's, who own land untouched by major industrial projects. His particular property was homesteaded by his grandfather in 1908 and has remained with

I-011-001
The alternative suggested by the commenter to follow the Western 230-kV line has been investigated as part of the EIS process. The 230-kV line provides an existing utility corridor that was developed and considered in the macro-corridor analysis. Although Alternative C does not parallel the existing line, it is generally located within the 6-mile wide macro-corridor considered in the macro-corridor study cited in the DEIS and in compliance with ND PSC requirements. While not specifically discussed in the macro-corridor study, the DEIS, or the SDEIS, portions of the Western line do not provide a reasonable alternative for the proposed project as they pass through the Theodore Roosevelt National Park. Numerous commenters, including the National Park Service indicated the project should be located as far as possible from the TRNP. In attempting to avoid the park and minimize potential impacts while also considering and balancing potential impacts to LMNG, including the Lone Butte roadless area, as well as address practical construction issues and concerns associated with crossing the steep and rugged terrain adjacent to the Little Missouri River, the current alignment that crosses Mr. Dahl's property was developed. To the extent adjustments to the route are possible and reasonable, Basin Electric is working with all landowners to develop the project that minimizes inconvenience to such owners. In addition, Basin Electric is completing wildlife surveys along the ROW that will cross Mr. Dahl's property in the spring 2014. Basin will utilize the results of these surveys to avoid or mitigate impacts to identified habitats, wildlife species, wetlands and other sensitive resources.

I-011-002
Comment is noted.

his family since. Basin Electric does not seem to understand, and the DEIS does not consider, the noneconomic impacts of routing the Project through the untouched land that is proposed in Alternative C. His family has been a steward of this land for more than 100 years, and the Project seeks to just throw that away without considering the incredible impacts that do not have anything to do with value. Those noneconomic impacts include loss of viewshed, aesthetic damage to his and surrounding properties, etc.

Impacts to Wildlife

I-011-003

The proposed route through Mr. Dahl's property will impact numerous species of wildlife, and those impacts were not thoroughly addressed in the SDEIS. For example, Mr. Dahl has recently spotted at least two golden eagles on his property in the vicinity of the proposed route; however, the SDEIS fails to address those impacts. The SDEIS notes that "Nest surveys for golden eagles and other raptors were conducted in a 1 mile area on both sides of the centerline for the western loop of Alternative C during spring 2013. No active golden or bald eagle nests were found." SDEIS, 3-41. The SDEIS does not define "western loop" and does not consider the remaining "loop" of Alternative C. Moreover, the Bald and Golden Eagle Protection Act, 16 U.S.C. § 668 *et seq.*, clearly does not limit protection to golden eagle nests; the birds are also protected, but the SDEIS does not discuss the presence of the birds.

I-011-004

Additionally, Mr. Dahl's property includes leks for the Plains sharp-tailed grouse. While the SDEIS discusses the sharp-tailed grouse, it does not properly consider the impacts to leks for the Plains sharp-tailed grouse on private lands, only mitigating impacts to the birds and their habitat on lands administered by the U.S.F.S. *See* SDEIS, at 3-61. Moreover, the SDEIS seeks to "mitigate" impacts by staying out of active leks from March 1 through June 15 on lands administered by U.S.F.S., but the SDEIS does not consider the impact of the Project's existence in the leks beyond construction.

I-011-005

Mr. Dahl's property also contains watering sources where his cattle and other wildlife hydrate. Routing the project straight through such locations will have great impacts on the animals, and those impacts are not addressed in the SDEIS.

Other Impacts

I-011-006

Mr. Dahl's property includes potential coal resources along the route in Alternative C. The SDEIS does not consider the impact of routing through such resources.

I-011-007

Mr. Dahl's property also includes potential historic sites that will be routed through, and those impacts are not considered in the SDEIS as mandated under the national Historic Preservation Act.

I-011-008

Finally, the SDEIS does not thoroughly consider the visual impacts to property owners who have been on the land long before Basin Electric. The SDEIS does consider the visual impacts from certain lands, but not to all the landowners who have kept their lands untouched from big industry. Moreover, the

I-011-003
See response to comment F-002-023.

I-011-004
The project has identified the overall distance of leks from the proposed project, as discussed in Section 3.5.2, Table 3-16 of the FEIS.

I-011-005
Basin Electric has worked with many agencies and landowners to come up with a route that has avoided and minimized potential impacts to the greatest extent possible, including those impacts near Mr. Dahl's property.

I-011-006
Transmission lines are capable of co-existing with coal resources. Only areas around structures would potentially be precluded from mining operations. Coal present between structures, if recoverable, could be mined with proper implementation of safety procedures. Additionally, during geotechnical studies, structure spotting, and easement negotiations, Basin Electric would coordinate with the property owner to develop the project to accommodate access to recoverable coal resources to the extent possible. Additional discussion of potential impacts to mining operations is included in Section 3.3 of FEIS.

I-011-007
Effects to historic properties on Mr. Dahl's property will be considered under the terms of a Programmatic Agreement executed pursuant to 36 CFR Section 800.14(b)(1)(ii).

I-011-008
Views from private property would be impacted by any of the action alternatives being considered. The visual effects upon private property are addressed in the analysis with regard to homes near the Missouri River crossing and roadways near private lands. Impacts to adjacent land uses are addressed under a separate resource topic. Impacts to adjacent lands are addressed in terms of how the features of the proposed action would result in impacts to lands that are under specific management authorities and with associated covenants or legislation that provide for protections to the visual integrity of the landscape.

I-011-009

SDEIS does not consider that having the Project run parallel to an existing line would minimize visual impacts everywhere a transmission line is not already located.

For these reasons, Mr. Dahl urges the agency to thoroughly consider those impacts not considered in the SDEIS, and to select either Alternatives D or E, or an alternative that does not route directly through Mr. Dahl's homestead, as currently planned in Alternative C. Again, Mr. Dahl appreciates the opportunity to participate, and we thank you in advance for your consideration of his comments.

Respectfully submitted this 31st day of January, 2014.

Franklin J. Falen
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I-011-009
Comment Noted

The Antelope Valley Station to Neset Transmission Project
A Critical Review

Principal Author, Thomas D. Isern

Submission to Rural Utilities Service
Submitted February 3, 2014

Commenting on
Antelope Valley Station to Neset Transmission Project,
Supplemental Draft Environmental Impact Statement

A White Paper from the

Center for Heritage Renewal
North Dakota State University
heritagerenewal.org

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And here is the source cited for the need statement above.

IS (Integrated System). 2011. Eastern Montana/Western North Dakota Load Serving Study facility Additions Justification-August 2011.

Screen capture of citation for paragraph immediately above

IS, Integrated System, is an entity that goes back to a 1962 agreement binding together Basin Electric and the Western Area Power Administration to build and maintain power transmission lines—another creature of public entrepreneurship. Thus the authority cited for the need to build the current transmission line is an entity dedicated to the building of transmission lines.

Throughout the hearings on the Basin proposal convened first by the North Dakota Public Service Commission and then by the Rural Utilities Service, there has been a notable paucity of representations stating need for the transmission line. Examining rosters and statements, it seems that those testifying to such need are Basin executives, residents of communities where Basin operates power plants, landowners who stand to benefit financially from Basin's purchase of easements, and cooperatives who are long-term clients of Basin.

One of them testified on January 16 that "members who may want additional electricity or new members wanting electricity at a new home site, water well or commercial location will eventually be refused service for the sake of keeping the lights on for those who are currently being served"—as quoted in a news release from Basin. Note the use of passive voice. The statement is not that the region will have to go without power. Rather, the fear is that Basin will not be the company to supply the power.

Given the acute situation described by Basin and its clients, we would expect a public outcry from communities and consumers desperate for power. We still await that outcry (which may well be manufactured, now that its lack has been noted).

I-012-001

Viewed historically, the Antelope Valley Station to Neset Transmission Project appears to be an attempt by a traditional lignite-based power supplier located in central North Dakota, using the advantages of federal funding, to preempt market share in the growth region of northwest North Dakota, thereby suppressing the growth of local generating capacity that would use abundant natural gas, obviate the need for Basin's transmission line, and establish long-term economic improvement in the northwest.

I-012-001
Please refer to response to comment N-006-004.

We are concerned here not about "long distances," but rather with a segment of a transmission line near and across the Killdeer Mountain Battlefield. Basin's 2011 submission clearly states, "Existing transmission lines may provide opportunities for routing the proposed transmission line adjacent to an existing right-of-way" in order to "potentially reduce environmental impacts associated with construction, operation, and maintenance." More broadly, "this is considered good routing practice." Concerns of "system reliability," it is noted, might make it "not practicable . . . to parallel existing high-voltage transmission lines (above 230-kV)." Note, precisely, the definition of "high-voltage transmission lines" that might preclude co-location of another transmission line: such lines would be "above 230-kV." The consideration, then, is crystalline: if there is an existing right-of-way, and the existing transmission line is not above 230kV, then the use of the existing right-of-way is not precluded. In fact, its use is to be considered "good routing practice."

I-012-002

Is there such an existing right-of-way in the locality of the Killdeer Mountain Battlefield, which might be used in order to avoid degradation of the historical integrity of the battlefield? The answer, according to Basin's submission, is yes, categorically and graphically.

See the map on the page following, reproduced from Basin's document. Closely paralleling Highway 200, running to the south of the battlefield, is an existing right-of-way. It is color-coded blue, which color denotes "Existing 115-kV & 230-kV Transmission Lines." Thus this line is not "above 230-kV." Basin's own study says that to use this right-of-way would be "good routing practice."

This is truly perplexing. Basin offers no explanation as to why it chose to ignore "good routing practice" and instead designate a route through the middle of the Killdeer Mountain Battlefield. (There have been secondhand reports that Basin representatives have expressed qualms about the security of building alongside an existing transmission line, but these have surfaced only after public advocates of battlefield preservation have raised the issue, not during the planning process, and no one has explained away the clear mandate in Basin's own study to pursue "good routing practice.")

The only explanation that seems feasible and logical is that Basin may be holding this preferable route in its back-pocket, as a backup or future alternative. This leaves us wondering what else we are not being told. We have only examined only one, obvious alternative. Surely assiduous research would produce others.

I-012-002

The NEPA process has evaluated a number of macro-corridors, corridors and different alignmens configurations. In addition, input from individual land owners is a very important consideration in determining location of the line. Based on all necessary considerations, the route developed provides the best means to minimize overall project impacts and address landowner concerns. The agencies must consider the potential impacts to the Killdeer Mountain Battlefield site and proposed study area, as well as all other impacts associated with this and other alternatives.

I-012-003
Comment noted.

With landowners fronting the diversionary campaign, Basin Electric began shopping the landowner grievances to editorial boards of major daily newspapers, sometimes succeeding in procuring buy-in for their stated grievances. At the same time, Basin representatives, in public statements, presented the controversy over the battlefield degradation as an unfair criticism, expressed too late, having to do with a theoretical designation of the battlefield area—ignoring the most definitive statements extant, those of the National Park Service.

The public relations campaign assumed a certain genius of concerted elements: deny the significance and integrity of the battlefield, say the results are inconclusive, and at the same time, deny access to persons prepared to investigate and confirm details. ND SHPO refused to allow parties outside the Basin-Metcalf alliance to update the site form for Killdeer Mountain Battlefield, despite abundant information available to justify the update, on the grounds that there needed to be more on-the-ground reconnaissance—thus rejecting the work done by the NPS. Of course, additional on-the-ground reconnaissance was impossible, because access was denied. Thus concerted firewalling succeeded in preventing any other parties from bringing new information to bear on the issues at hand.

All the while, landowners who had signed agreements with Basin Electric to build a 365kV transmission line across the most significant historic site in North Dakota kept proclaiming that they were the best custodians of the site's heritage.

I-012-003

What bearing does this sad story of information suppression and public disinformation have on the matter before the Rural Utilities Service, which decides whether taxpayer money should be spent to build Basin's transmission line? The point is that the RUS is receiving its information base from individuals, organizations, and processes that have proven themselves, at best, unreliable.

Impacts

Given the unreliability of intelligence previously provided by Basin Electric and its clients, it seems almost futile to comment on the most recent update of the DEIS, filed by Basin with the PSC January 8, 2014. Here, however, are some brief comments.

Section 3.6 is devoted to "Cultural Resources." There are debilitating problems with this section, including demonstrably false statements.

I-012-003

For instance, the document alleges at the outset,

> During the September 2013 NDPSC administrative hearing on Basin Electric's Route Permit Application for the proposed project alignment , several entities expressed concerns about the possible direct and indirect impacts of project construction on the Killdeer Mountain Battlefield.

> The DEIS recognizes the relationship between the project and the 1-acre Killdeer Mountain Battlefield State Historic Site. However, the DEIS does not acknowledge a more extensive boundary for this battlefield because that information was not on file at the State Historical Society of North Dakota, and neither the agencies nor the public provided comment on the potential impact of the project on the Killdeer Mountain Battlefield.

As demonstrated above, the information was "not on file" because the SHSND chose not to put it into the site file. The SHSND had the information, in fact provided the information to the National Park Service, and was fully aware of the National Park Service designation of the battlefield. Metcalf Archeology also was fully aware of this information, and moreover, was specifically obligated, under its charge from the SHSND, to bring it forward parcel to the cultural resource survey process, but declined to do so. The DEIS raises a false distinction by saying the absence of specific site file information about the Killdeer Mountain Battlefield justifies excluding it from consideration. That statement deliberately ignores the SHSND's explicit instructions to contractors to go beyond mere site files, which often are minimalist, and to use every information source available. Basin and Metcalf failed to do what they were required to do. They now claim that their failure to do their research somehow excuses them from taking into account the integrity of the battlefield.

There is another, even more explicit, problem with the passage above, as the DIES claims, "neither the agencies nor the public [making representations at hearings] provided comment on the potential impact of the project on the Killdeer Mountain Battlefield." This, we regret to say, must be adjudged a deliberate falsehood. The Center for Heritage Renewal made both oral and written submission to the PSC, and we provided explicit comment on the impact of the Basin project on the battlefield (see Appendix 1). We applied the stated guidelines of the National Park Service (the agency which houses the National Register of Historic Places, the source of all evaluative criteria for significance and integrity of historic sites) as to integrity of historic battlefields, showing that whereas many modifications of land use are acceptable without destruction of integrity, the building of a 365kV transmission line across the middle of a battlefield is exactly the type of change

I-012-003

Please see response to comment F-002-007.

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> During the September 2013 NDPSC administrative hearing on Basin Electric's Route Permit Application for the proposed project alignment , several entities expressed concerns about the possible direct and indirect impacts of project construction on the Killdeer Mountain Battlefield.

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I-012-004

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I-012-004

Under Section 106 the NDSHPO has no authority to require a specific level of effort to identify historic properties. Section 106 and NEPA are meant to be transparent and open public processes designed to elicit comments and concerns on important cultural resources and project effects to them.

I-012-004

most destructive of integrity. The new DIES has failed to answer this. Instead, it denies, falsely, that such guidance exists.

Later in the cultural resources section, the DIES addresses the question of definition of the battlefield and misrepresents the National Park Service study released in 2010. The DIES says, "NPS acknowledged that the study and core area boundaries, as proposed in the 2010study, had not yet been field-verified or confirmed through archeological or historical examination." In fact, as recounted above, the NPS said no such thing. The NPS said it based its findings on its own fieldwork and on information provided by the SHSND. The statement to the contrary is unsupported by any evidence that the NPS misrepresented its work, and thus appears to be another instance of attempting to discredit the authority of the NPS because its findings are inconvenient.

In the next paragraph the DIES attempts to discredit the legitimacy of the battle site by belittling it as merely a "site lead" and quoting SHPO verbiage to the effect that a site lead comes from a "nonprofessional." Are we to take from this that NPS staff are "nonprofessional"? The more damning circumstance is that the only reason the battlefield has only a "site lead" and not a "site file" at the SHSND is that ND SHPO stubbornly refuses to allow a site file for the battlefield to be created, despite abundant basis for it. That refusal, coupled with deployment of the "site lead" argument based on it, is disturbing.

In the subsequent discussion of impacts, the DIES submission concedes the significance of the Killdeer Mountain Battlefield and accepts the NPS maps as the basis of working boundaries. It goes on to argue, however, that petroleum and attendant developments in the locality "have significantly compromised the battlefield landscape and its viewshed." The DIES continues to ignore more specific guidelines provided by the NPS in 2010 and instead falls back on the more general criterion for integrity, "whether or not a participant in the battle would recognize it as it exists today."

This, of course, sounds like a judgment call. It is the professional judgment of the Center for Heritage Renewal that the battlefield most certainly retains sufficient integrity for National Register designation. The DIES seems to agree, but emphasizes that there are other industrial intrusions in the landscape, which make a 365kV transmission line, an unprecedented intrusion on the site, seem not so bad. The DIES provides an unsophisticated and impressionistic discussion of visual impacts of the proposed transmission line that places a 365kV transmission line in the same category of disturbance as a three-wire barbed wire fence.

I-012-004
Refer to section 3.6 for discussion on Killdeer Mountain Battlefield.

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I-012-005

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I-012-006

In the subsequent discussion of impacts, the DIES submission concedes the significance of the Killdeer Mountain Battlefield and accepts the NPS maps as the basis of working boundaries. It goes on to argue, however, that petroleum and attendant developments in the locality "have significantly compromised the battlefield landscape and its viewshed." The DIES continues to ignore more specific guidelines provided by the NPS in 2010 and instead falls back on the more general criterion for integrity, "whether or not a participant in the battle would recognize it as it exists today."

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I-012-005
Comment Noted

I-012-006
Comment noted. Please refer to Section 3.6 in FEIS for more detailed discussion of the effects from the construction of the 345 kV transmission line on the Killdeer Mountain Battlefield that takes into account the guidance in National Register Bulletin 40.

Conclusions

I-012-007 The sections in this submission make the following major points.

1. There is a lack of credible evidence for the need of Basin Electric to build the Antelope Valley to Neset Transmission Project, and strong evidence it is unneeded.

I-012-008

2. Basin has failed to explain why it has rejected other, superior line sitings and instead proposed only one, which runs across the middle of the most significant historic site in North Dakota.

I-012-009

3. Vital information as to the significance and location of the Killdeer Mountain Battlefield has been suppressed and withheld from regulatory authorities.

I-012-010

4. A concerted campaign of disinformation has sought to divert public and agency attention away from the deliberate degradation of the Killdeer Mountain Battlefield implicit in the Basin proposal.

I-012-011

5. The Basin proposal entails unacceptable and unnecessary degradation of the integrity of the Killdeer Mountain Battlefield as a historic site.

It is possible to back up from the myriad documents and tangled processes that have brought us to contemplate an unprecedented degradation of our state's most significant historic site. Since 1971 economists have been aware of a powerful undertow known as "regulatory capture," as described by University of Chicago economist George J. Stigler ("The Theory of Economic Regulation," *Bell Journal of Economics and Management Science* 2 [Spring 1971]: 3-21). Stigler's concept of regulatory capture is well-known; indeed, it is a staple of conservative thought in modern America.

Stigler posits that although the public generally thinks regulatory agencies exist for public benefit, "regulation is acquired by the industry and is designed and operated primarily for its benefits. . . . The most obvious contribution that a group may seek of the government is a direct subsidy of money." Surely Stigler's argument resonates through the expectation by Basin Electric of taxpayer support for its construction of a transmission line. "When an industry receives a grant of power from the state," Stigler continues, "the benefit to the industry will fall short of the damage to the rest of the community." In the case of Basin's proposed

I-012-007
The purpose and need for this project is outlined in detail Section 1.4 of the FEIS.

I-012-008
RUS required Basin to consider a number of alternative corridors and route alignments and different line configurations as documented in the Macro-corridor study and the DEIS and SDEIS for the AVS Transmission Project. In identifying alternatives for this project, RUS and the cooperating agencies have sought to balance the potential impacts of each alternative on a wide variety of environmental and social resources, including impacts to historic resources. These impacts must be considered in light of the project's purpose and need (load increases, reliability), overall project costs and the public interest.

I-012-009
Comment Noted

I-012-010
Comment noted.

I-012-011
Comment Noted

I-013-001

From: Gary Weydahl [mailto:weydahlg@srt.com]
Sent: Wednesday, January 22, 2014 3:26 PM
To: Rankin, Dennis - RD, Washington, DC
Subject: Killdeer mountain property

Dear Mr. Rankin, I and my family have owned property near the Killdeer Mountains for three generations. My father found a spur from the Sully battle of the Killdeer mountains on this property. This was donated to the county museum. A close friend found an arrowhead on this property. We enjoy the plants and animals present on this property and do not want it destroyed by ugly electric towers.
I have made my position known but from the last letter from Basin. They basically ignored our request to not go across our property. WE DO NOT WANT this line crossing our property. Our 880 acres is very close to our hearts and it will also be to our children. Please do not let these people destroy this wonderful property. Thank You , Gary Weydahl and family

I-013-001

RUS has required Basin to consider a number of route corridors, alternative route alignments, various project alternatives, and different line configurations starting with a maco-cooridor study and followed by the DEIS and SDEIS for the AVS Transmission Project. In identifying alternatives for this project, RUS and the cooperating agencies have sought to balance the potential impacts of each alternative on a wide variety of environmental and social resources, including impacts to historic resources. These impacts must be considered in light of the project's purpose and need (load increases, reliability), overall project costs and what option is best in the public interest. Additionally, Basin Electric always seeks to develop voluntary easements and negotiate the location of transmission line projects with landowners, while still balancing the overall needs of the project and potential environmental impacts.

I-014-001

From: Prairie Rose [mailto:ms.prairierose@gmail.com]
Sent: Tuesday, January 14, 2014 5:39 PM
To: Rankin, Dennis - RD, Washington, DC
Subject: Request to Postpone Public Hearing scheduled for January 16

Hello Mr. Rankin,

I am writing regarding the RUS public hearing for the proposed Basin Electric transmission project in the Williston Basin. Notice by Basin Electric Power was made public on January 9, 2014 on their web site: http://www.basinelectric.com/News_Center/Publications/News_Briefs/rus-public-hearing-to-be-held-on-basin-electric-transmission-project-plans.html

Media was notified on January 10 and the public notified January 14 in some publications in North Dakota. It is disappointing that there would be a violation of your own public meeting policies around public hearings to respect a notice of at minimum 15 days. This meeting is valuable and important to the process of hearing the public on this issue, yet there has been little done to see that this notice be listed on web sites and in newspapers across the state.

These actions appear to not act within good faith to inform the public. I ask that you postpone the public hearing scheduled on January 16, to a later date that respects the 15 day notice policy and acts in good faith to inform the public of this important step in the process.

--
In service and solidarity ~p.rose

****
Prairie Rose Seminole
701-793-6166 cell

www.prairieroseseminole.com
www.facebook.com/prairieroseseminole

****
Do what you do.....hecel lena oyate kin nipi kte - so that the people may live

****

I-014-001
Please refer to response to comment N-001-001.

From: Prairie Rose [mailto:ms.prairierose@gmail.com]
Sent: Thursday, January 16, 2014 11:42 AM
To: Rankin, Dennis - RD, Washington, DC
Subject: Re: Request to Postpone Public Hearing scheduled for January 16

Thank you for your timely response Mr. Rankin:

Again, I am formally asking you to halt this meeting until proper notification can be provided to those adversly impacted by the disregard of your own rules and regulations.

I-015-001

Please also consider this a formal request under the federal Freedom of Informtion act (FOI) for the names and dates of places this meeting was publicized. I also want a list of individuals, entities and companies notified; a list of those you and people in your agency spoke with about this meeting.

I-015-002

If you refuse to cancel this meeting for companies and supporters, I formally ask you for the holding of another meeting in a centralized location with the notification of tribes, historians, ranchers and others with an interest in this project.

Thank your for your time.

~p.rose

Prairie Rose Seminole

I-015-001
Please refer to response to comment N-001-001.

I-015-002
Please refer to response to comment N-001-001.

I-016-001

From: theodora bb [mailto:tbb58763@yahoo.com]
Sent: Monday, February 03, 2014 10:08 PM
To: Rankin, Dennis - RD, Washington, DC
Subject: Comments on Basin Electric DEIS

February 3, 2014
Dennis Rankin
Dept of Agriculture, Rural Utility Service
Engineering and Environmental Staff
Basin Electric Mega-Transmission Lines
Supplemental Draft EIS
1400 Independence Av SW
Stop 1571, Room 2244
Washington DC 20250-1571

Re: DEIS for Basin Electric's Mega-Transmission Lines in Western ND, including the Killdeer Mountains

Sir:

I am an enrolled tribal member of the Three Affiliated Tribes and a permanent resident of Mandaree on the Fort Berthold Indian Reservation in western North Dakota. I have concerns about the adverse and permanent impacts of the construction of a proposed transmission line and towers which will only last, according to the DEIS, for just fifty (50) years.

As the lead federal agency, the RUS is failing to comply with NEPA requirements for informed public notice, historic/cultural preservation, and the environmental justice component.

As was repeatedly noted in the public testimony of tribal members, Killdeer resident, and the superintendent of the federal Roosevelt Park at the January 16, 2014 RUS public hearing, there was inadequate notice to the public that the RUS had scheduled a public hearing and further, was accepting public comments on the proposed transmission lines.

The limited cultural survey linked to Alternative C, (Page 3-76) identified nearly 300 "cultural resources" within or adjacent to the 1,000 foot preliminary area of potential environmental impacts. ("APE"). The limited cultural site survey for Alternative D and E reportedly identified 88 cultural

I-016-001
Please refer to response to comment N-001-001.

sites within or immediately adjacent to a 1,000-foot area of potential environmental impact, damage, or destruction.

Traditional tribal members of Fort Berthold still maintain an active connection to the Killdeer Mountains. The attached photo shows a 1930's reproduced map drawing by Bears Arm, Hidatsa, who was then identified in documents at the time, as a tribal historian of the Three Affiliated Tribes history. (Bears Arm was 71 years old when he died in Elbowoods North Dakota on the Fort Berthold Indian Reservation in 1936. Accordingly, he would have been born in 1865). The attached map shows that the Killdeer Mountains were in the center of the Hidatsa lands used for hunting and ceremonial uses.

Failure to complete a full and complete cultural sites survey as required for this federally-funded project has prevented tribal members and the public from making informed comments during the Draft EIS comment period on this matter. I object to any planned "disturbances," damage, or destruction of tribal cultural sites in or near the path of the transmission line and towers in the Killdeer Mountains area, anywhere along the proposed path of the transmission line, and in the area as mapped by Bears Arm.

Despite the potentially-adverse impacts to just the known existing cultural sites, the incomplete cultural site survey for the transmission line and structures, and the unaccounted human remains of the Lakota in the Killdeer Battlefield area, the DEIS claims that there will be no impact to minority or low income communities, including tribes and traditional tribal members. This determination has no basis and I object to this decision made to expedite approval for this project.

This proposed transmission line will have a significant impact on the historic and cultural sites of tribes. Despite this, there are no tribal members nor tribal entities participating in the development of this federal document as listed in the 'List of Preparers' for the DEIS. This deficiency is a failure to comply with the federal National Environmental Protection Act (NEPA).

The DEIS 'List of Libraries' fails to include the Fort Berthold Community College library and all the other tribal college libraries of the thirteen (13) identified tribes who may seek consultation on the project. There is a failure to involve tribes and tribal members who will be adversely impacted by the environmental impacts of the construction and towers for the proposed transmission line.

Wildlife and their critical habitation has already been seriously undermined from the Bakken drilling and fracking in western North Dakota for at least seven-eight years so far. Industry estimates say the significant industrial develop from the unconventional oil and gas will continue for possibly 30-50 years. The DEIS for Basin Electric is failing to consider the full, cumulative and adverse impacts to wildlife and endangered species in their proposed plan.

Page 342: I object to Basin Electic's plan to allow "avian collisions with the transmission lines, particularly for larger, less maneuverable species and in areas of dense bird congregations, such as migrating waterfowl staging areas in the Missouri River crossing…..Migratory waterfowl would be especially susceptible to transmission line collisions where the proposed transmission line would be located near migration staging areas (areas where large concentrations of birds stopover and rest during migration) and at the Little Missouri River and Missouri River crossings…"

Page 342: Further, objectionable is "Alternatives C, D, and E are located entirely within the whooping crane migration corridors, with lengths of 278, 251, and 314 miles, respectively through the migration corridor."
Page 342: Basin Electric plans to allow electrocution of large migratory birds. There's nothing specifically documented in the DEIS to assure the public that "the phase-to-phase and phase-to-ground separation is adequate to prevent electrocution of avian species". As stated in the DEIS, "Electrocution impacts from operation of the line would be long term and of low intensity. The DEIS failed to identify what is considered "low intensity."

In the unplanned Bakken oil and gas development, industry operators have been wasting 30% or more of natural gas by flaring in western North Dakota for many years. In a more planned approach, the wasted natural gas could have been - and still should be used - to power the Bakken drilling.
But instead of requiring that this extracted energy resource be used in a responsible manner, the federal/State of North Dakota plan is to facilitate the costly transmission of another fossil fuel energy source, coal-fired electricity, to the already wasteful oil industry.

As stated in the DEIS, this project will have a significant and cumulative impact - cost - to the environment of western North Dakota. The Obama Administration needs to revise current national energy policy and prioritize federal funding for less-harmful energy developments available through alternative energy sources. The technology is already available.

Thank you for allowing me to comment.

Theodora Bird Bear
MAILING ADDRESS: P.O. Box 616
New Town ND 58763

N-001-001

Statement of Rob Sand
on behalf of the Killdeer Mountain Alliance
regarding the December 2013 Supplemental DEIS for the Basin Electric Power Cooperative's (Basin Electric) Antelope Valley Station (AVS) to Neset Transmission Project
January 16, 2014, Watford City, ND

Thank you for the opportunity to make a statement at this public hearing concerning this important project. I am speaking on behalf of The Killdeer Mountain Alliance, a group of individuals working to preserve the cultural, spiritual, ecological, archaeological, and historical integrity of the Killdeer Mountains.

We learned of this meeting as a result of a press release dated January 10, 2014 published by Basin Electric and made available on the internet. Apparently the Rural Utility Service limited its notifications to other media as no other information regarding the meeting is available on the internet, which we as a scattered membership must rely upon for timely information.

Yesterday we learned that a Federal Register Notice was published by the Rural Utilities Service on Tuesday, January 14, just two days ago regarding this project. It states: "RUS will hold an open-house public hearing in January 2014 once the SDEIS is published. The time and location of the meeting will be well advertised in local media outlets a minimum of 15 days prior to the time of the meeting." This commitment was not met; the notice of this meeting appeared in the Dunn County Herald on January 10, just six days ago. This edition of the Herald has not yet even been received by its mail subscribers. The January 14th Federal Register notice further states: "Public Participation: Pursuant to 36 CFR 800.22(d)(3), it is the intent of RUS to use its NEPA procedures for public involvement in lieu of the public involvement requirements of 36 CFR 800.3 through 800.7." If you pursue this reference, you will find it does not exist; apparently the Rural Utilities Service intended to refer to CFR 800.2(d)(3) which authorizes the use of agency procedures for public involvement under the National Environmental Policy Act.

N-001-001
RUS provided notification of both the availability of the SDEIS and the public hearing through various media outlets. The Notice of Availability of the SDEIS was published in the Federal Register on December 20, 2013. A legal notice announcing the availability of the SDEIS and the date and location of the public hearing were published in the following publications on the following dates: Beulah Beacon (12/24/13, 01/09/14); Bismarck Tribune (12/22/13, 01/09/14); Dunn County Herald (12/27/13, 01/10/14); McKenzie County Farmer (12/25/13; 01/10/14); Williston Hearld (12/22/13; 01/09/14). RUS published a notice of the SDEIS and public hearing in the Federal Register on 01/14/14.

The rush to hold this meeting is more than contemptuousness of the public input element of the NEPA process, it is reflective of the haste and superficiality of the investigations and analysis of alternatives that support this project in general and the Supplemental Draft Environmental Impact Statement (SDEIS) in particular.

N-001-002

The SDEIS for the Antelope Valley Station to Neset Transmission Project was developed to expand the alternatives considered because the original ones would not meet the current demand projections for movement of electrical energy in Western North Dakota. Equally important from our perspective was that for the first time the Rural Utility Service and the other cooperating agencies more appropriately recognized the extent and significance of the Killdeer Mountain Battlefield as an important element of America's Civil War experience. It is truly an important historical and cultural site from the perspective of both the Union Army forces and the Native Americans who fought and died there.

N-001-003

The fundamental problem with the SDEIS is that it develops no alternative that would avoid constructing eight miles (that is right, eight miles) of transmission lines though the heart of the Killdeer Mountain Battlefield. Consequently it fails to comply with the requirements of the National Environmental Policy Act (NEPA).

Section 1502.1 of the Council on Environmental Quality's NEPA implementing regulations states: "The primary purpose of an environmental impact statement is to serve as an action-forcing device to insure that the policies and goals defined in the Act are infused into the ongoing programs and actions of the federal government. **It shall provide full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.**"

Section 1502.14 of The Council on Environmental Quality's regulations further requires agencies to: **"Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated."** The National Park Service recognizes the Killdeer Mountain Battlefield as a place eligible to be placed on the National Registry of Historic Places. Proceeding to degrade a noteworthy historic site without even analyzing alternatives which

N-001-002
Comment noted.

N-001-003
See response to comment T-002-003.

would avoid doing so is unconscionable and fails to comply with the requirements of NEPA and the Council on Environmental Quality's Implementing Regulations (40 CFR Parts 1500-1508).

N-001-004 It must be kept in mind that the reason that an Environmental Impact Statement is being prepared is because Basin Electric is requesting Federal taxpayer subsidies for constructing the transmission project. As concerned citizens, we find it to be absurd that one agency of the Federal government, in this case the Department of Agriculture's Rural Utility Service, would even consider using its funds to degrade the Killdeer Mountain Battlefield. After all, its sister Federal agency, the National Park Service of the Department of the Interior, used taxpayer money to study and to identify the battlefield site as a place worthy of protection through its inclusion on the National Register of Historic Places.

N-001-005 What must be done to avoid degrading this unique historical and cultural site on the 150th anniversary of the Battle of Killdeer Mountain, which took place on July 28, 1864? The project must be sent back to the drawing board. Alternatives that avoid crossing the battlefield must be evaluated in a detail comparable to analysis of the present alternatives. It must be demonstrated that it is not practicable to avoid degrading the Battlefield site. Only then will the requirements of the Environmental Protection Act be satisfied, and we as citizens and taxpayers can have confidence that the decisions of government are indeed in the public interest.

N-001-004
The two federal agencies, RUS and NPS have different missions and implementing legislation.

N-001-005
The NEPA process requires not just the consideration of impacts to cultural resources (which this project has considered throughout the alternative development and evaluation process) but all potential project-related impacts. Based on all necessary considerations, the route developed provides the best means to minimize overall project impacts and address landowner concerns.

