Montana Major Facility Siting Act

Application for a Certificate of Compliance

North Plains Connector Project

Submitted to:

Montana Department of Environmental Quality

Submitted by:

North Plains Connector LLC, a Grid United LLC Company

August 2025

GRID UNITED
NORTH PLAINS CONNECTOR PROJECT
MONTANA MAJOR FACILITY SITING ACT
APPLICATION FOR A CERTIFICATE OF COMPLIANCE

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ACRONYMS AND ABBREVIATIONS

μV/m	microvolt per meter
A	ampere
AC	alternating current
ACEC	Areas of Critical Environmental Concern
ACGIH	American Conference of Governmental Industrial Hygienists
AFA	Aquatic Focal Areas
AIMP	Agricultural Impact and Mitigation Plan
AM	amplitude modulation
APLIC	Avian Power Line Interaction Committee
ARM	Administrative Rules of Montana
ARMP	Approved Resource Management Plan
ARS	Agricultural Research Station
ASCE	American Society of Civil Engineers
BCC	Birds of Conservation Concern
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMP	best management practice
CFR	Code of Federal Regulations
CIGRE	International Council on Large Electric Systems
CIP	North Plains Community Investment Program
CMRP	Construction, Mitigation, and Reclamation Plan
CTGCN	Community Types of Greatest Conservation Need
CWA	Clean Water Act
CWD	County Weed District
DASK	Dakota skipper
dB	decibel
dB(μV/m)	decibel microvolt per meter
dBA	A-weighted decibel
DC	direct current
DEQ	Montana Department of Environmental Quality
DMR	dedicated metal return
DNRC	Department of Natural Resources and Conservation
DOC	Department of Corrections
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOI	U.S. Department of Interior
EHV	extra high voltage
EIA	U.S. Energy Information Administration
EO	Executive Order

EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
ESA	Endangered Species Act of 1973
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
Fort Keogh	Fort Keogh Livestock and Range Research Laboratory
FR	Federal Register
G	gauss
GHMA	General Habitat Management Area
GIS	geographic information systems
Grid United	Grid United LLC
Grouse Management Plan	Management Plan and Conservation Strategy for Sage-grouse in Montana
GRSG	greater sage-grouse
GW	gigawatts
HUC	Hydrologic Unit Code
HQT	Habitat Quantification Tool
HV	high voltage
HVDC	high-voltage direct current
HVDC Transmission Line	New 525 kV HVDC electric transmission line
Hz	Hertz
IARC	International Agency for Research on Cancer
IBA	Important Bird Areas
ICES	International Committee on Electromagnetic Safety
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IPaC	Information for Planning and Consultation
IRP	Integrated Resource Plan (Montana)
kcmil	thousand circular mils
kHz	kilohertz
kV	kilovolt
kV/m	kilovolt per meter
LBBA	Little brown bat
LBNL	Lawrence Berkeley National Laboratory
L_d	daytime A-weighted equivalent sound level
L_{dn}	day-night average sound level
L_{eq}	A-weighted equivalent sound level
LMNG	Little Missouri National Grasslands
L_n	nighttime A-weighted equivalent sound level
LRR	Land Resource Region

MBCP	Migratory Bird Treaty Act Compliance Plan
MBEWG	Montana Bald Eagle Working Group
MBMG	Montana Bureau of Mines and Geology
MBTA	Migratory Bird Treaty Act
MCA	Montana Code Annotated
MDA	Montana Department of Agriculture
MDOR	Montana Department of Revenue
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
MFSA	Major Facility Siting Act
MFWP	Montana Fish, Wildlife, and Parks
mG	milligauss
MISO	Midcontinent Independent System Operator
MLCF	Montana Landcover Framework
MLR	Montana Land Reliance
MLRA	Major Land Resource Area
MMST	Montana Mitigation Stakeholder Team
MNHP	Montana Natural Heritage Program
MOA	Military Operations Area
MOP	Manual of Practice
MSGOT	Montana Sage Grouse Oversight Team
MSGWG	Montana Sage Grouse Working Group
MSL	Montana State Library
MTSHPO	Montana Historical Society Historic Preservation Office
MW	megawatt
MWh	Megawatt-hour
MWRF	Montana Wetland and Riparian Framework
NCEI	National Centers for Environmental Information
n.d.	no date
NEPA	National Environmental Policy Act
NERC	North American Reliability Corporation
NESC	National Electric Safety Code
NHPA	National Historic Preservation Act of 1966
NLEB	Northern long-eared bat
North Plains	North Plains Connector LLC
NRCS	Natural Resources Conservation Service
NREL	National Renewable Energy Lab
NRHP	National Register of Historic Places
NWPCC	Northwest Power and Conservation Council
OPGW	optical power ground wire
PAB	palustrine aquatic bed

PCA	priority conservation area
PEM	palustrine emergent
PFO	palustrine forested
PFYC	Potential Fossil Yield Classification
POI	point of interconnection
Project	North Plains Connector Project
PSS	palustrine shrub-scrub
PUB	palustrine unconsolidated bottom
Rosebud County Converter Station	new converter station in Rosebud County
Rosebud Transmission Line	New 500-kV EHV AC electric transmission line in Rosebud County
RpEm	riparian emergent
PRFO	riparian forested
RpSS	riparian scrub-shrub
SCADA	Supervisory Control and Data Acquisition
SCENIHR	Scientific Committees of the European Commission
SGCN	Species of Greatest Conservation Need
SGHCP	Sage-grouse Habitat Conservation Program
SOC	Species of Concern
SPP	Southwest Power Pool
SRMA	Special Recreation Management Area
SSURGO	Soil Survey Geographic
STGR	sharp-tailed grouse
Storm Water General Permit	General Permit for Storm Water Discharges Associated with Construction Activity
SWAP	State Wildlife Action Plan
SWPPP	Storm Water Pollution Prevention Plan
T	Tesla
TCP	Traditional Cultural Property
TCS	Tribal Cultural Specialist
TFA	Terrestrial Focal Area
THPO	Tribal Historic Preservation Officers
TOYR	time-of-year restrictions
USC	U.S. Code
UHF	ultra-high frequency
USACE	U.S. Army Corps of Engineers
USBR	U.S. Bureau of Reclamation
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

USGS	U.S. Geological Survey
V/m	volts per meter
VHF	very high frequency
VRM	Visual Resource Management
VSC	voltage source converter
WECC	Western Electricity Coordinating Council
Weed Control Act	Montana County Weed Control Act
WEG	wind erodibility group
WEI	wind erodibility index
WHO	World Health Organization
WOTUS	Waters of the U.S.

APPLICATION INDEX AND CROSS-REFERENCE [ARM 17.20.803(2)]

Requirement	Regulatory Reference	Application Package Reference
Application Filing and Contents		
An applicant shall file with the department an application for a certificate under this chapter and for the permits required under the laws administered by the department in the form that is required under applicable rules, containing the following information:	75-20-211(1)(a), MCA	(see below)
(i) a description of the proposed location and of the facility to be built	75-20-211(1)(a)(i), MCA	Section 2
(ii) a summary of any preexisting studies that have been made of the impact of the facility	75-20-211(1)(a)(ii), MCA	Section 8.3.3
(iii) for facilities defined in 75-20-104(10)(a) and (10)(b), a statement explaining the need for the facility, a description of reasonable alternate locations for the facility, a general description of the comparative merits and detriments of each location submitted, and a statement of the reasons why the proposed location is best suited for the facility	75-20-211(1)(a)(iii), MCA	Section 4 Section 5 Section 6 Section 7 Section 8
(iv)(A) for facilities as defined in 75-20-104(10)(a) and (10)(b), baseline data for the primary and reasonable alternate locations; or (B) for facilities as defined in 75-20-104(10)(c), baseline data for the proposed location and, at the applicant's option, any alternative locations acceptable to the applicant for siting the facility	75-20-211(1)(a)(iv), MCA	Section 5 Section 6 Section 7
The copy of the application must be accompanied by a notice specifying the date on or about which the application is to be filed	75-20-211(3), MCA	Appendix D
An application must also be accompanied by proof that public notice of the application was given to persons residing in the county in which any portion of the proposed facility is proposed or is alternatively proposed to be located, by publication of a summary of the application in those newspapers that will substantially inform those persons of the application	75-20-211(4), MCA	Appendix D
An application shall be organized according to the following general categories:		
a. introductory material	ARM 17.20.803(3)(a)	Section 1
b. description of proposed facility	ARM 17.20.803(3)(b)	Section 2
c. cost of the facility	ARM 17.20.803(3)(c)	Section 3
d. explanation of the purpose and benefits of the proposed facility	ARM 17.20.803(3)(d)	Section 4.2
e. explanation of need for a linear facility	ARM 17.20.803(3)(e)	Section 4.1
f. analysis of alternatives to the proposed facility	ARM 17.20.803(3)(f)	Section 5 Section 6 Section 7 Section 8
g. alternative siting study for linear facility	ARM 17.20.803(3)(g)	Section 6

Requirement	Regulatory Reference	Application Package Reference
h. environmental concerns	ARM 17.20.803(3)(h)	Section 7 Section 8
i. all maps must be in an electronic format acceptable to the department	ARM 17.20.803(3)(i)	Submitted Electronically
j. technical reports, reference or source documents, and other supplementary material provided by the applicant shall be presented as separate, consecutively arranged attachments, beginning with "Attachment A"	ARM 17.20.803(3)(i)	Appendices
Documentation of Information Sources and Omission of Certain Information Requirements		
An application must contain a list of sources of information used in preparing the application. An application must specify when field investigations were conducted.	ARM 17.20.804(1)	Section 10
Costs and Pricing		
All Facilities, Estimated Cost of Facility	ARM 17.20.811	Section 3.1
Linear Facilities, Estimated Annual Costs	ARM 17.20.815	Section 3.2
Linear Facilities, Pricing Policy	ARM 17.20.817	Section 3.3
Design Characteristics		
An application must contain an engineering description of the facility in detail sufficient to enable the department to assess the environmental impacts of construction, operation and maintenance and reliability of the proposed facility located on the preferred route.	ARM 17.20.1509(1)	Section 2.1
An application must contain a list of any reports, documents, studies, or calculations indicating that the preliminary design specifications and performance objectives for the major components of the facility are adequate and can be maintained in the continuous operation of the facility.	ARM 17.20.1509(2)	Section 2.1.1
An application must identify facility design features that were selected in order to reduce adverse environmental impacts.	ARM 17.20.1509(3)	Section 2.1.2
For an electric transmission facility, an application must contain an engineering description of major facility components, including the following: structure design and materials; height range of structures; approximate number of structures per mile; ground wire configurations; types and designs of markers and other warning devices; number and spacing of conductors; and location, size, and overall plan of new and modified substations, including present and future land requirements.	ARM 17.20.1509(4)	Section 2.1.3
For an electric transmission facility, an application must contain specifications for design peak voltage and amperage under adverse climatic conditions and under expected peak loading conditions.	ARM 17.20.1509(5)	Section 2.1.4

Requirement	Regulatory Reference	Application Package Reference
For an electric transmission facility, an application must include an estimate of radio and television interference, and electric and magnetic field strengths. This information on electric and magnetic fields must be provided for cross-sections of the right-of-way and must include maximum conditions under the conductors and at the edge of the right-of-way or easement, and attenuation rates beyond the edge of the right-of-way.	ARM 17.20.1509(6)	Section 2.1.5
For an electric transmission facility, an application must contain a statement certifying that the facility will meet the standards of the national electric safety code.	ARM 17.20.1509(7)	Section 2.1.6
An application must contain a description of communication facilities that will be used to control and monitor operation of the facility and their location, including, but not limited to, radio, microwave, or satellite antennas, and any fiber optic cables. If fiber optic cables are used, the application must describe the use of any excess communication capacity.	ARM 17.20.1509(11)	Section 2.1.3.5
An application must contain a specific engineering or design explanation of the opportunities and constraints for paralleling or sharing existing utility or transportation rights-of-way, or portions thereof, and if such opportunities were not chosen for part of the preferred route, an explanation of the reasons, including insufficient right-of-way and/or other land use constraints.	ARM 17.20.1509(12)	Section 2.1.7
Construction Description		
An application must contain a preliminary construction schedule, a description of typical construction equipment to be used, and a description of the steps involved in carrying out major construction activities, including plans for and use of staging areas, right-of-way clearing, access road construction, structure assembly, and conductor and sock line stringing.	ARM 17.20.1510(1)	Section 2.2
An application must contain an estimate of the amount of ground disturbance resulting from construction at a representative structure site, pulling site, and reel site.	ARM 17.20.1510(2)	Section 2.2.2
An application must contain a description of the types and sizes of roads needed to build and maintain the facility.	ARM 17.20.1510(3)	Section 2.2.3
An application must contain estimates of the minimum and maximum right-of-way widths for which permanent easements would be purchased for the cleared right-of-way, estimates of the minimum and maximum widths of any additional construction easements, a description of the criteria used to determine right-of-way widths, a description of any land use restrictions that would be placed on the permanent easement, and a general description of standard conditions in the easement agreement pertaining to protection of the facility from damage or pertaining to public safety and liability.	ARM 17.20.1510(4)	Section 2.2.2

Requirement	Regulatory Reference	Application Package Reference
An application must contain a description of the reclamation methods the applicant will use and the scheduled timing of activities proposed to restore the right-of-way.	ARM 17.20.1510(5)	Section 2.2.2.5
An application must contain a description of methods the applicant will use for fire control.	ARM 17.20.1510(6)	Section 2.2.4
Operations and Maintenance Description		
An application must include a description of operation and maintenance procedures for the proposed facility under normal and emergency conditions, including types and scheduling of anticipated maintenance and inspections. For electric transmission facilities, an application must contain a description of methods the applicant will employ to resolve complaints from nearby residents regarding noise and radio and television interference.	ARM 17.20.1512(1)	Section 2.3.1
An application must contain a discussion of the ability of the proposed facility to withstand destructive natural phenomena such as mass movement, earthquakes, floods, icing conditions and high winds or accidents, a description of the environmental impacts and/or public safety problems resulting from facility failure due to natural phenomena and accidents, and a general discussion of measures proposed to reduce the problems.	ARM 17.20.1512(2)	Section 2.3.2
An application must contain a description of the methods the applicant will employ to control land uses on the right-of-way, including encroachment of buildings.	ARM 17.20.1512(3)	Section 2.3.3
An application must contain a description of the right-of-way management procedures that will be used, including vegetation and weed control, herbicide use, and the scheduled timing of the proposed management activities.	ARM 17.20.1512(4)	Section 2.3.4
Evaluation of Alternatives		
An application must contain an evaluation of the nature and economics of relevant alternatives to the proposed facility, which could in whole or in part address the problem or opportunity that the proposed facility is designed to address, including transmission alternatives, alternative energy resources, alternative transmission technologies, alternative levels of reliability, and nonconstruction alternatives. The no action alternative must be evaluated. The evaluation must also include a comparison of alternatives leading to the selection of a preferred alternative and an explanation of the reasons for the selection of the proposed facility.	ARM 17.20.1304(1)	Section 5

Requirement	Regulatory Reference	Application Package Reference
An application for an electric transmission line must include an evaluation of transmission alternatives, including alternative end points and intermediate substation locations for the transmission line and upgrading or replacing an existing facility that would serve to provide the needed reinforcement that would be provided by the proposed facility. An application may also evaluate alternative timing of other electric transmission lines planned by the applicant, which in whole or in part would address the problem situation or opportunity or provide the needed reinforcement that would be provided by the proposed facility.	ARM 17.20.1304(2)	Section 5.1 Section 5.2 Section 5.3
Alternative energy resources and energy conservation alternatives are those that can individually or in combination offset or postpone the need for the proposed facility, or provide services comparable to the proposed facility. The evaluation must include a description of each alternative energy resource or energy conservation measure, the location and quantity available, any constraints to its availability and predictable daily and seasonal variations in the availability of the energy resource, if applicable.	ARM 17.20.1304(3)	Section 5.4
Alternative transmission technologies are those capable of providing comparable services or addressing the problem or opportunity the proposed facility is designed to address.	ARM 17.20.1304(4)	Section 5.5
Nonconstruction alternatives include the use of curtailable and interruptible load contracts with customers and load management.	ARM 17.20.1304(5)	Section 5.6
The no action alternative means no facility would be constructed to meet the need or provide the services the proposed facility is designed to meet or provide.	ARM 17.20.1304(6)	Section 5.7
An application must contain the applicant's evaluation of all relevant alternatives leading to a ranking and selection of alternatives and selection of the proposed transmission facility. An application must include a detailed description of the methods and criteria used by the applicant to select a facility which best addresses the problem or opportunity situations identified as the basis of need given consideration of economics, engineering, and environmental concerns.	ARM 17.20.1305(1)	Section 7 Section 8
In addition to the applicant's criteria for comparison, an application must include a ranking of all relevant alternatives which have no insurmountable environmental, technical or other problems serious enough to warrant elimination from further consideration, by levelized annual cost, including known mitigation costs. Alternatives whose levelized annual cost is not more than 35% higher than the proposed facility or 25% higher when the proposed facility is a transmission line 230 kV or higher and at least 30 miles long, or which have significant environmental advantages over the proposed facility, must then be compared based on performance, system impact, and environmental impact as outlined in a – c in the referenced Rule.	ARM 17.20.1305(2)	Section 8.1

Requirement	Regulatory Reference	Application Package Reference
In comparing the No Action alternative with other alternatives, the costs of no action shall include, if relevant, the net losses to consumers who would be deprived of the services of the facility.	ARM 17.20.1305(3)	Section 5.7
A full explanation must be given of the reasons for dropping any alternative from further consideration at any stage in the evaluation process.	ARM 17.20.1305(4)	Section 6.4.2
Overview Survey of Study Area, Baseline & Impact Assessment of Alternatives		
An application for a linear facility must contain an alternative siting study and baseline environmental data as specified in Circular MFSA-2. The department adopts and incorporates by reference Circular MFSA-2, "Application Requirements for Linear Facilities" 2023 edition, which sets forth the requirements for an alternative siting study and the baseline study requirements and impact assessment to be included in an application for a linear facility.	ARM 17.20.1426(1),(2)	Section 5 Section 6 Section 7 Section 8 Section 9 Appendix E Appendix F
An application for a linear facility must contain an alternative siting study and baseline environmental data as specified in this circular.	Circular MFSA-2, Section 3.0(1),(2),(3),(4)	Section 5 Section 6 Section 7 Section 8 Section 9 Attachments
Preferred locations conform to the criteria listed in 75-20-301 (l)(c), MCA, and achieve the best balance among the location criteria.	Circular MFSA-2, Section 3.1(1)	Section 8.2
An application must identify the study area or areas that include the following, considering the electrical loads to be served and electrical problems or opportunities to be addressed by the facility, or the market area for the product that would be transported by the facility	Circular MFSA-2, Section 3.2(1),(2),(3),(4)	Section 5 Section 6 Section 7 Appendix E Appendix F
An application must contain an overview survey of the study area identified in Section 3.2 to identify alternative locations suitable for siting the facility.	Circular MFSA-2, Section 3.1(1),(3),(4),(6),(7),(8),(9)	Section 5 Section 6 Section 7 Appendix E Appendix F
For electric transmission lines, an application must contain an electronic map, in a format acceptable to the department, of the study area required by Section 3.3(3) that delineates various environmental data.	Circular MFSA-2, Section 3.4(1),(3),(4),(5),(6),(7),(8),(9),(10)	Section 7 Appendix E Appendix F
The applicant shall select at least 3 reasonable alternative locations for the proposed facility within the study area for baseline study	Circular MFSA-2, Section 3.5(1),(2)	Section 6
An application must contain a baseline study of at least 3 reasonable alternative facility locations and their impact zones to gather baseline data describing the existing environment, to assess impacts associated with the proposed facilities, to identify mitigation strategies, and to select the preferred facility location.	Circular MFSA-2, Section 3.6(1),(2),(3),(4),(5),(6),(7)	Section 7 Appendix E Appendix F
An application must contain baseline information and an assessment of the following:	Circular MFSA-2, Section3.7(1)	Section 7
Land use	Circular MFSA-2, Section 3.7(2),(4)	Section 7.3
Construction crew	Circular MFSA-2, Section3.7(3)	Section 2.2 Section 7.10
Social impacts	Circular MFSA-2, Section 3.7(5)	Section 7.10

Requirement	Regulatory Reference	Application Package Reference
Public attitudes and concerns	Circular MFSA-2, Section 3.7(6)	Section 9.1.4
Access road requirements	Circular MFSA-2, Section 3.7(7)	Section 2.2.3
Geology and soil	Circular MFSA-2, Section 3.7(8)	Section 7.4
Engineering	Circular MFSA-2, Section 3.7(9)	Section 2 Section 2.1.1 Section 2.1.3.4 Section 7.5.4 Section 7.12
Visual resources	Circular MFSA-2, Section 3.7(10),(11)	Section 7.9.3
Biological resources	Circular MFSA-2, Section 3.7(12)	Section 7.6 Section 7.7 Section 7.8
Cultural, historical, and paleontological resources	Circular MFSA-2, Section 3.7(13),(14)	Section 7.9.1 Section 7.9.2
Recreation	Circular MFSA-2, Section 3.7(15),(16)	Section 7.3
Water quality	Circular MFSA-2, Section 3.7(17),(18)	Section 7.5
Noise, radio, and television interference and electrical effects	Circular MFSA-2, Section 3.7(19)	Section 7.11
An application must contain a comparison of the alternative facility locations which includes the following: a summary of the most important impacts; a description of the degree to which the most important adverse impacts can be mitigated; and a comparative ranking of the alternatives.	Circular MFSA-2, Section 3.9(1)	Section 8.1
The applicant must select a preferred facility location from the alternative locations selected in accordance with Section 3.5	Circular MFSA-2, Section 10(1)	Section 8.2
Consultation Requirements		
An application must contain a summary of the results of consultation with government agencies to identify their concerns over the proposed facility's possible locations or effects on the environment, including any mitigation measures suggested by those agencies, and the way the applicant considered these concerns in identifying preferred and alternative locations for the facility.	Circular MFSA-2, Section 3.0(4)	Section 6 Section 9
An applicant must conduct one or more public meetings that are accessible to the residents of the study area to identify resources potentially affected by the proposed facility, suggested locations for the proposed facility, alternatives to the proposed facility, and mitigation measures for the proposed facility.	Circular MFSA-2, Section 3.3(2)	Section 6.2.4

1.0 INTRODUCTION (ARM 17.20.803(3)(a))

North Plains Connector LLC (North Plains), a Delaware limited liability company formed pursuant to Section 18-201 of the Delaware Limited Liability Company Act, submits this Montana Major Facility Siting Act (MFSA) Application for a Certificate of Compliance to the Montana Department of Environmental Quality (DEQ) for the North Plains Connector Project (Project), a proposed interregional connector line. North Plains is a wholly owned, single-purpose, indirect subsidiary of Grid United LLC (Grid United), a Houston-based company developing next generation energy infrastructure to power the future. Grid United is focused on the infrastructure needed to make our power grid more modern, efficient, reliable, and secure.

This application describes the facilities associated with the Project, provides estimates of the costs of construction and operation of the Project, explains the purpose and need for the Project, outlines the analysis of the alternatives to the Project, and addresses potential environmental concerns.

2.0 DESCRIPTION OF THE FACILITY (75-20-211(1)(a)(i) MCA, ARM 17.20.803(3)(b) & Circular MFSA-2 Section 3.7(9))

As proposed, the Project will extend approximately 422 miles from near Colstrip to two separate end points in North Dakota – one near the town of Center and the other near St. Anthony as shown on Figure 2.0-1. The Project is a bidirectional line to move electricity east or west between the Western and Eastern Interconnections (also referred to as the western and eastern grids) in response to the growing need to move power across longer distances to improve the reliability and resiliency of the grid. The Western and Eastern Interconnections are the two largest electrical grids in North America and are shown on Figure 2.0-2.

