Montana-Dakota Utilities Co. and Otter Tail Power Company

APPLICATION TO THE NORTH DAKOTA PUBLIC SERVICE COMMISSION FOR A WAIVER OF PROCEDURES AND TIMELINES, AND CONSOLIDATED APPLICATION FOR A CERTIFICATE OF CORRIDOR COMPATIBILITY AND TRANSMISSION FACILITY ROUTE PERMIT

Big Stone South-Ellendale 345-kV Transmission Line Project & Associated Ellendale 345-kV Substation

October 18, 2013

BSSE
Big Stone South to Ellendale

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List of Acronyms and Abbreviations

Abbreviation	Meaning
AADT	average annual daily traffic
AC	alternating current
ACSR	aluminum conductor steel reinforced
ADT	average daily traffic
APE	area of potential effect
APLIC	Avian Power Line Interaction Committee
APP	Avian Protection Plan
ATV	all-terrain vehicle
BLM	Bureau of Land Management
BMPs	best management practices
CD-ROM (CD-R)	Compact disc
CFR	Code of Federal Regulations
Commission	North Dakota Public Service Commission(also PSC)
Corridor Certificate	Certificate of Corridor Compatibility
CPCN	Certificate of Public Convenience and Necessity
CVT	Capacitive Voltage Transformers
dB	decibels
dBA	A-weighted sound level in decibels
DVD-R or DVD+R	digital versatile disc
Eagle Act	Bald and Golden Eagle Protection Act
EF	electric field
ELF	extremely low frequency
EMF	electric and magnetic field
EMI	electromagnetic interference
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
GIS	Geographic Information System
GLO	General Land Office
GPS	Global Positioning System
Hz	hertz

Abbreviation	Meaning
HVTL	High Voltage Transmission Line
ICBM	intercontinental ballistic missile
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IEEE	Institute of Electrical and Electronics Engineers
kcmil	thousand circular mils
kV	kilovolt
kV/m	kilovolts per meter
m	meters
mA	milliamperes
MBTA	Migratory Bird Treaty Act
MF	magnetic field
mG	milliGauss
Midwest ISO	Midwest Independent Transmission System Operator
MISO	Midcontinent Independent System Operator, Inc., previously Midwest ISO
Montana-Dakota	Montana-Dakota Utilities Co.
MTEP	Midwest ISO Transmission Expansion Plan
MVA	Mega Volt Ampere
MVAR	Mega Volt Ampere Reactive
MVP	Multi-Value Project
NAAQS	National Ambient Air Quality Standards
NAD 83	North American Datum 1983
NDAC	North Dakota Administrative Code
NDCC	North Dakota Century Code
NDDOH	North Dakota Department of Health
NDDOT	North Dakota Department of Transportation
NDDTL	North Dakota Department of Trust Lands
NDGF	North Dakota Game and Fish Department
NDPDES	North Dakota Pollutant Discharge Elimination System
NDPR	North Dakota Parks and Recreation Department
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NGO	non-governmental organizations
NHD	National Hydrography Dataset
NHI	National Heritage Inventory
NHPA	National Historic Preservation Act
NIEHS	National Institute of Environmental Health Sciences
NLCD	National Land Cover Database
NOI	Notice of Intent

Abbreviation	Meaning
NOTAM	Notice to Airmen
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWP	Nationwide Permit
NWR	National Wildlife Refuge
Otter Tail Power	Otter Tail Power Company
PDF	portable document file
PLOTS	Private Lands Open to Sportsmen
ppm	parts per million
PSC	North Dakota Public Service Commission(also Commission)
RF	radio frequency
RGOS	Regional Generation Outlet Study
Route Permit	Transmission Facility Route Permit
ROW	Right-of-way
SHPO	North Dakota State Historic Preservation Office
SHSND	State Historical Society of North Dakota
Siting Act	The North Dakota Energy Conversion and Transmission Facility Siting Act
SPCC	Spill Prevention Control and Countermeasure
SSURGO	Soil Survey Geographic
STATSGO	State Soil Geographic
SUP	Special Use Permit
SWPPP	Storm Water Pollution Prevention Plan
THPO	Tribal Historic Preservation Office
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
WDA	Wildlife Development Area
WGS 84	World Geodetic System 1984
WHO	World Health Organization
WMA	Wildlife Management Area
WPA	Waterfowl Production Area

Definitions

Term	Definition
Applicants	Montana-Dakota Utilities Co. and Otter Tail Power Company
BMPs	Best Management Practices are used during construction to minimize adverse effects on the existing environment from the time the initial excavation begins until the transmission facility is operational.
Desktop survey	A method of review completed for the first phase of planning that does not typically require on-site review of resources. This methodology helps to determine areas of potential difficulty through a review of aerial photography and Geographic Information System (GIS) data.
Ellendale 230-kV Substation	Existing Ellendale 230-kV substation
Ellendale 345-kV Substation	New Ellendale 345-kV Substation (constructed as a part of this North Dakota Facility)
Kilovolt	1,000 volts; 345-kV = 345,000 volts
MISO	Midcontinent Independent System Operator, Inc., an independently governed organization tasked with ensuring transmission network reliability and efficiency. Formerly named Midwest ISO.
North Dakota Corridor	A corridor, 1 mile wide, centered on the North Dakota Route.
North Dakota Facility	The North Dakota portion of this Project consisting of approximately 9 to 11 miles of single-circuit, alternating current (AC), 345-kilovolt (kV) transmission line, the Ellendale 345-kV Substation, 230-kV tie line, modifications to the Ellendale 230-kV Substation, and a temporary laydown area and the associated facilities located in Dickey County, North Dakota. Details are provided in Section 1.1.1.
North Dakota Facility area	The vicinity of the North Dakota Corridor and North Dakota Facility.
North Dakota Facility ROW	The 150-foot-wide right-of-way in which the North Dakota Facility will be constructed as determined by final design.
North Dakota Route	The specific locations of the North Dakota Facility located in Dickey County, North Dakota, as determined by final design.
Project	The Project will consist of approximately 160 to 170 miles of single-circuit 345-kV transmission line in South Dakota and North Dakota and a new 345-kV substation located near Ellendale, North Dakota.
Right-of-way (ROW)	The land that must be acquired to safely construct, operate, and maintain an electrical line.
South Dakota Facility	The South Dakota portion of this Project, consisting of approximately 150 to 160 miles of single-circuit 345-kV transmission line traversing through Brown, Day, and Grant counties and associated facilities (two fiber optic regeneration stations and their associated access roads).
South Dakota Facility area	The vicinity of the South Dakota Facility.
South Dakota Facility ROW	The 150-foot-wide right-of-way in which the South Dakota Facility will be constructed as determined by final design.

1.0 INTRODUCTION

Montana-Dakota Utilities Co., a Division of MDU Resources Group, Inc., a Delaware corporation (Montana-Dakota) and Otter Tail Power Company, a Minnesota corporation (Otter Tail Power) (jointly, the Applicants), propose to construct, operate, and maintain a 345-kilovolt (kV) transmission line and associated facilities called the Big Stone South to Ellendale Project (Project). The Project consists of both a 345-kV transmission line that is approximately 160 to 170 miles long traversing through North Dakota and South Dakota and the new Ellendale 345-kV Substation near Ellendale, North Dakota. The North Dakota Facility, for which the Applicants are seeking a Certificate of Corridor Compatibility (Corridor Certificate) and a Transmission Facility Route Permit (Route Permit), consists of approximately 9 to 11 miles of single-circuit, alternating current (AC), 345-kV transmission line and associated facilities, located entirely in Dickey County, North Dakota (see Figure 1). The North Dakota Facility also includes a new 345-kV substation located immediately west of the existing Ellendale 230-kV Substation, called the Ellendale 345-kV Substation, in addition to a 230-kV tie line, modifications to the Ellendale 230-kV Substation, and a temporary laydown area. The North Dakota transmission facility will extend from the Ellendale 345-kV Substation to the North Dakota-South Dakota state border. Modifications to the North Dakota Facility may occur depending on the final route permitted, land rights, and final engineering design.

The Project was identified as one of seventeen Multi-Value Projects (MVPs) by the Midcontinent Independent System Operator, Inc. (MISO, formerly Midwest Independent Transmission System Operator [Midwest ISO]). The Applicants are MISO members. Significant study shows that MVPs will reduce the wholesale cost of energy delivery for consumers across the MISO region by enabling the delivery of low-cost generation to load, reducing congestion costs, and increasing system reliability.

The Applicants submit this application for a Waiver of Procedures and Time Schedules, a Corridor Certificate, and a Route Permit for the North Dakota Facility (collectively, Application) and respectfully request that the North Dakota Public Service Commission (Commission) approve the Corridor and Route developed for the North Dakota Facility. A Certificate of Public Convenience and Necessity (CPCN) was issued by the Commission for the North Dakota Facility in Case No. PU-13-272 for Montana-Dakota and Case No. PU-13-273 for Otter Tail Power on September 25, 2013.

Montana-Dakota is headquartered in Bismarck, North Dakota, and provides electric and natural gas service to parts of Montana, North Dakota, South Dakota, and Wyoming. The Montana-Dakota service area covers about 168,000 square miles and Montana-Dakota serves approximately 312,000 customers. In North Dakota, Montana-Dakota provides service to approximately 73,350 electric and 90,000 natural gas customers in about 150 communities.

Otter Tail Power is headquartered in Fergus Falls, Minnesota, and provides electric service to parts of Minnesota, North Dakota, and South Dakota. The Otter Tail Power service area covers about 70,000 square miles and Otter Tail Power serves approximately 129,400 customers in 422 communities.

1.1 COMPLIANCE WITH THE ENERGY CONVERSION AND TRANSMISSION FACILITY SITING ACT – NDCC CHAPTER 49-22

The North Dakota Energy Conversion and Transmission Facility Siting Act (Siting Act) requires applications for a Corridor Certificate and Route Permit to meet the criteria set forth in North Dakota Century Code (NDCC) Chapter 49-22. The siting of a transmission facility is to be made in an orderly manner compatible with environmental preservation and the efficient use of resources (NDCC Section 49-22-02). Consistent with this requirement, the Applicants have located and designed the North Dakota Facility to minimize potential environmental impacts and utilize existing corridors, section lines, and field breaks to the extent practicable in siting the North Dakota Facility.

Within this Application, the Applicants present information required by the Siting Act, including their consideration of the exclusion areas, the avoidance areas, the selection criteria, and the policy criteria set forth in North Dakota Administrative Code (NDAC) Section 69-06-08-02 to be used when selecting the North Dakota Corridor and North Dakota Route (see Figure 2). Additionally, transmission line design and technical information has been provided to allow a thorough evaluation of the North Dakota Facility (see Appendix A for the Design Data Report).

Tables 2 and 3 outline the information required to fulfill the requirements for a Corridor Certificate and Route Permit and identify where these requirements are addressed in this document.

1.1.1 Waiver of Procedures and Time Schedules

The Applicants submit this Application for a Waiver of Procedures and Time Schedules and consolidated application for a Corridor Certificate and Route Permit for the purposes of siting and constructing the North Dakota Facility. This Project is consistent with the Ten-Year Plans on file with the Commission for each of the Applicants. By this Application, the Applicants request that the Commission, pursuant to NDCC Section 49-22-07.2, waive the following requirement:

> *That the Commission hold separate hearings as may be required by NDCC Sections 49-22-08 and 49-22-08.1, 49-22-13 and NDAC Section 69-06-01-02.*

The Applicants request that the Commission hold a single consolidated hearing on this waiver request and combined application for a Corridor Certificate and Route Permit. The Applicants also request that the Commission shorten the three-month period specified in NDCC Section 49-22-08(5) and the six-month period specified in NDCC Section 49-22-08.1(5).

The Waiver of Procedures and Time Schedules (NDAC Chapter 69-06-06-01) requires a facility description (parts a through g), description of need (parts h through j), an estimate of capital cost for the facility (part k), and justification for the request of a waiver (part l), together with evidence that the Project will produce minimal adverse effects (part m). As demonstrated in the Application, and as summarized below, the Applicants' waiver request and the issuance of a Corridor Certificate and Route Permit is justified because the proposed North Dakota Facility is of such design, location, and purpose that it will produce minimal adverse effects.

Description

The Applicants propose to construct, own, and operate a single-circuit, 345-kV transmission line, approximately 160 to 170 miles long, extending from Ellendale, North Dakota, to Big Stone City, South Dakota. Montana-Dakota will construct a new substation and tie lines and modify the existing Ellendale 230-kV Substation, near Ellendale, North Dakota (see Figure 1). The South Dakota portion of the Project consists of 150 to 160 miles of single-circuit, AC 345-kV transmission line traversing through Brown, Day, and Grant counties (called the South Dakota Facility). The North Dakota Facility is located entirely in Dickey County, North Dakota.

The North Dakota Facility will consist of the following five major components:

1. **345-kV transmission line**: The Applicants propose to construct approximately 9 to 11 miles of new, high-voltage (345-kV), three-phase, single circuit AC electric transmission line from the new Ellendale 345-kV Substation to the North Dakota-South Dakota state border. The transmission line mostly parallels existing field breaks in Ellendale and Van Meter townships, Dickey County, North Dakota.
2. **Ellendale 345-kV Substation**: The new Ellendale 345-kV Substation will be constructed and owned by Montana-Dakota, about 1.5 miles west of Ellendale, North Dakota, along the west side of 87th Avenue SE in Section 9, Ellendale Township (Township 129N, Range 63W), Dickey County, and across the street from the existing Montana-Dakota Ellendale 230-kV Substation, which is located in Section 10 of Ellendale Township.

   The footprint of the substation will be approximately 11.3 acres. Construction of the new Ellendale 345-kV Substation will involve the installation of two 345-kV circuit breakers, one 345-kV line termination structure, five 345-kV disconnect switches, one 345-kV/230-kV 300/400/500 Mega Volt Ampere (MVA) Auto-Transformer, a 345-kV Shunt Line Reactor, eight 230-kV circuit breakers, twenty-one 230-kV disconnect switches, four 230-kV line termination structures, associated arresters, Capacitive Voltage Transformers (CVTs), bus work, and protective relaying and controls required to support the circuit breakers. The existing Merricourt, Tatanka, and Hankinson 230-kV lines will be relocated to terminate in this substation, as will the Ellendale 230-kV tie line described below. All construction will occur within the land purchased for the substation.
3. **230-kV tie line**: The existing Montana-Dakota-owned Merricourt-Ellendale 230-kV transmission line will be modified to terminate at the new Ellendale 345-kV Substation with part of the existing line being used as a 230-kV tie line between the new Ellendale 345-kV Substation and existing Ellendale 230-kV Substation within the existing right-of-way (ROW) of the Merricourt-Ellendale 230-kV transmission line.
4. **Ellendale 230-kV Substation modification**: Buswork within the existing Ellendale 230-kV Substation will be modified by removing the Merricourt, Tatanka, and Hankinson 230-kV lines and leaving only the Ellendale 345-kV Substation 230-kV tie line. All work will occur within the existing substation's fenced boundary.
5. **Temporary laydown area**: One temporary laydown area (approximately 40 acres) will be required in North Dakota for equipment storage before transportation to the

construction sites. It is anticipated that the laydown area will be located near the Ellendale 345-kV Substation in land that is currently cultivated. The exact location of this laydown area has not been determined at this time.

The schedule for the Project can be found in Section 1.3. There are no current plans for future expansion beyond the components listed above as the North Dakota Facility.

Need

On September 25, 2013, the Applicants were granted CPCNs (Numbers 5819 and 5820) demonstrating Project need. Additional information on the need for the Project is included in Section 2.0, including alternatives evaluated and a description of the area that will be served by the North Dakota Facility.

Cost

The total cost of the North Dakota Facility is estimated to be approximately $43 million to $50 million in 2013 dollars and includes expenses for surveys, engineering, materials, construction, land rights, and project management. The North Dakota Facility costs are provided in Table 1, along with the costs associated with the South Dakota Facility to arrive at the total Project cost. The cost of the North Dakota Facility will be paid by electric customers throughout the MISO footprint and will not be solely borne by North Dakota customers of Otter Tail Power or Montana-Dakota.

Table 1: Approximate Project Costs

Facility	Cost [1]
Ellendale 345-kV Substation, 230-kV tie line, and Ellendale 230-kV Substation modifications (located in Dickey County, North Dakota)	$28 million
New 345-kV transmission line in North Dakota (approximately 9 to 11 miles located in Dickey County, North Dakota)	$15–22 million
South Dakota Facility (approximately 150 to 160 miles of new 345-kV transmission line and associated facilities located in Brown, Day and Grant counties, South Dakota)	$250–320 million
Total Project Cost	**$293–370 million**

[1] *All Project costs are approximate and will be refined with additional engineering information. Costs are in 2013 dollars.*

Justification for Waivers

Section 49-22-07.2 of the Siting Act provides that the Commission may waive procedures and time schedules upon a finding that "the proposed facility is of such length, design, location or purpose that it will produce minimal adverse effects." Based upon the thorough investigation and analysis set forth in this Application, waivers are appropriate because the proposed facility will produce minimal adverse effects.

In determining the possible adverse impacts on the environment, the Applicants evaluated the North Dakota Facility using the criteria in Section 49-22-09 of the Siting Act (see Section 8.0 of this Application) and using the exclusion area, avoidance area, selection and policy criteria set forth in NDAC Section 69-06-08-02 (see Section 3.0 of this Application). Impacts associated with the North Dakota Facility are summarized in Section 5.17 of this Application. Based upon

this evaluation and the factors set forth in the Siting Act, the Project will have minimal adverse effects. Any potential adverse effects identified will be mitigated to the extent deemed practicable.

Federal and state agencies were consulted during the planning of the North Dakota Facility to provide input on potential impacts of the North Dakota Facility. In general, the agencies consulted have concluded that the proposed North Dakota Facility will produce minimal adverse effects. Their findings are summarized in Section 8.11 of this Application. Additionally, the Applicants' proposal takes into consideration the concerns of federal and state agencies and the Applicants will attempt to mitigate any adverse effects associated with the North Dakota Facility. The designated state agencies and officers listed in NDAC 69-06-01-05 were notified about the proposed North Dakota Facility during its development beginning in July 2012 and continuing through September 2013. The Applicants will continue to work with the agencies involved with the North Dakota Facility.

In short, the Applicants submit the evidence contained herein and believe the findings of the environmental review demonstrate that all necessary, feasible, and prudent actions will be taken to minimize and mitigate to the greatest extent possible all known or potentially adverse impacts of the North Dakota Facility. Accordingly, the Applicants respectfully request that the Commission grant the requested waivers and issue the Applicants a Certificate of Corridor Compatibility and Route Permit.

1.1.2 Certificate of Corridor Compatibility

Table 2 outlines the information to fulfill the requirements for a Corridor Certificate using Chapter 49-22-08 of the Siting Act and identifies where these requirements are addressed in this document.

Table 2: Corridor Certificate Completion Checklist

State Authority	Description	Application Section
Chapter 49-22-08 Part 1	Application for a certificate – Notice of filing – Amendment – Designation of a site or corridor	1.1
a.	A description of the size and type of facility.	1.1.1
b.	A summary of any studies which have been made of the environmental impact of the facility.	5.0, Appendix E
c.	A statement explaining the need for the facility.	2.0
d.	An identification of the location of the preferred site for any energy conversion facility.	1.2.2, 4.1
e.	An identification of the location of the preferred corridor for any transmission facility.	1.2.1, 4,1
f.	A description of the merits and detriments of any location identified and a comprehensive analysis with supporting data showing the reasons why the preferred location is best suited for the facility.	1.2.1, 1.2.2, 1.2.3
g.	A description of mitigative measures that will be taken to minimize all foreseen adverse impacts resulting from the location, construction, and operation of the proposed facility.	5.0

State Authority	Description	Application Section
h.	An evaluation of the proposed site or corridor with regard to the applicable considerations set out in section 49-22-09 and the criteria established pursuant to section 49-22-05.1.	3.0
i.	Such other information as the applicant may consider relevant or the commission may require.	
Chapter 49-22-05.1	The commission shall develop criteria to be used in identifying exclusion and avoidance areas and to guide the site, corridor, and route suitability evaluation and designation process. Except for transmission lines in existence before July 1, 1983, areas within five hundred feet [152.4 meters] of an inhabited rural residence must be designated avoidance areas. This criterion does not apply to a water pipeline. The five hundred foot [152.4 meter] avoidance area criteria for an inhabited rural residence may be waived by the owner of the inhabited rural residence in writing. The criteria may also include an identification of impacts and policies or practices which may be considered in the evaluation and designation process.	3.0
Chapter 49-22-09	Factors to be considered in evaluating applications and designation of sites, corridors, and routes.	8.0
1.	Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment.	8.1
2.	The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.	8.2
3.	The potential for beneficial uses of waste energy from a proposed energy conversion facility	8.3
4.	Adverse direct and indirect environmental effects which cannot be avoided should the proposed site or route be designated.	8.4
5.	Alternatives to the proposed site, corridor, or route which are developed during the hearing process and which minimize adverse effects.	8.5
6.	Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.	8.6
7.	The direct and indirect economic impacts of the proposed facility	8.7
8.	Existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site, corridor, or route.	8.8
9.	The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.	8.9
10.	The effect of the proposed site or route on areas which are unique because of biological wealth or because they are habitats for rare and endangered species	8.10
11.	Problems raised by federal agencies, other state agencies, and local entities	8.11

State Authority	Description	Application Section
Chapter 69-06-05-01 part 2	Application Contents	See Table 3 for details and locations of compliance with this Chapter.

1.1.3 Route Permit Application

Table 3 below outlines the information required in Chapter 49-22-08.1 and 69-06-05-01 of the Siting Act for a Route Permit. Information regarding easements for transmission lines per NDCC 49-22-08.1(f) is also included in Section 3.1.5 of this Application.

Table 3: Route Permit Completion Checklist

State Authority	Description	Application Section
Chapter 49-22-08.1 Part 1	Application for a permit - Notice of filing - Amendment - Designation of a route	
a.	A description of the type, size, and design of the proposed facility.	1.1.1
b.	A description of the location of the proposed facility.	1.2.2
c.	An evaluation of the proposed route with regard to the applicable considerations set out in section 49-22-09 and the criteria established pursuant to section 49-22-05.1.	3.0
d.	A description of mitigative measures that will be taken to minimize all foreseen adverse impacts resulting from the location, construction, and operation of the proposed facility.	5.0
e.	A description of the right-of-way preparation and construction and reclamation procedures.	4.2.2
f.	A statement setting forth the manner in which: (1) The utility will inform affected landowners of easement acquisition, and necessary easement conditions and restrictions. (2) The utility will compensate landowners for easements, without reference to the actual consideration to be paid.	4.2.3, 5.17
g.	Such other information as the utility may consider relevant or the commission may require.	
Chapter 69-06-05-01 part 2	Application Contents	
a.	A description of the following:	
1)	The type of facility proposed.	1.1.1
2)	The purpose of the facility.	2.0
3)	The technology to be deployed.	1.2.3
4)	The type of product to be transmitted.	1.2.3
5)	The source of the product to be transmitted.	1.2.3
6)	The final destination of the product to be transmitted.	1.2.3

State Authority	Description	Application Section
7)	The proposed size and design and any alternate size or design that was considered, including:	
a)	The width of right of way	1.2
b)	The approximate length of facility;	1.0, 1.1.1
c)	The estimated span length for electric facilities;	1.2
d)	The anticipated type of structure for electric facilities;	1.2
e)	The voltage for electric facilities;	1.0
f)	The requirement for and general location of any new associated facilities;	1.0
g)	The estimated distance between surface structures for pipeline facilities;	NA
h)	The pipe size for pipeline facilities;	NA
i)	The maximum design operating pressure and temperature for pipeline facilities;	NA
j)	The maximum design flow rate for pipeline facilities; and	NA
k)	The number and general location of compressor or pumping stations.	NA
b.	The anticipated time schedule for accomplishing major events, including:	
1)	Obtaining the certification of corridor compatibility;	1.3
2)	Obtaining the route permit;	1.3
3)	Completing right-of-way acquisition;	1.3
4)	Starting construction;	1.3
5)	Completing construction;	1.3
6)	Testing operations; and	1.3
7)	Commencing Operations	1.3
c.	A copy of each evaluative study or assessment of the environmental impact of the proposed facility submitted to the agencies listed in section 69-06-01-05 and each response received.	Appendix E, Appendix F
d.	An analysis of the need for the proposed facility based on present and projected demand for the product transmitted, including the most recent system studies supporting the analysis of the need.	2.0
e.	A description of any feasible alternative methods for serving the need	2.3
f.	The width of a corridor must be at least ten percent of its length, but not less than one mile [1.61 kilometers] or greater than six miles [9.66 kilometers] unless another appropriate width is determined by the commission.	1.2.1
g.	A study area that includes a proposed corridor of sufficient width to enable the commission to evaluate the factors addressed in North Dakota Century Code section 49-22-09.	1.2.1, Figure 3
h.	A discussion of the factors in North Dakota Century Code section 49-22-09 to aid the commission's evaluation of the proposed route.	8.0

State Authority	Description	Application Section
i.	A discussion of the applicant's policies and commitments to limit the environmental impact of its facilities, including copies of board resolutions and management directives.	3.4
j.	Identification and map of the criteria that led to the proposed route location within the designated corridor, including exclusion areas, avoidance areas, selection criteria, policy criteria, design construction limitations, and economic considerations.	Tables 6, 7 and 8; Figure 2
k.	A discussion of the relative value of each criteria and how the applicant selected the proposed corridor location, giving consideration to all criteria and how the location, construction, and operation of the facility will affect each criteria.	Tables 6, 7 and 8
l.	A discussion of the general mitigative measures that the applicant will take to minimize adverse impacts that result from a route location in the proposed corridor and the construction and operation of the facility.	5.0
m.	The qualifications of each person involved in the corridor location study.	9.0
n.	A map identifying the criteria that led to the proposed route location within the designated corridor and the location of any new associated facilities. Several different criteria may be shown on each map depending on the map scale and the density and nature of the criteria.	Figures 2, 7, 8, 9, 10, 11 and 12
o.	An eight and one-half-inch by eleven-inch black and white map suitable for newspaper publication depicting the site area.	Provided on CD
p.	A discussion of present and future natural resource development in the area.	5.2

State Authority	Description	Application Section
q.	Map and GIS requirements. The applicant shall provide information that is complete, current, presented clearly and concisely, and supported by appropriate references to technical and other written material available to the commission. Data must be submitted in the ESRI shapefile or geodatabase format. If the applicant cannot submit the data in the ESRI format, an alternate format may be submitted with written approval by commission staff. Data must include appropriate attribute data for the included features. Relevant and complete metadata in compliance with FGDC metadata standards must be provided with all files. Supporting documents such as base maps, figures, cross sections, and reports must be submitted in the portable document file (PDF). If the supporting documents were derived from GIS/Cad files the supporting GIS/Cad files must also be included in the submittal. Aerial photos (raster images) must be georeferenced and submitted in TIFF, GEOTIFF, or MrSID image file formats with the associated word files. Appropriate metadata must be provided with all files, such as the source for the raster images, dates of aerial photography, and the type of imagery, color bands, i.e., black and white, color, color infrared, and any other pertinent data. All GIS base map data must be referenced to a published geographic or projected coordinate system. The appropriate systems would be North Dakota coordinate system of 1983, north and/or south zones US survey feet (NAD 83). UTM zone 13N or 14N meters (NAD 83), or geographic coordinate system (WGS 84) meters. The vertical datum must be the North American vertical datum of 1988. Tabular data (i.e., laboratory analytical data, water level evaluation data, monitor well construction data, well and boring X and Y location data, grain size analysis data, hydraulic conductivity data, etc.) must be submitted in either a Microsoft Excel or Microsoft Access database format or both if both are used. Textural data may be submitted in Microsoft Word or PDF format. The application may be submitted to the commission on the following media: Compact disc (CD-ROM (CD-R)), digital versatile disc (DVD-R or DVD+R), or other media upon commission approval.	Provided on CD
Chapter 49-22-09	Factors to be considered in evaluating applications and designation of sites, corridors, and routes.	
1.	Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment.	8.1
2.	The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.	8.2
3.	The potential for beneficial uses of waste energy from a proposed energy conversion facility	8.3
4.	Adverse direct and indirect environmental effects which cannot be avoided should the proposed site or route be designated.	8.4
5.	Alternatives to the proposed site, corridor, or route which are developed during the hearing process and which minimize adverse effects.	8.5
6.	Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.	8.6
7.	The direct and indirect economic impacts of the proposed facility	8.7

State Authority	Description	Application Section
8.	Existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site, corridor, or route.	8.8
9.	The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.	8.9
10.	The effect of the proposed site or route on areas which are unique because of biological wealth or because they are habitats for rare and endangered species	8.10
11.	Problems raised by federal agencies, other state agencies, and local entities	8.11

1.2 PROJECT DESCRIPTION

The Applicants propose to construct the North Dakota Facility, for which this Application has been prepared. The proposed location for the Ellendale 345-kV Substation is along the west side of 87th Avenue SE, across the road from the Ellendale 230-kV Substation, located about 1.5 miles west of Ellendale, North Dakota (see Figure 1). In general, the 345-kV transmission line will be constructed with single-pole steel structures. The average height of the single-pole structures will range from 125 to 155 feet. The average span between structures will range from 700 to 1,200 feet (typically about 1,000 feet) and will vary depending on geological or engineering constraints identified during final design. The typical North Dakota Facility ROW will be 150 feet wide. Specialty structures and foundations may be required in certain circumstances. The construction of the North Dakota Facility (described in Section 1.2.2) will occur within the North Dakota Corridor identified in Section 1.2.1. The proposed North Dakota Route was selected after addressing the factors identified in NDCC 49-22-09 and evaluating the criteria in NDAC 69-06-08-02. Descriptions of the North Dakota Corridor and the North Dakota Route follow.

1.2.1 North Dakota Corridor

The Applicants began their analysis by collecting geographic information system (GIS) data from local, state, and federal agencies for much of northeastern South Dakota and southeastern North Dakota. The Applicants used this data, along with data collected during field visits, to develop a Project study area and identify initial opportunities and constraints. The Applicants then narrowed the study area into study corridors that were used during agency and public outreach efforts to help identify additional opportunities and constraints to be considered during route development (Figure 3). In North Dakota, the study corridor was 50 to 55 miles long and 10 to 15 miles wide, and covered areas of Dickey, Sargent, and Richland counties. Next, the Applicants developed a series of route segments within the study corridors, which were typically short linear segments near public roadways, section or quarter section field lines, or existing corridors with which a potential transmission line route could be compatible. It was considered desirable to locate the new transmission line near facilities such as roadways, section lines, and existing corridors to minimize impacts on open land areas, avoid impacts on homes, businesses, or wind energy facilities, and allow for easier access to the ROW for construction and maintenance purposes. The feasibility of using these segments was evaluated on an individual

basis. Once evaluation of the route segments was completed, the segments were linked together into numerous alternative preliminary transmission line routes.

Based on the results of the analysis for the route segments in both North Dakota and South Dakota, the Applicants refined the study corridors to focus on selecting preliminary route alternatives. These alternatives were provided to the public and agencies for comment. The refined study corridor in North Dakota covered an area that was approximately 12 miles wide and 24 miles long, in portions of Dickey and Sargent counties (Figure 3).

After additional analysis and public input, as well as consideration of the exclusion and avoidance criteria outlined in NDAC 69-06-08-02, the Applicants selected the North Dakota Corridor proposed in this Application within the refined study corridor in Dickey County. In addition, the North Dakota Corridor was developed considering other existing linear features such as power line and roadway corridors to maximize the potential to parallel existing corridors and minimize the length and effects of a new corridor.

The North Dakota Corridor is generally rural and intensively farmed or is pasture land interspersed by rural homesteads, open land, wind breaks, and distribution power lines.