February 2, 2014

Dennis Rankin, Project Manager
Engineering and Environmental Staff
Rural Utilities Service, Utilities Program
1400 Independence Avenue, SW., Mail Stop 1571
Washington, D.C. 20250-1571

Mr. Rankin,

N-002-001

My name is Valerie Barbie-Bluemle, I have been employed in Cultural Resources Management for the nearly 8 years in North Dakota, and my family has resided in North Dakota for five generations. I am a member of the Killdeer Mountain Alliance and am writing this letter in their behalf, as they do not have access to SHPO site files and manuscripts, nor are they allowed to by law, as I cannot share site information with members of the public. I have read through the Supplemental Draft Environmental Impact Statement (SDEIS) and I have concerns about Killdeer Mountain Battlefield, Killdeer Mountain as a Traditional Cultural Property, Medicine Hole, and the Diamond C Ranch property.

N-002-002

I notice that the Killdeer Mountain Battlefield is not fully acknowledged in the document, and the argument is made that the information was not on file at State Historical Society of North Dakota (SHSND). 32DU1094 was recorded October 14, 1993. The authors of the site form are Jeani Borchert and Greg Wermers, of UNDAR-WEST. The site form does not conclude the boundaries of the site, they believe the edge of the site was "inundated by the reservoir", but did not prove that boundary to be true in their document, as further investigation outside of their project corridor was not a part of the inventory, nor did they do the historical research necessary to prove their argument. The boundaries of the site in that document were also left open to the north. They recommend the site is eligible under Criterion A, but that further work is needed.

N-002-003

There are other historical resources that document the fighting and the length of the battle besides Sully's statements. Solider journals should be studied as well as any other military or War Department documents to understand the fighting as well as further archaeological study. Oral histories may also provide further information about the fighting and the importance of the Killdeer Mountain and surrounding areas.

N-002-004

The SDEIS states that Medicine Hole is confidential. I disagree with that statement, Medicine Hole can be found on Google Maps, and any topo map. Guided hikes are led by the SHSND yearly to the Medicine Hole, and a simple Google search will provide many results.

N-002-001
Comment noted

N-002-002
Comment noted

N-002-003
Pursuant to 36 CFR Section 800.14(b)(1), the agencies are required tomake a reasonable and good faith effort to identify historic properties. To do so, Section 106 regulations do not require implementation of any specific tasks. Rather it is up to the agencies to determine what is reasonable.

N-002-004
Revisions were incorporated in the Section 3.6 of the FEIS that disclose the location of the Medicine Hole.

The SHSND also has other site information on file that should have been utilized in understanding the impacts that the AVS transmission line would have to the battlefield that has boundaries that are not yet clearly defined for an event that is not fully understood.

N-002-005

- 32Dux370 is a site lead for the Medicine Hole and includes newspaper articles discussing the battle, the Medicine Hole's role in that battle, other uses by Native American peoples, and the Diamond C Ranch, 32DUx61.

N-002-006

- 32Dux61 is the Diamond C Ranch, which has the second oldest brand registered in North Dakota according to http://www.dakotagas.com/Miscellaneous/pdf/Basin_Today/2013-Nov-Dec-Proposed-study-of-battlefield.pdf. This ranch is especially significant in the history of cattle ranching and cattle drives from Texas to North Dakota as well as for its connection to President Theodore Roosevelt. The SHSND Archives has more than one volume of books from the South Dakota Historical Collections that address the topic of cattle drives, and peoples connected to the Diamond C Ranch. Theodore Roosevelt and the Dakota Badlands http://www.nps.gov/history/history/online_books/thro/tr_badlands.pdf, and several other sources can easily be found documenting Theodore Roosevelt's association to the Diamond C Ranch, and some may contain important details. A full deed search should be done for the Diamond C Ranch for association with other possible important figures in the history of the ranch, and what the full extent of the ranch boundary is, and it's relevance to North Dakota, and US history. One cannot possibly understand the impacts to the resource when the boundaries and the significance of the site are not determined.

N-002-007

- 32Dux369 documents the location of the burials of two soldiers killed on picket duty the night of July 28, 1864. It includes information about their excavation, reburial, and identification. This site lead has not been included in the ABPP Potentially Eligible Boundary. This location is marked by a monument for the Killdeer Battlefield placed by the Dunn County Historical Society, and according to Craig Dvirnak it was placed at the burial site in the 1930s. Why is this site information not considered important in relation to the battlefield and possible boundaries?

N-002-008

I question the goal of the project to avoid adverse effects to historic properties. If that is the intended goal than Killdeer Battlefield, the bivouac (not yet located), and the Diamond C Ranch would be fully avoided by the project. If this project proceeds with the current alternatives that impact these sites I cannot understand how adverse effects are being avoided. I also do not see a thorough argument as to why the battlefield cannot be avoided by this project.

N-002-005, N-002-006, N-002-007
Please see response to comment N-002-003

N-002-008
Please see response to comment N-002-014. The agencies have and will continue to consider measures to avoid adverse effects to historic properties. However, the implementation of such measures is not always prudent or feasible. Section 106 review recognizes that adverse effects, as determined by the agencies, will occur, and provides for their mitigation.

N-002-009 I disagree with the statement that Killdeer Mountain Battlefield is the final engagement in the Dakota War of 1862-1864. The Battle of the Badlands August 7-9, 1864 occurred between Sully's troops and the Sioux tribes involved in the Battle of Killdeer Mountain.

N-002-010 While I agree that Killdeer Mountain Battlefield is eligible under Criterion A and D it is also eligible under Criterion B for significant people. Sitting Bull is one of the most well-known Americans across the world. General Sully, Inkpaduta, and Gall are also important figures in American and regional history, and several biographies have been written about these individuals.

N-002-011 I disagree that the battlefield landscape is significantly compromised. I firmly believe that any person that participated in the Battle of Killdeer Mountain could come back today and still recognize the landmarks and topographic features to identify the location of the battle event. Unless the main physical attributes of the battlefield are removed or demolished the landscape itself cannot be significantly compromised. I also believe that the oil fields are more temporary than the transmission line, and the visual impacts will be removed when the wells go dry.

N-002-012 What I really wonder is how impacts to nationally significant cultural resource can be fully understood and mitigated when the site is not fully understood and the boundaries are still ambiguous. RUS and WAPA are utilizing public funds, and should have a duty to the public and the consulting parties to assess the site before destroying a nationally significant site that has been recognized by the National Park Service American Battlefield Protection Program as eligible for the National Register of Historic Places.

N-002-013 The cumulative impacts state the following. "Given ongoing industrial and energy development in the area, it is likely that additional electrical infrastructure (transmission and distribution lines and substation expansions) will be built in the future. Standard transmission siting practices state that when siting a new transmission line, efforts should be made to parallel existing linear features. If, at some time in the future, an additional transmission line is proposed within the project area, it is likely that the current project would be seen as an opportunity site for the construction of additional transmission line features, which could be built parallel to the line." This tells me that RUS expects further transmission lines running through the Killdeer Mountain Battlefield essentially opening up the Battlefield for further development and destruction of North Dakota's nationally significant Dakota War site. Again I question how RUS can understand the cumulative impacts of the project when the battlefield site has not been studied, is not fully understand, or evaluated for eligibility to the NRHP, nor is the Diamond C Ranch studied and evaluated.

I do not believe decisions of this magnitude can be made when they are based upon incomplete data, research and study. The cultural resource inventories from the archaeological consultant

N-002-009
Comment noted.

N-002-010
Please refer to the discussion in Section 3.6 of the FEIS.

N-002-011
Please refer to the discussion in Section 3.6 of the FEIS.

N-002-012
Agencies must meet the regulatory standards established in CFR 36 section 800.4.(6)(1) to determine the level of effort needed to identify historic properties. Refer to section 3.6 in the FEIS on how the agencies have applied these regulatory standards to the Killdeer Mountain Battlefield.

N-002-013
The typical linear features referred to in this section include other infrastructure features such as roadways not transmission and distribution lines. It should not be concluded that additional transmission lines would be developed in this area.

N-002-014

and the tribes are not even yet complete, so I do not view this document as complete, nor believe any recommendations should be made on incomplete information. I question the weight and consideration being given to tribal consultation when their input and concerns have not been addressed in the alternatives. It does not seem that tribal consultation occurred in the development of the alternative routes. If it had I would expect alternatives that avoid the battlefield, Medicine Hole, and Killdeer Mountain altogether since these are areas they have expressed much concern about, and are areas that they have continued to utilize in their spiritual beliefs.

N-002-015

Could there be an Environmental Justice issue in that the meeting was held at such a distance away from the reservations that are the consulting parties? The tribes of North Dakota have expressed concerns and requested complete avoidance of the battlefield. Was the meeting even advertised in places accessible to the people living on reservations?

N-002-016

I question the integrity of the agency in making a decision about bought and paid for easements. This to me looks like predetermined routes before the completion of NEPA. If a No Build option should be selected, or some alternatives not approved in the process Basin Electric would be losing a lot of money. Millions? Is the money already tied up in easements federal dollars? If a No Build option were the alternative would Basin Electric consider a lawsuit against RUS and WAPA because of their losses?

Utilizing natural gas for power is becoming quite common. In fact Exxon Mobil has an ad campaign currently promoting their use of natural gas for electrical power. Why is this alternative for power not being considered?

I wonder what exactly the agencies define as a well-advertised public hearing. I was planning to attend the hearing, and I kept searching Google for details concerning the hearing, but nothing turned up. I was not made aware of it until Killdeer Mountain Alliance learned of the hearing from Basin Electrics website. I was unable to attend the hearing in Watford City due to my concerns about traveling for hours in severe winter weather conditions. I would expect that consulting parties would be notified directly about public hearings. I also would think that a project of this magnitude and garnering this much public attention would have hearings in more than one location in order to truly open up the dialogue to the public.

North Dakota is celebrating its 125th Anniversary; this anniversary coincides with the commemoration of 150 years since the Battle of Killdeer Mountain. The people of North Dakota will be honoring both of these anniversaries; they are events that are significant to our state and our place in the history of our country. If Basin Electric, RUS, WAPA and the USFS are good stewards to the land and cultural resources they would respect and honor these anniversaries with the people and the State of North Dakota rather than disturb, destroy, and bring further

N-002-014

The agencies are consulting with the SRST and SWO Tribal Historic Preservation Officers. In accordance with 36 CFR Section 800.14(b)(1)(ii), the agencies will execute a Programmatic Agreement which establishes procedures for the identification of historic properties and the assessment and mitigation of adverse effects to them prior to construction.

N-002-015

The public hearing provides an opportunity for individuals to provide written and oral comments on the SDEIS. This is just one of many avenues that individuals can provide comments on the document including all Tribes that have expressed an interest in consulting on the project. In addition, Tribes have additional opportunities for consultation on the project which are outside of the public comment period for the EIS.

N-002-016

Throughout the DEIS and SDEIS, there is discussion of the multi-step process of evaluating macro-corridors, route corridors, alternative route alignments, various project alternatives, and different line configurations. At this time, no alternative has been approved for the project and all alternatives are available for review and consideration by the lead and cooperating agencies, as well as the public and other stakeholders. In identifying an alternative for this project, RUS and the cooperating agencies have sought to balance numerous alternatives and the potential impacts of each alternative to a wide variety of potential environmental and social impacts, while still considering the purpose and need for this project. RUS and the cooperating agencies are required to consider a wide range of impacts, as well as the interests of directly affected landowners. Basin's decision to acquire easements in advance of a decision is at their own risk and does not influence the agencies' final determination of a preferred alternative.

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N-002-017

Utilizing natural gas for power is becoming quite common. In fact Exxon Mobil has an ad campaign currently promoting their use of natural gas for electrical power. Why is this alternative for power not being considered?

N-002-018

I wonder what exactly the agencies define as a well-advertised public hearing. I was planning to attend the hearing, and I kept searching Google for details concerning the hearing, but nothing turned up. I was not made aware of it until Killdeer Mountain Alliance learned of the hearing from Basin Electrics website. I was unable to attend the hearing in Watford City due to my concerns about traveling for hours in severe winter weather conditions. I would expect that consulting parties would be notified directly about public hearings. I also would think that a project of this magnitude and garnering this much public attention would have hearings in more than one location in order to truly open up the dialogue to the public.

N-002-019

North Dakota is celebrating its 125th Anniversary; this anniversary coincides with the commemoration of 150 years since the Battle of Killdeer Mountain. The people of North Dakota will be honoring both of these anniversaries; they are events that are significant to our state and our place in the history of our country. If Basin Electric, RUS, WAPA and the USFS are good stewards to the land and cultural resources they would respect and honor these anniversaries with the people and the State of North Dakota rather than disturb, destroy, and bring further

N-002-017
Please refer to response to comment N-006-004.

N-002-018
Please refer to response to comment N-001-001.

N-002-019
Comment Noted

impacts to sacred and the uniquely significant cultural resources we have. North Dakota state agencies will be observing both anniversaries, and I believe the tribes of North Dakota intend to do the same. I invite the lead agencies to join in the events and help the people of North Dakota remember and honor these anniversaries. Electricity is important, but it does not have to cost us what we value. Just as the substation was moved the transmission line too can be moved in a parallel route south of Highway 200 and avoid the impacts to these traditional and historic properties.

Sincerely,

Valerie Barbie-Bluemle
Killdeer Mountain Alliance

N-003-001

N-003-002

N-003-003

Comments on December 2013 SDEIS "Antelope Valley Station to Neset Transmission Project" Submitted to Dennis Rankin, Rural Utilities Service, U S Department of Agriculture via Email January 31, 2014. (dennis.rankin@wdc.usda.gov) by Killdeer Mountain Alliance*

1.) The failure to understand the real extent of Killdeer Mountain Battlefield and its associated cultural and historic significance in the original November 2012 Draft EIS clearly affected Basin Electric's development of alternative routes and facilities. Unfortunately, Basin Electric subsequently did not take advantage of the opportunity to develop an alternative that avoids adversely impacting this asset of great significance to many Tribal, North Dakota, and other American citizens. A project can now only be approved by the Rural Utilities Service (RUS) after completion of the processes required under Section 106 of the National Historic Properties Act. We note that it is the intent of RUS to use its NEPA procedures for public involvement, in lieu of the public involvement requirements of 36 CFR 800.3 through 800.7. To meet these requirements of the Act through identification of measures to "minimize and mitigate" adverse impacts will take several months as a minimum and have an uncertain outcome.

The responsible federal agencies can meet the demands of this requirement by developing an alternative that avoids these adverse impacts on resources protected by the NHPA. The only explanation offered for not doing so is contained in the Bismarck Tribune's report on the January 16, 2014 public hearing in Watford City: "'The piece through the battlefield area can't be avoided because Basin has to connect to a major substation called Charlie Creek near U.S. Highway 85 to the west,' said Cris Miller, the co-op's senior environmental manager." This explanation begs the question of why the line cannot be routed further south, away from the Mountains and the Battlefield. Such a route would be longer, more costly to construct, and require the acquisition of different easements. However, without development of a plan such as this, it is difficult to understand how the sequential requirements of Section 106 to avoid, minimize and mitigate adverse effects can be realized, which means that the project cannot be approved by the Federal Government.

2.) A public meeting on the draft SEIS was held in Watford City on January 16, 2014. The March 14 Federal notice relating to this project states: "The time and location of the [open-house public] meeting will be well-advertised in local media outlets a minimum of 15 days prior to the time of the meeting." The meeting was sparsely attended, and apparently several speakers indicated that they had found out about the meeting from the Killdeer Mountain Alliance Facebook page, not the regular media.

- Please supply for the record a listing of the media announcements and their respective dates of publication or broadcast.
- Is it the agency's view that notification actions meet the requirements of NEPA?
- How was the following requirement of Section 106 of NHPA satisfied?

"The agency official shall submit the EA, DEIS or EIS to the SHPO/THPO, Indian tribes and Native Hawaiian organizations that might attach religious and cultural significance to affected historic properties, and other consulting parties prior to or when making the document available for public comment. If the document being prepared is a DEIS or EIS, the agency official shall also submit it to the Council."

3.) Please reconcile the following two statements:

N-003-001
The Killdeer Mountain Battlefield was not identified by federal, state or local agencies or the public during scoping or in comments received on DEIS as an important resource that could be impacted by the project. Please refer to section 3.6 in the FEIS for further information on the effects of the project on the Killdeer National Battlefield.

N-003-002
Please refer to response to comment N-001-001.

N-003-003
It is only required only when the agency is integrating the requirements of Section 106 in NEPA.

N-003-004

~~a)~~ a) The SDEIS states, with regard to the Section 106 process, "Following publication of the Supplemental DEIS for review, Western will host a meeting with consulting parties to seek and consider their views about effects on historic properties and the manner in which Section 106 review should be concluded."

~~a)~~b) Subsequently it states: "Concluding Section 106 Review. When the DEIS was prepared, Western, RUS, and USFS anticipated that Section 106 review would be concluded using a Memorandum of Agreement. However, with the change in scope of the project and increase in the land area involved coupled with restrictions on access, Western, RUS, and USFS agree that concluding Section 106 review with a Programmatic Agreement is more appropriate. While Western will remain the lead for Section 106 review, RUS has agreed to manage the development of the Programmatic Agreement. RUS will ensure that Section 106 review has been appropriately concluded prior to the issuance of the Record of Decision."

N-003-005

4.) Section 106 requires that a sequence be followed in the decision-making process regarding impacts on historic properties. That sequence is avoidance, minimization and mitigation. The SDEIS contains no explanation of why the adverse impacts on the battlefield can not be avoided. When can we expect the avoidance analysis to be available?

N-003-006

5.) We understand that Basin Electric has acquired many of the easements required to implement their desired route. Does that fact in anyway bias the decision as to what route will be finally approved?

*** Killdeer Mountain Alliance**

The Killdeer Mountain Alliance is a loose alliance of local landowners, Native Americans, hunters, outdoor enthusiasts, scientists, historians, archaeologists, and others who love the Killdeer Mountains and agree with the mission statement: "The Killdeer Mountain Alliance exists to preserve the cultural, spiritual, ecological, archaeological, and historical integrity of the Killdeer Mountains of western North Dakota and protect them from industrial development that harms the American Indian sites, plant and wildlife habitat, ranching, hunting, tourism, scenic beauty, and recreation for which the Killdeer Mountains are known and loved."

N-003-004

No reconciliation is needed of these two statements because a Programmatic Agreement is appropriate for the conclusion of Section 106 because the agencies will phase the identification of historic properties and evaluation of effects. LAURA TO REVISIT . Consulting party input is being sought on the specific terms to be included in the PA.

N-003-005

Section 106 requires consideration of ways to minimize or avoid adverse effects but does not require these such measures be implemented. Please refer to Section 3.6 in FEIS for further discussion.

N-003-006

Throughout the DEIS and SDEIS, there is discussion of the multi-step process of evaluating macro-corridors, route corridors, alternative route alignments, various project alternatives, and different line configurations. At this time, no alternative has been approved for the project and all alternatives are available for review and consideration by the lead and cooperating agencies, as well as the public and other stakeholders. In identifying an alternative for this project, RUS and the cooperating agencies have sought to balance numerous alternatives and the potential impacts of each alternative to a wide variety of potential environmental and social impacts, while still considering the purpose and need for this project. RUS and the cooperating agencies are required to consider a wide range of impacts, as well as the interests of directly affected landowners. Basin's decision to acquire easements in advance of a decision is at their own risk and does not influence the agencies' final determination of a preferred alternative.

1200 Missouri Avenue Ste 201
Bismarck, ND 58501

Dakota Resource Council Comments Regarding Rural Utilities Service (RUS) (SDEIS) Antelope Valley Station to Neset Transmission Project.

To Whom it May Concern:

Thank you for the opportunity to comment on the SDEIS prepared for the Antelope Valley Station to Neset Transmission project. The purpose of our comments are to stress two areas that Dakota Resource Council feels must be stressed in choosing a route for the transmission line, as well as to provide a possible alternative that could be a part of a future EIS document.

N-004-001

General Concerns that Dakota Resource Council believes should be heavily considered in the NEPA process for this project:

1. Impacts of the proposed transmission line to TRNP and Killdeer Mountains

Basin Electrics proposed 345kv transmission line as proposed will clearly impact two significant cultural and historical resources in North Dakota: Theodore Roosevelt National Park and the Historic Killdeer Mountains.

Theodore Roosevelt National Park will be impacted in one of the proposed alternatives because the transmission line is proposed to thread the eye of a needle along Highway 85 between Long X Divide and Lone Butte, which are both significant areas for recreation and National significance. Additionally, the proposed line route goes past the entrance of the North Unit of Theodore Roosevelt National Park, a major tourist attraction, and a power line of this size would undoubtedly impact the visitor experience for those visiting the park.

Lastly, the many alternatives show that power line crosses directly through the Killdeer Mountains, a place of historic significance due to historic battle that was fought there during the Civil War. And also due to its significance to DRC's first nation members that view the Killdeer Mountains as a sacred place for prayer and reflection.

N-004-001

Impacts to Theodore Roosevelt National Park are discussed in Sections 3.1 and 3.6 of the FEIS. Project ROW is on private lands and does not cross through the Killdeer Mountains. Please refer to Section 3.6 in FEIS for more detailed discussion on impacts to Killdeer Mountain Battlefield.

N-004-002

2. Impacts on wildlife

Habitat fragmentation is a major issue in western North Dakota. The proposed power line by Basin Electric will likely exacerbate this situation. Herds of bighorn sheep, elk, and mule deer have migration routes that will be impacted by the proposed route of the power line regardless of the alternative in the SEIS. If this power line is to be developed it must mitigate possible habitat fragmentation issues. Many DRC members are interested in wildlife viewing and hunting, which is something that would see adverse impacts if the power line without proper mitigation in place for major game populations such as mule deer.

North Dakota cannot continue to helicopter animals to new habitat; the opportunity for habitat "over the next hill" is increasingly being lost. Additionally, the migration route and the other pristine areas that will be impacted by the power line are key to foster and growing herds of wildlife creating robust abundant wildlife numbers in western North Dakota, which could be sustained for more than just this generation.

N-004-003

Proposed Alternative:

Other Alternatives to be considered (no build) Utilize Flared Natural Gas

Dakota Resource Council would like to offer another alternative route that is analogous to the no build option, but involves the use of natural gas in the Bakken to produce the energy that would be provided by the proposed transmission line.

Background

Currently approximately 30 percent of the natural gas that is produced in the oil fields of western North Dakota is flared/wasted. The state of North Dakota is currently working to reduce the flaring in the oil field. The proposed transmission line will not in any way reduce flaring, rather it will connect western ND to already existing coal-fired power plants.

One alternative to constructing this transmission line that should be considered in the scope of this EIS is an additional no build option that would consider the beneficial use of flared natural gas to meet the energy needs that the proposed power line would provide.

This proposed "no build option" would ask Basin Electric to capture, compress, and utilize flared natural gas to meet its customers energy needs. This would involve constructing multiple natural gas processing and generation plant throughout western ND.

With the utilization of flared natural gas, Basin electric could likely use existing transmission lines, and if needed construct some smaller transmission lines throughout the oil fields (while avoiding areas like Theodore Roosevelt National Park, and the

N-004-002
Does the FEIS show existing and known ungulate migration routes?

N-004-003
Please refer to response to comment N-006-004.

Killdeer Mountains) to deliver the electricity generated by natural gas power plants.

This alternative would be a win for both the state of North Dakota and Basin Electric because it could potentially significantly reduce flaring, while avoiding the possible impacts to historic and beautiful places such as Theodore Roosevelt National Park and the Killdeer Mountains.

N-005-001

N-005-002

N-005-003

N-005-004

From: Joseph A. Satrom [mailto:joe@satrom.com]
Sent: Monday, February 03, 2014 3:53 PM
To: Rankin, Dennis - RD, Washington, DC
Cc: Larry Heilmann
Subject: Fwd: transmission line comments

Date: February 3, 2014 at 11:34:49 AM CST

Comments on the Draft Supplemental Environmental Impact Statement for the Coyote Valley Station to Nesit Transmission Line:

The Friends of Theodore Roosevelt National Park is an organization devoted to preserving the natural, historical and cultural values of Theodore Roosevelt National Park. We are submitting this these comments to express our views on the Supplemental Draft EIS for the Coyote Valley Station to Nesbit transmission line proposed by Basin Electric Cooperative.

Our area of chief concern is that portion of the route that goes north along US 85 and the boundary of the North Unit of Theodore Roosevelt National Park. What appears to be the preferred route runs very near the park and could seriously impact the viewshed of the park. The height of the towers would make them visible over much if not all of the park. TR National Park is a major tourist attraction in western North Dakota and we are concerned that this transmission line could impact the enjoyment of visitors. The towers would also seriously degrade the natural integrity of the views within the park. No longer would the vistas of the park be what they were when Theodore Roosevelt lived there.

A couple of other proposed routes further to the east would reduce the amount of the park impacted by the towers and we urge that they be more seriously considered. However, these routes are not perfect and would impact badlands areas outside the park. We suggest that more study be done to design towers and routes that would have minimal impact on both the park and the surrounding areas and that a final decision on the route not be made immediately.

We ask that RUS and Basin Electric work with the National Park Service to minimize the impact of the transmission line on the park and adjacent areas. We also ask that further review of the route through the Killdeer Mountain Battlefield be conducted with input from state historians and local native american tribal leaders and historians before that area of the route is finalized. We respectfully request your consideration of these comments related to this EIS. Joe Satrom, Chairman of the Board of Directors of Friends of Theodore Roosevelt National Park and Larry Heilmann, Board Member

N-005-001
There would be visual impacts from the proposed action. As required under NEPA, these impacts have been fully disclosed in the analysis of alternative C. Further, NPS has conducted an analysis that shows that distant views of a length of less than one half mile of the transmission line would occur in less than 30% of the park unit. Areas contained within that 30% may not necessarily be classified as highly recreationally important and it is unknown whether these areas are easily accessible by visitors. However, it can be assumed that there would be some visual impacts where frequently travelled areas coincide with views of the transmission line.

N-005-002
Please refer to response to comment N-006-004.

N-005-003
As part of the NEPA process, RUS will continue to consulate with DOI and NPS staff to ensure avoidance or minimization of all adverse impacts from the proposed action as much is reasonably possible.

N-005-004
In accordance with 36 CFR Section 800.14(6)(1), RUS and cooperating agencies are consulting with SRST and SWO Tribal Historic Preservation Officers, North Dakota State Preservation Office, North Dakota State University Center for Heritage Renewal and others to assess effects of project on Killdeer Mountain Battlefield. Please refer to Section 3.6 in the FEIS for a more detailed discussion.

N-006-001

N-006-002

BADLANDS CONSERVATION ALLIANCE
A VOICE FOR WILD NORTH DAKOTA PLACES

Badlands Conservation Alliance
Field Office
801 North 10 Street
Bismarck, ND 58501
701-255-4958 badlandsconservationalliance.org

January 31, 2014

Dennis Rankin
U.S. Department of Agriculture, Rural Utilities Service
Engineering and Environmental Staff
Antelope Valley Station to Neset Transmission Project
Supplemental Draft EIS
1400 Independence Avenue SW
Stop 1571, Room 2244
Washington, DC 20250-1571

RE: Proposed Antelope Valley Station to Neset 345-kV Transmission Project Supplemental Draft Environmental Impact Statement (SDEIS)

Dear Mr. Rankin:

Badlands Conservation Alliance (BCA) is a western North Dakota based non-profit organization focused on public lands and public natural resources in western North Dakota, particularly Theodore Roosevelt National Park and the Little Missouri National Grassland. The majority of our members, and certainly the charter members, live in or originated in the small communities and rural landscapes surrounding these public lands. Members hold significant familiarity with these lands and value them for a host of ecological, heritage and personal reasons, frequently through multiple generations.

BCA attended the open house for this project in Killdeer, ND on November 16, 2011 and submitted comments during the scoping period. We again had representation at the public hearing in Killdeer, ND on January 15, 2013 and submitted comments on the Draft EIS dated January 21, 2013.

We attended and testified at North Dakota Public Service Commission (NDPSC) hearings in Killdeer, ND on September 4, 2013, and likewise in Williston, ND on September 12, 2013.

Under all of the above described circumstances we voiced opposition to any route that passed within or near the North Unit of Theodore Roosevelt National Park as well as the Long X Divide and Lone Butte roadless areas on the Little Missouri National Grassland.

In an attempt to find resolution for Basin Electric's proposed line we offered a number of opportunities and mitigation strategies, none of which we see as fully addressed by the SDEIS.

In our January 21, 2013 letter we requested full analysis of an alternative that would use natural gas currently flared and wasted in the development of Bakken wells through distributed

N-006-001
Throughout the NEPA process and through consultation with the USFS the project team is considering ways to avoid or minimize impacts to areas such as Long X Divide and Lone Butte. These measures have included adjustments to the alignment to place the route further from the designated roadless areas and more within the Highway 85 corridor, designated by USFS for utility use. Additional mitigation measures such as use of alternative structure coatings in visually sensitive areas to reduce overall structure visibility are being implemented. This is included as overall project mitigation (See Appendix A of FEIS). Efforts to locate the alignment further from visual sensitive areas, within existing linear corridors (Highway 85) and use of self-rusting structures provide practical measures to minimize overall project impacts.

N-006-002
As discussed in the FEIS, Section 2.1.6, Basin is actively developing additional natural gas-based generation in the northwest North Dakota area. This generation will provide voltage support and peaking power to the regional system and help facilitate current and future wind and other generation sources. This generation, however, is not sufficient to meet the needs of the rapidly developing industrial, commercial, and residential infrastructure throughout the area.

generation facilities within the boundaries of that area between the proposed crossings of the Little Missouri River and the larger Missouri River, therein eliminating the need for the kind of mega-transmission lines proposed here.

N-006-003

Additionally, we asserted that rapidly advancing technology for well site production of electricity may dramatically alter the development scenario in the Bakken field as a whole, requiring far less transmission from afar than currently estimated.
(See, e.g., www.undeerc.org/flaring_solutions/Search.aspx.)

N-006-004

We also stated: *BCA would suggest that the continued disuse and wasteful flaring of natural gas in the Bakken field of North Dakota threatens to impose financial and reputational risks on investors in any and all aspects of development. Continuing to ignore and excuse such financial and environmental deficiencies threatens the oil and gas industry's license to operate, and invites federal regulation that will be potentially punitive to the economy of North Dakota and the energy security of the nation as a whole. We offer here an alternative for your serious consideration that addresses a solution that satisfies both waste and need.*

N-006-005

While 2.1.6 of the SDEIS does approach the subject of additional generation powered by natural gas, it does NOT allow for viable alternatives as we have recommended. It is framed only in terms of currently existing procedures without any consideration of the creative solution we offered.

N-006-006

During ND Public Service Commission hearings held in September 2013, BCA requested revisiting of the eastern route around Lake Sakakawea addressed in SDEIS 2.1.3 as an effort to avoid the significant and contentious impacts on the Little Missouri River Valley Badlands. On page 2-7 of the SDEIS it states the alternative would run adjacent to and have potential impacts on US Fish and Wildlife Service refuge complexes and the Missouri Coteau region. These are concerns BCA would also share, but without full analysis there is no data to compare with the very real and considerable detrimental impacts of the alternatives offered here.

N-006-007

Finally, also at the NDPSC hearings, BCA requested study of a mitigation strategy which would put transmission lines underground past our core concern areas in the Little Missouri National Grassland and past the North Unit of Theodore Roosevelt National Park should the then Basin-preferred Alternative A be pursued. We requested full analysis of the potential for underground lines in this sensitive area to determine whether such an action would have successful potential for implementation while protecting the Park and roadless areas.

Several sources supporting the technological capability and increasingly wide use of such opportunities, including a fact sheet/promotional piece by Burns and McDonnell Engineering Company, already associated with this project, were included. Nowhere in the SDEIS is this addressed.

N-006-008

BCA understands that the RUS NEPA process and ND PSC decision-making process are not one and the same. However, Basin Electric was certainly aware of our ND PSC comments and efforts to find solutions compatible to all parties. None of these appear in this SDEIS.

N-006-009

Therein, Badlands Conservation Alliance must insist that Alternative C presented in the SDEIS be dropped from further consideration.

A fully developed Bakken field is estimated to cover 15,000 square miles of western North Dakota with anywhere from 40,000 to 60,000 wells. This does not include the additional figures

N-006-003

As discussion in Section 1.4 of the FEIS, the need for the project is the result in part of the tremendous growth that is occuring in western North Dakota. In the region, demand from the oil industry alone is projected to increase from 9 to 22 percent of Basin Electric's overall power production by 2025. The demand from large commercial operations follows a similar increase as it supports the oil and gas industry. This proposed project would address system capacity issues resulting from rapid growth in the area.

N-006-004

As discussed in the FEIS, Section 2.1.6, Basin is actively developing additional natural gas-based generation in the northwest North Dakota. This generation will provide voltage support and peaking power to the regional system and help facilitate current and future wind and other generation sources. This generation, however, is not sufficient to meet the needs of the rapidly developing industrial, commercial, and residential infrastructure throughout the area. While distributed generation using current flare gas may help meet the energy requirements of individual or small clusters of wells, it does little if anything to meet the larger electricity needs associated with large industrial facilities (such as gas processing plants), commercial areas, and residential developments. Ongoing efforts are aimed at improving the collection, processing and transport of flare gas that will reduce need for flaring in the future.

N-006-005

A key component of this project is the maintenance of reliable electric service. A large part of that is developing the capacity to serve the increasing demand in the region. However, an additional component is the need for additional transmission line infrastructure to provide system redundancy and greater voltage capacity throughout the region. Creative solutions offered by the commenter, while touching on these issues, do not provide robust, cost-effective, and long-term solutions to address not only the power supply needs of the region but the system reliability requirements as well.

N-006-006

The project team initially considered an alternative that would include an eastern route around Lake Sakakawea but dismissed this alternative from further review. It was determined that the alternative would not address the added load-serving capacity in McKenzie County and such would not eliminate the need for additional transmission infrastructure such as described in Alternatives C, D, and or E. In addition, the alternative would cross the Missouri River, be adjacent to significant U.S. Department of the Interior, Fish and Wildlife Service (USFWS) refuge complexes, and cross hundreds of miles of the Missouri Coteau region that includes significant wetland resources and migratory waterfowl nesting and stopover habitat. For these reasons, the alternative was not carried forward.

N-006-007

Undergrounding was evaluated and dismissed due to the significant technological challenges and increases in cost. Please see section 2.1.7 for a discussion of why undergrounding the line was dismissed as an alternative.

N-006-008, N-006-009

Comment noted.

that will come with oil and gas development in the expanded Tyler, Spearfish, Red River and Three Forks formations.

N-006-010

The three units of Theodore Roosevelt National Park in total make up less than two-tenths of one-percent of the State of North Dakota. They are a precious and significant part of the State's identity and inherent wealth, and contribute equally to the identity and wealth of the Nation. Absolute protection should come without saying. Park administrative analysis shows that Alternative C would be visible from 30% of the National Park. This is unacceptable.

N-006-011

Similarly, North Dakota is home to the Nation's largest National Grassland. Managed by the US Forest Service under its multiple-use directive, 95% of the Little Missouri National Grassland is open to oil and gas development. In the early 1970s, approximately half of its 1.1 million acres was undeveloped. By the late 1970s that acreage had been cut in half. Currently, the Forest Service manages less than 40,000 acres under what the 2002 Land and Resource Management Plan identifies as "suitable for wilderness."