The Project is a high-voltage direct current (HVDC) transmission line and related appurtenances and equipment, as illustrated on Figure 2.0-3. It will provide 3,000 megawatts (MW) of transfer capacity at ±525 kilovolts (kV) between the eastern and western grids. Specifically, the Project will connect the Western Electricity Coordinating Council (WECC) electrical power markets in the western grid with the Midcontinent Independent System Operator (MISO) and Southwest Power Pool (SPP) of the eastern grid. The Project will sell capacity without preference towards a particular generation technology. Portions of the Project or capacity rights may be owned by electric utilities, cooperatives, government entities, corporate energy providers, or independent generators in the WECC, MISO, or SPP regional power systems.

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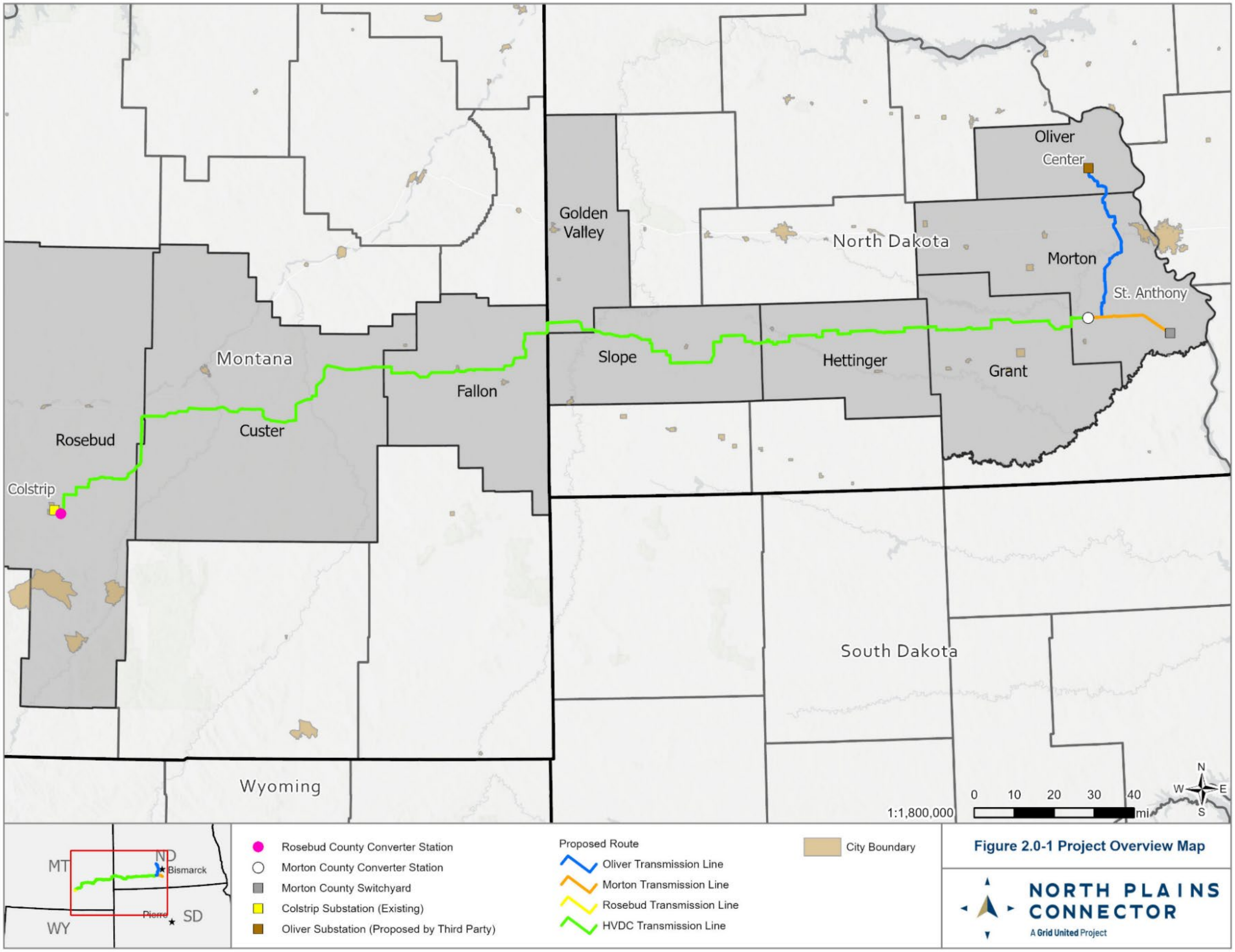
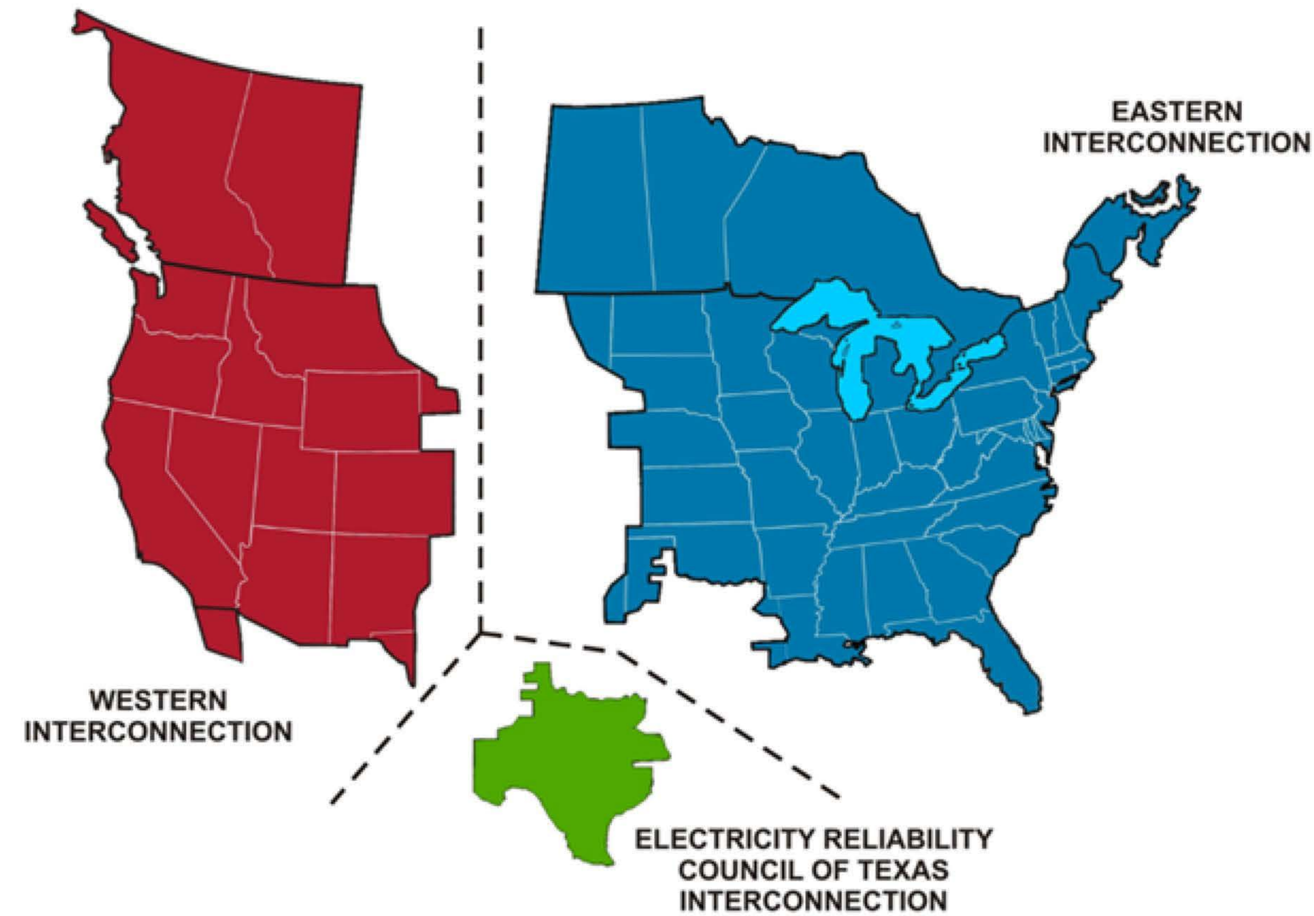


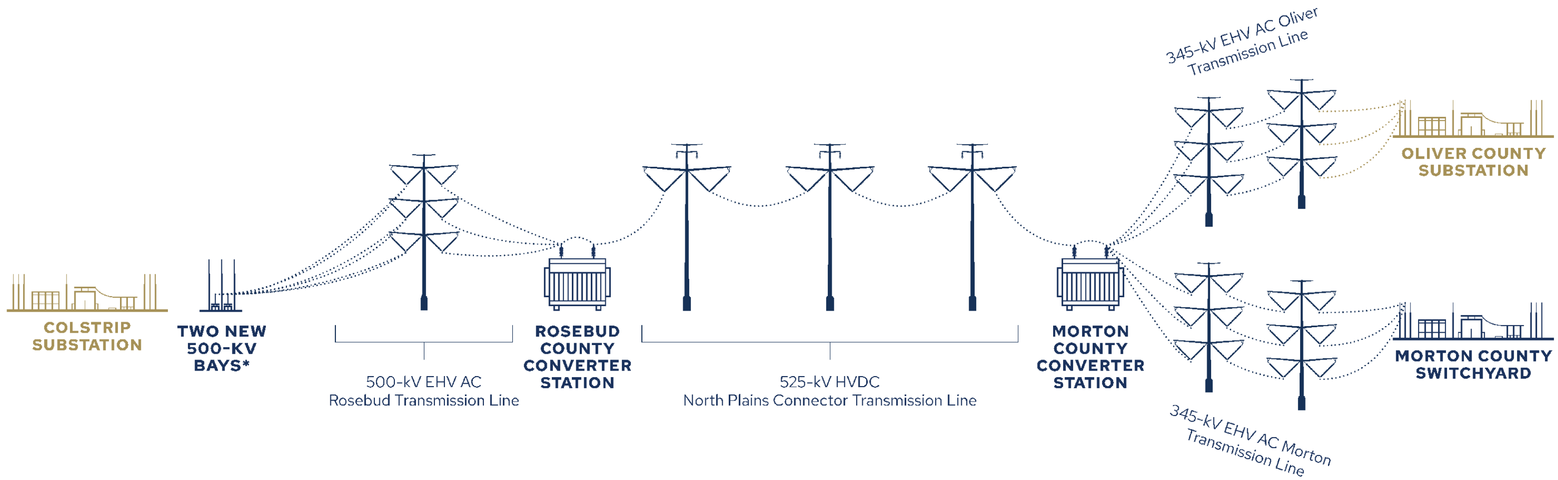
Figure 2.0-1 Project Overview Map



NORTH PLAINS CONNECTOR

For Environmental Review Purposes Only

Figure 2.0-2
North American Power Grid (Source: Energy.gov)
North Plains Connector Project
North Plains Connector LLC



LEGEND

- New project infrastructure
- Pre-existing infrastructure / Future planned / Not part of project

*The existing footprint of the Colstrip Substation is estimated to be expanded by approximately 13.18 acres to accommodate the NPC interconnection

Note: North Plains anticipates using tubular steel monopole structures in most areas. However, final structure selection and design will be made as part of the final design engineering process and may be based on physical, engineering, geological, environmental and landowner considerations.

NORTH PLAINS CONNECTOR
A Grid United Project

For Environmental Review Purposes Only

Figure 2.0-3
Project Major Facility Components
North Plains Connector Project

2.1 DESIGN CHARACTERISTICS (ARM 17.20.1509(1))

As listed below and shown on Figures 2.0-1 and 2.0-3 above, the Project will involve constructing new and modifying existing electric transmission facilities in Montana and North Dakota. The North Dakota facilities are presented here to provide an understanding of the Project as a whole. However, North Dakota facilities are not discussed further in this application as they are not within the jurisdiction of MFSA. Further, MFSA does not regulate the siting of substations.[1] A converter station is a special type of substation that forms the terminal equipment for HVDC transmission lines (Arrillaga, 1998). It converts alternating current (AC) power to direct current (DC) power and vice versa. Although MFSA does not regulate the siting of converter stations, this application includes a discussion of the converter station in Montana to provide context for the Project.

MONTANA

- Modifications at the existing Colstrip Substation in Rosebud County, which will involve an approximately 13-acre expansion of the existing site. The existing Colstrip Substation will be modified to interconnect the Rosebud Transmission Line by installing equipment within and adjacent to the substation including the installation of two new 500 kV bays and upgrading the Colstrip Switchyard 500kV bus from a 3,000 ampere (A) to a 5,000 A rating. The existing footprint of the Colstrip Substation will be expanded by approximately 4 acres to the northwest and approximately 9 acres to the south and east to accommodate the interconnection. This will be the point of interconnection (POI) to the WECC power system.

- A new 500-kV extra high voltage (EHV) AC electrical transmission line (Rosebud Transmission Line). The new line will consist of two separate, parallel circuits, each approximately 3 miles long, connecting the Colstrip Substation to a new switchyard associated with the Rosebud County Converter Station. Additionally, two 0.3- and 0.4-mile single-circuit lines connect the associated switchyard to the converter station, which are collectively part of the Rosebud County Converter Station.

- One new AC / DC converter station (Rosebud County Converter Station). The converter station will connect the eastern terminus of the Rosebud Transmission Line to the western terminus of the new ±525 kV HVDC electrical transmission line (HVDC Transmission Line).

- Approximately 174 miles of new ±525 kV HVDC Transmission Line in Rosebud, Custer, and Fallon counties. The line will extend east from the Rosebud County Converter Station to the Montana-North Dakota state line in Fallon County.

NORTH DAKOTA

- Approximately 168 miles of new HVDC Transmission Line in Golden Valley, Slope, Hettinger, Grant, and Morton counties. The line will extend east from the Montana-

[1] Transmission substations, switchyards, voltage support, and other control equipment are specifically exempt from MFSA under 75-20-104 10(a)(v), MCA.

North Dakota state line in Golden Valley County to a new converter station in Morton County.

- One new converter station in Morton County. The converter station will connect the eastern terminus of the HVDC Transmission Line to two new 345-kV EHV AC electric transmission line segments.

- Approximately 52 miles of new 345-kV EHV AC electric transmission line in Morton and Oliver counties. The line will extend east and then north from the Morton County Converter Station in Morton County to a new Oliver County Substation.

- A planned Oliver County Substation under development by Minnesota Power as part of a separate, independent project. This will be one of two POI into the eastern grid and the connection to MISO.

- Approximately 22 miles of new 345-kV EHV AC electric transmission line in Morton County. The line will extend southeast from the Morton County Converter Station to the new Morton County Switchyard.

- A new Morton County Switchyard. This will be the second POI into the eastern grid and the connection to the SPP.

2.1.1 Adequacy of Design Specifications and Performance Objectives (ARM 17.20.1509(2) & Circular MFSA-2 Section 3.7(9))

North Plains designed the Project in accordance with good utility practices, including the following:

HVDC TRANSMISSION LINE AND APPURTENANCES

- American Society of Civil Engineers (ASCE) Manual of Practice (MOP) 74-2020, *Guidelines for Electrical Transmission Line Structural Loading*

- International Council on Large Electric Systems (CIGRE) 186, *Economic Assessment of HVDC Links*

- CIGRE 388, *Impact of HVDC Lines on the Economics of HVDC Projects*

- Electric Power Research Institute (EPRI), *Transmission Line Reference Book HVDC to ±600 kV* (Green book)

- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 818-836, 2010, *Guidelines for Limiting Exposure to Electromagnetic Fields (1 hertz [Hz] to 100 kilohertz [kHz])*

- International Electrotechnical Commission (IEC) Technical Specification 60815-4, *Selection and Dimensioning of High-Voltage Insulators Intended for Use in Polluted Conditions – Part 4: Insulators for D.C. Systems*

- IEC 60826, *Design Criteria of Overhead Transmission Lines*

- International Electrical Insulation Conference2017, *Correlation Assessment Between Actual Pollution Performance of Insulator Strings in DC and Theoretical Models*
- Institute of Electrical and Electronics Engineers (IEEE) 430-2017, *IEEE Standard Procedures for the Measurement of Radio Noise from Overhead Power Lines and Substations*
- IEEE 1243-1997, *IEEE Guide for Improving the Lightning Performance of Transmission Lines*
- IEEE 1313.2-1999, *Guide for Application of Insulation Coordination*
- IEEE C2-2023, *National Electric Safety Code (NESC)*
- IEEE Std C95.6™, *IEEE Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 0–3 kHz*

<u>ROSEBUD TRANSMISSION LINE AND APPURTENANCES</u>

- ASCE MOP 74-2020, *Guidelines for Electrical Transmission Line Structural Loading*
- EPRI, *AC Transmission Line Reference Book – 200 kV and Above* (Red book)
- ICNIRP 818-836, 2010, *Guidelines for Limiting Exposure to Electromagnetic Fields (1 Hz to 100 kHz)*
- IEC 60826, 2003b, *Design Criteria of Overhead Transmission Lines*
- IEEE 430-2017, *IEEE Standard Procedures for the Measurement of Radio Noise from Overhead Power Lines and Substations*
- IEEE 1243-1997, *IEEE Guide for Improving the Lightning Performance of Transmission Lines*
- IEEE 1313.2-1999, *Guide for Application of Insulation Coordination*
- IEEE C2-2023, NESC
- IEEE Std C95.6™, *IEEE Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 0–3 kHz*

2.1.2 Siting and Design Features to Reduce Adverse Environmental Impacts (ARM 17.20.1509(3))

North Plains considered the following siting strategies to minimize adverse environmental impacts (see Sections 6 and 7 and the Construction, Mitigation, and Reclamation Plan [CMRP][2] in Appendix A for additional detail):

- avoidance of bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) nests and minimization of disturbance within recommended nest buffers;
- avoidance of core greater sage-grouse (GRSG) (*Centrocercus urophasianus*) habitat and the No Surface Occupancy buffers of active GRSG leks;
- minimization of impacts within 2 miles of active GRSG leks to the extent practicable, and commitment to compensatory mitigation according to state specifications where encroachment is unavoidable;
- avoidance or minimization of impacts on cultural resources and other sites specifically identified by tribal authorities;
- avoidance or minimization of impacts on wetlands, waterbodies, and floodplains; and
- avoidance or minimization of impacts on cultivated agricultural land, irrigation pivots and other agricultural facilities and buildings.

North Plains proposes the following design features to reduce operational impacts:

- installation of steel monopole structures as necessary to reduce visual impacts, limit potential nesting substrate for raptors and corvids (particularly near GRSG leks), and minimize the structure footprint (see Section 2.1.3.1 below);
- use of conductor bundles and sizes to reduce audible noise and potential radio interference impacts;
- use of insulators made of materials that have a reduced potential to reflect and refract light (see Section 2.1.3.1 below);
- installation of bird diverters to minimize strikes with the overhead shield wires in accordance with Avian Power Line Interaction Committee (APLIC) guidelines and U.S. Fish and Wildlife Service (USFWS) recommendations;
- increased span lengths to minimize the number of structures required per mile; and
- use of self-weathered steel surface finish on structures to minimize visual intrusion in sensitive areas (see Section 2.1.3.1 below).

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[2] The CMRP in Appendix A will be amended throughout the life of the Project to include Project commitments and conditions as they are identified and/or change.

2.1.3 Engineering Description of Major Facility Components (ARM 17.20.1509(4))

2.1.3.1 Structure Design and Materials

As summarized in Table 2.1.3-1, North Plains designed the transmission line to adequately transmit power between the Western and Eastern Interconnections. The structures were designed to withstand a variety of weather and loading conditions to not only be structurally adequate, but also to maintain necessary clearance between conductors and the ground, other electric facilities, and above-ground features such as buildings or structures. Construction workspace requirements and permanent right-of-way needs are discussed in Section 2.2.2.

North Plains evaluated tubular steel monopole structures, multi-pole structures, and steel lattice structures for use on the Project. North Plains will use tubular steel monopole structures as its default design. However, multi-pole structures and lattice structures may be used in some situations. Multi-pole structures may be used at dead ends and in locations where the alignment changes direction between 2 and 8 degrees provided there is reasonable access. Lattice structures will generally be used in topographically challenging areas with poor access, where the turning angle is greater than 8 degrees, and/or the structure height is greater than 165 feet (Rosebud Transmission Line) or 175 feet (HVDC Transmission Line). North Plains anticipates between about half and three-quarters of transmission line structures in Montana will be monopole structures. The remainder will be multi-pole or lattice structures. Final structure selection and design will be made as part of the final design engineering process and may be based on physical, engineering, geological, environmental and landowner considerations. Surface finish on monopole and multi-pole structures will typically be a self-weathered steel, although other finishes may also be used in limited areas to address specific aesthetic concerns. Surface finish on lattice structures will typically be dulled galvanized steel. To the extent reasonable and practicable, landowner preferences are being considered in the selection of structure types on their affected parcels.

Three main structure types are proposed for use on the transmission line: tangent structures, angle structures, and dead-end structures. Tangent structures will be used in straight-line segments, or with small line angles typically less than two degrees. They are the most common type of structure and will make up most of the transmission line. Where there is a change of direction in the route of more than two degrees, an angle structure will typically be used. Angle structures are like tangent structures, except the foundations may be deeper and wider to accommodate multidirectional, non-offsetting loads. Dead-end structures will be needed where the line terminates at a converter station (or substation) or for extremely long spans or sharp angles. Certain constraints or terrain features may also dictate that dead-end structures are used. Dead-end structures must support much larger loads than tangent and angle structures.

<u>HVDC TRANSMISSION LINE STRUCTURES</u>

HVDC structures will typically be between 130 and 165 feet tall but may be as short as 100 feet or as tall as 195 feet depending on structure type, turning angle, span length, and terrain. Each structure will typically be installed on drilled pier concrete foundations. For steel monopole structures, foundation dimensions will be approximately 7 to 15 feet in diameter and 20 to 60 feet deep. For lattice structures, foundations will be installed for each of the four legs. The foundations for each leg will be approximately 3 to 6 feet in diameter and 20 to 50 feet deep. The approximate base of lattice towers at ground level will be between 30 feet by 30 feet and 55 feet by 55 feet in area. Angle and dead-end structure foundations will be on the larger and deeper side of the range.

In all cases, dimensions could vary and foundation depth could exceed the anticipated range based on detailed geotechnical investigations and final design requirements

Each HVDC structure will support two to four main pole conductor bundles, up to two dedicated metal return (DMR) conductors, two overhead shield wires, and insulators (see Section 2.1.3.2). Insulators will typically be non-specular in nature to reduce the potential to reflect light, except in site-specific instances where engineering constraints may necessitate using another type of insulator. Conductors on tangent and angle structures will utilize suspension insulator assemblies, and dead-end structures will utilize in-line strain or dead-end insulator assemblies.