The factors addressed in NDCC 49-22-09 were considered in evaluating the North Dakota Corridor for a 345-kV transmission line and are discussed in Section 8.0. All exclusion and avoidance areas within the study corridors were considered in selecting the North Dakota Corridor. The Applicants sought to avoid residential areas, irrigated land, recreational areas, United States Fish and Wildlife Service (USFWS) Waterfowl Production Areas (WPAs), and state Wildlife Management Areas (WMAs) to the extent practicable. The Applicants also considered using existing transmission corridors. This is consistent with NDAC Policy Criteria for transmission corridors and routes (Sections 69-06-08-02 part 2e; 69-06-08-02 part 4i; 69-06-08-02 part 4g) which encourages applicants to avoid places of residence and maximize benefits by utilizing existing and proposed route corridors and coordinating facilities.

The North Dakota Corridor is 1 mile wide (0.5 mile on each side of the North Dakota Route) and the legal land descriptions are provided in Table 4 and represented in Figure 2. The selected corridor complies with NDCC 69-06-05-02 part 5, which states that the width of the corridor must be at least 10 percent of the length of the line, not less than 1 mile and not more than 6 miles in width.

Table 4: North Dakota Corridor Land Description

Township Name	Township	Range	Section
Ellendale	129N	63W	3
Ellendale	129N	63W	4
Ellendale	129N	63W	9
Ellendale	129N	63W	10
Ellendale	129N	63W	14
Ellendale	129N	63W	15
Ellendale	129N	63W	16
Ellendale	129N	63W	22
Ellendale	129N	63W	23

Township Name	Township	Range	Section
Ellendale	129N	63W	24
Ellendale	129N	63W	25
Ellendale	129N	63W	26
Van Meter	129N	62W	17
Van Meter	129N	62W	18
Van Meter	129N	62W	19
Van Meter	129N	62W	20
Van Meter	129N	62W	29
Van Meter	129N	62W	30
Van Meter	129N	62W	31
Van Meter	129N	62W	32

1.2.2 North Dakota Route

The Applicants identified the route for the North Dakota Facility within the North Dakota Corridor after considering the exclusion and avoidance criteria outlined in NDAC 69-06-08 (Section 3.0 of this Application) and after considering public and agency input as described in Section 6.0 of this Application.

The North Dakota Route was selected based on several considerations, including the following:

- Minimizing total length and construction costs
- Minimizing impacts on humans and human settlements, including (but not limited to) displacement, noise, aesthetics, cultural resources, recreation, and public services
- Consideration of effects on public health and safety
- Offsetting existing ROW (roadway or other utility ROW) or section lines to minimize impacts on current land use, including (but not limited to) agricultural fields and mining facilities
- Minimizing effects on archaeological, cultural properties, and historic resources
- Minimizing impacts on wetlands, surface waters, and rivers
- Minimizing impacts on rare or endangered species and unique natural resources
- Minimizing effects on airports or other land use conflicts

Figure 2 identifies the proposed North Dakota Route relative to the North Dakota Corridor and exclusion and avoidance criteria. Legal descriptions of the route location are provided in Table 5.

Table 5: North Dakota Route Land Description

Township Name	Township	Range	Section
Ellendale	129N	63W	9
Ellendale	129N	63W	10
Ellendale	129N	63W	15
Ellendale	129N	63W	22

Township Name	Township	Range	Section
Ellendale	129N	63W	23
Ellendale	129N	63W	24
Van Meter	129N	62W	19
Van Meter	129N	62W	20
Van Meter	129N	62W	29
Van Meter	129N	62W	32

1.2.3 Product

The Project will transmit electrical energy generated from sources primarily within North Dakota and South Dakota. The transmission line is intended to carry three-phase, AC power at 345 kV. The electric power (the "product" for purposes of this Application) will be available for delivery within the entire MISO region, including North Dakota, as well as potential delivery outside the MISO region.

1.3 PROJECT SCHEDULE

A preliminary schedule for the North Dakota Facility is provided below.

The Project schedule is based on information known as of the date of this filing and upon planning assumptions. This schedule is subject to adjustment and revision as further information is developed. The Applicants plan to give milestone updates through the Project's newsletter and website.

Submit Corridor and Route Permit Application ..... October 2013

Land Rights Acquisition Initiated 2013

Anticipated Date of Commission Order ..... October 2014

Material Procurement Commitments 2015

Final Transmission Line and Substation Design 2016

Construction Start 2016

Testing Operations 2019

In-Service Operations 2019

Final Land Rights, Settlements, and Cleanup 2020

2.0 NEED FOR FACILITY

2.1 NEED ANALYSIS

MISO is a not-for-profit, member-based regional transmission organization (see generally www.midwestiso.org). The Project is part of the MISO's MVP portfolio, a regionally-planned portfolio of transmission projects supported by significant research and analysis. On December 8, 2011, the MISO Board of Directors approved a regional transmission plan for the construction of a portfolio of MVPs[1]. The Applicants are members of MISO and participated in MISO's transmission planning efforts that identified the MVPs. The Applicants concur with MISO's planning report as it pertains to the Project. In total, the MVPs represent 17 electric transmission projects across the Midwest designed to reduce the wholesale cost of energy delivery for the consumers across the MISO region by enabling the delivery of low-cost generation to load, reducing congestion costs, and increasing system reliability. The MISO region, including all or parts of North Dakota, South Dakota, Montana, Minnesota, Wisconsin, Michigan, Iowa, Missouri, Illinois, Indiana and, Kentucky, is the general area served by the North Dakota Facility (NDAC Chapter 69-06-06-01). The Project, a MISO-approved MVP, is shown in Figure 4 labeled as Facility Number (#) 6 (Midwest ISO 2011).

A CPCN was issued by the Commission for the North Dakota Facility in Case No. PU-13-272 for Montana-Dakota and Case No. PU-13-273 for Otter Tail Power on September 25, 2013.

2.2 DESCRIPTION OF STUDIES DEVELOPED

MISO conducted several studies dating back to 2002 to investigate the reliable transmission of electrical power in the Midwest and the integration of wind energy resources to provide the best value to electric consumers. The most notable studies that contributed to the identification of the Project were the Northwest Exploratory Study completed during the Midwest ISO Transmission Expansion Plan (MTEP) 2005 (Midwest ISO 2005) planning cycle, the Regional Generation Outlet Study (RGOS) completed during the MTEP09 and MTEP10 planning cycles (Midwest ISO 2010), and the "Multi-Value Project Portfolio – Results and Analyses" paraphrased in the MISO Transmission Expansion Plan 2011 (MTEP11) planning report (Midwest ISO 2011).

The overall goal for the MVP portfolio analysis was to design a transmission portfolio that takes advantage of the linkages between regional reliability and economic benefits to promote a competitive and efficient electric market within the MISO territory. The Project was identified as one such project capable of providing regional electric reliability through the construction and operation of a higher-voltage transmission system. It would stabilize the regional network by providing a backbone system and contending with system contingencies. With the construction of a new 345-kV transmission line, the regional network of distribution and lower-voltage transmission lines will benefit from enhanced connections with the high-voltage transmission system. In addition, the enhanced transmission system will be better able to withstand system failures. Furthermore, the Project would remove overloads on local transmission facilities,

[1] Appendix A of the 2011 MISO Transmission Expansion Plan - MISO Transmission Expansion Plan 2011 ("MTEP11 Report"), MTEP 11 Report and related material are posted on the MISO website at: https://www.midwestiso.org/Planning/TransmissionExpansionPlanning/Pages/MTEP11.aspx

thereby improving reliability to the local transmission system as more generation facilities are constructed within North Dakota and South Dakota.

2.3 NO ACTION AND FEASIBLE ALTERNATIVE METHODS

The North Dakota Corridor and North Dakota Route were selected using the Commission's criteria in addition to other engineering, cost, and landowner considerations. The North Dakota Route was developed considering the location of avoidance and exclusion areas. Section 3.0 discusses the corridor and route criteria considered in determining the final route.

Per NDAC 69-06-05-01 part 2(e), MISO considered other feasible alternative methods of meeting the objectives of the MVP portfolio including the No Action Alternative. Under the No Action alternative, the Project would not be constructed, and only transmission projects previously identified or planned in the future would be implemented.

MISO's extensive regional expansion planning process involves a stakeholder process. One objective of the process is to derive the most cost-efficient transmission expansion plan that will meet local and regional needs for reliability, optimize access to low-cost power resources, and deliver other important values that benefit the ultimate consumer and society. If one key element of the regional expansion plan, especially a backbone element such as the Project, designed for both reliability and economic attributes, is not constructed, considerable redesign could be required. This would result in possible delay, additional expense, and adverse impacts on the addition of new generation supplies and service to load.

If the Project is not constructed as planned, the existing transmission system would be unable to reliably accommodate significant new generation interconnection. The MISO analyses of this Project identified several 230-kV and 115-kV transmission facilities that will be loaded above safe operating levels in the future without the Project, if additional generation is built (Midwest ISO 2012). The construction of the Project will provide a new high-voltage transmission path for the benefit of customers on the MISO network, including customers of the Applicants in North Dakota. In addition, the MISO MVP analysis identified economic benefits to North Dakota and South Dakota (and all Local Resource Zones within MISO) (Midwest ISO 2012). These economic benefits would not be realized by North Dakota and South Dakota without the Project. In summary, the short-term and long-term benefits listed in Section 3.6 (Economic Considerations) would not be realized under the No Action alternative.

2.3.1 Underground Transmission Lines

No portion of the Project will require underground transmission. While it is common for lower voltage lines to be buried, it is rare for high-voltage transmission lines (HVTLs) to be constructed underground. Transmission lines can be placed underground, but the cost to construct underground can be many times the cost of overhead construction. Because of the significantly greater expense associated with underground transmission construction, the use of underground technology is limited to locations where the impacts of overhead construction are completely unacceptable or where physical circumstances allow for no other option. The Applicants concluded that the environmental and land use setting did not warrant underground construction on any portion of the 345 kV transmission line.

2.3.2 Ten-Year Plan

The Applicants have filed required Ten-Year Plans with the Commission. Montana-Dakota filed a Ten-Year Plan with the Commission on June 29, 2012, under Case No. PU-12-454. Otter Tail Power submitted a Ten-Year Plan on July 2, 2013, under Case No. PU-13-549. This Project is consistent with the Ten-Year Plans on file with the Commission for both Applicants.

3.0 TRANSMISSION FACILITY CORRIDOR AND ROUTE CRITERIA

The Applicants evaluated a study area to determine the best location for a North Dakota Facility. Within this study area, a 1-mile-wide North Dakota Corridor was selected that complies with NDAC Section 69-06-04-02, which includes a requirement that "(b) The width of a corridor must be at least ten percent of its length, but not less than one mile [1.61 kilometers] or greater than six miles [9.66 kilometers] unless approved by the commission."

Within this North Dakota Corridor, a 9- to 11-mile-long route was selected for the 345-kV transmission line from the proposed Ellendale 345-kV Substation to the North Dakota-South Dakota border.

The North Dakota Corridor and North Dakota Route were selected according to an inventory and suitability analysis based on the criteria listed in NDAC Section 69-06-08-02. This includes an assessment of exclusion and avoidance areas; selection criteria that relate to minimizing potential land use and environmental impacts; policy criteria that relate to maximizing public benefits; and design and construction limitations. The Applicants also included economic considerations as part of the corridor and route selection process. The route selection process centered on a multi-faceted approach in which the Applicants considered state and federal requirements, public comments received at public meetings, and extensive analysis of environmental data. The route development process was primarily driven by extensive public participation and agency coordination programs in both North Dakota and South Dakota.

The North Dakota Corridor meets the criteria set forth in NDAC 69-06-08-02, which states that "exclusion and avoidance areas may be located within a corridor, but at no given point shall such an area or areas encompass more than 50 percent of the corridor width unless there is no reasonable alternative." There are no exclusion areas within the North Dakota Corridor. Avoidance areas (occupied homes) within the North Dakota Corridor are shown in Figure 2. The North Dakota Route avoided the Avoidance areas that are within the North Dakota Corridor. The specific criteria and considerations made by the Applicants for the North Dakota Facility are outlined in the following subsections.

3.1 EXCLUSION AREAS

In accordance with NDAC Section 69-06-08-02-1, "the following geographical areas shall be excluded in the consideration of a route for a transmission line, and shall include a buffer zone of reasonable width to protect the integrity of the area. Natural screening may be considered in determining the width of the buffer zone." See Table 6.

Table 6: Exclusion Areas

Exclusion Area	Present within North Dakota Corridor	Present within North Dakota Facility ROW	Route Buffer Zone Width	Application Section
Designated or registered national parks, memorial parks, historic sites and landmarks, natural landmarks, monuments, and wilderness areas	No	No	No buffer is proposed because no features are identified within the North Dakota Corridor.	5.7, 5.8, 5.15
Designated or registered state parks, historic sites, monuments, historical markers, archaeological sites, and nature preserves	No	No	No buffer is proposed because no features are identified within the North Dakota Corridor.	5.7, 5.8
County parks and recreational areas, municipal parks, and parks owned or administered by other governmental subdivisions	No	No	No buffer is proposed because no features are identified within the North Dakota Corridor.	5.8
Areas critical to the life stages of threatened or endangered species	No designated critical habitat	No	No buffer is proposed because no features are identified within the North Dakota Corridor.	5.16
Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged	No areas containing animal or plant species that are unique or rare to the state would be irreversibly damaged within the corridor.	No	No buffer is proposed because no features are identified within the North Dakota Corridor. The Applicants will continue to work with applicable federal and state agencies.	5.16
Areas within 1,200 feet of the geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility	No	No	No buffer is proposed because no features are identified within the North Dakota Corridor.	5.2.1.3
Areas within 30 feet on either side of a direct line between ballistic missile (ICBM) launch or launch control facilities to avoid microwave interference	No	No	No buffer is proposed because no features are identified within the North Dakota Corridor.	5.2.1.3

3.2 AVOIDANCE AREAS

In accordance with NDAC Section 69-06-08-02-2, "the following geographical areas shall not be considered in the routing of a transmission line unless the applicant shows that under the circumstances there is no reasonable alternative. In determining whether an avoidance area should be designated for a route, the Commission may consider, among other things, proposed management of adverse impacts; orderly siting of facilities; system reliability and integrity; efficient use of resources; and alternative routes. Economic considerations alone shall not justify approval of these areas. A buffer zone of a reasonable width to protect the integrity of the area shall be included unless a distance is specified in the criteria. Natural screening may be considered in determining the width of the buffer zone." See Table 7.

Table 7: Avoidance Areas

Avoidance Area	Present within North Dakota Corridor	Present within North Dakota Facility ROW	Route Buffer Zone Width	Application Section
Designated or registered national historic districts; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands	No	No	No buffer is proposed because no features are identified within the North Dakota Corridor.	5.8
Designated or registered state wild, scenic, or recreational rivers; game refuges; game management areas; management areas; forests; forest management lands; and grasslands	No	No	No buffer is proposed because no features are identified within the North Dakota Corridor.	5.2, 5.12, 5.14
Historical resources that are not specifically designated as exclusion or avoidance areas	Yes – one recorded archaeological site and one recorded archaeological site lead	No	The Applicants do not anticipate impacts to identified cultural resources within the North Dakota Facility ROW. Mitigation measures will take into consideration consultation with the North Dakota State Historic Preservation Office (SHPO).	5.7
Areas that are geologically unstable	No	No	No buffer is proposed because no features are identified within the North Dakota Corridor.	5.11

Avoidance Area	Present within North Dakota Corridor	Present within North Dakota Facility ROW	Route Buffer Zone Width	Application Section
Within 500 feet of a residence, school, or place of business	Yes	No	The Route is not within 500 feet of any of the 11 occupied residences within the North Dakota Corridor.	5.9
Reservoirs and municipal water supplies	No	No	No buffer is proposed because no features are identified within the North Dakota Corridor.	NA
Water sources for organized rural water districts	No	No	No buffer is proposed because no features are identified within the North Dakota Corridor.	NA
Irrigated land (This criterion shall not apply to an underground transmission line.)	No	No	No buffer is proposed because no features are identified within the North Dakota Corridor.	5.9
Areas of recreational significance that are not designated as exclusion areas	No	No	No buffer is proposed because no features are identified within the North Dakota Corridor.	5.8

3.3 SELECTION CRITERIA

In accordance with NDAC Section 69-06-08-02-3, "a corridor or route shall be designated only when it is demonstrated to the Commission by the applicant that any significant adverse effects resulting from the location, construction and maintenance of the route, as they relate to the following, will be at an acceptable minimum or that those effects will be managed and maintained at an acceptable minimum." See Table 8.

Table 8: Selection Criteria

Selection Criteria	Potential Adverse Effects		Application Section
	North Dakota Corridor	North Dakota Facility ROW	
The impact upon agriculture:			
Agricultural production	About 72 percent of the North Dakota Corridor is in cultivated land use. The North Dakota Facility will temporarily and permanently impact areas of cropland within the North Dakota Corridor.	Approximately 8.7 acres of land will be permanently impacted due to the North Dakota Facility.	5.9
Family farms and ranches	Land area used for the 345-kV transmission line will have a minimal adverse effect on family farms. No family farms will be displaced due to construction of the North Dakota Facility in the North Dakota Corridor.	Land area used for the 345-kV transmission line structures will have a minimal adverse effect on family farms. No family farms will be displaced due to construction of the North Dakota Route.	5.9
Land that the owner demonstrates has soil, topography, drainage, and an available water supply that cause the land to be economically suitable for irrigation	Currently, no irrigated land is located within the North Dakota Corridor.	No irrigated land is located within the North Dakota Facility ROW. If a landowner expresses concerns related to economically suitable irrigation on their land, the Applicants will work with them to avoid or minimize impacts.	5.9
Surface drainage patterns and groundwater flow patterns	No impacts are anticipated on rivers, streams, and drainageway resources; no effects on groundwater flow patterns are anticipated. The 345-kV transmission line would not affect surface drainage patterns. Localized changes to surface drainage patterns may be associated with the new Ellendale 345-kV Substation due to required grading.	No impacts are anticipated on rivers, streams, and drainageway resources; no effects on groundwater flow patterns are anticipated. The 345-kV transmission line will not affect surface drainage patterns. Localized changes to surface drainage patterns may be associated with the Ellendale 345-kV Substation due to required grading; the minimum necessary amount of grading will be done. To minimize impacts during construction, the Applicants will follow applicable regulations under the North Dakota Pollutant Discharge Elimination System (NDPDES) General Permit for Stormwater Discharges Associated with Construction Activity. A Notice of Intent (NOI) to obtain permit coverage will be submitted to the North Dakota Department of Health prior to construction.	5.11, 5.12

Selection Criteria	Potential Adverse Effects		Application Section
	North Dakota Corridor	North Dakota Facility ROW	
The impact upon:			
Sound-sensitive land uses	Residences within the North Dakota Corridor may be considered sound-sensitive land uses. Residences within the North Dakota Corridor are widely scattered.	Noise impacts are nominal. There are no sound-sensitive receptors within 500 feet of the North Dakota Route	5.5
Visual effect on the adjacent area	The 345-kV transmission line will be visible to landowners and residents who live near the line. The Applicants will minimize visual impacts to the extent practicable.	Visual impacts will be most evident to landowners and residents near the North Dakota Route and drivers traveling along adjacent roadways. The Applicants propose to mostly use single-pole steel structures commonly used by transmission line facilities across the state. Structures will also avoid sensitive areas to the extent practicable.	5.6
Extractive and storage resources	There are no known extractive or storage resources within the North Dakota Corridor; no adverse effects are anticipated to occur on these resources.	There are no known extractive or storage resources within the North Dakota Route; no adverse effects are anticipated to occur on these resources.	5.11
Wetlands, woodlands, and wooded areas	Approximately 12 percent of the North Dakota Corridor contains wetlands. Wetland resources will be avoided to the extent practicable. The Applicants will utilize transmission line and substation designs to minimize impacts on wetlands in the North Dakota Corridor consistent with regulatory requirements.	Approximately 16 percent of the North Dakota Facility ROW contains wetlands. Wetland resources will be avoided to the extent practicable. The Applicants will utilize transmission line and substation designs to minimize impacts on wetlands in the North Dakota Facility ROW consistent with regulatory requirements.	5.2, 5.9, 5.13
Radio and television reception and other communication or electronic control facilities	No impacts on communication resources are anticipated.	No impacts on communication resources are anticipated.	5.3
Human health and safety	No impacts on human health and safety are anticipated from the operation of the North Dakota Facility.	No impacts on human health and safety are anticipated from the operation of the North Dakota Facility.	5.4

Selection Criteria	Potential Adverse Effects		Application Section
	North Dakota Corridor	North Dakota Facility ROW	
Animal health and safety	No impacts on livestock are anticipated from the operation of the North Dakota Facility. Raptors, waterfowl, and other bird species may be affected by the construction and placement of the 345-kV transmission line. Avian collisions are a possibility after completion of the transmission line. Generally, collisions with the shield wire are most common. Mitigation measures, as outlined in Section 5.15.3, will minimize these impacts.	No impacts on livestock are anticipated from the operation of the North Dakota Facility. Raptors, waterfowl, and other bird species may be affected by the construction and placement of the 345-kV transmission line. Avian collisions are a possibility after the completion of the transmission line. Generally, collisions with the shield wire are most common. Mitigation measures, as outlined in Section 5.15.3, will minimize these impacts.	5.9, 5.15
Plant life	The North Dakota Corridor is a mixture of cropland, planted grassland, native grassland/prairie, and wetlands. Construction of the North Dakota Facility within the North Dakota Corridor will likely require a relatively small acreage of impacts on both native and introduced plant life.	Approximately 6 acres of pasture will be temporarily impacted, and this area can potentially include native grassland/prairie. Nearly all of this native grassland/prairie is currently being used as pasture.	5.9, 5.14

3.4 POLICY CRITERIA

In accordance with NDAC Section 69-06-08-02-4, "the Commission may give preference to an applicant that will maximize benefits that result from the adoption of the following policies and practices, and in a proper case may require the adoption of such policies and practices. The Commission may also give preference to an applicant that will maximize interstate benefits." These policy criteria are described with respect to the Project in Table 9.

Table 9: Policy Criteria

Policy Criteria	Suitable Policy or Practice of Applicant	Application Section
Location and design	The Applicants have attempted to locate and design the North Dakota Facility to minimize environmental impacts and utilize existing corridors where practical.	1.1
Training and utilization of available labor in this state for the general and specialized skills required	The Applicants will use local labor and resources during construction to the extent practicable based on available qualified personnel.	5.1
Economies of construction and operation	The Applicants will utilize local contractors to the extent practicable based on available qualified personnel.	5.1

Policy Criteria	Suitable Policy or Practice of Applicant	Application Section
Use of citizen coordinating committees	The Applicants have and will continue to work with landowners on development of the Project.	6.0
Labor relations	No labor relations will be affected.	5.1
Coordination of facilities	Existing facilities were considered in the location of the North Dakota Facility.	1.2.1, 1.2.2
Monitoring of impacts	The Applicants and the construction contractor will employ Best Management Practices (BMPs) during construction to minimize environmental impacts and will maintain commitments made in this Application and applicable permit conditions, including the Commission's Order approving the North Dakota Facility. The Applicants will monitor the success of tree and shrub replacement, if needed.	5.10, 5.14, 5.15
Utilization of existing and proposed rights-of-way (ROW) and corridors	One of the primary goals in locating the North Dakota Route was to maximize use of existing transmission and roadway corridors and ROW. The proposed North Dakota Route is consistent with this policy and is the best location when considering the factors identified by the Commission, the policies of the Applicants, and Project design.	1.2.1, 1.2.2, 3.5
Other existing or proposed transmission facilities	The North Dakota Corridor parallels existing transmission and roadway corridors to the extent practical.	1.2.1, 1.2.2, 3.5

The Applicants' practices and policies are guided by their missions, which are as follows.

Montana-Dakota will operate efficiently to meet the needs of the present without compromising the ability of future generations to meet their own needs. Montana-Dakota's environmental goals are:

- To minimize waste and maximize resources;
- To support environmental laws and regulations that are based on sound science and cost- effective technology; and
- To comply with or exceed all applicable environmental laws, regulations and permit requirements.

Otter Tail Power's mission is to produce and deliver electricity as reliably, economically, and environmentally responsibly as possible to the balanced benefit of customers, shareholders, and employees and to improve the quality of life in the areas in which they do business.

The North Dakota Route will be located in such a manner as to maximize operational efficiency and economic benefits and to minimize impacts on agriculture, extractable resources, health and safety, plant and animal life, communications, and the visual effect on the surrounding area. The North Dakota Route will be sited in compliance with the federal, state, and local laws and with the Commission's rules and regulations.

The Applicants are substantially compliant with all federal, state, and local environmental regulations and requirements for their wholly-owned and jointly-owned facilities. The Applicants' environmental policies and best practices are consistent with the Commission policy criteria outlined in NDAC Section 69-06-08-02-4.

3.5 DESIGN AND CONSTRUCTION LIMITATIONS

Pursuant to NDAC Section 69-05-01(2)(j), the proposed location of the North Dakota Facility is the most direct route which also minimizes impacts on the exclusion, avoidance, selection, and policy criteria identified in Section 69-06-08-02.

Most wetland impacts in North Dakota will be avoided through careful routing of the North Dakota Facility. The Applicants will attempt to span all wetlands. Wetlands more than 1,000 feet in length may require that transmission structures be placed within wetlands. If wetland impacts are unavoidable, they will be mitigated as required by the United States Army Corps of Engineers (USACE).

Since new easements may be secured by USFWS and the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), the Applicants will continue to work with the agencies and landowners to obtain the exact locations of USFWS grassland and wetland easements and parcels of land enrolled in USDA NRCS programs, including the Wetlands Reserve Program, Conservation Reserve Program, and Conservation Reserve Enhancement Program.

Following geotechnical exploration, it may become necessary to utilize special structures to avoid sensitive environmental features or different construction methodology may be required such as a specific footing design to accommodate soil features or other design limitations.

3.6 ECONOMIC CONSIDERATIONS

There are several economic considerations in deciding where the North Dakota Facility should be routed (Section 69-06-05-01(2)(j)). Overall, minimizing the length decreases the cost to construct the 345-kV transmission line because of less material usage and ROW needed and fewer potential effects upon the land use. Minimized length also reduces line loss as electricity travels from the generation source to the end user. As described in Section 2.3, the Applicants believe that this proposed line design is the most economical and efficient alternative to deliver the electricity.

The Applicants are proposing to use a single-pole, self-supporting design, which are more expensive than other structure types (H-frame), but minimize impacts to crops because of a smaller footprint. The Applicants decreased Project costs by minimizing the number of corner structures required for the transmission line. Corner structures increase the 345-kV transmission line costs, since special structures, foundation, and engineering are typically required. They also slightly increased environmental and land use impact as they have a larger construction footprint. The Applicants attempted to minimize the overall North Dakota Facility costs while simultaneously considering exclusion areas, avoidance areas, selection criteria, policy criteria, and landowner and agency concerns.

Short-term economic benefits will be derived from activities associated with construction of the North Dakota Facility. Local businesses would likely see an increase in revenues from

construction of the North Dakota Facility and positive economic gains will result from increased spending on lodging, meals, and other consumer goods and services. In addition, short-term economic benefits will be realized by landowners that will receive payments for land rights for the North Dakota Facility ROW.

Long-term economic benefits of the North Dakota Facility include supporting public policy, increasing system capacity, and increasing the tax base. By increasing the capability of the transmission system, there will be additional opportunities to transmit energy generated from renewable and other energy resources. It is anticipated that the construction of the Project will reduce obstacles impeding energy development, resulting in additional economic gains to the state and local areas. In addition, the North Dakota Facility will increase the tax base for local taxing jurisdictions where this facility is located, and additional property taxes of approximately $200,000 will be paid annually primarily due to the Ellendale 345-kV Substation.

4.0 ENGINEERING AND OPERATIONAL DESIGN

4.1 PREFERRED NORTH DAKOTA FACILITY DESCRIPTION

The North Dakota Corridor and North Dakota Route proposed in this Application extend from the planned Ellendale 345-kV Substation paralleling the west side of 87th Avenue SE for approximately 0.8 mile south, crossing State Highway 11. Approximately 0.2 mile north of the intersection of 87th Avenue SE and 98th Street SE, the North Dakota Route turns southeast for approximately 1,000 feet, then turns east paralleling 98th Street SE for approximately 0.5 mile before turning south along quarter-section lines for 1.5 miles. In the middle of Section 22 of Ellendale Township, the North Dakota Route turns east, continuing to follow quarter-section field lines into Van Meter Township for 4 miles. At the center of Section 20 of Van Meter Township, the North Dakota Route turns south, and continues for approximately 2.5 miles to the South Dakota state border.

4.2 DESCRIPTION OF PROPOSED FACILITY

4.2.1 Transmission Structures and Right-of-Way Design

A design data report is attached as Appendix A.

Transmission Structures

The Applicants propose to use single-pole, steel single-circuit structures for the 345-kV transmission line, unless engineering or environmental conditions require the use of steel H-frame or guyed single-pole structures. Public input was a consideration in the selection of the structure type. Single-pole, steel structures are typically placed on concrete foundations measuring about 6 to 11 feet in diameter. Specialty structures, including dead-end structures, H-frame structures, or guyed single-pole structures, may be used in certain circumstances. Typically, H-frame structures consist of two steel poles with cross bracing. A guyed single-pole structure is a single-pole with guy wires that extend diagonally out to the ground. Concrete pier foundations may be used for angle structures or if soil conditions are poor. As engineering continues, it will be determined if and where specialty structures may be used.

Table 10 shows a summary of the configuration of the structures that are under consideration for the North Dakota Route.

The North Dakota Facility will be designed to meet or surpass all relevant state and local codes, National Electrical Safety Code (NESC) requirements, Avian Power Line Interaction Committee (APLIC) guidelines, and Applicant standards. Appropriate standards will be met for construction and installation and all applicable safety procedures will be followed during and after installation.

Table 10: Structure Design and Configuration Summary

Structure Type	Structure Material	ROW Width (feet)	Approx. Structure Height (feet)	Approx. Structure Base Diameter (feet)	Approx. Foundation Diameter (feet)	Average Span Between Structures (feet)	Pole-to-Pole Span on Single H-Frame Structure (feet)
345-kV Single-Pole Davit Arm (majority of route)	Steel	150	125-155	3-4 (tangent structures) 4-6 (angle structures)	6-11	1,000 (range of 700 to 1,200)	NA
345-kV Guyed Single-Pole	Steel	150	125-155	3-4 (tangent structures) 4-6 (angle structures)	3-5	1,000 (range of 700 to 1,200)	NA
345-kV H-Frame (if necessary)	Steel	150	100-130	3-4 (tangent structures)	3-5	1,000 (range of 700 to 1,200)	30
230-kV Tie Line Structure	Wood	Existing ROW	90	2	No foundation – structures will be direct embed	300 (range of 200 to 500)	N/A

The capacity of the 345-kV and 230-kV transmission lines are anticipated to be approximately 2,000 amps and 950 amps, respectively. Preliminary plan and profiles are included in Appendix B. If any changes occur prior to the public hearing for this Project, revisions will be submitted to the Commission at least 7 days prior. Appendix C depicts the typical 345-kV structures that will be used.

Conductor Configuration

It is anticipated that each phase will consist of two conductor-bundled, twisted-pair 477 thousand circular mils (kcmil), 26/7, Hawk, aluminum conductor steel reinforced (ACSR) or conductors of comparable capacity.

The vertical overhead design clearance is based on the conductor's final sag at the maximum design operating temperature. Table 11 identifies the minimum design clearances for the 345-kV transmission line.

Table 11: Minimum Design Clearance for 345-kV Transmission Conductor

Land Use	Height (feet)
Roads	34
State highways	34
Cultivated fields	30
Pasture	30
Existing 115-kV transmission line	14

Span

Span represents the distance between structures (regardless of structure type or service design). The average span distance will be about 1,000 feet, with a general range of 700 to 1,200 feet. Spans used throughout the Project will be adjusted to account for topography, specific physical resources along the transmission line route, and land uses.