Badlands Conservation Alliance and its coalition partners advocate permanent protection for those parcels and citizen additions which equal a total of less than 60,000 acres in five separate parcels on the 1.1 million acre Little Missouri National Grassland. Alternative C threatens to drastically diminish the quality of two of those areas adjacent to the Park. Given the extreme value represented in this acreage and the irreversible loss a transmission line of the proposed size and magnitude would cause, we oppose further consideration of this route.

N-006-012

Furthermore, the North Unit of Theodore Roosevelt National Park is oriented in such manner that it looks southeast into Long X Divide roadless area and Lone Butte roadless area on the National Grassland. Historically, visitors to the Park have not recognized the boundaries and limited size of the 24,070-acre North Unit. Current oil and gas development is shrinking that perception and increasingly isolating the Park.

N-006-013

Both Long X Divide and Lone Butte offer some level of protection for the Park viewshed. Of particular note is their wild undeveloped status that provides unfragmented wildlife habitat and wildlife corridors. Lone Butte is known for its elk, mule deer, bighorn sheep, golden eagle and even mountain lion populations, all of which are put at risk by Alternative C. The few remaining undeveloped parcels that exist are essential as havens within the broader oil field that will be western North Dakota. Adopting the Alternative C route would result in the irreversible desecration of the National Park's viewshed and irreplaceable loss of critical wildlife habitat, ultimately resulting in an environmental tragedy for future generations of North Dakotans if not the Nation as a whole.

N-006-014

The recently reconstructed Western Area Power Authority lines have degraded the scenic integrity of the HWY 85 corridor, diminishing the character of the approach to the Park and the above mentioned roadless areas. Under Alternative C as presented in *Table 2-2, page 2-12, of the DEIS,* Alternative C of the SDEIS would exceed the height of the WAPA structures again by half to nearly double. This is unacceptable.

N-006-015

The Scenic Integrity Classification *Figure 3-10* on page 3-18 of the DEIS clearly shows the route of the SDEIS' Alternative C surrounded by a landscape of high classification. No level of mitigation is sufficient to make this acceptable.

N-006-016

In *Appendix C* of the DEIS, *Visual Simulation 2* looks to the western horizon and the proposed route of SDEIS Alternative C as seen from just below the southern face of Lone Butte itself. While we agree that this is outside the boundaries of the Lone Butte management area, we

N-006-010
Comment noted.

N-006-011
Comment noted.

N-006-012
Comment noted.

N-006-013
There would be visual impacts from the proposed action. As required under NEPA, these impacts have been fully disclosed in the analysis of Alternative C. Further, NPS has conducted an analysis that shows that distant views of a length of less than one half mile of the transmission line would occur in less than 30% of the park unit. Areas contained within that 20% may not necessarily be classified as highly recreationally important and it is unknown whether these areas are easily accessible by visitors. However, it can be assumed that there would be some visual impacts where frequently travelled areas coincide with views of the transmission line.

Impacts to adjacent lands are addressed in terms of how the features of the proposed action would result in impacts to lands that are under specific management authorities and with associated covenants or legislation that provide for protections to the visual integrity of the landscape .

N-006-014
Comment noted

N-006-015
Comment noted

N-006-016
Visual Simulation 2 - Lone Butte Looking West, in the FEIS, Appendix E - Visual Simulations, is intended to provide the agencies and readers an indication of the visual contribution of the proposed project to the landscape and view shed from Lone Butte. As can be seen in the simulation, the view shed contains modern farmsteads and considerable topographic elements. Alternative C is over 3 miles west of the Lone Butte location and while the photograph was taken at the base on the butte, little additional perspective could have been obtained by ascending the butte for the photograph. The fact that the proposed alternative is over 3 miles away results in the limited visibility of the structures. In the simulation prepared, many of the structures can be seen just below the horizon. Should the photograph been taken atop Lone Butte, the horizon would likely have been extended and the view would have been looking down at the line rather than toward it at approximately the same elevation. Under this perspective, the structures would have had additional ground elements behind them, into which the structures would have been absorbed and rendered less visible. As a result, the simulation presents a conservative view of the line from the Lone Butte area, enabling the reader to see the presence of the line and determine the potential intrusion of the line into the landscape.

cannot express deeply enough the harm that will be experienced by users of this rare parcel of undisturbed public land. We find it particularly disingenuous that this photo was taken from the southern edge of the management area and without the added effort of ascending the namesake butte to fully assess both the area's beauty and its potential for degradation.

N-006-017

Additionally, the life expectancy of the Bakken oil field according to the ND Department of Mineral Resources is now estimated to surpass 70 years. That is equivalent to or exceeds three human generations. Wildlife populations will need some small haven of suitable habitat to maintain even the most limited resource for re-population once oil and gas production is abated. Without the pre-development template the Park and associated areas represent, we will have only a forgotten landscape, unequal to the task of reclamation. Wildlife habitat maps recently developed by the North Dakota Game and Fish Department should be consulted to verify the significance of the area in question. The majority of these maps are unavailable to the general public due to the sensitivity of wildlife populations, but are readily available upon agency and/or project-specific consultation.

N-006-018

A valuable reference for the severity of impacts to wildlife in North Dakota may be found in a North Dakota Game and Fish Department report dated May 2011: http://gf.nd.gov/sites/default/files/publications/specialty-publications/directors-report-oil-gas-may-2011.pdf

N-006-019

BCA finds particular objection with the statement on page 3-107 of the *Recreation and Tourism* section of the *Affected Environment Analysis*, SDEIS, which states:

> *Potential impacts on recreation users accessing the TRNP-North Unit would include traffic delays or temporary road closures related to construction activity; however, these impacts would be short term, localized, and limited to the construction phase of the project. Alternative C would have no direct impacts on recreational use the TRNP-North Unit in either the short or long term.*

And continued on page 3-108, SDEIS in reference to the LMNG, including the Summit Campground, Lone Butte (managed by the USFS as backcountry recreational non-motorized and Long X Divide (managed by the USFS as suitable for wilderness):

> *Overall, project construction would have short-term, low impacts on recreational facilities in LMNG. ...access to dispersed recreational opportunities would be expected to return to pre-project conditions following completion of construction. No other impacts on recreation on the LMNG are expected.*

Statements as the above underscore the entrenched fallibilities that can arise in the NEPA process, resulting in a shallow assessment and interpretation of what is a valid and detrimental impact. No true understanding or comprehension of the significance of management directives defined by USFS *backcountry* and *suitable for wilderness* designations are reflected in the kind of callousness that attempts to deflect the dramatic long term negative impacts Alternative C of this project imparts. For some users this will be diminishment of experience. For many, even a majority of those invested in these management designations, it will be permanent impairment of a degree that can provoke permanent dis-use for the life of the individual, a scenario that often becomes generational by default.

The further dismissal of unique and irreversible values significant to these areas appears on page 4-41 and 4-42 in the *Cumulative Impacts* chapter of this SDEIS. Under *4.4.10 Recreation and Tourism* all alternatives are lumped together to state:

> *Under Alternatives C, D, and E, the proposed project would avoid the TRNP and the Lone Butte and Long X Divide management areas of the LMNG. Therefore, it would not be expected to have any cumulative impacts on recreational use of those areas.*

N-006-017
See response to comment N-006-021.

N-006-018
The new website is: http://www.gf.nd.gov/sites/default/files/publications/specialty-publications/directors-report-oil-gas-may-2011.pdf
Not included in FEIS, since it doesn't deal with transmission lines, only oil and gas development.

N-006-019
Comment noted.

N-006-020

...Thus, no adverse cumulative effects on recreation are anticipated as a result of this project under Alternatives C, D, or E.

A recent survey conducted by the Badlands Conservation Alliance in Fargo, ND at the March 2013 Fargo Sportsmens Show involved an estimated 880 individuals engaged. The subject of the survey was public opinion on a proposal for Wilderness designation in the LMNG and including Lone Butte and Long X Divide management areas. Of the 880 individuals approached, 862 participated. Of that 862, 860 favored Wilderness designation. Two opposed.

This is significant to the discussion of alternatives here in that many of those ND citizens already expressed diminished experiences from oil and gas development, even to the degree of a compromised experience in traveling to a chosen designation. Furthermore, a range of self-initiated personal decisions were expressed as to what limits would stop their use of these lands all together, with many stating this boundary had already been crossed – that further recreational experiences would be sought elsewhere at the expense of all benefactors, economically as well as recreationally.

N-006-021

It must be stated here as well that wildlife use of these areas, among the most rich and sensitive on the LMNG and used in association with protected National Park Service lands, will sustain similar long term and even permanent impacts. The pressure from scope and scale of Bakken development (wells and ALL associated infrastructure) is compressing viable habitat to the limits of sustainability. There is increasingly no "over the next hill" for wildlife populations to go.

Extensive categorized, unassociated analysis appears in the *Affected Environment and Environmental Effects* chapter under *3.5 Biological Resources* of the SDEIS, but there is no comprehensive expression of the interwoven, encompassing impacts that will result. Again, the science of the SDEIS process is shoving the reality of inescapable ecological impacts not merely out of the big picture but into the shadows.

N-006-022

In the development of the current Supplemental Draft Environmental Impact Statement, three action alternatives are offered as satisfying purpose and need. Two of them, Alternatives D and E do not trespass on BCA's core area of concern, while Alternative C remains inarguably unacceptable.

That being said, Alternative D exhibits the least disturbance on many levels while adequately satisfying the purpose and need to provide additional electric transmission in western North Dakota.

Table 5-1: Comparative Impacts of Alternatives beginning on page 5-3 of the SDEIS readily supports this conclusion:

- Alternative D includes the least number of miles of disturbance.
- Alternative D requires the least number of acres of ROW.
- Alternative D (and E) cuts use of LMNG acreage by nearly two-thirds.
- Alternative D requires only @3/4s of the school trust lands of either C or E.
- Alternative D impacts the fewest number of residences and associated property value changes.
- Property tax revenues to study area counties are least under Alternative D, however the monetary figure is inconsequential when compared with financial benefits from aid to county oil and gas development incomes.
- Alternative D (and E) impacts fewer total residences within environmental justice blocks.

N-006-020
Comment noted.

N-006-021
Chapter 4 of the FEIS presents a discussion of the additional and ongoing impacts, including those from Bakken infrastructure development, to wildlife and other resources within the project area, as discussed under Section 4.4.5 of the FEIS.

N-006-022
Comment noted. Alternative D will not meet the purpose and need of the project I58(reliability standards) as discussed in Section 1.4 of the FEIS. I60

- Alternative D requires by far the fewest acres of federal land open to dispersed recreation, including hunting.
- Alternative D avoids the North Unit of Theodore Roosevelt National Park, Lone Butte and Long X Divide on the LMNG, and the USFS Summit Campground.
- Alternative D requires the least displacement of soil and rock during construction.
- Alternative D requires the fewest number of transmission line structures.
- Alternative D includes the least number of acres with a history of landslides and slopes greater than 10%.
- Alternative D includes the fewest acres of open water within the ROW, and the fewest perennial waterways.
- Alternative D includes a single crossing of the Little Missouri State Scenic River.
- Alternative D includes the fewest acres of woodland potentially removed for ROW, and the least overall vegetation loss.
- Alternative D includes the least potential loss of forested wildlife habitat.
- Alternative D's overall length and single crossing of the Little Missouri River Valley decreases impacts on avian species including golden eagles and whooping crane, due to decreased potential for collisions with structures, territorial trespass and a single crossing of migratory pathways.
- Alternative D includes the least acres of wetland within ROW.
- Alternative D (and E) include the least number of identified cultural resources.
- Alternative D would have the least increase in Greenhouse Gas Emissions.

In all three action alternatives brought forward by the SDEIS, tribal and publicly raised concerns regarding crossing of the Killdeer Mountain Battlefield study area as delineated by the National Park Service in their 2010 update on civil war battlefields have been ignored in determining ROW routes. Simultaneously, the SDEIS does acknowledge invocation of Section 106 of the National Historic Preservation Act, and Western Area Power Administration has increased consultation with tribes and granted consulting party status to the Killdeer Mountain Alliance.

N-006-023

It is BCA's estimation that the highest, most fractious issues regarding Basin Electric Power Cooperative's proposed 345kV transmission line, at least in the public arena, have surrounded these TRNP/LMNG and Killdeer Mountain issues. As a publicly owned cooperative with a history of sensitivity to public concerns, BCA asserts it is incumbent on and beneficial to the company to continue that legacy.

Basin repeatedly expresses concerns with meeting their electrical transmission forecast in a timely manner. Alternatives D and E of the SDEIS each satisfy issues surrounding the North Unit of Theodore Roosevelt National Park and the Lone Butte and Long X Divide areas on the LMNG. Dropping Alternative C from further consideration and moving the transmission ROW out of the Killdeer Mountain Battlefield study area would do that.

N-006-024

It is of note to BCA that no cost comparison of alternatives is included in the SDEIS, particularly when Basin is seeking federal funding assistance from the USDA Rural Utilities Service. We would request that this information be a part of record with no consideration of easements acquired prior to completion of the NEPA process and route determination.

N-006-025

While this proposed project will serve the local residents and communities of western North Dakota, it is ultimately designed to serve the oil and gas industry. There will be benefits and there will be adverse impacts. If the "timeliness of project completion is critical" as stated in this SDEIS and by Basin, then it is time to do it right and fix the problems.

N-006-023

RUS required Basin to consider a number of corridors, alternative alignments, and different line configurations as documented in the Maco-corridor study and the DEIS and SDEIS for the AVS Transmission Project. In identifying alternatives for this project, RUS and the cooperating agencies have sought to balance the potential impacts of each alternative on a wide variety of environmental and social resources, including impacts to historic resources. These impacts must be considered in light of the project's purpose and need (load increases, reliability), overall project costs and the public interest. In addition, consultation with USFS staff has helped to identify project modifications that would minimize impacts to TRNP and LMNG.

N-006-024

A cost comparison of all alternatives is included in Section 2.4 , Table 2-1 of the FEIS.

N-006-025

Comment noted.

N-006-026

BCA maintains the sanctity of Theodore Roosevelt National Park and the significance that the USFS-managed, unroaded areas Lone Butte and Long X Divide bring to that Park's future, to our wildlife populations, and to the historic and future quality of life issues reflected. They are templates for future reclamation. We urge the Rural Utilities Service, the USFS, Western, and Basin Electric to pursue an alternative for the proposed transmission line on that basis and with solidarity that a solution satisfactory to all interests may be adopted.

Badlands Conservation Alliance asks that Alternative D, including route corrections for the Killdeer Mountain Battlefield study area, be selected for the reasons cited above. Not only does good sense uphold this appeal, it is also the right thing to do.

Respectfully,

Jan Swenson

Jan Swenson, ED
Badlands Conservation Alliance

cc: Thomas Tidwell, Chief, US Forest Service
Dennis Neitzke, Supervisor, Dakota Prairie Grasslands
Jay Frederick, McKenzie District Ranger, Dakota Prairie Grasslands

N-006-026

You comment is noted. However, as discussed in Section 1.4, the AVS transmission project is being designed to meet both an increase in projected load and to improve system reliability. Alternative D does not meet both of these requirements outlined in the purpose and need for the project.

N-007-001

September 3, 2013

North Dakota Public Service Commission
Attn: Scott Sheldon
600 East Boulevard Avenue, # 408
Bismarck, ND 58505

On behalf of the 1200 members of the North Dakota Wildlife Federation, I would like to recommend a denial of Basin Electric Power Cooperative's request for a waiver of procedures and time schedules and a route permit for a proposed 345 kV transmission line in western North Dakota.

This proposed project crosses the Killdeer Mountain area, several tracts of the U.S. Forest Service National Grasslands, and the Game and Fish Department's Lewis and Clark Wildlife Management Area. The proposed transmission line also crosses both the Little Missouri and Missouri Rivers. The route goes through important habitats for mule deer and elk, and antelope. These resources are important to not only our 1200 members, but also to most North Dakotans

These areas are included on the proposed list of "special places" developed by the ND Industrial Commission to receive protection and extra consideration from oil and energy development.

The North Dakota Wildlife Federation asks that the waiver of procedures and time schedules and the route request for this proposal be denied at this time.

Sincerely,

Chuck Vasicek
Vice President, NDWF

cc: Karlene Fine, ND Industrial Commission

N-007-001
Comment noted.

UnderGoldenWings
Golden Eagle Project

February 2, 2014

Dennis Rankin
U.S. Department of Agriculture, Rural Utilities Service
Engineering and Environmental Staff
Antelope Valley Station to Neset Transmission Project
Supplemental Draft EIS
1400 Independence Avenue SW
Stop 1571, Room 2244
Washington, DC 20250-1571

RE: Proposed Antelope Valley Station to Neset 345-kV Transmission Project Supplemental Draft Environmental Impact Statement (SDEIS)

Dear Mr. Rankin:

I will start by introducing myself professionally. My name is Dr. Anne Marguerite Coyle (Margi), I am currently an assistant professor of biology at Jamestown College. My past employment as an ecologist/wildlife/ landscape biologist includes working for the UFWS, USFS, and the USGS. For the past 9 years I have served as the principle investigator of the North Dakota golden eagle project. I have studied the population in North Dakota extensively since 2002. I compiled all known nests, conducted nest site checks, new nest surveys, monitored reproduction, survival, mortality, juvenile dispersal and movements, created potential habitat models, and investigated the potential impacts of disturbance. I work closely with the USFWS federal agent, the Dakota Zoo, and the Minnesota Raptor Rehabilitation Center with the recovery of injured raptors. I not only created and manage the North Dakota golden eagle database, I also serve on the North America Conservation of the Golden Eagle Working Group with the other experts in North America.

I grew up in northeastern Indiana. My family was in the oil business for years. I understand perspectives of both business and biology. I was raised to believe that people in positions of power

Anne Marguerite Coyle, PhD
Jamestown ND,
701-260-3753
[illegible] / [illegible]

have an obligation to be leaders in the community. I also believe politicians, heads of industry, and other leaders have an obligation to lead with responsible citizenship. That means always placing human, community, and subsequently environmental health for-front in the decision-making process. As any successful business understands, on the job safety must be a top priority. This proactive preventative strategy reduces risk and saves the industry money in the long run. Similarly, being preventative on environmental, community, and human health issues will also lead to long-term success.

The Little Missouri National Grassland in western North Dakota provides some of the largest expanses of grasslands in North America. Grasslands are the second most heavily used and disturbed habitats worldwide. Approximately 47% of the temperate grasslands worldwide have been converted to agriculture or urban development. The remaining grasslands are under pressure from over-grazing and multi-use activities that compromise habitat integrity and species diversity. One of the largest threats to the remaining grasslands is habitat fragmentation. Once disturbed the land can never fully recover. Most of the vegetative regeneration must come from root propagation, and in some cases this is prohibited by constructed and disturbed locations. Disturbed areas such as roads, oil pads, and industry infrastructure (including this proposed transmission right of way), hinder species movements, increase habitat fragmentation, and decreasing available habitat. Habitat is compromised in two ways, first by reduction of habitat area and second by providing corridors for invasive species. These non-native invasive species thrive in disturbed areas, out-compete native species, spread, and cause a cascading degradation to the integrity of neighboring in-tack grasslands habitats and consequently decrease species diversity and richness. Minimizing disturbance and maintaining large continuous sections of habitat provide core areas essential for maintaining ecological integrity and biodiversity.

Disturbances and invasive species can penetrate the exposed edges of a habitat. This is termed "edge effect". Large road-less and undisturbed areas have a larger "core" area compared to their perimeter. The larger the core the less influence from active and disturbance along the perimeter. Consequently, sections of habitat that have larger core areas contain greater biodiversity. These "core" areas if protected can be sources for populations of species. The species in the core area can flourish and help to maintain surrounding areas with dispersing individuals.

The core areas that have habitat surrounding them with minimal use have greater ecological integrity and greater biodiversity. This is because the surrounding areas can "buffer" the "edge effect" created by disturbances and invasive species. The North Unit of Theodore Roosevelt National Park, Long X Divide, and Lone Butte Roadless areas serve as an important core ecological complex. The TRNP together with LMNG managed by the USFS then acts as a source for the overall ecological health and integrity of the entire grasslands ecosystem of western North Dakota.

Anne Marguerite Coyle, PhD
Jamestown ND,
701-260-3753

N-008-001

Additionally, these grasslands provide the vital habitat for nesting golden eagles in North Dakota.

Therefore, I present to you two recommendations and supporting evidence to minimize potential impacts of the proposed placement of a major power line (Basin Electric Power Cooperative) on: 1) core habitat areas in the grasslands ecosystem and 2) the golden eagle population in Western North Dakota.

I also presented before the ND Public Service Commission hearings held in September 2013.

Recommendations:

1) Alternative D, including route corrections for the Killdeer Mountain Battlefield study area, be selected for the reasons cited below.
2) All Power lines, all junctions, and related structures be constructed with the most effective raptor friendly equipment.

1) Figure 1 - There are over 200+ known potential territories and an uncertain number of undiscovered territories centered along the Little Missouri River, the Killdeer Mountains, and throughout the Little Missouri National Grassland extending west into Montana, as far east as Flasher, ND, and south into South Dakota. In some cases these birds can endure disturbance; however, each pair reacts differently and many have illustrated intolerance to disturbance. My research along with other research in North America illustrates that electrocutions are a significant cause of mortality; and therefore, still present a direct threat to the population. Ensuring major power lines and any secondary lines branching from this main route are directed away from known nesting territories is my strong recommendation. This will minimize fragmentation and disturbance in areas of critical habitat, and reduce the chance for electrocutions and or line strikes of golden eagles in areas of high density: nesting, hunting, movement, migration. Golden eagles can have up to 13 or more alternative nesting sites within their territories. The frequency of use of these nests varies between pairs and although the nest may be unused for a number of years it may still be used by the pair and the dispersing offspring. Additionally, these nest sites may provide critical habitat in future years therefore the lack of use may not illustrate a lack of importance to the nest eagles.

2) Figure 2 - Not only do the LMNG and the area in and around the Killdeer Mountains serve as the primary nesting grounds for golden eagles in North Dakota, they also provide vital habitat for nesting, hunting, migrating, and dispersing juvenile eagles. During my research I tagged 18 juvenile golden eagles and monitored their movements from 2002 - 2011. Birds use the natal and alternative nest sites frequently during and after fledging. They is a strong concentration of

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flyfreeage@aim.com / http://undergoldenwings.org/

N-008-001
See response to comment F-002-023.

N-009-001

From: Scott Skokos [mailto:scott@drcinfo.com]
Sent: Tuesday, January 14, 2014 4:11 PM
To: Rankin, Dennis - RD, Washington, DC
Subject: SEIS (Basin Electric Power Line) Public Meeting

Dennis,

On behalf of my organization, Dakota Resource Council I would like to know if there is any way possible to delay the public meeting on the EIS that you had recently released.

Dakota Resource Council has been following this proposed transmission line for the past year and did not see any notices published in newspapers within 15 days of the meeting that is scheduled for this Thursday Jan. 16.

I understand that my request may not be possible to fulfill, but I just wanted to bring this to your attention. It is our organizations stance that the public will be more likely to appear and participate if the meeting is moved to a later date.

Thanks for your consideration.

Best Regards,

Scott Skokos
Senior Field Organizer
Dakota Resource Council

--
Scott Skokos
Field Organizer
701-224-8587
scott@drcinfo.com

N-009-001
Please refer to response to comment N-001-001.

February 6, 2014

Dennis Rankin
U.S. Department of Agriculture, Rural Utilities Service
Engineering and Environmental Staff
Antelope Valley Station to Neset Transmission Project
Supplemental Draft EIS
1400 Independence Avenue SW
Stop 1571, Room 2244
Washington, DC 20250-1571

RE: Proposed Antelope Valley Station to Neset 345-kV Transmission Project Supplemental Draft Environmental Impact Statement (SDEIS)

Dear Mr. Rankin:

I'm writing on behalf of Dacotah Chapter of Sierra Club concerning the Antelope Valley Station to Neset Transmission Project. Sierra Club members often recreate in the Theodore Roosevelt National Park, Little Missouri Grasslands and on the Little Missouri River itself. We therefore have a vested interest in this proposal and the potential impacts it presents to our use of the public lands involved.

N-010-001

Dacotah Chapter originally commented on this proposal on January 22, 2013. The following additional comments pertain to the Supplemental Draft Environmental Impact Statement (SDEIS).

After reviewing the SDEIS, Dacotah Chapter respectively requests that Alternative C be dropped from further consideration due to its negative impacts to the recreational use of Theodore Roosevelt National Park and the Little Missouri River National Grasslands.

Alternative D provides the least negative impacts to Dacotah Chapter's interests of all the proposed alternatives. Regardless of which alternative is chosen, an alternate route circumventing the historic Killdeer Mountain Battlefield should be incorporated.

Thank you for the opportunity to comment on this proposal.

Sincerely,

Wayde Schafer
Conservation Organizer
Dacotah Chapter of Sierra Club
311 N Mandan Street, Suite 1
Bismarck, ND 58501

N-010-001
Comment noted.

McKenzie Electric Comments by John Skurupey, GM/CEO

McKenzie Electric is growing – it's growing such that the existing and proposed transmission and generation facilities will be inadequate when everything is constructed, hence the need for what I call the North Killdeer Loop.

McKenzie Electric is a not-for-profit rural electric cooperative whose sole function is to provide reliable electricity to its membership at the lowest possible cost. Without this additional North Killdeer Loop, members who may want additional electricity or new members wanting electricity at a new home site, water well or commercial location will eventually be refused service for the sake of keeping the lights on to those who are currently being served. This is not a futuristic prediction but rather the road we're travelling and a stop sign we're already slowing down for.

Typically a utility will plan into its transmission and distribution delivery plant a system of redundancy for reliability purposes. What this means is that we want, as much as possible, to have a minimum of two separate and independent sources by which to feed a main line. Case and point, I'll discuss McKenzie Electric's eastern service area, which is inclusive of the western side of the Fort Berthold Indian Reservation.

Presently this eastern area is served with transmission lines emanating from two delivery points, those being Watford City and Killdeer. Due to the voltage of transmission line, the size of the conductor used on the line, and the distance between those two delivery points, McKenzie Electric is load limited as to what we can serve reliably from that eastern system. How bad is it today? I'm going to tell you.

We have been told that the Killdeer delivery has the ability to serve a maximum load in the neighborhood of 70 megawatts. The Watford City delivery has a maximum capacity in the neighborhood of 100 megawatts. I don't have the December 2013 numbers yet so I'll use November 2013 numbers. The Killdeer delivery had a peak demand of just over 50 megawatts while the Watford City delivery had just over 76 megawatts. Add in an estimated 10 megawatts at Watford City for the local investor owned utility's load and Watford would have run right around 86 megawatts. Now for the math.

Remember when I said redundancy? By having two sources, a utility will normally only load those two sources such that either source can serve the total load served by both sources. That being said, with Killdeer being the weakest source at 70 megawatts of capacity, we should not let the sum of the two sources exceed 70 megawatts. With Killdeer at 50 megawatts and Watford City at 76, the total is 126 megawatts. So what does this mean? I'm going to tell you.

In the event of a transmission line outage in the eastern regions of the McKenzie Electric service area, if the source of the outage isn't magically located such that each source can share the total load, homes and businesses will experience an extended outage while repairs are made. Why? Because of the math. If an outage occurs close to either delivery point, large numbers of meters will be without electricity because as we isolate the outage, we will also need to isolate that part of the system that we are unable to serve due to the limitations of the remaining delivery point. If the cause of the outage is severe, the duration of the outage could be significant. In a winter such as we have been experiencing recently, where air temperatures dropped into the negative 40°F range, damage to property and potential loss of life become very possible in the absence of electricity. So what does the North Killdeer Loop do? I'm going to tell you.

Because the location of the now named Kummer Ridge substation near Johnson's Corner, McKenzie Electric will be able to place one or more transformers somewhat in the middle of its Watford City to Killdeer transmission line which will not only inject another source but it also reduces the total load between delivery points such that the reliability returns to the members it serves. Where the load out of Killdeer today is 50 megawatts, with a Kummer Ridge that Killdeer load might be 25 megawatts as Kummer Ridge is now serving half that load. A similar situation would exist for Watford City.

O-001-001

Simply put, without the installation of the Kummer Ridge substation on the North Killdeer Loop, McKenzie Electric will be refusing service to both current and future members. This is not a road McKenzie Electric wants to go down.

The North Killdeer Loop must be constructed.

Thank you.

O-001-001
Comment noted.

UPPER MISSOURI G & T
ELECTRIC COOPERATIVE, INC.
111 2ND AVE. SW, PO BOX 1069, SIDNEY, MT 59270 BUS.: 406-433-4100 FAX: 406-433-4105

January 14, 2014

Mr. Dennis Rankin, Environmental Protection Specialist, USDA, Rural Utilities Service
1400 Independence Avenue, SW, Stop 1571
Washington, DC 20250-1571

Dear Mr. Rankin,

This letter is offered in support of the AVS to Neset 345kV Transmission Project planned by Basin Electric Power Cooperative (Basin Electric).

Upper Missouri G & T Electric Cooperative (Upper Missouri) is a Class A Member System of Basin Electric . Upper Missouri provides transmission services to ten electric cooperatives; five in Western North Dakota and five in Eastern Montana. All ten of Upper Missouri's member cooperatives are experiencing electric load growth due to oil and gas exploration, discovery and development.

O-002-001

Each successive load forecast is showing greater load requirements putting immense pressure on the region's electric transmission system which is reaching capacity limitations. The AVS to Neset 345kV Transmission Project is a vital infrastructure improvement which is required in order for Basin Electric, Upper Missouri and its ten member cooperatives to keep pace with development and to assure safety, comfort, security, and economic stability in the region.

System infrastructure improvements will enable timely development of housing, schools, and ultimately developing safe communities and services for business and industry workforce families.

We encourage expeditious action and attention to this important transmission project. Project delays would lead to severe transmission limitations, ultimately affecting the security, safety and comfort of ranchers, farmers and residents of the region.

Upper Missouri strongly supports the development and expeditious construction of this vital transmission link.

Sincerely,

Claire J. Vigesaa, General Manager

O-002-001
Comment noted.

"VARIETY IN HUNTING AND FISHING"

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

January 31, 2014

Dennis Rankin
Project Manager
USDA Rural Utilities Service
1400 Independence Avenue, SW
Stop 1571, Room 2244
Washington, DC 20250-1571

Dear Mr. Rankin:

RE: Antelope Valley Station to Neset Transmission Project
Supplemental Draft Environmental Impact Statement

The North Dakota Game and Fish Department has reviewed this project for wildlife concerns. We originally submitted comments on this project to Burns & McDonnell in September 2011, however the project has changed since that time.

S-001-001 We recommend that the project be sited in existing utility corridors where feasible but prefer the transmission line be built on one route. Having considered the three alternatives, Alternative D appears to have the least impacts to wildlife and wildlife habitat while Alternative C is the least acceptable.

S-001-002 The Department manages several Wildlife Management Areas (WMA's) in or adjacent to the proposed study area. A special use permit would be required to cross these lands. Information regarding WMA locations is available in various formats at http://gf.nd.gov/maps/. Mr. Kent Luttschwager, Wildlife Resource Management Supervisor, should be contacted at 701-774-4320 for information on permissible activities and permit requirements.

S-001-003 The project study area includes the range of several bighorn sheep herds. As North Dakota is on the eastern edge of the bighorn's range, these populations are very sensitive to disturbance. We recommend that the project be routed to avoid bighorn sheep habitat. If this is not possible, timing restrictions should be implemented to minimize adverse effects to bighorn sheep.

S-001-004 A primary concern is the disturbance of native prairie and wooded draws during construction of the transmission line. We ask that work within these areas be avoided to the extent practicable,

S-001-001
Comment noted.

S-001-002
Basin Electric has been in consultation with the NDGFD, along with the USACE, regarding crossing lands owned by the USACE and managed by the NDGFD. Basin Electric has initiated actions to obtain an easement from the USACE to cross these lands and will continue to coordinate with the NDGFD to obtain the necessary special use permit(s) from NDGFD to cross these lands.

S-001-003
Alternatives D and E avoid identified lands within the range of bighorn sheep. Alternative C passes through bighorn sheep habitat, including lambing areas, along the Highway 85 corridor. As noted in Appendix A of FEIS, Basin Electric would coordinate with the USFS and NDGFD to avoid construction through bighorn sheep lambing areas between April 1 and July 1, as discussed in Section 3.5.2 of the FEIS (Table 3-16).

S-001-004
These amounts have been calculated in FEIS in Table 3-11.

every effort be made to prevent destruction of woody vegetation, and disturbed areas be reclaimed to pre-project conditions.

S-001-005

There are a variety of classified fisheries within the study area, including the Missouri, Little Missouri, Yellowstone, Knife, White Earth, and Little Muddy Rivers; and Brush, Spring, Cherry, Tobacco Garden, and Beaver Creeks. Riparian corridors provide important wildlife habitat in addition to the fisheries resource. Any necessary construction activity should not take place within these waterways between April 15 and June 1. We also recommend that above-ground appurtenances not be placed in wetland areas and any unavoidable destruction or degradation of wetland acres be mitigated in kind.

S-001-006

We recommend that overhead lines be marked when placed over perennial streams or sited in close proximity to large wetland complexes to minimize possible avian impacts. The publication "Mitigating Bird Collisions with Power Lines: the State of the Art in 1994" provides a range of management options which can be used to reduce avian collisions.

We appreciate the opportunity to provide comments, and would like to be kept informed as this project progresses.

Sincerely,

Greg Link
Chief
Conservation & Communication Division

js

S-001-005

No structures will be placed in waterways or wetlands as streams, rivers, and wetlands will be spanned during construction. Appendix A - Standard Mitigation Measures, includes numerous measures to protect water resources from impact by the proposed project. If other measures are required as part of specific permits for the approved alignment, these will also be implemented.

S-001-006

The Line Marking Plan is described in detail in the Biological Assessment, and only addresses whooping cranes. This plan calls for the marking of lines within one mile of suitable or potential whooping crane roosting habitat, which includes wetlands and perennial streams (such as the Missouri River and Little Missouri River). This is discussed further in Section 3.5.2 of the FEIS.

Antelope Valley Station to Neset Transmission Project

Standing Rock Sioux Tribe

Tribal Historic Preservation Office

Comments submitted by: Waste' Win Young, Tribal Historic Preservation Officer

January 15, 2014

T-001-001

Alternative Routes have not been surveyed due to land owner issues/access.

T-001-002

- What route is the tribal survey completing?—since many areas are off limits (due to land access or land owner issues)

T-001-003

- (1) How can you take into account the effects that this project will have on historic properties, if the class III survey hasn't been completed? Or the Tribal survey?

T-001-004

- (2) How can these "alternative routes" be labled "alternative routes" if no access is granted or given to the applicant? Or, all alternative routes go directly through the Killdeer Mountain Battle area?

T-001-005

This supplemental EIS document's intention is to seek approval and show that as much information was gathered as possible in order to fulfill the NEPA requirements of providing an environmental impact statement with clear and unbiased information.