Table 2.1.3-1

Typical Design Characteristics

Design Component	HVDC Transmission Line	Rosebud Transmission Line
Nominal voltage	±525 kV	500-kV
Capacity	3,000 MW	3,000 MW
Overhead or buried	Overhead	Overhead
Conductor configuration [a]	Two poles (+/-) per structure, three subconductors per pole, and two DMR conductors.	Double circuit with six phases per structure and three subconductors per phase
Minimum ground clearance of conductor (at 100 degrees Celsius)	36 feet	34 feet
Conductor size	3-2156 Bluebird and 2-2312 Thrasher (DMR)	3-1590 Lapwing
Circuit configuration	Vertical and Horizontal	Vertical and Horizontal
Approx. line length (in Montana)	174 miles	7 miles
Approx. number of structures	865	38
Structure type [b]	Tubular steel monopole (steel lattice or multi-pole structures may be used in some situations)	Tubular steel monopole (steel lattice or multi-pole structures may be used in some situations)
Structure height (typical)	Estimated at 130-165 feet, but structures may be higher or lower depending on structure type, turning angle, span length, and terrain.	Estimated at 110-195 feet, but structures may be higher or lower depending on structure type, turning angle, span length, and terrain.
Structure height (full range)	Estimated at 100 to 195 feet	Estimated at 90 to 195 feet
Span length (typical)	Estimated at 1,200 feet, but spans may be shorter or longer depending on constraints.	Estimated at 1,200 feet, but spans may be shorter or longer depending on constraints.
Structures per mile	Estimated at 4 to 6	Estimated at 8 to 12
Right-of-way width	200 feet, but a wider temporary and/or permanent right-of-way may be needed in specific locations to accommodate rough terrain or long spans. Additionally, a narrower right-of-way may be utilized in limited areas to accommodate landowner request.	200 feet, but up to 320 feet where the two parallel Rosebud Transmission Lines are in a single corridor. A wider temporary and/or permanent right-of-way may be needed in specific locations.

[a] North Plains is proposing to operate the HVDC line as bipole circuits under normal conditions, with the option to operate as monopole circuits if required.

[b] North Plains anticipates using tubular steel monopole structures in most areas. However, multi-pole structures and lattice structures may be used in some situations as described in Section 2.1.3.1.

Figures B-1 through B-4 in Appendix B depict the HVDC Transmission Line structures to be installed in Montana. Angle structures will have similar pole geometry as the tangent structures, but the insulator assemblies will be angular.

ROSEBUD TRANSMISSION LINE STRUCTURES

Like HVDC structures, Rosebud Transmission Line structures will typically be between 110 to 195 feet tall but may range from 90 feet to 195 feet depending on structure type, turning angle, span length, and/or terrain. Typically, the structures will be installed on drilled pier concrete foundations. Tangent structures will have foundation dimensions 5 to 10 feet in diameter and 20 to 60 feet deep. Dead-end structures will be multi-pole structures and will have a foundation approximately 6 to 15 feet in diameter and 20 to 60 feet deep for each pole. For lattice structures, foundations will be installed for each of the four legs. The dimensions of the foundations for each leg will be approximately 3 to 6 feet in diameter and 20 to 50 feet deep. The approximate base of lattice towers at ground level will be between 25-feet by 25-feet and 55-feet by 55-feet in area.

Each EHV AC structure will support three phases of bundled conductor, two overhead shield wires, and insulators. Insulators will typically be non-specular in nature to reduce the potential to reflect and refract light, except in site-specific instances where engineering constraints may necessitate using another type of insulator. Conductors on tangent and running angle structures will utilize suspension insulator assemblies, and dead-end structures will utilize in-line strain or dead-end insulator assemblies.

Figures B-1 through B-8 in Appendix B depict the EHV AC structures to be installed in Montana. Angle structures will have similar pole geometry as the tangent structures, but the insulator assemblies will be angular.

2.1.3.2 Conductors

Conductors are the wires used to transport electricity, and for an HVDC transmission line, they are known as pole conductors. For a bipolar HVDC transmission line, there are two pole conductors, with one pole conductor being positive and the other being negative with respect to the earth. Conductors will generally be comprised of aluminum, which is where the electricity flows, and steel, which gives the conductor strength. HVDC lines will include both the main pole conductors and DMR conductors to provide redundancy and resiliency during a faulted condition or during imbalanced flows to and from MISO and SPP. If there is a fault with one of the main pole conductors, electricity can continue to flow through the DMR conductors to still provide power flow on one pole. The EHV AC uses three conductors in a three-phase configuration typical of AC systems. Conductors will be suspended from structures by insulators. The primary function of insulators is to provide the conductors with sufficient clearance from the structure to prevent flashover and thereby prevent a phase-to-ground outage.

Overhead electric transmission lines can experience faults, including from events such as lightning strikes. Therefore, overhead electric transmission lines are equipped with overhead shield wires to protect against lightning strikes. Shield wires also minimize corona effects, audible noise, and radio and television interference. See Sections 2.1.5 and 7.2.11 for more detailed information on noise, radio and television interference. North Plains is proposing to use optical power ground wire (OPGW) for the shield wires, which combines the functions of shielding and communications. The conductive part of the OPGW will be grounded at each structure and shield the conductors from lightning strikes. The optical fiber part of the OPGW will have fiber optic cables which will be used for high-speed communication and data transmission, which are necessary for Project telecommunications, but will not be utilized for commercial purposes.

North Plains completed a detailed conductor optimization study for the HVDC portion of Project and selected 525-kV conductors and DMR conductors for the HVDC Transmission Line.

Additionally, North Plains selected the triple-bundled 1590 thousand circular mils (kcmil) aluminum conductor steel reinforced Lapwing Conductor for the Rosebud Transmission Line. Typical design characteristics, including conductor selections, are listed in Table 2.1.3-1.

2.1.3.3 Ground Rods/Counterpoise

North Plains will install a grounding system at the base of each transmission structure to protect against the dangers of high voltage. The grounding system will consist of copper ground rods embedded in the ground in immediate proximity to the structure foundation and connected to the structure by a buried copper or aluminum clad lead. After the ground rods have been installed, North Plains will test the grounding to determine the resistance to ground. If the resistance to ground for a transmission structure is excessive, then North Plains will install counterpoise to lower the resistance. Counterpoise consists of a bare copper-clad or galvanized-steel cable buried a minimum of 12 inches deep (18 inches in cultivated land), extending from the structure for approximately 100 feet within the right-of-way with a ground rod driven in at the end.

2.1.3.4 Line Markers and Bird Diverters (Circular MFSA-2 Section 3.7(9))

Line markers will be used on the transmission line to make the conductors visible to aircraft where required by the Federal Aviation Administration (FAA). The FAA requires colored marker balls in specific situations, such as near airports, airstrips, landing pads, or where small aircraft or helicopters fly low in mountain passes or near freeways. North Plains will install line markers and lighting as dictated by FAA regulations. North Plains does not anticipate that structure lighting will be required because all structures are expected to be less than 200 feet tall. Line markers will also be used at pipeline crossings to help identify the overhead transmission line and prevent accidental contact by pipeline maintenance equipment that may occasionally need to operate in the area.

Bird diverters may be installed on the line at certain locations to minimize avian collision risk. Under low visibility conditions, in-flight birds could collide with electric transmission facilities; these collisions are often injurious or fatal to the birds. Bird diverters are used to increase the visibility of lines for birds to reduce the potential for collisions. The conductor bundles selected for the HVDC Transmission Line are large enough to be seen by flying birds; therefore, bird diverters are typically not needed on conductors. Shield wires, however, are less visible to birds. North Plains may install bird diverters at large wetland or waterbody crossings where habitat or site-specific conditions may increase collision risk. North Plains will work with the DEQ; Montana Fish, Wildlife and Parks (MFWP); and USFWS to review bird diverter placement plans. The locations and types of diverters will be identified in the North Plains Migratory Bird Treaty Act Compliance Plan (MBCP).

2.1.3.5 Control and Monitoring Communication Systems (ARM 17.20.1509(11))

The OPGW will provide telecommunication connectivity for Project operations. The wire properties for this OPGW are provided in Table 2.1.3-2. The optical data signal will degrade with distance as it travels through the optical fiber due to attenuation of the optical fiber and distortion of the optical signal. Consequently, the Project requires fiber repeater stations along the route to overcome signal loss. During detailed engineering, North Plains will perform fiber loss calculations to determine the exact location of fiber repeater stations. The maximum distance between fiber repeater stations is estimated to be around 50 to 60 miles; therefore, the Project will include 2 or 3 fiber repeater stations over the 174 miles of HVDC line in Montana.

A typical fiber repeater station will be 100 feet by 100 feet in area. North Plains will locate each fiber repeater station within the 200-foot-wide permanent right-of-way or within an easement adjacent to the right-of-way. Where possible, North Plains will locate fiber repeater stations in upland areas that have been previously disturbed, such as existing yards, parking lots, or agricultural fields; additionally, North Plains will site these stations to avoid or minimize impacts to environmentally and culturally sensitive sites.

At each fiber repeater station, a small building, approximately 20 feet by 20 feet, will house signal regeneration equipment. Each station will include a permanent access road and power supply via an electric distribution line, likely a 25-kV line. Each fiber repeater station will house emergency backup generators with a liquified petroleum gas storage tank and a battery bank to provide power to the communication system if the main power supply goes down. North Plains will finalize the specific locations of fiber repeater stations prior to construction.

Table 2.1.3-2

Optical Ground Wire Properties

Wire	48-fiber OPGW
Configuration	Single
Wire Diameter (inches)	0.646
Wire Weight (pound per foot)	0.509
Rated Breaking Strength (pounds)	25,098
Fault Current Rating (kA * sec)	151

Note: kA sec = kiloampere seconds

OPGW communications will support North Plains' Supervisory Control and Data Acquisition (SCADA) system. The SCADA system is a computer system for gathering and analyzing real-time data, which is used to monitor and control the transmission line's performance. A SCADA system gathers information, such as the status of a transmission line, and transfers the information back to a central site, alerting the central site of the line's status. The SCADA system also performs necessary analysis and control, such as determining if outage of the line is critical and displaying the information in a logical and organized fashion. SCADA is critical to the operation of the transmission line; therefore, a second OPGW will be installed on the structures to provide redundancy. North Plains will finalize the OPGW specifications prior to construction.

To facilitate mobile communications (e.g., for transmission line patrol, inspection, routine maintenance, and emergency operations), North Plains will use a mobile ultra-high frequency (UHF) / very high frequency (VHF) radio communications system. Each fiber repeater station will include UHF/VHF radio equipment, structures, antennae, and repeaters.

2.1.3.6 HVDC Converter Station

North Plains will site the Rosebud County Converter Station on an approximately 40-acre tract of land east of the Colstrip Substation. The converter station will be capable of converting power between AC and DC current, stepping up voltages, and housing protection and control systems. The converter station will include a DC line entry, DC hall, AC yard, valve hall, control building, cooling equipment, converter transformers, generators, cooling equipment, and spare parts building (see Figure 2.1-1). The converter station will use modern voltage source converter (VSC) technology. VSC is becoming the standard for HVDC transmission lines due to its many advantages including:

- near instantaneous change of direction of power flow;
- operation in weak regions of the grid with low short circuit ratios;
- independent control of active and reactive power with high dynamic response;
- static synchronous compensator-like functionality with network equipment that provides dynamic voltage response to disturbances on the grid within milliseconds;
- the ability to provide a black start during a blackout;
- a grid-forming design providing inertial response to the grid, like conventional synchronous generators, if practical; and
- a smaller footprint and less audible noise than older converter technology.

2.1.3.7 Modifications at Colstrip Substation

North Plains proposes to connect the Project to the existing Colstrip Substation in Rosebud County. This will be the POI to connect to the WECC power system. NorthWestern Energy will make modifications to the Colstrip Substation, which will include installation of additional equipment within and adjacent to the substation to transmit power back and forth between the two separate, parallel EHV AC circuits and the substation. The interconnection will require expanding the fenceline of the existing substation by about 13 acres to accommodate the additional equipment. The existing Colstrip Substation will be modified to interconnect the Rosebud Transmission Line by installing equipment within and adjacent to the substation including the installation of two new 500 kV bays and upgrading the Colstrip Switchyard 500kV bus from a 3,000 A to a 5,000 A rating. The existing footprint of the Colstrip Substation will be expanded by approximately 4 acres to the northwest and approximately 9 acres to the south and east to accommodate the interconnection.

2.1.4 Specifications for Design Peak Voltage (ARM 17.20.1509(5))

The HVDC transmission line is designed for 3,000 megawatts (MW) at ±525 -kV nominal and ±550 kV peak voltages. The Rosebud Transmission Line is designed for 3,000 MW at 500-kV nominal and 550 kV peak voltages.

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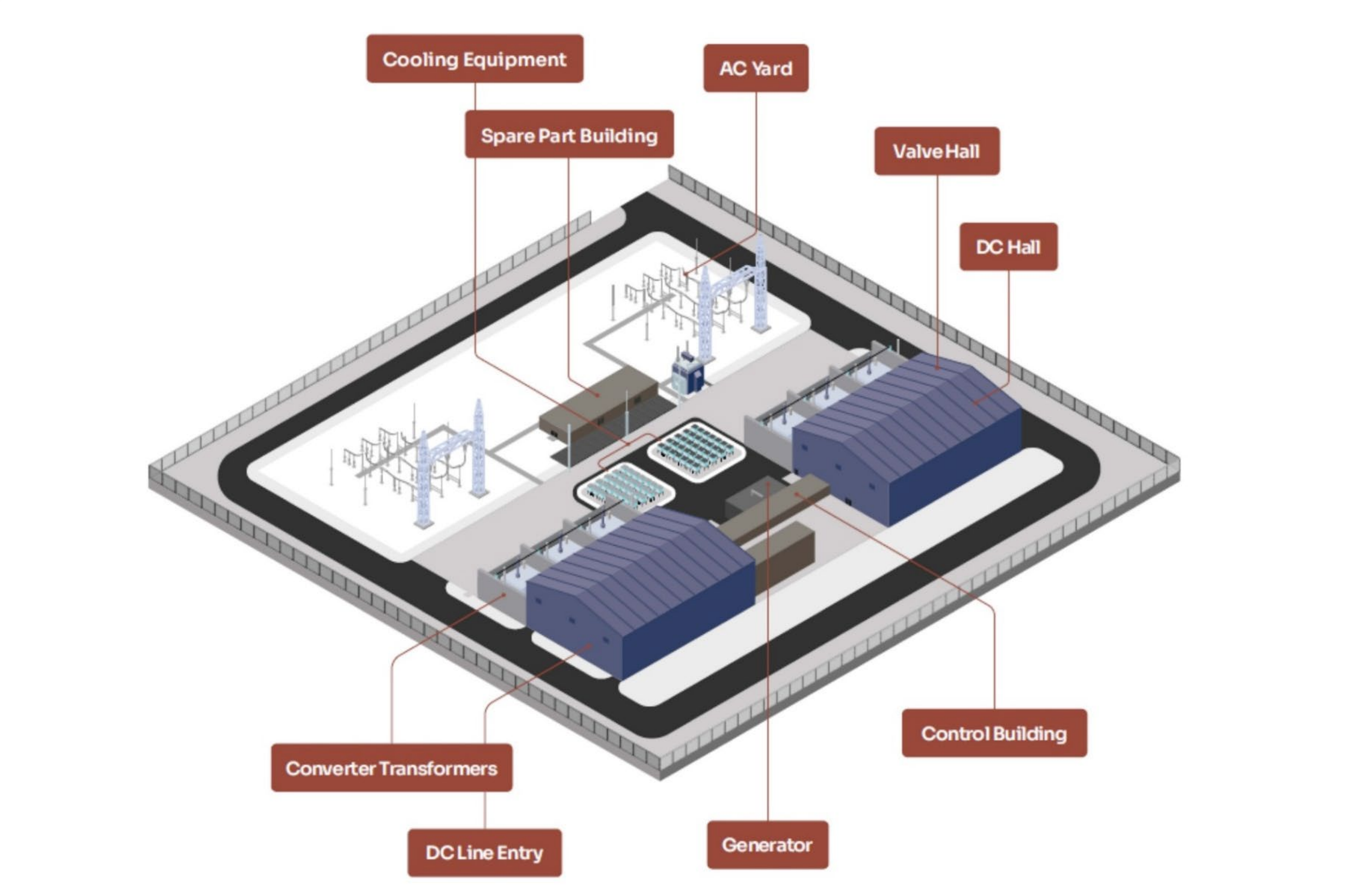

NORTH PLAINS CONNECTOR
A Grid United Project

For Environmental Review Purposes Only

Figure 2.1-1
Diagram of a Typical Converter Station
North Plains Connector Project

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2.1.5 Radio and Television Interference, and Electric and Magnetic Field Strengths (ARM 17.20.1509(6))

MFSA requires an estimate of radio and television interference, and electric and magnetic field strengths for cross-sections of the right-of-way, including maximum conditions under the conductors and at the edge of the right-of-way. This section provides an overview of radio and television interference as well as electric and magnetic field strengths while a more robust discussion is included in Section 7.11.

Electric and magnetic fields are physical fields representing the influences on and from electric charges associated with transmission lines. There are substantial differences in the characteristics of these phenomena in EHV AC and HVDC fields, and as a result, on their potential interactions with the environment including people. The AC electric and magnetic fields induce voltages and currents within nearby conductive objects, whereas static DC electric and magnetic fields do not.

2.1.5.1 Radio and Television Interference

A potential for interference with amplitude modulation (AM) radio signals exists when the receiver is close to overhead AC or DC transmission lines. Radio noise would only affect AM car radio reception at road crossings when a driver passes under the transmission line, like what commonly occurs near AC transmission lines in foul weather.

2.1.5.2 Electric Fields

AC Electric Fields

AC power transmission lines give rise to 60 Hz electric fields that can induce very weak voltages and currents within objects including persons. The induced electric field is weak because the interior of the body is mostly shielded from the electric field at the body's surface. The proposed EHV AC line was calculated to produce electric and magnetic fields at levels below health-based guidance levels recommended by two international organizations, International Committee on Electromagnetic Safety (ICES) and ICNIRP (Exponent, 2024). Under EHV AC lines, these fields may be perceptible. At the highest levels of EHV AC electric fields, persons are protected from harmful shocks by limits imposed by NESC, and the Project is designed to meet these NESC standards.

Table 2.1.5-1 summarizes the 500 kV AC electric field strengths of the Project at its highest level, as well as at both edges of the right-of-way.

TABLE 2.1.5-1

500 kV AC Single Circuit Transmission Line Electric Field

Location	AC Electric Field (kV/m) [a]
Right-of-way edge minus 100 feet	1.8
Maximum on right-of-way	8.9
Right-of-way edge plus 100 feet	1.6

[a] Modeling Assumptions: Operating conditions: 3,000 MW load; +10% overvoltage; 39 feet minimum ground clearance; 3,475 feet elevation

Note: kV = kilovolt; kV/m = kilovolt per meter; MW = megawatt

Source: Exponent, 2024

Studies report that while few persons can detect an AC electric field at levels less than 5-kilovolt per meter (kV/m), more than half can detect an AC electric field of 10 kV/m (Cabanes and Gary, 1981; Deno and Zaffanella, 1982; Graham and Cohen,1985). Other studies conducted in controlled experimental chambers report a threshold of 16.9-kV/m for detection of AC 50 Hz electric fields (e.g., Kursawe et al, 2021). Based on these studies, the AC electrical field would be imperceptible at the edge of the right-of-way and only perceptible to a very few people at the highest level within the right-of-way.

DC Electric Fields

DC transmission lines produce approximately 0 Hz and are thus often referred to as "static" electric fields. In contrast to an AC electric field, a DC electric field induces no significant current within the body. Under a DC transmission line, current is only induced *within* an object or person by movement in a very high intensity static magnetic field. The fields are constrained to the surface of the body and there is no potential for harmful shocks. While operating at full rated power, the DC electric field from the Project will be difficult for most persons to even perceive and the DC magnetic field will not be perceptible. Research and expert evaluations have not found adverse effects that would justify setting limits for static electric fields, and therefore, no evidence-based regulations to limit exposure to static electric fields have been implemented for DC lines.

Table 2.1.5-2 summarizes the 525 -kV DC static electric field and space charge strengths at its highest levels, as well as at both edges of the right-of-way.

TABLE 2.1.5-2

525-kV DC Single Circuit Transmission Line Electric Field

	DC Electric Field		
	Static	Static + Space Charge [a]	
Location	(kV/m)	Fair weather (kV/m)	Foul weather (kV/m)
Right-of-way edge minus 100 feet	-2.3	-5.3	-11.2
Maximum (+) on right-of-way	-15.2	-24.1	-41.6
Maximum (-) on right-of-way	15.2	31.5	42.6
Right-of-way edge plus 100 feet	2.3	7.8	11.2

[a] Modeling Assumptions: Operating conditions: 3,000 MW load; 2,857 A/Polarity; +5% overvoltage; 36 feet minimum ground clearance; 3,490 feet elevation

Note: kV/m = kilovolt per meter; MW = megawatt; A = ampere

Source: Exponent, 2024

A previous study of DC electric fields conducted in an environmental chamber similar to that used by Kursawe et al. reported that critical values for detection of DC electric fields could be more than 40 kV depending upon other factors (Blondin et al., 1996). These studies show that AC electric fields are detected at levels well below those for detection of DC electric fields. The detection of electric fields at both frequencies is strongly related to the perceived movement of body hair on the head and arms (Odagiri-Shimizu and Shimizu, 1999; Chapman et al., 2005). Based on these studies, the DC electrical field would be imperceptible under most circumstances inside and at the edge of the right-of-way but may be slightly perceptible under foul weather conditions at the highest levels within the right-of-way.

2.1.5.3 Magnetic Fields

Despite repeated testing, neither 60-Hz AC nor DC magnetic fields can be reliably detected by any sense at levels at or above those from transmission lines (Tucker and Schmitt, 1978; Graham et al., 1985). Only far stronger AC magnetic fields (i.e., greater than 270 Gauss [G]) as reported by Legros et al. (2024) and far stronger DC magnetic fields (i.e., 40,0000 G) as reported by Schenck (2000) can be detected by mild stimulation of the visual and vestibular systems.

AC Magnetic Fields

Table 2.1.5-3 provides a summary of 500-kV AC magnetic field strengths within and outside the Project right-of-way.

TABLE 2.1.5-3

500-kV AC Single Circuit Transmission Line Magnetic Field (Rosebud Transmission Line)

Location	AC Magnetic Field (mG) [a]
Right-of-way edge minus 100 feet	138
Lowest field on right-of-way	119
Highest field on right-of-way	589
Right-of-way edge plus 100 feet	119

[a] Modeling Assumptions: Operating conditions: 3,000 MW load; 3646 A/Phase; +10% overvoltage; 39 feet minimum ground clearance; 3,475 feet elevation

Note: kV = kilovolt; AC = alternating current; mG = milligauss; A = ampere

Source: Exponent, 2024

DC Magnetic Fields

The magnetic field levels from the ±525-kV DC line are about 4,000 times lower than the only international standard limit specific to static magnetic fields that was developed to minimize minor sensory effects of medical and industrial devices (ICNIRP, 2009). Table 2.1.5-4 provides a summary of the DC magnetic field strengths inside and outside the Project right-of-way.

TABLE 2.1.5-4

525-kV DC Single Circuit Transmission Line Magnetic Field (HVDC Transmission Line)

Location	DC Magnetic Field (mG) [a]
Right-of-way edge minus 100 feet	466
Lowest field on right-of-way	424
Highest field on right-of-way	1,062
Right-of-way edge plus 100 feet	503

[a] Modeling Assumptions: Operating conditions: 3,000 MW load; 2,857 A/Polarity; +5% overvoltage; 36 feet minimum ground clearance; 3,250 feet elevation

Note: kV = kilovolt; mG = milligauss; MW = megawatt; A = ampere

Source: Exponent, 2024

2.1.6 National Electric Safety Code (ARM 17.20.1509(7))

The Project will meet all NESC system design, construction, maintenance, inspection, and worker training standards for overhead power lines, communications lines, and associated substations and converter stations. The design of the Project facilities will meet the electrical standards as discussed in Section 2.1.1.

2.1.7 Opportunities and Constraints on Paralleling or Sharing Rights-of-Way (ARM 17.20.1509(12))

North Plains identified opportunities for paralleling existing utility or transportation rights-of-way, or portions thereof, during the development of the Project route and alternative routes. Paralleling existing rights-of-way can offer advantages over greenfield construction, including potential cost savings, improved construction and maintenance access, and potential compatibility with the surrounding built environment. North Plains prioritized paralleling the Project with existing utility and transportation rights-of-way wherever practicable. Applicable opportunities for paralleling existing utility or transportation rights-of-way included: Interstate 94; U.S. Highway 12; Montana State Highways 39, 59, and 7; various county roads; and various electrical transmission and distribution lines.