Right-of-Way Design

North Dakota Facility ROW will be secured prior to construction. If additional ROW is required it will be identified in the easement agreement with the landowner. If the 345-kV transmission line is placed on property division lines across private land, the easement width to be acquired from each of the adjacent landowner(s) will vary.

The transmission line will be located within the North Dakota Facility ROW, but the location within the ROW will be dependent on terrain, the presence of other existing facilities and ROW, environmental features, and landowner concerns. ROW impacts and calculations for this Application are based upon a 150-foot-wide ROW.

It is intended that the Project will not share ROW with existing features; rather, the North Dakota Facility ROW will be offset from road ROW and section lines; the transmission structures and North Dakota Facility ROW are not expected to be located within the road ROW. The final engineering design will utilize available information on planned or programmed improvements to area roadways, to locate structures such that room is provided for known roadway expansion projects.

North Dakota Century Code 49-22-05.1 states that "Except for transmission lines in existence before July 1, 1983, areas within five hundred feet [152.4 meters] of an inhabited rural residence must be designated avoidance areas. The five hundred foot [152.4 meter] avoidance area criteria for an inhabited rural residence may be waived by the owner of the inhabited rural residence in writing." There are no occupied residences within 500 feet of the North Dakota Facility.

4.2.2 Right-of-Way Preparation, Construction, Restoration, and Maintenance

Right-of-Way Preparation

During the land rights process, individual property owners will be advised as to the construction schedule, needed access to the North Dakota Facility ROW, and any vegetation clearing required for the North Dakota Facility. To maintain North American Electric Reliability Corporation (NERC) standards, the North Dakota Facility ROW will be cleared of vegetation as necessary to construct, operate, and maintain the North Dakota Facility. Clear cutting (that is, the removal of all trees, brush, and other low-growing vegetation) will occur within the North Dakota Facility ROW, along construction and maintenance travel paths, and at structure erection sites. Trees that could present a danger to the safe operation of the North Dakota Facility (Danger trees) will also be removed or pruned to address safety standards. Danger trees include trees outside of the North Dakota Facility ROW that could hit the transmission line should they fall. Disposal of timber, tree tops, limbs, and slash will comply with state and local ordinances and the desires of landowners. Wood from the clearing operation will be offered to the landowner or removed from the site.

Transmission Line Construction Procedures

Construction will begin after federal, state, and local approvals are obtained and land rights determined for the area to be constructed. The precise timing of construction will consider various requirements that may be in place due to permit conditions, prudent construction timing, and available workforce. Once access to the North Dakota Facility ROW has been granted and the necessary permits are received, site preparation activities could begin. These activities include clearing the North Dakota Facility ROW of vegetation that will interfere with construction or the safe operation of the transmission line. If temporary removal or relocation of fences is necessary, installation of temporary or permanent gates will be coordinated with the landowner. The Applicants anticipate working with landowners to minimize disruptions.

Transmission line structure sites are typically selected in areas that will require minimal grading. Structure sites with slopes of 10 percent or less typically will not be graded or leveled, unless it is necessary to provide a level area for construction access and activities. At sites with more than 10 percent slope, working areas may require grading or fill to develop a suitable work area. If the landowner permits, leveled areas and working pads will remain in place for use in future maintenance activities.

Typical construction equipment consists of tree removal equipment, mowers, cranes, backhoes, digger-derrick line trucks, track-mounted drill rigs, dump trucks, front end loaders, bucket trucks, bulldozers, flatbed trucks, pickup trucks, concrete trucks, helicopters, and various construction trailers. Many types of excavation equipment are set on wheel or track-driven vehicles. Structures are transported on tractor-trailer trucks, usually in three sections.

The Applicants employ standard construction and mitigation practices that have been developed from experience as well as industry-specific Best Management Practices (BMPs).

For structures that require concrete foundations, concrete will be delivered to the structure site by concrete ready mix trucks. Foundations are typically allowed to cure for approximately 3 weeks prior to erecting (or installing) the structures. Any excess soil from the excavation will

be offered to the landowner, scattered on site, or removed from the site. Soil scattered on site or removed from the area would not be placed in wetlands or other sensitive areas.

From the construction staging areas, the steel structures and components are transported to the structure assembly areas by truck. The structure assembly areas are typically located within the North Dakota Facility ROW immediately adjacent to the structure site. At each structure assembly area, the steel structure sections are assembled, the davit arms are attached, and insulators and other hardware are attached while the steel structure is on the ground. The structure is then lifted and placed into the excavation (direct embedded) or set on top of the concrete foundation. Any temporary laydown areas that are outside of the North Dakota Facility ROW will be obtained through easements from affected landowners.

After the structures have been erected, conductors are installed by establishing stringing setup areas. These stringing setup areas are typically located every 2 to 5 miles along the North Dakota Route and usually occupy approximately 1,600 square feet of land. Conductor stringing operations require access to each structure to secure the conductor wire to the insulators or to install shield wire clamps once final sag is established. Temporary guard or clearance structures are installed as needed over existing distribution or communication lines, roads, highways, railways, and/or other obstructions so that construction operations will not obstruct traffic and to prevent the conductors from contacting existing energized conductors or other cables.

Substation Construction Procedures

Construction of the Ellendale 345-kV Substation will begin once the final design is complete and the necessary property and materials are acquired. The site will be surveyed, cleared, and graded prior to construction. Because the land is cultivated, minimal clearing will be required. Improvements to the existing Ellendale 230-kV Substation will occur within the existing fenced area, which is already graded and cleared. All grading will be completed in compliance with the applicable North Dakota Pollution Discharge Elimination System (NDPDES) permit and other applicable permit requirements.

Once grading is complete, a grounded perimeter fence will be installed to secure the site. Crews will place concrete foundations to accommodate equipment and facilities, and then excavate and trench. Gravel will be delivered and leveled after completing all subsurface work, including installing control cables, which will be housed in trenches within 4 feet of the surface. Crews will erect the control enclosure and substation equipment. Transformer foundations will be at-grade. Smaller pole structures will be on drilled piers. Substation equipment will be delivered on tractor-trailers and installed on concrete foundations.

Restoration Procedures

During construction, ground disturbance at the structure sites and structure assembly areas will occur. Following the completion of construction, disturbed areas including staging areas, structure assembly areas, and stringing areas will be restored according to the agreement negotiated with the landowner.

Unless otherwise agreed to by the landowner, all construction materials and debris will be removed from the site once construction is complete. Post-construction reclamation activities also include dismantling all temporary facilities (including laydown areas), employing appropriate erosion control measures, and reseeding or otherwise stabilizing areas disturbed by construction

activities per applicable permit requirements. Native grasses that will not interfere with the safe operation of the transmission line facility will be allowed to reestablish in the North Dakota Facility ROW. The Applicants will follow the Commission's Tree and Shrub Mitigation Specifications as outlined in the Order. Restoration activities will be completed in coordination with the affected landowners.

Maintenance Procedures

Access to the North Dakota Facility ROW once the Project is complete is required periodically to perform inspections, conduct maintenance, and repair damage. Regular maintenance and inspections will be performed during the life of the North Dakota Facility to preserve its continued integrity. Generally, the Applicants inspect the transmission lines at least once per year. Inspections are typically limited to the immediate North Dakota Facility ROW and travel paths. If problems are found during inspections, repairs will be performed and the landowners and agencies will be notified if appropriate.

The North Dakota Facility ROW will be managed to remove trees and vegetation that interfere with the operation and maintenance of the transmission line. ROW clearing practices include a combination of mechanical and hand clearing, and may include application of herbicides, where allowed, to remove or control vegetation and weed growth.

4.2.3 Easement and Right-of-Way Acquisition

Formal easement option negotiations began in the summer of 2013, and the Applicants will continue to contact all affected landowners throughout the easement acquisition process. The Project will require the acquisition of easements to cross private property and the coordination with appropriate agencies where the North Dakota Facility ROW crosses ROWs of other public utilities or public roads. In addition, Montana-Dakota purchased the land needed for the new Ellendale 345-kV Substation. The majority of affected landowners are aware of the North Dakota Facility. Land rights agents will continue to work with the landowners to answer questions about the North Dakota Facility and to obtain permission for route surveys, environmental surveys, and soil investigations to occur prior to construction. As the design of the North Dakota Facility is further developed, contacts with the owners of affected properties will continue.

In the event soil or environmental investigations are required, the Applicants will inform the landowners at the initial consultation that soil borings or environmental surveys may occur. An independent geotechnical testing company will take and analyze these borings. Survey crews will also work with local utilities to identify underground utilities along the North Dakota Facility. Environmental crews will gather specific information such as wetland boundaries and cultural resource site boundaries.

Where possible, the staging and laydown area will be limited to previously disturbed or developed areas. When additional property is temporarily required for construction, temporary limited easements may be obtained from landowners. Temporary limited easements will be limited to construction access needs or additional staging or laydown areas required outside of the North Dakota Facility ROW.

The Applicants do not anticipate that the North Dakota Facility will require extensive tree clearing. Trees will need to be removed pursuant to easement requirements. Wood from the

clearing operation will be offered to the landowner or removed from the site, dependent upon the preference of the landowner.

4.2.4 Associated Facilities

Please reference Section 1.1.1 for a description of the associated facilities.

5.0 ENVIRONMENTAL ANALYSIS

This section describes the environmental setting as it relates to the North Dakota Route, North Dakota Facility ROW, the North Dakota Facility area, and the North Dakota Corridor as well as impacts anticipated to result from the Project and proposed mitigation measures. Impact estimates were developed based on the 9.3-mile-long transmission line route utilizing single-pole, steel structures with an average span length of 1,000 feet and a maximum span length of 1,200 feet.

General information on the environmental setting, land use, and vegetation resources within the North Dakota Corridor and North Dakota Facility ROW were estimated using publicly available GIS data or data generated by the Applicants through field or desktop observations. Resource impacts include the North Dakota Corridor and the impacts for the North Dakota Route and the footprint of the Ellendale 345-kV Substation. Impact calculations for this North Dakota Route were completed using the ArcInfo license of ESRI® ArcMap™ 10.1, using Universal Transverse Mercator North American Datum 83 (UTM NAD83) projection.

The North Dakota Route has been designed to minimize its environmental impact. Proposed temporary and permanent impacts are described in this section for each resource, along with mitigation measures to minimize the potential impacts. In most cases, impacts from the North Dakota Corridor are indirect and generalized, while more detailed impacts are provided for the North Dakota Route. Temporary impacts from the North Dakota Route are expected during the construction phase and these impacts will be mitigated following construction. Permanent impacts will remain throughout the operational life of the facility.

Temporary impacts will be associated with the construction area around structure locations for the new transmission line, a temporary travel path within the North Dakota Facility ROW, temporary impacts outside of the permanent footprint of the Ellendale 345-kV Substation, one temporary laydown area, and wire stringing areas.

Only minor permanent impacts are expected from the North Dakota Route. These will occur at structure locations and the new Ellendale 345-kV Substation. Because land uses are affected differently by the proposed structures, permanent impact assumptions have been differentiated based on land use. Greater impacts per structure are assumed within cropped lands because of potential lost usable area around the individual poles (which is referred to as Restricted Tillage Area in this document), because landowners may not wish to cultivate the land any closer than five feet from the structure base. Impacts on grazed lands are limited to the actual pole footprint since it is expected that cattle will graze adjacent to the structure. Table 12 provides a summary of the temporary and permanent impacts for the North Dakota Facility.

Table 12: North Dakota Facility Summary Table

	Impact	North Dakota Facility
Temporary Impacts	Estimated Length of Transmission Line (miles)	9.3
	Total ROW Acres[1]	168.8
	Temporary Structure Impact (acres)	42.1
	Temporary Travel Path Impact (acres)	26.4
	Ellendale 345-kV Substation (acres)[2]	4.6
	Laydown Area (1 area) (acres)	40
	Wire Stringing Area (acres)	0.2
	Total Temporary Impact (acres)	113.3
Permanent Impacts	Permanent Structure Impact in Non-Cropland (acres)[3]	0.01
	Permanent Structure Impact in Cropland (acres) [4]	0.3
	Ellendale 345-kV Substation (acres)	11.3
	Total Permanent Impact (acres) [5]	11.6
	Percent of ROW – Permanent Impact	6.9%

[1] *150-foot-wide North Dakota Facility ROW (transmission line) and 1,000-foot-long by 475-foot-wide Ellendale 345-kV Substation*

[2] *Temporary impacts outside of the permanent footprint of the substation*

[3] *The permanent impacts associated with each structure not located in cultivated fields were calculated by assuming a 5-foot radius (approximately 78.5 square feet) representing the actual structure foundation.*

[4] *A Restricted Tillage Area was added to the calculated impact on tillable land as the landowner may not wish to farm the land any closer than five feet from the structure base, assuming a 10-foot radius at each structure on cultivated land – this adds an additional approximately 235.5 square feet of impacts to crops for a total of 314 square feet. Extent of cultivated land determined using land cover digitized form 2010 aerial photography (cropland).*

5 *Includes additional Restricted Tillage Area impacts as worst case assumption to crop production, per footnote 4. Total permanent impact using just the physical footprint of the structures results in a total permanent impact of about 11.4 acres for the North Dakota Facility.*

The following assumptions were used to estimate total permanent and temporary impacts from the North Dakota Facility. Temporary impacts on land cover, vegetation, soils, prime farmland, wetlands, floodplains, and managed resource areas are based on the preliminary structure locations, temporary travel path, and the Ellendale 345-kV Substation. The exact locations of the wire stringing areas and laydown area are not known; therefore, specific impacts due to these temporary areas were not quantifiable for some resources.

Impact assumptions are as follows:

- The average span between single-pole structures (tangent and deadend) is 1,000 feet.
- A majority of structures are single-pole, self-supporting.
- The North Dakota Facility ROW will be 150 feet wide, and one 30-foot-wide temporary travel path is proposed to be located within the North Dakota Facility ROW for the length of the proposed transmission line.
- North Dakota Facility ROW acres were calculated based on a width of 150 feet multiplied by the length of the North Dakota Route.

- Total temporary impacts were calculated by summing the temporary construction impacts from the structure foundations, temporary travel path, wire stringing areas, the Ellendale 345-kV Substation, and one laydown area.
- Total permanent impacts were determined by summing impacts from transmission structures in cropland and non-cropland land uses and the Ellendale 345-kV Substation.
- Temporary impacts will include:
    - One acre (118-foot radius) for each single-pole structure (approximately 43,560 square feet)
    - For the Ellendale 345-kV Substation, 4.6 acres will be temporarily disturbed by construction (outside of permanent footprint)
    - 30-foot-wide temporary travel path that will follow the proposed centerline
    - One laydown area along the transmission line in North Dakota (approximately 40 acres)
    - For wire stringing areas, one 1,600-square-feet area for stringing located approximately every 2 miles (For conservative purposes, assumed up to six stringing areas, for a total of 9,600 square feet [0.22 acre])
- Permanent impacts will include:
    - For the Ellendale 345-kV Substation, 11.3 acres will be permanently impacted
    - A 5-foot radius for each structure (approximately 78.5 square feet per structure)representing the actual structure foundation
        - For structure foundations in cropland, an additional 5-foot radius will be added as a Restricted Tillage Area for a total of 10-foot radius permanent impact (approximately 314 square feet per structure). This additional Restricted Tillage Area will be used to calculate impacts on land use and prime farmland resources only. Impacts to other resources will be limited to the physical footprint of the five foot radius foundation
- Temporary and permanent impacts associated with the relocation of existing transmission line structures to the Ellendale 345-kV Substation and the tie line between the Ellendale 230-kV Substation to Ellendale 345-kV Substation are not included in the impact discussions because any impact will occur on previously disturbed Montana-Dakota ROW or Montana-Dakota-owned property and within an area of the same land use. The construction of these facilities would result in no change from existing conditions.

The mitigation discussion in each section and Table 34 provides potential measures to reduce or eliminate anticipated adverse impacts identified as potentially occurring during construction or operation of the North Dakota Route for each resource area. Mitigation measures are not discussed for identified potential effects that are anticipated to result in a positive effect. The mitigation discussion addresses typical HVTL permit conditions issued for similar projects in the region, mitigation strategies proposed by the Applicants and additional mitigation measures that may be warranted.

5.1 DEMOGRAPHICS

5.1.1 Description of Resources

The North Dakota Facility area is generally located within a sparsely populated rural area in southeastern North Dakota. The North Dakota Corridor and the North Dakota Route cross Ellendale and Van Meter townships, in Dickey County, North Dakota. The largest city located near the North Dakota Corridor and the North Dakota Route is Ellendale (with a 2010 population of 1,394) (United States Census Bureau 2010). Ellendale is approximately 0.5 mile from the North Dakota Corridor and approximately 1.0 mile from the North Dakota Route at its closest point. The North Dakota Corridor and the North Dakota Route do not pass through areas with higher than average minority populations.

Economic Characteristics

Dickey County had an estimated population of 5,268 in 2012. The median household income for Dickey County ($41,776) is less than the statewide average ($49,415). However, the percentage of persons below the poverty level in this county (9.0 percent) is lower than the statewide average (12.3 percent). According to the 2010 U.S. Census, health care and social assistance is the largest industry employing residents of Dickey County (United States Census Bureau 2010). Other industries are discussed in Section 5.9.

Population by Race and Ethnicity

The racial composition of Dickey County in 2011 was 94.6 percent white (higher than the average of 90.4 percent for North Dakota), with the remaining non-white races distributed among American Indian and Native Alaskan (0.8 percent), Black (0.8 percent), Asian (0.4 percent), Hispanic or Latino (2.0 percent), and persons reporting two or more races (1.4 percent).

5.1.2 Impacts

North Dakota Corridor

The short-term impacts on demographic resources within the North Dakota Corridor will be relatively minor. Permanent agricultural land conversion associated with the North Dakota Route within the North Dakota Corridor will result in a small socioeconomic impact on those landowners with facilities on their land. There is no indication that any minority or low-income population is concentrated in any one area of the North Dakota Corridor, or that the transmission line will be placed in an area occupied primarily by any minority group.

North Dakota Route

Long term benefits of the North Dakota Facility include supporting public policy, increasing system capacity, and adding to the tax base. Short-term economic benefits will be derived from activities associated with construction of the North Dakota Facility. See Section 3.6 for more information on the economic considerations.

Based on a review of structure types and locations relative to existing land use, approximately 111 acres of agricultural land will be temporarily removed from production during Project construction, including the laydown area (see Table 30). Permanent agricultural land conversion associated with the North Dakota Facility will be approximately 8.7 acres (see Table 30).

Landowner compensation for crop damages will be negotiated during individual easement agreements.

The Applicants will obtain an easement from each landowner whose property will be crossed by the North Dakota Facility ROW. The easements allow the Applicants to locate the 345-kV transmission line on the property and to enter the property for maintenance when needed. The landowner retains ownership and use of the land subject to the easement, which restricts certain activities within the easement to avoid compromising the safety of the landowner and reliability of the transmission line.

Agricultural and pasture areas surrounding transmission line structures still will be able to be farmed or pastured following construction of the North Dakota Facility.

The construction of the North Dakota Facility will not cause impacts on other industries. There is no indication that any minority or low-income population is concentrated in any one area of the North Dakota Route, or that the North Dakota Facility or new substation will be placed in an area occupied primarily by any minority group.

5.1.3 Mitigation

North Dakota Corridor

Socioeconomic impacts associated with the North Dakota Facility will be primarily positive due to a minor influx of wages and expenditures made at local businesses during construction and an increase in the county's tax base resulting from the incremental increase in revenues from utility property taxes.

The Project is expected to employ between 75 and 150 workers to support construction. The positions created during construction of the North Dakota Facility are expected to include the following categories of employment:

- Land rights
- Survey
- Travel path construction
- Structure foundations
- Structure assembly
- Wire stringing
- Substation construction

The majority of the positions require specialized skills and expertise. These positions may be filled by qualified individuals from North Dakota. The contractor, who will be responsible for determining employment needs for the construction, will determine the estimated annual employment expenditures during the construction phase of the North Dakota Facility, the plans for utilizing and training North Dakota labor for the specialized positions, and the adequacy of the local workforce to meet the temporary labor positions arising from construction of the North Dakota Facility. No permanent or long-term employees are expected to be hired in North Dakota. In the North Dakota Facility area, the population and the types and number of jobs are not expected to change in the long term as a result of construction, maintenance, and operation of the North Dakota Facility. It is not anticipated that the North Dakota Facility will create new

permanent jobs, but it will create temporary construction jobs that will provide a one-time influx of income to the area.

Impacts on landowners will be minimized to the extent practicable by negotiating easements, and establishing and maintaining good lines of communication, throughout the North Dakota Facility ROW acquisition, construction, and operation processes. Easements will allow the Applicants to locate transmission facilities on the property and to enter the property for maintenance when needed. In return, the landowner receives compensation and a crop damage payment for damages caused by construction. The North Dakota Facility is not anticipated to impact minority or low-income populations. Therefore, no mitigation measures are necessary.

North Dakota Route

The same discussion in Section 5.1.3 applies for mitigation associated with the North Dakota Route.

5.2 LAND USE

The North Dakota Facility area is dominated by rural agricultural land use, such as pasture or cropland and nearby farmsteads. Less common types of land use in the North Dakota Facility area include depressional wetlands and wet meadows or prairies. The only natural resource development within the North Dakota Facility area is gravel mining, and the only urban area present near the North Dakota Facility is the City of Ellendale, located approximately 1 mile from the North Dakota Route at its closest point.

Data sources used to analyze land use include federal, state, and local agencies; nonprofit organizations; and field work conducted by the Applicants' consultants. Land cover data was digitized using 2010 World Imagery by the Applicants (see additional discussion in Section 5.14). The latest information from the North Dakota National Land Cover Database (NLCD) from 2006 was not used, because it did not match the actual land use as visible on aerial photos and verified during field reconnaissance.

5.2.1 Description of Resources

Agriculture

Land use within the North Dakota Corridor and North Dakota Facility ROW primarily consists of cultivated crops with some areas used for hay production and livestock pasture. In general approximately 72 percent of the North Dakota Corridor is in cultivated land use and approximately 12 percent of the North Dakota Corridor is in pasture/hay land use. Table 29 provides more detail on the breakdown of agricultural land uses in the North Dakota Corridor and North Dakota Facility ROW.

Human Settlement

Farmsteads are widely distributed in the area, but are typically located near rural roads running along section lines. In general, farmstead density is higher surrounding the City of Ellendale.

According to the NDAC 69-06-08-02, the edge of the nearest transmission line facility, usually the end of the transmission structure arm or conductor, must be 500 feet or greater from the edge of an occupied residence (NDCC Section 49-22-05.1 and NDAC Rules 69-06-08-02(2)(e)).

There are no occupied homes within 500 feet of the transmission facility.

Existing Infrastructure

Developed infrastructure in the North Dakota Facility area includes federal, state, county, and township roads and utility ROWs. Rural water lines may be present in the North Dakota Facility area. Figure 2 displays the known locations of various infrastructure types within and adjacent to the North Dakota Corridor and the North Dakota Route.

The following is a summary of the existing infrastructure within the North Dakota Corridor. There are 11 occupied residences, 58 agricultural buildings and structures (excluding homes), and 2 Federal Communications Commission (FCC) towers present within the North Dakota Corridor. In addition, the North Dakota Corridor and the North Dakota Route cross an abandoned and unnamed railroad in Sections 15 and 24, Township 129N, Range 63W, and a gas pipeline in Sections 9 and 16, Township 129N, Range 63. No cemeteries, churches, or airports and airstrips are located within the North Dakota Corridor. In addition, there are no

intercontinental ballistic missile (ICBM) launch or launch control facilities near the North Dakota Corridor and microwave interference is not anticipated (National Park Service, 2013).

Planned Wind Energy Facilities

There are several generation projects at different stages of development within North Dakota, but the North Dakota Corridor does not intersect any known planned wind development areas.

Mining Resources

Due to the glacial history of the landscape, sand and gravel are present in the North Dakota Facility area, and gravel or sand extraction occurs. Transmission line development may be compatible with aggregate resource extraction, if structure placement and overhead lines will not interfere with future operations at the gravel pit facility. However, there are no gravel pits crossed or located within the North Dakota Corridor or the North Dakota Route.

Conservation Areas

Approximately 60 percent of the North Dakota Facility ROW and 50 percent of the North Dakota Corridor is either within or adjacent to USFWS wetland easements. The North Dakota Corridor and the North Dakota Facility ROW will not cross any USFWS grassland easements, National Forests, National Grasslands, WPAs, or National Wildlife Refuges (NWRs). There are no Private Lands Open to Sportsmen (PLOTS) areas or Nature Conservancy lands within the North Dakota Corridor.

State Trust Lands

The North Dakota Department of Trust Lands (NDDTL) (formerly known as the North Dakota State Land Department) manages the State Trust Lands and School Trust Lands in North Dakota, which were granted at statehood for the support of primary and secondary education. Some of these tracts have identifiable assets, such as wind development or gravel extraction in addition to the current pastureland or cultivated land uses. There are no State Trust Lands within the North Dakota Corridor.

5.2.2 Impacts

North Dakota Corridor

Agriculture

Land use in the North Dakota Corridor is not expected to change as a result of construction of the proposed 345-kV transmission line; however, it will change for the Ellendale 345-kV Substation. Land used for crops is abundant within the North Dakota Corridor.

Human Settlement

Short-term impacts on residents and local business owners in the North Dakota Corridor primarily will be related to temporary disruption caused by construction activities, such as elevated noise levels and increased vehicle traffic. Eleven homes are located within the North Dakota Corridor. The Applicants developed the North Dakota Route to avoid these structures by maximizing the setbacks to the extent practicable. Any long-term effects upon residences will be visual in nature and includes any restrictions stated in the land rights agreement.

Planned Wind Facilities

The North Dakota Corridor does not cross any existing wind energy facilities or known planned wind development areas. Therefore, no impacts are anticipated.

Mining Resources

There are no gravel pits or mining operations located in the North Dakota Corridor. Impacts on mining are not anticipated from the North Dakota Facility.

Existing Infrastructure

Transmission lines, gas pipelines, and roadways are present within the North Dakota Corridor. Existing corridors for transmission lines and road ROWs will be spanned by the North Dakota Route. Use of existing roads and the operation of other facilities such as gas pipelines will not be disrupted by a transmission line route within the North Dakota Corridor. The Applicants will coordinate with pipeline owners to coordinate the North Dakota Facility ROW crossing and gather information so that poles avoid the pipeline. No impacts on existing infrastructure are anticipated.

Conservation Areas

USFWS maintains wetland easements within the North Dakota Corridor. A wetland easement would be impacted by placement of a structure within a wetland under easement, but placement of a structure in the uplands of a wetland easement does not constitute an impact. The Applicants will work with USFWS and landowners to determine the exact location and size of wetland easements to avoid or minimize impacts by the North Dakota Facility.

There are no USFWS grassland easements, NRCS easements, WPAs, NWRs, WMAs, State parks, PLOTS, or Nature Conservancy land crossed by the North Dakota Corridor. No impacts are anticipated.

State Trust Lands

There are no impacts on State Trust Lands.

North Dakota Route

Agriculture

Land use in the North Dakota Facility ROW is dominated by cultivated land followed by pastureland (see Table 29). The most common form of agricultural land use is row crops. The only agricultural land that will be permanently removed from production is the area directly affected by structure placement and the Ellendale 345-kV Substation. The area directly under the transmission line that is outside of the structure location may continue to be used for agriculture. Approximately 8.7 acres of cultivated land would be permanently impacted by the North Dakota Facility. These impacts also include a Restricted Tillage Area around each structure in cultivated land, which represents the fact that landowners may not wish to cultivate the land any closer than five feet from the structure base. Permanent impacts to pasture/hay land uses are anticipated to be approximately 0.01 acres. Table 30 provides more detail on the temporary and permanent impacts to agricultural land use anticipated to result from the North Dakota Facility.

Where appropriate, the North Dakota Facility ROW follows existing field edges or crosses fields in a manner designed to minimize impacts to cultivation or as discussed with the landowner in the land rights agreement.

For construction that takes place outside of the winter months, temporary impacts on agriculture could occur as a result of construction activity. These impacts could include, but are not limited to, loss of planting opportunity, crop damage, and soil compaction. The Applicants will work directly with landowners to minimize impacts and to provide appropriate compensation for lost planting opportunities and crop damage. Soils compacted by construction activities will be restored using a deep tillage practice, such as disking, or the landowners will be otherwise compensated.

Drain tiles may be present along the North Dakota Route. The Applicants will work with the landowners to identify and mark drain tile lines to avoid damage during construction. Where locations are known, temporary travel paths will avoid drain tiles where possible. When travel over drain tile is unavoidable, matting may be required. If drain tile lines are inadvertently damaged by construction, the Applicants will repair the tile lines.

The North Dakota Facility may make certain agricultural activities more difficult, such as maneuvering equipment around structures and aerial spraying. Landowners may conduct aerial spraying to apply pesticides, fungicides, and fertilizers, which is typically done by small aircraft at low altitudes. After the 345-kV transmission line is constructed, aerial sprayers will need to employ the same flight patterns as used when working adjacent to tree rows, transmission or distribution lines, or communication structures.

Human Settlement

Impacts on residents and local business owners in the North Dakota Facility area will be primarily related to temporary disruption caused by construction activities, such as elevated noise levels, increased fugitive dust, and increased vehicle traffic.

There are no occupied homes located within 500 feet of the North Dakota Route. Long-term effects upon residences will include visual impacts and building restrictions within the land rights agreement area.

Existing Infrastructure

No communication towers are located within the North Dakota Facility ROW and no impacts on the operation of these facilities are anticipated.

There are no structures located within the North Dakota Facility ROW. Two abandoned railroads, State Highway 11, U.S. Highway 281, and several township and county roads are crossed by the North Dakota Route. These crossings will be spanned and impacts are not anticipated.

Planned Wind Facilities

The North Dakota Route does not cross any existing wind energy facilities or known planned wind development areas. If wind development does occur in the North Dakota Facility area, the Applicants will be in communication with the wind energy developers.

Mining Resources

There are no gravel pits or mining operations located in the North Dakota Facility ROW. Impacts on mining are not anticipated from the North Dakota Route.

Conservation Areas

USFWS maintains wetland conservation easements within the North Dakota Facility ROW. A wetland easement would be impacted by placement of a structure within a wetland basin under easement. The Applicants will work with local USFWS wetland management districts and landowners to determine the exact location and size of these wetlands under easement and to avoid or minimize impacts.

The North Dakota Facility will result in about 42.8 acres of temporary impacts and 0.05 acres of permanent impacts to USFWS wetland easements. Actual impacts will be determined during final design and coordination with the USFWS. The temporary impacts include structures, and temporary travel paths. Exact locations of the laydown areas and wire stringing areas (occupying 1,600 square feet locations every 2 miles) have not yet been determined and could affect the easement areas.

State Trust Lands

No State Trust Lands are located within or adjacent to the North Dakota Facility ROW. No impacts are anticipated.

5.2.3 Mitigation

North Dakota Corridor

Agriculture

The Applicants will work closely with the landowners in finalizing transmission structure locations within the North Dakota Facility ROW and temporary access to structure locations to minimize land use disruptions to the extent practicable. Disturbed areas will be returned as near as possible to pre-construction condition and non-agricultural areas will be reseeded or otherwise stabilized per applicable permit requirements. Agricultural lands disturbed during construction will be decompacted and restored to preconstruction contours to the extent practicable and in accordance with landowner agreements so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate re-vegetation, provide for proper drainage, and prevent erosion. The construction laydown area and temporary travel paths will be restored in accordance with the landowner agreement. Landowners will be compensated for loss of crops or damage to crops, fences, drain tiles, or other damage in accordance with landowner agreements.