This supplemental EIS is peppered with biased statements that are misleading, false and catered towards the approval of this project. Such examples can be found in section 3-73 under Tribal Cultural Resources, in referring to a resolution passed by the 5 tribes of North Dakota opposing the development of the Killdeer Mountain Battlefield area: "*Additionally, the 2013 tribal resolution states that the Tetons who escaped the battle buried the bodies of their dead relatives in a long line along the hills where they were killed. Therefore, it is likely, that these burials took place close to the main area of combat. The transmission line would be constructed south of this location.*"

This (EIS) document disputes the core area of the battlefield as well as the main areas of battle—how can it then propose to know where the Tetons buried their dead following the battle? No agency, state or federal nor their contractors have the right to propose to tell tribes where their dead lie buried. This is propriety tribal information.

T-001-006

On page 3-80 at the top of the page it states that, "Killdeer Mountain Battlefield and Medicine Hole have been further compromised by the construction of oil production facilities, such as wells, tanks, gas and oil gathering, electrical distribution lines, and access. In addition, to those that already exist, additional wells and their associated infrastructure continue to be constructed. Therefore, the nature of the landscape is being transformed from agricultural to industrial."

T-001-001

The PA, which the agencies plan to execute in accordance with 36 CFR Section 800.14(b)(1)(ii), will establish procedures for the identification of historic properties and those parts of Alternative C for which access currently has been denied.

T-001-002

A tribal cultural resources survey which was initiated in November of 2013 is evaluating the ROW for Alternative C. Survey of the ROW segment between the Antelope Valley Station and the Missouri River has been completed. The remaining portions of the ROW will be surveyed in the Spring of 2014.

T-001-003

In order to identify affected historical properties, Basin Electric has completed a Class I Survey of the entire corridor. This was followed by initiation in September 2012 of a Class II (Reconnaissance) and Class III (intensive pedestrian with some subsurface testing) survey within the corridor, including reroutes, access roads, substations and laydown areas wherever access has been granted. A tribal cultural resources survey was initialed in November of 2013. Survey of the ROW segment between AVS and the Missouri River has been completed. The remaining portions of the ROW will be surveyed in the Spring of 2014, weather permitting. In spite of the extensive study which has already been conducted, survey of the Area of Potential Effects cannot be completed for project construction to meet load demand forecasts without a phased approach to Section 106 review. Access will be obtained prior to construction to enable surveys to be conducted and any appropriate adjustments made. In accordance with 36 CFR Section 800.14(b)(1)(ii), the agencies will execute a Programmatic Agreement which establishes procedures to identify historic properties and assess impacts to them prior to construction.

T-001-004

Identification of alternates under NEPA is not dependent on access to private lands. When access to historic properties is restricted prior to approval of a project, Section 106 allows for phased identification and evaluation under the terms of a Programmatic Agreement.

T-001-005

The following statement "the Tetons that managed to escape… were unable to ever give their relations the appropriate burial ceremony, with many of the bodies being buried in a long line along the hills where they were killed" is a direct quote from the United Tribes of North Dakota Tribal Resolution No. 9-13-10.

T-001-006

Text used in the SDEIS to describe current development in the vicinity of the Killdeer Mountain Battlefield and Medicine Hole and the compromises to the sites as a result of these developments uses the most accurateand current information available and was prepared by the agencies.

The whole premise of an Environmental impact statement is that the federal agency presents all the pertinent information to inform the public. Instead, the federal agency hires a contractor to write a document that skews facts, omits information and presents the project in a favorable manner. Forget environmental justice, land owner rights, safe drinking water, protection of sacred areas and burials of tribes. Tribes have had to continually contend with this corrupt system.

We challenge the federal agencies who are making decisions that have the ability to affect thousands of people--to produce unbiased documentation using that data that is presented to them. No matter what happens here today, we will continue to raise the issues that need to be raised. We will continue to advocate for a fair and just process. We will continue to demand to participate in consultation with agencies who are making decisions behind cubicles, office spaces far removed from the project areas—areas important and significant to tribes. officials who are deciding for the people of this state and the tribes what is best for us.

RUS in Washington, DC

T-001-007

The Section 106 process for this project (National Historic Preservation Act) is incomplete. The tribes have not been allowed to survey the areas where the proposed lines are to go in—similar to the archeologists. There is no land access. If there is no land access, how can this EIS present the facts? And take into account the effects to wetlands, cultural resources, air quality, etc when there has been no access to other alternative routes? This EIS is incomplete.

T-001-008

There are 21 wells located in the core area of the Killdeer Mountain study area, where the proposed transmission line is to go directly through. This is an area that is sacred, historical and culturally valuable not only to the tribes but to this state. The tribal survey that was taking place for this project (before being stopped by the weather) have documented burials, ceremonial sites, prayer sites and have experienced the power of these areas on Killdeer Mountain. This EIS conclusively states on page 3-80: "Therefore, the nature of this landscape is being transformed from agricultural to industrial." This statement is misleading. The current industrial landscape does not diminish the historical and cultural value of the area. If industrial development continues at the current rate it will transform the landscape irreparably.

T-001-009

We are seeking to participate in a fair process. A process that it not manipulated or corrupted by agencies, contractors, and applicants.

process as well as the Section 106 process

As it stands now, the EIS for this project is incomplete and omits critical information.

Waste Win Young
(pg. 2)

T-001-007
Tribal cultural resource survey conducted by the SRST preferred contractor began in 2013 and will resume in the spring of 2014. The PA which the agencies intend to execute will establish procedures for the identification and treatment of historic properties on lands which access is currently denied.

T-001-008
Comment noted.

T-001-009
Comment noted.

Statement of LaDonna Brave Bull Allard
Historian Standing Rock Sioux Tribe
Supplemental DEIS for the Basin Electric Power Cooperative's (Basin Electric)
Antelope Valley Station
(AVS) to Neset Transmission Project
January 16, 2014, Watford City, ND

I greet you each with a warm handshake from my heart as we come together to give comment on this sacred site "Tahca WaKutepi Paha" a place where my relatives came to pray and bury their dead.

T-002-001

The SDEIS Supplemental DEIS for the Basin Electric Power Cooperative's (Basin Electric) Antelope Valley Station (AVS) to Neset Transmission Project needs to **be postponed,** until a full Archeological Survey is completed by archeologist and our Native Monitor's to define the border of the site. It seems premature for this project to be pushed though because of the need of a few. We need to be thinking of the future generations as look at these sites, there is more for us to learn about the land and the history it hides within.

T-002-002

I am speaking for my relatives Red Thunder, Bear Face, Iron Horn, and Rain in the Face, Shaved Head, Little Bear, and my Ihunktonwana relatives who fought here at Kill Deer. They lived, fought, prayed and died and were buried at this sacred site for many generations. The "Tahca WaKutepi Paha" Killdeer Mountain- this site was known as prayer and ceremony site before the Great Battle of Kill Deer Mountain.

The Killdeer Mountain Battle is the most important America's Civil War battle in North Dakota. As other states protect Civil War Battle Sites does North Dakota destroy their sites or is it because these are Native sites? As we approach the 150 year Anniversary of this battle do we stand in protection of the site or do we destroy the integrity of the site. We as Native People and American are just now understanding these sites and what really happened at this site. It time to come together to protect these sites for the future so that we can learn to live as human beings again.

T-002-003

The major problem with the SDEIS is that it develops no alternative that would avoid constructing eight miles of transmission lines though the heart of the Killdeer Mountain Battlefield.
I believe it fails to comply with the requirements of the National Environmental Policy Act (NEPA).
Section 1502.1 of the Council on Environmental Quality's NEPA implementing regulations states: "The primary purpose of an environmental impact statement is to serve as an action-forcing device to insure that the policies and goals defined in the Act are infused into the ongoing programs and actions of the federal government. **It shall provide full and fair discussion of significant environmental impacts and shall inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.**"

T-002-001
The PA which the agencies intend to execute in accordance with 36 CFR Section 800.14(b)(1)(ii), will establish procedures to ensure that archeological and tribal surveys are completed prior to construction.

T-002-002
Comment noted

T-002-003
NEPA requires the identification of alternatives. A number of project alternatives as well as alternative macro-corridors, corridors, and individual route alignments were developed and considered for this project. Alternatives were developed using aerial photography, topographic maps, and field reconnaissance from public access points. NEPA does not require private access to all options for the identification of alternatives. They are designated as alternative routes for planning purposes. The Killdeer Mountain Battlefield Study Area has not met criteria for being classified as an avoidance or exclusion area as the boundaries are still undefined. Once a final project alignment has been approved, access to it will be obtained for the completion of any necessary environmental, engineering, design, and construction studies, surveys, and activities.

T-002-004

Section 1502.14 of The Council on Environmental Quality's regulations further requires agencies to: **"Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated."**

The National Park Service recognizes the Killdeer Mountain Battlefield as a place eligible to be placed on the National Registry of Historic Places. I believe that continuing with this process fails to comply with the requirements of NEPA and the Council on Environmental Quality's Implementing Regulations (40 CFR Parts 1500-1508).

I want to say that in my heart that this project need to be postponed instead of rushing it though without clear planning for the future.

LaDonna Brave Bull Allard-Tamaka Waste Win

Director Tribal Tourism
Sitting Bull Visitor Center
9296 Highway 24
Fort Yates, North Dakota 58538
Office: 701-854-3698
Email: lallard@standinrock.org

T-002-004
Comment noted.

T-003-001

Rankin, Dennis - RD, Washington, DC

From:	Jay Levy <jlevy@moheganmail.com>
Sent:	Tuesday, January 28, 2014 9:43 AM
To:	Rankin, Dennis - RD, Washington, DC
Cc:	talli.nauman@gmail.com
Subject:	killdeer

Dennis

I hope consultation with tribes is occurring and a full archeological survey with digital mapping takes place before any type of finalization.
Basin Electric needs to consider impact on cultural significant sites.

Jay Levy
Archaeology Field Supervisor
Tribal Historic Preservation Office
The Mohegan Tribe
13 Crow Hill Road
Uncasville, CT 06382
P: 860-862-6318
C: 860-917-8447
F: 860-862-6395

T-003-001

The agencies are consulting with SRST and SWO tribal historic preservation officers under Section 106 and will conclude the process with a Programmatic Agreement which will establish procedures to identify historic properties and access affects to them prior to construction of the project.

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Appendix D— Segment by Segment Description of Alternative C

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SELECTION OF PROJECT ALTERNATIVES

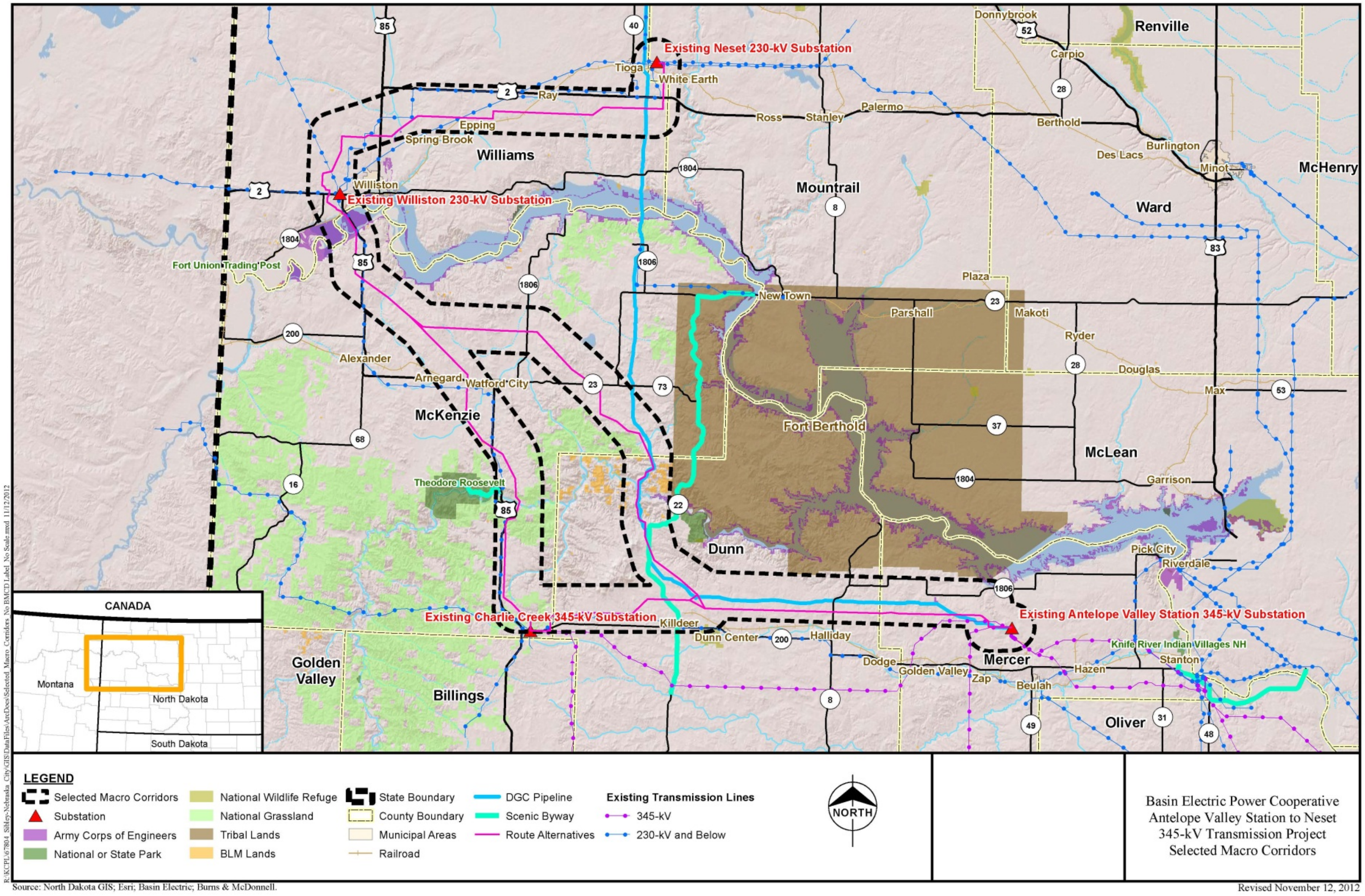
The National Environmental Policy Act (NEPA) requires that an environmental impact statement (EIS) consider a full range of alternatives to the proposed action and fully evaluate all reasonable alternatives. In addition, the EIS must also consider the no-action alternative. For the Antelope Valley Station (AVS) Transmission Line, alternatives consist of individual route segments that, when combined, form a complete route between the proposed endpoints. This section describes the individual, 1,000-foot-wide alternative route corridors located within the 6-mile-wide macro-corridors identified for the proposed project. See Figure D-1.

Macro-corridors identified for the proposed project contain a variety of resources. However, land use patterns, topography, and natural and socioeconomic resources (Chapter 3, Affected Environment and Environmental Effects) for any particular portion of each macro-corridor are similar. As such, while there are various opportunities and constraints within each macro-corridor, any 1,000-foot-wide route corridor developed within each macro-corridor extends across largely the same land use and topography, encountering similar types and quantities of natural and socioeconomic resources. Additionally, macro-corridors contain few impediments to transmission line routes and are generally undeveloped and favorable for transmission line construction should the line need to be adjusted or revised for various reasons. Therefore, it was determined to be unnecessary to develop an extensive number of routes, although multiple routes were developed within the macro-corridors to provide options for the project and geographic diversity between options.

Route corridors consist of approximately 1,000-foot-wide corridors extending between the endpoints and intermediate connection locations. The objective was to identify potential route corridors that minimize impacts on natural and human resources and provide cost-effective project options. The following routing principles were used to develop the route corridors.

- Minimize length.
- Minimize angles.
- Follow existing ROWs and land divisions (electric lines, roads, property boundaries, fence rows, and field borders), as appropriate.
- Minimize visual contrast with natural landscape.
- Minimize conflict with current and planned uses of land.
- Minimize impacts on natural resources such as wetlands, woodlands, and wildlife.
- Minimize impacts on socioeconomic resources such as residences and cultural resources.

Figure D-1: Macro-corridors Identified for the Proposed Project



- Avoid densely populated residential areas and maintain as much distance as practicable from individual homes and public facilities (churches, schools, etc.).
- Avoid crossing back and forth across waterways and roads.
- Maximize distance from airports, landing strips, and other aviation facilities.
- Avoid crossing major roads in the vicinity of intersections and interchanges.

A network of 46 individual, 1,000-foot-wide route corridor segments was initially developed within the 6-mile-wide macro-corridors to avoid constraints and take advantage of opportunity areas while simultaneously taking public and agency comments under consideration. These individual route segments are described in more detail in the Macro-Corridor Report (BMcD, 2011) and summarized in Appendix A of the Environmental Report (BMcD, 2012).

Following public and agency review of the Macro-Corridor Report (BMcD, 2011), the Rural Utilities Service held public and agency scoping meetings in several locations throughout the project area to gain input about opportunities and constraints within the project area, and particularly within the identified macro-corridors. Public scoping meetings were held to provide the public with information regarding the proposed project, and to identify concerns regarding potential impacts from the proposed project. The agency scoping meeting was held to provide federal, state, and local agencies with information about the proposed project, and to identify compliance, permitting, and other issues related to the proposed project.

Agency and public comments on the possible route alignments for the project resulted in revisions to the preliminary alternatives under consideration. Specifically, agencies and the public expressed concerns about the transmission line crossing areas of the Lone Butte Management Area within the Little Missouri National Grasslands, south of the Little Missouri River. Concerns over visual resource impacts and access across areas of the National Grassland that are currently valued due to their roadless characteristics resulted in moving alternative routes in this area further west to parallel U.S. Highway 85 and to be located within an existing utility corridor in this area. Alternative project alignments were relocated to better comply with the location of this proposed utility corridor and avoid crossing the Lone Butte Management Area.

Additionally, two alignments were presented for crossing the Missouri River, one alignment within the U.S. Highway 85 corridor and parallel to an existing transmission line and a second alignment several miles west, avoiding residential and commercial development along the U.S. Highway 85 corridor. Both the U.S. Army Corps of Engineers, the agency that owns much of the land adjacent to this portion of the Missouri River, and the North Dakota Game and Fish Department, the agency that manages these lands, expressed strong preference for the route to be located in the U.S. Highway 85 corridor. Such routing would confine the new corridor to an existing corridor, minimizing impacts on wildlife habitat and habitat for the federally threatened piping plover. Based on this feedback, potential alternatives west of the U.S. Highway 85 corridor were dropped from further consideration.

Basin Electric identified two alternative routes, one within each macro-corridor. Each alternative route is defined as a 150-foot-wide right-of-way (ROW) within a larger 1,000-foot-wide route corridor. These alternative routes are used in the evaluation of potential impacts of the proposed transmission line and its supporting infrastructure. It is likely that as the project continues to be developed, conditions will be identified or encountered during survey, engineering, ROW acquisition, and (should the project be approved) construction that may require Basin Electric to make adjustments to this route. These adjustments would be to address specific, localized conditions, circumstances, and landowner requests not readily apparent as part of the route development and environmental review process and would not be anticipated to result in substantial (if any) additional or different impacts. Any adjustments would generally be intended to reduce overall environmental impacts, reduce project inconvenience to landowners, and/or protect public safety.

Alternative C Route Description

AVS to Proposed Red 345-kV Switchyard

Alignment C exits the AVS Substation in Mercer County and travels generally westward for approximately 2.8 miles before turning north and extending for approximately 0.75 mile, crossing 2 ½ Street and the existing Charlie Creek to AVS 345-kilovolt (kV) transmission line. The route travels approximately 1.5 miles in a northwesterly direction and crosses 64th Avenue and 2913 Street. The route extends due west along the quarter-section line for approximately eight miles. During this stretch the route crosses 66th Avenue, 67th Avenue, 68th Avenue, 69th Avenue, 71st Avenue, 2905 Street, and 73rd Avenue. The route extends to the northwest for 0.9 mile before again heading due west for approximately 3.4 miles and paralleling the south side of 1st Street. In this stretch the route crosses 74th and 75th Avenues as well as 2901 Street. The route turns due south for approximately 0.5 mile before turning west along the quarter-section line for an additional 0.6 mile before crossing 78th Avenue and entering Dunn County.

Once entering Dunn County, the route extends to the west along the quarter-section line for 22.4 miles, traveling about 0.5 mile to the north of numerous oil wells. The route also crosses the following roads or highways during this portion: 79th, 80th, 81st, and 83rd Avenues; State Highway 8, 85th, 86th, 87th, 88th, and 89th Avenues; 1329 Street, 91st, 92nd, 93rd, 94th, 95th, and 96th Avenues, 1323 Street, and 98th Avenue. The route continues in a northwest direction for approximately 1.2 miles and crosses 101st Avenue before turning to the west for 0.9 mile along 1330 Street. The route turns northwest again for about 0.7 mile, crosses 103rd Avenue, and continues to the west for 1.1 mile before crossing 104th Avenue and terminating at the proposed Red 345-kV Switchyard.

Proposed Red 345-kV Switchyard to Charlie Creek 345-kV Substation

The route exits the proposed Red 345-kV Switchyard location and travels west for about 1.7 miles along the quarter-section line and crosses State Highway 22. The route turns briefly to the northwest for 0.5 mile before turning to the west for an additional 5.7 miles. During this stretch the route crosses 107th, 109th, and 110th Avenues. The route turns to the southwest and extends for about 6 miles, crossing 113th Avenue, 1305 Street, 115th Avenue, 2nd Street, and 117th Avenue. The route heads to the west and southwest for an additional 2.9 miles before entering McKenzie County after crossing 120th Avenue. The route continues to the southwest briefly (about 0.3 mile) before turning south for about 1.6 miles through portions of Little Missouri National Grassland before crossing State Highway 200. The route parallels the south side of State Highway 200 to the southwest and west for an additional 2.6 miles before connecting at the Charlie Creek 345-kV Substation. Portions of the route along State Highway 200 extend through National Grassland areas as well.

Charlie Creek 345-kV Substation to Proposed Blue 345-kV Substation

Upon exiting the Charlie Creek Substation, the route crosses State Highway 200 and travels north for approximately 1.1 miles before turning and extending in a northwesterly direction for an additional 2.8 miles. The route extends in a general northward direction for another 3.4 miles, crossing 2nd Street and 125th Avenue. The route angles to the northwest for approximately one mile before turning due north and traveling along the quarter-section line for another two miles as it crosses 3rd Street and 4th Street. The route heads west-northwest for 2.4 miles as it crosses 5th and 6th Streets. The route extends in a general northwest direction for approximately 1.8 miles before entering a large tract of National Grassland. The route parallels the east side of U.S. Highway 85 for about 1.2 miles before turning in a general northeast direction for another 2.7 miles before crossing 11th Street. The route makes a small jog to the northwest before turning due north and crossing the Little Missouri River (Section 6, Township 147, Range 98). After crossing the river, the route heads due north for an additional 1.2 miles and turns to the northwest for another 6.8 miles. Within these 6.8 miles the route crosses 14th Street, U.S. Highway 85, and an existing 230-kV transmission line. After crossing the transmission line, the route continues in a general northwest direction for about 4.7 miles and crosses 126 ½ Avenue, 21st Street, and 129th Avenue. The route turns due west and continues along the quarter-section line for another 1.9 miles and crosses 2730 Street and 131st Avenue in the process. The route continues to the north-northwest for another two miles before turning due north along a quarter-section line and continuing for another 6.2 miles and crossing 24th Street, 25th Street, an existing 230-kV transmission line, 26th Street, U.S. Highway 85, 28th Street, and 29th Street. The route extends to the northwest for three miles and crosses 133rd and 134th Avenues. The route continues to the north, paralleling the west side of 134th Avenue for approximately 1.8 miles before turning west and extending another four miles and crossing 2729 Street, 33 ½ Street, and 137th Street. The route turns due north for 0.5 mile and enters the site of the proposed Blue 345-kV Substation.

Proposed Red 345-kV Switchyard to Proposed White 345-kV Substation

The route extends to the west approximately 0.3 mile from the site of the Proposed Red 345-kV Switchyard. It continues to the north and crosses Center Street and follows the quarter-section line for approximately three miles. The route turns to the northwest and extends another 6.6 miles, crossing 106th Avenue, 5th Street, State Highway 22, and 7th Street. The route turns due north, follows the quarter-section line for 1.8 miles, and crosses 8th and 9th Streets. The route turns in a general north-northwest direction and enters the Little Missouri River badlands. The route continues in this direction for approximately three miles and turns northward for approximately 1.8 miles before crossing the Little Missouri River (Section 26, Township 148, Range 96). After crossing the river, the route heads north for approximately 1.2 miles, turns to the northeast for another 2.5 miles, and crosses 20th Avenue. The route turns to the north-northwest for 1.7 miles and enters McKenzie County. The route continues to the north-northwest for an additional 3.2 miles as it leaves the Little Missouri River badlands. The route also crosses 2753 Street during this stretch. The route extends to the west-northwest for approximately 1.9 miles before entering the site of the proposed White 345-kV Substation.

Proposed White 345-kV Substation to Proposed Blue 345-kV Substation

Upon leaving the site of the proposed White 345-kV Substation, the route extends due west for 0.2 mile before turning in a northwest direction for approximately 3.6 miles and crossing 110th, 111th, and 112th Avenues. The route turns north, crosses 24th Street, and extends approximately 3.3 miles. The route travels in a northwest direction for approximately 11 miles. During this 11-mile stretch, the route crosses 113th Avenue, State Highway 23, 28th Street, 29th Street, 31st Street, and 33rd Street. The route turns due west and generally follows the quarter-section line for approximately 17 miles. During this stretch the route crosses 121st Avenue, State Route 1806, 125th Avenue, 34th Street, 131st Avenue, 2729 Street, and 137th Avenue. The route turns north for 0.2 mile and enters the site of the proposed Blue 345-kV Substation.

Proposed Blue 345-kV Substation to Existing 230-kV Transmission Line

From the site of the proposed Blue 345-kV Substation, the route extends southwest for 1.1 miles and crosses 139th Avenue. The route travels west for 3.9 miles and crosses 140th Avenue, 142nd Avenue, and U.S. Highway 85 before connecting to an existing 230-kV transmission line.

Proposed Blue 345-kV Substation to Proposed Judson 345-kV Substation

When leaving the site of the proposed Blue 345-kV Substation, the route heads due north for approximately 2.4 miles, turns in a northwest direction for approximately four miles, and crosses 139th Avenue. The route extends to the west for 0.9 mile before turning again to the northwest for approximately 3.5 miles. Within these 3.5 miles the route crosses 143rd Avenue, an existing 230-kV transmission line, U.S. Highway 85, 144th Avenue, and 145th Avenue. The route continues approximately 0.9 mile to the north along the west side of 145th Avenue before turning to the northeast for approximately 1.5 miles and crossing back over 145th Avenue and 42nd Street. The route enters the Missouri River badlands and heads north for approximately 2.5 miles. During this stretch the route crosses 45 ½ Street and 45th Street, as well as entering the Lewis & Clark Wildlife Management Area (WMA). The route turns northwest and parallels the west side of U.S. Highway 85 through the WMA for approximately 2.7 miles and crosses 46 ½ Street and 47th Street before crossing the Missouri River for approximately 0.25 mile and entering Williams County (Section 6, Township 153, Range 101). Once across the river, the route continues to travel in a northwest direction for 1.3 miles, passing near several homes located along 140 ½ Avenue. The route extends to the west along the quarter-section line for 0.9 mile and crosses 142nd Avenue before turning north along the quarter-section line for another 1.4 miles and crossing 49th Street. The route extends east-northeast for 0.1 mile, turns north for another 0.3 mile, and crosses U.S. Highway 2 and an existing 230-kV transmission line. The route continues to the west another 0.3 mile, then north an additional 0.25 mile before turning west and entering the site of the proposed Judson 345-kV Substation.

Proposed Judson 345-kV Substation to Existing Williston 230-kV Substation

The route exits the site of the proposed Judson 345-kV Substation and travels east approximately 1.2 miles before extending to the southeast for an additional 0.5 mile. The route continues to the east for approximately 0.2 mile and parallels the north side of an existing 230-kV transmission line. The route turns north for approximately 0.1 mile before turning to the northeast, crossing 142nd Avenue, and entering the existing Williston 230-kV Substation.

Proposed Judson 345-kV Substation to Proposed Tande 345-kV Substation

The route exits the site of the proposed Judson 345-kV Substation and travels northwest for 0.4 mile and crosses 51st Street before turning west for 0.2 mile. The route extends due north for about 2.2 miles and crosses 52nd and 53rd Streets. The route turns to the east for one mile and crosses 143rd Avenue before turning north for another 3.2 miles and crossing 54th, 55th, and 56th Streets. The route turns east along the quarter-section line and travels about 2.3 miles, crossing 142nd Avenue and 141st Avenue. The route extends north for 4 miles and crosses 57th, 58th, and 60th Streets. The route turns east for about 5.2 miles along the quarter-section line and crosses 138th and 139th Avenues as well as U.S. Highway 2. The route extends northeast for 0.9 mile to the section line, travels east 1 mile and crosses 135th Avenue, then travels southeast for 1.4 miles and crosses an existing 230-kV transmission line. The route extends east along the quarter-section line for 10 miles. Within the 10 miles the route crosses 132nd, 131st, 130th, 129th, 127th, and 126th Avenues. It also crosses 5333 Street and 124th Avenue. The route turns north along the quarter-section line for 1 mile and crosses 61st Street. The route extends east along the quarter-section line for 12.8 miles, crossing 123rd, 121st, 120th, 119th, 117th, 116th, 115th, 114th, 113th, and 112th Avenues. The route travels northeast for about 1.6 miles and extends to the east for another 7.8 miles along the quarter-section line. During the 7.8 mile stretch the route crosses 109th Avenue, 5351 Street, 107th, 106th, 105th, 104th, and 103rd Avenues. The route turns north along the quarter-section line and extends 4.1 miles, crossing 63rd Street, U.S. Highway 2, and 65th Street as it enters Mountrail County. The route travels northwest for 0.9 mile, turns north for another 0.5 mile, and crosses 3110 Street and 67 ½ Street before entering the site of the proposed Tande 345-kV Substation.

Proposed Tande 345-kV Substation to Existing Neset 230-kV Substation

When leaving the site of the proposed Tande 345-kV Substation, the route extends approximately 0.4 mile to the north. The route turns west-northwest for 0.5 mile and enters the existing Neset 230-kV Substation.

REFERENCES

Burns & McDonnell Engineering Company, Inc. 2012. Draft Environmental Report for the AVS- Neset 345-kV Transmission Project. May 2012. 652 pp.

Burns & McDonnell Engineering Company, Inc. 2011. Macro-Corridor and Alternatives Report for the AVS to Neset 345-kV Transmission Project. Prepared for Rural Utilities Service. Project No. 61495. October.

Appendix E—Visual Simulations

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Before

After

Description of Photo Location:

47^{th} LN NW

Looking North

Visual Simulation 1

AVS 345-kV Transmission Line

Basin Electric

Source: Trinity Animation, Inc.

Structure placements as shown are for photo simulation purposes only. Actual structure placement will be determined during detailed design and engineering of the route selected and approved.

Before

After

Description of Photo Location:

Lone Butte

Looking West

Burns & McDonnell SINCE 1898

Visual Simulation 2
AVS 345-kV Transmission Line
Basin Electric

Source: Trinity Animation, Inc.

Structure placements as shown are for photo simulation purposes only. Actual structure placement will be determined during detailed design and engineering of the route selected and approved.

Description of Photo Location:
Theodore Roosevelt National Park
Looking East

Burns & McDonnell SINCE 1898

Visual Simulation 3
AVS 345-kV Transmission Line
Basin Electric

Source: Trinity Animation, Inc.
Structure placements as shown are for photo simulation purposes only. Actual structure placement will be determined during detailed design and engineering of the route selected and approved.

Description of Photo Location:
47th LN NW (Missouri River)
Looking Southeast

Burns & McDonnell
SINCE 1898

Visual Simulation 4
AVS 345-kV Transmission Line
Basin Electric

Source: Trinity Animation, Inc.
Structure placements as shown are for photo simulation purposes only. Actual structure placement will be determined during detailed design and engineering of the route selected and approved.

Before

After

Description of Photo Location:
State Highway 22
Looking North

Visual Simulation 5
AVS 345-kV Transmission Line
Basin Electric

Source: Trinity Animation, Inc.
Structure placements as shown are for photo simulation purposes only. Actual structure placement will be determined during detailed design and engineering of the route selected and approved.

Before

After

Description of Photo Location:
State Highway 22
Looking Northeast

Visual Simulation 6
AVS 345-kV Transmission Line
Basin Electric

Source: Trinity Animation, Inc.

Structure placements as shown are for photo simulation purposes only. Actual structure placement will be determined during detailed design and engineering of the route selected and approved.