In some instances, paralleling rights-of-way can be difficult and is sometimes prohibited due to clear zone requirements in transportation or utility corridors. It can also be difficult because the irregular spacing of structures for parallel electrical transmission lines can create a hinderance to ongoing agricultural or other land uses that could be avoided by providing more distance between the facilities. Additionally, widening existing corridors through colocation can exacerbate existing habitat fragmentation problems and hinder wildlife movement. For some species, two separate corridors may be preferable to one wider corridor, although impact varies greatly among species and the types of habitat affected.

While paralleling can be desirable in some cases, longer paralleling opportunities are often limited due to already congested utility corridors, dense residential and commercial development surrounding the utility corridors, and existing easements that may make siting additional transmission infrastructure on the involved parcels more challenging. Section 6.4 provides details about paralleling opportunities for each route alternative.

2.2 CONSTRUCTION DESCRIPTION (ARM 17.20.1510(1) & Circular MFSA-2 Section 3.7(3))

North Plains anticipates the total construction timeframe for the Project to be approximately 3 to 4 years. North Plains will perform transmission line construction concurrent with converter stations and switchyard construction. North Plains currently anticipates starting construction in 2028 and placing the facility in service by the end of 2032. Construction is anticipated to occur year-round, weather permitting, except for areas that have applicable timing restrictions to protect sensitive species and habitat.

Construction on the Project will typically occur on a 6-day work week (Monday through Saturday) with a typical construction workday duration of at least 10 hours, occurring mostly during daytime hours, typically between 7:00 a.m. and 7:00 p.m. in the summertime. However, weather conditions, site conditions, emergencies, or other atypical circumstances may necessitate extended work outside of typical workday hours, including work at night and on Sundays and holidays.

The general sequence of transmission line construction includes survey and staking, access road construction, workspace clearing, installation of foundations, assembly and erection of structures, installation of conductors and OPGW, and site cleanup and reclamation. Typical transmission line construction activities and sequencing are illustrated in Figure 2.2-1. Various activities will occur concurrently during the construction process, with several construction crews operating simultaneously at different locations, but with each crew passing through any given area at least once. Different crews will work at different paces, but as a rule of thumb, assembly and erection of structures is the slowest activity. Crews can assemble and erect structures at an average pace of about 1 to 2 miles per day. Progress may be slowed where the size and/or depth of foundations requires additional time. Further, progress may be slowed where subsurface conditions are difficult and require a long-term drilling or blasting program or redesign of foundations. Conductor and OPGW installation can be completed at an average pace of about 1 mile per day.

North Plains anticipates construction will require a peak temporary workforce of approximately 800 workers. Appendix C shows a list of typical construction personnel and equipment expected for the Project, assuming uninterrupted construction. Delays due to weather, material delivery, and natural resource time-of-year restrictions (TOYR) may extend the construction timeline.

Prior to construction, North Plains will obtain all necessary federal, state, and county permits and approvals (see Table 9.0-1 in Section 9); acquire relevant easements and right-of-way grants; and conduct pre-construction engineering, geotechnical testing, and environmental surveys.

2.2.1 Survey and Staking

The first step of construction typically involves survey crews staking, flagging, or otherwise marking the limits of the construction right-of-way, the centerline of the proposed route, the limits of pulling and tensioning workspaces, the locations of approved access routes, and other permitted work areas. Crews also mark environmentally sensitive areas (e.g., waterbodies, cultural resource sites, sensitive species locations) where appropriate. The construction contractor will contact the One Call system to locate, identify, and flag existing underground utilities to prevent accidental damage during construction.

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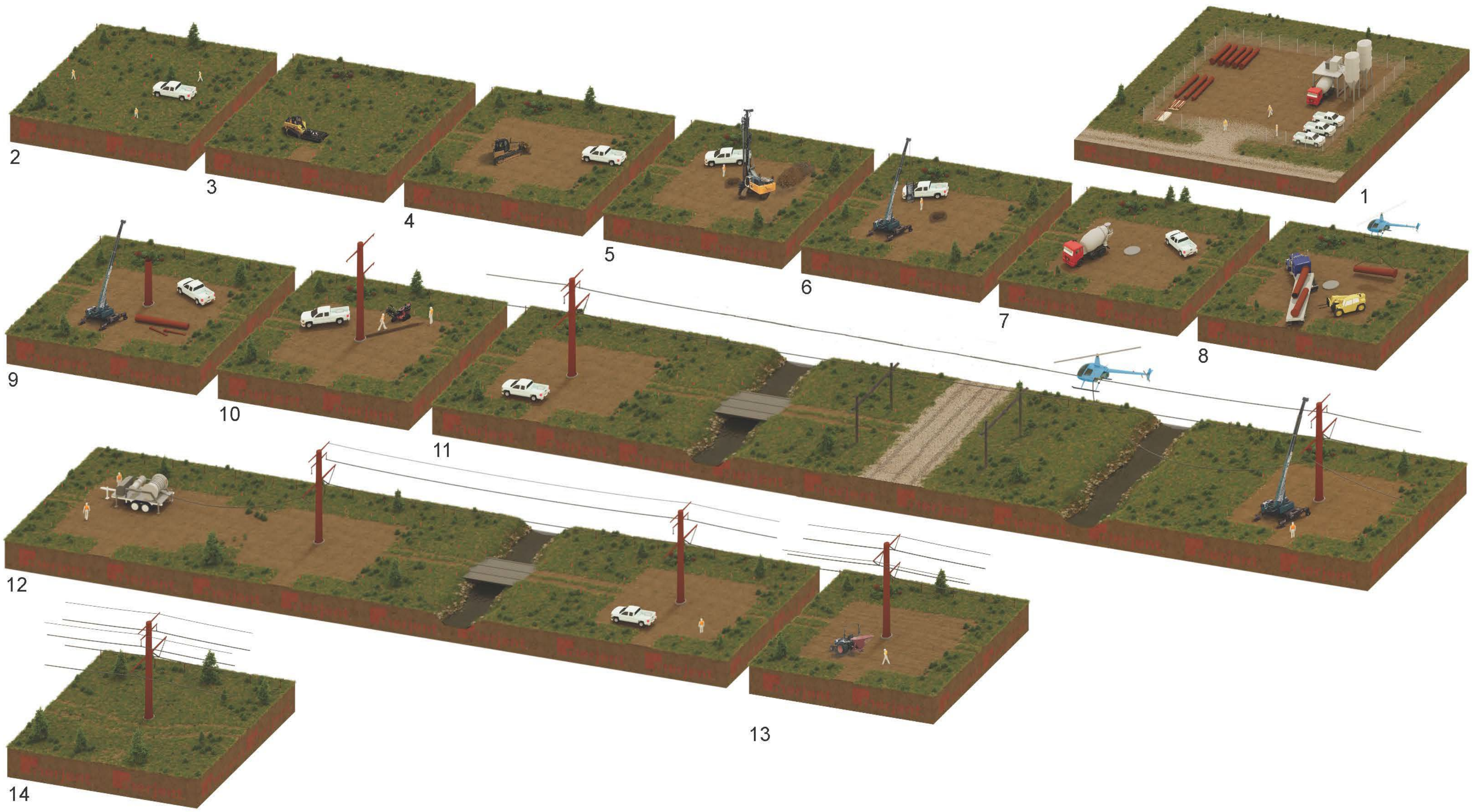

NORTH PLAINS CONNECTOR
A Grid United Project

Graphic is not to scale and for environmental review purposes only.

Figure 2.2-1
Typical Construction Sequence
North Plains Connector Project
North Plains Connector LLC

1. Material yard and/or concrete batch plant
2. Survey and staking
3. Workspace clearing and access road construction
4. Grading and/or site preparation
5. Foundation hole drilling
6. Foundation cage installation
7. Concrete foundation poured
8. Material delivery to site
9. Tower structure assembly
10. Grounding system and guy wire installation
11. Conductor and optical ground wire stringing
12. Tensioning
13. Site cleanup and restoration
14. Opperation and maintenance

2.2.2 Project Workspace Requirements (ARM 17.20.1510(2) & ARM 17.20.1510(4))

The following sections address the Project workspace requirements identified in the Administrative Rules of Montana (ARM) 17.20.1510 (2, 4, and 5), including an estimate of the ground disturbance at a typical structure site and pulling and tensioning site. Additionally, these sections address right-of-way widths, construction easements, and land use restrictions. Finally, these sections describe the reclamation methods that will be used to restore the right-of-way. Table 2.2.2-1 summarizes Project workspace needs. Figure 2.2-2 shows the typical layout of various workspaces on the Project route.

Table 2.2.2-1

Project Workspace Requirements

Feature	Proposed Value or Description
LAND REQUIRED DURING CONSTRUCTION	
Structure pad work areas	Structure pad work areas typically will be 200 x 200 ft (0.92 acre) or 200 x 250 ft (1.15 acres). However, some sites will be as large as 200 x 500 (2.30 acres). Individual structure pads are adjusted to avoid sensitive resources, including wetlands and waterbodies and cultural resources and tribal sites. There will be approximately 38 structures on the Rosebud Transmission Line and approximately 865 structures on the HVDC Transmission Line in Montana. Actual structure count may vary and will depend on the final engineering design based on engineering, geological, environmental, and landowner considerations.
Wire pulling/tensioning site	Wire pulling/tensioning sites will be up to 200 x 750 ft (3.4 acres) in size. Individually, these sites are highly customized, and many sites will be smaller. Some sites will also be bi-directional (two “wings” at single structure). Sites range in size from 0.4 acre to 8.4 acres, possibly larger. There will be approximately 8 pulling/tensioning sites on the Rosebud Transmission Line and approximately 146 pulling/tensioning sites on the HVDC Transmission Line in Montana.
Fiber splicing/line splicing site	Splicing sites are typically 200 x 300 ft per site (1.38 acres) and are needed approximately every 2 miles. There are about 90 fiber splicing/line splicing sites total in Montana.
Fiber repeater station	Fiber repeater stations sites are typically 100 x 100 ft per site (0.23 acre). Sites are needed approximately every 50-60 miles for a total of about 2 or 3 stations in Montana.
Guard structures	Guard structures typically are 80 x 80 ft (0.15 acres). There will be approximately 30 guard structures at road and railroad crossings and other sensitive areas in Montana.
Multi-purpose construction yard	Typical multi-purpose construction yards will be about 20 acres per site and will be needed approximately every 30 miles for a total of about 6 or 7 sites in Montana. Some yards may be smaller and some may be larger than the typical 20-acre site.
Helicopter fly yard	Helicopter fly yards are about 5 acres per site and normally will be located adjacent to a construction yard. One fly yard is proposed in each Rosebud, Custer, and Fallon counties.
Access roads	Access roads typically require a 16-foot-wide travel lane. Access roads (not including overland travel) may result in a limit of disturbance of up to approximately 25 feet to accommodate clearing and grading, as necessary. The limits of disturbance may increase up to 50 feet in some locations to accommodate the safe and efficient movement of construction equipment through varying terrain. Overland travel lanes during construction typically will be 16 feet wide within a 25-foot-wide designated corridor.
Existing substation interconnection	An approximate 13.2-acre expansion of existing site for operation
Rosebud County Converter Station	Approximately 40 acres for construction.

Table 2.2.2-1

Project Workspace Requirements

Feature	Proposed Value or Description
LAND PERMANENTLY REQUIRED	
Right-of-way width	The Project will require a 200-foot-wide permanent right-of-way for the transmission line, except where the Rosebud Transmission Line consists of two parallel lines, the Project will require a 320-foot-wide right-of-way to accommodate both lines.
Area occupied by structure (structure footprint)	Rosebud Transmission Line (EHV AC) Tangent Monopole: up to a 10-foot-diameter per structure Dead-end Monopole: up to 15- foot-diameter per structure x 3 structures Tangent Lattice: up to 50 by 50 feet Dead-end Lattice: up to 55 by 55 feet HVDC Transmission Line Tangent Monopole: up to a 15-foot-diameter per structure Dead-end Monopole: up to a 15-foot-diameter per structure Tangent Lattice: up to 55 by 55 feet Dead-end Lattice: up to 55 by 55 feet
Fiber repeater station	Fiber repeater stations normally will be occupy 40 x 80 ft per site (0.07 acre) after construction.
Access roads (improved existing and new)	Same as construction.
Existing substation interconnection	An approximate 13.2-acre expansion of existing site for operation.
Rosebud County Converter Station	Approximately 23 acres for operation.

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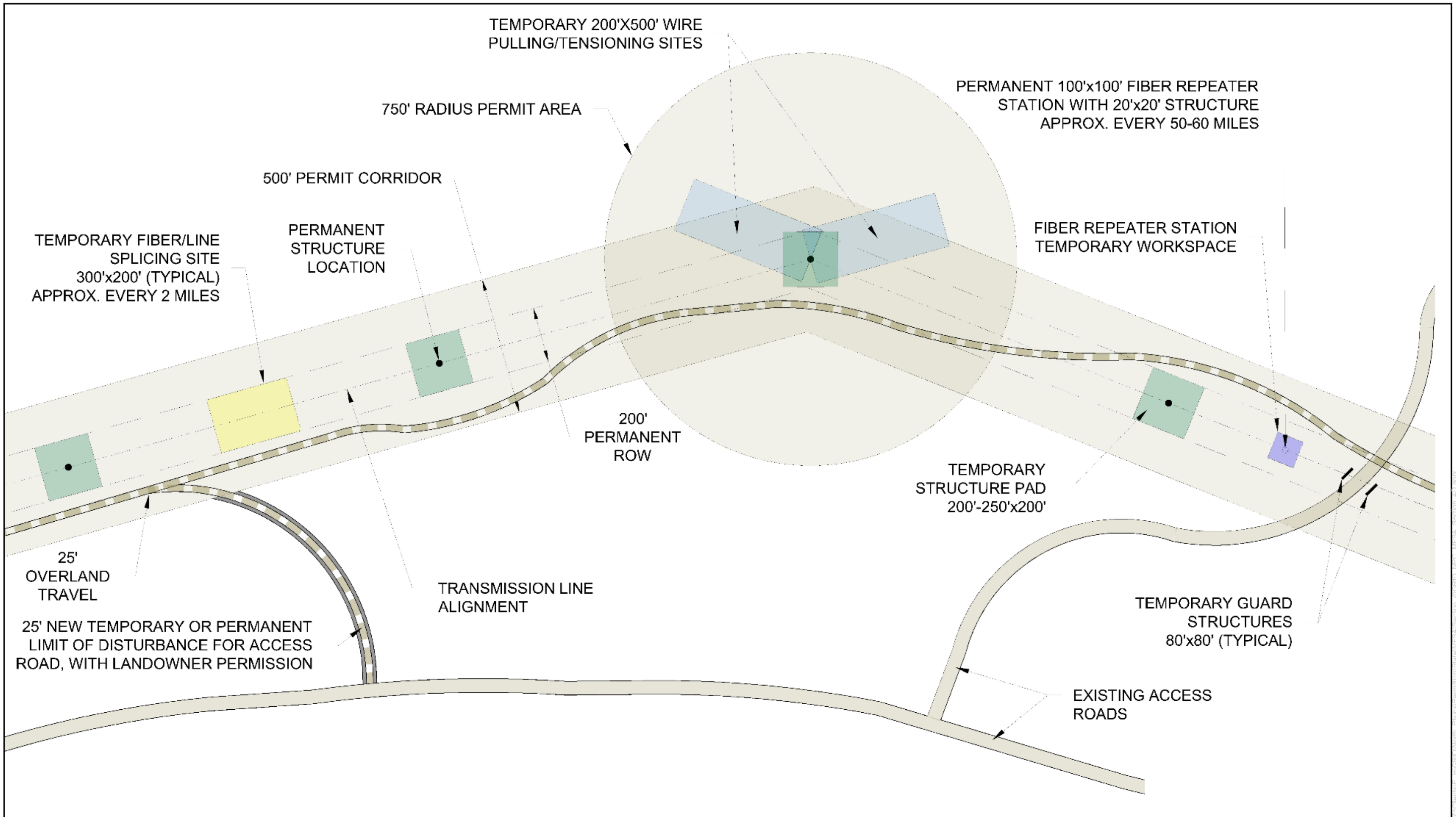

NORTH PLAINS CONNECTOR

For Environmental Review Purposes Only

Figure 2.2-2
Typical Construction Workspace
North Plains Connector Project
North Plains Connector LLC

New Access Road/Overland Travel
Permanent Right-of-Way Boundary
Transmission Line Alignment
Permit Area
Fiber Repeater Station
Structure Work Area
Fiber/Line Splicing Site
Pulling/Tensioning Site

2.2.2.1 Project Workspace Clearing

In general, the Project will require a 200-foot-wide construction and permanent right-of-way. The right-of-way width was calculated based on anticipated span lengths and conductor blow out during inclement weather. Within the permanent right-of-way, each structure will typically require a 200-foot by 200-foot construction workspace approximately centered on the structure. Structures exceeding 170 feet in height will require a 250-foot by 200-foot workspace. Adjustments will be made for Project workspaces to avoid encroachment into sensitive resources. The Project workspace will be used for laydown, assembly, and erection of each structure. Workspaces also will be needed between structure sites and at other locations on or adjacent to the right-of-way for a variety of other purposes, including access (see Section 2.2.3), wire pulling/tensioning (see Section 2.2.2.4), fiber line splicing (see Section 2.2.2.4), fiber repeater stations (see Section 2.1.3.5), and guard structures at roads, railroads and other powerline crossings (see Section 2.2.2.4). Workspace will also be needed outside of the typical 200-foot right-of-way for multi-purpose construction yards and fly yards (see Section 2.2.2.3), as well as for the converter station (see Section 2.1.3.6) and where modifications will be required at the Colstrip Substation (see Section 2.1.3.7).

During construction, construction crews will prepare workspaces, which potentially will involve removing trees, shrubs, brush, and large rocks from the work site. Crews will generally cut vegetation at or slightly above the surface of the ground, leaving rootstock in place where possible. Crews will burn, chip, or mulch brush and other cleared material within the construction right-of-way, or temporarily store the material within the construction work area before hauling to an appropriate disposal location. Where burning is conducted, North Plains will obtain necessary burn permits and comply with all applicable federal, state, county, and local fire regulations as detailed in Section 2.2.4 and outlined in the Project's CMRP and accompanying Fire Prevention and Suppression Plan. Crews will either leave excess spoil/fill and rock on the right-of-way after construction with landowner or land management agency permission or haul excess rock away and dispose of properly.

In some cases, construction crews may need to perform grading to level the ground and allow for the safe operation of construction equipment within the Project workspace. Where grading extends below the topsoil layer, North Plains will separate topsoil and store it separately from subsoil in accordance with the CMRP. During restoration, North Plains will return subsoil to its original horizon, followed by topsoil.

North Plains will obtain all necessary permits, including storm water discharge authorizations, prior to construction. North Plains will install temporary erosion controls during clearing and prior to grading in accordance with the CMRP and accompanying Storm Water Pollution Prevention Plan (SWPPP). North Plains will employ environmental inspectors during construction to help determine the need for erosion controls and ensure they are properly installed and maintained. Temporary erosion control measures will remain in place until permanent erosion controls are installed, or restoration is completed.

2.2.2.2 Installation of Foundations

Steel monopole or multi-pole structures and lattice towers will typically be supported by cast-in-place, concrete pier foundations. To construct a cast-in-place foundation, construction crews first make a vertical hole (or holes, for multi-pole structures or lattice towers) using power drilling equipment, such as track-mounted augers of various sizes, depending on the diameter and depth requirements of the hole to be drilled. In rocky areas, the foundation holes may be excavated by blasting or installing special rock anchor or micro-pile type foundations.

Once the hole (or holes) is excavated, construction crews install reinforced-steel anchor bolt cages in the hole. These cages are designed to increase the structural integrity of the concrete. Typically, crews will assemble the cages at the nearest staging area and deliver the cages to the structure site via flatbed truck. Crews will insert these cages in the holes prior to pouring concrete. Next, crews will fill the excavated holes containing the reinforcing anchor bolt cages with concrete or approved bedding material. However, because of the remoteness of some of the transmission line structures, North Plains may need to provide concrete from portable batch plants located at multi-purpose construction yards about every 30 miles along the route. Crews will wash out concrete trucks within the Project workspace or in designated concrete washout areas on the right-of-way according to the CMRP. No hardened waste concrete will be dumped or left on the right-of-way after construction. Excess waste concrete will be hauled off and disposed of properly.

If construction crews encounter hard rock during grading or excavation for structure foundations, crews may need to perform blasting (i.e., the use of explosives) to loosen or fracture the rock to reach the required depth. Prior to blasting, the construction contractor will prepare a site-specific blasting plan to validate the intended outcome of blasting and to ensure the safety of people, property, and the environment in the vicinity of the blast. The plan will include measures for notifying landowners and tenants in advance of blasting, stipulate that blasting be conducted only during daylight hours, and prohibit blasting near sensitive areas, such as residences, wells, septic systems, and active nesting sites.

Construction crews will spread excess fill from foundation excavation on contour at the structure excavation site prior to seeding. Subsoil spoil will be returned to the subsoil horizon and topsoil spoil will be restored to the topsoil horizon. Where the landowner or land managing agency requests spoil be removed from the site or where there is excess subsoil spoil, crews will remove spoil as well as hardened waste concrete from the site for proper disposal or recycling.

2.2.2.3 Assembly and Erection of Structures

Constructions crews will transport monopole and multi-pole structures to each structure work area as an entire structure or in sections by truck or helicopter. At the structure site, crews will place each structure section on wood blocking. First, crews will use a large crane to hoist the bottom section onto the structure foundation and mount on the anchor bolts. Next, crews will lift the middle section (or sections) into place, using guide brackets to align the section. Crews will then climb the assembly to ensure proper alignment and secure the fitting. Finally, crews will guide and secure the top section into place to complete the structure. North Plains will then install a grounding system at the base of each transmission structure. Ground rods/counterpoise are discussed in more detail in Section 2.1.3.3.

Where welding is required, North Plains will take appropriate precautions to prevent accidental fire as described in the CMRP and accompanying Fire Prevention and Suppression Plan. Where there is a high fire risk, North Plains will restrict welding to areas where vegetation has been cleared or the risk of igniting vegetation is mitigated in accordance with the CMRP and accompanying Fire Prevention and Suppression Plan. Construction crews will maintain an adequate supply of fire extinguishers in working order. In cases of extreme fire danger, North Plains may implement additional site-specific precautions or stop welding for a prescribed period in consultation with federal, state, and local fire authorities. In the event of a fire, North Plains personnel will immediately notify relevant fire authorities and their designated representatives and make available the resources necessary to contain the fire. Section 2.2.4 provides additional information regarding fire control.

Lattice tower assembly is like monopole or multi-pole structure assembly, with crews transporting bundles of steel members and associated hardware and wood to each structure site by truck. Next, crews lay out wood blocking, open the structure steel bundles, and place the structure steel bundles on the wood blocking for assembly. Typically, crews assemble the leg extensions for the structures first and erect the leg extensions with a small crane. Crews then assemble subsections and hoist the subsections into place with a large crane. Crews fasten the subsections together to form a complete structure. A follow-up crew then tightens the bolts in the joints.

North Plains may use helicopters to erect structures. The use of helicopters for structure erection is typically limited to areas that are difficult to access, either due to a lack of roads, rough terrain, or both. North Plains will consider several site- and region-specific factors when deciding whether to use helicopters, including access to structure locations, sensitive resources, permitting restrictions, landowner needs and preferences, construction schedule, weight of structural components, time of year, elevation, availability of heavy lift helicopters, and construction economics.