Human Settlement

The Applicants developed the North Dakota Route within the North Dakota Corridor to avoid occupied homes by maximizing setbacks to the extent practicable. The North Dakota Route was routed to be located at least 500 feet from occupied homes.

Residents and local business owners in the North Dakota Facility area will primarily be affected by temporary construction activities and long-term aesthetic changes. Construction will be limited to the North Dakota Facility ROW, unless access permission across adjacent property is

obtained from the landowner(s). Disturbed areas will be returned as near as possible to pre-construction condition and non-agricultural areas will be reseeded with native vegetation.

Existing Infrastructure

No impacts on existing infrastructure are anticipated; therefore, no mitigation is proposed.

Planned Wind Facilities

The North Dakota Corridor does not cross through any wind development areas and no impacts on planned facilities are anticipated. Therefore, no mitigation is proposed.

Mining Resources

There are no gravel pits present within the North Dakota Corridor; therefore, no mitigation is necessary.

Conservation Areas

The Applicants are working with USFWS to avoid or minimize impacts on the wetland easements within the North Dakota Corridor and along the North Dakota Route. If impacts cannot be avoided, the Applicants will continue to work with USFWS to determine appropriate mitigation.

State Trust Lands

The North Dakota Corridor does not cross any State Trust Lands and no mitigation is required.

North Dakota Route

The same discussion in Section 5.2.3, North Dakota Corridor, applies for mitigation associated with the North Dakota Route.

5.3 PUBLIC SERVICES

5.3.1 Description of Resources

Public services generally refer to services provided by government entities to their citizens to benefit public health and safety, such as education and emergency services (for example, fire, ambulance, and police). Public services are concentrated within the municipalities near the North Dakota Facility ROW and there is one within the North Dakota Facility area (that is, Ellendale). Fiber optics, pipelines, transmission lines, rural water lines, and associated facilities exist within or are crossed by the North Dakota Facility ROW.

Airports

No commercial or general aviation airports are present within the North Dakota Corridor. The closest airport is the Ellendale Municipal Airport and is located in Section 1, Township 129N, Range 63W, and is approximately 2.6 miles from the North Dakota Facility ROW and outside of the North Dakota Corridor.

Roads

County and township (section line) roads characterize the existing roadway infrastructure in the North Dakota Facility area. The North Dakota Facility ROW will cross State Highway 11 in Section 9, Township 129N, Range 63W, and U.S. Highway 281 in Section 23, Township 129N, Range 63W. Average daily traffic (ADT) on State Highway 11 was 925 vehicles just west of Ellendale, North Dakota, and the ADT of U.S. Highway 281 south of Ellendale was 1,500 in 2012 (North Dakota Department of Transportation 2012). The average daily traffic volumes on the area's highways are documented in Table 13 and in Figure 5. Determining the specific capacity of any highway is a complex process; however, general estimates are used for planning purposes. For purposes of comparison, the functional capacity of a two-lane, paved rural highway is approximately 5,000 vehicles per day, referred to as the average annual daily traffic (AADT). In general, the U.S. and state highways in and near the North Dakota Facility carry higher levels of traffic than the average for rural North Dakota, but represent only a fraction of the roadway capacity. Additional county and township roads run through the North Dakota Corridor, but have no count data available.

Table 13: 2012 Average Daily Traffic Levels

Roadway Segment	Daily Traffic
South of Ellendale on US 281	1,500
West of Ellendale on State Highway 11	952
North of Ellendale on US 281	1,175
East of Ellendale on State Highway 11	905

Source: North Dakota Department of Transportation, 2012.

5.3.2 Impacts

North Dakota Corridor

Many public services near or within the North Dakota Corridor are located within municipality boundaries, but rural water, fiber optic, transmission lines, and distribution lines are also located

outside of municipalities. The City of Ellendale has a medical center, hospital, fire station, police station, and schools.

There are no anticipated long-term, negative direct or indirect effects on public services. A minor negative effect on emergency public services during construction within the North Dakota Corridor may occur, due to construction activities that may temporarily disrupt roadways and access. Generally, construction activities will be staged such that public roads will not be closed for any substantial period. Emergency access for local residents will be provided by halting construction and relocating equipment so emergency vehicles can access the residence. Once construction is complete, the transmission line will span all roads and therefore will not impede emergency services.

Airports

Transmission lines can present an important safety concern to airports and aircraft. The Federal Aviation Administration (FAA) has established guidelines to determine the appropriate setback distance for tall structures, including transmission lines, from public use airports and heliports. Federal Aviation Regulation (FAR) Part 77 establishes standards and notice requirements for reporting airspace obstructions for objects currently impacting or that could impact navigable airspace around aviation facilities. Certain objects such as steel pole transmission line structures have the potential to conflict with the operation of airport navigational aids and weather observation station facilities, including radar facilities used for aircraft navigation. These facilities may require routing regulations similar to those applicable to airports and airstrips. The Ellendale Municipal Airport was notified of the Project on September 25, 2012, and a response was not received. Coordination with FAA and the North Dakota Airports Commission staff indicates that the Project will not impact airport navigational aids or weather observation facilities. The Applicants will comply with FAA's guidance and will file an airspace form with FAA and advise the Ellendale Municipal Airport of any activities that may be taking place around the airport so that it may comment or file a Notice to Airmen (NOTAM) for safety precautions if needed.

Roads

The construction workforce is expected to generate increased vehicle trips on local roadways. The maximum construction workforce is expected to generate an average of approximately 50 additional vehicle trips per day on local roadways. Considering any combination of state and county highways and other township roads throughout the North Dakota Facility area, the traffic impacts are negligible. Since many of the area roadways have minimal traffic currently, the addition of about 50 vehicle trips represents a large percentage increase and may be perceptible; however, no significant impact on traffic is expected. Slow-moving construction vehicles may cause delays on smaller roads, similar to farm equipment during harvest. In addition, delays may occur as the transmission line is being strung across a roadway. These impacts will be short term and temporary.

Truck access to the North Dakota Corridor will be via State Highway 11 and U.S. Highway 281. Specific additional truck routes will be dictated by the location required for delivery. Operating permits may be issued by the state, county, and/or township for over-sized truck movements. No temporary or permanent impacts are anticipated for State Highway 11 and U.S. Highway 281.

The Applicants will acquire an access permit from the North Dakota Department of Transportation (NDDOT) if an access point is needed for State Highway 11 and U.S. Highway 281. The Applicants will also work with the County and townships to minimize the impact to their roads and acquire any necessary permits

Constructing the transmission line will require temporary travel along the North Dakota Route, approximately 30-feet in width for the length of the route. No major grading or filling is anticipated since the access will be needed only during construction. Public and private roads will be used to the extent practicable with no new permanent roads constructed. Where necessary, temporary travel paths may be used to access individual pole locations. Where temporary travel paths are required, access will be approved by each landowner in advance and access will be routed through uplands to minimize passing through sensitive features such as wetlands to the extent practicable.

North Dakota Route

The same discussion in Section 5.3.2, North Dakota Corridor, applies for impacts associated with the North Dakota Route.

5.3.3 Mitigation

North Dakota Corridor

Construction and operation of the Project will be in accordance with all associated federal and state permits and laws, as well as industry construction and operation standards. Due to the minor impacts expected on the existing infrastructure during Project construction and operation, extensive mitigation measures are not anticipated.

The Project will be designed to meet the state, local, NESC, and the Applicants' standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, and ROW widths. Construction crews will comply with state, local, NESC, and the Applicants' standards regarding installation of facilities and standard construction practices. The Applicants' and industry safety procedures will be followed during and after installation of the North Dakota Facility.

The Project will be equipped with protective devices to safeguard the public from the transmission lines if an accident occurs and a structure or conductor falls to the ground. The protective devices are breakers and relays located where the transmission line connects to the substation. The protective equipment will de-energize the transmission line should such an event occur. In addition, the substations will be fenced and access limited to authorized personnel. The costs associated with these measures have not been tabulated separately from the overall facility costs since these measures are standard practice for the Applicants.

North Dakota One Call will be contacted prior to construction to locate underground facilities. To the extent that the proposed facilities cross or otherwise may affect existing telephone or fiber optic lines or equipment, the Applicants will negotiate agreements with service providers. Since no impacts on communication or water pipeline systems are anticipated, no mitigation is proposed.

Airports

The Applicants will work with the North Dakota Airports Commission and FAA and do not anticipate any impacts on airport navigational aids, weather observation station facilities, airspace, or glide slope intercept for public airports near the North Dakota Corridor. According to FAA's instructions, the Applicants will file an airspace form with FAA and advise the Ellendale Municipal Airport of any activities that may be taking place around the airport so that the Airport may comment or file a NOTAM for safety precautions if needed.

Roads

Use of public and private roads for delivery of equipment and materials, and by construction personnel, is not expected to affect the road conditions. The Applicants will work with the county and townships so that roads are maintained in preconstruction condition and will repair any road damage. Additionally, when crossing roads during stringing operations, guard structures may be utilized as necessary to eliminate traffic delays and provide safeguards for the public. No additional mitigation should be needed.

Construction equipment and material weights generally will be no greater than the existing large farm equipment common in the North Dakota Facility area. The Applicants will acquire an access permit from NDDOT, if necessary. In addition, the Applicants will apply for an overweight permit from the State Patrol, if necessary.

Use of temporary access roads across agricultural lands may result in compaction of agricultural soils and loss of crops. Where necessary, compacted soils will be disked following construction, and landowners will be compensated for crop losses.

North Dakota Route

The same discussion in Section 5.3.3, North Dakota Corridor, applies for mitigation associated with the North Dakota Route.

5.4 HUMAN HEALTH AND SAFETY

Human health and safety concerns include potential issues such as electric and magnetic fields (EMF) (collectively referred to as electromagnetic fields), induced voltage, stray voltage, and air quality. The majority of the information in this section was obtained from federal and state agencies and national and international organizations, including the National Institute of Environmental Health Sciences (NIEHS), U.S. Environmental Protection Agency (EPA), and World Health Organization (WHO).

5.4.1 Description of Resources

Electric and Magnetic Fields

EMF refers to electric and magnetic fields that are coupled together such as in high-frequency radiating fields. For the lower frequencies associated with power lines, EMF should be separated into electric fields (EFs) and magnetic fields (MFs), which arise from the flow of electricity and the voltage of a line and are measured in kilovolts per meter (kV/m) and milliGauss (mG), respectively. The intensity of the EF is proportional to the voltage of the line, and the intensity of the MF is proportional to the current flow through the conductors. Transmission lines operate at a power frequency of 60 hertz (Hz) (that is, cycles per second). See Tables 15 through 17, below, for more information.

Electric Fields

The electric field from a transmission line can couple with a conductive object, such as vehicles, buildings, pipelines, railways, fences, or other equipment near the line. This will induce a voltage on the object, and the magnitude of this voltage is dependent on many factors, including the weather condition, object shape, object size, object orientation, object to ground resistance, object capacitance, and object location along the ROW. If the object is insulated or semi-insulated from the ground and a person touches it, a small current could pass through the person's body to the ground. This might be accompanied by a spark discharge and mild shock, similar to what can occur when a person walks across a carpet and touches a grounded object or another person.

To ensure that any discharge does not reach unsafe levels, the NESC requires that any discharge be less than 5 milliamperes (mA). Based on the Applicants' transmission line operating experience, the discharge from any large mobile object—such as a bus, truck, or farm machinery—parked under or adjacent to the line would be unlikely to reach levels considered to be an annoyance, and will be less than the 5 mA NESC limit. The Applicants will plan to ground existing fixed objects, such as a fence or other large permanent conductive objects close to or parallel to the line, such that any discharge would be less than the 5 mA NESC limit.

Currently, there are no state regulations within North Dakota for maximum EF limits for transmission line siting. The facilities will comply with the recommended NESC standards.

Magnetic Fields

Current passing through any conductor, including a wire, produces an MF in the area around the wire. Table 14 shows the MF levels associated with common household sources.

Table 14: Magnetic Field Levels Associated with Common Sources

Magnetic Field Level (mG)		Magnetic Field Source
7 – 20 mG at 6 inches 2 – 6 mG at 1 ft	1 – 3 mG at 2 ft 0 mG at 4 ft	Computer color monitors
1 – 700 mG at 6 inches 0 – 70 mG at 1 ft	0 – 10 mG at 2 ft 0 – 1 mG at 4 ft	Hair Dryers
0 – 20 mG at 1 ft	0 – 8 mG at 2 ft 0 – 4 mG at 4 ft	Color Televisions
500 – 1500 mG at 6 inches 40 – 300 mG at 1 ft	3 – 30 mG at 2 ft 0 – 4 mG at 4 ft	Can Openers
100 – 300 mG at 6 inches 1 – 200 mG at 1 ft	1 – 30 mG at 2 ft 0 – 20 mG at 4 ft	Microwave Ovens
20 – 200 mG at 6 inches 0 – 30 mG at 1 ft	0 – 9 mG at 2 ft 0 – 6 mG at 4 ft	Electric Ranges
100 – 700 mG at 6 inches 20 – 200 mG at 1 ft	4 – 50 mG at 2 ft 0 – 10 mG at 4 ft	Vacuum Cleaners

Source: EMF in Your Environment, U.S. Environmental Protection Agency, 1992.

The MF associated with an HVTL surrounds the conductor and decreases rapidly with increasing distance from the conductor. Considerable research has been conducted to determine whether exposure to power-frequency (60 Hz) MFs causes biological responses and health effects.

EMF research expert Dr. Peter A. Valberg provided testimony at the State of Minnesota Office of Administrative Hearings in 2010 for the Public Utilities Commission Docket No. E002/TL-09-1056 (Valberg 2010). Valberg testified on EMF and potential health effects of a 345-kV transmission line, and the conclusions of his 2009 literature review (Valberg 2010) of the status of scientific research on potential health effects. He summarized scientific research on HVTLs and MFs as:

> [T]hese studies do not change the factual conclusion that power-line MF exposure is not an established cause of health effects, as has been detailed throughout this report. As has been noted, the overall weight of evidence, combing the epidemiology with laboratory-animal and mechanistic research, fails to support a role for power-line MF in disease risk... [overall] the scientific research literature to date remains an insufficient basis for assigning any actual health risk to power-line MF exposure levels.

Recent Research on EMF Exposure and Human Health

Many organizations have conducted research on EMFs from extremely low frequency (ELF) source to study their potential effects on human health and safety as a follow-up to studies conducted primarily in the 1980s and 1990s which correlated EMFs and adverse health risks.

In 2007, WHO made the following statement regarding effects of EMFs on health:

> Given both the weakness of the evidence for a link between exposure to ELF magnetic fields and childhood leukemia, and the limited impact on public health

> if there is a link, the benefits of exposure reduction on heath are unclear. Thus, the costs of precautionary measure should be very low.

The 2009 President's Cancer Panel heard testimony concerning ELF, radio frequency (RF), and MFs and discussed that prior to 1996, the epidemiologic studies shared weaknesses. Testimony heard included, "U.S. environmental organizations…generally conclude that the link between ELF-MF and cancer is controversial or weak" (Reuben 2010).

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) reviewed scientific studies performed since its last published guidelines in 1998 that established exposure limitations to EMFs and published their recommendations in 2010 (ICNIRP 2010), concluding:

> [S]cientific data available so far do not indicate that low frequency electric and/or magnetic fields affect the neuroendocrine system in a way that these would have an adverse impact on human health. There is no substantial evidence for an association between ELF exposure and diseases such as Parkinson's disease, multiple sclerosis, and cardiovascular diseases. The evidence for an association between low frequency exposure and Alzheimer's disease and amyotrophic lateral sclerosis is inconclusive. The evidence for an association between low frequency exposure and developmental and reproductive effects is very weak.

In addition, the 2010 ICNIRP recommendations stated "evidence that prolonged exposure to ELF-MF is causally related with an increased risk of childhood leukemia is too weak to form the basis for exposure guidelines."

There is no federal standard for transmission line electric fields, nor state standards in North Dakota. EMF levels for the Project at the edge of the ROW are below the ICNIRP guidelines (830 mG and 4.2 kV/m) for public exposure to EMF. The Project EMF levels are also below IEEE Standard C95.6-2002 both outside and within the ROW (9,040 mG, 5 kV/m outside the ROW, and 10 kV/m within the ROW). Tables 15 through 17 show the calculated EMF levels for the Project; more information can also be found in Appendix G. The H-frame structure produced the highest levels of electric and magnetic fields.

Table 15: Maximum Calculated EMF Levels for Each Structure Type on the ROW

Project Load Condition	Electric Field (kV/m)[1]		Magnetic Field (mG)	
	H-Frame Structure	Single-pole Structure	H-Frame Structure	Single-pole Structure
Normal Operating Condition[2]	6.72	5.85	55.69	39.29
Maximum Operating Condition[3]	6.72	5.85	445.51	314.31

[1] *This value depends on voltage and is expected to be relatively constant (will vary slightly if the operating voltage changes). Results are calculated at the operating voltage of 1.05 per unit*

[2] *Normal Operating Condition value is for predicted flow of ~250 Amps*

[3] *Maximum Operating Condition value is based on ~2,000 Amps*

Source: Appendix G – Big Stone South - Ellendale TP 477 Hawk ACSR Corona & EMF Memo

Table 16: Maximum Calculated EMF Levels for the H-Frame Structure

Project Load Condition	Electric Field (kV/m)[1]		Magnetic Field (mG)	
	On ROW	Edge ROW	On ROW	Edge ROW
Normal Operating Condition[2]	6.72	1.93	55.69	15.34
Maximum Operating Condition[3]	6.72	1.93	445.51	122.74

[1] This value depends on voltage and is expected to be relatively constant (will vary slightly if the operating voltage changes). Results are calculated at the operating voltage of 1.05 per unit

[2] Normal Operating Condition value is for predicted flow of ~250 Amps

[3] Maximum Operating Condition value is based on ~2,000 Amps

Source: Appendix G – Big Stone South - Ellendale TP 477 Hawk ACSR Corona & EMF Memo

Table 17: Maximum Calculated EMF Levels for the Single-Pole Structure

Project Load Condition	Electric Field (kV/m)[1]		Magnetic Field (mG)	
	On ROW	Edge ROW	On ROW	Edge ROW
Normal Operating Condition[2]	5.85	1.25	39.29	8.47
Maximum Operating Condition[3]	5.85	1.25	314.31	67.72

[1] This value depends on voltage and is expected to be relatively constant (will vary slightly if the operating voltage changes). Results are calculated at the operating voltage of 1.05 per unit.

[2] Normal Operating Condition value is for predicted flow of ~250 Amps

[3] Maximum Operating Condition value is based on ~2,000 Amps

Source: Appendix G – Big Stone South - Ellendale TP 477 Hawk ACSR Corona & EMF Memo

To date, the most exhaustive research done on HVTLs and cancer was conducted over a 35-year span with one of the largest study groups of persons near HVTLs ever used for EMF research was published in March 2013 (Elliott, et al. 2013). Their case-controlled study investigating cancer risks and ELF-MF from HVTLs concluded that their "results do not support an epidemiologic association of adult cancers with residential magnetic fields in proximity to high-voltage overhead power lines."

While the general scientific consensus is that electric fields pose no risk to humans, the question of whether exposure to magnetic fields potentially can cause biological responses or even health effects continues to be the subject of research and debate despite current scientific evidence showing no correlation with distance to an HVTL and adverse health effects. In addressing this issue, the Applicants provide information on EMFs to the public, interested customers, and employees to assist them in understanding EMFs. The Applicants provide measurements for landowners, customers, and employees who request them. In addition, the Applicants have followed the prudent avoidance guidance suggested by most public agencies. This includes using structure designs that minimize magnetic field levels and attempting to site facilities in locations with lower residential densities.

Stray Voltage

Stray voltage is a condition that can occur on the electric service entrances to buildings from distribution lines—not transmission lines. More precisely, stray voltage is a voltage that exists

between the neutral wire of the service entrance and grounded objects in buildings such as barns and milking parlors.

Transmission lines do not, by themselves, create stray voltage because they do not connect to businesses or residences. However, transmission lines can induce stray voltage on a distribution circuit that is parallel to and immediately under the transmission line. Appropriate measures will be taken to address stray voltage concerns on a case-by-case basis.

Induced Voltage

Induced voltage is an electrical condition through which very low levels of voltage are transferred to and may be measured in objects near an HVTL. More information is available in Section 5.4.1, Electric Fields. Induced voltage from capacitive coupling normally is not a problem. Where it is, the problem can be mitigated with proper grounding of the affected objects.

Air Quality

The North Dakota Facility area is currently in attainment for both national and North Dakota Ambient Air Quality Standards, as is the entire state (NDCC 33-15-02). The nearest Ambient Air Quality Monitoring Site is located in Cass County, North Dakota, which is nearly 100 miles northeast of the North Dakota Facility.

5.4.2 Impacts

North Dakota Corridor

Electric and Magnetic Fields

EMF will be strongest directly under the transmission line and decrease with increasing distance from the transmission line toward the ROW edge. The Applicants conducted an analysis of calculated EMF levels for the Project (as shown in Tables 15 through 17). As load changes on the transmission line, the electric current flow changes; therefore, the MFs change.

At the maximum-load operating condition on the ROW edge, the EF is 1.9 kV/m and the MF is 122.7 mG. The results of the Applicants' analysis show that calculated EMF levels for the North Dakota Facility under maximum operating conditions and normal operating conditions on the edge of the ROW are below the published guidelines from ICNIRP and IEEE.

Stray Voltage

Since transmission lines do not produce stray voltage, there are no anticipated stray voltage impacts as a result of the construction or operation of the North Dakota Facility.

Induced Voltage

The main concern with induced voltage on an object is the current flow through a person to ground if a person were to touch an ungrounded metal object under the lines. Insulated electric fences used in livestock operations may pick up an induced charge from transmission lines. Potential shocks can be prevented by shorting out one or more of the fence insulators to ground with a wire when the charger is disconnected or installing an electric filter to ground charges induced from a power line, while still allowing the charger to be effective. Buildings are permitted near transmission lines but are generally prohibited within the ROW. Any person with

questions about new or existing metal structures near the ROW may contact the Applicants for further information about proper grounding requirements.

As discussed in Section 5.4.3, the Applicants will utilize appropriate mitigation measures to avoid and minimize induced voltage impacts on railway or pipeline facilities. There are no anticipated induced voltage impacts expected as a result of the construction or operation of the North Dakota Facility.

Air Quality

Temporary air quality impacts caused by emissions from construction vehicles and concrete batch plants, and by fugitive dust from North Dakota Facility ROW clearing and construction may occur. Exhaust emissions from diesel equipment will vary during construction, but only minor, short-term impacts are anticipated. The concentration of pollutants during construction will be greatest near the North Dakota Facility ROW, but will decrease rapidly with distance from the North Dakota Facility ROW. Concentrations of all air pollutants during construction are expected to remain well below the National Ambient Air Quality Standards (NAAQS).

No impacts on air quality due to the operation of the North Dakota Facility are anticipated. Corona consists of the breakdown or ionization of air within a few centimeters of transmission line conductors and hardware. Usually water or some imperfection such as a sharp edge, a protrusion on hardware, or a scratch on the conductor is necessary to cause corona. Corona can produce small concentrations of ozone and oxides of nitrogen in the air surrounding the conductor. Ozone also forms in the lower atmosphere from lightning discharges and from reactions between solar ultraviolet radiation and air pollutants, such as hydrocarbons from auto emissions. The natural production rate of ozone is directly proportional to temperature and sunlight and inversely proportional to humidity. Thus, humidity or moisture, the same factor that increases corona discharges from transmission lines, inhibits the natural production of ozone. Ozone is a very reactive form of oxygen molecules and combines readily with other elements and compounds in the atmosphere. Because of its reactivity, ozone is relatively short-lived.

North Dakota Route

The same discussion in Section 5.4.2, North Dakota Corridor, for electric and magnetic fields, stray voltage and induced voltage applies for impacts associated with the North Dakota Route.

Air Quality

The ambient air quality standard for ozone is 0.075 parts per million (ppm), based on a 3-year average of the annual fourth-highest daily maximum 8-hour averaging period. Numerous environmental assessments cite calculations of ozone concentrations from 345-kV transmission lines using the Corona and Field Effects Program Version 3, supplied by the Bonneville Power Administration. These environmental assessments cite maximum 1-hour concentrations during foul weather (worst case) of 0.0007 ppm, which is well below federal and North Dakota standards for ozone. The same discussion in Section 5.4.2, North Dakota Corridor, applies for impacts associated with the North Dakota Route.

5.4.3 Mitigation

North Dakota Corridor

Electric and Magnetic Fields

The calculated EMF levels from normal operating conditions and maximum operation conditions will create EMF levels nearby the lines that will be at or below published guidelines from ICNIRP and IEEE. In selecting a route that avoids impacts on residences and other occupied structures, the Applicants have limited human exposure to EMF to the extent practicable. The Applicants do not anticipate any effects from EMF; thus it is not anticipated that any mitigation will be necessary.

Stray Voltage

Transmission lines do not, by themselves, create stray voltage because they do not connect to businesses or residences. No impacts from stray voltage are anticipated; therefore no mitigation is proposed.

Induced Voltage

As part of the design and engineering process, the North Dakota Facility will be designed to minimize any induced voltages in objects near the facilities. NESC clearances will be met, and the transmission line engineered in such a way so that induced voltages are minimized. To ensure that any electric discharge from induced voltages does not reach unsafe levels, the NESC requires that any discharge be less than 5 milliamperes (ma). During construction, the Applicants will plan to ground all existing fixed objects, such as a fence or other large permanent conductive object close to or parallel to the North Dakota Facility, so any discharge will be less than the 5 mA NESC limit.

Insulated electric fences used in livestock operations may pick up an induced charge from transmission lines. Potential shocks can be prevented by shorting out one or more of the fence insulators to ground with a wire when the charger is disconnected or installing an electric filter to ground charges induced from a power line, while still allowing the charger to be effective.

Air Quality

BMPs will be used to control fugitive dust during construction; this could include use of water or other dust minimization methods in accordance with the NDPDES permit. Dust suppression will be required of the construction contractors who will access and maintain the North Dakota Facility ROW during construction, to conform with NDPDES permit conditions. The construction contractors will apply for a permit from the State Water Commission for water appropriations related to construction purposes including dust suppression.

North Dakota Route

The same discussion in Section 5.4.3, North Dakota Corridor, applies for mitigation associated with the North Dakota Route.

5.5 NOISE

5.5.1 Description of Resources

Noise is defined as unwanted sound. Noise may include a variety of sounds of different intensities across the entire frequency spectrum. Noise is measured in units of decibels (dB) on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more weight. The A-weighted decibel (dBA) scale corresponds to the frequency sensitivity range for human hearing.

Cumulative noise increases occur on a logarithmic scale. If a noise source is doubled, there is a 3-dBA increase in noise. Changes in noise levels of less than 3 dBA are generally considered to be barely discernible to people with average hearing (and when there is not a lot of background noise). A 5-dBA change in noise level is considered to be clearly perceivable to people with average hearing. For cumulative increases resulting from sources of different magnitudes, the rule of thumb is that if there is a difference of greater than 10 dBA between noise sources, there will be no additive effect (that is, only the louder source will be heard and the quieter source will not contribute to louder noise levels). Table 18 provides noise levels associated with common, everyday sources and places the magnitude of noise levels discussed here into context.

Table 18: Noise Levels Associated with Common Sources

Sound Pressure Level (dBA)	Noise Source
140	Jet engine (at 25 meters)
130	Jet aircraft (at 100 meters)
120	Rock concert
110	Pneumatic chipper (powered by compressed air or hydraulics)
100	Jackhammer (at one meter)
90	Chainsaw (at one meter)
80	Heavy truck traffic
70	Busy business office, vacuum cleaner
60	Conversational speech at 3 feet
50	Library
40	Bedroom
30	Secluded woods
20	Whisper

Source: Minnesota Pollution Control Agency (MPCA), A Guide to Noise Control in Minnesota (revised, 2008)

The State of North Dakota does not regulate noise from transmission lines (that is, corona noise) with measureable standards. Also, corona noise does not contain high levels of low frequency noise. Generally, background noise levels in rural areas vary between 40 and 50 dBA, while in suburban areas these levels increase to 50 to 60 dBA. In urban areas, noise levels vary between 60 and 70 dBA (FRA 2006). Most of the North Dakota Facility area has background levels consistent with rural areas. Windy conditions in the North Dakota Facility area tend to

increase ambient noise levels compared to times when the wind is calm. Additionally, higher levels exist near roads and other areas of human activity.

5.5.2 Impacts

North Dakota Corridor

There will be few people near the transmission line or substation on a routine basis in the North Dakota Corridor because it crosses through primarily rural and agricultural areas. Those individuals that are within the North Dakota Corridor may experience a small amount of noise near the transmission line or substation during some conditions. The noise levels will be greater for those closer to the North Dakota Facility, as described in Section 5.5.2, North Dakota Route. Typically, the attenuation rate for linear noise sources (that is, the transmission line) is approximately -3 dB per distance doubled. In other words, the farther from the generation outlet a person is, the less noise they will hear.

North Dakota Route

Construction activities will generate short-term and intermittent noise. Construction noise will affect nearby residences on a short-term basis. During operation, transmission lines produce noise under certain conditions, called corona noise. The level of noise depends on conductor conditions, voltage level, and weather conditions. In foggy, damp, or rainy weather, transmission lines can create a crackling sound due to a small amount of electricity ionizing the moist air near the conductors. During heavy rain, the background noise level of the rain is usually greater than the noise from the transmission line. As a result, people normally do not hear noise from a transmission line during heavy rain. During light rain, dense fog, snow, and other times when there is moisture in the air, transmission lines will produce audible noise approximately equal to household background levels.

The North Dakota Facility was modeled to evaluate audible noise from HVTLs using the Bonneville Power Administration's Corona and Field Effects Program CORONAII version 3.0 (United States Department of Energy undated). The model was executed under fair weather and foul weather conditions for an H-frame and single-pole structure at the edge of the North Dakota Facility ROW, so that noise was not under-predicted (see Appendix G). Model results are expressed as a median sound pressure level (L50), which is exceeded 50 percent of the time for a given time period. Noise from the transmission line is expected to be below average rural background noise levels. Table 19 lists the calculated audible noise for the transmission line.

Table 19: Calculated Audible Noise (L50) at the Edge of the Transmission Line ROW

Structure Type	Fair Weather Condition[1]	Foul Weather Condition[1]
H-Frame Structure	17.0 dBA (L50)	42.0 dBA (L50)
Single-Pole Structure	18.2 dBA (L50)	43.2 dBA (L50)

[1] *Results shown are the maximum at the edge of the Right-of-Way for a current of 500 amps which is about twice the expected initial loading of the facility.*

Source: Appendix G – Big Stone South - Ellendale TP 477 Hawk ACSR Corona & EMF Memo

Substation

Montana-Dakota anticipates designing the Ellendale 345-kV Substation to minimize corona noise levels. Therefore, transformer noise levels are expected to be the loudest source. Inside large transformers, alternating current and voltage causes the plates or sheets of steel in the core to vibrate at the rate the current alternates (approximately 60 cycles per second or 60 Hz); this vibration emits noise. The noise is usually a steady tone or hum, and is also expressed in units of cycles per second, or Hz. The noise radiated by transformers occurs at even harmonics of the line frequency (for example, 120 Hz, 240 Hz, and 360 Hz when the line frequency is 60 Hz). Other noise emissions associated with substation operation occur when the cooling fans and oil pumps operate. Overall noise emissions from substations are not loud, but they can sometimes be audible including the tonal noise from transformers. The nearest noise-sensitive land use is a residence located approximately 1,600 feet from the proposed Ellendale 345-kV Substation. Transformer noise emissions from the Ellendale 345-kV Substation were evaluated using the Cadna-A acoustical modeling software. Analysis results show that the calculated equivalent sound level (Leq) at the nearest residence was found to be 39 dBA (Appendix H). The Leq and L50 are both average noise levels: the L50 is the median, and the Leq is the mean. Although distinctly perceivable, transformer noise is estimated to be comparable to background noise conditions.