Appendix F—List of Wildlife and Fish Species Observed or Known to Occur near the Proposed Project

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Scientific Name*	Common Name*
Mammals	
Sorex cinereus	masked shrew
Myotis lucifugus	little brown myotis
Myotis septentrionalis	northern myotis
Myotis evotis	long-eared myotis
Lasionycteris noctivagans	silver-haired bat
Eptesicus fuscus	big brown bat
Lasiurus borealis	red bat
Lasiurus cinereus	hoary bat
Sylvilagus floridanus	eastern cottontail
Sylvilagus nuttallii	Nuttall's cottontail
Lepus townsendii	white-tailed jackrabbit
Eutamius minimus	least chipmunk
Sciurus niger	fox squirrel
Spermophilus tridecemlineatus	thirteen-lined ground squirrel
Spermophilus richardsonii	Richardson's ground squirrel
Spermophilus franklinii	Franklin's ground squirrel
Cynomys ludovicianus	black-tailed prairie dog
Thomomys talpoides	northern pocket gopher
Perognathus fasciatus	olive-backed pocket mouse
Castor canadensis	beaver
Peromyscus maniculatus	deer mouse
Peromyscus leucopus	white-footed mouse
Onychomys leucogaster	northern grasshopper mouse
Clethrionomys gapperi	southern red-backed vole
Microtus pennsylvanicus	meadow vole
Microtus ochrogaster	prairie vole
Ondatra zibethicus	muskrat
Rattus norvegius	Norway rat
Mus musculus	house mouse
Zapus hudsonius	meadow jumping mouse
Zapus princeps	western jumping mouse
Erethizon dorsatum	porcupine
Canis latrans	coyote
Vulpes vulpes	red fox
Procyon lotor	raccoon
Mustela nivalis	least weasel
Mustela frenata	long-tailed weasel
Mustela vison	mink

Scientific Name*	Common Name*
Taxidea taxus	badger
Mephitis mephitis	striped skunk
Lutra canadensis	river otter
Felis concolor	mountain lion
Felis rufus	bobcat
Cervus elaphus	elk
Odocoileus hemionus	mule Deer
Odocoileus virginianus	whitetail deer
Antilocapridae americana	pronghorn
Bison bison	bison
Ovis canadensis	bighorn sheep
Reptiles and Amphibians	
Scaphiopus bombifrons	plains spadefoot toad
Bufo woodhousei	Woodhouse's toad
Bufo cognatus	great plains toad
Bufo hemiosphrys	Canadian toad
Rana pipiens	northern leopard frog
Rana sylvatica	wood frog
Pseudacris triseriata	western chorus frog
Ambystoma tigrinum	tiger salamander
Phrynosoma douglassi	short-horned lizard
Sceloporus graciosus	sagebrush lizard
Chrysemys picta belli	western painted turtle
Chelydra serpentina	common snapping turtle
Thamnophis sirtalis	common garter snake
Thamnophis radix	plains garter snake
Opheodrys vernalis	smooth green snake
Heterdon nasicus	western hognose snake
Pituophis catenifer	bullsnake
Coluber constrictor	racer
Crotalus viridis	prairie rattlesnake
Birds	
Perdix perdix	gray partridge
Tympanuchus phasianellus	sharp-tailed grouse
Phasianus colchicus	ring-necked pheasant
Meleagris gallopavo	wild turkey
Zenaida macroura	mourning dove
Ardea herodias	great blue heron
Botaurus lentiginosus	American bittern
Nycticorax nycticorax	black-crowned night heron
Aechmophorus occidentalis	western grebe

Scientific Name*	Common Name*
Podiceps nigricollis	eared grebe
Grus canadensis	sandhill crane
Fulica americana	American coot
Charadrius melodus	piping plover
Charadrius vociferus	killdeer
Recurvirostra americana	American avocet
Phalaropus tricolor	Wilson's phalarope
Larus delawarensis	ring-billed gull
Sterna hirundo	common tern
Chlidonias niger	black tern
Sternula antillarum	least tern
Bartramia longicauda	upland sandpiper
Actitis macularia	spotted sandpiper
Catoptrophorus semipalmatus	willet
Limosa fedoa	marbled godwit
Tringa melanoleuca	greater yellowlegs
Branta canadensis	Canada goose
Aix sponsa	wood duck
Anas crecca	green-winged teal
Anas discors	blue-winged teal
Anas americana	American widgeon
Aythya valisineria	canvasback
Aythya americana	redhead
Anas strepera	gadwall
Anas platyrhynchos	mallard
Oxyura jamaicensis	ruddy duck
Anas clypeata	northern shoveler
Anas acuta	northern pintail
Tyrannus tyrannus	eastern kingbird
Tyrannus verticalis	western kingbird
Tachyceneta bicolor	tree swallow
Hirundo rustica	barn swallow
Progne subis	purple martin
Eremophila alpestris	horned lark
Parus atricapillus	black-capped chickadee
Sitta carolinensis	white-breasted nuthatch
Troglodytes aedon	house wren
Turdus migratorius	American robin
Sialia sialis	eastern bluebird
Lanius ludovicianus	loggerhead shrike
Toxostoma rufum	brown thrasher

Scientific Name*	Common Name*
Bombycilla cedrorum	cedar waxwing
Cyanocitta cristata	blue jay
Vireo gilvus	warbling vireo
Carduelis tristis	American goldfinch
Dendroica petechia	yellow warbler
Pheucticus melanocephalus	black-headed grosbeak
Spizella passerina	chipping sparrow
Sturnella neglecta	western meadowlark
Icterus galbula	northern oriole
Quiscalus quiscula	common grackle
Agelaius phoeniceus	red-winged blackbird
Cathartes aura	turkey vulture
Haliaeetus leucocephalus	bald eagle
Aquila chrysaetos	golden eagle
Circus cyaneus	northern harrier
Accipiter cooperii	cooper's hawk
Buteo swainsoni	Swainson's hawk
Buteo jamaicensis	red-tailed hawk
Falco columbarius	merlin
Falco sparverius	American kestrel
Falco mexicanus	prairie falcon
Asio otus	long-eared owl
Asio flammeus	short-eared owl
Bubo virginianus	great-horned owl
Athene cunicularia	burrowing owl
Otus asio	eastern screech owl
Fish	
Esox lucius	northern pike
Sander vitreus	walleye
Sander canadensis	sauger
Perca flavescens	yellow perch
Etheostoma nigrum	johnny darter
Micropterus salmoides	largemouth bass
Micropterus dolomieu	smallmouth bass
Lepomis macrochirus	bluegill
Pomoxis nigromaculatus	black crappie
Pomoxis annularis	white crappie
Morone chrysops	white bass
Aplodinotus grunniens	freshwater drum
Ictalurus punctatus	channel catfish
Ameiurus melas	black bullhead

Scientific Name*	Common Name*
Polyodon spathula	paddlefish
Lepisosteus platostomus	shortnose gar
Oncorhynchus mykiss	rainbow trout
Salmo trutta	brown trout
Salvelinus namaycush	lake trout
Oncorhynchus tshawytscha	chinook salmon
Lota lota	burbot
Catostomus commersonii	white sucker
Ictiobus cyprinellus	bigmouth buffalo
Moxostoma macrolepidotum	shorthead redhorse
Cyprinus carpio	common carp
Pimephales promelas	fathead minnow
Semotilus atromaculatus	creek chub
Notemigonus crysoleucas	golden shiner
Osmerus mordax	rainbow smelt

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Appendix G—U.S. Fish and Wildlife Service Endangered Species Act Species List

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U.S. Fish and Wildlife Service

Natural Resources of Concern

This resource list is to be used for planning purposes only — it is not an official species list.

Endangered Species Act species list information for your project is available online and listed below for the following FWS Field Offices:

North Dakota Ecological Services Field Office
3425 MIRIAM AVENUE
BISMARCK, ND 58501
(701) 250-4481
http://www.fws.gov/northdakotafieldoffice/endspecies/endangered_species.htm

Project Counties:

Dunn, ND | McKenzie, ND | Mercer, ND | Mountrail, ND | Williams, ND

Project Type:

** Other **

Endangered Species Act Species List (USFWS Endangered Species Program).

There are a total of **8** threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fishes may appear on the species list because a project could cause downstream effects on the species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section below for critical habitat that lies within your project area. Please contact the designated FWS office if you have questions.

Species that should be considered in an effects analysis for your project:

Birds	Status		Has Critical Habitat	Contact
Least tern (*Sterna antillarum*) Population: interior pop.	Endangered	species info		North Dakota Ecological Services Field Office

Natural Resources of Concern

Piping Plover (*Charadrius melodus*) Population: except Great Lakes watershed	Threatened	species info	Final designated critical habitat Final designated critical habitat	North Dakota Ecological Services Field Office
Sprague's Pipit (*Anthus spragueii*)	Candidate	species info		North Dakota Ecological Services Field Office
Whooping crane (*Grus americana*) Population: except where EXPN	Endangered	species info	Final designated critical habitat	North Dakota Ecological Services Field Office
Fishes				
Pallid sturgeon (*Scaphirhynchus albus*) Population: Entire	Endangered	species info		North Dakota Ecological Services Field Office
Insects				
Dakota Skipper (*Hesperia dacotae*)	Proposed Threatened	species info	Proposed critical habitat	North Dakota Ecological Services Field Office
Mammals				
Black-Footed ferret (*Mustela nigripes*) Population: U.S.A. (specific portions of AZ, CO, MT, SD, UT, and WY)	Experimental Population, Non-Essential	species info		North Dakota Ecological Services Field Office
Gray wolf (*Canis lupus*) Population: U.S.A.: All of AL, AR, CA, CO, CT, DE, FL, GA, KS, KY, LA, MA, MD, ME, MO, MS, NC, NE, NH, NJ, NV, NY, OK, PA, RI, SC, TN, VA, VT and WV; those portions of AZ, NM, and TX not included in an experimental population; and portions of IA, IN, IL, ND, OH, OR, SD, UT, and WA. Mexico.	Endangered	species info		North Dakota Ecological Services Field Office

U.S. Fish and Wildlife Service

Natural Resources of Concern

Critical habitats within your project area: (View all critical habitats within your project area on one map)

The following critical habitats lie fully or partially within your project area.

Birds	Critical Habitat Type
Piping Plover (*Charadrius melodus*) Population: Great Lakes watershed	Final designated critical habitat
Insects	
Dakota Skipper (*Hesperia dacotae*)	Proposed critical habitat

FWS National Wildlife Refuges (USFWS National Wildlife Refuges Program).

There are **9** refuges in your refuge list

Lake Ilo National Wildlife Refuge (701) 548-8110 489 102 AVENUE SW DUNN CENTER, ND58626	refuge profile
Shell Lake National Wildlife Refuge (701) 848-2466 C/O LOSTWOOD WETLAND MANAGEMENT DISTRICT 8315 HIGHWAY 8 KENMARE, ND58746	refuge profile
Lostwood National Wildlife Refuge (701) 848-2722 8315 HIGHWAY 8 KENMARE, ND58746	refuge profile
Lake Zahl National Wildlife Refuge (701) 965-6488 C/O CROSBY WMD 10100 HIGHWAY 42 NW CROSBY, ND58730	refuge profile
Crosby Wetland Management District (701) 965-6488 10100 HIGHWAY 42 NW CROSBY, ND58730	refuge profile

U.S. Fish and Wildlife Service

Natural Resources of Concern

North Dakota Wildlife Management Area (701) 442-5474 3275 11TH STREET NW COLEHARBOR, ND58531	refuge profile
Audubon Wetland Management District (701) 442-5474 C/O AUDUBON NWR 3275 11TH STREET NW COLEHARBOR, ND58531	refuge profile
Lostwood Wetland Management District (701) 848-2466 8315 HIGHWAY 8 KENMARE, ND58746	refuge profile
Northeast Montana Wetland Management District (406) 789-2305 C/O MEDICINE LAKE NWR 223 NORTH SHORE ROAD MEDICINE LAKE, MT59247	refuge profile

FWS Migratory Birds (USFWS Migratory Bird Program).

Most species of birds, including eagles and other raptors, are protected under the Migratory Bird Treaty Act (16 U.S.C. 703). Bald eagles and golden eagles receive additional protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668). The Service's Birds of Conservation Concern (2008) report identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

Migratory bird information is not available for your project location.

NWI Wetlands (USFWS National Wetlands Inventory).

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

IPaC is unable to display wetland information at this time.

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Appendix H—County Occurrence for U.S. Fish and Wildlife Service Federally Listed Species

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County Occurrence of Endangered, Threatened, Proposed and Candidate Species and Designated Critical Habitat in North Dakota

March 2014

Species	Adams	Barnes	Benson	Billings	Bottineau	Bowman	Burke	Burleigh	Cass	Cavalier	Dickey	Divide	Dunn	Eddy	Emmons	Foster	Go. Valley	Gr. Forks	Grant	Griggs	Hettinger	Kidder	Lamoure	Logan	McHenry	McIntosh	McKenzie
Interior Least Tern - E								X					X		X												X
Whooping Crane - E	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Black-Footed Ferret - E	X			X		X							X				X		X		X						X
Pallid Sturgeon – E								X					X		X												X
Gray Wolf - E	X			X	X	X	X					X	X				X		X		X						X
Piping Plover - T			X				X	X				X	X	X	X	X						X		X	X	X	X
Western Prairie Fringed Orchid - T																											
Dakota Skipper - P		X			X		X						X	X						X					X		X
Poweshiek Skipperling – P																											
Northern Long-Eared Bat - P	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rufa Red Knot - P																											
Sprague's Pipit – C	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X		X	X	X	X	X	X	X
Greater Sage-Grouse - C						X											X										
Designated Critical Habitat																											
Piping Plover			X				X	X				X	X	X	X							X		X	X	X	X

E – Endangered **T – Threatened** **P – Proposed** **C – Candidate** **Endangered West of HWY 83 - Delisted East of HWY 83**

County Occurrence of Endangered, Threatened, Proposed and Candidate Species and Designated Critical Habitat in North Dakota

March 2014

Species	McLean	Mercer	Morton	Mountrail	Nelson	Oliver	Pembina	Pierce	Ramsey	Ransom	Renville	Richland	Rolette	Sargent	Sheridan	Sioux	Slope	Stark	Steele	Stutsman	Towner	Traill	Walsh	Ward	Wells	Williams
Interior Least Tern - E	X	X	X	X		X										X										X
Whooping Crane - E	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Black-footed Ferret - E		X	X			X										X	X	X								
Pallid Sturgeon - E	X	X	X	X		X										X										X
Gray Wolf - E	X	X	X	X		X					X					X	X	X						X		X
Piping Plover - T	X	X	X	X		X		X			X				X	X				X				X	X	X
Western Prairie Fringed Orchid - T										X		X														
Dakota Skipper - P	X			X		X		X		X		X		X						X				X	X	
Poweshiek Skipperling – P												X		X												
Northern Long-Eared Bat - P	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rufa Red Knot - P																										
Sprague's Pipit - C	X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X		X	X		X	X	X	X
Greater Sage-Grouse – C																	X									
Designated Critical Habitat																										
Piping Plover	X	X	X	X		X		X			X				X	X				X				X		X

E – Endangered T – Threatened P – Proposed C – Candidate Endangered West of HWY 83 - Delisted East of HWY 83

Appendix I—U.S. Forest Service Sensitive Wildlife Species

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SENSITIVE SPECIES LIST Forest Service, Region 1 Februrary 2011	States Where Sensitive (a)				State Ranking				Forests Where Species is Known (K) or Suspected (S) to Occur													Comments
	MT	**ID**	**ND**	**SD**	MT	ID	ND	SD	B/D	BRT	CLW	CUS	DPG	FLAT	GAL	HEL	IPNF	KOOT	L&C	LOLO	NEZ	
BIRDS																						
American peregrine falcon (*Falco peregrinus anatum*)	X	X	X	X	S3	S2B	S1	SX	K	K		K		K	K	K	K	K	K	K	K	Federally delisted on August 25, 1999. USFWS monitoring of status for 5-year intervals after delisting. Species of Concern in MT, State Endangered in SD. ND CWCS Level 3 spp.
Baird's sparrow (*Ammodramus bairdii)*			X	X	S3B		SU	S2B SZN				K	K									MT CFWCS as a Priority 2 spp. Listed in SD CWCS, and as a Level 1 species in ND CWCS.
Bald eagle (*Haliaeetus leucocephalus*)	X	X	X	X	S3	S3B S4N	S1	S1B S2N	K	K	K	K	K	K	K	K	K	K	K	K	K	Federally delisted on June 28, 2007. USFWS monitoring for 5-year intervals after delisting. State Threatened in SD. ND CWCS Level 1 spp.
Black-backed woodpecker (*Picoides arcticus*)	X	X			S3	S3		S3	K	K	K	K		K	K	K	K	K	K	K	K	Species of Concern in MT, and in MT CFWCS as a Priority 2 spp. Listed in SD CWCS, and as a Level 1 species in ND CWCS.
Black swift *(Cypseloides niger)*		X			S1B	S1B											K				S	Colonial nester with few known nesting sites. IPNF has known nesting sites.
Blue-gray gnatcatcher (*Polioptila caerulea)*	X				S2B			S1B SZN				K										Species of Concern in MT, and in MT CFWCS as a Priority 2 spp. South end of Priors Mtns. in MT.
Burrowing owl (*Athene cunicularia)*	X		X	X	S3B	S2B	SU	S3 S4B SZN				K	K						S			Species of Concern in MT, and in MT CFWCS as a Priority 1 spp. Listed in SD CWCS, and as a Level 2 species in ND CWCS.
Common loon *(Gavia immer)*	X	X			S3B	S1B S2N	S4	S1B S3						K			K	K		K	S	Species of Concern in MT, and in MT CFWCS as a Priority 1 spp. ID CWCS spp.
Flammulated owl *(Otus flammeolus)*	X	X			S3B	S3B		S1B SZN	K	K	K			K	S	K	K	K	S	K	K	Species of Concern in MT, and in MT CFWCS as a Priority 1 spp. ID CWCS spp.
Greater prairie chicken *(Tympanuchus cupido)*			X		SX		S2	S4					K									Listed in SD CWCS, and as a ND CWCS Level 2 spp.

SENSITIVE SPECIES LIST Forest Service, Region 1 Februrary 2011	States Where Sensitive (a)				State Ranking				Forests Where Species is Known (K) or Suspected (S) to Occur													Comments
	MT	**ID**	**ND**	**SD**	MT	ID	ND	SD	B/D	BRT	CLW	CUS	DPG	FLAT	GAL	HEL	IPNF	KOOT	L&C	LOLO	NEZ	
BIRDS continued																						
Greater sage-grouse *(Centrocercus urophasianus)*	X		X	X	S2	S2	SU	S2	K			S	K						S			Species of Concern in MT, and in MT CFWCS as a Priority 1 spp. Listed in SD CWCS, and as a Level 2 species in ND CWCS. No breeding sites on BDNF.
Harlequin duck *(Histrionicus histrionicus)*	X	X			S2B	S1B			K		K	K		K	K	S	K	K	K	K	K	Species of Concern in MT, and in MT CFWCS as a Priority 1 spp. ID CWCS spp.
Loggerhead shrike *(Lanius ludovicianus)*			X	X	S3B		SU	S3				K	K									Species of Concern in MT, and in MT CFWCS as a Priority 2 spp. ND CWCS Level 2 spp.
Long-billed curlew *(Numenius americanus)*			X	X	S3B	S2B	S2	S3B SZN				K	K								S	Species of Concern in MT, and in MT CFWCS as a Priority 1 spp. SD CWCS
Mountain quail *(Oreortyx pictus)*		X				S1															K	ID CWCS spp.
Pygmy nuthatch *(Sitta pygmaea)*		X			S4	S2		S2 S3			K						K				K	MT CFWCS Priority 2 spp. ID CWCS spp.
Sprague's pipit *(Anthus spragueii)*			X	X	S3B		S3	S2B SZN					K									Species of Concern in MT, and in MT CFWCS as a Priority 2 spp. Listed in SD CWCS, and as a Level 1 species in ND CWCS.
Trumpeter swan *(Cygnus buccinator)*	X				S3	S1B S2N	SX	S3	K						K							Species of Concern in MT, and in MT CFWCS as a Priority 2 spp. Listed in
White-headed woodpecker *(Picoides albolarvatus)*		X			SNA	S2															K	ID CWCS spp.
MAMMALS																						
Black-tailed prairie dog *(Cynomys ludovicianus)*	X		X	X	S3		SU	S4				K	K									Species of Concern in MT, and in MT CFWCS as a Priority 1 spp. ND CWCS
Bighorn sheep *(Ovis canadensis)*	X	X	X	X	S4	S1	S2		K	K		K	K	K	K	K		K	K	K	K	MT CFWCS as a Priority 3 spp.

SENSITIVE SPECIES LIST Forest Service, Region 1 Februrary 2011	States Where Sensitive (a)				State Ranking				Forests Where Species is Known (K) or Suspected (S) to Occur													Comments
	MT	**ID**	**ND**	**SD**	MT	ID	ND	SD	B/D	BRT	CLW	CUS	DPG	FLAT	GAL	HEL	IPNF	KOOT	L&C	LOLO	NEZ	
MAMMALS continued																						
Fisher *(Martes pennanti)*	X	X			S3	S1	S2		K	K	K			K		K	K	K	K	K	K	Species of Concern in MT, and in MT CFWCS as a Priority 2 spp. ID CWCS spp.
Fringed myotis *(Myotis thysanodes)*		X			S3	S2		S2	K		K	K	K			K	K	K	K		K	Sub Species of Concern does not occur on FS in SD.
Gray wolf *(Canis lupus)*	X	X			S4	S2			K	K	K	K	K	K	K	K	K	K	K	K	K	Delisted in Idaho and Montana in 2011. However, wolves remain federally listed in North and South Dakota.
Great Basin pocket mouse *(Perognathus parvus)*	X				S2 S3				S													Species of Concern in MT, and in MT CFWCS as a Priority 1 spp. At periphery of range on BDNF.
Long-eared myotis *(Myotis evotis)*				X	S4		SU	S1	K	K	K	K	K	K	K	K	K	K	K	K	K	MT CFWCS Priority 3 spp. ND CWCS Level 3 spp. Limited distribution, but does occur on NFS lands based on survey results.
Long-legged myotis *(Myotis volans)*				X	S4		SU	S5	K	K	K	K	K	K	K	K	K	K	K	K	K	MT CFWCS Priority 3 spp. ND CWCS Level 3 spp. Limited distribution, but does occur on NFS lands based on
North American wolverine *(Gulo gulo luscus)*	X	X			S3	S2			K	K	K	K		K	K	K	K	K	K	K	K	Species of Concern in MT, and in MT CFWCS as a Priority 2 spp. ID CWCS spp.
Northern bog lemming *(Synaptomys borealis)*	X	X			S2	S1			K	K				K		S	K	K	K	K		Species of Concern in MT, and in MT CFWCS as a Priority 1 spp.
Pallid bat *(Antrozous pallidus)*	X				S2	S1						K										Species of Concern in MT, and in MT CFWCS as a Priority 1 spp.
Pygmy rabbit *(Brachylagus idahoensis)*	X				S3	S2			K													Species of Concern in MT, and in MT CFWCS as a Priority 1 spp.
Spotted bat *(Euderma maculatum)*	X				S2	S3			K			K										Species of Concern in MT, and in MT CFWCS as a Priority 1 spp.
Towsend's big-eared bat *(Corynorhinus townsendii)*	X	X		X	S2	S3		S2 S3	K	K	K	K	K	K	K	K	K	K	K	K	K	Species of Concern in MT, and in MT CFWCS as a Priority 1 spp. SD CWCS spp. ID CWCS spp. Occurs on Nez

SENSITIVE SPECIES LIST Forest Service, Region 1 Februrary 2011	States Where Sensitive (a)				State Ranking				Forests Where Species is Known (K) or Suspected (S) to Occur													Comments
	MT	**ID**	**ND**	**SD**	MT	ID	ND	SD	B/D	BRT	CLW	CUS	DPG	FLAT	GAL	HEL	IPNF	KOOT	L&C	LOLO	NEZ	
White-tailed prairie dog *(Cynomys leucurus)*	X				S1							K										Species of Concern in MT, and in MT CFWCS as a Priority 1 spp.
AMPHIBIANS																						
Coeur d'Alene salamander (*Plethodon idahoensis)*	X	X			S2	S2				K	K						K	K		K	K	Species of Concern in MT, and in MT CFWCS as a Priority 1 spp. ID CWCS spp.
Great Plains toad *(Bufo cognatus)*	X				S2		SU	S5				K										MT CFWCS Priority 2 spp. Probable reduction in occurance/range.
Northern leopard frog *(Rana pipiens)*	X				S1-w S4-e	S2	SU	S5		S		K		S	K	K		K	K	S		Species of Concern in MT, and in MT CFWCS as a Priority 1 spp.
Plains spadefoot (*Spea bombifrons*)	X				S3		SU	S5				S				K						MT CFWCS Priority 2 spp. ND CWCS Level 1 spp. Probable reduction in occurance/range.
Western toad *(Bufo boreas)*	X	X			S2	S4			K	K	K	K		K	K	K	K	K	K	K	K	Species of Concern in MT, and in MT CFWCS as a Priority 1 spp. Loss of breeding sites is ongoing.
REPTILES																						
Greater short-horned lizard (*Phrynosoma hernandesi*)	X				S3		SU	S2				K							S			Species of Concern in MT, and in MT CFWCS as a Priority 2 spp. ND CWCS Level 2 spp.
Milk snake *(Lampropeltis triangulum)*	X				S2			S4				K										Species of Concern in MT, and in MT CFWCS as a Priority 1 spp.
Ringneck snake *(Diadophis Punctatus)*		X				S2		S2			K										S	ID CWCS spp. Unconfirmed occurance on NFS lands on Nez Perce NF.
Western hognose snake *(Heterodon nasicus)*	X				S2		SU	S5				K										Species of Concern in MT, and in MT CFWCS as a Priority 1 spp. ND CWCS
INSECTS																						
Arogos skipper *(Atrytone arogos iowa)*			X		SNR		SU	S2					K									

SENSITIVE SPECIES LIST Forest Service, Region 1 Februrary 2011	States Where Sensitive (a)				State Ranking				Forests Where Species is Known (K) or Suspected (S) to Occur													Comments
	MT	**ID**	**ND**	**SD**	MT	ID	ND	SD	B/D	BRT	CLW	CUS	DPG	FLAT	GAL	HEL	IPNF	KOOT	L&C	LOLO	NEZ	
INSECTS continued																						
Broad-winged skipper *(Poanes viator)*			X				S2	S2					K									
Dakota skipper (*Hesperia dacotae)*			X	X			S2	S2					K									
Dion skipper *(Euphyes dion)*			X				S1						K									
Mulberry wing *(poanes massasoit)*			X				S2	S1					K									
Ottoe skipper *(Hesperia ottoe)*			X	X	S2-w S3-e		SU	S2					K									Species of Concern in MT. SD CWCS spp.
Powesheik skipper *(Oarisma powesheik)*			X	X			SU	S2					K									SD CWCS spp.
Regal fritillary *(Speyeria idalia)*			X				S2	S3					K									SD CWCS spp.
Tawny crescent *(Phyciodes batessi)*			X		S2-w S3-e		S3	S2					K									

(a) Species are listed as Sensitive by State. The State where a species is listed as Sensitive is indicated by an "X" in the State/species column. A species iedntified as Sensitive within a State, will be considered as Sensitive on all Units within the state where it occurs, unless described otherwise.

(b) National Forest (Grasslands) where a species is known or suspected to occur, within States where a species is listed as Sensitive, are identified by shading and either a known "K" or suspected "S" in the Forest/species column.

CWCS = Comprehensive Wildlife Conservation Strategy

CFWCS = Comprehensive Fish and Wildlife Conservation Strategy

SD bird species may have two state ranks, one for breeding (S#B) and one for nonbreeding seasons (S#N)

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Appendix J—100 Species of Conservation Priority for North Dakota

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Level I Species	Level II Species	Level III Species
horned grebe	northern pintail	whooping crane
American white pelican	canvasback	peregrine falcon
American bittern	redhead	Brewer’s sparrow
Swainson’s hawk	northern harrier	McCown’s longspur
ferruginous hawk	golden eagle	smooth softshell turtle
yellow rail	bald eagle	false map turtle
willet	prairie falcon	northern prairie skink
upland sandpiper	sharp-tailed grouse	northern sagebrush lizard
long-billed curlew	greater prairie chicken	arctic shrew
marbled godwit	greater sage grouse	western small-footed myotis
Wilson’s phalarope	piping plover	long-eared myotis
Franklin’s gull	American avocet	long-legged myotis
black tern	least tern	plains pocket mouse
black-billed cuckoo	short-eared owl	hispid pocket mouse
Sprague’s pipit	burrowing owl	sagebrush vole
grasshopper sparrow	red-headed woodpecker	eastern spotted skunk
Baird’s sparrow	loggerhead shrike	gray wolf
Nelson’s sharp-tailed sparrow	sedge wren	chestnut lamprey
lark bunting	dickcissel	silver lamprey
chestnut-collared longspur	Le Conte’s sparrow	central stoneroller
Canadian toad	bobolink	hornyhead chub
plains spadefoot toad	common snapping turtle	pugnose shiner
smooth green snake	short-horned lizard	blacknose shiner
western hognose snake	redbelly snake	roseyface shiner

black-tailed prairie dog

sturgeon chub

sicklefin chub

pearl dace

blue sucker

pygmy shrew

Richardson's ground squirrel

swift fox

river otter

black-footed ferret

paddlefish

pallid sturgeon

silver chub

northern redbelly dace

flathead chub

trout-perch

threeridge

wabash pigtoe

mapleleaf

black sandshell

creek heelsplitter

pink heelsplitter

finescale dace

yellow bullhead

flathead catfish

logperch

river darter

pink papershell

Appendix K—Special Status Vegetation and Survey Requirements

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1. Contractor Qualifications

a. A degree in Botany or Plant Ecology, or thoroughly demonstrated botanical experience and knowledge to accurately inventory and document plant species and vegetation conditions.

b. Demonstrated skill in plant identification, use of plant taxonomic keys, and rare plant surveys. Knowledge of flora and habitat types of the northern Great Plains.

c. Ability to analyze the effects of a proposed project on botanical resources through knowledge of ecological theory and plant community dynamics in response to disturbance.

d. Ability to prepare technical reports and apply Forest Service procedures and directives in the preparation of BEs.

e. Ability to apply Standards and Guidelines identified in the Dakota Prairie Grasslands Land and Resource Management Plan (2001) to proposed projects.

2. Survey Protocol

Sensitive plant surveys must be conducted in a manner that provides a high probability of locating any sensitive or watch plant species that may be present. The survey botanist must obtain an accurate map of the site and proposed areas of disturbance from the permit applicant, and the field site must be accurately marked or flagged prior to the survey. All habitat likely to be disturbed by the proposed project must be systematically surveyed. Refer to survey intensity levels in the *Field Guide for Plant Survey* manual, and the article *Rare Plant Surveys: Techniques for Impact Assessment*, by James R. Nelson, from the Natural Areas Journal (Vol. 5, No. 3).

The following guidelines must be followed when conducting plant surveys.

a. Sensitive plant surveys must be conducted when sensitive species are most identifiable, such as during periods of flowering or phenological stages that facilitate their discovery. Compromises inevitably occur because there are fourteen sensitive plant species with different periods of growth and flowering. However, survey periods of May 15 through September 15 span a period of active growth or identifiable litter for most sensitive plant species on the LMNG. These dates encompass the acceptable survey season unless otherwise specified by the Forest Service.

b. Survey botanists must be familiar with characteristics of the twenty-four watch species listed for the LMNG and document any occurrences in the same manner as sensitive plant species. A determination of effects for watch plant species is not required within a BE unless one of the species is encountered.

c. Sensitive plant surveys must be discontinued during adverse weather conditions such as drought or plant-killing frost, and reasonable effort must be given to revisiting sites at a more appropriate time when these situations occur. If in doubt, the Forest Service botanist should be contacted.

d. Developments such as roadways and utility lines must be surveyed a minimum distance of 125 feet on each side of the centerline of disturbance, while a minimum of ten acres must be surveyed around well sites, stock tanks, or similar points of development. The total area of survey is referenced as the ***project area***.

e. If a sensitive or watch plant species is discovered within an area that would be adversely affected by the project, the surveyor must contact the Forest Service within seven days. If the occurrence is not reported within seven days it could result in delaying the concurrence of the survey and BE until the next year's survey season.

If a sensitive plant discovery is made within an area that would be directly disturbed by the project, there is a high potential that the project will be redesigned to alleviate adverse effects to the sensitive/watch plant species. In such cases, it may be appropriate for the contract botanist to survey potential alternate routes or site locations. However, it is the contractor's responsibility to coordinate project location adjustments with Forest Service personal and company representatives requesting the survey to ensure that alternate project locations will be acceptable.

f. The contractor must complete a *Sensitive/Watch Plant Population Survey Form* whenever a sensitive or watch plant species is discovered. Copies of the completed form must be submitted to the Forest Service botanist and the North Dakota Natural Heritage Program. Include a topographic map (maximum scale of 1:24,000) that delineates the plant population. Photographs and any additional notes on the occurrence should also be included.

g. Any collections of sensitive or watch plant species must be approved in a Forest Service permit. 36CFR261.9(d) prohibits "removing any plant that is classified as a threatened, endangered, sensitive, rare, or unique species", with a fine in ND of $100. Details of collection will be outlined in the permit that can be obtained at a local Forest Service office. However, it is important to evaluate the effect of collecting on potentially rare or small plant populations. If in doubt, collect the smallest quantities possible and/or only portions of individual plants. If there is a question about the possible identification of a sensitive species, the surveyor should contact the local Forest Service Botanist.

The collection of any plant species for personal use (not for resale) and not covered under 36CFR261.9(d) also requires a Forest Service permit,. A Forest Products Free Use Permit to collect plant specimens for personal use or species identification can be obtained at a local Forest Service office, free of charge.

h. A *Site and Setting Field Form* and *Plant Survey Form* must be completed for every proposed project for which a field survey is conducted. Latitude and longitude in degrees, minutes, and seconds, in **NAD83 datum**, must be recorded for each site. The datum used, including anything other than NAD83, must be recorded.

g.

h. Prominent plant communities across the survey site must be verbally (written description) or graphically identified with respect to their location of occurrence within the area of the proposed action. Habitat locations with the potential to support sensitive plant populations must be verbally or graphically identified. The occurrence of any invasive plant species within the project area must also be accurately identified.

i.

j. Invasive species are defined as non-native species that have the capacity to displace native species. On the LMNG, invasive species include those on the North Dakota noxious weed list such as leafy spurge and Canada thistle, as well as palatable species such as sweet clover, crested wheatgrass, Kentucky and Canada bluegrass, and smooth brome. See the attached list of invasive plant species that must be identified if occurring on a project site.

i. An assessment must be conducted for cumulative affects to vegetation resources. It is suggested that a 0.5 mile radius extending from all areas of likely disturbance associated with the project be used as the ***analysis area*** for cumulative effects. However, other areas or distances could be used if they logically represent past, present, and reasonably foreseeable future affects surrounding the project area.

An intensive ground survey of the analysis area is not expected, but the amount and type of active and reclaimed roads, well sites, utility lines, and other developments, must be estimated within the analysis area. These estimates are derived from a combination of field observations during survey work, aerial photographs, USGS quadrangle maps, and numerous GIS layers provided by the Forest Service that depict vegetation types and infrastructure developments. Observed plant compositions with respect to these developments must be discussed.

j. All activities on National Forest System lands are required to conform to the Federal Code of Regulations and applicable laws. It is the responsibility of surveyors to be aware of any special orders for the Dakota Prairie Grasslands or individual Ranger Districts in effect. Contact the local Ranger District for information on special orders or to obtain any required permits.

Off-road permits and collection permits must be retained at all times while on National Forest System lands.

3. Biological Evaluation / Report Protocol

The following information must be included in the BE and/or any forms specified for completion.

a. The BE must have a date and contain the name, address, and contact information of the company submitting the report. The project name should be identified on the cover page and the beginning of the BE/report. If the BE/report is acting on the behalf of another company for a lease or permit application with the Forest Service, the applicants name and contact information must be included.

b. The proposed action must be identified, i.e. construction of a well pad and 1.1 miles of access road, or upgrading of an existing two-track road to serve as the access road, etc. This includes the manner of action, i.e. a trackhoe will be used to dig a 6 feet wide trench or a dozer will blade 10 acres to remove the A soil layer and level the site. A full description of the action is required for adequate environmental effects analysis. Without this description it may be assumed there is no knowledge of the proposed action and the effects analysis is incomplete.

c. A legal description by Section, Quarter Section, Township, and Range, of the proposed project location. Include a legible topographic view of the project area with a scale no smaller than 1:24,000. We suggest providing larger scale maps and aerial or orthoquad maps of the project area.

d. The date of the field survey and name of the botanist(s) must be identified, along with the type of survey methodology utilized. The Site and Setting Survey Form must be included in the BE/report or attached as an appendix.

e. The current list of LMNG Sensitive and Watch plant species and a brief description of the preferred habitat for each sensitive species must be included in the BE/report or appendix.

f A site-specific narrative description of the habitat types and existing vegetation communities found within the survey area. The description must be logical and cohesive, such that the reader is provided with an accurate picture of vegetation composition and conditions within and around the project area. Dominant and co-dominant species by life form within distinct community types must be identified. Aspects, topographic positions, and dominant soil textures should be included in these descriptions.

g A complete floristic list of all plant species identified during the field survey must be provided. A field checklist is acceptable. A completed copy of the *Sensitive/Watch Plant Population Survey Form* is required if any new populations are discovered. Unoccupied but apparently suitable habitat for sensitive plant species must be identified with respect to its location within the project area.

h The occurrence and extent of invasive species within the project area must be discussed. It is particularly important to identify areas where project disturbances are likely to intersect with invasive plant communities. Maps of invasive species distributions across the project area are very helpful.

i Determination of Effects: Effects to sensitive plant species fall into the following categories. Contractors must utilize these categorical statements rather than paraphrase.