Where helicopters are used to erect structures, construction crews will stage construction activity at a fly yard. Fly yards will be approximately 5 acres in area. North Plains will transport the structure sections and associated hardware (e.g., insulators, hardware, blocking, stringing sheaves) to the fly yard by truck, where construction crews will assemble the structure in sections and stage the structure for transport to the right-of-way. Once staged for transport, crews will attach structure sections by cables from the helicopter to the top of the structure section and will airlift the structure section to the structure location. Upon arrival, crews will place the section directly onto the foundation or stacked on top of the previous structure section. North Plains will locate helicopter fly yards in upland areas that have been previously disturbed, such as existing yards, parking lots, or fields, and will avoid impacts to environmentally and culturally sensitive sites.

2.2.2.4 Installation of Conductors and OPGW

Insulators, hardware, and stringing sheaves will be delivered to each structure site. The structures will be rigged with insulator strings and stringing sheaves at each conductor, DMR conductor, and OPGW position. For safety and efficiency reasons, wire stringing and tensioning activities are typically performed during daylight hours and are scheduled to coincide to the extent practicable with periods of minimal road traffic to minimize traffic disruptions.

Pilot lines will be pulled (strung) from structure to structure by either a helicopter or land-operated equipment, then threaded through the stringing sheaves at each structure. Following pilot lines, a stronger, larger-diameter line will be attached to conductors to pull them onto structures. This process will be repeated until the conductor and OPGW are pulled through the sheaves. Stringing will use powered pulling equipment at one end and powered braking or tensioning equipment at the other end of a conductor segment. The tensioner, in concert with the puller, will maintain tension on the wires while they are fastened to the structures. Once each type of wire has been pulled in, the tension and sag will be adjusted, stringing sheaves will be removed, and the conductors will be permanently attached to the insulators. Refer to Figure 2.2-1 for a general illustration of this procedure.

At tangent structures, conductors will be attached to insulators using clamps, and at dead-end structures, the conductors will be cut and attached to the insulator assemblies by "dead-ending" the conductors either with a compression fitting or an implosive-type fitting. Before proceeding with the implosive-type fitting, appropriate land management and resource agencies, private landowners, and public safety organizations will be notified.

North Plains will transport conductor wire and OPGW to the Project on large reels (spools). Construction crews will splice the conductor wire from separate reels together approximately every 8,000 feet. Similarly, OPGW wire will be spliced end-to-end to ensure a continuous path for the optical signal. Splicing activities occur in workspaces about 300 feet long by 200 feet wide. These workspaces will be about 2 miles apart. Where possible, North Plains will locate splicing workspaces to avoid or minimize impacts to environmentally and culturally sensitive sites.

Temporary guard structures will be erected at road and railroad crossing locations where necessary to protect the public during stringing activities. Guard structures will typically consist of H-frame wood poles or line trucks placed on either side of the road/railway to prevent ground wires, conductors, or equipment from falling onto and disrupting road traffic. Equipment for erecting guard structures will include augers, tractor/pole trailers with lift, and pickup trucks. Guard structures may not be required for small roads. In such cases, other safety measures such as barriers, flagmen, or other traffic controls will be used. Guard structures typically will temporarily occupy an area 80 feet by 80 feet. Refer to Figure 2.2-1 for a general illustration of the use of guard structures.

Typically, guard structures are installed just outside of the road/railroad right-of-way. Although the preference is for access to each of these guard structures to be located outside the road/railroad right-of-way, it may be necessary for access to be in the road/railroad right-of-way depending on topography and access restrictions imposed by the regulatory agency (e.g., the Federal Highway Administration, Montana Department of Transportation (MDT), and/or county road and bridge departments). Exceptionally wide road crossings (greater than 200 to 300 feet), such as may occur at the Interstate, will require installation of temporary guard structures in medians between opposite-traffic-flow lanes. The erection and dismantling of these temporary guard structures may require short-term traffic diversions. Traffic impacts resulting from wire-stringing include short-term traffic diversions, traffic congestion, and brief road closures.

Railroad crossing operations and procedures are controlled by the railroad company operating the affected rail line. Typically, stoppage of railroad traffic is not required during construction or conductor stringing and tensioning activities. Crossing activities are like those for road crossings and typically involve the use of temporary guard structures, as discussed above. Stringing and tensioning activities will be performed in coordination with the appropriate railroad authorities. For safety and efficiency, stringing and tensioning activities are performed during daylight periods and are scheduled to coincide with times when railroad traffic is minimal. The railroad will typically provide a switchman to be present when work is being performed near or over railroad lines. Following stringing and tensioning, the guard structures will be removed, and the area reclaimed.

North Plains will follow standard industry practice where crossing other powerlines. Standard industry practice generally dictates that the higher voltage line cross over the top of the lower voltage line, except where site-specific conditions may necessitate otherwise. Standard industry practice also suggests that the lines cross at mid-span and at right angles where possible and that guard structures be used to protect the powerlines during stringing and tensioning where needed. North Plains will follow standard industry practice where crossing other powerlines and will coordinate crossings with the other powerline operators.

2.2.2.5 Site Cleanup and Reclamation (ARM 17.20.1510(5))

Cleanup and restoration will begin within weeks of stringing the conductors and OPGW in any given area. Restoration will involve grading work areas to establish drainage away from foundations, maintain soil stability, and allow for operational access to structure sites while also maintaining natural contours as practicable. Solid waste will be recycled or hauled away for proper disposal. If seasonal or other weather conditions prevent grading within a reasonable amount of time, temporary erosion controls will be maintained until replaced by permanent erosion control structures or restoration is complete.

Soil will be tested for compaction in cultivated fields that are disturbed by construction. Compacted areas will be plowed as necessary. Where applicable, cut and scraped vegetation will be spread back across the work area. Surplus construction material, debris, and rock will be removed from the right-of-way and disposed of properly unless the landowner or land-managing agency approves otherwise.

Disturbed areas will be seeded following final grading, weather and soil conditions permitting. North Plains will conduct restoration activities in accordance with landowner agreements, permit requirements, and written recommendations on weed-free seeding mixes, rates, and dates obtained from the local Natural Resources Conservation Service office or other duly authorized agency, and in accordance with Project construction and restoration plans. Alternative seed mixes specifically requested by the landowner or required by agencies may be used, excluding designated noxious weeds. Vegetation management will occur on an ongoing basis, as discussed in Section 2.3, including weed control. More detail on weed control best management practices and coordination with the local Montana Weed Districts is included in the CMRP and accompanying Noxious Weed and Aquatic Invasive Species Management Plan.

North Plains will stabilize inactive construction areas in accordance with the Project SWPPP. Stabilization methods may include the application of temporary weed-free seed and/or mulch. North Plains will not apply mulch in cultivated areas unless specifically requested by the landowner and will not apply mulch within wetlands.

2.2.3 Access Road Construction (ARM 17.20.1510(3) & Circular MFSA-2 Section 3.7(7))

Access roads are essential during construction to provide adequate entry to structure sites and appurtenance locations. Project access will rely on a variety of road types, including existing roads, new temporary or permanent access roads, and overland travel in areas where no road is currently present and no improvements are necessary to provide Project access. The large equipment used during construction will typically require a 16-foot-wide travel lane. Access roads (not including overland travel) may result in a limit of disturbance of up to approximately 25 feet to accommodate clearing and grading, as necessary. The limits of disturbance may increase up to 50 feet in some locations to accommodate the safe and efficient movement of construction equipment through varying terrain (locations may include accommodations for passing lanes or turnouts; large equipment turning radii; cut and fill in rugged terrain; tree, boulder, and rock removal; bridge and culvert construction; and other waterbody crossings). The following access road types are anticipated to be used on the Project. In all cases, gates and cattle guards will be installed and maintained on access roads where required by the landowner to contain livestock and/or secure the road.

- Existing Access Road – No Improvement. This access road type includes paved or all-weather surfaced roads and well-traversed and established dirt or gravel roads that will not require improvements for use. No new disturbance will be created outside of the established roadbed and shoulders. This access road type could require regular maintenance to keep the road passable throughout construction. Regular maintenance could include minor blading activities, repair of washed-out areas, grading down washboards, filling depressions and blow-outs with clean fill, and repaving potholes and damaged surfaces.

- Existing Access Road – Improvement. This access road type includes existing roads that will require improvement prior to Project use. Improvements could include blading, cut-and-fill activities, widening/straightening curves, re-establishing drainage features, tree removal, boulder and rock removal, bridge and culvert construction/repair, installation of wash crossings, and other improvements to provide an adequate surface to support construction and maintenance vehicles. North Plains will install the appropriate best management practices (BMPs) for water crossings, pipeline protection, and sediment and erosion control before or during road improvement. Improvements to existing access roads will be permanent, unless removal is required by the land-management agency or landowner; temporary road improvements will be reclaimed to preconstruction conditions, if necessary.

- New Permanent Access Road. This access road type includes the construction of new permanent access roads where roads do not exist, with the purpose of allowing access to the Project right-of-way. Access road construction may include vegetation, rock, and debris clearing; cut-and-fill and grading; establishing drainage features; bridge and culvert construction; laying of aggregate; paving; and other improvements to provide an adequate surface to support construction and maintenance vehicles. North Plains will obtain and follow all necessary federal, state, and/or local permits for construction of new permanent access roads and install BMPs as defined in the Project SWPPP for water crossings, pipeline protection, and sediment and erosion control before or during permanent access road construction. Permanent access roads may be dirt, gravel, asphalt, concrete, or another hard surface.

- New Temporary Access Road. This access road type includes temporary access roads required for the construction of the Project. Construction of temporary access roads may involve many of the same steps as permanent access roads; however, temporary access roads are not paved with asphalt or concrete. North Plains will install the appropriate BMPs for water crossings, pipeline protection, and sediment and erosion control before or during temporary access road construction. In some cases, such as in wetlands or hydric soils, matting may be used to provide support for construction equipment. Following construction, temporary access roads will be reclaimed and revegetated, although cut and fill contours may be retained to allow for future safe overland travel during operation.

- Overland Travel. This road type consists of using the Project right-of-way and adjacent routes leading to the right-of-way and other Project areas as the primary access where there are no existing roads, and no road construction or improvements are necessary to move equipment during construction or operation. Overland travel lanes during construction typically will be 16 feet wide within a 25-foot-wide designated corridor. Vegetation will be driven over and may be damaged.

Any areas where the soil becomes rutted, or vegetation is disturbed, will be reclaimed.

- Turnarounds. Additional temporary space along some access roads allowing for vehicle turnarounds or bi-directional travel.

Where access road improvements or new access road construction is needed, North Plains will commence road work by clearing vegetation and other obstacles in the path of the roads. North Plains will conduct grading where needed to provide a safe and level driving surface. Dirt or gravel may be imported to stabilize the roadbed. Fill materials that may be used to construct and maintain access roads may include aggregate materials such as gravel, sand, and clay. North Plains will purchase these materials as needed from local commercial operations. Fill materials will not contain unsuitable material such as trash, debris, and asphalt and will be free of toxic pollutants in toxic amounts. Topsoil will not be used as fill. After construction, North Plains will reclaim temporary roads or leave the roads in place in accordance with land management agency or private landowner requests.

As required in Circular MFSA-2, Section 3.7(7), access roads have been identified for all alternatives analyzed in this application. Impacts are described throughout Section 7 of this application and are included in the acreage calculations of that section. North Plains will design temporary permanent access roads in accordance with federal, state, and local design standards and permits.

2.2.4 Fire Control (ARM 17.20.1510(6))

North Plains will comply with all applicable federal, state, county, and local fire regulations pertaining to the prevention of uncontrolled fires, as outlined in the Fire Prevention and Suppression Plan included as an attachment to the Project's CMRP. The Plan will include guidance on storage of flammable materials and wastes; requirements for firefighting equipment; restrictions on welding, equipment idling, and burning under certain conditions; and relevant fire authorities and notification requirements.

2.3 OPERATION AND MAINTENANCE

2.3.1 Operation and Maintenance Procedures under Normal and Emergency Conditions (ARM 17.20.1512(1))

Regular inspection of transmission lines and substation equipment is important for the safe, efficient, and economical operation of the Project. Regular ground and aerial inspections will be performed in accordance with good utility practices for transmission line inspection and maintenance. Project facilities will be inspected regularly for corrosion, equipment misalignment, loose fittings, vandalism, and other mechanical problems. The need for vegetation management on the transmission line right-of-way will also be determined during inspections and in accordance with a Transmission Vegetation Management Plan. North Plains will respond to outages from line failure (e.g., downed conductor) with immediacy and will exercise its emergency ingress/egress rights to make necessary repairs. Vegetation related outages, although rare, may require forestry personnel to remove vegetation.

Although not anticipated, North Plains will respond to any impacts of line-generated radio and/or television interference by investigating complaints and implementing appropriate mitigation measures.

2.3.2 Resiliency and Public Safety (ARM 17.20.1512(2))

Transmission lines will be designed in accordance with the specifications, guidance, and other documents outlined in Section 2.1 with regard to regional weather and load cases. The types of weather and load cases that are used on transmission line projects include extreme wind cases, combined ice and wind, and other more local practice type cases such as extreme ice. These weather and load cases are used to help provide resilient structural designs and minimize structure failures and outages. While extreme weather events such as tornados and derecho wind may occur, these events are rare and unpredictable and require an operational response rather than using design metrics to prevent failure.

In addition to the NESC and ASCE weather and load cases, transmission system design also considers conductor blowout (sway) for right-of-way calculations and conductor galloping to prevent outages from occurring when energized conductors meet grounded objects. Vegetation management is important to prevent phase-to-ground outages from lines touching trees. The vegetation clearance requirements (see Table 2.1.3-1) will be maintained within (and outside of, if necessary) the permanent right-of-way to prevent these outages. When the right combination of ice on the wires and steady wind occurs, the wires can undulate or "gallop." This galloping motion can cause the electrical clearance between wires to decrease such that a flashover occurs, causing a line fault. To the extent possible, the transmission line has been designed to withstand galloping.

2.3.3 Right-of-Way Control (ARM 17.20.1512(3))

The transmission line will be designed and constructed to meet or exceed the requirements of the NESC. These requirements provide for the safety and protection of landowners and their property, the public, and operator employees. After construction, compatible uses in the Project's right-of-way will be considered and approved by North Plains, as appropriate.

For private land, compatible uses are determined in accordance with the terms and conditions of the easement for the Project. Ranching and farming activities, gardening, recreational activities, and other uses are generally permitted in the right-of-way if care is taken to prevent damage and maintain access to transmission line structures. However, no buildings or structures may be erected in the permanent right-of-way because they could impede the safe operation of the transmission line or interfere with maintenance access. For safety reasons, pumps, wells, swimming pools, and flammables must not be placed in the permanent right-of-way. Properly grounded fences, gates, wells, and irrigation systems are acceptable.

Inspection of the transmission line will be conducted by air and on the ground on a regular basis. Inspections and other non-emergency operational activities will be conducted in compliance with state and federal regulations and Project commitments (including the Project's CMRP) to minimize impacts to sensitive habitats and species.

In general, the inspections will assess the condition of the transmission line and hardware to determine if any components need to be repaired or replaced, or if other conditions exist that require maintenance or modification. Inspections will also determine the need for vegetation management, including noxious weed treatment, and note unauthorized encroachments, such as trash dumping on the right-of-way that could constitute a safety hazard.

2.3.4 Right-of-Way Management (ARM 17.20.1512(4))

The right-of-way will be allowed to revegetate with herbaceous and low growing brushy vegetation after construction; however, larger shrubs and trees will be periodically trimmed from the right-of-way where they pose a risk of damage or interference with the transmission line. The frequency of this vegetation maintenance will depend on the vegetation growth rate, but as a rule, targeted vegetation management will occur annually based on the results of ongoing inspections. North Plains will consider environmentally sensitive constraints when scheduling vegetation maintenance, including avoiding interference with the GRSG and migratory bird nesting seasons, unless a critical situation arises that warrants immediate attention, such as high potential for phase-to-ground outages from trees touching lines.

North Plains has prepared a Noxious Weed and Aquatic Invasive Species Management Plan for construction and operations, which will be submitted to County Weed Boards for review and is included as an attachment to the CMRP. This plan includes provisions to identify areas of noxious weed infestations where required under state and county regulations and/or landowner agreements before construction to establish a baseline condition for the right-of-way. It also includes a requirement to identify noxious weed infestations during operations as part of the annual right-of-way ground inspections for a minimum of three years following construction (see Section 2.3.3). Treatment of weed infestation will include options for mowing prior to seed development as well as herbicide application and/or spot treatment near ecologically sensitive areas. Additional weed control methods will include provisions for equipment cleaning during construction and operation and using only weed-free seed, mulch, and straw/hay bales to stabilize the right-of-way.

3.0 COST OF THE FACILITY (ARM 17.20.803(3)(c))

3.1 Estimated Cost of Facilities (ARM 17.20.811)

For the purposes of general disclosure, estimates of capital costs for the facility are:

- Total Project – $5.033 billion;
- Outside Montana – $2.883 billion; and
- Inside Montana – $2.150 billion.

The detailed breakout of the costs outlined in ARM 17.20.811 has been provided in a non-public confidential submittal to the DEQ pursuant to a request for confidentiality under ARM 17.20.302.

The North Plains capital expenditure estimate has been developed based on preliminary design quantities, indicative HVDC pricing, and current commodity and labor rates. The transmission line cost is based on the current Project route, typical ±525-kV HVDC design quantities, and current market rates for supply and installation/labor for materials, equipment, and construction such as foundations, steel poles, and conductor. The converter station capital expenditure is estimated based on indicative pricing received from multiple HVDC suppliers for the North Plains selected HVDC configuration.

3.2 Estimated Annual Costs (ARM 17.20.815)

Estimates of annual costs for the facility are $26,800 per mile after the commercial operation date of the facility. The North Plains annual cost estimates have been developed based on preliminary estimates on annual maintenance and inspection costs. The North Plains annual cost estimates exclude equipment replacement costs.

The estimated annual costs of the facilities (escalated dollars) and the estimated annual costs (constant dollars) outlined in ARM 17.20.811 will be provided in a non-public confidential version to DEQ pursuant to a request for confidentiality under ARM 17.20.302.

3.3 Pricing Policy (ARM 17.20.817)

With transmission owned by a traditional, incumbent utility, energy customers pay the cost of building a new project, and the utility collects its costs plus a regulated rate of return on their investment. In Montana, the Public Service Commission assesses the costs and benefits associated with a given project and determines what costs may be passed on to the Montana ratepayer.

Independent transmission projects like the Project are typically funded by developers and investors, and sometimes through public-private partnerships. Developers and investors recover their costs through the sale of transmission services ownership of all or a portion of the project, or some combination thereof.

North Plains is marketing and negotiating potential ownership of the Project with utilities located in WECC, MISO, and SPP that will benefit from the completed Project. The terms of these marketing and negotiation discussions are proprietary and strictly confidential.

The anticipated future owners and operators of North Plains are expected to be regulated utilities whose pricing policies will be regulated by their respective public utility commissions.

4.0 PROJECT PURPOSE AND NEED (75-20-211(1)(a)(iii) MCA, ARM 17.20.1604 & ARM 17.20.1606)

Transmission infrastructure forms the backbone of the nation's power system, ensuring that Americans across the country have constant access to affordable and reliable electricity to power their homes, businesses, and communities.

Like many other forms of transportation, municipal water/wastewater and communications infrastructure across the country, the electrical grid is in need of significant investment in maintenance upgrades and modernization to meet rapidly changing market demands.

4.1 STATEMENT OF NEED (ARM 17.20.803(3)(e))

While the United States has an abundance of energy generation resources spread throughout the country, these resources are not always located in close proximity to, or directly connected to load centers, thus the nation relies on a highly-functioning, effectively connected grid to deliver reliable power from generation to load. A major complication of the nation's electrical system stems from the fact that the United States contains not one, but three separate grids, known as interconnections, as shown previously on Figure 2.0-2. These three systems—the Western Interconnection, Eastern Interconnection, and the Texas Interconnection (or Electric Reliability Council of Texas)—are managed independently and transfer very limited amounts of energy between each other.

As illustrated on Figure 4.1-1, there are currently seven "cross-seam" connections between the Western and Eastern Interconnections; however, these small back-to-back DC ties are located in relatively remote locations at the very edge of the seam and serve localized needs. These ties were designed to meet the load obligations of nearby utilities or wholesale power providers rather than to realize larger-scale integration between the Interconnections.

This grid structure served its purpose for several decades, but changing market dynamics are forcing development of a more robust system. First, electrical energy consumption is increasing across the U.S. The U.S. Energy Information Administration (EIA) Annual Energy Outlook 2023 estimates that electricity consumption in the U.S. will increase by about 17 percent by 2050 (EIA, 2023). According to the Pacific Northwest Utilities Conference Committee's 2024 Northwest Regional Forecast, annual energy demand is projected to increase by 30 percent in the next 10 years – a six percentage-point increase over the 2023 forecast – driven by data center installations, high-tech manufacturing growth, and electrification. NorthWestern Energy's 2023 Montana Integrated Resource Plan (IRP) reports that retail load in NorthWestern's territory is forecast to grow at an annual average rate of 0.3 percent, and peak demand is projected to increase at 0.3 percent in the summer and 0.4 percent in the winter (NorthWestern, 2023). Traditional capacity increases from performing minor system upgrades or adding new generation are increasingly unable to keep pace with these rapidly changing market demands. In fact, at least three primary factors threaten the ability of the United States' electrical grid to reliably deliver energy to consumers and are hastening the need for significant transmission infrastructure investment. These threats arise from:

- changes in public policy that decrease historically reliable baseload generation capacity, and hamper the ability of overall supply to meet growing energy demands or load growth;
- rapid changes in the generation resource portfolio mix that affect reliability by reducing the ability to balance supply and demand in real time; and
- increasing frequency of extreme weather events that affect grid resiliency.

For purposes of clarity, it may be helpful to define some key functional terms. First, "growing energy demand," or "load growth," refers to the naturally occurring increase in consumer demand for electricity. This is occurring due to increases in population, and a transition in modes of transportation and home heating from individual fuel combustion to electrical power.

"Reliability" refers to the ability to consistently balance supply and demand in real time, maintaining electrical supply to provide an adequate, safe, and stable flow of electricity. Traditional threats to reliability have included the loss of generation from equipment failure, or loss of transmission when extreme weather knocks out power lines.

"Resilience" refers to the ability to withstand and reduce the magnitude and/or duration of extreme or prolonged disruptive events that threaten reliability. Building on reliability, resilience encompasses preparing for, operating through and recovering from significant disruptions or threats to reliability, no matter what the cause.

Each of these is discussed further in the following subsections.