5.5.3 Mitigation

North Dakota Corridor

All occupied houses and structures will be farther than 500 feet from the transmission line and substation. At 500 feet, noise from the transmission line is predicted to be below background levels, so it is not expected that landowners will hear an appreciable difference in audible noise levels compared to existing levels.

Noise emissions from the Ellendale 345-kV Substation are predicted to be comparable to background levels in terms of overall volume level; therefore mitigation is not anticipated to be necessary. In addition, there is a tree row located between the Ellendale 345-kV Substation and the nearest residence that will provide some psychological noise reduction by blocking line of sight between the residence and the substation. Industry design standards that Montana-Dakota anticipates following to minimize corona noise levels include:

- Using round rigid bus instead of flexible bus. The larger the diameter, the less corona noise.
- Welded bus connections create less corona than mechanical connections.
- Using rounded edges instead of sharp edges on energized hardware and parts
- Adding corona shield rings to disconnects and other mechanical electrical connections

During construction, noise levels will be minimized by ensuring that construction equipment is equipped with mufflers that are in good working order. Construction activities generally will be limited to the hours of 7 a.m. to 9 p.m. No additional mitigation measures are necessary because there will be minimal noise impacts from the operation of the North Dakota Facility.

North Dakota Route

The same discussion in Section 5.5.3, North Dakota Corridor, applies for mitigation associated with the North Dakota Route.

5.6 VISUAL IMPACTS

5.6.1 Description of Resources

The discussion of visual quality and aesthetics is based on a qualitative review of the existing landscape environment within the North Dakota Facility area. Visual and aesthetic resources within the North Dakota Facility area were identified through comments with state and local agency officials, comments received from participating citizens, and through a review of aerial photography and field observation.

The landscape topography crossed by the North Dakota Corridor is a mixture of agriculture, farmsteads, fallow fields, wetlands, and gently rolling hillside topography. The North Dakota Corridor is primarily located in a rural area of North Dakota. A topographic map of the North Dakota Facility area is shown in Figure 6. Rural residences and farm buildings (inhabited and uninhabited) scattered along rural county or township roads are focal points in the agricultural character of the landscape. Scattered areas of tree cover occur throughout the North Dakota Corridor, primarily planted as protection from the wind and sun around rural residences or farmsteads. Many residents have surrounded their homes with a mix of deciduous and coniferous trees that serve as natural windbreaks, shade, and enhanced privacy for homes. Throughout the North Dakota Corridor there are also scattered isolated wetland areas, some of which are under easements with USFWS. Wetland areas are dominated by cattails, sedges, rushes, and willows.

No additional designated recreational resources, such as boat landings, golf courses, playgrounds, or ball fields, are located within the North Dakota Corridor. Approximately 1 mile from the North Dakota Corridor, in the City of Ellendale, there are numerous recreational resources including a golf course, opera house (which is now used as a museum), the Ellendale Public School Track and Field Facility, and the Dr. Roy Lynde Baseball Field. Outside of the Ellendale city limits, the closest designated recreational resource is the Heine WPA located approximately 3 miles northwest of the North Dakota Corridor (see Figure 7). In addition to identifying the naturally occurring landscape features and the developed farmsteads and roads within the North Dakota Corridor, a search of historic structures was conducted using data from the North Dakota State Historic Preservation Office (SHPO) and the National Register of Historic Places (NRHP). No historic structures were identified within the North Dakota Corridor. The nearest historic structures are within the City of Ellendale, North Dakota.

5.6.2 Impacts

North Dakota Corridor

Transmission lines and substations are not new visual features in the North Dakota Corridor, as there are several existing transmission lines and one substation within the viewshed of landowners within the North Dakota Corridor. The proposed transmission line and substation facilities will be visible to landowners who live near the proposed North Dakota Facility within the North Dakota Corridor or community residents who regularly travel along area roads. Depending on a viewer's physical location, the terrain conditions, and natural landscape features such as tree cover or man-made features such as a barn, the transmission line structures could be visible for distances up to 2 miles. A viewer's degree of discernible detail decreases as the physical distance from an object increases. Beyond 2 miles in physical distance, the outline of

structures most likely will not be seen. The transmission line conductors are unlikely to be seen clearly beyond distances of 0.5 to 0.75 mile.

North Dakota Route

The same general discussion in Section 5.6.2, North Dakota Corridor, applies for impacts associated with the North Dakota Route. Typical single-pole structures will be between 125 and 155 feet tall, typically located just outside the field break or public road ROW. Many of these roads currently do not share a ROW with a transmission line. However, they often include power distribution lines serving rural residences and farmsteads.

No specific areas of visual significance are crossed by the North Dakota Route. The 345-kV Ellendale Substation footprint will occupy approximately 11.3 acres. It will be visible to travelers along 87th Avenue SE. The closest residents live 0.3 mile south of the substation location, and there are tree rows between these homes and the substation location. In addition, the location for the Ellendale 345-kV Substation is across 87th Avenue SE from an existing substation. The incremental impacts on the visual resources in the North Dakota Facility area are expected to be minimal.

5.6.3 Mitigation

North Dakota Corridor

The North Dakota Corridor contains existing roadways, substations, and transmission line infrastructure. Visual and aesthetic impacts are anticipated to be minimal. Therefore, no mitigation is proposed.

North Dakota Route

The Applicants will continue to work with landowners and public agencies to identify concerns related to the North Dakota Route and aesthetics. Many of these areas have already been impacted visually by the existing roadways, transmission lines and distribution lines. In general, mitigation includes enhancing positive effects as well as minimizing or eliminating negative effects. Potential mitigation measures include the following:

- Where feasible, the location of structures and other disturbed areas will be determined by considering input from landowners or land management agencies to minimize visual impacts.
- Structure types (that is, designs) will be uniform to the extent practicable. In general, the Applicants propose to use single-pole steel structures ranging in height from 125 to 155 feet. Care will be used to preserve the natural landscape; construction and operation will be conducted to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings. During operation, clearing of trees and shrubs will be conducted only as necessary in accordance with NERC standards and to allow safe operation and inspection of the North Dakota Facility ROW.

Most of the lands crossed by the North Dakota Route are currently used for agriculture. If trees are removed, the Applicants will follow the Commission's tree and shrub replacement guidelines. Following construction, most of these lands will return to their current agricultural use and visual characteristics.

5.7 CULTURAL RESOURCES

5.7.1 Description of Resources

This section presents the results of a literature search of previously recorded cultural resources. In September 2012, the Applicants requested information for the initial literature search from the State Historical Society of North Dakota (SHSND). This data request included an approximate 13- to 22-mile-wide study corridor, since the North Dakota Route had not yet been determined.

On October 19, 2012, SHSND provided cultural resources data including GIS data that document the location of all previous cultural surveys, previously identified archaeological sites, and recorded architectural properties within the study corridor. As Project plans progressed, the study corridor was evaluated through a desktop review, taking into account the data received from SHSND, and the North Dakota Route was selected.

Additional background research included online research of the National Park Service's (NPS's) NRHP, online research of historical General Land Office (GLO) survey plat maps, and a review of SHSND's planning document *The North Dakota Comprehensive Plan for Historic Preservation: Archaeological Component* (Gregg et al. 2008).

A Class I literature search has been completed for the North Dakota Facility and was submitted to SHPO on July 22, 2013, for review and comment. Information provided in the Class I literature search is considered confidential and a redacted version is filed with this Application (see Appendix D). The findings presented below represent a summary of that information. Specific locational information has been removed.

Class I Literature Search Results

North Dakota Corridor

One previously recorded archaeological site (32DI0034) and one previously recorded archaeological site lead (32DIx0102) have been identified within the North Dakota Corridor. Site 32DI0034 consists of a historic artifact scatter and farmstead foundations. Site lead 32DIx0102 consists of a precontact isolated find and includes one tertiary flake and one biface. The previously recorded site and site lead have not been evaluated for NRHP eligibility.

No previously recorded architectural properties were identified in the North Dakota Corridor.

In addition, GLO survey plat maps corresponding with the North Dakota Corridor were examined to identify areas that may have potential for containing historical era cultural resources (see Appendix D, Table 5). These maps reveal that by 1882 both townships within the North Dakota Corridor contained evidence of Euro-American settlement (North Dakota Water Commission 2013). Most evidence of settlement includes named residences scattered across the landscape. Settlement concentrations were identified west of the Maple River in Van Meter Township (that is, Township 129N, Range 62W).

Additional features identified on the GLO survey plat maps include agricultural fields and the Chicago Milwaukee & St. Paul Railway. This rail line extends across the entirety of the Ellendale Township (that is, Township 129N, Range 63W), transecting the eastern portion of the township. The rail extends nearly north to south with a slight northwest to southeast angle. One

residence was identified adjacent to the rail in Section 11. No other features were identified in this township.

North Dakota Route

No previously identified archaeological sites, site leads, or architectural properties have been identified within the North Dakota Facility ROW.

5.7.2 Impacts

North Dakota Corridor

Construction activities within the North Dakota Corridor may occur near previously identified archaeological and historic resources. Potential impacts include direct physical effects, indirect effects through long-term continuing operation and maintenance activities, and visual effects attributable to the intrusion of the North Dakota Facility on the setting of properties whose integrity of setting contributes to their significance.

Potential effects on archaeological sites and miscellaneous files (that is, suspected sites that have not been formally recorded) may occur within the North Dakota Corridor as a result of direct construction impacts. Therefore, the survey strategy for archaeological sites will be limited to the North Dakota Facility ROW and any other areas where direct construction impacts are likely to occur. These additional areas may include the Ellendale 345-kV Substation, temporary travel paths, laydown areas, and other areas necessary for construction outside of the North Dakota Facility ROW.

Potential effects on architectural properties may include visual impacts. Therefore, a 0.5-mile-wide visual impacts area of potential effects (APE) will be established to evaluate architectural properties. The purpose of the 0.5-mile-wide visual impacts APE is to account for the diminishment of integrity of setting for standing architectural properties for which setting contributes to their significance.

Class III Survey

As part of North Dakota Facility planning, the Applicants will continue to consult with SHPO and the Tribal Historic Preservation Offices (THPOs) to develop a Class III survey approach to locate and direct the identification of important cultural resources that may be vulnerable to the effects of the North Dakota Facility construction and operation or to visual effects. This survey strategy will focus on locating properties that may qualify for listing on the NRHP.

Potential conditions that merit a Class III survey include properties listed on the NRHP, previously recorded properties determined eligible or unevaluated, undisturbed areas including rangelands and grasslands, proximity to certain environmental and/or physical features, and portions of the North Dakota Route identified as sensitive areas.

Potential conditions that may not merit a survey include areas of recent industrial development and disturbance, cultivated lands, inundated areas, and areas that exhibit a slope of greater than 20 percent.

The Class III survey approach will include three components: a component focused on locating traditional cultural properties important for tribal associations with historic events or cultural beliefs and their contributions to the continuation of traditional communities' sense of identity; a

component for locating and evaluating archaeological properties that may retain important information; and a component for locating important historic architectural or engineering properties. The review and consideration of effects on important cultural resources in those portions of the North Dakota Route that are subject to a federal permit or approval will be reviewed in accordance with Section 106 of the National Historic Preservation Act (NHPA) and National Environmental Policy Act (NEPA) as determined by the responsible federal agencies.

The Applicants will also design a discovery plan to be implemented during construction to account for the possibility of encountering previously unknown archaeological resources or human remains. This plan will specify procedures for handling such discoveries in an efficient and expeditious manner. The discovery plan will include the following topics: monitoring methods, construction contractor training, identification of resources in the field including resources defined in NDCC 23-06-27, contact information, procedures for avoidance, and associated tasks in the event of work stoppage.

North Dakota Route

The same discussion in Section 5.7.2, North Dakota Corridor, applies for impacts associated with the North Dakota Route.

5.7.3 Mitigation

North Dakota Corridor

The Class I Literature Search identified one previously recorded archaeological site (32DI0034), one previously recorded site lead (32DIx0102), and no architectural properties within the North Dakota Corridor.

Following the completion of a Class III survey, the Applicants will seek to avoid impacts on any identified NRHP-eligible cultural resources and properties of traditional cultural importance. Avoidance measures may include placing poles so that sites are avoided by spanning, the use of fencing for site protection during construction, and burial of the resource under a protective buffer.

In addition, potential visual impacts on traditional cultural properties will be considered. Mitigation measures may include vegetative screening, additional documentation and research, or other mitigation measures deemed appropriate through SHPO consultation. The Applicants will consult with SHPO as the mitigation measures are further developed.

If avoidance of any identified NRHP-listed or eligible archaeological site is not feasible, the Applicants will consult further with SHPO to determine an appropriate course of action prior to plan implementation.

The Applicants will develop a discovery plan should previously unknown cultural resources or human remains be inadvertently encountered during construction or maintenance. The plan would outline the framework for handling such discoveries in an efficient and legally compliant manner.

North Dakota Route

The Class I literature search identified no previously recorded archaeological sites and no previously recorded architectural properties within the North Dakota Facility ROW.

The same discussion in Section 5.7.3, North Dakota Corridor, applies for mitigation associated with the North Dakota Route.

5.8 RECREATIONAL RESOURCES

5.8.1 Description of Resources

Recreational resources exist in the North Dakota Facility area, including trails, rivers, and federal lands. Outdoor recreational opportunities include riding all-terrain vehicles (ATVs) and snowmobiles, hiking, swimming, golfing, fishing, hunting, camping, and nature observation. Recreational resource and land management data were gathered from state and federal agencies.

State Managed Lands

North Dakota Game and Fish's (NDGF's) WMAs and the North Dakota Parks and Recreation Department's (NDPR's) state parks, nature preserves, and recreation areas play a large role in North Dakota's outdoor recreation system. There are no state parks or nature preserves located within the North Dakota Corridor.

PLOTS is a voluntary program offered to landowners by NDGF that provides landowners with monetary compensation for allowing public access to their land for fishing or hunting. There are no PLOTS lands within the North Dakota Corridor.

Federally Managed Lands

USFWS manages WPAs, Wildlife Development Areas (WDAs), and NWRs. None of these resources are located within the North Dakota Corridor.

As discussed in the Land Use section (Section 5.2.1), USFWS also holds easements on private lands for the protection of wetland resources, several of which are within the North Dakota Corridor. The habitat preserved by these easements supports the reproduction and habitat of wildlife species, particularly waterfowl and gamebirds.

Trails and Scenic Byways

No trails (that is, public hiking, historic or scenic) are located within or adjacent to the North Dakota Corridor. The nearest trail is the NPS-administered North Country National Scenic Trail which is approximately 46 miles northeast of the North Dakota Corridor. No designated state or federal scenic byways or backways are crossed by the North Dakota Corridor. The closest byway is the Chan SanSan Scenic Backway located approximately 24 miles northwest of the North Dakota Corridor.

Other Recreational Resources

No additional designated recreational resources, such as boat landings, golf courses, playgrounds, or ball fields are located within the North Dakota Corridor. The closest designated recreational resource is 1 mile east of the North Dakota Corridor in the City of Ellendale.

5.8.2 Impacts

North Dakota Corridor

In general, recreational impacts will be visual in nature and limited to individuals using private property in the North Dakota Corridor for hiking, hunting, fishing, or nature observation. The

North Dakota Facility will not cause any direct changes to the use of the existing recreational resources.

North Dakota Route

State Managed Lands

There are no state-managed lands such as state parks, nature preserves, or PLOTS located within or adjacent to the North Dakota Route; therefore, no impacts are anticipated.

Federally Managed Lands

The North Dakota Route crosses USFWS wetland easements. Impacts on easements are discussed in Section 5.2.2. The Applicants will work with USFWS on the location of transmission line structures in the wetlands to minimize or avoid potential impacts. The presence of the transmission line would not affect any existing recreational uses by the landowners of wetland easement parcels.

Trails and Scenic Byways

No trails (that is, public hiking, historic or scenic) or scenic byways are located within or adjacent to the North Dakota Route; therefore, no impacts are anticipated.

Other Recreational Resources

No impacts on other recreation resources, such as golf courses, parks, and camps, are anticipated. Hunting may occur on private lands within the North Dakota Facility ROW; however, the North Dakota Route will not block access to hunting areas, and landowners may pass under the North Dakota Route to access a hunting area.

5.8.3 Mitigation

North Dakota Corridor

Because it is not anticipated that any recreational resources will be removed from service by implementation of the North Dakota Facility, no adjacent land will need to be converted or dedicated to recreational use or wildlife management No mitigation is anticipated to be necessary.

North Dakota Route

The same discussion in Section 5.8.3, North Dakota Corridor, applies for mitigation associated with the North Dakota Route.

5.9 EFFECTS ON LAND-BASED ECONOMIES

5.9.1 Description of Resources

Agriculture and Farming

Agriculture is the primary land-based economic resource in the North Dakota Facility area. The highest yield resources include wheat, corn, soybeans, hay, barley, and sunflowers. Much of the agricultural land is designated as prime farmland, indicating land that is most desirable for agricultural production. Federal regulations define prime farmland as "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses" (7 Code of Federal Regulations [CFR] 657.5(a)(1)). Prime farmland is discussed in Section 5.10, Soils. Livestock operations are also located within the North Dakota Facility area including cattle and hogs.

According to the North Dakota 2007 Agricultural Statistics published by USDA, the state of North Dakota ranks 18th among the states in total crop cash receipts. In 2007, there were an estimated 31,970 farms in North Dakota and 545 farms in Dickey County. Average farm size is 1,280 acres, which ranks 22nd among the 53 North Dakota counties. The majority (that is, 77 percent) of this farmland is used as cropland in Dickey County, with pastureland accounting for 19 percent. Dickey County is ranked 13th for the state's total value of agricultural products sold (United States Department of Agriculture 2007).

In 2007, Dickey County sold $162 million in agricultural products (77 percent crops, 23 percent livestock). Corn and soybeans are the most widely grown crops in Dickey County, accounting for about 75 percent of county crop sales; other notable crops include wheat and forage. Cattle is the primary livestock inventory in the county (14th out of the 53 counties); Dickey County was also ranked 4th in the state in hog production (United States Department of Agriculture 2007).

GPS

Global Positioning System (GPS) navigation is becoming more common on farm equipment. GPS units collect location data from at least three or more satellites at any given time. The accuracy of the location data is affected by the number of satellites, how they are dispersed across the sky at any instant and atmospheric and satellite information factors. Because satellites are in constant motion above the earth, GPS units are constantly picking up and dropping satellite signals. At times, there might be instances when the GPS unit is not able to connect to enough satellites, and the required accuracy is not met.

In 2002, the Institute of Electrical and Electronics Engineers (IEEE) published a study that investigated the effects of overhead power lines on GPS receivers (Silva and Olsen 2002). Measurements evaluated whether GPS signal could be blocked by overhead conductors or whether use of GPS signal could be affected by electromagnetic interference (EMI) (that is, corona discharge or gap discharge noise). The study found that neither occurred.

Forestry

The North Dakota Corridor is located primarily in pasture and cultivated land with some forested areas adjacent to farmsteads and waterways. There are no economically important forestry resources within the North Dakota Corridor.

Tourism

The Applicants reviewed potential tourism activities located within the North Dakota Corridor along with resources within the vicinity that may be indirectly impacted by the North Dakota Facility because of viewshed effects or alteration of the landscape. There are no major tourism resources within the North Dakota Corridor; the Dakota Lake National Wildlife Refuge is approximately 15 miles east of the North Dakota Facility. Pheasant and waterfowl hunting is a popular recreational activity in the North Dakota Facility area. No state or federal-owned lands or PLOTS parcels, are found within the North Dakota Corridor. Hunting may occur on private lands within the North Dakota Corridor. The City of Ellendale contains tourist activities, such as a museum, opera house, and courthouse.

Mining

North Dakota's most important mined products are petroleum, coal, and natural gas. Other mined products include sand, gravel, clays, and salt. Of these, only sand and gravel are produced in Dickey County, and there are no mining resources present in the vicinity of the North Dakota Corridor (see Section 5.2).

5.9.2 Impacts

North Dakota Corridor

Agriculture and Farming

Impacts on agriculture will be nominal. Permanent impacts will be associated with the structure locations, areas surrounding the structures where a farmer may not wish to farm within 5 feet of the structure, and the Ellendale 345-kV Substation. All areas underneath and surrounding the proposed transmission line will be available for agricultural use following construction. Considering the large amount of agricultural land in the North Dakota Corridor, potential impacts will be negligible. Temporary impacts typically include soil disturbance, possible compaction of farm soils and crop damage if construction occurs during the growing season.

Forestry

No economically important forestry operations are in the North Dakota Corridor; therefore, no impacts are anticipated.

Tourism

The impacts on recreational resources are discussed in Section 5.8. Direct impacts on tourism resources are not anticipated, and the North Dakota Facility will not affect tourism in Dickey County.

Mining

No mining activities are present in the North Dakota Corridor; therefore, no impacts are anticipated.

North Dakota Route

Agriculture and Farming

The North Dakota Route will result in permanent and temporary impacts on farmland. During construction, temporary impacts, such as soil compaction, crop damage, and construction and

use of temporary travel paths, will occur. Permanent impacts on agricultural lands will occur as a result of transmission structure placement, Restricted Tillage Area, and substation construction. Please reference the agricultural impacts discussion in Section 5.2.2. As a result, the North Dakota Route will not affect the overall agricultural economy of Dickey County.

Global Positioning System

The 2002 IEEE study found that conductors and associated EMI will not block or affect use of GPS satellite signal. However, a GPS receiver may experience less accuracy due to temporarily poor satellite alignment and/or outages to the base station or transmitter. On rare occasions, a transmission line structure may cause a temporary drop in GPS accuracy due to blockage of line-of-sight to one satellite, but this will occur only if the receiver, structure, and satellite are in a line, which is rare. The connection will return as the farm equipment moves past the structure. Connection is usually restored within moments, and the GPS unit returns to normal function.

Forestry

Woodlands are primarily associated with homesteads and shelterbelts. Permanent impacts as a result of ROW clearing are discussed in Section 5.14.2. No impacts on economically important forestry resources will occur, as there are none within the North Dakota Facility ROW.

Tourism

No tourism resources are located in the North Dakota Facility ROW; therefore, no impacts are anticipated.

Mining

No mining activities are present in the North Dakota Facility ROW; therefore, no impacts are anticipated.

5.9.3 Mitigation

North Dakota Corridor

Agriculture and Farming

The Applicants will work with landowners to minimize impacts on all farming and grazing operations within the North Dakota Corridor. By aligning the transmission line along existing ROWs, roads, and section and field lines, impacts will be minimized. The Applicants will compensate landowners for any crop damage, soil compaction, or damages that may occur during construction. Areas disturbed during construction will be repaired and restored to preconstruction contours to the extent practicable so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural re-vegetation, provide for proper drainage, and prevent erosion. Construction laydown areas and temporary travel paths will be disked as necessary to relieve excessive compaction caused by construction or in accordance with the landowner agreement. Tile lines may be present along the transmission line route. The Applicants will work with the landowners to identify and mark drain tile lines to avoid damage during construction. Where locations are known, temporary travel paths will avoid tile lines where possible and when they are unavoidable, matting may be used. If drain tile lines are inadvertently damaged by construction of the North Dakota Facility, the Applicants will repair the tile lines.

The Applicants will meet with the landowners to determine crop damages. Landowners will be compensated for any crop damage that occurs during construction.

Global Positioning System

Minimal impacts on GPS units are anticipated. No mitigation measures are necessary.

Forestry

The North Dakota Facility will be routed to minimize impacts on trees to the maximum extent practicable. The Applicants will conduct a tree and shrub inventory of the ROW and will follow the Commission's replacement ratio of 2:1 for tree and shrub impacts.

Tourism

No impacts on tourism are anticipated; therefore, no mitigation is proposed.

Mining

No impacts on mining are anticipated; therefore, no mitigation is proposed.

North Dakota Route

The same discussion in Section 5.9.3, North Dakota Corridor, applies for mitigation associated with the North Dakota Route.

5.10 SOILS

Soil Survey Geographic (SSURGO) soils data made available by NRCS were analyzed using the ArcInfo license of ESRI® ArcMap™ 10.0 to determine impacts on prime farmland. General State Soil Geographic (STATSGO) soil associations, which consist of groupings of soils with distinctive characteristics, were also reviewed as part of this analysis and listed in Table 20.

5.10.1 Description of Resources

General Soils

Soils within the North Dakota Corridor consist of deep, well-drained soils formed over glacial till or glaciofluvial settings. Table 20 summarizes the primary STATSGO soil series for the North Dakota Corridor and the North Dakota Facility ROW. Three soil associations are found in the North Dakota Corridor; only two of these soil associations occur within the North Dakota Facility ROW. Figure 8 displays the soil map units across the North Dakota Facility ROW.

Table 20: STATSGO Soil Associations in North Dakota Corridor and Facility ROW

Soil Association	Acres of Soil Type in Corridor	Percent of Soil Type in Corridor	Acres of Soil Type in ROW	Percent of Soil Type in ROW	Description of Primary Soil Series
Barnes-Svea-Tonka (ND045)	4,234.0	69.6	120.1	71.2	The Barnes-Svea-Tonka soils consist of very deep, well-drained soils that formed in loamy till. The Barnes soils form on till plains and moraines and have slopes ranging from 0 to 25 percent, the Svea soils are on concave and nearly level positions, and the Tonka soils are on lower lying footslopes and flats and in depressions. They are wetter and have water tables at or near the surface.
Cavour-Svea-Barnes (ND052)	175.3	2.9	0.0	0.0	The Cavour-Svea-Barnes soils consist of very deep, well-drained soils. The Cavour series are formed in glacial till on uplands, have slow or very slow permeability, and have slopes ranging from 0 to 6 percent. Barnes soils form on till plains and moraines and have slopes ranging from 0 to 25 percent. The Svea soils are on concave and nearly level positions.

Soil Association	Acres of Soil Type in Corridor	Percent of Soil Type in Corridor	Acres of Soil Type in ROW	Percent of Soil Type in ROW	Description of Primary Soil Series
Swenoda-Barnes-Tiffany (ND014)	1,674.6	27.5	48.7	28.8	The Swenoda series consists of very deep, well-drained and moderately well-drained soils formed in loamy sediments underlain by silty and loamy sediments on uplands. The Swenoda soils are nearly level to moderately sloping on uplands. The slopes are plain or convex. Slope gradients typically are less than 4 percent. The soil formed in loamy sediments overlying laminated lacustrine silt to clay or loam or clay loam till. The Barnes soils form on till plains and moraines and have slopes ranging from 0 to 25 percent. The Tiffany series consists of very deep, poorly drained soils that have moderately high or high saturated hydraulic conductivity. These soils are in depressions and on glaciolacustrine deltas and outwash plains. Slope ranges from 0 to 1 percent.

Sources: USDA, NRCS. 2006; https://soilseries.sc.egov.usda.gov/osdname.asp

Prime Farmland

Soils may be classified as prime farmland, prime farmland if drained, not prime farmland, and farmland of statewide importance. Figure 9 displays the location of these farmland classifications within the North Dakota Corridor.

Soils considered prime farmland are widespread throughout the North Dakota Corridor, but are most densely continuous in the central portions of the route of the new transmission line. Soils classified as prime farmland if drained are somewhat more common along the southeastern portions of the North Dakota Corridor, as are soils designated as not prime farmland. There are no soils identified as farmland of statewide importance within the North Dakota Corridor. Table 21 displays farmland classifications for the North Dakota Corridor and the North Dakota Facility ROW.

Table 21: Farmland Classifications for North Dakota Corridor and North Dakota Facility ROW

Farmland Classification	Acres of Corridor	Percent of Corridor	Acres of ROW	Percent of ROW
All areas are prime farmland	3,074.8	50.5	91.7	54.3
Prime farmland if drained	1,544.7	25.4	43.3	25.6
Not prime farmland	1,440.6	23.7	33.8	20.0
No data	23.8	0.4	0.0	0.0
Total	**6,083.9**	**100.0**	**168.8**	**100.0**

Source: SSURGO

Potentially Erodible Soils

The North Dakota soil databases do not have attributes to identify erodible or highly erodible soils. In general, soils of 6 percent or greater slope have a higher potential for erosion due to surface water runoff, if disturbed. Based on the soil types identified in SSURGO, soils types with slope descriptions of less than 6 percent comprise more than 99.8 percent of the total area within the North Dakota Corridor, and no mapped soils in the North Dakota Facility ROW have descriptions with slopes greater than 6 percent.

5.10.2 Impacts

North Dakota Corridor

The permanent impact on soils in the area will be limited to areas at transmission line structure locations and the substation. Temporary impacts on soils are anticipated during construction in the areas immediately surrounding the transmission line structures and the Ellendale 345-kV Substation. Given the general abundance of prime farmland in the North Dakota Corridor, the small amount of anticipated impacts would not have any discernible effect on production.

North Dakota Route

General Soils

Surface soils will be disturbed by site clearing, grading, and excavation activities at the substation and structure locations, pulling and tensioning sites, setup areas, and during the transport of crews, machinery, materials, and equipment over access routes (primarily along the North Dakota Facility ROW). This disturbance is minimal, and is generally less invasive than typical agricultural practices such as plowing and tilling. Soil compaction will occur on temporary travel paths, laydown areas, and along the North Dakota Facility ROW. The Applicants will attempt to utilize existing, disturbed areas for the laydown area to the extent practical. Table 22 provides temporary and permanent impact by soil association.

Table 22: Temporary and Permanent Impact Areas for the North Dakota Route by Soil Association

Soil Association	Temporary Impacts[1] (acres)	Permanent Impacts (acres)
Barnes-Svea-Tonka (ND045)	48.4	0.05
Swenoda-Barnes-Tiffany (ND014)	24.7	11.3
Laydown and Wire Stringing Areas	40.2	0
Total	**113.3**	**11.4**

[1] *The temporary soil impacts with particular soil associations include those associated with poles, temporary travel paths, and the substation. Laydown and stringing area impacts would occur; however the exact locations are not known, so soil association information is not available.*

Source: STATSGO

Prime Farmland

Table 23 provides the temporary and permanent impacts on prime farmland classifications.

Table 23: Temporary and Permanent Impacts on Prime Farmland Classifications

Prime Farmland Classification	Temporary Impacts[1] (acres)	Permanent Impacts (acres)[2]
Prime farmland	41.5	7.9
Prime farmland if drained	18.1	3.6
Not prime farmland	13.2	0.04
Laydown and Wire Stringing Areas	40.2	0
Total	**113.3**	**11.6**

[1] *The temporary soil impacts with particular prime farmland status include those associated with poles, temporary travel paths, and the substation. Laydown and stringing area impacts would occur; however the exact locations are not known, so prime farmland information is not available.*

[4] *A Restricted Tillage Area was added to the calculated impact on prime farmland as the landowner may not wish to farm the land any closer than five feet from the structure base. Therefore, 0.2 acres are an additional impact to prime farmland.*

Potentially Erodible Soils

Disturbed soils can be subject to erosion, defined as the detachment and transport of individual soil grains by wind or water. Erosion by wind is related to soil moisture, soil texture, organic matter content, soil structure, vegetative cover, and climate. Wind erosion often occurs on dry, fine sandy soils when vegetation cover is sparse and strong winds are prevalent. Water erosion is related closely to a soil's infiltration capacity and the coherence of the soil particles that comprise the soil. Slopes of 6 percent or greater tend to have a higher potential for erosion. Well-drained and well-graded gravels and gravel sand mixtures with little or no silt are the least erodible soils. Water erosion is also influenced by slope length and gradient, as well as frequency, intensity, and duration of rainfall and the amount of time bare soils are exposed. Erosion could be caused by

site clearing and earthmoving in addition to natural processes. However, given the soil types and land slopes present in the North Dakota Facility ROW, the overall potential for erosion is relatively low.