1. No impact
2. May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

3. Will impact individuals or habitat with a consequence that the action may contribute to a trend towards federal listing or cause a loss of viability to the population or species.
4. Beneficial impact.

See Section 4 for discussion on determinations.

A summary table of determinations should be included in the BE/report

The BE must provide a logical context for the determination of effects, considering ecological principles of habitat fragmentation, population dynamics, and viability. The absence of sensitive plant species in the project area does not necessarily equate to no impact. If suitable but unoccupied habitat exists for a particular sensitive plant species that is likely to be disturbed by the project, the determination will usually fall under Category 2 due to decreased habitat for dispersal. However, rationale for Category 2 should also include reasons why the project would not contribute to federal listing. For example, there may be documented populations in other areas of the LMNG that would not be affected, habitat within the project area is marginal, suitable habitat that would not be disturbed is extensive immediately adjacent to the project area, etc.

Direct and indirect effects of the proposed project on native plant communities and habitats must also be addressed in the BE. Examples of these effects include direct disturbance, habitat fragmentation, invasive plant expansion, invasive weed control treatments, decreased plant diversity, and loss of unique habitat unlikely to be reclaimable to pre-disturbance conditions.

An analysis of the cumulative effects must be addressed with respect to past, present, and reasonably foreseeable future effects. This entails an analysis of land use practices on the apparent condition and character of native prairie communities across the analysis area. A one-half mile radius around the project site should be used unless a more logical and defendable analysis area can be identified. Recorded field observations from the *Site and Setting Form* will include the presence and present vegetative characteristics of various active or reclaimed developments and other land use influences such as livestock grazing, agricultural lands, or invasive weed occurrences. GIS layers will be helpful in quantifying the land area that has been influenced by these activities, as well as the potential contribution of the proposed project and its effects. Contractors may not have complete knowledge or access to data sets of past, current, and future land use practices, but they should carry the analysis as far as possible from observations within the analysis area and data sets to which they have access.

j. Design Criteria: The report should include suggested design criteria to alleviate adverse effects and avoid unnecessary disturbances to native plant communities. Examples include recommendations for avoiding impacts to certain plant communities or species, or incorporating the control of invasive species within the scope of project development and design.

k. Bibliography of literature or references cited. Include only those cited in the text of the report.

4. BE Determination Language

a. *No Impact.*

A determination of "No Impact" for sensitive species occurs when a project or activity will have no environmental effects on habitat, individuals, a population or a species. If any "effects" are listed for a sensitive species in the NEPA document, then a "No Impact" conclusion is not appropriate.

b. *May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing Or Cause a Loss of Viability To the Population or Species.*

Impacting of individuals or habitats of sensitive species should be given careful consideration. The loss of populations or metapopulations is often the basis for eventual species extinction. Rationale should be provided regarding why the effects would not contribute to federal listing.

c. *Will Impact Individuals Or Habitat With A Consequence That The Action Will Contribute To A Trend Towards Federal Listing Or Cause a Loss of Viability To the Population or Species.*

Loss of individuals or habitat can be considered significant when the potential effect may contribute to a trend toward federal listing. The loss of individuals is particularly serious when there are few populations and/or few individuals within populations. For these situations, any effects to the species may lead to a loss of viability and contribute towards federal listing.

Projects or activities that adversely affect many individuals of a species with limited population numbers, or even a few individuals with a limited number of small populations should probably receive this conclusion.

d. *Beneficial Impact.*

Projects or activities that are designed or happen to benefit sensitive species should receive this conclusion.

Sensitive Species

NRCS Code	Scientific Name	Common Name	Conserv. Ranking	Documented Habitat on the LMNG
CHSU2	*Chenopodium subglabrum*	smooth goosefoot	G2G4/S1	Sandbars , terraces, and dune complexes along rivers and creeks. Exposed sandy substrates in uplands, blowouts, outcrops, colluvium, etc.
COPA3	*Collinsia parviflora*	blue lips	G5/S2	Woody understories, including green ash/elm draws, Rocky Mountain juniper, mesic shrub communities, and occasional xeric shrub communities.
CRTO4	*Cryptantha torreyana*	Torrey's cryptantha	G5/S1	Dry plains, rock outcrops, escarpments, pine slopes.
ERCE2	*Eriogonum cernuum*	nodding buckwheat	G5/S1	Exposed sand substrates with low plant cover in grasslands, hillsides, sandstone outcrops.
ERVI14	*Eriogonum visheri*	Dakota buckwheat	G3/S2S3	Relatively exposed clay/silt substrates with low plant cover such as outwash zones around eroding buttes, saddles, steep convex slopes, erosional breaks on prairie slopes. Occasional populations among dense saltgrass communities.
ESMI3	*Escobaria missouriensis*	Missouri foxtail cactus	G5/SNR	Prairie slopes and plains, stony to loamy to clayey short-grass to mixed-grass prairies. Also reported in woodlands of ponderosa pine or Quercus spp.
LEMO4	*Leucocrinum montanum*	sand lily	G5/S2	Generally shortgrass communities with fine textured substrates but also found in crested wheatgrass communities. Reported from open coniferous woodlands and hillsides, sagebrush scrub, and sandy flats, but common name seems to be a misnomer. ,..
MEPU3	*Mentzelia pumila*	dwarf mentzelia	G4/S1	Scoria exposures and colluvium with low plant cover. Also reported on slopes and sandy plains; occasionally on hard clays and rocky soils.
PHAL3	*Phlox alyssifolia*	alyssum-leaved phlox	G5/S1S2	Sandy or gravelly soil on and around Bullion Butte. Also reported on clay banks and limestone ridges of open prairie.
PIFL2	*Pinus flexillis*	limber pine	G5/S1	Semi-arid exposed rocky ridges and foothills in the Limber Pines RNA, likely of native-American origin.
POAC5	*Populus x acuminata*	lanceleaf cottonwood	HYB/S2	Mesic woody draws, often with springs/seeps, occasional near springs on open hillsides. Floodplains and stream banks.
SPAI	*Sporobolus airoides*	alkali sacaton	G5/S2	Secondary succession on clay outwash where tolerant of saline conditions, also on dry to moist sandy or gravelly soil.
TOHO	*Townsendia hookeri*	Hooker's Townsendia	G5/S1	Low to moderate plant cover on dry plains, hillsides, gravelly benches and weathered scoria, but often clay matrix subsoil.
TOEX2	*Townsendia exscapa*	Easter daisy	G5/SNR	Dry plains and hillsides, often with loamy or increased soil development and increased pant cover relative to T. hookeri.

Watch Species

NRCS Code	Scientific Name	Common Name	Conservation Ranking
AGEX	*Agrostis exarata*	spike bentgrass	G5/S1
ASAU4	*Astragalus australis* (*Astragalus aboriginum)*	Indian milkvetch	G5/S2S3
ASCR3	*Astragalus drummondii*	Drummond's milkvetch	G5/S1
ASVE5	*Astragalus vexilliflexus*	bentflower milkvetch	G4/S3
EPPY4	*Epilobium pygmaeum* [*Boisduvalia glabella*]	smooth spike-primrose	G5/S1S2
VRCA5	*Bromus carinatus*	mountain brome	G5/S1
CASI12	*Carex siccata* (*Carex feonea)*	dry spike sedge	G5/SNR
CASCS8	*Carex scirpoidea* (*Carex scirpiformi)*	bulrush sedge	G5/S1S2
CLCOT	*Clematis Columbiana var. tenuiloba* (*Clematis tenuiloba)*	rock clematis	G5?T4?/S1
ERCI4	*Erigeron divergens*	spreading fleabane	G5/S1
ERRA2	*Erigeron radicatus*	taproot fleabane	G3G4/S1
FRPU2	*Fritillaria pudica*	yellow fritillary	G5/SH
MYAPM	*Myosurus apetalus* var. *montanus*	bristly mousetail	G5T3T5/S1
OELA	*Oenothera laciniata*	cutleaf evening primrose	G5/SA?
ORLUL2	*Orobanche ludoviciana ssp. Ludoviciana (Orobanche multiflora)*	Louisiana broomrape	G5/S1
OXSE	*Oxytropis sericea*	white locoweed	G5/S1
PHPA29	*Phemeranthus parviflorus* (*Talinum parviflorum*)	prairie fameflower	G5/S2
PODI	*Potamogeton diversifolius*	pondweed	G5/S2S3
PODI2	*Potentilla diversifolia*	varileaf potentilla	G5/S1
POJA2	*Populus x jackii*	Balm-of-Gilead	GNA/SNR
SITR3	*Sibbaldiopsis tridentata* (*Potentilla tridentata)*	shrubby fivefingers	G5/S1
RACA4	*Ranunculus cardiophyllus*	heartleaf buttercup	G4 S1
ROCA	*Rorippa calycina* persistent	persistent sepal yellowcress	G3/SH
SMEC	*Smilax ecirrhata*	upright carrionflower	G?/S1S2

SENSITIVE/WATCH PLANT POPULATION SURVEY FORM

DATE OF SURVEY: ____/____/____ OBSERVER(S): ____________________

LOCATION/POSITION TITLE (Forest/District of observer(s)): ____________________

TAXONOMY: FAMILY: ____________________ SCIENTIFIC NAME: ____________________

LOCATION (**ATTACH COPY OF PERTINENT TOPOGRAPHIC MAP SECTION, WITH POPULATION LOCATIONS):

COUNTY: ____________________ USGS QUAD: ____________________

TOWNSHIP: __________ RANGE: __________ SEC.(S): __________ 1/4 SEC.: ____________________

LATITUDE:____________________ LONGITUDE:____________________
(degrees, minutes, seconds, with NAD83 Datum)

OR UTM at Zone 13 Northing ____________________ Easting ____________________

ELEVATION (at population center (and range if known)): ____________________

NATIONAL FOREST: ______LMNG__________ RANGER DISTRICT: ____________________

LAND OWNERSHIP/MANAGEMENT (IF NOT FS):____________________

SITE NAME (usually based on an adjacent landmark): ____________________

HABITAT:

ASPECT (S, SE, NNW, etc.): ____________ % SLOPE: ____________________

LIGHT EXPOSURE (open, shaded, etc.): ____________________

TOPOGRAPHIC POSITION (crest, midslope, bottom, etc.): ____________________

MOISTURE (typically xeric versus mesic versus wetland etc, do not reflect current/recent precipitation conditions)
____

VEGETATION STRUCTURE WITH POPULATION AREA:

TOTAL TREE COVER (%) ____________________TOTAL SHRUB COVER (%)____________________
TOTAL FORB COVER (%) ____________________TOTAL GRAMINOID COVER (%) ____________________
TOTAL MOSS/LICHEN COVER (%) ____________________TOTAL BARE GROUND (%) ____________________

ASSOCIATED PLANT COMMUNITY (dominant species):____________________
____
____
____
____
____

HABITAT TYPE (if known): ____________________

SOIL TYPE/TEXTURE (include type of bedrock, if known): ____________________

POPULATION SIZE:

ESTIMATED # OF INDIVIDUALS (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): ______________________________

OF SUBPOPULATIONS (if applicable): ______________________________

SIZE OF POPULATION AREA (acres): ______________________________

BIOLOGY:

PHENOLOGY (% flower, fruit, dispersed fruit, vegetative): ______________________________

ANY SYMBIOTIC OR PARASITIC RELATIONSHIPS?: ______________________________

EVIDENCE OF DISEASE, PREDATION OR INJURY?: ______________________________

EVIDENCE OF SEED DISPERSAL AND ESTABLISHMENT: ______________________________
____
____

DOCUMENTATION:

PHOTOGRAPH TAKEN? (if so, indicate photographer and repository): ______________________________
____

SPECIMEN TAKEN? (if so, list collector, collection #, and repository): ______________________________
____

IDENTIFICATION (list name of person making determination, and/or name of flora or book used):______________________________
____

ECODATA PLOT NUMBER (generally completed by FS): ______________________________

EVIDENCE OF DISTURBANCE: ______________________________
____
____

MEASURES FOR PROTECTION:______________________________
____
____
____
____

INVASIVE / NOXIOUS PLANT SPECIES TO BE REPORTED WHEN OCCURRING ON A

5. PROJECT SURVEY SITE

FORBS	
Artemisia absinthium	Absinth Wormwood
Carduus acanthoides	Musk Thistle
Cardaria draba	Hoary Cress
Carduus nutans	Plumeless Thistle
Centaurea diffusa	Diffuse Knapweed
Centaurea maculosa	Spotted Knapweed
Centaurea repens	Russian Knapweed
Centaurea solstitalis	Yellow Starthistle
Cirsium arvense	Canada Thistle
Convolvulus arvensis	Field Bindweed
Euphorbia esula	Leafy Spurge
Cynoglossum officinale	Houndstongue
6. *Hyoscyamus niger*	Henbane
Lythrum salicaria	Purple Loosestrife
Melilotus spp.	Yellow or White Sweetclover
Sonchus spp.	Sowthistle
Tamarix spp.	Saltcedar
GRASSES	
Agropyron cristatum	Crested Wheatgrass
Agropyron elongatum	Tall Wheatgrass
Agropyron intermedium	Intermediate Wheatgrass
Agropyron repens	Quackgrass
Bromus inermis	Smooth Brome
Bromus japonicus	Japanese Brome
Bromus tectorum	Downy Brome / cheatgrass
Poa Pratensis	Kentucky bluegrass
Poa compressa	Canada bluegrass

SITE AND SETTING FORM

Site and Setting Form for Inventory Information

SITE ID **®**
DATE (MMDDYYY) **®**
Project Name
Site Sample Type ®

LAST **Name®**	***FIRST*** **Name ®**	
Ownership ®		
Region ® 01	**National Forest/Grassland ® 18**	**District ®**
State North Dakota	**County Number®**	**County Name**

Location Information

USGS Quad Name		
Township / Range / Section		
Q SEC	**QQ SEC**	**QQQ SEC**

Geodetic Datum	**NAD83 is required**		
Lat dms:	**Degrees ______ N**	**Minutes __ __**	**Seconds __ __.__ __**
Long dms:	**Degrees _______ W**	**Minutes __ __**	**Seconds __ __.__ __**

Existing Vegetation Information

Please enter major dominance types found on the project area.

Dominant Life Form ®
Dominance Type
Dominance Type
Dominance Type
Dominance Type

Potential Vegetation Information

Habitat Type Name
Habitat Type Name
Habitat Type Name
Habitat Type Name
Habitat Type Name
Habitat Type Name

Description of past & current land use practices including reclaimed or active oil wells, roads, utility corridors, misc. developments, and apparent livestock grazing patterns. Include observations of species composition in regards to native versus non-native (invasive).

Estimate current acreage or mileage of active and reclaimed access roads, utility corridors, or other developments within ½ mile radius of project area. Document source of data as observed or compiled from GIS software and/or aerial photographs.

ACTIVE

RECLAIMED

Other Comments

Plant Survey Form

Area Surveyed __ __ __ __ __ __ __ __ ®	Unit of Measure ____________________________®
Survey Method___________________________®	Survey Type__________________________________

Invasive Plants and Noxious Weeds

Species:	Extent (area):
Description & Location:	
Species:	Extent:
Description & Location:	
Species:	Extent:
Description & Location:	
Species:	Extent:
Description & Location:	

Plant Species List (use additional format if needed)

Plant Name	Comments

USFS DPG Site and Setting Form Field Guide

Using the form in the Field

The Site and Setting Form will be used to record information on the location, site, and ecological setting.

Site ID [Var char 2(30)] ***Required***

Filled in by District Botanist

Date [Date (12)] ***Required***
Record the calendar month, day, and year the site was visited.

Code	Description
01/23/1984	January 23, 1984

Project Name Code (10-VarChar) Required
Use the code "O&G-survey" for botany surveys for oil and gas facilities and associated pipelines and roads.

Code	Project Name
O&G-survey	List project or company name, including well/pipeline name etc.

Site Sample Type (4-Char) Required
Record site sample type. For oil & gas associated surveys it should be FLGE.

Site Sample Type	Description
FLGE	Flora-general description

Examiner's Last, First Name and Middle Initial [Varchar 2(40)] ***Required***
Record the examiner's last, and first name is required. The middle initial is optional.

Last Name	First Name	Middle Initial
MacDonald	John	Q

<u>Ownership</u> (10-VarChar) Required. Record the landownership where the site is located. In the case of multiple ownerships, record the landownership where the preponderance of the site is located.

CODE	DESCRIPTION
USFS	U.S.D.A. Forest Service
PRIV	Private
STDL	State Land Dept.
OTH	Other
BLM	Bureau of Land Management

<u>Region</u> (2-Num) Required. Record 01 for Region One.

Region	Description
01	R 1 - Northern Region

<u>National Forest/Grassland</u> (2-Num) **Required.** Record 18 for the DPG.

National Forest/Grassland	Description
18	Dakota Prairie Grasslands

<u>District</u> (2-Num) **Required.** Record the Ranger District number where the site is located.

District Code	Description
07	Medora Ranger District
08	McKenzie Ranger District

<u>State</u> (7-VarChar) **Required.** Record the code for the state in which the site is located.

State	State Name
ND	North Dakota

<u>County Number (</u>7-VarChar) **Required and <u>County Name</u>** (255 VarChar)

County Number	County Name
007	Billings
033	Golden Valley
053	McKenzie
087	Slope

<u>USGS Quads Name</u> (8 Num, 40 VarChar). Record the USGS Quads Name where the site is located.

USGS Quad Name
Pretty Butte

Township/Direction and Range/Direction (60 VarChar). Record the Township and Direction and the Range and Direction where the site is located.

Township/Dir & Range/Dir	Description
7 N 14 E	Township 7 North Range 14 East

Section (3 VarChar). Record the Section where the site is located.

Section Code	Description
16	Section 16

Quarter Section (3 VarChar). Record the ¼ section subdivision where the site is located.

Q Section	Description
NE	NW ¼ of Section 16, T.7 N., R.69W. of 6th P.M

Quarter, Quarter Section (3 VarChar). Record the ¼¼ section subdivision where the site is located.

Quarter, Quarter Section	Description
SE	SW ¼ of NW ¼ of Section 16, T.7 N., R.69W. of 6th P.M

Quarter, Quarter, Quarter Section (3 VarChar). Record the ¼¼¼ section subdivision of the site.

Quarter, Quarter, Quarter Section	Description
SW	SE ¼ of SW ¼ of NW ¼ of Section 16, T.7 N., R.69W. of 6th P.M

Latitude and Longitude (Degrees, minutes, seconds)

Datum (6 VarChar) Record the geodetic datum for the Latitude and Longitude coordinates.

Datum	Description
NAD-83	North American Datum of 1983

<u>**Latitude (degree, minute, second)**</u> **(**9 VarChar)
Record the site latitude as measured by a Global Positioning System (GPS). Latitude consists of a 2-Character "degree", a 2-Character "minute", and a 4 character, 2 decimal "second". **(Default North Latitudes.)**

Latitude	Description
422006.07	Degree, minutes, seconds

<u>**Longitude (degree, minute, second)**</u> **(**10 VarChar)
Record the site longitude as measured by a GPS. Longitude consists of a 3-Character "degree", a 2-Character "minute", and a 4 character, 2 decimal "second". **(Default West Longitudes.)**

Longitude Code	Description
1051052.06	Degree, minutes, seconds

<u>**Dominant Life Form**</u> **(2, 50** VarChar) **®.** Dominant life form on the site, transect or polygon. Dominant life form is defined as the characteristic form or appearance of a species at maturity.

Dominant Life form	Description	Corresponding PLANTS Life form
FB	Forb/herb	FB
GR	Graminoid	GR
NP	Nonvascular Plant	NP
SH	Shrub	SH
SS	Sub shrub	SS
TR	Tree	TR
UK	Unknown	

<u>**Dominance Type**</u>
Enter the dominance types using a naming convention that uses two dominant species for that type.

Dominance Type (examples)
Agropyron smithii/Bouteloua gracilis
Agropyron cristatum/Stipa comata

<u>Habitat Type Code and Habitat Type Name</u> (30, 240 VarChar)
The code associated with a habitat type. These codes are for regionally stewarded PNV habitat classification codes. The collective area which one plant association occupies or will come to occupy as succession advances.

LMNG Habitat Type Names
Agropyron smithii-Stipa viridula
Agropyron smithii-Stipa viridula-Bouteloua gracilis
Agropyron smithii-Stipa comata
Andropogon scoparius-Carex filifolia
Andropogon gerardii
Calamovilfa longifolia-Carex
Distichlis spicata
Puccinellia nuttalliana-Distichlis spicata
Stipa comata-Carex filifolia
Artemisia arbuscula-Bouteloua gracilis
Artemisia cana-Agropyron smithii
Artemisia tridentata wyomingensis-Agropyron smithii
Artemisia tridentata wyomingensis-Agropyron spicatum
Atriplex confertifolia-Artemisia tridentate wyomingensis
Juniperus horizontalis-Andropogon scoparius
Potentilla fruticosa-Andropogon scoparius
Rhus aromatica-Agropyron spicatum
Rhus aromatica-Muhlenbergia cuspidate
Sarcobatus vermiculatus-Agropyron smithii
Sarcobatus vermiculatus-Agropyron spicatum
Shepherdia argentea
Symphoricarpos occidentalis
Quercus macrocarpa/Corylus sp.
Quercus macrocarpa/Prunus virginiana
Populus tremuloides/Prunus virginiana
Fraxinus pennsylvanica/Prunus virginiana
Fraxinus pennsylvanica/Ulmus americana/Prunus virginiana
Fraxinus pennsylvanica/Symphoricarpos occidentalis
Juniperus scopulorum/Oryzopsis micrantha
Juniperus scopulorum/Agropyron spicatum
Pinus flexilis/Agropyron spicatum
Pinus ponderosa/Prunus virginiana
Pinus ponderosa/Juniperus communis

Pinus ponderosa/Agropyron spicatum
Pinus ponderosa/Carex heliophilia

Plant Survey Form

7. Area Surveyed [Numeric (12,2)] *Required.* Enter the number of acres or hectares in the survey area.

Area Surveyed
1,250

Survey Area Unit of Measure [Varchar 2(12)] ***Required***
The *Survey_Area* can be measured either in acres or hectares. Enter either hectares or acres in this field, acres are the default value for this field.

Code	Description
Acres	Acres surveyed
Hectares	Hectares surveyed

Survey Method [Varchar 2(20] ***Required***
Enter the method used for the survey. The three survey methods are recognized are observed, aerial and satellite imagery.

Code	Description
Observed	Surveys that were conducted using direct observation. They could have been completed on horseback, by vehicle, walking or helicopter. This is the default value.

Survey Type [Varchar2 (20,0] ***Required***
Enter the type of survey that was conducted. Enter one or more of the following. You may enter up to three survey types.

Code	Description
Aquatic	Aquatic surveys are confined to surveys within waterbodies such as streams, lakes, ponds and irrigated canals. Vegetation can be classified as emergent, floating, hydrophytic, or submergent. For surveys that include the transition zone to uplands and areas of seasonal or periodic flooding also record riparian surveys.
Cursory	The cursory survey is appropriately used to confirm the presence of objects of interest identified in previous surveys and the prefield analysis step. By its nature, the cursory visit is rapid, but does not provide in-depth environmental information. The entire area is traversed at least once. For example, stand condition as seen in aerial photography can be verified by a cursory visit to a location. Also, a cursory visit can be used to determine if a population that had been previously cataloged at a site remains present or intact
Features	The surveyed focused on area in and adjacent to developed features such as road, trails, campgrounds, parking lots and boat launches.

Code	Description
Field Check	Field Check is where the area is given a quick “once over” but do not walk completely through the project area. The entire area is not examined.
General	The area is given a closer look by walking through the area and perimeter or by walking more than once through the area. Most of the area is examined
Focused (Intuitive Controlled)	The intuitive controlled survey is the most commonly used and most efficient method of surveying. During pre-field analysis, potential suitable habitat is identified for each species of interest and the survey effort is focused in those areas. This method requires adequate knowledge of suitable habitat in order to accurately select the areas of focused search. When conducting intuitive controlled surveys, an area somewhat larger than the identified suitable habitat should be searched to validate current suitable habitat definitions.
Random	Random surveys employ an undirected traverse through a project area. They are employed either when there is inadequate natural history information about a species to discern its suitable habitat and the surveyor is simply searching for occurrences, or when a target species is very abundant within a search area and the surveyor is attempting to make estimates of population parameters such as intra-patch variations in density or the occurrence of predation or herbivory. However, a stratified random survey may be more efficacious in these cases.
Riparian	These are surveys that follow the shoreline of waterbodies such as lakes, streams and rivers. Riparian areas are defined as those areas that form the transition between permanently saturated wetlands and upland areas. For plants or areas that are obligatory in standing or moving water use aquatic survey.
Stratified Random	The stratified random survey is most often used within known population areas of target species or when an area of unknown suitability to be surveyed is relatively large. Stratified random surveys employ a series of randomly selected plots of equal size within a project area that are each thoroughly searched for target species. When conducting a stratified random survey, it is important to search an adequate number of sites that are of sufficient size to represent an adequate sample.
Systematic	The systematic survey is typically used in limited areas where the likelihood of occurrence of a target species is evenly distributed throughout the survey area. Systematic surveys are often employed either within focused search areas (e.g., stratified random and intuitive controlled methods), or when a proposed project is likely to produce significant habitat alterations for species that are especially sensitive to the proposed activities.

Invasive Plants and Noxious Weeds: Enter the scientific names of the invasive species or noxious weeds observed in the project area and their estimated extent in acres or square meters.

Plant Species List. List the scientific name of plant species observed in the project area.

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Appendix L—Cultural Resources Documents

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STATE HISTORICAL SOCIETY OF NORTH DAKOTA

September 3, 2013

September 3, 2013

Mr. Brian P. Kalk, Chairman
North Dakota Public Service Commission
600 East Boulevard Avenue, Department 408
Bismarck, North Dakota 58505-0840

NDSHPO Ref.: 12-1016 PSC/WAPA Basin Electric Power Cooperative Antelope Valley Station to Neset 345kV Transmission Line
PSC: PU-11-696

Dear Chairman Kalk:

We wish to inform the PSC with respect to the current status of project activity and review for **12-1016** "Basin Electric Power Cooperative Antelope Valley Station to Neset 345kV Transmission Line." The State Historical Society of North Dakota (SHSND)/North Dakota State Historic Preservation Office (NDSHPO) are presently participating and engaged in on-going consultations with the applicant, Basin Electric Power Cooperative on particular matters that are addressed in the ensuing paragraphs. As the PSC also is undoubtedly aware, the project is an undertaking that is subject to federal regulations and permitting, and with accompanying concurrent review activity by the Western Area Power Administration (WAPA) and the NDSHPO.

The SHSND/NDSHPO received and initially commented on an April 2013 preliminary project cultural resources report: "Basin Electric Cooperative's Antelope Valley Station to Neset 345kV Transmission Line: A Class II and Class III Cultural Resource Inventory in Dunn, McKenzie, Mercer, Mountrail, and Williams Counties, North Dakota Interim Report." The cultural resources survey is not complete with an estimated 20% of the project corridor yet to be inventoried and reported on for cultural resources. At this point, it is important to reiterate that the project is not complete in terms of overall project cultural resources review and with concurrence on determinations of project effects from either a state or federal regulatory perspective.

As the result of on-going consultations with Basin Electric the following project activities and actions are to take place in the Killdeer Mountain Battlefield core and study areas that address identified cultural resource concerns and potential effects from the project. These are:

(1) Proposed Electrical Substation will be moved to an alternate approved location outside the Killdeer Mountain Battlefield core area;

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Comments
State Historical Society of North Dakota
Merlan Paaverud, Jr.

(2) Visual effects assessments of the proposed transmission line from the perspective of the overlooking and elevated (a) "Medicine Hole" locality and from the down slope (b) Killdeer Mountain Battlefield State Historic Site (32DU1094) location will be undertaken and reviewed;

(3) Geophysical investigations (using a magnetometer) are proposed along the transmission line route for the 8-mile length of the Killdeer Mountain Battlefield study area treated in the National Park Service American Battlefield documentation. The aim is to identify battlefield-related deposits or artifacts along this stretch of the proposed transmission corridor route. At the present time, no definitive battlefield-related deposits or artifacts have been identified in the transmission line corridor based on the interim cultural resources report; and,

(4) At the proposed structure locations additional archaeological testing work will be undertaken.

It is important to note that in 1993 when the Killdeer Mountain State Historic Site (32DU1094) location was formally recorded with the SHSND/NDSHPO that the full extent of the site boundaries were not defined and established at that time. The 2010 National Park Service Battlefield core study area is based on historic records and did not include a professional archaeological inventory or assessment of subsurface features.

To summarize, the **12-1016** project reporting for cultural resources is incomplete at the present time but the aforementioned activities and actions are to be undertaken and completed. At that future time, following subsequent state and federal review activities, determinations of overall project effect will be made and issued. Best practices dictate that final review activities be undertaken for projects that are complete in order to alleviate the need for later revisions or reroutes.

Thank you for the opportunity to comment on this project. If you have any questions, please contact Fern Swenson fswenson@nd.gov at (701-328-3575), Paul Picha at (701) 328-3574 or ppicha@nd.gov, or Susan Quinnell at (701) 328-3576 or squinnell@nd.gov.

Sincerely,

Merlan E. Paaverud, Jr.

Merlan E. Paaverud, Jr.
State Historic Preservation Officer (North Dakota)
and
Director, State Historical Society of North Dakota

DRAFT PROGRAMMATIC AGREEMENT
AMONG
THE WESTERN AREA POWER ADMINISTRATION,
THE RURAL UTILITIES SERVICE,
THE U.S. FOREST SERVICE,
AND
THE NORTH DAKOTA STATE HISTORIC PRESERVATION OFFICE
REGARDING
THE AVS-NESET 345 kV TRANSMISSION LINE PROJECT
TO BE CONSTRUCTED IN
MERCER, DUNN, BILLINGS, MCKENZIE, WILLIAMS AND MOUNTRAIL COUNTIES, NORTH DAKOTA

WHEREAS, in accordance with the Rural Electrification Act of 1936 (7 U.S.C. §§ 901-950b), the Rural Utilities Service (RUS) is authorized to provide federal financial assistance for the development of electric infrastructure in rural America; and

WHEREAS, Basin Electric Power Cooperative, Inc. (Basin Electric) intends to request federal financing assistance from RUS to modify four (4) existing substations-Antelope Valley Station (AVS), Charlie Creek, Williston and Neset - and to construct approximately 278 miles of transmission line - 265 miles of new 345 kilovolt (kV) transmission line and 13 miles of new 230 kV line – along with five (5) new substations (Blue, Judson, Tande, Red and White), and ancillary facilities, such as access roads, and temporary construction work and staging areas, in Mercer, Dunn, Billings, McKenzie, Williams and Mountrail Counties, North Dakota (AVS-Neset Project); and

WHEREAS, in accordance with the Federal Power Act, 16 U.S.C. Chapter 12, the Western Area Power Administration (Western) is authorized to provide interconnections among electric facilities; and

WHEREAS, Basin Electric has requested that Western authorize an interconnection between the Williston Substation and the Williston to Charlie Creek 230 kV transmission line; and

WHEREAS, the U.S. Forest Service (USFS) is considering a request by Basin Electric for the AVS-Neset Project to cross lands managed by that federal agency; and

WHEREAS, RUS, Western and USFS (the Agencies) have determined that the individual federal actions which each may take regarding the AVS-Neset Project would make the AVS-Neset Projectan undertaking subject to review under Section 106 of the National Historic Preservation Act, 16 U.S.C. § 470, and its implementing regulations, "Protection of Historic Properties" (36 CFR Part 800); and

WHEREAS, RUS and USFS have agreed, in accordance with 36 CFR § 800.2(a)(2), that Western will be the lead federal agency for the purposes of review under 36 CFR Part 800 (Section 106 review); and

WHEREAS, RUS has been designated as the lead agency for review under the National Environmental Policy Act (NEPA) conducted pursuant to 7 CFR Part 1794; and

WHEREAS, based on the NEPA analysis conducted pursuant to 7 CFR Part 1794, RUS will select a 1000-foot wide corridor within which the AVS-Neset Project can be constructed; and

WHEREAS, the North Dakota Public Service Commission will select the 150-foot-wide right-of-way (ROW), preferably located within the RUS corridor, for construction of the AVS-Neset Project; and

WHEREAS, Western has determined that the area of potential effects (APE) for this undertaking consists of the 150-foot-wide ROW, beginning at the AVS near Beulah, North Dakota and terminating at the Neset Substation near Tioga, North Dakota, as well as all Project-related access roads, associated appurtenances, such as substations, and ancillary facilities, such as temporary construction work and staging areas that may be located outside of the ROW and may not be contiguous (Attachment 1); and

WHEREAS, Western also has established an APE for visual effects that is one-half mile wide from the centerline on either side of the ROW (Attachment 2); and

WHEREAS, in accordance with 36 CFR § 800.4(b)(2) and 36 CFR § 800.5(a)(3), respectively, Western is phasing identification and evaluation of historic properties, and application of the criteria of adverse effect because the AVS-Neset Project consists of a corridor where access has been restricted in certain cases; and

WHEREAS, in accordance with 36 CFR § 800.14(b)(1)(ii), execution of a Programmatic Agreement (PA) is appropriate because effects on historic properties cannot be fully determined prior to approval of the Project; and

WHEREAS, RUS has agreed to manage the development and execution of this PA on behalf of Western; and

WHEREAS, in consultation with the SHPO, Western has determined that the AVS-Neset Project could have an adverse effect on historic properties (that is, properties which are listed on or eligible for listing on the NRHP); and

WHEREAS, on January 31, 2012, Western invited the Flandreau Santee Sioux Tribe, the Santee Sioux Nation, the Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation, the Spirit Lake Nation, the Fort Belknap Indian Community, the Standing Rock Sioux Tribe (SRST), the Leech Lake Band of Ojibwe, the Three Affiliated Tribes of the Fort Berthold Reservation, the Lower Sioux Indian Community, the Turtle Mountain Band of Chippewa, the Minnesota Chippewa Tribe, the Upper Sioux Indian Community, the Prairie Island Indian Community, and the White Earth Band of Ojibwe to participate in consultation for the AVS-Neset Project; and

WHEREAS, the Leech Lake Band of Ojibwe declined the invitation to participate in consultation; and

WHEREAS, the White Earth Band of Ojibwe declined the invitation to participate in consultation, but asked to be kept informed of the progress of Section 106 review; and

WHEREAS, the remaining twelve (12) Indian tribes did not respond to the January 31, 2012 invitation; and

WHEREAS, in February 2013, the SRST asked to participate in consultation for the AVS-Neset Project; and

WHEREAS, in April 2013, Western confirmed consulting party status for the SRST; and

WHEREAS, in September 2013, the Sisseton Wahpeton Oyate (SWO) requested and was granted consulting party status; and

WHEREAS, the SRST and the SWO have participated in consultation and have been invited to sign this PA as concurring parties; and

WHEREAS, Basin Electric has participated in consultation and has been invited to sign this PA as an invited signatory; and

WHEREAS, the Killdeer Mountain Alliance (KMA) has participated in consultation and has been invited to sign this PA as a concurring party; and

WHEREAS, the Center for Heritage Renewal at North Dakota State University (Center) has participated in consultation and has been invited to sign this PA as a concurring party; and

WHEREAS, the American Battlefield Protection Program (ABPP) has participated in consultation and has been invited to sign this PA as a concurring party; and

WHEREAS, Mr. and Mrs. Craig Dvirnak have participated in consultation and have been invited to sign this PA as concurring parties; and

WHEREAS, the North Dakota SHPO, SRST, SWO, Basin Electric, KMA, Center ABPP and the Dvirnaks are considered "consulting parties;" and

WHEREAS, on March 25, 2014, RUS, on behalf of Western, invited the Advisory Council on Historic Preservation (ACHP) to participate in consultation, in accordance with 36 CFR § 800.6(a)(1)(i)(C), providing the specified documentation; and

WHEREAS, via email dated April 10, 2014 the ACHP advised RUS that it would participate in consultation; and

WHEREAS, pursuant to 36 CFR § 800.6(a)(1)(iii), the ACHP will submit a formal notification of its decision to participate in consultation to Western; and

WHEREAS, definitions of the terms used in this PA are defined in 36 CFR § 800.16;

NOW, THEREFORE, the Agencies, the ACHP, and the North Dakota SHPO agree that the undertaking will be implemented in accordance with the following stipulations in order to take into account the effect of the undertakings on historic properties.