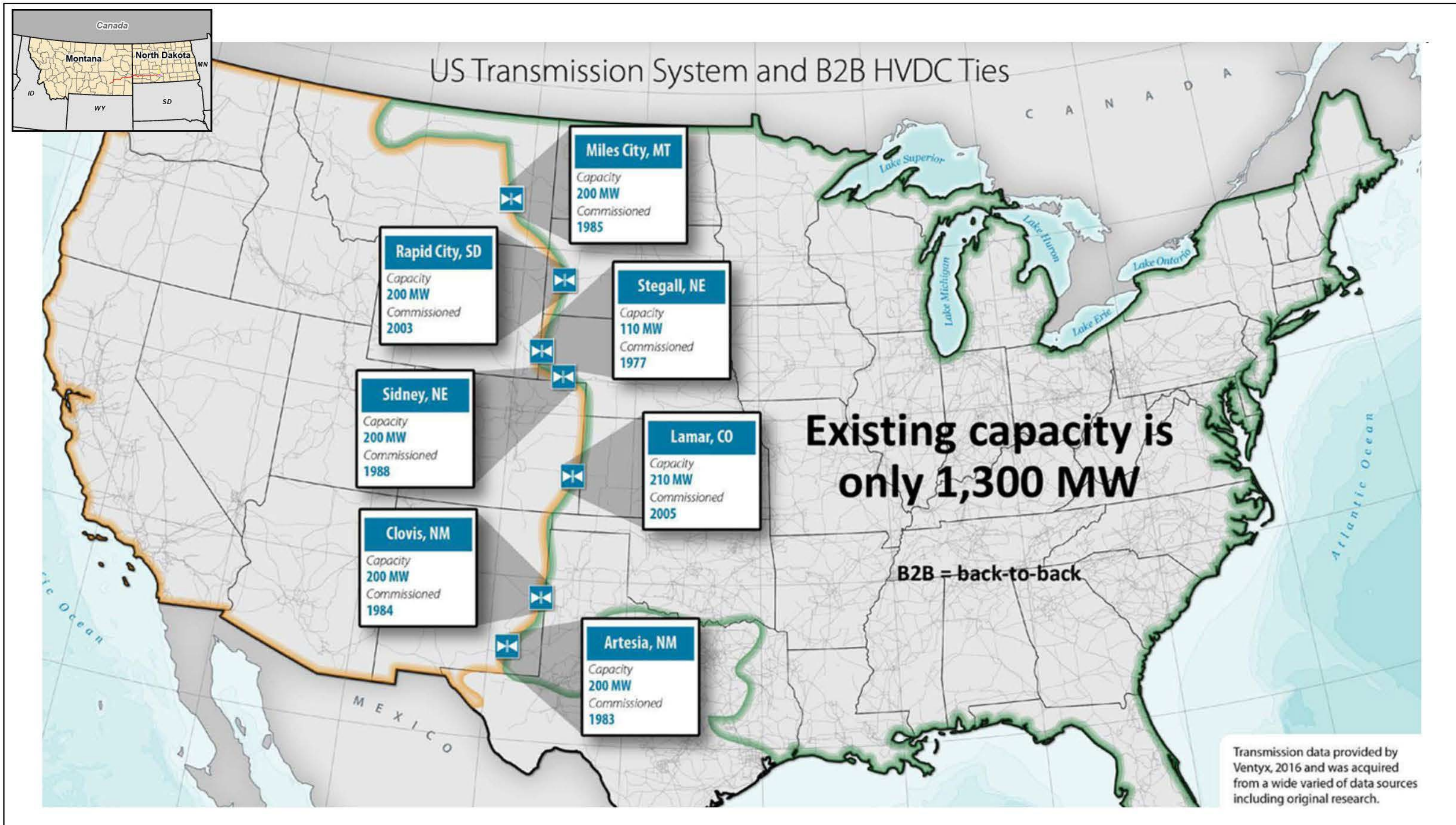

Figure 4.1-1
Western and Eastern Interconnections Transfer Capacity
North Plains Connector Project
North Plains Connector LLC

4.1.1 Changing Public Policy Affecting Supply

The energy sector is undergoing a transition due in large part to aggressive state and federal decarbonization policies that force the early retirement of thermal generation and provide high incentives for the development of wind and solar generation. These policies, on top of growing demand, are affecting the availability and operating characteristics of supply, which then affects the reliability of the nation's grid system.

State-mandated decarbonization goals in Washington and Oregon are leading the majority of the west coast Colstrip owners to seek lower emitting sources of generation in the very near future. Oregon passed the Clean Electricity, Coal Transition Act that forces Oregon-based utilities to divest of coal-fired power in favor of renewables. Oregon's goal is to reduce emissions 100 percent below baseline levels by 2040 (Oregon Legislative Assembly, 2021). Similarly, Washington state has a goal to reduce emissions 95 percent below 1990 levels and to be at net-zero by 2050 (Washington State Senate, 2021).

At the federal level, policies enacted under the bipartisan Infrastructure Investment and Jobs Act of 2021 and the Inflation Reduction Act of 2022 have committed unprecedented amounts of money through grants, loans, Investment Tax Credits, and Production Tax Credits to encourage further private investment in renewable energy generation and related technologies.

Coal generation retirements and growth of inverter-based generation has been occurring across the region for several years; however, the pace and magnitude of this change in generation is intensifying, resulting in increased challenges for utilities to plan for and maintain an adequate and reliable power system while accommodating future market uncertainty.

In Montana, these changing policies and the attending reduction in demand from west coast utilities resulted in the retirement of Colstrip units 1 and 2 in January 2020, reducing the plant's operating capacity from 2,000 MW to 1,480 MW. The Northwest Power and Conservation Council's (NWPCC) 2024 resource adequacy assessment of the Pacific Northwest cited coal retirements as a primary driver in Loss-of-Load probability results that exceed their 5 percent limit beginning in 2021. NWPCC states that replacing lost capacity due to coal retirements will be the major challenge in the region for several years (NWPCC, 2019).

In its 2023 IRP, NorthWestern Energy indicates that it does not have adequate supply resources to fully serve peak loads throughout the year. Due to deficiency of power supply during peak demand, NorthWestern regularly relies on imported energy purchases to meet demand. Currently, that imported energy comes from tight supply markets located to the west. Utilities across the Pacific Northwest are experiencing these same conditions, which are expected to persist with projected coal retirements and a lack of adequate replacement power capacity resources. NorthWestern states that it "cannot count on continued energy imports to serve our customers reliably during peak demand given the risk of declining capacity generation in the region" (NorthWestern Energy, 2023).

Even with the Yellowstone gas plant online and the acquisition of additional Colstrip capacity, NorthWestern projects a capacity deficit early in the planning period in the winter season with larger deficits beyond 2029 when the remaining contracts with west coast utilities expire. NorthWestern indicates that "an early closure of Colstrip would not only increase the existing supply deficit but would also create a need for significant transmission upgrades" (NorthWestern Energy, 2023).

Inverter-based resources, like wind, solar, and battery technology, are frequently proposed as replacements for legacy energy resources such as coal. In fact, the NWPCC recommends acquisition of at least 3,500 MW of renewable resources in the region by 2027 (NWPCC, 2023). Inverter-based resources create operational challenges due to their intermittency and uncertainty, which must be balanced with other dispatchable resources available to the utility. During peak demand hours, renewables may not generate at a level that maintains reliable operations.

In response to these changing policies and the subsequent imbalance between generation and load, utilities are faced with the need to invest in transmission connectivity to higher levels of diverse energy generation, and the current transmission constraints between the west coast and the eastern boundary of the Western Interconnection make an interregional connection a critical part of the solution.

4.1.2 Rapid Changes in Generation Mix Affect Reliability

The policies discussed above are affecting the availability and operating characteristics of supply, which then affects the reliability of the nation's grid system as demand continues to increase.

The existing grid was built to transport power from large, centralized, dispatchable power plants to load centers throughout the country. System operators, who keep the grid in balance, must ensure that generation matches load precisely and instantaneously. Neither the layout nor the technology used in the existing grid contemplated the high penetration of inverter-based resources being loaded onto the aging system. As noted above, the early retirement of thermal generation and rapid increase in intermittent resources is creating threats to overall grid reliability.

The North American grid operates at a frequency of 60 Hz and small differences between generation and load cause the frequency of the grid to deviate from this balance. If frequency deviations exceed +/- 5 percent, the grid can experience reliability challenges. Large, spinning thermal generators create "grid inertia" that can respond to frequency deviations quickly and help to maintain the balance of the system. As thermal units are retired, the total amount of inertia on the grid – and subsequent voltage and frequency stability – declines. This condition will continue to decline as the grid becomes more dependent on inverter-based resources and there is a mounting body of research to indicate the near-term nature of this threat.

The North American Reliability Corporation (NERC) 2024 Summer Reliability Assessment notes that resource adequacy remains a critical risk in the western region as the resource mix changes and that dispatchable resources are relied on to support balancing the increasingly weather- dependent load with the variable energy generation within the resource mix. NERC assessed the summer risk for the western states as "elevated," with the potential for insufficient operating reserves in above normal conditions. The assessment also cites three particular risks that merit attention, including increasing variability, the rate of demand growth and uncertainty of future load patterns, and the pace of new resource growth necessary to meet future energy demand (NERC, 2024).

During a July 2023 webinar hosted by the Western States Transmission Initiative, WECC Vice President of Strategic Engagement and External Affairs, Kris Rapper, referenced the Federal Energy Regulatory Commission (FERC's) 2022 Western Assessment of Resource Adequacy which identified a risk of resource shortages in the 4-to-10-year timeframe based on the anticipated thermal generation retirements and introduction of higher levels of inverter-based resources. Rapper stated that, "the transition necessary to meet clean, green energy policies and the pace of electrification are creating a risk to reliability that we need to address . . . [and] it looks like adding transmission can help ameliorate some of that risk" (Western States Transmission Initiative, 2023).

Figure 4.1-2 depicts the WECC-rated transmission capacity at the major interconnections with NorthWestern's transmission system. Because NorthWestern does not own all of the transmission capacity depicted, that total capacity is not necessarily available to NorthWestern for import or export of power. Further, to address peak loads effectively, there must be simultaneous generation capacity and transmission capacity to be able to rely on outside resources. NorthWestern views this as a risky and expensive approach to addressing supply capacity shortages (NorthWestern, 2023).

With the rapid change in generation mix, NorthWestern must be prepared to procure power from other sources to serve existing and projected load. Some sources of replacement power could be located outside of NorthWestern's balancing area and imported on one of the paths depicted above. NorthWestern's Electric Transmission Planning group analyzed the use of imports from off-system resources to make up for lost supply. According to the IRP, Paths 8 and 18 were assumed to provide the majority of the imports as they were deemed the most liquid and reliable import paths. However, there is no guarantee that off-system purchases can be made, and there is no guarantee that transmission capacity would be available to reliably import off-system purchases as described above.

Relying on Path 8 or 18 would require significant investment in upgrades to both NorthWestern and Bonneville Power Administration's systems to achieve greater import/export capacity and still only provides linkage to an already constrained western supply market. Investment in a new cross-grid connection becomes even more attractive by providing a much greater increase in capacity and access to additional supply markets to better ensure system reliability.

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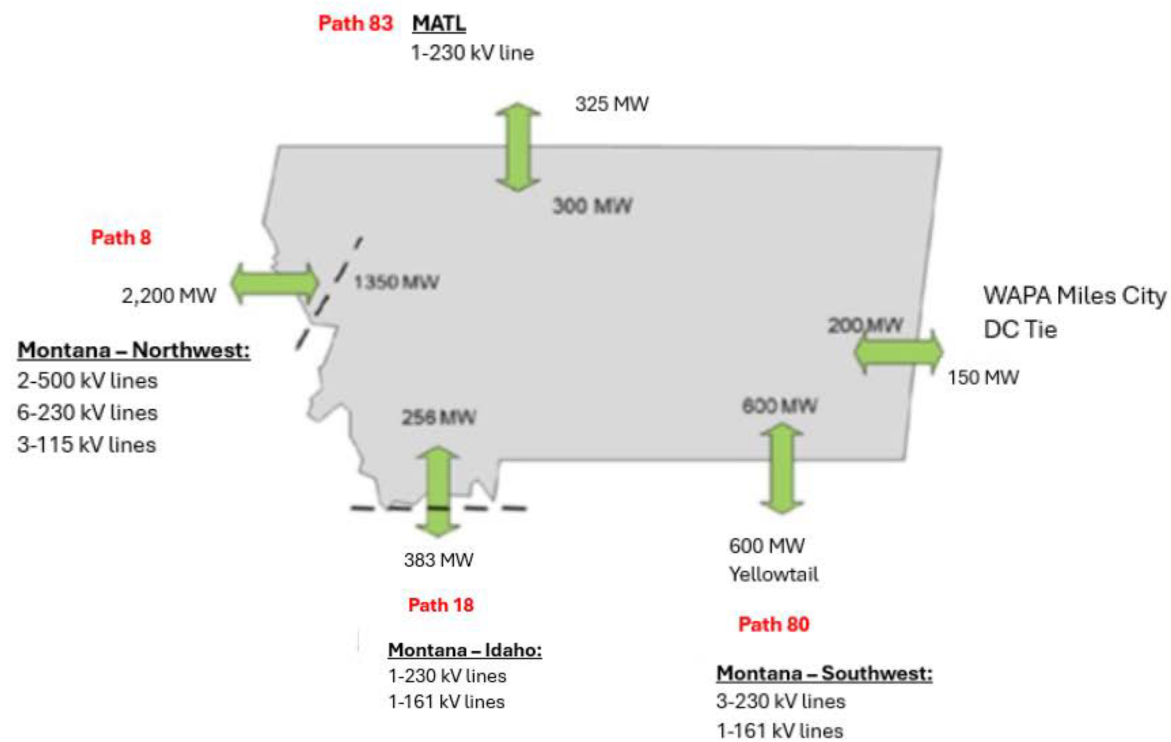

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Figure 4.1-2
Total WECC-rated Transmission Capacity at Major Interconnections with NorthWestern's Transmission System
North Plains Connector Project

4.1.3 Changes in Weather Impact Resiliency

According to recent studies prepared independently by the U.S. Department of Energy (DOE), NERC, and ASCE, severe weather poses an increasing threat to grid resiliency.

The DOE's "National Transmission Needs Study," released by the Grid Deployment Office in October of 2023, notes the mounting pressure to expand transmission development driven by the need to improve grid reliability, resilience, and resource adequacy to address extreme weather events and significant load growth to support the electrification of heating and transportation systems (DOE, 2023). NERC also identified "significant evolving and interdependent risks" threatening grid reliability (NERC, 2022). And the 2021 ASCE Infrastructure Report Card gave U.S. energy infrastructure a C-minus rating, stating "[extreme] weather remains an increasing threat" (ASCE, 2021). Severe weather was cited as the predominant cause of 638 transmission outage events from 2014 to 2018. More recently, Winter Storms Uri and Viola in February 2021, the Pacific Northwest heat dome in June of 2021, the heat wave that covered much of the country in September 2022, Winter Storm Elliott in December 2022, and most recently, Winter Storm Finn in January 2024, all tested the limits of our nation's existing electricity infrastructure.

One of the most dramatic weather events from a grid resiliency standpoint involved Winter Storm Uri. In February of 2021, 69 percent of Texans lost power (Castellanos, et al, 2021) and an estimated 246 people lost their lives, many from cold exposure or "loss of power while on electricity dependent equipment required to sustain life" (Texas Health and Human Services, 2021).

Winter Storm Elliott was another extreme weather event that slowly moved from the Pacific Northwest eastward in late December 2022. This storm event caused extremely cold temperatures across both the Western and Eastern interconnections, but as illustrated in Figure 4.1-3, those extremes did not occur concurrently. North Dakota experienced temperatures as much as 25 degrees Fahrenheit below historic averages for December 24th while the Pacific Northwest was actually warmer than average.

During this storm event, the Eastern grid lost over 90 gigawatts (GW) of capacity – 13 percent of total generating capacity – due to unplanned outages. Over 90 percent of the lost generating capacity would be considered dispatchable power under normal conditions; however, under such extraordinary circumstances the only truly dispatchable power that could respond quickly to the spike in demand was located outside of the areas experiencing extremely cold weather conditions, and unable to connect to the load.

In general, extreme weather events have broad geographic footprints affecting entire regions, but they do not typically affect multiple regions with the same intensity at the same time. For instance, MISO and SPP had adequate electric reserves during the September 2022 heat dome event that settled in on the Pacific Northwest; and the Pacific Northwest and Mountain west did not experience supply issues during the winter storm events at the same time as they strained supply in the Midwest. This suggests that interregional grid connectivity and the ability to shift power quickly and efficiently back and forth could provide substantive reliability and resiliency benefits for both grids by making the grid "bigger than the weather."

Departure from Average Daily Minimum
December 24, 2022

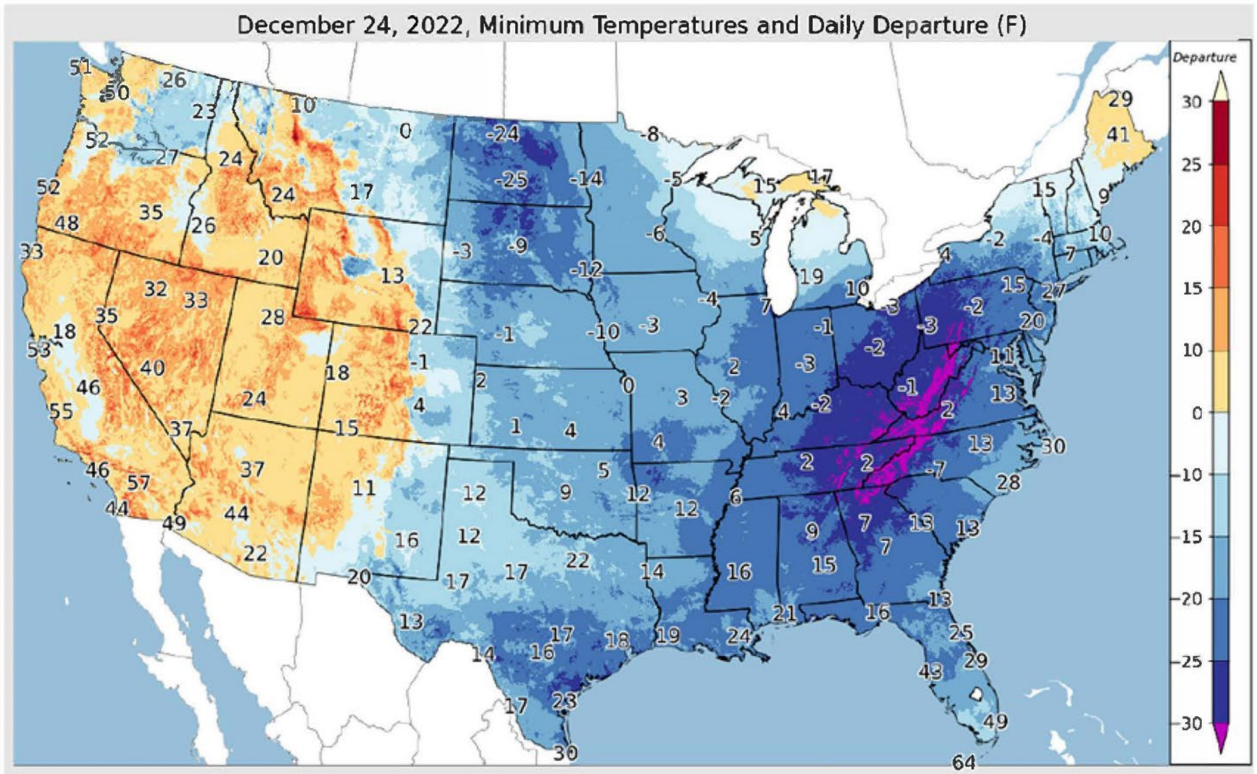

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Figure 4.1-3
Departure from Average Daily Minimum December 24, 2022 (Winter Storm Elliott)
North Plains Connector Project
North Plains Connector LLC

4.2 STATEMENT OF PURPOSE (ARM 17.20.803(3)(d))

Without significant increases in reliable generation or access to less constrained markets, the ability of existing and projected resources to mitigate intermittency in electricity supply and variability in demand is tightly constrained. NorthWestern Energy has identified a need to procure more capacity to achieve a resource adequate portfolio. Among strategies to achieve this goal, NorthWestern indicated that they would explore "the most effective transmission expansion opportunities" as part of a multi-faceted action plan. (NorthWestern, 2023)

The purpose of the Project is to bridge the interregional gap between WECC in the Western Interconnection, and SPP and MISO in the Eastern Interconnection. This high-capacity, bi-directional connection into regional generation and transmission hubs is intended to:

- improve reliability and efficiency for both Interconnections by increasing transfer capacity and access to additional generation in new market areas;
- improve resiliency through the ability to tap regional dispatchable and inverter-based generation across the region, and to provide dynamic voltage and frequency support services to help maintain operational flexibility and stability; and
- mitigate weather-driven system outages by providing a path to quickly and efficiently shift power to where it's needed most.

The Project will provide opportunities for utilities across the Pacific Northwest, Montana and the northern Great Plains to access generation in less constrained, more cost-competitive markets across both the Western and Eastern Interconnections.

4.2.1 Project Benefits

Enhancing the ability of the grid to transfer power effectively and efficiently from diversified generation to growing load is becoming increasingly important, particularly as more inverter-based resources are being integrated into the system.

The National Renewable Energy Lab (NREL) Seam Study concluded that interregional connections, "would create a more integrated power system that could drive economic growth and increase the efficient development and utilization of the nation's abundant energy resources, including solar, wind, and natural gas." Other independent studies in recent years corroborate the need for and benefits from investment in high-capacity interregional connectors between the Western and Eastern grids. These benefits range from reliability and resiliency enhancements, to improvements in efficiency and cost effectiveness, to national security enhancements, as discussed in the following subsections.

4.2.2 Improved Regional Reliability

The enhanced market access afforded by the Project has the potential to mitigate the risk of power not being available when it is needed most, and to improve the utilization of conventional and renewable energy resources across the northern U.S.

To examine these benefits in more detail, North Plains commissioned Astrape Consulting to perform a loss of load modeling study of WECC, SPP and MISO to determine the reliability value of the Project, operating at 3,000 MW of transfer capacity. The study quantified the value that connecting diverse resources and load profiles across the interconnection seam contributes towards avoiding blackouts. The study found that the reliability attributes of the Project are roughly equivalent to 1,800 MW of new generation in both the Western and Eastern Interconnections, despite not being tied to any particular generating unit. This finding concludes that the Project will provide Montana with access to electricity when it is needed most, effectively leveraging generation resources to provide reliability value to both regions by capitalizing on differences in when peak need occurs across the interconnected seam – often when that electricity or the transmission needed to deliver it is in short supply in the Northwest.

Aside from the inherent reliability benefits afforded by connectivity between the Western and Eastern Interconnections, new technologies provide additional opportunities for improved reliability and resiliency. For instance, the VSC technology employed on the Project is able to maintain voltage and frequency on the grid while transporting power between regions. VSC technology advantages include lower power losses on the line, and the ability to control the flow of power, acting as both the extension cord bringing electricity to customers impacted by disruptive events, and the jumper cables needed to restart grids suffering from outages.

VSC-based converters can be both switched on and switched off with an external control signal, enabling VSC-type converters to offer superior performance and control capabilities over older converter technology commonly in use. HVDC VSC high-capacity long-distance overhead transmission lines are also bi-directional and can instantaneously change direction of power flow, unlike AC systems. HVDC VSC can reverse the direction of flow in as little as 200 milliseconds.

As demonstrated through the quickly growing body of commercial experience (including over 30 GW of deployment in Europe), HVDC VSC is a proven cost-effective solution for many bulk-power transmission needs that offers important advantages compared to the conventional high-voltage and EHV AC technologies. Of particular interest to the Project, the ability to provide black start capability and system restoration in coordination with neighboring power systems or connected resources is a valuable aspect that can be used during extreme weather or other major grid events.

4.2.3 Improved Regional Responsiveness to Extreme Weather

In the early weeks of January 2024, temperatures across Montana plummeted and were sustained at sub-zero levels for several days. Base temperatures hovered between -30 and -20 degrees Fahrenheit across much of the state. As illustrated in Figure 4.2-1, NorthWestern Energy's owned or contracted generation was able to accommodate roughly 20 percent of retail demand with hydro power, roughly 25 percent with coal and natural gas, and a very small percentage with intermittent wind and solar. NorthWestern was importing over 50 percent of the power necessary to serve peak retail load during this extreme weather event. Transmission planners at the utility forecast such events and purchase power on the market to the extent that they are able. Being market takers, utilities are often forced into the day-ahead or hour-ahead (real-time) markets, where prices can reach or exceed the soft cap of $1,000 per MW-hour (MWh).

In its 2023 IRP, NorthWestern noted the danger of relying on generation from already constrained markets outside of Montana for such a large share of its portfolio. They note the dual challenges created by the declining availability of surplus power within WECC, and the very limited paths to bring power into NorthWestern's balancing authority, compounded by the high competition for the available transmission capacity on those lines – particularly during peak periods.