5.10.3 Mitigation

North Dakota Corridor

To reduce adverse effects on and from soils, the Project will develop and utilize BMPs during construction to protect topsoil and adjacent wetland resources, and minimize soil erosion. A NDPDES permit will be obtained and a Storm Water Pollution and Prevention Plan (SWPPP) will be developed that includes appropriate BMPs for construction. All disturbed areas will be re-vegetated or otherwise stabilized once construction is complete per applicable permit requirements.

Construction practices will be completed in accordance with the NDPDES permit requirements. BMPs may include:

- Containment of stockpiled material away from stream banks and shorelines as required by the NDPDES permit
- Stockpiling and respreading topsoil at laydown areas and/or permitted areas
- Reseeding and revegetating disturbed areas as required by the NDPDES permit
- Implementing erosion and sediment controls as required by the NDPDES permit
- Minimizing waste waters generated by construction by following BMPs

Soils disturbed during construction will be decompacted and restored to preconstruction contours to the extent practicable and in accordance with landowner agreements so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate re-vegetation, provide for proper drainage, and prevent erosion. Construction laydown areas and temporary travel paths will be restored per the landowner agreement. In the event that previously contaminated soils are discovered during construction, the contractor will stop work immediately and contact the North Dakota Department of Health (NDDOH).

North Dakota Route

The same discussion in Section 5.10.3, North Dakota Corridor, applies for mitigation associated with the North Dakota Route.

5.11 GEOLOGIC AND GROUNDWATER RESOURCES

5.11.1 Description of Resources

Geology

The North Dakota Corridor is underlain by Quaternary-age glacial sediments deposited by glacial ice originating from the Keewatin Ice Sheet. Glacial till of the Coleharbor Group is the dominant type of surficial sediment. Bluemle (1979) describes the till as an unsorted, unbedded mixture of boulders, gravel, and sand in a matrix of silt and clay, yellowish-brown to olive-gray in color. Smaller pockets of cross-bedded sand, also part of the Coleharbor Group, exist near some streams. The Coleharbor Group thickness exceeds 100 feet in the North Dakota Facility area.

The Late Cretaceous Pierre Shale immediately underlies the glacial drift in the area. This shale is dark-greenish-gray to dark-blackish-gray, brittle and fissile. Along with the Pierre Shale, and in descending sequence, other members of the Cretaceous System which are present in the Ellendale area are the Niobrara Formation, Greenhorn Formation and the Dakota Group.

Groundwater

Groundwater resources in the North Dakota Facility area exist in both surficial (that is, unconsolidated) and bedrock aquifers. Major surficial aquifers are composed of river alluvium and glacial outwash. Nearby mapped aquifers include the Nortonville, Ellendale, and Guelph aquifers. These types of aquifers tend to be long and narrow in shape, and are not present in the North Dakota Facility area (Armstrong 1980).

Undifferentiated glacial-drift aquifers are interspersed within the till in most of Dickey County. The aquifer materials consist of sand and gravel that was deposited in long, narrow channels wherever there was sufficient glacial melt water to cause sorting. Thus, the areas most likely to contain these aquifers are where elongate surface depressions occur, or where several sloughs are in a chain. The small size of most of the undifferentiated glacial-drift aquifers restricts their capacity to yield water. However, they generally yield enough for domestic and stock supplies (Armstrong 1980).

Yields of groundwater from the Pierre Shale should not be expected to exceed 5 gallons per minute (Armstrong 1980). Bedrock aquifers are generally 90 to 150 feet deep in this area (Lindvig 1965).

5.11.2 Impacts

North Dakota Corridor

Impacts on groundwater resources could result from dewatering activities during construction. Structure foundations might encounter shallow groundwater, but would not affect the quantity or quality of groundwater available. Impacts on geologic resources are not anticipated.

North Dakota Route

Permanent in-ground structure foundations that extend below the water table will have minimal impact on groundwater flow patterns. Impacts will be limited to the displacement of surficial sediments and groundwater during construction of structure foundations. A boring for a structure foundation may extend 40 to 100 feet below ground surface depending on soil

conditions and structure type. Boring diameter may be 7 to 10 feet. Given these values, the maximum volume of displaced soil and groundwater will be approximately 7,854 cubic feet (or 291 cubic yards) at a structure location. The removal of soil and groundwater at each structure location is not anticipated to impact local groundwater flow patterns due to the temporary and small-scale nature of the removal. Construction spoils, including soil cuttings and boring stabilization fluids, will be either scattered onsite or disposed of offsite unless otherwise requested by the landowner or agency with jurisdiction. Topsoil will be left on site, if desired by the landowner. Soil scattered on site or removed from the site would not be placed in wetlands or other sensitive areas. Effects on aquifers and potable water supplies by the North Dakota Facility are not anticipated. Permanent impacts on surface waters or groundwater aquifers are not expected to occur.

The storage and use of fuels, greases, and other chemicals during construction has the potential, if not handled properly or spilled, to impact geologic materials and groundwater. In addition, there is potential for construction activities to encounter previously contaminated soil.

5.11.3 Mitigation

North Dakota Corridor

Impacts on geologic and groundwater sources will be avoided and/or mitigated by the following:

- The depth and diameter of structure foundations will be minimized as much as feasible.
- To limit impacts on groundwater resources caused by groundwater contamination, the Applicants will follow applicable permit conditions as appropriate and use BMPs to reduce impacts during construction. Should vehicle fueling be required within the North Dakota Facility ROW, BMPs will be employed so that equipment fueling and lubricating occur at a distance from waterways.

North Dakota Route

The same discussion in Section 5.11.3, North Dakota Corridor, applies for mitigation associated with the North Dakota Route.

5.12 SURFACE WATER AND FLOODPLAIN RESOURCES

5.12.1 Description of Resources

Rivers, Streams, and Lakes

While some lakes in North Dakota are in a traditional sense actually large wetlands, for the purpose of this Application, lakes were identified as surface waters that have been named as lakes or are labeled as lakes in the National Hydrography Dataset (NHD). There are 10 NHD lakes within the North Dakota Corridor (totaling 39.9 acres) and 3 proposed crossings of lakes along the North Dakota Facility ROW. Table 24 summarizes surface waters crossed by the North Dakota Facility ROW, including three streams.

Table 24: Surface Waters Crossed by the North Dakota Facility ROW from West to East

Surface Waters Crossed	Number of Crossings	Comment
Unnamed NHD Lake	1	ROW crosses an unnamed intermittent lake mapped by the NHD. The centerline crosses approximately 525 feet of this mapped surface water body.
Unnamed Tributary of Sewer Branch and Associated Unnamed NHD Lake	1	ROW crosses unnamed tributary of Sewer Branch with an associated unnamed perennial pond. The pond is approximately 256 feet wide where the centerline crosses.
Sewer Branch and Associated Unnamed NHD Lake	1	ROW crosses the Sewer Branch. The riparian area associated with the stream is approximately 115 feet wide where the centerline crosses.
Dry Branch	1	ROW crosses Dry Branch with an associated unnamed perennial pond. The pond is approximately 118 feet wide where the centerline crosses.

Pursuant to the Clean Water Act, every two years, the State releases a list of streams and lakes that are not meeting their designated uses because of excess pollutants (impaired waters). The impaired waters list, known as the 303(d) list, is based on violations of water quality standards. None of the water bodies crossed by the North Dakota Facility ROW are listed as impaired by the EPA.

Floodplains

There are no mapped Federal Emergency Management Agency (FEMA) floodplains crossed by the North Dakota Corridor or the North Dakota Route.

5.12.2 Impacts

North Dakota Corridor

During construction there is a limited possibility of sediment reaching surface waters as the ground is disturbed by excavation, grading, and construction traffic. This could potentially affect water quality if the erosion is not controlled. However, no impacts on surface waters or floodplain resources are anticipated. All rivers, streams, and lakes will be completely spanned,

and no mapped floodplains occur within the North Dakota Corridor. Construction of the transmission line and substation will cause some limited land disturbance along the North Dakota Corridor. These disturbances will typically occur outside of the bed of surface waters. The structures utilized for both the substation and transmission lines will not be prone to flood damages and will not contribute to any possible flooding within the North Dakota Corridor. There are no EPA-listed impaired waters within the North Dakota Corridor.

North Dakota Route

The same discussion in Section 5.13.2, North Dakota Corridor, applies for impacts associated with the North Dakota Route.

5.12.3 Mitigation

North Dakota Corridor

No permanent impacts on surface waters or floodplain resources are anticipated as a result of the North Dakota Facility. All rivers, streams, and lakes will be completely spanned. Potential impacts on wetlands are addressed in Section 5.13.

To limit impacts on surface waters, the Applicants will follow applicable permit conditions as appropriate and use BMPs to reduce impacts during construction. Should vehicle fueling be required within the North Dakota Facility ROW, BMPs will be employed so that equipment fueling and lubricating occur at a distance from waterways.

It is anticipated that all rivers, streams, and lakes will be spanned by the North Dakota Facility, and no structures will be located within these features. Therefore, direct impacts on these features are not expected. The Applicants anticipate receiving a NDPDES permit, as applicable. The Applicants will also prepare and follow the commitments set forth in the associated SWPPP. As necessary, the SWPPP will identify BMPs specific for impaired waters if any waters that are crossed by the transmission line are designated as impaired prior to construction.

Once the North Dakota Facility is constructed, there will be no significant impact on surface water quality because wetland and waterway impacts will be minimized and mitigated, disturbed soil will be restored to previous conditions, and the amount of land area converted to an impervious surface will be small.

In the event construction activities could cause a disturbance to surface water resources, the Applicants will use BMPs to minimize impacts on surface waters. Temporary erosion and sediment control methods will be properly placed, monitored, and maintained adjacent to water resources. These erosion control methods will remain in place until work areas become re-vegetated or are stable. BMPs may include vegetative buffers, silt fencing, mulching, seeding, and straw wattles. Where appropriate, the Applicants will revegetate disturbed areas to as close to preconstruction conditions as possible in consultation with the landowner and as per appropriate permit requirements.

No impacts on floodplains are anticipated; therefore, no mitigation is proposed.

North Dakota Route

The same discussion in Section 5.13.3, North Dakota Corridor, applies for mitigation associated with the North Dakota Route.

5.13 WETLANDS

5.13.1 Description of Resources

The North Dakota Corridor occurs in an area that is generally described as part of the prairie pothole region. The prairie pothole region is characterized by numerous shallow freshwater lakes and wetlands that pockmark the landscape. This region, which extends south from Canada to South Dakota and Minnesota, provides waterfowl habitat that is estimated to produce 50 to 75 percent of North American waterfowl in any given year (Witsch et al. 2000).

The ecology of these wetlands is dictated by seasonal wet-dry cycles. Snowmelt and spring rains serve as the primary water sources, resulting in many seasonal wetlands that hold surface water early in the growing season and then dry out as the summer progresses. While some of these wetlands can be quite large (that is, greater than 100 acres), the majority of pothole wetlands are less than 10 acres.

Wetlands are identified as shallow water systems that provide unique functions and values to the surrounding landscape, such as water quality protection, wildlife habitat, and flood storage. Wetlands connected to Waters of the U.S. (that is, not isolated basins) are protected under Section 404 of the Clean Water Act and are regulated by USACE and EPA. Some of the wetlands within the North Dakota Corridor and the North Dakota Facility ROW are held in USFWS wetland easements.

General wetland locations were obtained from the National Wetlands Inventory (NWI) (see Figure 10). Because the size of wetlands were determined by the use of aerial photography that is dependent on the year the photograph was taken and the level of water in the wetland at that time, the NWI data in North Dakota may not reflect the true size of wetlands. NWI data represents general locations and acreages of wetlands within the North Dakota Corridor and the North Dakota Facility ROW. The various NWI wetland types located throughout the North Dakota Corridor and the North Dakota Facility ROW are shown in Table 25.

Table 25: NWI Wetlands Identified within North Dakota Corridor and North Dakota Facility ROW

Wetland Type	Acres of Wetlands within Corridor	Percent of Corridor	Acres of Wetlands within ROW	Percent of ROW
Freshwater Emergent Wetland	534.8	8.8	13.2	7.8
Freshwater Forested/Shrub Wetland	7.5	0.1	0.2	0.1
Freshwater Pond	54.1	0.9	3.8	2.2
Total	**596.4**	**9.8**	**17.2**	**10.1**

Source: USFWS National Wetlands Inventory

In addition to the evaluation of NWI wetlands, the Applicants have performed a desktop digitization of wetlands within the North Dakota Corridor and the North Dakota Facility ROW (Figure 2). This desktop assessment was based on the review of aerial and NWI mapping, and resulted in potential wetland boundaries being digitized for structure spotting purposes. A field

assessment of the wetland areas will be performed once landowner access along the North Dakota Route has been granted. Once a field review is complete, a wetland delineation report will be filed with the Commission and USACE.

These digitized wetlands do not have specific types associated with them, but are meant to provide a conservative estimate of wetland coverage. Table 26 shows acreage of digitized wetlands within the North Dakota Corridor and the North Dakota Facility ROW. As can be seen, the digitized wetland areas occupy a larger percentage of the North Dakota Corridor and North Dakota Facility ROW when compared to the NWI data, indicating that the NWI mapping likely underestimates the wetland coverage in the North Dakota Corridor and the North Dakota Facility ROW.

Table 26: Digitized Wetlands Identified within North Dakota Corridor and North Dakota Facility ROW

	Acres Wetland within Corridor	Percent of Corridor	Acres of Wetland within ROW	Percent of ROW
Digitized Wetlands	734.0	12.1	27.4	16.2

Source: HDR Engineering, Inc.

5.13.2 Impacts

North Dakota Corridor

In general, the transmission line can be routed to avoid or structures can be designed to span and thus avoid and minimize, wetland areas. Wetlands more than 1,000 feet in length would likely require that one or more transmission structures be placed within the wetland boundary. Each structure would result in approximately 79 square feet of permanent impact (see Section 5.13.2, North Dakota Route, for more details).

During construction there is the possibility of sediment reaching wetlands as the ground is disturbed by excavation, grading, and construction traffic. As described in Section 5.12, the Applicants will implement BMPs during construction to protect topsoil and adjacent water resources (including wetlands). Following completion of construction it is anticipated that there will be no additional impacts on wetlands.

North Dakota Route

Wetland impacts will be avoided or minimized to the extent practicable through careful siting of the North Dakota Route. As noted previously, USFWS manages some wetlands on wetland easements. Impacts to USFWS easements are discussed in Section 5.2.2.The Applicants will attempt to span all wetlands within these easements. Once field delineations occur and further coordination with USFWS Kulm Wetland Management District staff identifies the precise wetland boundaries, the Applicants will work with USFWS to document temporary and/or permanent wetland impacts on easement lands.

Temporary construction impacts may occur in association with the North Dakota Route construction. Permanent impacts are associated with installation of structures that result in fill

being placed within a wetland, such as transmission structure foundations and substation facilities. Coordination with USACE is described below.

National Wetlands Inventory-Mapped Wetland Impacts

Table 27 estimates wetland impacts for the North Dakota Route based on NWI wetlands within the North Dakota Facility ROW. According to NWI data, the North Dakota Route is anticipated to permanently impact approximately 0.02 acre of wetlands.

As described above, the NWI mapping for the Project area appears to underestimate wetland coverage. Therefore, a more conservative estimate of potential wetland impacts is represented by the digitized wetland impacts as described in the subsequent section.

Table 27: Estimated Wetland Impacts for North Dakota Route – NWI

Wetland Type	Estimated Wetland Impact	
	Temporary Impact (acres)	Permanent Impact (acres)
Freshwater Emergent Wetland	5.3	0.02
Freshwater Pond	1.0	0.0
Total	**6.3**	**0.02**

Source: USFWS National Wetlands Inventory

Digitized Wetland Impacts

Using the digitized wetland information, the North Dakota Route is anticipated to permanently impact approximately 2.9 acres of wetlands. Table 28 provides information on potential temporary and permanent impacts for the North Dakota Route based on the digitized wetland boundaries.

Table 28: Estimated Wetland Impacts for the North Dakota Route – Digitized

	Estimated Wetland Impact	
	Temporary Impact (acres)	Permanent Impact (acres)
Digitized Wetland	11.0	2.9

Source: HDR Engineering, Inc.

The Applicants have coordinated with USACE regarding the wetland areas proposed to be impacted by the Ellendale 345-kV Substation, which account for the majority (2.86 acres of the 2.9 acres) of the anticipated permanent wetland impacts. The basins within the substation footprint are cultivated during drier years, according to historic aerial photographs. The basins also appear to be isolated, and therefore are not subject to jurisdiction under the Clean Water Act. In a January 11, 2013, response letter, USACE North Dakota Regulatory Office provided a

Jurisdictional Determination agreeing that the basins are not jurisdictional waters of the United States (Appendix I).

5.13.3 Mitigation

North Dakota Corridor

Permanent impacts on wetlands will be avoided to the extent practicable through refinement of the design. The majority of the wetlands within the North Dakota Corridor that may be permanently impacted by the North Dakota Facility appear to be isolated basins that do not fall under USACE jurisdiction. Surveys for USACE-jurisdictional wetlands will be completed prior to construction. Permanent impacts on jurisdictional wetlands and waters will be permitted according to USACE regulatory requirements, as applicable. Permanent impacts to wetlands under USFWS easements will be coordinated with the USFWS.

The Applicants will use BMPs during construction and operation of the North Dakota Facility to protect topsoil and adjacent wetland resources and to minimize soil erosion. Additional BMPs may be used to limit impacts include the use of tracked equipment, winter construction in wetlands, and matting. Practices may include containing excavated material, protecting exposed soil, stabilizing restored material, and re-vegetating disturbed areas. Should there be impacts to wetlands the Applicants will work with the respective agency to execute mutually agreed upon BMPs to restore wetland impacts.

North Dakota Route

In general the same discussion in Section 5.13.3, North Dakota Corridor, applies for mitigation associated with the North Dakota Route.

As stated above, USACE has determined that the wetlands proposed to be impacted by the Ellendale 345-kV Substation are not jurisdictional waters of the United States and therefore no permit pursuant to Section 404 of the Clean Water Act is required from USACE for these impacts. For the remainder of the North Dakota Route, the Applicants will continue to coordinate with USACE and USFWS for wetlands under their jurisdiction. Once landowner permission is obtained, field delineations will occur in areas where potential impacts on wetlands may occur, and impacts on Section 404 jurisdictional waters will be mitigated according to USACE regulatory requirements, as applicable.

5.14 VEGETATION

5.14.1 Description of Resources

World Imagery aerials from 2010 were used to digitize land cover. Figure 11 depicts the land cover within the North Dakota Corridor and the North Dakota Facility ROW. Table 29 presents the acres of each land cover category that occurs within the North Dakota Corridor and the North Dakota Facility ROW.

Table 29: Digitized Land Cover Types within North Dakota Corridor and North Dakota Facility ROW

Digitized Land Cover Category	Acres in Corridor	Percent of Corridor	Acres in ROW	Percent of ROW
Cultivated	4,381.9	72.0	122.5	72.6
Developed	96.2	1.6	0	0
Pasture/Hay	725.6	11.9	15.5	9.2
Open Space (Road ROW)	45.6	0.8	0.9	0.5
Trees (tree rows and windbreaks)	100.6	1.7	2.5	1.5
Wetland	734.0	12.1	27.4	16.2
Total Area	**6,083.9**	**100.0**	**168.8**	**100.0**

Source: HDR Engineering, 2013; World Imagery 2010 Data

The North Dakota Facility area is located in the Great Plains Steppe Ecological Provinces as defined in the Ecological Subregions of the United States (McNab and Avers 1994). Historically, land cover in the Great Plains Steppe occurred as an area of nearly level to undulating continental glacial till and glacial lake plains dominated by fire-dependent grasslands, wetlands, and stream courses. Most of the grasslands, wetlands, and stream courses were modified to agricultural production. Native grasses and forbs persist in those areas where steep slopes, rocky soils, or wetlands prohibited conversion of lands to crop production. Native communities in the North Dakota Facility area such as native prairie, wetland, or woodland are limited to small fragments or patches near streams, on slopes, or at field margins. Prairie habitats in this part of the North Dakota Facility area included a variety of grasses and forbs including species such as bluestem (*Andropogon* and *Schizachyrium* spp.), side-oats (*Bouteloua* spp.), prairie dropseed (*Sporobolus heterolepis*), and forbs such as pasque-flowers (*Anemone patens*), silky aster (*Aster sericeus*), narrow-leaved purple coneflower (*Echinacea pallida*), blanket flower (*Gaillardia aristata*), and prairie coneflower (*Ratibida columnifera*). Observations from public roads indicate that in general, the native prairies found in the North Dakota Corridor are degraded and in pasture land use.

The primary cover types present within the North Dakota Corridor and the North Dakota Facility ROW consist of cultivated crops and pasture/hay. Crops include grain and legume species such as wheat, barley, corn, and soybeans. Usually, croplands are established as monotypic communities with few native grasses or forbs present within fields used for crop production. Pastured areas generally contain lands that have been degraded by overgrazing or converted to non-native pasture grasses.

Wetlands are abundant in the North Dakota Corridor and the North Dakota Facility ROW. The wetlands that do occur are isolated potholes surrounded by cropland or located along the Dry Branch, a tributary to the Maple River. Common wetland vegetation includes cattails (*Typha* spp.), reed canary grass (*Phalaris arundinacea*), and prairie cordgrass (*Spartina pectinata*).

In general, woodlands do not occur within the North Dakota Corridor and the North Dakota Facility ROW. However, several windrows and planted windbreaks occur at field margins or around farm buildings. Species commonly associated with these areas include spruce (*Picea* spp.), green ash (*Fraxinus pennsylvanica*), and eastern cottonwood (*Populus deltoides*).

Land cover classes that may conflict with the construction and operation of a new transmission line include developed areas, water crossings, and large wetland complexes.

Impaired and Vulnerable Terrestrial Communities

NDPR maintains the North Dakota Natural Heritage Inventory (NHI) as a spatial reference to occurrences of protected and rare flora and fauna species or sensitive natural communities (see Figure 12). No rare flora or fauna or impaired and vulnerable terrestrial communities are documented within the North Dakota Corridor or the North Dakota Facility ROW.

Conservation Focus Areas

NDGF's Private Lands Initiative Program utilizes a State Wildlife Grant to provide assistance to landowners to develop and protect habitat for species of conservation priority that are located within Conservation Focus Areas identified in the North Dakota Comprehensive Wildlife Conservation Strategy Plan (NDGF 2011). No state Conservation Focus Area is crossed by the North Dakota Corridor. The nearest Conservation Focus Area is the Missouri Coteau that is approximately 20 miles east of the North Dakota Facility.

5.14.2 Impacts

North Dakota Corridor

For all land cover, the extent of temporary and permanent impacts will be associated with the transmission line and substation within the North Dakota Corridor. Permanent impacts will be limited to structure locations and the Ellendale 345-kV Substation for all vegetation types except tree and shrubs. As described in more detail in Section 5.14.2, North Dakota Route, woody vegetation will be permanently cleared within the North Dakota Facility ROW.

Agricultural land cover in the North Dakota Corridor is not expected to change as a result of construction of the proposed transmission line facilities. Cultivated crops are abundant within the North Dakota Corridor. Pasture land cover is also not expected to be impacted by the proposed transmission line located within the North Dakota Corridor. The majority of the area under or adjacent to the transmission line still may be used for agricultural practices following construction of the North Dakota Facility. The site purchased and developed for the Ellendale 345-kV Substation will be permanently removed from the current cultivated land use.

In some areas, wetlands may share characteristics with prairie areas, but in many cases are degraded or dominated by non-native vegetation. Impacts on wetland resources are discussed in Section 5.13.

Impaired and Vulnerable Terrestrial Communities

No Impaired and Vulnerable Terrestrial communities occur within the North Dakota Corridor; therefore, no impacts on Impaired and Vulnerable Resources are anticipated.

Conservation Focus Areas

No Conservation Focus Areas occur within the North Dakota Corridor; therefore, no impacts are anticipated.

North Dakota Route

Temporary and permanent impacts on land cover are provided in Table 30. Tree cover impacts will result in a permanent vegetation conversion to grassland or cultivation within the North Dakota Facility ROW.

Table 30: Digitized Land Cover Impacts for the North Dakota Facility

Digitized Land Cover Category	Temporary Impacts (acres)	Permanent Impacts (acres)
Cultivated[1]	54.4	8.7
Developed	0	0
Pasture/Hay	6.0	0.01
Open Space (Road ROW)	0.5	0
Trees (tree rows and windbreaks) [2]	NA	2.5
Wetland	11.0	2.9
Laydown and Wire Stringing Areas[3]	40.2	0
Total Area[4]	112.2	14.1

Source: HDR Engineering, 2013 World Imagery 2010 Data

[1] Temporary impacts to cultivated land cover include the structures, access paths, laydown areas, stringing areas, and the Ellendale 345-kV Substation. Permanent cultivated impacts include the Restricted Tillage Area around structures and the footprint of the Ellendale 345-kV Substation.

[2] All impacts to trees within the ROW will be permanent. Permanent impacts to trees will be from clearing of the ROW. Clearing during construction would not be counted as temporary impact because the ROW will be maintained throughout the life of the Project. The ROW would convert to another landcover (likely pasture or cultivated) depending on the landowner preference.

[3] Laydown and stringing areas will temporarily impact land cover; however the exact locations are not known. It is anticipated that the majority of these temporary impacts would occur within cultivated fields.

[4] Total temporary impacts to land cover are different in this table than for overall temporary impacts (113.3 acres) because the tree impacts within the temporary impact areas are assumed to be permanent. Permanent impacts in this table are different than for overall permanent impacts (11.4 acres), because the table counts all tree acreage in the ROW as a permanent impact, but does not incorporate an increase in cultivated or pasture land covers in the transmission line ROW in formerly wooded areas.

Land cover in the North Dakota Facility ROW is dominated by agricultural cropland and pasture. Permanent impacts to cultivated land will be limited to structure footprints, Restricted Tillage Area around each structure, and the Ellendale 345-kV Substation. As described above, the pasture grassland in the North Dakota Corridor and North Dakota Facility ROW is generally

heavily grazed, dominated by non-native plants. The small amount of permanent impacts to this land cover would just be associated with the structure footprint.

It is anticipated that temporary impacts will occur during construction and will include ground disturbance and compaction of vegetation by construction equipment around each structure and along the access routes. Temporary and permanent impacts on agricultural vegetation are provided in Table 30.

In some areas, wetlands may share characteristics with prairie areas, but in many cases are degraded or dominated by non-native vegetation. Impacts on wetland resources are discussed in Section 5.13.

Tree rows and planted windbreaks and will be cleared of tall, woody vegetation within the North Dakota Facility ROW and therefore, permanently impacted (see Table 30). Consideration was given to limiting tree clearing to a narrower area; however, this would not meet the operation and safety standards under NERC for a 345-kV transmission line. The digitized data do not indicate that significant shrublands occur along the North Dakota Facility ROW. The Applicants will inventory trees and shrubs prior to clearing.

If there are shrubs, they would be cleared during construction. However, shrubs may be allowed regrow to the extent that such growth complies with NERC standards and does not interfere with operation and maintenance of the North Dakota Facility, as agreed to with the landowner. Therefore, shrub impacts, if any, may be temporary.

Impaired and Vulnerable Terrestrial Communities

No Impaired and Vulnerable Terrestrial communities occur within the North Dakota Facility ROW; therefore, no impacts are anticipated.

Conservation Focus Areas

No Conservation Focus Areas occur within the North Dakota Facility ROW; therefore, no impacts are anticipated.

5.14.3 Mitigation

North Dakota Corridor

The Applicants will work closely with landowners to minimize impacts on agricultural vegetation associated with structure placement. Final structure locations will be designed to minimize impacts on agricultural production where feasible.

In pasture, impacts on native vegetation will be minimized, when possible, by spanning habitats of higher quality. Where spanning is not feasible, impacts on native vegetation will be mitigated by reestablishing similar native species once construction is complete. Areas disturbed during construction will be reseeded or otherwise stabilized per applicable permit requirements.

Structure placement will be selected to avoid placement in wetland areas when possible. Wetlands are discussed in Section 5.13.

Impacts on wooded vegetation will occur to planted windbreaks and shrubs within the North Dakota Facility ROW. The Applicants will mitigate tree and shrub impacts in accordance with Commission requirements.

Impaired and Vulnerable Terrestrial Communities

No impacts on Impaired and Vulnerable Terrestrial communities are anticipated; therefore, no mitigation is proposed.

Conservation Focus Areas

No impacts on Conservation Focus Areas are anticipated; therefore, no mitigation is proposed.

North Dakota Route

The same discussion in Section 5.14.3, North Dakota Corridor, applies for mitigation associated with the North Dakota Route.

5.15 WILDLIFE

5.15.1 Description of Resources

General Wildlife

In general, wildlife species occurring within in the North Dakota Facility area are typical of agricultural landscapes, pasture, and wetland habitats. Mammals common in these habitat types include raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), muskrat (*Ondatra zibethicus*), red fox (*Vulpes vulpes*), black-tailed jackrabbit (*Lepus townsendii*), white-tailed deer (*Odocoileus virginianus*), and coyote (*Canis latrans*). The avian community includes songbirds, such as red-winged black bird (*Agelaius phoeniceus*), horned-lark (*Eremophila alpestris*), common grackle (*Quiscalus quiscula*) and American crow (*Corvus brachyrhynchos*), waterfowl such as mallard (*Anas platyrhynchos*) and blue-winged teal (*Anas discors*), raptors such as red-tailed hawk (*Buteo jamaicensis*), owls such as great-horned owl (*Bubo virginianus*), shorebirds such as killdeer (*Charadrius vociferous*) and Virginia rail (*Rallus limicola*) and game birds such as ring-necked pheasant (*Phasianus colchinus*). Reptiles found in the North Dakota Corridor include northern leopard frog (*Rana pipiens*), tiger salamander (*Ambystoma tirgrimun*), western painted turtle (*Chrysemys picta belli*), American toad (*Bufo americanus*), and common garter snake (*Thamnophis sirtalis*) (Hoberg and Gause 1992).

5.15.2 Impacts

North Dakota Corridor

Both direct and indirect effects could occur on wildlife species. Potential direct effects include:

- Direct habitat modification and reduction associated with construction clearing or grading and placement of the transmission line and substation
- Increase of sediment and fugitive dust in the North Dakota Corridor through soil disturbance during construction
- Potential for disturbance or displacement of ground nesting birds, or removal or disturbance of nests during construction. A more detailed discussion of eagle stick nests in included in Section 5.16
- Exposure to contaminants from fuels and chemicals that may be spilled during construction and operation
- Injury or mortality associated with collisions with construction equipment and/or overhead transmission lines

Potential indirect effects include:

- Habitat disturbances that result in habitat fragmentation or species crowding in adjacent habitat, interfering with behavior or migration
- Introduction of invasive vegetation that could change on-site habitat conditions
- Interference with behavior or migration from noise created by construction and human activity

Raptors, waterfowl, and other bird species may be affected by the construction and placement of the transmission line and associated facilities. Avian collisions are a possibility after the completion of the transmission line. This concern was raised by the North Dakota USFWS Ecological Services Office during consultations, because the North Dakota Route passes over a

number of wetland complexes. Waterfowl may be susceptible to transmission line collision, especially if the line is placed between agricultural fields that serve as feeding areas, or between wetlands and open water, which serve as resting areas. The transmission line shield wire is the part of the structure that is most likely to cause avian collision. USFWS recommends following guidelines included in APLICs *Reducing Avian Collisions with Power Lines: The State of the Art in 2012*.

Electrocution of large birds, such as raptors, is a concern generally associated with smaller distribution lines. Electrocution occurs when birds with large wingspans come in contact with either two conductors or a conductor and a grounding device. USFWS recommends incorporating guidelines included in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* to reduce or eliminate the potential for electrocution. The Applicants' transmission line design standards provide adequate spacing to minimize the risk of raptor electrocution. Therefore, avian electrocution is not a significant concern for the North Dakota Facility.