STIPULATIONS

The Agencies will ensure that the following stipulations are carried out.

I. STANDARDS AND CONDITIONS

A. Archeological, historical, or architectural studies, including visual effects analysis, required by the Agencies under the terms of this PA will be carried out by or under the direct supervision of a professional who, at a minimum, meets the Secretary of the Interior's *Professional Qualification Standards* (48 FR 44716, September 29, 1983) in the appropriate field.
B. Studies to identify and evaluate historic properties of importance to Indian tribes will be carried out by or under the direct supervision of an individual who possesses the requisite

knowledge and expertise as recognized by the SRST and SWO, and who have been identified as tribal cultural specialists by those tribes.

C. Basin Electric will not initiate construction of any segment of the AVS-Neset Project until Section 106 review conducted in accordance with the terms of this PA has been satisfied for that segment.

D. In order to ensure that the terms of this PA are properly coordinated and implemented, Basin Electric will establish and facilitate open communication between its engineers, environmental contractors, tribal cultural specialists, and professional archeologists during the performance of the phased identification and treatment, and phased construction of AVS-Neset Project components.

E. Western, in consultation with RUS and USFS, may identify and invite other parties to participate in consultation during implementation of the terms of this PA. A copy of Western's invitation and the party's affirmative response will be attached to this PA. The newly participating party will be considered to be one of the consulting parties as defined in the Preamble to this PA.

II. IDENTIFICATION AND TREATMENT

A. Identified Historic Properties

1. The Agencies and the North Dakota SHPO have agreed to treat the Killdeer Mountain , Medicine Hole (32DUX370) and an as yet undetermined area surrounding the Killdeer Mountain Battlefield State Historic Site, referred to in this PA as the Killdeer Mountain Engagement, as eligible for listing on the NRHP for the purposes of Section 106 review for the AVS-Neset Project only. The Killdeer Mountain Engagement historic property overlaps with, but is believed to be smaller than the preliminary boundaries of the core and study areas of the Killdeer Mountain Battlefield (KMB) as defined by the ABPP in 2010.
2. The Agencies and SHPO agree that because of its religious significance to Indian tribes, particularly its past use for vision quests, the boundaries of Killdeer Mountain are not finite.
3. The Agencies and SHPO further agree that due to costs and schedules it is not reasonable to definitively identify the boundaries of the Killdeer Mountain Engagement historic property at this time.
4. In accordance with 36 CFR § 800.5(b) and (c), the Agencies will formally propose for consulting party review that the AVS-Neset Project will have no adverse effect on Killdeer Mountain, Medicine Hole, or the Killdeer Mountain Engagement historic property. After consideration of objections filed in accordance with 36 CFR § 800.5(c)(2) and (3), should the Agencies agree that the AVS-Neset Project will have an adverse effect on any of the above historic properties, they will consult with the consulting parties to identify appropriate treatment in accordance with Stipulation II.G of this PA.

B. Phasing: For each constructive component of the AVS-Neset Project, Basin Electric will complete the requirements of Stipulations II through VII as directed by the Agencies.

C. Design Changes: Each and every change in the location of AVS-Neset Project components is subject to review under the terms of this PA. Basin Electric will submit any proposed design change which might alter the APE to the Agencies for their review. The Agencies, in consultation with the consulting parties, will determine if, pursuant to 36 CFR § 800.4(b)(1), study is needed to identify affected historic properties for the specific design change. Investigation and treatment of historic properties for design changes will be implemented by Basin Electric in accordance with the terms of this PA.

D. Identification: For each constructive component of the AVS-Neset Project, Basin Electric will conduct study of the APE, as directed by the Agencies, to identify historic properties which might be affected by the AVS-Neset Project pursuant to the regulatory standard established by 36 CFR § 800.4(b)(1). This effort consists of the following studies:

1. In order to identify known historic properties and other cultural resources in the APE, at the direction of Western Basin Electric completed a Class I literature review of a large study area which contains the APE.
2. In September 2012, Basin Electric initiated and will continue to implement Class II (Reconnaissance) and Class III (pedestrian) cultural resources surveys of the ROW, reroutes, access roads, substations and laydown areas wherever access has been granted by the private landowner. Findings to date are described in the interim report titled, Basin Electric Power Cooperative's Antelope Valley Station to neset 345 kV Transmission Line: A C lass II and Class III Cultural Resource Inventory in Dunn, McKenzie, Mercer, Mountrail and Williams Counties, North Dakota, Interim Report (April 2013). This survey includes subsurface testing of structure locations only within the eight (8) miles which cross the 2010 KMB study area, and any other parts of the APE that would be impacted by construction activities.
3. The findings of Basin Electric's geophysical survey (metal detection inventory) of eight (8) miles of the centerline of the ROW which may cross the Killdeer Mountain Engagement historic property is presented in the report titled, *Draft Basin Electric Power Cooperative's Antelope Valley State To Neset 345 kV Transmission Line: 2013 Supplemental Investigations Through The Killdeer Mountain Battlefield Study Area in Dunn County North Dakota* (February 2014).
4. In October 2013, Basin Electric initiated and will continue to conduct a survey of the APE to identify historic properties of importance to the SRST and the SWO. This survey is being performed by the SRST's preferred tribal cultural specialist (Basin Electric's contractor). The preferred tribal cultural specialist has completed study of the Project segment between AVS and the Missouri River wherever permission to access for survey had been granted in November, 2013. The Tribal Cultural Survey will resume in the Spring of 2014.
5. Western, in consultation with RUS, USFS and the consulting parties, may require that Basin Electric conduct a study of the APE for indirect effects to identify historic properties which might experience adverse visual effects resulting from construction of the AVS-Neset Project.
6. As directed by Western, Basin Electric will conduct evaluation studies, as appropriate, in accordance with 36 CFR § 800.4(c)(1).

E. Interim Report: When the studies described in Stipulation II.D have been completed for a particular constructive component or components, Basin Electric will prepare a draft interim report to submit to Western which will then distribute it to RUS, USFS and the consulting parties.

1. The interim report will
   a. Describe the historic properties and other cultural resources identified and the methods of identification;
   b. Identify those resources for which additional study might be needed;
   c. Include recommendations regarding the NRHP eligibility of identified cultural resources;

   d. Illustrate the geographic relationship between the identified historic properties and other cultural resources, the APE, the ROW, and the proposed structures and other AVS-Neset Project -related ground disturbance; and
   e. Propose treatment, including those measures which would avoid adverse effects.

2. When determined acceptable by the Agencies, Western will submit the draft interim report to the consulting parties for their review. The consulting parties will have thirty (30) days from receipt to provide written comments to Western on the draft interim report.
3. Western will ensure that written comments submitted in a timely manner are considered in preparation of the final interim report.

F. Avoidance: The avoidance of adverse effects to historic properties is the treatment preferred by Western, RUS and USFS. Accordingly, Basin Electric will seek agreement with Western, RUS, USFS and the consulting parties on the identification and implementation of appropriate and reasonable avoidance measures.

   1. Whenever the parties agree, Basin Electric will incorporate agreed upon avoidance measures into the draft interim report required under Stipulation II.D, and AVS-Neset Project plans and specifications.
   2. Wherever the parties cannot agree, the Agencies will consult with the consulting parties either to identify appropriate treatment in accordance with Stipulation II.G or resolve the dispute in accordance with Stipulation IX.

G. Treatment
   1. Pursuant to 36 CFR § 800.4(c)(2) and 36 CFR § 800.5(a), Western, in consultation with RUS, USFS and the consulting parties, will determine if historic properties are located in the APE and that will be adversely affected by construction of a AVS-Neset Project phase. When Western determines that there may be an adverse effect, it will consult with RUS, USFS and the consulting parties to identify those treatment measures, which are in the public interest and will minimize or mitigate such effects to historic properties.
   2. When the Agencies and the consulting parties agree on treatment measures to address adverse effects to historic properties for an AVS-Neset Project phase, Basin Electric will prepare a Treatment Plan (Plan) describing the agreed upon measures, the manner in which they will be carried out, and a schedule for their implementation.
   3. Western will ensure that the Plan takes into account applicable State, tribal and professional standards and guidance.
   4. When treatment consists of or includes data recovery, the Plan will identify the specific research questions to be addressed by data recovery with an explanation of their relevance, the archeological methods to be used, and provisions for public interpretation and education subject to confidentiality restrictions required by 36 CFR § 800.6(a)(5).
   5. Basin Electric will submit the Plan to the SHPO and consulting tribes for review. These parties will have thirty (30) days from receipt to submit a written review. The Agencies will take into account timely comments and recommendations submitted by the consulting parties.
   6. The Agencies will ensure that Basin Electric implements all approved Plans prior to beginning construction of that Project component.

H. Protection During Construction
   1. Prior to beginning construction of the AVS-Neset Project phase, Basin Electric will mark and delineate identified stone features and historic properties within the APE for that phase.
   2. The marked areas will include the location of the stone feature or historic property as well as a fifty (50) foot buffer around it.
   3. Basin will include the requirement to avoid marked areas, designated as "exclusion areas," as defined in Stipulation II.H1 and 2 in construction contracts.
   4. Anytime project construction will or is likely to occur within the fifty (50) feet buffer, Western, and Basin Electric will consult with the SRST, the SWO and other consulting parties as appropriate to determine additional protective measures to be implemented.
   5. In addition, to help protect these stone features and historic properties post-construction, Basin Electric will designate their location including the 50 foot buffer as "exclusion areas" on Operation and Maintenance maps of the permanent right-of-way.

III. U.S. FOREST SERVICE LANDS

A. Prior to the release of funding for construction of any component of AVS-Neset Project that will cross USFS lands, Western will document for RUS the manner in which the terms of this PA have been implemented.
B. RUS may approve financial assistance for the construction of a component of AVS-Neset Project that will cross USFS lands once the terms of this PA have been implemented and a special use permit has been issued by the USFS.

IV. CURATION

A. Any artifacts, materials, or records removed from federal land that are not subject to the Native American Graves Protection and Repatriation Act (NAGPRA) will be curated by the federal agency in accordance with 36 CFR Part 79. The USFS will curate any artifacts, materials, or records not subject to NAGPRA at the State Historical Society of North Dakota (SHSND) Museum.
B. Basin Electric will return all artifacts and materials recovered through implementation of the terms of this PA from nonfederal lands to the respective landowner. The respective landowner may then elect to donate the artifacts and materials to a local curation facility acceptable to the SHPO/ SHSND.

V. CONFIDENTIALITY

A. The Agencies will protect information about historic properties, including location information or information provided by Indian tribes to assist in the identification of such properties, especially properties of religious and cultural significance to Indian tribes, to the extent allowable under Section 304 of the National Historic Preservation Act, 16 U. S. C. § 470w3, 36 CFR § 800.11(c) and other applicable legal requirements.
B. The Agencies will work with the SRST, SWO and Basin Electric to develop and implement additional measures to protect location information about important tribal cultural resources

VI. POST- REVIEW UNANTICIPATED DISCOVERIES ON FEDERAL LANDS

A. Basin Electric will treat the unanticipated discovery of cultural resources and human remains on Federal lands in accordance with Appendix I, *Unanticipated Discovery Plan and*

Discovery of Human Remains Protocols, Northern Region, USDA, v1, September 2011, of the Region I Heritage Protection Plan.

B. When the post-review unanticipated discovery contains human remains NAGPRA [25 U.S.C. 3001 et. seq.] and its implementing regulations (43 CFR Part 10) also apply.

VII. POST- REVIEW UNANTICIPATED DISCOVERIES ON NONFEDERAL LANDS

A. If previously unidentified historic properties or unanticipated effects to historic properties are discovered during AVS-Neset Project construction on non-federal lands, Basin Electric's construction contractor will immediately halt all activity within a one hundred (100) foot radius of the discovery; notify Basin Electric of the discovery; and implement interim measures to protect the discovery from looting and vandalism.

B. Immediately upon receipt of the notification required in Stipulation VII.A, Basin Electric, with the assistance of an individual meeting the professional standards in Stipulation I will inspect the construction site to

1. Determine the extent of the discovery;
2. Ensure that construction activities have halted;
3. Clearly mark the area of the discovery;
4. Implement additional measures, as appropriate, to protect the discovery from looting and vandalism; and
5. Notify the Agencies, the ACHP, the North Dakota SHPO, SRST and the SWO. The points of contact for such notification are listed in Attachment 3.

C. Basin Electric may resume construction outside of the 100 foot radius once the terms of Stipulation VII.B. have been completed.

D. Upon receipt of the notification, Western and RUS will treat the discovery in accordance with 36 CFR § 800.13(b)(3) and (c). The consulting parties will have 48 hours from receipt of the notification submitted in accordance with 36 CFR § 800.13(b)(3) to respond.

E. When the discovery may contain human remains, Basin Electric's construction contractor will comply with the requirements of Stipulation VII.A. Immediately upon receipt of notification from its construction contractor, Basin Electric will comply with Stipulation VI.B, notify the Intertribal Reinterment Committee of the discovery of human remains, andcomply with the requirements of North Dakota Century Code § 23-06-27 and 55-03 as well as North Dakota Administrative Code Chapter 40-02-03.

E. Basin Electric may resume construction activities in the area of the discovery once the terms of Stipulation VII have been implemented.

F. Basin Electric will ensure that the requirements of Stipulation VII are incorporated into all construction contracts.

VIII. REPORTING

A. Until construction is complete, every six (6) months following the execution of this PA, Basin Electric will submit a written report electronically to signatories and consulting s parties.

B. The report will describe

1. the period covered by the report
2. progress on implementation of the terms of the PA during that period of time,
3. the Project schedule and any proposed scheduling changes;
4. any proposed design changes;
5. progress on development of construction plans and specifications by segment,

6. construction completed during the period,
7. status of identification efforts and implementation of treatment conducted pursuant to Stipulation II; and

the treatment of any post-review discoveries pursuant to Stipulations VI and VII.

IX. DISPUTE RESOLUTION

A. Should any signatory or consulting party to this PA object in writing at any time to any actions proposed or the manner in which the terms of this PA are implemented, the Agencies, within the limits of their individual authority, will consult with such party to resolve the objection. If the Agencies agree that the objection cannot be resolved, they will forward all documentation relevant to the dispute, including the resolution they propose, to the ACHP.

B. Upon receipt of adequate documentation, the ACHP will provide the Agencies with its advice or comment on the resolution of the objection within thirty (30) days.
   1. Prior to reaching a final decision on the dispute, the Agencies, will prepare a written response that takes into account any timely advice or comment regarding the dispute received from the ACHP and other consulting parties, and provide them with a copy of this written response. The Agencies will proceed according to their final decision.
   2. If the ACHP does not provide its advice regarding the dispute within thirty (30) days, the Agencies may make a final decision on the dispute and proceed accordingly. Prior to reaching a final decision, the Agencies will prepare a written response that takes into account any timely comments from the consulting parties to the PA regarding the dispute, and provide them and the ACHP with a copy of such written response.

C. The responsibility of the Agencies to carry out all other actions subject to the terms of this PA that are not the subject of the dispute remain unchanged.

D. If at any time during the implementation of the measures stipulated in this PA an objection should be raised by the public, the signatory in receipt of the objections will notify the other signatories and consult with the objecting party to seek resolution. If the Agencies determine that the objection cannot be resolved, then they will seek the advice or comment of ACHP in accordance with Stipulation VII.A and B.

X. TERM OF AGREEMENT

A. The term of this PA will expire September 30,2019] unless the signatories agree to extend its term prior to expiration.

B. Six (6) months prior to September 30, 2019, Basin Electric will notify the Agencies and other consulting parties of the impending expiration. The Agencies may consult with the consulting parties to reconsider the terms of the PA and amend it in accordance with Stipulation XI. The Agencies will notify the consulting parties as to the course of action each will pursue.

C. The PA will terminate when all of its stipulations have been carried out and all AVS-Neset Project phases are in service.

XI. AMENDMENT

A. This PA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date it is executed by all of the signatories and filed with ACHP.

B. Prior to reaching agreement the signatories, led by Western, will consult with the consulting parties on the terms of any proposed amendment to this PA.

XII. TERMINATION

A. If any signatory to this PA determines that its terms will not, or cannot be carried out, that signatory will immediately consult with the other signatories to attempt to develop an amendment in accordance with Stipulation XI. If within thirty (30) days an amendment cannot be reached, any signatory may terminate the PA upon written notification to the other signatories.

B. Once the PA has been terminated, and prior to work continuing on the AVS-Neset Project, the Agencies must either
   1. Execute an agreement pursuant to 36 CFR Part 800; or
   2. Request, take into account, and respond to the comments of ACHP pursuant to 36 CFR § 800.7. The Agencies will notify the consulting parties as to the course of action each will pursue.

EXECUTION of this PA by the Agencies and the North Dakota SHPO, and implementation of its terms evidence that the Agencies have taken into account the effects of this undertaking on historic properties and afforded the ACHP a reasonable opportunity to comment.

Signatories:

Western Area Power Administration

By:____Date:_________

US Department of Agriculture Rural Utilities Service

By:____Date:__________
Mark S. Plank, Director
Engineering and Environmental Staff
Water and Environmental Programs

US Department of Agriculture U.S. Forest Service

By:____Date:__________

Advisory Council on Historic Preservation

By: ____Date:______________
John M. Fowler
Executive Director

North Dakota State Historic Preservation Office

By:____Date:__________
Merlan E. Paaverud, Jr.
State Historic Preservation Officer

Invited signatory:

Basin Electric Power Cooperative, Inc.

By:____Date:__________
[Name and Title of Representative of Applicant]

Tribal Concurring Parties:

Sisseton Wahpeton Oyate of the Lake Traverse Reservation

By: ____Date:______________
[Name and Title of Concurring Party]

Standing Rock Sioux Tribe

By: ____Date:______________
[Name and Title of Concurring Party]

Other Concurring Parties:

Killdeer Mountain Alliance

By: ____Date:______________

G.Edward Dickey

American Battlefield Protection Program

By: ____Date:_____________
Paul Hawke
Director

Mr. and Mrs. Craig Dvirnak

By: ____Date:_____________
Mr. and Mrs. Craig Dvirnak

North Dakota State University Center for Heritage Renewal

By: ____Date:_____________
Professor Tom Isern
Director

Appendix M—Modeled Corona Outputs

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**********************************************
*      C O R O N A   A N D   F I E L D       *
*       E F F E C T S   P R O G R A M        *
*   Source: Bonneville Power Administration  *
**********************************************


  +++++++++++++++++++
  + INPUT DATA LIST +

 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 10/ 9/2013           9:22:54 am
+********  Basin 345/3415kV EMF Calcs  *************10/07/2013*********
+****  Double-Circuit Vertical -- (1)2306.2kcmil ACSR each Ckt     ****
+      1       0       6       8   362.0    2.00    1.00     .00

(ENGLISH UNITS OPTION)

   LINE GRADIENTS COMPUTED BY PROGRAM

PHYSICAL SYSTEM CONSISTS OF   8 CONDUCTORS, OF WHICH   6 ARE ENERGIZED PHASES

+COMB  MF  XX  XX  XX  XX  XX  XX
+   4.921   6.562   9.842    .000   1.000  75.000   3.280   4.000   3.280
+345A1        A   -15.00   80.00    1   1.802     .00  209.00      .0    1.61     .00
+345B1        A   -17.00   55.00    1   1.802     .00  209.00  -120.0    1.65     .00
+345C1        A   -15.00   30.00    1   1.802     .00  209.00   120.0    1.61     .00
+345A2        A    15.00   30.00    1   1.802     .00  209.00      .0    1.65     .00
+345B2        A    17.00   55.00    1   1.802     .00  209.00  -120.0    1.65     .00
+345C2        A    15.00   80.00    1   1.802     .00  209.00   120.0    1.65     .00
+GND1         A    -8.00  110.00    1    .500     .00     .00      .0     .00     .00
+GND2         A     8.00  110.00    1    .500     .00     .00      .0     .00     .00
+       4  -300.0    25.0
+      81  -200.0     5.0
+       4   225.0    25.0
+       0      .0      .0
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COMBINED OUTPUT OF AUDIBLE NOISE, RADIO NOISE, TVI, OZONE CONCENTRATION, GROUND GRADIENT AND MAGNETIC FIELD

```
 ********  Basin 345/3415kV EMF Calcs  *************10/07/2013*********
 ****  Double-Circuit Vertical -- (1)2306.2kcmil ACSR each Ckt     ****
```

362.0 KV

	DIST. FROM CENTER OF TOWER (FEET)	HEIGHT (FEET)	MAXIMUM GRADIENT (KV/CM)	SUBCON DIAM. (IN)	NO. OF SUBCON	SUBCON SPACING (IN)	VOLTAGE L-N (KV)	PHASE ANGLE (DEGREES)	CURRENT (KAMPS)	CORONA LOSSES (KW/MI)
345A1	-15.00	80.00	16.01	1.80	1.00	.00	209.00	.00	1.605	30.157
345B1	-17.00	55.00	15.61	1.80	1.00	.00	209.00	-120.00	1.650	25.581
345C1	-15.00	30.00	16.26	1.80	1.00	.00	209.00	120.00	1.605	33.274
345A2	15.00	30.00	16.26	1.80	1.00	.00	209.00	.00	1.650	33.274
345B2	17.00	55.00	15.61	1.80	1.00	.00	209.00	-120.00	1.650	25.581
345C2	15.00	80.00	16.01	1.80	1.00	.00	209.00	120.00	1.650	30.157
GND1	-8.00	110.00	2.27	.50	1.00	.00	.00	.00	.000	.000
GND2	8.00	110.00	2.27	.50	1.00	.00	.00	.00	.000	.000

AN MICROPHONE HT.= 4.9 FT, RI ANT. HT.= 6.6 FT, TV ANT. HT.= 9.8 FT, ALTITUDE=   .0 FT
RI FREQ= 1.000 MHZ, TV FREQ= 75.000 MHZ, WIND VEL.(OZ) = 2.000 MPH, GROUND CONDUCTIVITY =   4.0 MMHOS /M
E-FIELD TRANSDUCER HT.= 3.3FT, B-FIELD TRANSDUCER HT. = 3.3FT

LATERAL DIST FROM REFERENCE (FEET)	AUDIBLE NOISE (RAIN) L50 DBA	AUDIBLE NOISE (FAIR) L50 DBA	RADIO INTERFERENCE (RAIN) L50 DBUV/M	RADIO INTERFERENCE (FAIR) L50 DBUV/M	TVI TOTAL RAIN DBUV/M	OZONE FOR RAIN RATE OF 1.00 IN/HR AT 0. FT.LEVEL PPB	ELECTRIC FIELD KV/M	MAGNETIC FIELD GAUSS
-300.0	50.7	25.7	49.7	32.7	13.4	.000000	.018	.00154
-275.0	51.2	26.2	50.7	33.7	14.7	.000000	.022	.00179
-250.0	51.6	26.6	51.7	34.7	15.5	.000000	.028	.00213
-225.0	52.1	27.1	52.8	35.8	16.5	.000000	.035	.00261
-200.0	52.7	27.7	54.2	37.2	17.6	.000000	.045	.00334
-195.0	52.8	27.8	54.4	37.4	17.8	.000000	.047	.00353
-190.0	52.9	27.9	54.7	37.7	18.1	.000000	.049	.00374
-185.0	53.0	28.0	55.0	38.0	18.3	.000000	.052	.00398
-180.0	53.2	28.2	55.3	38.3	18.6	.000000	.054	.00424
-175.0	53.3	28.3	55.7	38.7	18.8	.000000	.057	.00453
-170.0	53.4	28.4	56.0	39.0	19.1	.000000	.060	.00485
-165.0	53.6	28.6	56.3	39.3	19.4	.000000	.063	.00522
-160.0	53.7	28.7	56.7	39.7	19.7	.000000	.066	.00563
-155.0	53.9	28.9	57.0	40.0	20.0	.000000	.069	.00609
-150.0	54.0	29.0	57.4	40.4	20.3	.000000	.073	.00661
-145.0	54.2	29.2	57.8	40.8	20.6	.000000	.076	.00720

LATERAL DIST FROM REFERENCE (FEET)	AUDIBLE NOISE (RAIN) L50 DBA	AUDIBLE NOISE (FAIR) L50 DBA	RADIO INTERFERENCE (RAIN) L50 DBUV/M	RADIO INTERFERENCE (FAIR) L50 DBUV/M	TVI TOTAL RAIN DBUV/M	OZONE FOR RAIN RATE OF 1.00 IN/HR AT 0. FT.LEVEL PPB	ELECTRIC FIELD KV/M	MAGNETIC FIELD GAUSS
-140.0	54.3	29.3	58.2	41.2	21.0	.000000	.080	.00786
-135.0	54.5	29.5	58.6	41.6	21.3	.000000	.083	.00861
-130.0	54.6	29.6	59.0	42.0	21.7	.000000	.086	.00947
-125.0	54.8	29.8	59.4	42.4	22.0	.000000	.090	.01044
-120.0	55.0	30.0	59.9	42.9	22.4	.000000	.093	.01156
-115.0	55.2	30.2	60.3	43.3	22.8	.000000	.097	.01283
-110.0	55.4	30.4	60.8	43.8	23.3	.000000	.101	.01430
-105.0	55.6	30.6	61.3	44.3	23.7	.000000	.106	.01600
-100.0	55.8	30.8	61.7	44.7	24.2	.000000	.114	.01796
-95.0	56.0	31.0	62.2	45.2	24.7	.000000	.125	.02025
-90.0	56.2	31.2	62.7	45.7	25.2	.000000	.142	.02293
-85.0	56.4	31.4	63.2	46.2	25.8	.000000	.169	.02608
-80.0	56.7	31.7	63.7	46.7	26.3	.000000	.209	.02981
-75.0	56.9	31.9	64.2	47.2	27.0	.000000	.268	.03424
-70.0	57.2	32.2	64.7	47.7	27.6	.000000	.352	.03953
-65.0	57.4	32.4	65.2	48.2	28.4	.000000	.467	.04591
-60.0	57.7	32.7	66.4	49.4	29.1	.000000	.624	.05361
-55.0	58.0	33.0	67.9	50.9	30.0	.000000	.835	.06297
-50.0	58.3	33.3	69.5	52.5	30.9	.000000	1.116	.07437
-45.0	58.6	33.6	71.2	54.2	31.8	.000000	1.481	.08824
-40.0	58.9	33.9	73.0	56.0	32.9	.000000	1.940	.10499
-35.0	59.3	34.3	74.8	57.8	33.9	.000000	2.485	.12488
-30.0	59.6	34.6	76.6	59.6	35.0	.000000	3.069	.14775
-25.0	59.9	34.9	78.1	61.1	36.0	.000000	3.589	.17261
-20.0	60.1	35.1	79.1	62.1	36.7	.000000	3.887	.19741
-15.0	60.3	35.3	79.5	62.5	36.9	.000000	3.812	.21933
-10.0	60.4	35.4	79.1	62.1	36.7	.000000	3.326	.23592
-5.0	60.4	35.4	78.1	61.1	36.0	.012246	2.608	.24613
.0	60.5	35.5	76.6	59.6	35.0	.120977	2.174	.25008
5.0	60.4	35.4	78.1	61.1	36.0	.267293	2.608	.24795
10.0	60.4	35.4	79.1	62.1	36.7	.381196	3.326	.23937
15.0	60.3	35.3	79.5	62.5	36.9	.459313	3.812	.22405
20.0	60.1	35.1	79.1	62.1	36.7	.512414	3.887	.20294
25.0	59.9	34.9	78.1	61.1	36.0	.561756	3.589	.17850
30.0	59.6	34.6	76.6	59.6	35.0	.696522	3.069	.15363
35.0	59.3	34.3	74.8	57.8	33.9	.856858	2.485	.13052
40.0	58.9	33.9	73.0	56.0	32.9	.975017	1.940	.11026
45.0	58.6	33.6	71.2	54.2	31.8	1.055529	1.481	.09309
50.0	58.3	33.3	69.5	52.5	30.9	1.111975	1.116	.07880
55.0	58.0	33.0	67.9	50.9	30.0	1.152366	.835	.06700
60.0	57.7	32.7	66.4	49.4	29.1	1.180866	.624	.05727
65.0	57.4	32.4	65.2	48.2	28.4	1.199834	.467	.04922
70.0	57.2	32.2	64.7	47.7	27.6	1.210881	.352	.04254
75.0	56.9	31.9	64.2	47.2	27.0	1.215307	.268	.03697
80.0	56.7	31.7	63.7	46.7	26.3	1.214253	.209	.03229
85.0	56.4	31.4	63.2	46.2	25.8	1.208736	.169	.02835
90.0	56.2	31.2	62.7	45.7	25.2	1.199649	.142	.02500
95.0	56.0	31.0	62.2	45.2	24.7	1.187760	.125	.02215
100.0	55.8	30.8	61.7	44.7	24.2	1.173718	.114	.01970
105.0	55.6	30.6	61.3	44.3	23.7	1.158062	.106	.01759
110.0	55.4	30.4	60.8	43.8	23.3	1.141233	.101	.01576
115.0	55.2	30.2	60.3	43.3	22.8	1.123588	.097	.01418
120.0	55.0	30.0	59.9	42.9	22.4	1.105415	.093	.01279
125.0	54.8	29.8	59.4	42.4	22.0	1.086941	.090	.01158
130.0	54.6	29.6	59.0	42.0	21.7	1.068349	.086	.01051
135.0	54.5	29.5	58.6	41.6	21.3	1.049779	.083	.00957
140.0	54.3	29.3	58.2	41.2	21.0	1.031342	.080	.00874
145.0	54.2	29.2	57.8	40.8	20.6	1.013123	.076	.00800
150.0	54.0	29.0	57.4	40.4	20.3	.995185	.073	.00735
155.0	53.9	28.9	57.0	40.0	20.0	.977576	.069	.00676
160.0	53.7	28.7	56.7	39.7	19.7	.960332	.066	.00623
165.0	53.6	28.6	56.3	39.3	19.4	.943476	.063	.00576
170.0	53.4	28.4	56.0	39.0	19.1	.927025	.060	.00534
175.0	53.3	28.3	55.7	38.7	18.8	.910987	.057	.00495
180.0	53.2	28.2	55.3	38.3	18.6	.895368	.054	.00461
185.0	53.0	28.0	55.0	38.0	18.3	.880168	.052	.00430
190.0	52.9	27.9	54.7	37.7	18.1	.865383	.049	.00401
195.0	52.8	27.8	54.4	37.4	17.8	.851009	.047	.00376
200.0	52.7	27.7	54.2	37.2	17.6	.837038	.045	.00352
225.0	52.1	27.1	52.8	35.8	16.5	.772912	.035	.00264
250.0	51.6	26.6	51.7	34.7	15.5	.717356	.028	.00208
275.0	51.2	26.2	50.7	33.7	14.7	.669040	.022	.00172
300.0	50.7	25.7	49.7	32.7	13.4	.626778	.018	.00147

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***********************************************
*      C O R O N A   A N D   F I E L D        *
*        E F F E C T S   P R O G R A M        *
*   Source: Bonneville Power Administration   *
***********************************************
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+++++++++++++++++++
+ INPUT DATA LIST +

+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 10/ 9/2013            9:23: 4 am
+********  Basin 345/345kV EMF Calcs  *************10/07/2013*******
+**** (2)Single-Circuit Vertical -- (1)2306.2kcmil ACSR eack ckt ***
+      1       0       6      10   362.0    2.00    1.00     .00

(ENGLISH UNITS OPTION)

   LINE GRADIENTS COMPUTED BY PROGRAM

PHYSICAL SYSTEM CONSISTS OF  10 CONDUCTORS, OF WHICH   6 ARE ENERGIZED PHASES

+COMB  MF  XX  XX  XX  XX  XX  XX
+   4.921   6.562   9.842    .000   1.000  75.000   3.280   4.000   3.280
+345A1       A   -90.00   65.00    1   1.802     .00  209.00      .0    1.65     .00
+345B1       A   -58.00   52.50    1   1.802     .00  209.00  -120.0    1.65     .00
+345C1       A   -92.00   40.00    1   1.802     .00  209.00   120.0    1.65     .00
+345A2       A    60.00   65.00    1   1.802     .00  209.00      .0    1.65     .00
+345B2       A    92.00   52.50    1   1.802     .00  209.00  -120.0    1.65     .00
+345C2       A    58.00   40.00    1   1.802     .00  209.00   120.0    1.65     .00
+GND1        A   -83.00  100.00    1    .500     .00     .00      .0     .00     .00
+GND2        A   -67.00  100.00    1    .500     .00     .00      .0     .00     .00
+GND3        A    67.00  100.00    1    .500     .00     .00      .0     .00     .00
+GND4        A    83.00  100.00    1    .500     .00     .00      .0     .00     .00
+       4  -300.0    25.0
+      81  -200.0     5.0
+       4   225.0    25.0
+       0      .0      .0
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COMBINED OUTPUT OF AUDIBLE NOISE, RADIO NOISE, TVI, OZONE CONCENTRATION, GROUND GRADIENT AND MAGNETIC FIELD

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********  Basin 345/345kV EMF Calcs  *************10/07/2013*******
**** (2)Single-Circuit Vertical -- (1)2306.2kcmil ACSR eack ckt ***
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362.0 KV