In general, extreme weather events have broad geographic footprints affecting entire regions, but they do not typically affect multiple regions with the same intensity at the same time. For instance, MISO and SPP had adequate electric reserves during the September 2022 heat dome event that settled in on the Pacific Northwest; and the Pacific Northwest and Mountain west did not experience supply issues during the winter storm events at the same time as they strained supply in the Midwest. This suggests that interregional grid connectivity and the ability to shift power quickly and efficiently back and forth could provide substantive reliability and resiliency benefits to both grids.

Winter Storm Uri affected not only Texas but created extreme conditions throughout the central U.S. sending both SPP and MISO into emergency conditions and causing both systems to curtail load. At the same time, utilities within WECC had abundant power and remained in normal operating condition throughout the week. An interregional connector would have been able to dispatch reserves in the west to bolster both SPP and MISO in the east.

The Project will provide much greater opportunity to access supply in less constrained markets during extreme weather events and enhance the ability of utilities to provide safe and reliable power regardless of the threats.

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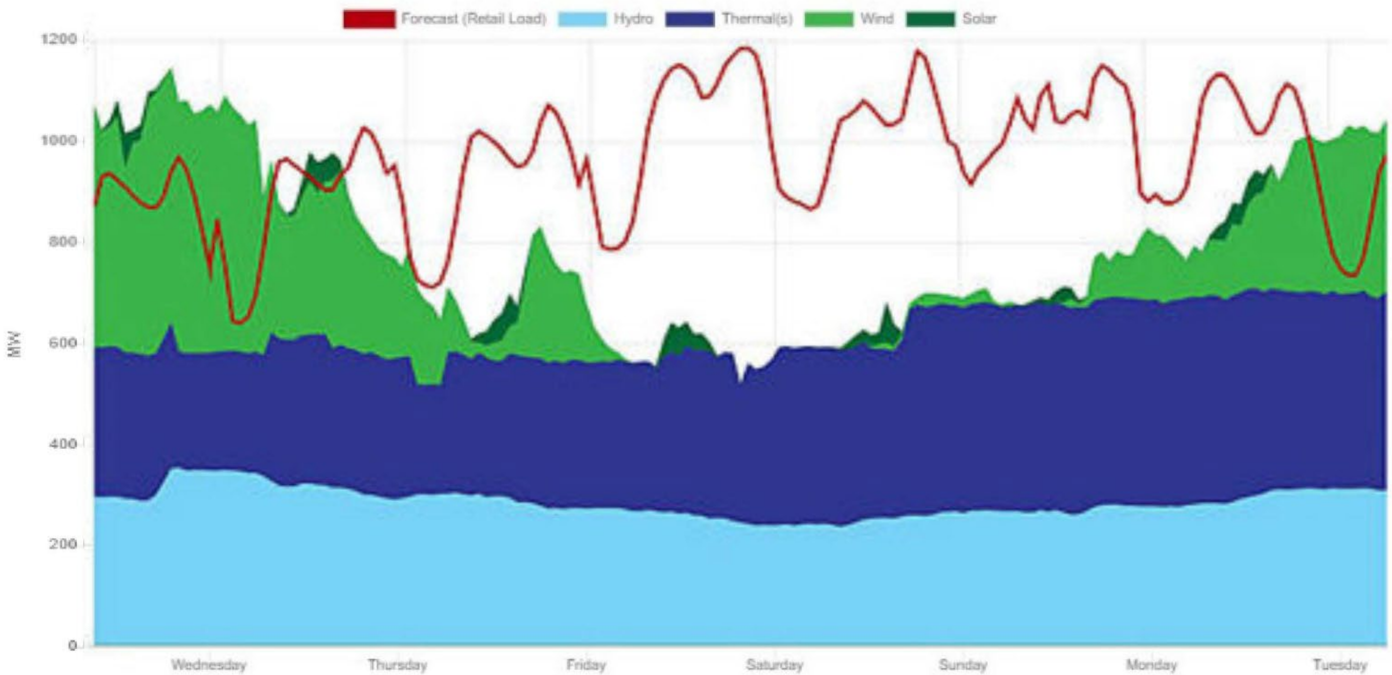

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Figure 4.2-1
Hourly Electric Generation by Source (Montana)
North Plains Connector Project

4.2.4 Greater Efficiency and Cost Effectiveness

In its "Grid of the Future Report," SPP recommended that it, "should identify and assess approaches to increase connectivity of the Eastern and Western Interconnections. Increasing the ability to transfer power between interconnections would allow for more efficient use of resources across the nation" (SPP, 2023). The Project provides just such high capacity, bi-directional connectivity between affected market areas. This access would help utilities meet growing electricity demand by opening up new resource procurement options and allowing the most efficient resources to be used to serve load.

Other studies by DOE and Lawrence Berkeley National Laboratory (LBNL) have shown that an increased connectivity between the Western and Eastern grids provides benefits such as increased reliability and decreased costs of electricity to consumers. Weather is increasingly the driver of generation and can lead to imbalances between when energy is needed and when it is available. This variability on the supply side creates low prices in times of surplus and higher prices when power is scarce. On the demand side, extremely hot or cold temperatures increase electricity demand, thereby increasing wholesale prices, whereas more temperate weather can reduce electricity demand, leading to cheaper real-time electricity prices.

The price differentials in the Western and Eastern Interconnections are often exacerbated by extreme weather events. For instance, during Winter Storm Uri, the average electricity price difference between SPP and Mid-C electricity was $358 per MWh (February 15th-21st). As illustrated in Figure 4.2-2, in December 2022 Winter Storm Elliott affected both the Eastern and Western interconnections but at different times. While the storm drove Mid-C prices towards $750/MWh on the 22nd it was yet to arrive in MISO and SPP. As the storm moved east and impacted MISO and SPP, prices began to decline in the Northwest (IEEE, 2024).

Leaving aside the occurrence of extreme weather events, there are strong seasonal patterns associated with the geographic regions within WECC, MISO and SPP territories. In MISO and SPP, wind power is typically strongest in the winter and weakest in the summer. This cheap and abundant wind power is unable to be exported to the west, which typically sees its peak load in the winter. In the spring and early summer, plentiful hydropower from the west is unable to flow into MISO and SPP, which are summer peaking systems.

The price differentials resulting from inverse peaks during extreme weather events, season variations, and even diurnal fluctuations provide an opportunity to leverage available surplus power at lower prices in other regional markets. Table 4.2.4-1 illustrates the large spreads in the coincident peak pricing (or the pricing at the highest period of demand) across WECC's Pacific Northwestern region (shown through the Mid- Columbia "Mid-C" power hub price) and at locations near the Project's point of interconnection in SPP and MISO. As depicted, the 800 hours in 2021-2022 with the highest real time prices in SPP averaged $239/MWh, while average prices ranged from $101/MWh to $103/MWh in each of MISO and Mid-C at the same time.

As noted previously, the bi-directional, market-based flow afforded by the Project will allow utilities experiencing high demand and higher market prices in the West to obtain lower priced surplus power from the East when MISO and SPP demand is low. Conversely, it will allow utilities in the West to sell surplus power into the Eastern grid when MISO and SPP demand and market prices are at a peak. The Project would also reduce the amount of curtailment that western area generation would experience through this additional energy sale opportunity.

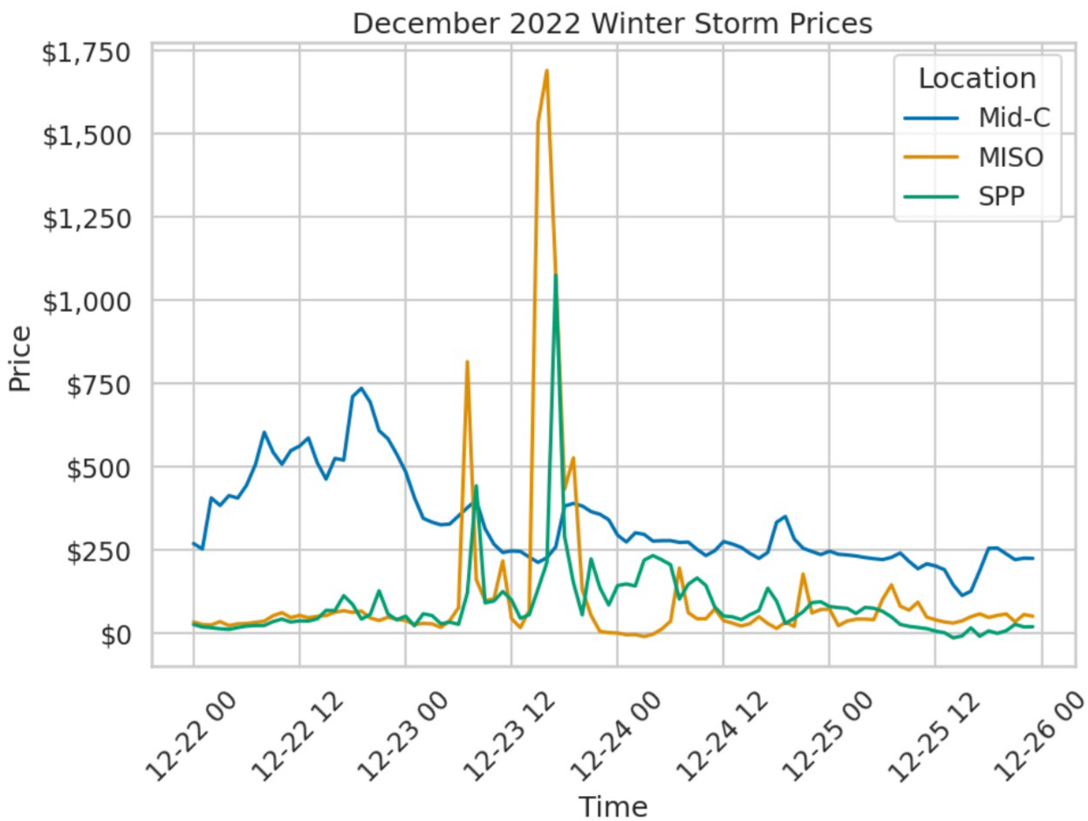

Figure 4.2-2
Electricity Prices During Winter Storm Elliott
North Plains Connector Project
North Plains Connector LLC

NORTH PLAINS CONNECTOR
A Grid United Project

For Environmental Review Purposes Only

Date: (8/16/2024) Source: Z:\Clients\E_H\GRID\North_Plains\Permitting\State\MFSA\Section_4\GRID_NPC_MFSA_Section_4C.aprx

Table 4.2.4-1

Coincident Real-Time Prices During the 800 Highest Price Hours 2021-2022

High Priced Region	Mid-Columbia "Mid-C" (WECC)	Southwest Power Pool	Midcontinent Independent System Operator
Mid-Columbia	$294	$79	$59
Southwest Power Pool	$103	$239	$101
Midcontinent Independent System Operator	$107	$158	$157

Source: Midcontinent Independent System Operator (MISO), Southwest Power Pool (SPP), and California Independent System Operator

4.2.5 Potential Savings to Ratepayers

Unlike simply adding new generation capacity within a service territory – the capital costs of which are simply passed on to the ratepayer – access to wider markets provided by the Project provides substantive cost savings opportunities. The full extent of these savings is difficult to model. A 2022 LBNL study noted that current energy models likely leave the full value of interregional transmission and the ability to leverage price differentials, such as those illustrated above, understated. Extreme conditions and high-value periods, which are difficult to model, play an outsized role in the value of transmission. Existing transmission planning approaches run the risk of understating the economic value of new transmission infrastructure by inadequately modeling such periods (LBNL, 2022).

Even so, the NREL Seam Study found that investments in HVDC interconnections can reach a 35-year benefit-to-cost ratio of up to 2.89 and net present value consumer savings of up to $28.8 billion from increased transfer capability between the Western and Eastern Interconnections (NREL, 2020). Additionally, while the LBNL study did not estimate the value of any specific connection, it did estimate the approximate value of connecting the Upper Midwest and the West as being approximately $414 million per 1000 MW, per year. Considering the size of the Project (3,000 MW), this is well over $1 billion per year in energy benefits delivered to the owners of the line (LBNL, 2022). This represents a significant opportunity for overall cost savings for utilities which can be reinvested in system upgrades or passed on to ratepayers.

Production cost modeling was performed by PA Consulting to understand the potential value of the Project to the interconnection locations. The PA Consulting studies considered the ability to dispatch energy resources more efficiently between MISO, SPP, and the Pacific Northwest, optimizing the utilization of low-cost resources. The studies indicate utilization of over 50 percent and reductions in average wholesale prices of up to 25 percent, leading to large reductions in customer electricity costs. The studies indicate that the Project will enable roughly $10 billion of generation cost savings over the course of its lifespan. This figure represents a discounted net present value for the utilities in the vicinity of the Project and does not include or quantify the Project's extreme weather mitigation capability. Even so, it compares favorably to the roughly $3.2 billion cost of the Project.

4.2.6 National Security Benefits

The lack of interregional transmission capacity also poses a potential threat to our national security. Given the dependence of our society on electricity, the North American grid stands as a target for adversarial countries through cyber or physical attacks. In a 2022 U.S. Department of Defense (DoD) sponsored paper, the authors outline the key role that modern HVDC transmission can play in preparing for such threats, writing that:

> *Achieving energy resilience will require physical infrastructure capable of accessing geographically dispersed electric generation resources and delivering them across the country through a process which addresses the diverse needs of DoD missions and the resilience of defense communities that support installations. The status quo of transmission planning and design does not provide the resilience necessary to support national security needs. Existing electric transmission systems are serviceable, but inadequate, in meeting the requirements of installations in the modern threat environment (Converge Strategies, LLC, 2022).*

5.0 EVALUATION OF ALTERNATIVES TO THE FACILITY (75-20-211(1)(a)(iii) MCA, 75-20-211(1)(a)(iv) MCA, ARM 17.20.803(3)(f), ARM 17.20.1304(1), ARM 17.20.1426(1 & 2), Circular MFSA-2 Section 3.0(1, 2, 3 & 4), Circular MFSA-2 Section 3.1(1, 3, 4, 6, 7, 8 & 9) & Circular MFSA-2 Section 3.2(1, 2, 3 & 4))

Per ARM 17.20.1304(1), this application contains an evaluation of the nature and economics of relevant alternatives to the proposed transmission line and includes an evaluation of: transmission alternatives (see Sections 5.1 through 5.3), alternative energy resources (see Section 5.4), alternative transmission technologies (see Section 5.5), alternative levels of reliability (see Section 5.6), nonconstruction alternatives (see Section 5.7), and the No Action alternative (see Section 5.8).

5.1 ALTERNATIVE END POINTS AND INTERMEDIATE SUBSTATION LOCATIONS (ARM 17.20.1304(2))

Per ARM 17.20.1304(2), an application must include an evaluation of transmission alternatives including alternative end points and intermediate substation locations for the proposed facility.

The Project will connect the existing Colstrip Substation in Rosebud County to a new Oliver County Substation approximately 6 miles southeast of Center, North Dakota and a new Morton County Switchyard near St. Anthony, North Dakota (see Section 2.0). The following sections discuss alternative substation and endpoint locations in Montana. The Project does not require intermediate substations, so they are not discussed in this application.

North Plains initially identified 5 substation alternative locations capable of accommodating at least 500-kV in Montana. Of these, 3 substations were located more than 300 miles northwest of Colstrip, on the other side of the Continental Divide, and were eliminated from consideration due to distance and steep terrain. The two remaining alterative substation locations were further evaluated to determine the Project's westernmost terminus: Broadview Substation in Yellowstone County and Colstrip Substation in Rosebud County.

The Broadview Substation is located approximately 106 miles northwest of Colstrip at an elevation of approximately 3,800 feet; the Colstrip Substation sits at an elevation of approximately 3,300 feet. A transmission line extending from the Broadview Substation to the Montana-North Dakota state line would be about 100 miles longer than the proposed route extending from the Colstrip Substation and would cross additional natural resources such as the Yellowstone River, which is considered a Navigable Water of the U.S. and would require a permit from the U. S. Army Corps of Engineers (USACE) under Section 10 of the Rivers and Harbors Appropriation Act of 1899 to span the river. A route emanating from Broadview would also involve added routing complexity associated with utility corridor congestion along Interstate 94. Further, when evaluating power injection capabilities at either Colstrip or Broadview results were similar. This indicates that a shorter project length with fewer impacts and lower costs could achieve the same benefits as a longer project length. Based on these factors, the Broadview Substation was eliminated from further consideration. Of the existing substations in Montana, the Colstrip Substation best fits the Project's size requirements and grid connection goal and is considered by North Plains to be the only reasonable western endpoint alternative in Montana.

North Plains also reviewed potential Montana-North Dakota state line crossings associated with the Project. Based on the review, only one reasonable state line crossing location was identified. Protected national grasslands and sage grouse habitat on the North Dakota side of the state line preclude other crossing locations in the vicinity of the proposed route. All routes out of Colstrip trend in an east-northeasterly direction to eventually reach the endpoint in North Dakota. The east-northeasterly trend is further influenced by rugged terrain that lies to the east, particularly near the state line. Routes that extend directly east of Colstrip (as opposed to trending in a northeasterly direction) are less desirable due to expressed landowner concerns. Finally, the Little Missouri National Grasslands (LMNG) east of the Montana-North Dakota state line in Slope and Golden Valley counties compel siting the state line crossing at the proposed location. The LMNG are managed by the U.S. Forest Service (USFS) for various resources and land uses, including important GRSG habitat and semi-primitive and natural areas, where commercial development is discouraged or restricted. Siting near the Montana state line in North Dakota is further constrained by the South Unit of Theodore Roosevelt National Park to the north and a GRSG priority conservation area (PCA) to the south. The proposed crossing location best addresses avoiding or minimizing impacts associated with the LMNG and GRSG PCA and is the best fit for the Project and the only reasonable location for a state line crossing.

5.2 UPGRADING OR REPLACING AN EXISTING FACILITY (ARM 17.20.1304(2))

Per ARM 17.20.1304(2), an application must include an evaluation of upgrading or replacing an existing facility that would serve to provide the needed reinforcement that would be provided by the proposed facility.

As noted in Section 4.1 above, there is an existing cross-seam connection near Miles City. This connection is a 200 MW facility commissioned in 1985. To use a transportation infrastructure analogy with regard to the function and capacity of the existing connection, this current back-to-back DC tie amounts to a county road, whereas the type of facility necessary to help stabilize the grid would be more akin to a multi-lane Interstate highway. Given the existing low-capacity, remote location and age of the existing DC tie, even upgrades to this facility would not provide benefits comparable to those of a high-capacity connection penetrating deeper into the Western and Eastern Interconnections and tying in critical generation and transmission hubs at each end point.

Additionally, no existing facility provides all three connections to WECC, MISO, and SPP; therefore, the application contains no further evaluation of upgrading or replacing an existing facility.

5.3 ALTERNATIVE TIMING (ARM 17.20.1304(2))

Per ARM 17.20.1304(2), an application must include an evaluation of alternative timing of other electric transmission lines planned by the applicant, which in whole or in part would address the problem or opportunity or provide the needed interregional improvements that would be provided by the proposed facility.

Currently, no other electric transmission lines are planned by the applicant in Montana. Therefore, the application does not include an evaluation of alternative timing of other electric transmission lines planned by the applicant.

5.4 ALTERNATIVE ENERGY RESOURCES (ARM 17.20.1304(3))

Per ARM 17.20.1304(3), an application must include an evaluation of alternative energy resources and energy conservation alternatives, defined as those that can individually, or in combination, offset or postpone the need for the proposed facility or provide services comparable to the proposed facility. The evaluation must include a description of each alternative energy resource or energy conservation measure, the location and quantity available, any constraints to its availability, and predictable daily and seasonal variations in the availability of the energy resource, if applicable.

Unlike a traditional transmission line that connects generation to load, the Project – as an interregional connector – is simply intended to connect the western and eastern grids. Neither the purpose of the Project, nor the projected benefits to grid stability and reliability are affected by the type of energy generation that will ultimately flow on the line. In fact, as an Open Access transmission line regulated by FERC, the operator cannot discriminate against any particular form of generation when determining what power will flow on the line at any given time.

With the projected growth in energy consumption over the next several decades, demand can only be met with a combination of improved efficiency, and increased generation and transmission capacity. Without an interregional connection, increased alternative energy generation or energy conservation measures in either the western or eastern grid do not provide the same reliability and resiliency benefits as the Project. Expansion of both traditional and alternative energy generation along with energy conservation measures are critical to meeting future demand, and the Project does not preclude the pursuit of those measures in either grid, but the intended benefits of the Project can only be met by connecting all of those energy strategies across both grids.

5.5 ALTERNATIVE TRANSMISSION TECHNOLOGIES (ARM 17.20.1304(4))

Per ARM 17.20.1304(4), alternative transmission technologies are those capable of providing comparable services or addressing the problem or opportunity the proposed facility is designed to address.

5.5.1 AC Transmission in Lieu of DC Transmission

AC transmission technology can sometimes be a viable alternative to DC technology, subject to certain constraints, such as the need to connect to asynchronous grids or provide bidirectional flow. Both AC and DC transmission systems are designed to transmit electricity over long distances. One of the main benefits of AC technology is its widespread use and flexibility. Most electricity in the United States is generated, transmitted, and distributed as AC power. Therefore, AC transmission lines can more easily integrate into the existing infrastructure and accommodate future connections to other grids, power generators, and load centers along the system.

DC transmission technology is not as ubiquitous. It is generally used only in special applications, such as long-haul transmission, connecting asynchronous AC grids, or where bidirectional flow is necessary. For long-haul transmission, DC technology is generally considered to have several advantages. When compared to an AC line, a DC line is simpler in design, requires fewer materials, and operates with less power loss. However, DC transmission requires high-cost converter stations to connect to the AC grid. The additional cost of the converter stations can weigh against DC technology. Normally, a DC transmission line will need to be a few hundred miles long without interposing AC connections before achieving favorable economics. Notwithstanding cost, DC transmission lines may still be desirable because of technical advantages: they can more easily connect asynchronous grids and they can provide bidirectional flow.

Constructing an AC transmission line in lieu of a DC transmission line on the Project is notionally possible, although the design of the line would require more materials and infrastructure to provide the same capacity and operational characteristics. For example, an additional conductor would be required to be strung on the towers to achieve the same capacity and operational characteristics. This, in turn, would necessitate installing more robust towers, which also, in turn, may require more workspace. Overall, the economics of the additional materials and construction costs weigh against AC transmission technology for a 400-mile-long line such as the Project. Further, one requirement of the Project is to provide bidirectional flow between the Eastern and Western Interconnection regions. Although AC transmission lines can theoretically provide bidirectional flow, managing such a system presents unique technical challenges that are still being addressed by ongoing research and development (Jordan, 2017). Hence, bidirectional power flow on an AC transmission line is presently not considered to be technically practical. Therefore, the application does not include an evaluation of AC transmission technology for its entire length.

5.5.2 Underground Transmission in Lieu of Aboveground Transmission

Underground transmission lines can, in some circumstances, be an alternative to aboveground transmission lines. Electric transmission lines are usually constructed above ground because aboveground lines are easier and cheaper to build, inspect, maintain, and repair. Transmission lines are typically only installed underground in visually sensitive areas or where there are obstacles that make aboveground construction exceptionally challenging. For these reasons, only about one-half of one percent of high-voltage transmission lines in the U.S. are underground (Xcel Energy, 2021).

Aboveground transmission lines are known for their efficiency in transmitting electrical power over long distances. Compared to underground transmission lines, the conductors used in aboveground transmission lines have lower resistance, resulting in fewer losses during transmission. This higher efficiency contributes to reduced energy waste, improved overall system performance, and lower operational costs. Underground conductors, on the other hand, have higher transmission losses due to the inherent resistance of the cable insulation and the additional cooling requirements. This leads to a decrease in overall system efficiency. However, the higher losses associated with underground conductors can sometimes be offset by using reduced line length due to shorter transmission distances and improved voltage regulation.