Raptor Nests

Several species of raptor can occur in the area around the North Dakota Facility. These species construct or utilize stick nests and include the bald eagle (*Haliaeetus leucocephalus*), red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), osprey (*Pandion haliaetus*), and great-horned owl (*Bubo virginianus*). Suitable nest trees typically occur along major river courses, lakes, wetland complexes, tree rows (shelter belts), and farm copses.

Based on information and data provided by USFWS and NDPR, no raptor stick nests are documented within the North Dakota Corridor at the time this document was developed; therefore, impacts on these resources are not anticipated. Stick nests may be established in the North Dakota Corridor during subsequent breeding seasons. If this occurs, impacts on raptor stick nests will be limited to habitat loss and removal of inactive nests prior to tree clearing. Trees in planted windbreaks will be removed from the North Dakota Facility ROW. This tree clearing is anticipated to occur outside of the breeding season.

A detailed discussion of bald eagle stick nests is included in Section 5.16.

Sharp-tailed Grouse Leks

While suitable sharp-tailed grouse habitat is present in the North Dakota Facility area, no sharp-tailed grouse leks were located within the North Dakota Corridor during field surveys that were conducted April 29 to May 2, 2013.

North Dakota Route

The same discussion in Section 5.15.2, North Dakota Corridor, applies for impacts associated with the North Dakota Route.

5.15.3 Mitigation

North Dakota Corridor

To discourage active nesting within temporary or permanent disturbance areas associated with the construction, tree removal, ground clearing, or mowing will occur in late fall or early spring (before the bird breeding season) to discourage tree and ground nesting. If areas are not cleared

in early spring before the breeding season, a survey of the construction areas for active nests of protected species will be conducted and if an active nest is found a construction buffer around the nest will be established. Restricting construction activities during this time frame (May to August) will allow nesting birds to breed without direct disturbance. In areas where construction activity disturbs non-cropland vegetative cover, the Applicant will reseed or otherwise stabilize these areas to a similar condition as it was before construction per applicable permit requirements.

In consultation with USFWS, the Applicants will develop a line marking plan to reduce the potential for bird strikes with the transmission line consistent with recommendations in *Avian Collisions with Power Lines: The State of the Art in 2012***.** In addition, the transmission line will be designed following APLIC's *Suggested Practices for Avian Protection On Power Lines: State of the Art in 2006* to minimize the potential for electrocution.

Wetland mitigation will occur as required by applicable permits. Temporary impacts will be minimized by utilizing erosion and sedimentation control BMPs that minimize or prevent sediment from reaching adjacent waterways and protect topsoil.

Prior to construction, the Applicants will conduct lek surveys for new sites. If during surveys, a lek site is found that is active and within 1 mile of the North Dakota Facility, construction activity timing will be restricted in that specific location, so that construction activities do not occur between sunrise and 3 hours after sunrise during the active lekking season (March 1 through June 30), to avoid disturbance to the birds attending the lek.

Other recommendations from USFWS to avoid impacts on, or restore terrestrial habitat, include no alterations to stream channels or drainage patterns, avoiding placement of fill in wetlands, replacing unavoidable loss to wetlands that are functionally equivalent , installation and maintenance of appropriate erosion control measures and replanting disturbed areas. The North Dakota Facility will attempt to span wetlands and surface waters, thereby minimizing impacts. Most likely, impacts on wetlands will occur and the Applicants will mitigate in accordance with USFWS authorization and/or USACE permit conditions. In addition, the Applicants will follow the conditions outlined by the NDPDES permit regarding erosion control measures.

Appropriate erosion and sediment control measures will be installed and maintained to reduce sediment transport to adjacent wetlands, streams, and river channels.

If impacted, in accordance with the Commission's requirements, trees will be replaced at a 2:1 ratio outside the proposed ROW, subject to landowner approval.

Should vehicle fueling be required within the North Dakota Facility ROW, BMPs will be employed so that equipment fueling and lubricating protect waterways.

The North Dakota Facility is not expected to result in the listing of or jeopardizing the continued existence of any wildlife species, and will not violate any wildlife protection law, including the Migratory Bird Treaty Act (MBTA).

North Dakota Route

The same discussion in Section 5.15.3, North Dakota Corridor, applies for mitigation associated with the North Dakota Route.

5.16 RARE AND UNIQUE NATURAL RESOURCES

5.16.1 Description of Resources

Federally Threatened and Endangered Species

USFWS was contacted to review the North Dakota Facility for threatened and endangered species and unique habitats. The Endangered Species Act (ESA) of 1973, as amended, provides for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend. Section 7 of the ESA requires federal agencies to ensure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of listed species, or to modify their critical habitat. USFWS and USACE will conduct their own Section 7 consultation as a part of issuing their permits or approvals.

Federally threatened species are those species likely to become endangered within the foreseeable future throughout all or a significant portion of their range. Federally endangered species are those species already in danger of extinction throughout all or a significant portion of their range. Designated critical habitat is a specific geographic area(s) that is essential for the conservation of a threatened or endangered species and that may require special management and protection. No designated critical habitat is located in Dickey County, North Dakota.

Federal candidate species are those species that USFWS has concluded should be proposed for addition to the federal endangered and threatened species list based on scientific study that indicate biological vulnerabilities. However, the ESA does not provide legal protection for candidate species.

USFWS reports that within Dickey County there is one federally listed species (whooping crane, *Grus americana*) and one candidate species (Sprague's pipit, *Anthus spragueii*). No records of whooping cranes have been documented within 5 miles of the North Dakota Corridor (Cooperative Whooping Crane Tracking Project 2007), and the North Dakota Facility is located beyond the eastern edge of the 95 percent migration corridor. Table 31 provides a summary of these threatened and endangered species and indicates whether suitable habitat may be present within the North Dakota Corridor and the North Dakota Facility ROW. The bald eagle (*Haliaeetus leucocephalus*) has been delisted from the ESA. However, the bald eagle is also addressed as it is still protected by other federal laws including the Bald and Golden Eagle Protection Act (Eagle Act) and the MBTA.

Table 31: Federally Listed Threatened and Endangered Species in Dickey County, North Dakota

Species	Species Type	USFWS Designation	Preferred Habitat	Habitat Present in Corridor	Habitat Present in ROW
Whooping crane (*Grus americana*)	Bird	Endangered	Whooping cranes migrate through North Dakota during spring and fall. This species prefers to roost in wetlands and stock dams with good visibility (minimal tall vegetation around wetland fringe). Foraging often occurs in adjacent crop fields.	Yes, shallow wetlands	Yes, shallow wetlands
Sprague's pipit (*Anthus spragueii*)	Bird	Candidate	Sprague's pipits utilize native grasslands between 20 and 145 hectares in size	No	No
Bald eagle (*Haliaeetus leucocephalus*)	Bird	Delisted	Bald eagles generally nest near coastlines, rivers, large lakes, or streams that support an adequate food supply. Roost sites are usually in mature trees where the eagles are somewhat sheltered from the wind and weather.	No nesting or roosting habitat	No nesting or roosting habitat

Source: USFWS, 2012

North Dakota Species of Concern

NDGF and NDPR were contacted to review the North Dakota Facility for threatened and endangered species and unique habitats. The response received from NDGF expressed concern over possible disturbance of native prairie and wetland areas during construction.

The State of North Dakota maintains a list of 100 species of conservation concern. Several of these species have been documented near the North Dakota Facility area as mentioned in NDPR's response. NDPR provided a response and information from the NHI, which NDPR maintains as the most complete source of data on North Dakota's rare, endangered, or otherwise significant plant and animal species, plant communities, and other natural features. The NHI provides a system for identifying and prioritizing ecologically significant natural features in the state. Species of Concern include those plant and animal species that have populations considered at risk in the state of North Dakota. However, North Dakota Species of Concern do not receive legal protection under state and/or federal endangered species acts (Dirk 2012). Table 32 lists the species of concern found in Dickey County, North Dakota.

According to the NHI data, no records of Species of Concern occur within 1 mile of the North Dakota Corridor (Dirk 2012).

Table 32: Species of Concern Occurring in Dickey County, North Dakota

Species	Species Type	Preferred Habitat	Habitat Present in Corridor	Habitat Present in Route
Yellow-billed cuckoo (*Coccyzus americanus*)	Bird	Second growth, thicketed streamsides	Yes	Yes
Swainson's hawk (*Buteo swainsoni*)	Bird	Native prairie or croplands that include thickets of natural tree growth or brush margins of native forested tracts	Yes	Yes
Red-bellied woodpecker (*Melanerpes carolinus*)	Bird	Woods, edges, farms, and swamps	Yes	Yes
Swamp sparrow (*Melospiza georgiana*)	Bird	Marshes, particularly those that contain stands of cattail or *Phragmites* and scattered shrubs	Yes	Yes
Northern mockingbird (*Mimus polyglottos*)	Bird	Parklands, cultivated lands, and second growth habitats	Yes	Yes
Plains pocket mouse (*Perognathus flavescens*)	Mammal	Sandy soils with grass and sagebrush cover	No	No
Regal fritillary (*Speyeria idalia*)	Butterfly	Tallgrass prairies	No	No

Source: Dirk 2012

Eagle Stick Nests

The Eagle Act prohibits the take of bald and golden eagles. The Eagle Act defines take to include molestation or disturbance of nests. Additionally, the MBTA prohibits the take of migratory bird nests, including eagle nests and other raptor species known to construct or use stick nests. Bald eagles have been documented breeding in Dickey County, North Dakota (North Dakota Game & Fish 2013), but none of the NDGF-documented nests occur within 5 miles of the North Dakota Facility Corridor. The Applicants conducted an eagle nest survey for the Project and found one active bald eagle nest located approximately 1.6 miles southeast of the North Dakota Facility ROW in northern Brown County, South Dakota, along the Maple River.

5.16.2 Impacts

North Dakota Corridor

Impacts that will be associated with development of a transmission facility within the North Dakota Corridor are discussed in Section 5.16.2, North Dakota Route.

North Dakota Route

Due to the transmission line's linear nature, impacts on potential terrestrial species habitat will be limited to the ROW because of vegetation clearing, the substation site, and structure locations. Long-term habitat impacts will occur at permanent structure locations and at the substation. Existing, adjacent habitat will be left undisturbed.

Whooping Crane

No records of whooping cranes have been documented within 5 miles of the North Dakota Corridor (Cooperative Whooping Crane Tracking Project 2007).

North Dakota has experienced conversion of native prairie and wetlands into agricultural land use beginning with 19th century settlement, negatively impacting the quality and quantity of migration stopover habitat for numerous migratory birds. Construction of utility lines and roads, and the increased urban and industrial developments with the associated human disturbance near the North Dakota Route have also negatively affected whooping cranes and migration habitat.

Potential direct effects on whooping cranes include collisions with transmission lines. According to USFWS, collisions with power lines are the greatest known source of mortality for fledged whooping cranes. Specifically, Stehn and Wassenich (2007) stated that shield wires are the wires most often struck by birds in flight. The North Dakota Corridor is located outside the 95th percentile band of the whooping crane migration corridor. Migrating cranes are most vulnerable to collisions with structures in the early morning or late evening when light levels are diminished, as they fly at very low altitudes between roost and foraging sites, or when flying at low altitude when starting or ending a migration flight, especially when thermal currents are minimal.

Short-term impacts could occur in the event that a whooping crane is displaced from available stopover habitat during construction.

The primary indirect effect is the potential for complete avoidance by whooping cranes of the stopover habitat located near the proposed transmission line. Loss of migration habitat is a growing concern regarding the Aransas-Wood Buffalo population. Searching for suitable stopover habitat may cause increased exposure to hazards as birds are required to fly low for longer distances. The increased disturbance could also place the cranes at greater risk of exposure to other hazards encountered during migration such as structures, hunters, disease, and predation.

Sprague's Pipit

Overall, no impacts on Sprague's pipit are expected, or if they occur they would be negligible.

Most of the land cover within the North Dakota Facility ROW is actively cultivated land or small parcels of pasture land, and therefore the potential for suitable habitat is low. No occurrences of Sprague's pipit have been documented within 1 mile of the North Dakota Facility ROW, and the July 2013 response from USFWS did not list Sprague's pipit as a species that may be affected by the Project. However, Sprague's pipit may be present during migration.

Direct effects to Sprague's pipit would occur if transmission line structures or other infrastructure eliminates native prairie habitat or where this habitat type is reduced. However, habitat fragmentation has already eliminated the potential for breeding Sprague's pipits within the North Dakota Facility ROW. No permanent travel paths are proposed for the North Dakota Facility. Most of the North Dakota Facility occurs on disturbed (cultivated) lands.

Indirect effects would occur if existing native prairie habitats were degraded by the introduction of non-native or invasive species that could degrade or destroy these habitats over time.

However, the North Dakota Facility ROW does not cross any block of native grassland of sufficient size to be Sprague's pipit habitat.

North Dakota Species of Concern

Impacts on North Dakota Species of Concern would be limited to potential habitat loss associated with pole placement or tree clearing and would be similar to the impacts on wildlife, discussed in Section 5.15. Avian species may be susceptible to collision with the static overhead wire; however, North Dakota Avian Species of Concern occurring in Dickey County do not exhibit traits or behavior (such as large bodied species or those which engage in aerial courtship displays), which would increase their risk of collision (APLIC 2012). Swainson's hawks may be more susceptible to collision if engaged in distracting activities such as territory defense or pursuing prey, but are otherwise capable fliers with good vision and typically have the ability to avoid collision. A more detailed discussion of avian collision is included in Section 5.15.

Eagle Stick Nests

To consider impacts on nesting eagles, a stick nest survey was conducted between April 29 and May 2, 2013 (the redacted report can be found in Appendix E). No eagle stick nests were located within the North Dakota Corridor during the survey; therefore, no impacts are anticipated.

5.16.3 Mitigation

North Dakota Corridor

In general mitigation for impacts on rare and unique resources will be in the form of avoidance or by scheduling construction activities outside of the breeding season and by placing line marking devices in areas of potentially suitable avian habitat.

North Dakota Route

Specific wildlife mitigation measures associated with the North Dakota Route are included in Section 5.15.3 and include the following:

Whooping Crane

Although the potential for individual whooping crane occurrences in the area around the North Dakota Facility is low, the Applicants will develop a line marking plan to reduce the potential for bird strikes with the transmission line. In addition, the transmission line will be designed following APLIC's *Suggested Practices for Avian Protection On Power Lines: State of the Art in 2006*. Line marking plans will be based upon the February 2012 USFWS Region 6 guidelines and APLIC guidelines included in *Reducing Avian Collisions with Power Lines: State of the Art in 2012*.

Sprague's Pipit

Direct impacts on Sprague's pipit are not anticipated because potentially suitable breeding habitat is not present within the North Dakota Facility, therefore no mitigation is anticipated.

North Dakota Species of Concern

Direct impacts on North Dakota Species of Concern are not anticipated due to the lack of habitat or because surveys would occur in areas of suitable habitat prior to construction activities during the breeding season with construction buffers placed around any documented nests, or construction, in the area of the identified species, would be scheduled outside of the breeding

season. As described above, a line marking plan will be developed to consider impacts on sensitive avian species and reduce the potential for direct collision.

Eagle Stick Nests

To minimize impacts on breeding eagles, subsequent field surveys will occur during the spring leaf-out period (March 1 to May 15) to locate any eagle nests that may have been built after the 2013 field surveys.

If an active eagle nest is located in the North Dakota Corridor, the Applicants will follow USFWS guidelines to reduce impacts on breeding eagles.

5.17 SUMMARY OF ROUTE IMPACTS

Table 33 summarizes temporary and permanent impacts on the resources discussed in Section 5. Table 34 summarizes the appropriate mitigation for resources that will be impacted as a result of North Dakota Facility construction.

Table 33: Summary of North Dakota Facility ROW and Associated Impacts

	Resource	Impact	
North Dakota Facility	Total Length (miles)	9.3	
	Total ROW Acres	168.8	
Impact Acres	Acres of Temporary Impact (structures, substation, temporary travel path impacts, laydown area, wire stringing area)	113.3	
	Acres of Permanent Impact (substation and structure impacts, including Restricted Tillage Area)	11.6	
Homes	Count within 500 feet of the Transmission Facility	0	
Wetlands	Acres of Desktop and Field Reviewed Wetlands in the North Dakota Facility ROW	27.5	
	Wetland Impact (using digitized wetlands)	Temporary	Permanent
		11.0 ac	2.9 ac
Land Cover	Impact Acres	Temporary	Permanent
	Cultivated	54.4	8.7
	Developed	0	0
	Pasture/Hay	6.0	0.01
	Open Space (Road ROW)	0.5	0
	Trees (tree rows and windbreaks)	NA	2.5
	Wetland	11.0	2.9
	Laydown and Wire Stringing Areas	40.2	0
Resource Areas	Managed Resource Areas affected by the North Dakota Facility	0	
Cultural	Archaeological Resources	0 sites in North Dakota Facility ROW One site within North Dakota Corridor and one site lead within North Dakota Corridor No impacts anticipated	
	Architectural Properties in Architectural APE	0 Properties No impacts anticipated	
Species	Federally Listed Species within ROW	0	
	Federally Listed Species within 1 mile	0	
	Sensitive Species within ROW (nests)	0	

	Resource	Impact
	Sensitive Species within 1 mile (including NHI-listed species, leks, nests, and bald eagles)	No sensitive species are located within one mile of the North Dakota Facility ROW. No impacts anticipated
Infrastructure	Center Pivot Irrigation systems within ROW	0
	Communication Towers within ROW	0
	Airports within 1 Mile of Route Centerline	0

Table 34: Mitigation Summary

Resource	Impact	Mitigation
Demographics	Socioeconomic impacts are primarily positive due to increased expenditures during construction and the long term benefits of an increased tax base of the county due to transmission line tax. A nominal amount of land will be permanently removed from production due to the construction of the North Dakota Facility. The North Dakota Facility is not anticipated to result in an economic or social hardship to minority or low-income populations.	The North Dakota Facility is not expected to have negative economic impacts on local and regional economies. As such, no mitigation measures are proposed to address the socioeconomic impacts. The payments of taxes to the state, then allocated to Dickey County, will have a positive impact. Easement payments to landowners will compensate landowners for the utility easement on their property and crop damage.
Land Use	Approximately 8.7 acres of agricultural cropland (includes Restricted Tillage Area) will be permanently impacted due to the construction of the transmission line. The existing land use is primarily agricultural and would remain in agricultural use since the land under or adjacent to the line can still be used by the landowner. There are no occupied homes within 500 feet of the transmission line.	The Applicants are working with landowners and regulatory agencies to minimize impacts of the North Dakota Facility. To minimize impacts to landowners, the Applicants have agreed to the following mitigation measures: -The North Dakota Route, and other disturbed areas will be determined with landowner input, to the extent practicable. -Use of single-pole structures has minimized the area of disturbance -Construction activities will be limited to the ROW, unless permission to access adjacent property is obtained from the landowner(s). - Disturbed areas will be returned as near as possible to pre-construction condition and non-agricultural areas will be reseeded with native vegetation based on site characteristics. -Landowner compensation will be established by individual easements. -Landowners will be compensated for crop damage caused by construction or operation and maintenance activities. -The Applicants routed the North Dakota Facility to be at least 500 feet from all occupied homes.

Resource	Impact	Mitigation
Public Services	A minor negative effect on emergency public services during construction within the North Dakota Corridor, due to construction activities that may temporarily disrupt roadways and access.	Construction and operation of the Project will be in accordance with all associated federal and state permits and laws, as well as industry construction and operation standards. Due to the minor impacts expected on the existing infrastructure during Project construction and operation, extensive mitigation measures are not anticipated. The Project will have a positive effect on public services by providing improved reliability and capacity to meet the growing demands for electrical service in the vicinity of the Project.
Human Health and Safety	The Project will not cause interference with implantable medical devices. No EMF-related impacts to humans or animals are anticipated. There are no anticipated induced voltage or stray voltage impacts expected as a result of the construction or operation of the Project. No impacts to air quality due to the operation of the transmission line are anticipated.	The Applicants do not anticipate any effects to human health or safety; thus it is not anticipated that any mitigation will be necessary. BMPs will be used to control fugitive dust during construction; this could include use of water or other dust minimization methods, per NDPDES permit. Dust suppression will be required of the construction contractors who will access and maintain the North Dakota Facility ROW during construction, as necessary.
Noise	Homes near the North Dakota Facility may experience short-term elevated noise levels and increased vehicle traffic during construction. However, no noise impacts are anticipated during North Dakota Facility operation. No impacts to noise-sensitive land uses are anticipated.	No long-term noise impacts are anticipated, thus, no mitigation will be necessary. Construction activities will generate noise that is short-term and intermittent. Noise impacts associated with construction will be mitigated in noise-sensitive areas by limiting the hours of work to 7 a.m. to 9 p.m.
Visual	The transmission line will be evident to individuals traveling on adjacent roads as well as residences and landowners that live in close proximity to the transmission line. The new Ellendale 345-kV Substation will be located across the street from an existing substation and therefore no new types of visual impacts would be introduced and the incremental impact to the visual resources of the area immediately surrounding the substation are expected to be minimal.	Mitigation includes enhancing positive effects as well as minimizing or eliminating negative effects. Potential mitigation measures include: -Where feasible, the location of structures and other disturbed areas will be determined by considering input from landowners or land management agencies to minimize visual impacts. -Structure types (designs) will be uniform to the extent practical and the Applicants propose to use single-pole steel structures, which are preferred by the surrounding landowners. -Construction and operation will be conducted to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings. During operation, clearing of trees and shrubs will be conducted only as necessary per North American Electric Reliability Corporation (NERC) standards and to allow safe operation and inspection of the North Dakota Facility.

Resource	Impact	Mitigation
Cultural and Archaeological	The Class I Literature Search identified no previously recorded archaeological sites and no previously recorded architectural properties within the North Dakota Facility ROW. Potential effects to archaeological sites and miscellaneous files (suspected sites that have not been formally recorded) may occur within the North Dakota Corridor as a result of direct construction impacts.	Following the completion of a Class III survey, the Applicants will seek to avoid impacts to NRHP-eligible cultural resources and properties of traditional cultural importance. Avoidance measures may include placing poles so that sites are avoided by spanning, the use of fencing for site protection during construction, and burial of the resource under a protective buffer. In addition, potential visual impacts to architectural properties or traditional cultural properties will be considered. Mitigation measures may include vegetative screening, additional documentation and research, or other mitigation measures deemed appropriate through SHPO and THPO consultation. The Applicants will consult with SHPO as the mitigation measures are further developed. If avoidance of a NRHP-listed or eligible archaeological site or architectural property is not feasible, the Applicants will consult further with SHPO to determine an appropriate course of action prior to plan implementation.
Recreation Resources	Impacts to recreational resources are primarily visual, and limited to individuals using the resources. The North Dakota Route does not cross any known public-access recreational resource.	The Applicants will generally route the transmission line along field breaks and section lines and avoid state and federal managed lands. Visual impacts will be minimized by placement of structures away from these features to the extent possible. Since it is not anticipated that any recreational resources will be removed from service by implementation of the North Dakota Facility, no adjacent land will need to be converted or dedicated to recreational use or wildlife management. No mitigation is anticipated to be necessary.
Land Based Economies	The permanent agricultural cropland that will be converted due to the North Dakota Facility will be approximately 8.7 acres (includes Restricted Tillage Area). The permanent impacts associated with each structure in non-cropland were calculated by assuming a five-foot radius (approximately 78.5 square feet) of permanent impact. The permanent impacts to crop production associated with each structure in cropland were calculated by assuming a ten-foot radius (approximately 314 square feet), which includes an additional five-foot radius (total of ten foot radius) around the structure foundation since landowners may not wish to cultivate the land any closer than five feet from the structure base.	The Applicants will work with landowners to minimize impacts to all farming and grazing operations along the North Dakota Facility Area disturbed during construction will be repaired and restored to preconstruction contours to the extent practicable so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural re-vegetation, provide for proper drainage, and prevent erosion. Construction laydown areas and temporary travel paths will be disked as necessary to relieve compaction caused by construction or per the landowner agreement.

Resource	Impact	Mitigation
Soils	Approximately 113.3 acres of temporary impacts and 11.4 acres of permanent impacts are anticipated.	A NDPDES Permit will be applied for and a SWPPP will be developed that includes appropriate BMPs for construction. All disturbed areas will be re-vegetated or otherwise stabilized once construction is complete. Only land needed for the transmission line structures will be permanently impacted.
Geologic and Groundwater Resources	Impacts to groundwater resources will be related to dewatering activities during construction. Structure foundations might encounter shallow groundwater, but would not affect the quantity or quality of groundwater available. The removal of soil and groundwater at each structure location is not anticipated to impact local groundwater flow patterns due to the small-scale of the removal.	Impacts can be mitigated by minimizing the depth and diameter of structure foundations during the design phase, stopping work immediately if contaminated soils are discovered, development of a Spill Pollution and Prevention Plan, developing controlled laydown areas for refueling, hazardous material loading/unloading, and specific equipment inspection and maintenance to minimize any potential for hazardous material spillage or leakage.
Surface Water and Floodplain Resources	No direct impacts are anticipated to rivers, streams, lakes or mapped floodplains. Indirect impacts to surface water could occur if sediment reaches these resources during construction.	To avoid and minimize indirect impacts during construction, the Applicants will follow applicable permit conditions as appropriate and use BMPs to reduce impacts during construction. Should vehicle fueling be required within the North Dakota Facility ROW, BMPs will be employed so that equipment fueling and lubricating are isolated from waterways.
Wetlands	Substation and preliminary structure locations indicate up to 2.9 acres of permanent wetland impacts.	The Applicants will work with the USACE and USFWS to initiate the permitting process and to identify appropriate mitigation, if necessary. In addition, the Applicants will use BMPs during construction and operation of the transmission line to protect topsoil and adjacent wetland resources and to minimize soil erosion.
Vegetation	According to the digitized land cover data, a total of approximately 8.7 acres (including Restricted Tillage Area) of cropland, 0.01 acres of pasture, and up to 2.9 acres of wetlands will be permanently impacted by construction of the North Dakota Facility.	The Applicants will use BMPs during construction and operation to minimize impacts. Temporarily disturbed areas will be reseeded and restoration activities will be completed.
Wildlife	Impacts to wildlife populations are expected to be minimal. The potential for avian collisions with the North Dakota Facility exists, but is anticipated to be relatively small.	A variety of mitigation measures would be implemented, as discussed in Section 5.15.3. Some examples of wildlife mitigation measures include continued consultation with USFWS, designing the transmission line following APLIC standards, conducting preconstruction wetland and woodland surveys, staging construction in grasslands outside of the breeding bird nesting season if possible, and implementing erosion control measures.

Resource	Impact	Mitigation
Rare and Unique Natural Resources	Impacts to rare and unique natural resources are not anticipated. No eagle nests were documented within the North Dakota Corridor or ROW. Whooping cranes may migrate through the North Dakota Facility area and use a wetland as stopover habitat, but the potential for direct impacts are relatively low. Potential for suitable Sprague's pipit habitat (large contiguous grasslands) is low within the North Dakota Facility area so direct impacts are not anticipated. Indirect impacts to these species would be relatively minor and could include temporary disturbance during construction, and/or displacement to adjacent similar habitat during operation.	To mitigate for the potential for whooping crane collisions, the placement of line marking devices in the vicinity of potentially suitable migratory stopover habitat will be considered. If large areas of suitable Sprague's pipit habitat are crossed (contiguous grasslands) the Applicants will consider line marking. If an eagle nest is documented within the ROW prior to construction, the Applicants will coordinate with the USFWS.

6.0 PUBLIC COORDINATION

The public and agency coordination efforts began in July 2012 and were designed to assist the Applicants with identifying the best possible route for the North Dakota Facility and South Dakota Facility.

The Applicants identified the importance of keeping stakeholders and the public informed about the North Dakota Facility status throughout the route development process. A public outreach program was developed and implemented to provide education and comment opportunities for landowners, federal and state agencies, local government units, and non-government organizations.

The Applicants engaged stakeholders in the route development process through a variety of tools including direct communication with landowners, a Project-specific website (www.bssetransmissionline.com), a Project-specific toll-free information line (888-283-4678), and a Project-specific email address (info@bssetransmissionline.com).

6.1 STUDY AREA OUTREACH

The Applicants identified an initial study area based on the Project need and endpoints. At the early planning stages of the Project, the Applicants were interested in feedback from federal and state agencies regarding routing constraints and opportunities, significant natural and cultural features, permitting requirements, river crossing opportunities, and other issues. The Applicants sent a Project notification letter to federal and state agencies; state, county, and local representatives; and non-government organizations within the study area. To understand the study area, the Applicants met with permitting agencies, held interagency meetings with state and federal representatives in North Dakota, and met with the county planners in the North Dakota counties within the study area. Input and feedback from these meetings was reviewed and considered as the study corridors were identified.

6.2 STUDY CORRIDOR OUTREACH

The Applicants hosted corridor open house meetings throughout the study corridors to gather input on the study corridors to help refine them into preliminary routes. Six open house meetings were scheduled from October 15 through October 18, 2012, in the following locations: Ellendale, North Dakota; Wheaton, Minnesota; Webster, South Dakota; Aberdeen, South Dakota; Britton, South Dakota; and Milbank, South Dakota. Meeting locations were selected based on proximity to the study corridors and to minimize attendee driving distance. Out of the 8,582 corridor open house notification postcards mailed, the Project team met a total of 206 attendees and gathered important feedback during the open house meetings. There were 16 attendees at the meeting in Ellendale, North Dakota.

To continue the outreach, the Applicants mailed Issue 1 of the *Power Delivered* Project Newsletters to all federal, state, and local agencies; local government units; elected officials; non-government organizations; and interested stakeholders who participated in open house meetings, submitted a comment, or requested to be on the Project mailing list.

6.3 PRELIMINARY ROUTES OUTREACH

After preliminary routes were selected, the Applicants hosted routing open house meetings to gather input on the preliminary routes. Five open house meetings were scheduled from February 25 through February 27, 2013, in the following locations: Ellendale, North Dakota; Groton, South Dakota; Milbank, South Dakota; Britton, South Dakota; and Webster, South Dakota. Meeting locations were selected based on proximity to the preliminary routes and to minimize attendee driving distance. Out of the 5,533 preliminary route notification postcards mailed, the Project team met a total of 336 attendees and gathered important feedback during the open house meetings. There were 54 attendees at the meeting in Ellendale, North Dakota. The Applicants gave a formal presentation during the routing open house meetings with a question and answer session afterwards.

All comments collected were reviewed and considered by the Applicants' routing team as the preferred route was identified.

6.4 PREFERRED ROUTE OUTREACH

Prior to this Route Application submittal, the Applicants sought input on the identified preferred route. A preferred route outreach was developed to contact all necessary stakeholders that may be impacted by the preferred route. To communicate the identified preferred route, the Applicants mailed letters and a map to landowners within 500 feet of the preferred route. In addition, the preferred route information was posted on the Project's website and published in the *Power Delivered* Project Newsletter. Issue 2 of the *Power Delivered* Project Newsletter was sent out to landowners within 0.5 mile of the preliminary routes, persons on the mailing list, state agencies, federal agencies, county officials and staff, township chairs, and tribal representatives. Additionally, Issue 3 of the *Power Delivered* Project Newsletter was sent out in September 2013 to landowners within 0.5 mile of the preferred route, persons on the mailing list, state agencies, federal agencies, county officials and staff, township chairs, and tribal representatives.

Table 35 provides a general overview of the public involvement efforts undertaken by the Applicants for the Project.

As the Project progresses and moves into construction, the Applicants will continue to notify the public of Project milestones through Project completion.