	DIST. FROM CENTER OF TOWER (FEET)	HEIGHT (FEET)	MAXIMUM GRADIENT (KV/CM)	SUBCON DIAM. (IN)	NO. OF SUBCON	SUBCON SPACING (IN)	VOLTAGE L-N (KV)	PHASE ANGLE (DEGREES)	CURRENT (KAMPS)	CORONA LOSSES (KW/MI)
345A1	-90.00	65.00	15.36	1.80	1.00	.00	209.00	.00	1.650	22.965
345B1	-58.00	52.50	15.02	1.80	1.00	.00	209.00	-120.00	1.650	19.919
345C1	-92.00	40.00	15.69	1.80	1.00	.00	209.00	120.00	1.650	26.361
345A2	60.00	65.00	15.47	1.80	1.00	.00	209.00	.00	1.650	24.042
345B2	92.00	52.50	14.82	1.80	1.00	.00	209.00	-120.00	1.650	18.206
345C2	58.00	40.00	15.77	1.80	1.00	.00	209.00	120.00	1.650	27.270
GND1	-83.00	100.00	3.29	.50	1.00	.00	.00	.00	.000	.000
GND2	-67.00	100.00	2.52	.50	1.00	.00	.00	.00	.000	.000
GND3	67.00	100.00	3.10	.50	1.00	.00	.00	.00	.000	.000
GND4	83.00	100.00	2.58	.50	1.00	.00	.00	.00	.000	.000

AN MICROPHONE HT.= 4.9 FT, RI ANT. HT.= 6.6 FT, TV ANT. HT.= 9.8 FT, ALTITUDE=   .0 FT
RI FREQ= 1.000 MHZ, TV FREQ= 75.000 MHZ, WIND VEL.(OZ) = 2.000 MPH, GROUND CONDUCTIVITY =   4.0 MMHOS /M
E-FIELD TRANSDUCER HT.= 3.3FT, B-FIELD TRANSDUCER HT. = 3.3FT

LATERAL DIST FROM REFERENCE (FEET)	AUDIBLE NOISE (RAIN) L50 DBA	AUDIBLE NOISE (FAIR) L50 DBA	RADIO INTERFERENCE (RAIN) L50 DBUV/M	RADIO INTERFERENCE (FAIR) L50 DBUV/M	TVI TOTAL RAIN DBUV/M	OZONE FOR RAIN RATE OF 1.00 IN/HR AT 0. FT.LEVEL PPB	ELECTRIC FIELD KV/M	MAGNETIC FIELD GAUSS
-300.0	49.2	24.2	49.1	32.1	14.7	.000000	.085	.00909
-275.0	49.7	24.7	50.5	33.5	15.8	.000000	.109	.01110
-250.0	50.3	25.3	52.1	35.1	17.0	.000000	.144	.01388
-225.0	50.9	25.9	54.0	37.0	18.4	.000000	.197	.01790
-200.0	51.7	26.7	56.3	39.3	20.1	.000000	.283	.02407
-195.0	51.8	26.8	56.8	39.8	20.5	.000000	.307	.02570
-190.0	52.0	27.0	57.3	40.3	20.9	.000000	.333	.02750
-185.0	52.2	27.2	57.8	40.8	21.3	.000000	.363	.02951
-180.0	52.3	27.3	58.4	41.4	21.8	.000000	.398	.03176
-175.0	52.5	27.5	59.0	42.0	22.2	.000000	.437	.03428
-170.0	52.7	27.7	59.6	42.6	22.7	.000000	.482	.03711

LATERAL DIST FROM REFERENCE (FEET)	AUDIBLE NOISE (RAIN) L50 DBA	AUDIBLE NOISE (FAIR) L50 DBA	RADIO INTERFERENCE (RAIN) L50 DBUV/M	RADIO INTERFERENCE (FAIR) L50 DBUV/M	TVI TOTAL RAIN DBUV/M	OZONE FOR RAIN RATE OF 1.00 IN/HR AT 0. FT.LEVEL PPB	ELECTRIC FIELD KV/M	MAGNETIC FIELD GAUSS
-165.0	52.9	27.9	60.2	43.2	23.2	.000000	.535	.04031
-160.0	53.1	28.1	60.8	43.8	23.7	.000000	.598	.04394
-155.0	53.3	28.3	61.5	44.5	24.3	.000000	.671	.04807
-150.0	53.5	28.5	62.6	45.6	24.8	.000000	.760	.05276
-145.0	53.8	28.8	63.6	46.6	25.4	.000000	.867	.05812
-140.0	54.0	29.0	64.7	47.7	26.1	.000000	.998	.06422
-135.0	54.3	29.3	65.9	48.9	26.7	.000000	1.156	.07116
-130.0	54.5	29.5	67.1	50.1	27.4	.000000	1.346	.07901
-125.0	54.8	29.8	68.4	51.4	28.1	.000000	1.570	.08779
-120.0	55.0	30.0	69.6	52.6	28.8	.000000	1.827	.09747
-115.0	55.2	30.2	70.8	53.8	29.6	.000000	2.105	.10788
-110.0	55.5	30.5	71.9	54.9	30.2	.000000	2.383	.11867
-105.0	55.7	30.7	72.9	55.9	30.8	.000000	2.625	.12926
-100.0	55.9	30.9	73.6	56.6	31.2	.000000	2.785	.13887
-95.0	56.0	31.0	74.0	57.0	31.5	.000000	2.819	.14661
-90.0	56.0	31.0	74.0	57.0	31.5	.000000	2.702	.15171
-85.0	56.1	31.1	73.7	56.7	31.3	.000000	2.441	.15373
-80.0	56.1	31.1	73.1	56.1	30.9	.001280	2.086	.15262
-75.0	56.0	31.0	72.1	55.1	30.3	.022876	1.717	.14872
-70.0	55.9	30.9	71.0	54.0	29.7	.073763	1.438	.14253
-65.0	55.8	30.8	69.8	52.8	29.0	.131702	1.332	.13459
-60.0	55.7	30.7	68.8	51.8	28.3	.183752	1.377	.12541
-55.0	55.6	30.6	68.8	51.8	27.6	.227224	1.472	.11546
-50.0	55.5	30.5	68.6	51.6	26.9	.262140	1.543	.10518
-45.0	55.4	30.4	68.2	51.2	26.2	.289142	1.557	.09494
-40.0	55.3	30.3	67.7	50.7	25.6	.310539	1.511	.08509
-35.0	55.2	30.2	67.0	50.0	25.2	.333126	1.414	.07590
-30.0	55.2	30.2	66.2	49.2	24.7	.359676	1.277	.06758
-25.0	55.1	30.1	65.4	48.4	24.2	.386423	1.114	.06031
-20.0	55.0	30.0	64.5	47.5	23.7	.409437	.936	.05424
-15.0	55.0	30.0	63.7	46.7	23.5	.426992	.750	.04952
-10.0	55.0	30.0	62.8	45.8	24.0	.439014	.562	.04630
-5.0	55.0	30.0	61.9	44.9	24.5	.446194	.378	.04473
.0	55.0	30.0	62.8	45.8	25.1	.449439	.214	.04486
5.0	55.1	30.1	63.9	46.9	25.7	.449619	.210	.04669
10.0	55.2	30.2	65.0	48.0	26.3	.447475	.396	.05010
15.0	55.3	30.3	66.2	49.2	27.0	.443608	.626	.05503
20.0	55.4	30.4	67.4	50.4	27.7	.438487	.889	.06140
25.0	55.5	30.5	68.6	51.6	28.4	.432474	1.182	.06916
30.0	55.6	30.6	69.9	52.9	29.1	.425847	1.499	.07827
35.0	55.8	30.8	71.1	54.1	29.8	.418815	1.832	.08857
40.0	55.9	30.9	72.2	55.2	30.5	.411536	2.156	.09980
45.0	56.1	31.1	73.2	56.2	31.1	.404131	2.438	.11147
50.0	56.1	31.1	73.9	56.9	31.5	.396689	2.633	.12288
55.0	56.2	31.2	74.3	57.3	31.8	.389276	2.696	.13316
60.0	56.2	31.2	74.3	57.3	31.8	.381941	2.605	.14148
65.0	56.2	31.2	74.0	57.0	31.6	.374721	2.370	.14724
70.0	56.1	31.1	73.3	56.3	31.2	.368979	2.045	.15020
75.0	55.9	30.9	72.4	55.4	30.6	.384632	1.718	.15045
80.0	55.8	30.8	71.3	54.3	30.0	.431076	1.498	.14831
85.0	55.6	30.6	70.1	53.1	29.3	.485105	1.457	.14415
90.0	55.4	30.4	68.9	51.9	28.5	.533241	1.551	.13836
95.0	55.2	30.2	68.1	51.1	27.8	.572678	1.680	.13132
100.0	55.0	30.0	67.9	50.9	27.1	.603403	1.779	.12340
105.0	54.8	29.8	67.5	50.5	26.5	.626042	1.823	.11498
110.0	54.6	29.6	66.9	49.9	25.8	.642762	1.809	.10639
115.0	54.3	29.3	66.3	49.3	25.2	.659758	1.747	.09792
120.0	54.1	29.1	65.5	48.5	24.6	.679654	1.651	.08979
125.0	53.9	28.9	64.7	47.7	24.1	.699254	1.535	.08214
130.0	53.7	28.7	63.8	46.8	23.6	.715193	1.409	.07507
135.0	53.5	28.5	62.9	45.9	23.1	.726045	1.282	.06861
140.0	53.2	28.2	62.1	45.1	22.6	.731833	1.159	.06275
145.0	53.0	28.0	61.2	44.2	22.1	.733237	1.045	.05747
150.0	52.8	27.8	60.4	43.4	21.7	.731116	.939	.05272
155.0	52.7	27.7	59.5	42.5	21.3	.726283	.844	.04847
160.0	52.5	27.5	58.7	41.7	20.9	.719427	.759	.04465
165.0	52.3	27.3	58.0	41.0	20.5	.711104	.683	.04123
170.0	52.1	27.1	57.2	40.2	20.1	.701746	.615	.03816
175.0	51.9	26.9	56.5	39.5	19.8	.691687	.555	.03541
180.0	51.8	26.8	55.8	38.8	19.4	.681181	.503	.03292
185.0	51.6	26.6	55.2	38.2	19.1	.670420	.456	.03068
190.0	51.5	26.5	54.8	37.8	18.8	.659547	.414	.02865
195.0	51.3	26.3	54.4	37.4	18.5	.648670	.378	.02682
200.0	51.2	26.2	54.0	37.0	18.2	.637867	.345	.02515
225.0	50.5	25.5	52.1	35.1	16.8	.586538	.229	.01873
250.0	49.9	24.9	50.6	33.6	15.6	.541180	.160	.01450
275.0	49.4	24.4	49.2	32.2	14.6	.501834	.118	.01156
300.0	49.0	24.0	48.0	31.0	13.7	.467742	.090	.00944

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***********************************************
*      C O R O N A   A N D   F I E L D       *
*        E F F E C T S   P R O G R A M       *
*   Source: Bonneville Power Administration   *
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  +++++++++++++++++++
  + INPUT DATA LIST +

 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
10/ 9/2013            9:23:15 am
+********  Basin 345/345kV EMF Calcs  *************10/07/2013*******
+**** (2)Single-Circuit H-Frame -- (1)2306.2kcmil ACSR eack ckt ***
+      1       0       6      10   362.0    2.00    1.00     .00

(ENGLISH UNITS OPTION)

   LINE GRADIENTS COMPUTED BY PROGRAM

PHYSICAL SYSTEM CONSISTS OF  10 CONDUCTORS, OF WHICH   6 ARE ENERGIZED PHASES

+COMB  MF  XX  XX  XX  XX  XX  XX
+   4.921   6.562   9.842    .000   1.000  75.000   3.280   4.000   3.280
+345A1        A  -103.00   42.00    1   1.802     .00  209.00      .0    1.65     .00
+345B1        A   -75.00   42.00    1   1.802     .00  209.00  -120.0    1.65     .00
+345C1        A   -47.00   42.00    1   1.802     .00  209.00   120.0    1.65     .00
+345A2        A    47.00   42.00    1   1.802     .00  209.00      .0    1.65     .00
+345B2        A    75.00   42.00    1   1.802     .00  209.00  -120.0    1.65     .00
+345C2        A   103.00   42.00    1   1.802     .00  209.00   120.0    1.65     .00
+GND1         A   -93.00   75.00    1    .500     .00     .00      .0     .00     .00
+GND2         A   -57.00   75.00    1    .500     .00     .00      .0     .00     .00
+GND3         A    57.00   75.00    1    .500     .00     .00      .0     .00     .00
+GND4         A    93.00   75.00    1    .500     .00     .00      .0     .00     .00
+       4  -300.0    25.0
+      81  -200.0     5.0
+       4   225.0    25.0
+       0      .0      .0
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COMBINED OUTPUT OF AUDIBLE NOISE, RADIO NOISE, TVI, OZONE CONCENTRATION, GROUND GRADIENT AND MAGNETIC FIELD

******** Basin 345/345kV EMF Calcs *************10/07/2013*******
**** (2)Single-Circuit H-Frame -- (1)2306.2kcmil ACSR eack ckt ***

362.0 KV

	DIST. FROM CENTER OF TOWER (FEET)	HEIGHT (FEET)	MAXIMUM GRADIENT (KV/CM)	SUBCON DIAM. (IN)	NO. OF SUBCON	SUBCON SPACING (IN)	VOLTAGE L-N (KV)	PHASE ANGLE (DEGREES)	CURRENT (KAMPS)	CORONA LOSSES (KW/MI)
345A1	-103.00	42.00	14.87	1.80	1.00	.00	209.00	.00	1.650	18.596
345B1	-75.00	42.00	15.81	1.80	1.00	.00	209.00	-120.00	1.650	27.757
345C1	-47.00	42.00	15.06	1.80	1.00	.00	209.00	120.00	1.650	20.267
345A2	47.00	42.00	15.06	1.80	1.00	.00	209.00	.00	1.650	20.267
345B2	75.00	42.00	15.81	1.80	1.00	.00	209.00	-120.00	1.650	27.757
345C2	103.00	42.00	14.87	1.80	1.00	.00	209.00	120.00	1.650	18.596
GND1	-93.00	75.00	2.87	.50	1.00	.00	.00	.00	.000	.000
GND2	-57.00	75.00	1.90	.50	1.00	.00	.00	.00	.000	.000
GND3	57.00	75.00	1.90	.50	1.00	.00	.00	.00	.000	.000
GND4	93.00	75.00	2.87	.50	1.00	.00	.00	.00	.000	.000

AN MICROPHONE HT.= 4.9 FT, RI ANT. HT.= 6.6 FT, TV ANT. HT.= 9.8 FT, ALTITUDE=   .0 FT
RI FREQ= 1.000 MHZ, TV FREQ= 75.000 MHZ, WIND VEL.(OZ) = 2.000 MPH, GROUND CONDUCTIVITY =   4.0 MMHOS /M
E-FIELD TRANSDUCER HT.= 3.3FT, B-FIELD TRANSDUCER HT. = 3.3FT

LATERAL DIST FROM REFERENCE (FEET)	AUDIBLE NOISE (RAIN) L50 DBA	AUDIBLE NOISE (FAIR) L50 DBA	RADIO INTERFERENCE (RAIN) L50 DBUV/M	RADIO INTERFERENCE (FAIR) L50 DBUV/M	TVI TOTAL RAIN DBUV/M	OZONE FOR RAIN RATE OF 1.00 IN/HR AT 0. FT.LEVEL PPB	ELECTRIC FIELD KV/M	MAGNETIC FIELD GAUSS
-300.0	48.9	23.9	46.3	29.3	14.4	.000000	.084	.01393
-275.0	49.4	24.4	47.7	30.7	15.4	.000000	.116	.01713
-250.0	49.9	24.9	49.2	32.2	16.5	.000000	.167	.02163
-225.0	50.5	25.5	51.1	34.1	17.8	.000000	.254	.02826
-200.0	51.3	26.3	53.5	36.5	19.3	.000000	.412	.03860
-195.0	51.4	26.4	54.2	37.2	19.7	.000000	.459	.04136
-190.0	51.6	26.6	54.9	37.9	20.0	.000000	.512	.04443
-185.0	51.8	26.8	55.7	38.7	20.4	.000000	.574	.04785
-180.0	51.9	26.9	56.5	39.5	20.7	.000000	.645	.05167
-175.0	52.1	27.1	57.3	40.3	21.1	.000000	.728	.05597
-170.0	52.3	27.3	58.2	41.2	21.5	.000000	.825	.06081

LATERAL DIST FROM REFERENCE (FEET)	AUDIBLE NOISE (RAIN) L50 DBA	AUDIBLE NOISE (FAIR) L50 DBA	RADIO INTERFERENCE (RAIN) L50 DBUV/M	RADIO INTERFERENCE (FAIR) L50 DBUV/M	TVI TOTAL RAIN DBUV/M	OZONE FOR RAIN RATE OF 1.00 IN/HR AT 0. FT.LEVEL PPB	ELECTRIC FIELD KV/M	MAGNETIC FIELD GAUSS
-165.0	52.5	27.5	59.1	42.1	21.9	.000000	.938	.06628
-160.0	52.7	27.7	60.1	43.1	22.4	.000000	1.068	.07247
-155.0	53.0	28.0	61.2	44.2	22.8	.000000	1.220	.07948
-150.0	53.2	28.2	62.3	45.3	23.3	.000000	1.396	.08743
-145.0	53.4	28.4	63.4	46.4	23.9	.000000	1.596	.09643
-140.0	53.7	28.7	64.5	47.5	24.5	.000000	1.821	.10657
-135.0	53.9	28.9	65.7	48.7	25.2	.000000	2.067	.11790
-130.0	54.2	29.2	66.9	49.9	25.9	.000000	2.325	.13039
-125.0	54.5	29.5	68.0	51.0	26.5	.000000	2.578	.14385
-120.0	54.7	29.7	69.0	52.0	27.1	.000000	2.801	.15792
-115.0	55.0	30.0	69.8	52.8	27.6	.000000	2.959	.17197
-110.0	55.2	30.2	70.4	53.4	28.0	.000000	3.016	.18517
-105.0	55.4	30.4	70.7	53.7	28.7	.000000	2.943	.19658
-100.0	55.6	30.6	70.7	53.7	29.3	.000000	2.740	.20541
-95.0	55.8	30.8	71.6	54.6	30.0	.000000	2.435	.21122
-90.0	56.0	31.0	72.5	55.5	30.5	.000964	2.092	.21404
-85.0	56.1	31.1	73.3	56.3	31.0	.013570	1.788	.21440
-80.0	56.2	31.2	73.8	56.8	31.3	.042022	1.579	.21308
-75.0	56.3	31.3	73.9	56.9	31.4	.073931	1.478	.21082
-70.0	56.3	31.3	73.8	56.8	31.3	.100555	1.483	.20788
-65.0	56.3	31.3	73.3	56.3	31.0	.119804	1.615	.20393
-60.0	56.2	31.2	72.5	55.5	30.5	.138764	1.867	.19835
-55.0	56.2	31.2	71.6	54.6	30.0	.179902	2.175	.19056
-50.0	56.1	31.1	71.3	54.3	29.3	.236862	2.449	.18036
-45.0	56.0	31.0	71.4	54.4	28.9	.289608	2.620	.16799
-40.0	55.8	30.8	71.1	54.1	28.7	.329282	2.653	.15410
-35.0	55.7	30.7	70.5	53.5	28.3	.355954	2.550	.13958
-30.0	55.6	30.6	69.7	52.7	27.8	.381583	2.339	.12534
-25.0	55.5	30.5	68.7	51.7	27.2	.418198	2.057	.11216
-20.0	55.4	30.4	67.6	50.6	26.6	.456007	1.741	.10062
-15.0	55.3	30.3	66.4	49.4	25.9	.485324	1.422	.09115
-10.0	55.2	30.2	65.2	48.2	25.2	.503883	1.131	.08406
-5.0	55.2	30.2	64.1	47.1	24.6	.513119	.907	.07964
.0	55.1	30.1	63.0	46.0	23.9	.515326	.815	.07814
5.0	55.2	30.2	64.1	47.1	24.6	.512578	.907	.07964
10.0	55.2	30.2	65.2	48.2	25.2	.506478	1.131	.08406
15.0	55.3	30.3	66.4	49.4	25.9	.498191	1.422	.09115
20.0	55.4	30.4	67.6	50.6	26.6	.488537	1.741	.10062
25.0	55.5	30.5	68.7	51.7	27.2	.478088	2.057	.11216
30.0	55.6	30.6	69.7	52.7	27.8	.467235	2.339	.12534
35.0	55.7	30.7	70.5	53.5	28.3	.456249	2.550	.13958
40.0	55.8	30.8	71.1	54.1	28.7	.445312	2.653	.15410
45.0	56.0	31.0	71.4	54.4	28.9	.434545	2.620	.16799
50.0	56.1	31.1	71.3	54.3	29.3	.424029	2.449	.18036
55.0	56.2	31.2	71.6	54.6	30.0	.413813	2.175	.19056
60.0	56.2	31.2	72.5	55.5	30.5	.405006	1.867	.19835
65.0	56.3	31.3	73.3	56.3	31.0	.409574	1.615	.20393
70.0	56.3	31.3	73.8	56.8	31.3	.432228	1.483	.20788
75.0	56.3	31.3	73.9	56.9	31.4	.459100	1.478	.21082
80.0	56.2	31.2	73.8	56.8	31.3	.480400	1.579	.21308
85.0	56.1	31.1	73.3	56.3	31.0	.493776	1.788	.21440
90.0	56.0	31.0	72.5	55.5	30.5	.506402	2.092	.21404
95.0	55.8	30.8	71.6	54.6	30.0	.540915	2.435	.21122
100.0	55.6	30.6	70.7	53.7	29.3	.591115	2.740	.20541
105.0	55.4	30.4	70.7	53.7	28.7	.637084	2.943	.19658
110.0	55.2	30.2	70.4	53.4	28.0	.670048	3.016	.18517
115.0	55.0	30.0	69.8	52.8	27.6	.690085	2.959	.17197
120.0	54.7	29.7	69.0	52.0	27.1	.708190	2.801	.15792
125.0	54.5	29.5	68.0	51.0	26.5	.735436	2.578	.14385
130.0	54.2	29.2	66.9	49.9	25.9	.763340	2.325	.13039
135.0	53.9	28.9	65.7	48.7	25.2	.783442	2.067	.11790
140.0	53.7	28.7	64.5	47.5	24.5	.793851	1.821	.10657
145.0	53.4	28.4	63.4	46.4	23.9	.795944	1.596	.09643
150.0	53.2	28.2	62.3	45.3	23.3	.791831	1.396	.08743
155.0	53.0	28.0	61.2	44.2	22.8	.783407	1.220	.07948
160.0	52.7	27.7	60.1	43.1	22.4	.772129	1.068	.07247
165.0	52.5	27.5	59.1	42.1	21.9	.759053	.938	.06628
170.0	52.3	27.3	58.2	41.2	21.5	.744920	.825	.06081
175.0	52.1	27.1	57.3	40.3	21.1	.730243	.728	.05597
180.0	51.9	26.9	56.5	39.5	20.7	.715374	.645	.05167
185.0	51.8	26.8	55.7	38.7	20.4	.700551	.574	.04785
190.0	51.6	26.6	54.9	37.9	20.0	.685932	.512	.04443
195.0	51.4	26.4	54.2	37.2	19.7	.671623	.459	.04136
200.0	51.3	26.3	53.5	36.5	19.3	.657689	.412	.03860
225.0	50.5	25.5	51.1	34.1	17.8	.594484	.254	.02826
250.0	49.9	24.9	49.2	32.2	16.5	.541769	.167	.02163
275.0	49.4	24.4	47.7	30.7	15.4	.497797	.116	.01713
300.0	48.9	23.9	46.3	29.3	14.4	.460746	.084	.01393

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          ************************************************
          *       C O R O N A   A N D   F I E L D        *
          *        E F F E C T S   P R O G R A M         *
          *   Source: Bonneville Power Administration    *
          ************************************************

        +++++++++++++++++++
        + INPUT DATA LIST +

       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      10/ 6/2011          5:46:35 pm
    +********  Basin 345/115kV EMF Calcs  ***************************
    +****  Double-Circuit Vertical -- (1)2306.2kcmil, (1)795kcmil ACSR ****
    +      1       0       6       8   362.0    2.00    1.00     .00

    (ENGLISH UNITS OPTION)

       LINE GRADIENTS COMPUTED BY PROGRAM

    PHYSICAL SYSTEM CONSISTS OF   8 CONDUCTORS, OF WHICH   6 ARE ENERGIZED PHASES

    +COMB  MF  XX  XX  XX  XX  XX  XX
    +   4.921   6.562   9.842    .000   1.000  75.000   3.280   4.000   3.280
    +115-A        A   -15.00   90.00    1   1.063     .00   69.70      .0     .88     .00
    +115-B        A   -17.00   65.00    1   1.063     .00   69.70  -120.0     .88     .00
    +115-C        A   -15.00   40.00    1   1.063     .00   69.70   120.0     .88     .00
    +345-A        A    15.00   80.00    1   1.802     .00  209.00      .0    1.65     .00
    +345-B        A    17.00   55.00    1   1.802     .00  209.00  -120.0    1.65     .00
    +345-C        A    15.00   30.00    1   1.802     .00  209.00   120.0    1.65     .00
    +GND-1        A    -8.00  110.00    1    .500     .00     .00      .0     .00     .00
    +GND-2        A     8.00  110.00    1    .500     .00     .00      .0     .00     .00
    +      81  -200.0     5.0
    +       0      .0      .0
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COMBINED OUTPUT OF AUDIBLE NOISE, RADIO NOISE, TVI, OZONE CONCENTRATION, GROUND GRADIENT AND MAGNETIC FIELD

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********  Basin 345/115kV EMF Calcs  ***************************
****  Double-Circuit Vertical -- (1)2306.2kcmil, (1)795kcmil ACSR ****
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362.0 KV

	DIST. FROM CENTER OF TOWER (FEET)	HEIGHT (FEET)	MAXIMUM GRADIENT (KV/CM)	SUBCON DIAM. (IN)	NO. OF SUBCON	SUBCON SPACING (IN)	VOLTAGE L-N (KV)	PHASE ANGLE (DEGREES)	CURRENT (KAMPS)	CORONA LOSSES (KW/MI)
115-A	-15.00	90.00	6.39	1.06	1.00	.00	69.70	.00	.875	.009
115-B	-17.00	65.00	7.93	1.06	1.00	.00	69.70	-120.00	.875	.038
115-C	-15.00	40.00	7.55	1.06	1.00	.00	69.70	120.00	.875	.028
345-A	15.00	80.00	14.96	1.80	1.00	.00	209.00	.00	1.650	19.347
345-B	17.00	55.00	15.88	1.80	1.00	.00	209.00	-120.00	1.650	28.506
345-C	15.00	30.00	15.44	1.80	1.00	.00	209.00	120.00	1.650	23.775
GND-1	-8.00	110.00	4.80	.50	1.00	.00	.00	.00	.000	.000
GND-2	8.00	110.00	5.50	.50	1.00	.00	.00	.00	.000	.000

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AN MICROPHONE HT.=  4.9 FT,  RI ANT. HT.=  6.6 FT,  TV ANT. HT.=  9.8 FT, ALTITUDE=      .0 FT
 RI FREQ=  1.000 MHZ,   TV FREQ=  75.000 MHZ,   WIND VEL.(OZ) =  2.000 MPH,  GROUND CONDUCTIVITY =   4.0 MMHOS  /M
 E-FIELD TRANSDUCER HT.=  3.3FT,  B-FIELD TRANSDUCER HT. =  3.3FT
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LATERAL DIST FROM REFERENCE (FEET)	AUDIBLE NOISE (RAIN) L50 DBA	AUDIBLE NOISE (FAIR) L50 DBA	RADIO INTERFERENCE (RAIN) L50 DBUV/M	RADIO INTERFERENCE (FAIR) L50 DBUV/M	TVI TOTAL RAIN DBUV/M	OZONE FOR RAIN RATE OF 1.00 IN/HR AT 0. FT.LEVEL PPB	ELECTRIC FIELD KV/M	MAGNETIC FIELD GAUSS
-200.0	47.6	22.6	49.1	32.1	14.8	.000000	.085	.01588
-195.0	47.7	22.7	49.4	32.4	15.0	.000000	.087	.01662
-190.0	47.8	22.8	49.7	32.7	15.2	.000000	.090	.01741
-185.0	47.9	22.9	49.9	32.9	15.4	.000000	.093	.01826
-180.0	48.0	23.0	50.2	33.2	15.6	.000000	.096	.01917
-175.0	48.2	23.2	50.5	33.5	15.9	.000000	.098	.02015
-170.0	48.3	23.3	50.8	33.8	16.1	.000000	.101	.02121
-165.0	48.4	23.4	51.1	34.1	16.3	.000000	.104	.02234
-160.0	48.5	23.5	51.4	34.4	16.5	.000000	.107	.02356
-155.0	48.7	23.7	51.8	34.8	16.8	.000000	.109	.02488
-150.0	48.8	23.8	52.1	35.1	17.0	.000000	.112	.02631
-145.0	49.0	24.0	52.5	35.5	17.2	.000000	.114	.02786
-140.0	49.1	24.1	52.8	35.8	17.5	.000000	.116	.02955
-135.0	49.2	24.2	53.2	36.2	17.8	.000000	.117	.03138
-130.0	49.4	24.4	53.6	36.6	18.0	.000000	.118	.03337
-125.0	49.5	24.5	54.0	37.0	18.3	.000000	.118	.03555
-120.0	49.7	24.7	54.4	37.4	18.6	.000000	.117	.03793
-115.0	49.9	24.9	54.9	37.9	18.9	.000000	.115	.04054
-110.0	50.0	25.0	55.3	38.3	19.2	.000000	.111	.04341
-105.0	50.2	25.2	55.8	38.8	19.5	.000000	.105	.04656
-100.0	50.4	25.4	56.3	39.3	19.8	.000000	.097	.05002
-95.0	50.6	25.6	56.8	39.8	20.1	.000000	.086	.05385
-90.0	50.8	25.8	57.4	40.4	20.5	.000000	.071	.05807
-85.0	51.0	26.0	58.0	41.0	20.8	.000000	.054	.06274
-80.0	51.2	26.2	58.5	41.5	21.2	.000000	.039	.06790

LATERAL DIST FROM REFERENCE (FEET)	AUDIBLE NOISE (RAIN) L50 DBA	AUDIBLE NOISE (FAIR) L50 DBA	RADIO INTERFERENCE (RAIN) L50 DBUV/M	RADIO INTERFERENCE (FAIR) L50 DBUV/M	TVI TOTAL RAIN DBUV/M	OZONE FOR RAIN RATE OF 1.00 IN/HR AT 0. FT.LEVEL PPB	ELECTRIC FIELD KV/M	MAGNETIC FIELD GAUSS
-75.0	51.4	26.4	59.2	42.2	21.5	.000000	.058	.07361
-70.0	51.6	26.6	59.8	42.8	21.9	.000000	.104	.07993
-65.0	51.8	26.8	60.5	43.5	22.3	.000000	.168	.08690
-60.0	52.1	27.1	61.2	44.2	22.7	.000000	.253	.09456
-55.0	52.3	27.3	61.9	44.9	23.2	.000000	.362	.10295
-50.0	52.6	27.6	62.6	45.6	23.6	.000000	.500	.11206
-45.0	52.8	27.8	63.4	46.4	24.3	.000000	.671	.12184
-40.0	53.1	28.1	64.2	47.2	25.0	.000000	.881	.13216
-35.0	53.4	28.4	65.0	48.0	25.7	.000000	1.133	.14286
-30.0	53.7	28.7	65.8	48.8	26.4	.000000	1.432	.15374
-25.0	54.0	29.0	66.6	49.6	27.3	.000000	1.778	.16468
-20.0	54.3	29.3	67.5	50.5	28.2	.000000	2.176	.17580
-15.0	54.7	29.7	68.6	51.6	29.1	.000000	2.629	.18759
-10.0	55.0	30.0	70.3	53.3	30.2	.000000	3.147	.20086
-5.0	55.3	30.3	72.1	55.1	31.2	.000000	3.727	.21630
.0	55.6	30.6	73.9	56.9	32.3	.000022	4.343	.23370
5.0	55.9	30.9	75.4	58.4	33.3	.000115	4.915	.25125
10.0	56.1	31.1	76.4	59.4	34.0	.000254	5.310	.26541
15.0	56.1	31.1	76.8	59.8	34.2	.000401	5.389	.27219
20.0	56.1	31.1	76.4	59.4	34.0	.000536	5.091	.26924
25.0	55.9	30.9	75.4	58.4	33.3	.008542	4.488	.25721
30.0	55.7	30.7	73.9	56.9	32.3	.078357	3.728	.23901
35.0	55.4	30.4	72.1	55.1	31.2	.170008	2.958	.21798
40.0	55.0	30.0	70.3	53.3	30.2	.241779	2.269	.19666
45.0	54.7	29.7	68.9	51.9	29.1	.297819	1.696	.17651
50.0	54.4	29.4	68.1	51.1	28.2	.344113	1.242	.15819
55.0	54.1	29.1	67.3	50.3	27.3	.382264	.893	.14188
60.0	53.8	28.8	66.5	49.5	26.4	.412707	.630	.12750
65.0	53.5	28.5	65.7	48.7	25.7	.435999	.437	.11489
70.0	53.2	28.2	64.8	47.8	25.0	.452955	.301	.10384
75.0	52.9	27.9	64.0	47.0	24.4	.464513	.214	.09414
80.0	52.7	27.7	63.2	46.2	24.0	.471607	.172	.08562
85.0	52.4	27.4	62.5	45.5	23.5	.475091	.164	.07812
90.0	52.2	27.2	61.7	44.7	23.1	.475709	.172	.07148
95.0	51.9	26.9	61.0	44.0	22.7	.474085	.183	.06560
100.0	51.7	26.7	60.3	43.3	22.3	.470733	.192	.06036
105.0	51.5	26.5	59.7	42.7	21.9	.466068	.199	.05570
110.0	51.2	26.2	59.0	42.0	21.5	.460423	.203	.05152
115.0	51.0	26.0	58.4	41.4	21.1	.454061	.204	.04777
120.0	50.8	25.8	57.8	40.8	20.7	.447193	.203	.04439
125.0	50.6	25.6	57.3	40.3	20.4	.439981	.201	.04135
130.0	50.5	25.5	56.7	39.7	20.1	.432554	.198	.03859
135.0	50.3	25.3	56.2	39.2	19.7	.425012	.193	.03609
140.0	50.1	25.1	55.7	38.7	19.4	.417433	.188	.03381
145.0	49.9	24.9	55.3	38.3	19.1	.409875	.182	.03174
150.0	49.8	24.8	54.8	37.8	18.8	.402385	.177	.02984
155.0	49.6	24.6	54.4	37.4	18.5	.394997	.171	.02810
160.0	49.4	24.4	53.9	36.9	18.2	.387736	.165	.02651
165.0	49.3	24.3	53.5	36.5	18.0	.380620	.159	.02504
170.0	49.1	24.1	53.1	36.1	17.7	.373663	.153	.02369
175.0	49.0	24.0	52.8	35.8	17.4	.366874	.147	.02244
180.0	48.9	23.9	52.4	35.4	17.2	.360259	.142	.02129
185.0	48.7	23.7	52.0	35.0	17.0	.353819	.137	.02022
190.0	48.6	23.6	51.7	34.7	16.7	.347556	.131	.01922
195.0	48.5	23.5	51.4	34.4	16.5	.341469	.127	.01830
200.0	48.3	23.3	51.1	34.1	16.3	.335557	.122	.01744