Table 35: Public & Agency Coordination

Year	Month	Action
2012	July	• Project notification letter mailed to North Dakota and South Dakota state and federal agencies
	August	• Project notification letter mailed to county, state, and local representatives, and non-government organizations in North Dakota and South Dakota • Held meetings with North Dakota and South Dakota county zoning and planning representatives (Spink, Clark, Grant, Day, Hamlin, Codington, Brown, Deuel, Marshall, Roberts, Richland, Dickey, and Sargent counties) • Held two interagency meetings with state and federal agencies for North Dakota and South Dakota

Year	Month	Action
2012	September	• Project website and toll-free Project information line made available to the public (www.bssetransmissionline.com and 888-283-4678) • Study corridor notification letter for open house meetings mailed to the public, county, state, and city representatives, and non-government organizations in North Dakota, South Dakota, and Minnesota • Study corridor notification letter for open house meetings mailed to township representatives in North Dakota, South Dakota, and Minnesota
	October	• Meeting with Sisseton Wahpeton Oyate and Standing Rock Sioux Tribal Historic Preservation Offices (THPOs) for Project introduction and study area discussion • Study corridor notification postcard for open house meetings mailed to landowners within the study corridors • Paid advertisements and press releases sent to North Dakota, South Dakota, and Minnesota publications to notify the communities of the study corridor open house meetings • Study corridor public open house meetings (October 15-18, 2012): o Wheaton, Minnesota o Milbank, South Dakota o Webster, South Dakota o Aberdeen, South Dakota o Ellendale, North Dakota o Britton, South Dakota
	November	• *Power Delivered* Project Newsletter (Issue 1) was posted to the website and hard copies were mailed to stakeholders in the Project, open house meeting attendees and those who had commented or signed up for the mailing list
	December	• *Power Delivered* Project Newsletter (Issue 1) from November sent electronically to contact persons above who provided email addresses
2013	January	• Conducted interagency meetings for North Dakota and South Dakota state and federal agencies. Follow-up letter sent to agencies which included the meeting minutes and letter from the Applicants • Hosted an online webinar and conference call with county representatives in North Dakota and South Dakota including Day, Brown, Grant, Dickey, and Marshall counties to describe the routing process and gather input on preliminary routes followed up with meeting minutes and a message from the Applicants

Year	Month	Action
2013	February	• Conference call with North Dakota State Historic Preservation Office (SHPO) to discuss expected cultural resource identification efforts and tribal involvement • Paid advertisements and press releases sent to North Dakota and South Dakota publications to notify the communities of the preliminary route open house meetings • Notification letter for preliminary route open house meetings sent to stakeholders including state, federal, and local agencies, elected officials, and non-governmental organizations (NGOs) • Notification postcards for preliminary route open house meetings sent to landowners within the study corridors of the Project and active participants who attended a meeting or submitted a comment • Routing public open house meetings (February 25-27, 2013): o Groton, South Dakota o Ellendale, North Dakota o Britton, South Dakota o Webster, South Dakota o Milbank, South Dakota
	March	• A thank you postcard was sent to routing open house meeting attendees • Meeting with Sisseton Wahpeton Oyate and Standing Rock Sioux THPOs to discuss preliminary routes
	April	• Additional route segment notification letters were mailed to landowners within the 150-foot-wide right-of-way (ROW) of a new route segment added to the preliminary routes for review
	May	• Preferred route notification mailed to federal and state agencies including a map of the preferred route • Preferred route notification mailed to county officials and staff • Preferred route notification mailed to township chairs • Preferred route notification mailed to tribal representatives • Meeting held with Sisseton Wahpeton Oyate and Standing Rock Sioux THPOs to discuss general cultural resource identification and survey approach • Conference call with SHPO held to discuss cultural survey approach and schedule
	June	• Preferred route notification mailed to landowners within 500 feet of the North Dakota Facility centerline, landowners within the original corridors, and to people on the mailing list at the time of the mailing • Preferred route maps available on Project website • *Power Delivered* Project Newsletter (Issue 2) was posted to the website and hard copies mailed to stakeholders and landowners within a half-mile of the preliminary routes, and to active participants in the Project
	July	• Meeting held with Sisseton Wahpeton Oyate and Standing Rock Sioux THPOs to finalize discussions on the North Dakota Facility and the cultural resources survey approach • Submitted Class I Literature Review report to SHPO and received a response letter
	August	• Started contacting landowners for easement options
	October	• *Power Delivered* Project Newsletter (Issue 3) was posted to the website and hard copies mailed to stakeholders and landowners within a half mile of the preferred route and to active participants in the Project

7.0 IDENTIFICATION OF REQUIRED PERMITS AND APPROVALS

The Applicants are required to obtain approvals from a variety of federal, state, and local agencies prior to constructing the North Dakota Facility. Table 36 identifies permits, approvals, and other project coordination that may be needed with federal and state agencies, tribal governments, and townships. This listing of regulatory requirements is subject to change as development of the North Dakota Facility continues.

Table 36: Potential Required Permits and Approvals

Agency	Type of Permit, Regulatory Compliance, or Coordination	Status*	Need
Federal			
U.S. Fish and Wildlife Service	Section 7 of the Endangered Species Act, Migratory Bird Treaty Act of 1918, and Bald and Golden Eagle Protection Act of 1972	3	Section 7 Consultation under NEPA for USFWS authorization.
	Special Use Permit (SUP), Right of Way Permit, or letter of non-objection	3	If construction in wetlands within wetland easements, then compatibility analysis is required. Authorization needed for temporary and permanent disturbance to wetland subject to a wetland easement.
U.S. Army Corps of Engineers	Section 404 of the Clean Water Act	3	Nationwide Permit 12 required for dredging or fill in jurisdictional waters of the United States for utility line projects.
Federal Aviation Administration	FAA Form 7460-1, Notice of Proposed Construction or Alteration	2	The Federal Aviation Administration (FAA) issues determination that construction of the North Dakota Facility does not constitute a hazard to air navigation.
	FAA Form 7460-2 - Notice of Actual Construction or Alteration	2	Notifies FAA of actual constructed or altered structures.
	FAA Form 7461-1, Notice of Proposed Construction Hazard Determination	2	Notifies FAA of structures that might affect navigable airspace. Form requires proposed markings and lighting. FAA must review possible impacts to air safety and navigation, as well as the potential for adverse effects on radar systems.

Agency	Type of Permit, Regulatory Compliance, or Coordination	Status*	Need
U.S. Environmental Protection Agency	Spill Prevention Control and Countermeasure (SPCC) Plan	3	Required if the substation facility has greater than 1,320 gallons of oil. Current SPCC Plans will be revised as necessary. A copy of the plan will be maintained on file with the substation's owner/operator and will be reviewed by the certifying engineer every five years.
State			
Public Service Commission	Certificate of Public Convenience and Necessity	1	Applied in May 31, 2013 and June 3, 2013
	Waiver of Procedures and Time Schedules	1	Application included herein.
	Certificate of Corridor Compatibility	1	Application included herein.
	Route Permit	1	Application included herein.
Department of Health	Section 401 Water Quality Certification	3	Required for fill in jurisdictional waters of the United States.
	NDPDES Permit: General Construction Storm Water	2	Required for disturbance of over 1 acre of land. Must prepare a SWPPP.
Division of Emergency Management	Emergency Planning and Community Right-to-Know Act (EPCRA) Tier II report	3	Required for owner/operators of facilities containing hazardous materials. A copy of the report must be filed annually by March 1st.
Parks and Recreation Department	Natural Heritage Inventory	1	Compliance with NDCC § 20.1-02-05 – Management programs have been established for protection of threatened and endangered species in North Dakota. North Dakota does not have a list of threatened and endangered species.
State Water Commission – Office of State Engineer	State Sovereign Lands Permit	2	If a project's proposed construction activities could impact an island or bed of a navigable water or stream, a Sovereign Lands Permit must be obtained from the North Dakota State Water Commission, Office of the State Engineer.
	Conditional Water Permit	3	Water appropriation.
State Historical Society	Section 106 of the National Historic Preservation Act Coordination	3	Compliance with NDCC §§ 55-03-01 and 55-03-01.1 and consultation under Section 106 of the NHPA is required for federal permits (USFWS and USACE).
	Permit to Investigate Effects on Cultural Resources	2	Compliance with NDCC Ch 55-03 to assess the potential project effects to cultural resources.

Agency	Type of Permit, Regulatory Compliance, or Coordination	Status*	Need
North Dakota Highway Patrol	Overheight/Overweight Permit	2	Permit required for hauling construction equipment and materials on state highways. Contractors will obtain as necessary.
Department of Transportation	Road Approach/Access Permit	2	Permit required for construction of temporary travel paths from state highways.
	Utility Permit/Risk Management Documents	2	Permit required for utility crossings on state highway ROW.
Local			
Ellendale Township	Building Permit and Township Board Approval	2	Building Permit required for Facility components; Township Board Approval also required for construction of Facility in Ellendale Township.
Van Meter Township	Township Board Approval	2	Township Board Approval required for construction of Facility in Van Meter Township

** Status Explanation:*

1 Applied – decision pending

2 Will apply once Certificate of Corridor Compatibility and Route Permit is received

3 Final layout will determine whether permit/approval is needed, or final layout is needed for permit application

8.0 FACTORS CONSIDERED

Section 49-22-09 of the North Dakota Century Code (within the North Dakota Energy Conversion and Transmission Facility Siting Act) lists 11 factors to guide the Commission in evaluation of the North Dakota Corridor and the North Dakota Route.

8.1 PUBLIC HEALTH AND WELFARE, NATURAL RESOURCES, AND THE ENVIRONMENT

The preceding sections discuss the research and investigations related to the potential effects of the proposed facility on public health and welfare, natural resources, and the environment. The effects and mitigation in relation to the corridor and route are discussed under the impact and mitigation subheadings within Section 5.0. Planning for the North Dakota Facility has taken many public health and welfare, and natural resource considerations into account to develop a preferred corridor and route that minimize potential impacts on human and natural environments. The Applicants took into consideration public, agency, and tribal input and concerns when selecting the route for the North Dakota Facility. The Applicants have identified necessary mitigation strategies and BMPs that will be used during construction to minimize impacts.

8.2 TECHNOLOGIES TO MINIMIZE ADVERSE ENVIRONMENTAL EFFECTS

The Applicants will utilize the most recent technologies that minimize potential impacts on the environment. The transmission facility corridor and route proposed for the North Dakota Facility make use of the most appropriate technologies and construction materials to minimize adverse environmental effects. This is evident in the minimal environmental effects associated with the North Dakota Facility that have been identified in this Application.

8.3 POTENTIAL FOR BENEFICIAL USES OF WASTE ENERGY

The potential for beneficial uses of waste energy is not applicable to the North Dakota Facility.

8.4 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS OF THE NORTH DAKOTA FACILITY

Unavoidable adverse environmental effects include the visual impacts and physical impacts on the land (primarily agricultural land) associated with the North Dakota Facility. The Applicants will implement measures as described in the environmental analysis herein and as identified by regulatory agencies to minimize these unavoidable adverse environmental effects.

8.5 ALTERNATIVES TO THE PROPOSED NORTH DAKOTA CORRIDOR OR NORTH DAKOTA ROUTE

The Applicants initially considered several alternative corridors and routes during the evaluation to identify a North Dakota Corridor and North Dakota Route that best satisfied the requirements prescribed by the Commission, the purpose and need for the North Dakota Facility, and input received during the open houses and from agency responses. Following a

rigorous review of alternative corridors and preliminary routes, along with involvement from the public and Project stakeholders, the Applicants identified the North Dakota Corridor and North Dakota Route proposed in this Application as the preferred corridor and route for implementation. The North Dakota Route presented in this Application minimizes and avoids impacts on the exclusion, avoidance, and selection criteria as defined in Section 3.0 of this Application.

8.6 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF NATURAL RESOURCES FOR THE NORTH DAKOTA CORRIDOR OR NORTH DAKOTA ROUTE

Irreversible and irretrievable natural resource commitments are related to the use of non-renewable resources and the effects that the use of these resources have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action. There are few commitments of resources associated with the North Dakota Facility that are irreversible and irretrievable, but include those resources primarily related to construction. The 8.7 acre impact is conservative because it includes a Restricted Tillage Area around each structure.

Construction resources that will be used to construct the North Dakota Facility include aggregate resources, concrete, and steel. During construction, vehicles will be traveling to and from the site, utilizing hydrocarbon fuels.

8.7 DIRECT AND INDIRECT ECONOMIC IMPACTS OF THE PROPOSED FACILITY

Direct economic impacts of the North Dakota Facility are principally related to the loss of approximately 8.7 acres of cultivated land being removed from production due to the construction of the transmission line and associated facilities. In general, agricultural areas surrounding each structure and beneath the transmission line wires can still be farmed, and landowners will be compensated for the land occupied by the transmission line and associated facilities.

The remaining direct and indirect economic effects are considered to be positive. To the extent that local contractors are used for portions of the North Dakota Facility's construction, total wages and salaries paid to contractors and workers will contribute to the total personal income of the region. Additional personal income will be generated for residents in the county and the state by circulation and re-circulation of dollars paid out by the Applicants as business expenditures and state and local taxes. Expenditures made for equipment, energy, fuel, operating supplies, and other products and services benefit businesses in the state and county.

Long-term beneficial economic effects to the county's tax base will most likely be the result of the construction and operation of the transmission line that will contribute to improving the local economy in this area of North Dakota. The transmission facility will provide greater reliability and stability to the power grid, helping to ensure the smooth and continuous delivery of power to residences and commercial establishments. The development of wind energy

facilities in this region will be important in diversifying and strengthening the economic base of North Dakota. Additional revenues are expected from property taxes.

8.8 EXISTING DEVELOPMENT PLANS OF THE STATE AND LOCAL GOVERNMENT AND OF PRIVATE ENTITIES AT OR IN THE VICINITY OF THE NORTH DAKOTA CORRIDOR AND NORTH DAKOTA ROUTE

No conflicts are anticipated with existing state and local government and private entities' development plans. The Applicants will obtain the necessary permits from local governmental units for the proposed North Dakota Facility if required.

8.9 EFFECT OF ROUTE ON CULTURAL RESOURCES

The Applicants have reviewed cultural resource information on file with SHPO for the North Dakota Corridor and North Dakota Route and prepared the Class I cultural resources inventory based on this data. The Applicants will, as a part of the Class III archaeological resources inventory, update and summarize SHPO data for the North Dakota Corridor and North Dakota Route. A review of 14 previous Class III survey reports and additional records at SHPO identified one previously recorded archaeological site and one previously identified archaeological site lead within 1 mile of the proposed transmission line route (see Appendix D). There are no previously identified cultural resources crossed by the North Dakota Route.

Following the completion of a Class III survey, the Applicants will seek to avoid impacts on NRHP-eligible cultural resources. Avoidance measures may include placing poles so that sites are avoided by spanning, the use of fencing for site protection during construction, and burial of the resource under a protective buffer.

In addition, potential visual impacts on traditional cultural properties will be considered. Mitigation measures may include vegetative screening, additional documentation and research, or other mitigation measures deemed appropriate through SHPO consultation. The Applicants will consult with SHPO as the mitigation measures are further developed.

If avoidance of a NRHP-eligible archaeological site or architectural property is not feasible, the Applicants will consult further with SHPO to determine an appropriate course of action prior to plan implementation.

The Applicants will develop a discovery plan should previously unknown cultural resources or human remains be inadvertently encountered during construction or maintenance. The plan would outline the framework for handling such discoveries in an efficient and legally compliant manner. With regard to a discovery of human remains, procedures would be followed so that the appropriate authorities would become involved quickly and in accordance with local and state guidelines (NDCC 23-06-27 and NDCC 40-02-03).

8.9.1 State Historical Society of North Dakota

In a February 2013 meeting with the Applicants, SHPO recommended that a Class I literature review and a Class III archaeological resources inventory be completed for areas with a potential for cultural resources that may be impacted by North Dakota Facility activity. As stated above

and described in Section 5.7, the Applicants have completed the Class I literature review (see Appendix D).

The Applicants will continue to coordinate with SHPO.

8.10 EFFECT OF THE NORTH DAKOTA FACILITY ON BIOLOGICAL RESOURCES

The Applicants have implemented measures to avoid and minimize effects on biological resources in the vicinity of the North Dakota Facility. The potential impacts of the North Dakota Facility on wildlife are anticipated to be minimal. The proposed facilities will include measures to minimize impacts on avian species.

8.11 CONCERNS RAISED BY AGENCIES

Applicable public agencies were contacted to receive their comment on the proposed North Dakota Facility in a letter sent to each agency on May 6, 2013. A copy of the notification letter is provided in Appendix F. This section provides a summary of comments received as well as relevant comments gathered throughout the agency outreach that has occurred for this Project since July 2012. Where applicable, letters and other correspondence received from agencies are also provided in Appendix F.

8.11.1 North Dakota Game and Fish Department

From the January 17, 2013, interagency meeting, NDGF inquired about wildlife surveys for leks and eagles. It was explained that habitat surveys were done in October 2012 from public ROW. Subsequent to this interagency meeting, eagle stick nest and lek surveys were conducted from April 29 to May 2, 2013. No sharp-tailed grouse leks or eagle stick nests were located within the North Dakota Corridor. The survey did identify one active bald eagle nest located about 1.6 miles from the North Dakota Route in northern Brown County, South Dakota.

8.11.2 U.S. Fish and Wildlife Service

The South Dakota USFWS responded to the preferred route notification on July 24, 2013; this letter serves as the response to the entire Project on behalf of both the North Dakota and South Dakota USFWS Ecological Services offices and Refuge Divisions. USFWS had the following comments on the preferred route, including the North Dakota Route.

Migratory Birds

USFWS commented that avian mortality can result from interactions with electric utility facilities (for example, collisions and electrocutions). USFWS stated that Avian Protection Plans (APPs) can be tailored by the Applicants to address possible avian issues early in the North Dakota Facility planning process. To minimize possible collisions or electrocutions, USFWS recommended that new or updated power lines be constructed in accordance with current APLIC guidelines. USFWS also recommended that construction take place outside of the breeding season, to the extent practicable. The Applicants continue to work with USFWS on these comments.

Threatened and Endangered Species

Of the four listed and candidate species that were noted in USFWS response letter as potentially occurring in the Project area, only one, the whooping crane, may occur in the North Dakota Facility area; the rest have the potential to occur in the South Dakota Facility area. Although the North Dakota Route is outside of the corridor where 95 percent of confirmed whooping crane sightings have occurred, the cranes could still pass through the North Dakota Route during migration.

The Applicants continue to work with USFWS on a line marking plan.

High-Value Wildlife Habitat

High-value habitat areas in North Dakota include wetlands, stream basins, native prairie, wooded draws, and riparian forests. USFWS recommended that construction through or adjacent to these areas be avoided, where possible, or measures be taken to minimize disturbance to these areas. Specific disturbance minimization measures are listed in the USFWS letter attached in Appendix F.

Property Interests

Within the North Dakota Corridor and the North Dakota Facility ROW, USFWS administers wetland easements. USFWS has recommended that impacts on the areas be avoided as much as possible, which includes investigating alternatives to eliminate or reduce potential impacts. If impacts are unavoidable, USFWS requests that every attempt be made to keep impacts to a minimum. The Applicants are continuing to work with the Kulm WMD on USFWS wetland easements that are crossed by the North Dakota Route.

8.11.3 U.S. Army Corps of Engineers

USACE responded on February 6, 2013, to a request for comment on the North Dakota Facility preliminary routes, indicating that utility lines are already authorized by Nationwide Permit (NWP) 12, Utility Line Activities provided that applicable conditions are met. Permits will be required where they cross bodies of water under Section 10 of the Rivers and Harbors Act or Waters of the United States (under Section 404 of the Clean Water Act).

The North Dakota Route does not cross any Section 10 waters; the Applicants will continue to coordinate with USACE for the Section 404 process.

During the interagency meeting on January 17, 2013, USACE expressed concerns with the accuracy of the NWI data and wanted to know if wetland delineations would be done. It was explained that the process was to supplement NWI data with desktop review of aerials, and to do field review from public ROW. This level of analysis has occurred and was used in the route selection process. Delineations will be limited to larger complexes that may not be spannable along the final route, and field work will not occur until right of entry along the transmission ROW has been obtained.

8.11.4 North Dakota Geological Survey

The North Dakota Geological Survey did not provide any comments.

8.11.5 North Dakota Parks and Recreation Department

NDPR met with the Applicants during the interagency meeting on January 17, 2013, and noted that lack of survey work completed in the North Dakota Facility area is a concern and it may be difficult to make good decisions without this information. The Applicants continue to coordinate with the NDPR on surveys and NHIS data.

8.11.6 North Dakota Department of Health

NDDOH responded on May 14, 2013 to the preferred route notification letter sent by the Applicants. NDDOH believes that the environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. NDDOH provided comments and guidance on fugitive dust emissions, degradation of waterways, storm water management, and noise in their letter (see Appendix F).

8.11.7 North Dakota Department of Transportation

During the interagency meeting on January 17, 2013, NDDOT noted that it had no concerns at this time. The highway crossings should be straightforward, requiring utility crossing permits.

8.11.8 North Dakota State Water Commission

During the interagency meeting on January 17, 2013, the North Dakota State Water Commission noted that there are no flood plains or sovereign lands associated with the preliminary routes.

8.11.9 Natural Resources Conservation Service

The Applicants are working with NRCS to address easements as related to the North Dakota Facility.

8.11.10 North Dakota Department of Emergency Services

On May 9, 2013, NDDES, Division of Homeland Security that they have no comments on the proposed North Dakota Facility.

8.11.11 North Dakota Aeronautics Commission

The North Dakota Aeronautics Commission responded via email on August 6, 2012, noting that the Ellendale airport was in proximity to the Project. They requested that the Applicants file the appropriate airspace form with FAA if needed, and coordinate with the Ellendale airport as the Project progresses.

8.11.12 North Dakota Department of Agriculture

The North Dakota Department of Agriculture did not respond.

8.11.13 North Dakota Department of Human Services

The North Dakota Department of Human Services did not respond.

8.11.14 North Dakota Department of Labor

The North Dakota Department of Labor did not respond.

8.11.15 North Dakota Department of Commerce

On May 13, 2013, the North Dakota Department of Commerce responded that clearance will be given to the North Dakota Facility only with respect to the consultation process. In addition, any changes to the schedule, scope, description, budget, or location will require notification to the North Dakota Department of Commerce for a complete review.

8.11.16 North Dakota Department of Career and Technical Education

The North Dakota Department of Career and Technical Education did not respond.

8.11.17 North Dakota Indian Affairs Commission

The North Dakota Indian Affairs Commission did not respond.

8.11.18 North Dakota Office of Management and Budget

The North Dakota Office of Management and Budget did not respond.

8.11.19 North Dakota Soil Conservation Committee

The North Dakota Soil Conservation Committee did not respond.

8.11.20 Federal Aviation Administration

The Bismarck Airports District Office of the FAA responded on September 20, 2012 and December 18, 2012 to notification letters sent by the Applicants. The agency indicated that if the Project meets any of the notification criteria listed in 14 CFR 77.9, that the Applicants must coordinate with FAA and file the appropriate forms.

8.11.21 Federal Highway Administration

During the August 29, 2012 interagency meeting the Federal Highway Administration noted that it did not have any concerns.

8.11.22 U.S. Geological Survey

The U.S. Geological Survey did not respond.

8.11.23 County Officials

The Applicants coordinated with the Dickey County auditor, meeting with that office at the study area phase and providing a webinar at the preliminary route phase. The Dickey County auditor indicated that the Project would need to obtain permits from the townships in Dickey County; no permits from the County would be required.

8.11.24 State Officials

The Governor's Office and applicable state senator and representatives did not respond.

8.11.25 North Dakota Transmission Authority

The North Dakota Transmission Authority attended the interagency meeting on January 17, 2013, to receive an update on the Project and the North Dakota Facility. They described the history the transmission authority had with MISO to address power needs in North and South Dakota.

8.11.26 North Dakota Bureau of Reclamation

The North Dakota Route avoids North Dakota Bureau of Reclamation properties; therefore, no concerns were noted.

8.11.27 North Dakota Energy Development Impact Office

The Energy Development Impact Office did not respond.

8.11.28 Job Service of North Dakota

The Job Service of North Dakota did not respond

8.11.29 North Dakota Department State Land Department

The North Dakota State Land Department did not respond

9.0 QUALIFICATIONS OF CONTRIBUTORS

Name/Project Role	Education and Professional Experience
Angela Piner Environmental Project Manager/ Energy Environmental Practice Leader HDR Engineering, Inc.	Ms. Piner is an associate vice president responsible for managing projects and is currently the north central client development lead for HDR Engineering, Inc. She has extensive experience preparing and managing environmental analyses for transmission lines, wind farms, and other generation facilities. She routinely works collaboratively with engineering and real estate staff to move projects to construction. During the last 11 years, Ms. Piner has successfully permitted approximately 2,300 miles of transmission lines that are currently in operation or in construction. Angela also excels at planning, organizing, and participating in effective public and agency meetings for energy projects. M.S., Biology, California Polytechnic State University, San Luis Obispo B.S., Biology, California Polytechnic State University, San Luis Obispo
Brian Hunker Environmental Scientist HDR Engineering, Inc.	Mr. Hunker is an Environmental Scientist with a diverse project background in environmental documentation and permitting. He has been involved in the preparation of Environmental Assessments, Environmental Impact Statements, and other NEPA-related and environmental permitting documents for local, state, and federal power and energy projects across the United States. B.S., Environmental Sciences/Studies (Zoology and Biological Aspects of Conservation), University of Wisconsin-Madison
Joyce Pickle Environmental Scientist HDR Engineering, Inc.	Ms. Pickle has over 13 years of experience as an environmental scientist, with extensive experience managing regulatory compliance issues for energy development and transmission projects in the upper Midwest, particularly those requiring preparation of documents necessary to comply with NEPA and state regulations. M.S., Ecology (Ecology and Evolutionary Biology), Iowa State University B.A., Biology, Augustana College
Melissa Lundberg Environmental Scientist HDR Engineering, Inc.	Ms. Lundberg has six years of experience in environmental consulting including biological surveys, archaeological/historic structures surveys, and environmental documentation and permitting. She has experience with Environmental Assessments, Biological Assessments, and other various environmental permitting documents. B.A., Environmental Studies and Geography, Gustavus Adolphus College
Monica Peterson Environmental Scientist HDR Engineering, Inc.	Ms. Peterson has one year of experience in environmental consulting including permitting support, administrative support, and technical editing. Additionally, she has one year of experience as a research assistant in sociology and agriculture and three years in higher education administration. B.A., Political Science and Environmental Studies, Iowa State University

Emily Hyland Environmental Scientist/Public Involvement Specialist HDR Engineering, Inc.	Ms. Hyland has seven years of experience in environmental consulting and managing public outreach programs. The majority of Emily's experience has been developing and implementing statewide and project-specific public outreach programs and public relations strategies, with an emphasis in the energy industry. Emily has experience working with federal, state, and local agencies, non-government organizations, landowners and the general public. B.A., Environmental Studies (Geography), Gustavus Adolphus College M.A., Strategic Communications Management, Concordia College – St. Paul (Degree not complete)
Anjali Malhotra GIS Specialist HDR Engineering, Inc.	Ms. Malhotra has eight years of experience in GIS, spatial analysis, data development and processing, and modeling. She is proficient in generating cartographic products, mapping, and graphic presentations using GIS and advanced graphic software. She provided GIS and technical support to a variety of wind energy, transmission line, and transportation projects; especially providing support in the development of NEPA documents and permit applications. M.S., Urban and Regional Planning (Specialization in Information Technology and GIS)
Catherine Storey Environmental Project Manager HDR Engineering, Inc.	Ms. Storey has 28 years of professional experience in the environmental field, including six years of experience in environmental consulting. Ms. Storey serves as project manager and conducts various tasks for NEPA permitting for natural gas pipeline, electric transmission lines, wind, solar, and coal gasification projects. She has coordinated and contributed to preparation of Environmental Impact Statements and Environmental Assessments for Federal Energy Regulatory Commission (FERC), U.S. Department of Energy, Bureau of Land Management (BLM), and Department of Defense clients. B.S. Chemistry, Colorado School of Mines
Kimberly Gust Document Production Specialist HDR Engineering, Inc.	Ms. Gust has 16 years of experience as an editor and document production manager. Ms. Gust's experience includes developing templates and style guidelines, technical editing, copy editing, compiling references, formatting, and preparing documents for publication. Her experience encompasses a variety of technical documents, including environmental impact statements, environmental assessments, and other NEPA-related and environmental documents as well as proposals, plans, and presentations. M.A., English Composition and Rhetoric, University of Nebraska at Omaha B.S.E., English, Missouri Western State University
Henry Ford Projects Manager / Director Electric Transmission Engineering Montana-Dakota Utilities Co.	Mr. Ford is the Director of Electric Transmission Engineering for Montana-Dakota Utilities, a position he has held for the past 10 years. He has 35 years of experience in distribution, transmission and substation engineering on projects throughout the Dakotas and Eastern Montana including previous project siting experience in North Dakota. B.S., Engineering Physics, North Dakota State University

Chad Miller Environmental Scientist Montana-Dakota Utilities Co.	Mr. Miller has 6 years of experience in the environmental field, including three years of experience with environmental siting. Mr. Miller has worked on natural gas pipeline, electric transmission, and power generation projects requiring state and federal agency interaction. B.S., Biology, University of North Dakota
Dean Pawlowski Principal Engineer / Transmission Project Developer Otter Tail Power Company	Mr. Pawlowski has twenty-two years of experience in the utility industry. He has held positions within different departments including positions in generation, transmission, capital budgeting, and project development. B.S., Mechanical Engineering, University of North Dakota M.B.A., North Dakota State University M.A. in Pastoral Ministry, St. John's University, (Degree not completed)
Jason Weiers Delivery Planning Manager Otter Tail Power Company	Mr. Weiers currently holds the position of Manager, Delivery Planning at Otter Tail Power Company. Mr. Weiers is responsible for managing an employee group primarily involved in transmission planning, supporting regulatory related activities, administering various transmission contracts, and capital budget development. He has over 13 years of experience in the utility business, all of which has been within Delivery Planning at Otter Tail. B.S., Electrical Engineering, North Dakota State University
Al Koeckeritz Manager Otter Tail Power Company	Mr. Koeckeritz has over 25 years of experience in the electric utility industry serving in transmission substation design, distribution system design and construction, operations support, transmission construction and project management. He is a registered Professional Engineer and holds a certification as a Project Management Professional. BS Engineering, North Dakota State University MS Engineering, North Dakota State University
Mark Shaw Senior Project Manager POWER Engineers, Inc.	Mr. Shaw is a Senior Project Manager for the Power Delivery Group with POWER Engineers. Mr. Shaw has over 35 years of experience designing and managing transmission line projects throughout the United States. Mr. Shaw has extensive experience with projects ranging from 69 kV to 500 kV and with structure types ranging from wood single-pole and H-frame to steel and concrete single-pole, steel H-frame and lattice towers. Mr. Shaw is typically involved from the routing and permitting phases of projects, through design and construction. B.S, Civil Engineering, University of Missouri
Danny Frederick Project Engineer POWER Engineers, Inc.	Mr. Frederick is a Project Engineer in the Power Delivery Group with POWER Engineers. He has extensive experience in all aspects of transmission line engineering including preliminary structure spotting, structure and foundation design, specification development and on-site construction support. During the last 11 years, Mr. Frederick has worked on over 1,000 miles of high-voltage and extra-high-voltage transmission lines. Mr. Frederick is a registered professional engineer. B.S. Civil Engineering, University of Missouri

Terry Fasteen Right-of-Way Project Manager Kadrmas, Lee, and Jackson, Inc.	Mr. Fasteen is the leader of the KLJ Right-of-Way (ROW) services group with 30 years of experience in Engineering, construction management and right-of-way services. He is a licensed real-estate sales person in Minnesota and has headed up the ROW, TA for the past six years working with electrical transmission, distribution, oil and gas line projects in addition to surface and air transportation projects.

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