Aboveground transmission lines are known to be very reliable because of the ease of inspection, maintenance, and repair. Routine inspection of aboveground lines involves open air visual assessments of the conductors, insulators, and support structures. Maintenance, repair, and replacement can be carried out easily and quickly as the affected section can be isolated and repaired without significant downtime or operational disruptions in the transmission network. Underground transmission lines can also offer reliability by reducing susceptibility to weather-related damage and reducing risk of accidental contact. However, their reliability can be compromised due to faults caused by ground movement, water ingress, and insulation degradation over time. Damage to underground transmission lines is difficult to pinpoint. Repairs may take a few weeks to several months to complete and may potentially affect a wider area of the transmission network than similar work on aboveground transmission lines. Additional components associated with underground transmission lines, such as duct banks, vaults, splices, and terminations, can also reduce overall system reliability.

Aboveground transmission lines generally have a longer lifespan compared to underground transmission lines. With proper maintenance and occasional component replacements, aboveground transmission lines have a life expectancy of about 80 years (Xcel Energy, 2021). Moreover, the open nature of aboveground transmission lines allows for easier upgrades or modifications to accommodate changes in power demand or technological advancements. Underground transmission lines have a shorter lifespan compared to aboveground transmission lines due to factors such as insulation degradation over time. Environmental conditions, such as soil moisture and temperature, can also influence the lifespan of underground transmission lines. The average lifespan of an underground transmission line is estimated at about 50 years (Xcel Energy, 2021). Further, modifications and upgrades to underground transmission lines are more challenging and expensive than aboveground transmission lines, often requiring extensive excavation and replacement of cable sections.

Accidents involving aboveground transmission lines can pose risks to the public and maintenance personnel. Contact with live conductors can result in severe injuries or fatalities. However, the visibility of aboveground transmission lines is a deterrent, reducing the likelihood of accidental contact by providing a clear visual indication of their presence. Safety measures such as public awareness efforts, warning signs, and barriers help mitigate the risks associated with aboveground lines and associated equipment. In contrast, underground transmission lines eliminate the risk of accidental contact with live open-air conductors. The practice of burying conductors can enhance safety, especially in areas with high population density or where the transmission lines pass through residential neighborhoods. However, third-party excavation in the vicinity of underground lines presents a notable risk. Therefore, it is essential to implement effective warning systems and accurate cable mapping to prevent accidental damage during excavation.

The conductor and structural materials required for aboveground transmission are typically less complex, less expensive, and require less specialized equipment and labor than underground transmission lines to install. Underground cable material, such as insulated conductors and protective sheaths, are costlier, and a greater number of cables are often required to match the capacity of a similar aboveground circuit. The installation process for underground transmission lines is also costlier because it involves trenching and the need for specialized equipment, increasing labor and material costs, as well as longer and costlier land reclamation. An underground transmission line typically requires a continuous trench measuring at least 3 feet wide at the bottom and 5 feet deep, with a total surface disturbance area between 30 and 50 feet wide. An underground transmission line also requires large buried concrete splice vaults about every half mile with permanent operational access for maintenance and repair. As a result, the initial investment required for underground transmission lines is considerably, if not exponentially, higher than that of aboveground lines.

Some sources estimate the cost of constructing an underground transmission line is 10 to 15 times the cost of an aboveground transmission line due to time, materials, processes, the need to include transition substations, and the use of specialized labor (Xcel Energy, 2021). Other estimates place the cost at about seven times the cost of an aboveground line (EIA, 2018). Even advocates of underground high-voltage direct current transmission lines acknowledge that that the cost of installing underground transmission lines can be two to four times as much as aboveground transmission lines. As such, cost is often a leading factor in deciding if and where to bury a transmission line.

The environmental impacts of constructing and operating an aboveground transmission line are different than those for an underground transmission line. For example, an aboveground transmission line is typically considered to have greater impacts on birds, and visual resources. Birds are known to have collisions with transmission lines, which sometimes lead to injury or fatalities. An aboveground transmission line can also be a conspicuous feature in an otherwise natural landscape. Aboveground transmission lines, however, have lesser impacts on other resources, such as archaeological sites, paleontological sites, and certain wildlife habitat. This is because an aboveground transmission line can frequently span these resources with no physical intrusion, whereas an underground transmission line requires a continuous trench and buried splice vaults. Overall, aboveground transmission lines and underground transmission lines each have their own set of environmental advantages and disadvantages. Categorically selecting one design over another typically results in merely shifting environmental impacts from one set of resources to another.

Because of the lack of a clear, material environmental advantage to an underground transmission, and because of the reduced transmission efficiency and system performance; increased difficulty in repair and upgrade; risk of prolonged downtime in the event of an outage; overall shorter lifespan; and substantial addition cost, North Plains eliminated adopting underground transmission on a Project-wide basis as a viable alternative.

5.6 NONCONSTRUCTION ALTERNATIVE (ARM 17.20.1304(5))

Per ARM 17.20.1304(5), nonconstruction alternatives include the use of curtailable and interruptible load contracts with customers and load management.

The use of curtailable and interruptible load contracts or load management will not meet the purpose of the Project outlined in Section 4 and the contracting of load in this fashion is outside the scope of the applicant’s ability to execute as an independent transmission developer. Therefore, the application does not include an evaluation of curtailable and interruptible load contracts with customers or load management.

5.7 NO ACTION ALTERNATIVE (ARM 17.20.1304(6) & ARM 17.20.1305(3))

Per ARM 17.20.1304(6), a No Action alternative means no facility would be constructed to meet the need or provide the services the proposed facility is designed to meet or provide.

Under the No Action Alternative, the Project would not be approved or constructed, resulting in the inability to achieve the desired enhancements to grid reliability and resiliency and cross-grid market access between regions. The existing transmission systems in Montana and North Dakota would remain unchanged. Consumers would not receive the efficiency and cost benefits described in Section 4.2.4 or potential savings described in Section 4.2.5. In theory, other developers could propose and construct projects in the future to fill the need that would be satisfied by the Project. These other projects would require construction of new electric transmission line facilities in the same or other locations to connect the western and eastern grids and would result in their own set of impacts that would be less than, equal to, or greater than those associated with the Project. Those other projects are entirely speculative.

6.0 ALTERNATIVE SITING STUDY FOR THE FACILITY (75-20-211(1)(a)(iii) MCA, 75-20-211(1)(a)(iv) MCA, ARM 17.20.803(3)(f), ARM 17.20.803(3)(g), ARM 17.20.1426(1 & 2), Circular MFSA-2 Section 3.0(1, 2, 3 & 4), Circular MFSA-2 Section 3.1(1, 3, 4, 6, 7, 8 & 9), Circular MFSA-2 Section 3.2(1, 2, 3 & 4) & Circular MFSA-2 Section 3.5(1 & 2))

Per ARM 803(3)(g) and 17.20.1426 and Circular MFSA-2 Section 3.0, the following sections of the application contain an alternative siting study for the Project. The alternative siting study delineates the geographical area between the end points of sufficient width to include all reasonable locations for the proposed facility (see Section 6.1); provides an overview survey of the potential siting locations (see Section 6.2); and identifies a minimum of three alternative locations for the Project (see Section 6.3). Alternative locations are evaluated for cost, engineering considerations, and adverse environmental impacts as part of a baseline study (see Section 7). An explanation of the reasons for selecting the proposed location for the Project (see Section 8) completes the siting study.

Terms used in this application are the same as those used in Circular MFSA-2, with one clarification: throughout this application the terms “Study Area” and “Facility Location” are used, whereas “Impact Zone” is not. Circular MFSA-2 uses the terms Study Area and Impact Zone interchangeably; however, the term Impact Zone as it is defined in Circular MFSA-2 suggests that impacts will occur across the entirety of the Impact Zone, when in fact, impacts will vary by resource and in most cases will only occur within a portion of the zone (see Section 2.2.2). As such, the term Facility Location (defined in Section 7.0) is used in this application to assess resource-specific impacts. Where Circular MFSA-2 defines the Study Area for a particular resource larger than the Facility Location, maps and tables presenting data within that resource-specific Study Area are included in Appendices E and F, respectively. Avoiding the term Impact Zone in this application is intended to avoid the misrepresentation of potential impacts within the resource-specific Study Area(s).

North Plains obtained publicly available geographic information systems (GIS) data to provide an overview of siting and constructability considerations within the Study Area(s), including MFSA avoidance areas (see Section 6.2.2 and Circular MFSA-2 Section 3.2(1)(d)). This information was used as part of an iterative process to develop alternative Project routes for further analysis. The alternatives described in this application are designed to prioritize MFSA preferred location criteria as specified in Circular MFSA-2 Section 3.1, and balance Project cost and constructability while minimizing environmental impacts. The following sections describe the delineation of the alternative siting study area, siting criteria, and alternative routing development process.

6.1 DELINEATION OF THE ALTERNATIVE SITING STUDY AREA

Per Circular MFSA-2 Section 3.2, an application must identify the alternative siting study area for siting the facility, considering the electrical loads to be served and electrical problems or opportunities to be addressed by the facility, or the market area for the product that would be transported by the facility.

Prior to defining the alternative siting study area utilized in this application, North Plains initially reviewed a broad 17-county area in southeastern Montana to identify potential routing opportunities. As a result of this review, North Plains determined that the only viable endpoints for the Project would be the existing substation near Colstrip at the western end and a point on the Montana-North Dakota state line, in Fallon County, at the eastern end. Section 5.1 describes the rationale for this determination.

In accordance with Circular MFSA-2 Section 3.2(2), North Plains considered preferred location criteria (see Section 6.2.1); avoidance areas (see Section 6.2.2); and other resource and topographic factors in determining the boundaries of the alternative siting study area for the Project. Based on these constraints, the alternative siting study area was defined to include Rosebud, Custer, and Fallon counties in Montana. This three-county area contains the geographical area between the Project end points and is of sufficient width to include reasonable routing alternatives for the facility. The western half of the siting area focused on routing opportunities south of Interstate 94, east of U.S. Highway 39, and northeast of the Colstrip Substation. The eastern half of the siting area focused on the region near the U.S. Highway 12 corridor, north of the GRSG core habitat area. An overview map of the alternative siting study area is provided on Figure 6.2-1.

6.2 OVERVIEW SURVEY

The following sections describe the overview survey of the alternative siting Study Area (see Figure 6.2-1), and an explanation of the methods used to identify alternative locations suitable for siting the facility.

6.2.1 Preferred Location Criteria

This section lists preferred location criteria as specified in Circular MFSA-2 Section 3.1(1)(a-k). As discussed in the previous sections, the Project balances these criteria against the Project costs and constraints and avoids or mitigates significant adverse impacts that might otherwise occur due to Project construction or operation. MFSA-specified preferred location criteria are:

a) where there is the greatest potential for general local acceptance of the facility;

b) where they utilize or parallel existing utility and/or transportation corridors;

c) to allow for selection of a location in nonresidential areas;

d) on rangeland rather than cropland and on non-irrigated or flood irrigated land rather than mechanically irrigated land;

e) in logged areas rather than undisturbed forest, in timbered areas;

f) in geologically stable areas with non-erosive soils in flat or gently rolling terrain;

g) in roaded areas where existing roads can be used for access to the facility during construction and maintenance;

h) so that structures need not be located on a floodplain;

i) where the facility will create the least visual impact;

j) a safe distance from residences and other areas of human concentration; and

k) in accordance with applicable local, state, or federal management plans when public lands are crossed.

6.2.2 Avoidance Areas

The avoidance areas listed in Circular MFSA-2 Section 3.2(1)(d) were considered during the development of Project alternatives. Avoidance of these areas is required unless the alternative siting study shows that no significant impacts are likely, significant adverse effects can be mitigated, or cumulative impacts to these areas would be less costly and impactful than siting the facility in an alternative location. None of the alternative routing crosses any of these areas, with the exception of rugged topography. MFSA-specified avoidance areas are:

i. national wilderness areas;

ii. national primitive areas;

iii. national wildlife refuges and ranges;

iv. state wildlife management areas and wildlife habitat protection areas;

v. national parks and monuments;

vi. state parks;

vii. national recreation areas;

viii. corridors of rivers in the national wild and scenic rivers system and rivers eligible for inclusion in the system;

ix. roadless areas of 5,000 acres or greater in size, managed by federal or state agencies to retain their roadless character;

x. rugged topography defined as areas with slopes greater than 30 percent; and

xi. specially managed buffer areas surrounding national wilderness areas and national primitive areas.

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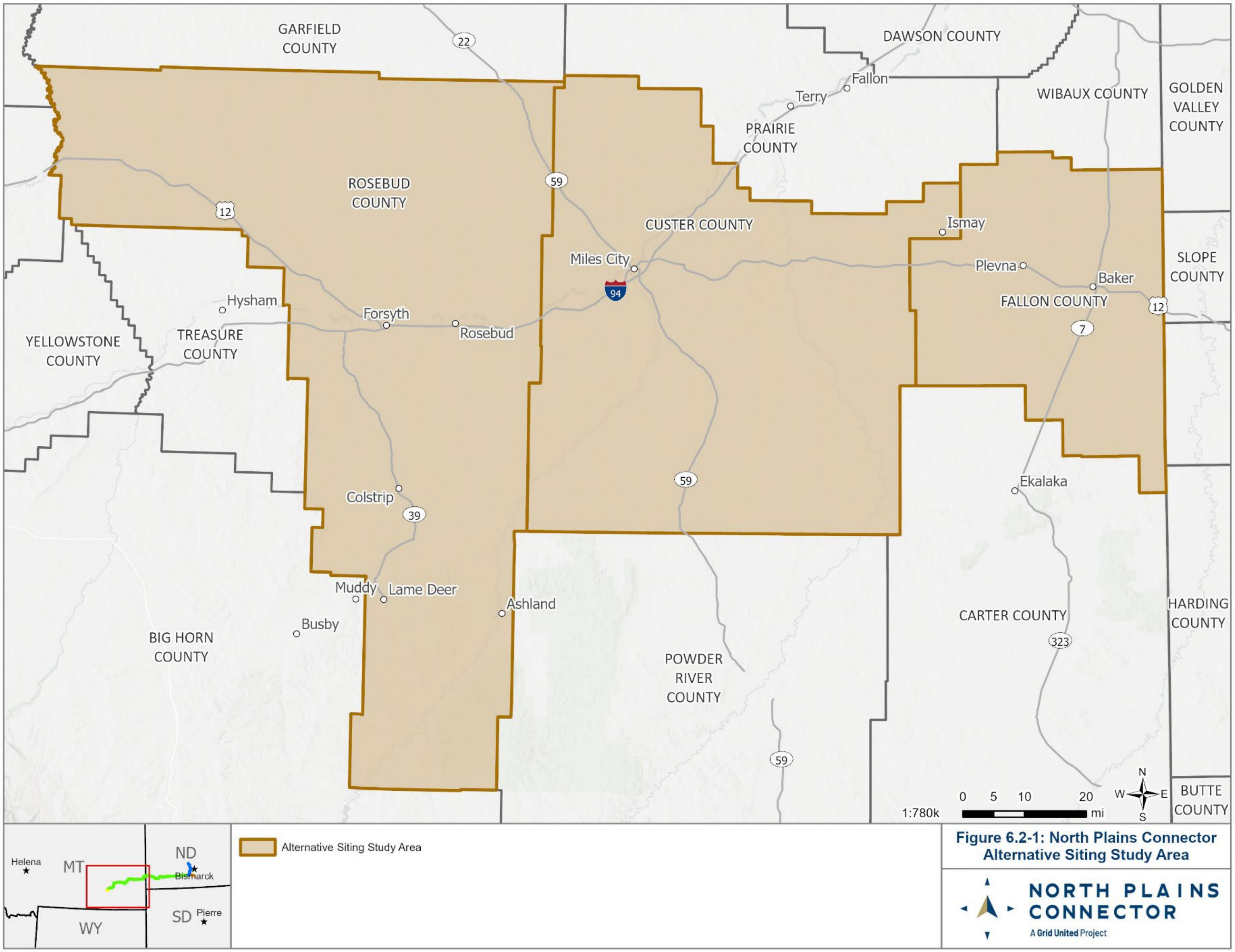

Figure 6.2-1: North Plains Connector Alternative Siting Study Area

6.2.3 Constraint Areas

Throughout the alternative route development process, several critical avoidance areas were identified that influenced the development of routing alternatives. These areas presented unique challenges and constraints that ultimately shaped the alternative route locations. Some of these areas also presented pinch points where no feasible alternative route could be identified. The following sections describe key constraint areas that played a pivotal role in alternative route development.

Greater Sage-Grouse Core and General Habitat Areas

In 2015, the Governor of Montana released Executive Order (EO) 12-2015, which established conservation measures for the GRSG that require projects undergoing state permitting to conduct a consistency review to ensure compliance with the requirements of the EO. This EO specifies, among other things, stipulations, and prohibitions for activities that may occur near GRSG leks within general habitat and core habitat areas. Depending on the habitat type crossed, EO 12-2015 describes specific development stipulations, including noise, surface disturbance, colocation requirements, and seasonal use limitations, as well as requirements specific to overhead power line siting.

GRSG core habitat areas in Montana encompass 9.6 million acres (approximately 30 percent) of the defined GRSG habitat located throughout eastern and southern Montana on private, state, and federal lands. All Project routing was planned to avoid GRSG core habitat areas (as defined by the MFWP) north of the Yellowstone River between Forsyth and Miles City and along the Montana-North Dakota state line south of Baker.

General habitat could not be avoided; however, historical GRSG lek data provided by MFWP was used to analyze each alternative for lek avoidance. Where general habitat is crossed, EO stipulations require “No Surface Occupancy” within 0.25-mile of a lek. See Section 7.7.1.5 for a detailed discussion of GRSG lek buffers along the alternatives.

BLM Pumpkin Creek Ranch Recreation Area and Strawberry Hill Recreation Area

Project routing considered specific designations and allocations outlined in the BLM’s Miles City Field Office Approved Resource Management Plan (ARMP). This plan establishes allowable uses and designates special areas, which played a role in alternative route development. Notably, the Pumpkin Creek Ranch Recreation Area and Strawberry Hill Recreation Area are among the special designations that influenced Project routing.

Strawberry Hill Recreation Area, located approximately 6 miles east of Miles City on the north side of U.S. Highway 12, is a designated Special Recreation Management Area (SRMA) covering approximately 4,248 acres of public lands administered by the BLM. Pumpkin Creek Ranch Recreation Area, situated about 17 miles south of Miles City, contains an Extensive Recreation Management Area encompassing approximately 2,200 acres plus an additional 19,006 acres of public lands administered by the BLM.

Neither the Pumpkin Creek Ranch nor Strawberry Hill recreation areas are crossed by alternative routes evaluated in this application (see Section 7.3.1.2). Additionally, the Lewis and Clark Trail SRMA, Dean S. Reservoir SRMA, and Matthews Recreation Area SRMA are located within the Study Area but outside of the Facility Locations (see Section 7.3.1.2).

6.2.4 Constructability

Alternative Project routing considered the region's unique terrain and resulting impact on constructability. The diverse topography and land features in the region, including rolling hills, river valleys, buttes, badlands, and plains, presented both challenges and opportunities for routing. Factors such as karst terrain, slope stability, soil composition, structure placement and span distances, and access to construction sites were assessed to ensure safe and efficient construction practices. By considering the terrain and constructability aspects, the alternative Project routing attempted to minimize environmental impacts and construction difficulties, while optimizing the long-term operational efficiency of the transmission line.

6.2.5 Use of Public Land

MFSA directs applicants to assess the utilization of public lands and federally designated energy corridors for location of a facility. There are no federally designated energy corridors in the alternative siting study area, but public lands are interspersed amongst privately owned land forming a checkerboard land ownership pattern throughout the region. Public lands within the Study Area include:

- state trust lands managed by the Montana Department of Natural Resources and Conservation (DNRC), which the state leases out to private entities as working land to create revenue for Montana’s public education institutions;
- federal land that is managed by the BLM for multiple uses; and
- Fort Keogh Livestock and Range Research Laboratory (Fort Keogh), managed by the U.S. Department of Agriculture (USDA) Agricultural Research Service (ARS) as a beef cattle research facility.

Routing on public land can be desirable where it provides relief to adjacent environmental or private land use concerns, or in the case of state trust lands where it raises revenue for public education consistent with the purpose of the land. While MFSA places a preference on the use of public lands, federal land management policies often run counter to this preference and will permit use of those lands only after exhausting other alternatives first.

Where practical and where not in conflict with other concerns, constraints, or requests from landowners, North Plains attempted to route the alternatives on state trust lands and coordinated extensively with federal land management agencies on appropriate avoidance or access easements as deemed appropriate for each affected parcel.

6.2.6 Public and Agency Engagement and Consultation (Circular MFSA-2 Section 3.3(2))

Starting in the fall of 2021, North Plains initiated agency coordination efforts to ensure effective communication with various governmental agencies. These agencies include state, federal, and local authorities responsible for overseeing environmental regulations and land management. The initial meetings served as introductions, allowing North Plains to discuss the Project objectives and scope, provide an overview of the Project, and establish points of contact. As development progressed, subsequent meetings addressed specific topics, such as required permits, survey details, the need for environmental review and compliance obligations. These ongoing agency coordination efforts have helped foster a cooperative environment to ensure that the Project aligns with the relevant regulations and guidelines. North Plains anticipates that agency coordination will continue throughout the Project's lifecycle to maintain open lines of communication, address any concerns or challenges, and seek necessary approvals and permits. Engaged federal, state and county entities include:

FEDERAL

- U.S. Department of Energy
- U.S. Department of Interior
- Bureau of Land Management
- U.S. Forest Service
- U.S. Department of Agriculture Agricultural Research Station
- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers
- National Park Service
- Bonneville Power Administration
- Western Area Power Administration

STATE

- Montana Governor's Office
- Montana Department of Environmental Quality
- Montana Fish, Wildlife and Parks
- Montana Department of Natural Resources and Conservation
- Montana Natural Heritage Program
- Montana Department of Transportation
- Montana Sage Grouse Oversight Team
- Montana Public Service Commission
- Montana State Senators
- Montana State Representatives
- Montana Department of Commerce
- Montana State Historic Preservation Office

COUNTY

- Rosebud County Conservation District
- Custer County Conservation District
- Fallon County Conservation District
- Little Beaver Conservation District

6.2.6.1 Engagement With Tribes and Tribal Representatives

North Plains recognizes the importance of engaging with Tribal Nations in the Project development and permitting process and is committed to engaging with Tribal Nations in a way that acknowledges Tribal sovereignty, minimizes potential Project impacts, and encourages broad Tribal participation. To fulfill this commitment, North Plains sought to engage with Tribal Nations early and continues to coordinate with and maintain an open dialogue with potentially interested Tribal Nations through the development of the Project.

To initiate outreach, North Plains engaged consultants to identify potentially interested Tribal Nations at the earliest stages of development. Working with a team of Federal Indian Law and Tribal engagement experts, the Project engaged in a robust research and mapping process, identifying known areas of Tribal concern – including Treaty areas, Tribal cessions, and ancestral territories near the Project Study Areas. Based on this analysis, 21 Tribal Nations were identified as having potential historic interest in the Study Areas, including all 8 Tribal Nations in Montana (see Table 6.2.6-1).

Table 6.2.6-1

Tribal Nations Identified with Potential Interest in Study Area

Tribal Nation	State
Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation (Fort Peck)	Montana
Blackfeet Tribe of the Blackfeet Indian Reservation of Montana (Blackfeet)	Montana
Chippewa Cree Indians of the Rocky Boy's Reservation (Rocky Boy)	Montana
Confederated Salish and Kootenai Tribes of the Flathead Reservation (CSKT)	Montana
Crow Tribe of Montana (Crow Tribe)	Montana
Fort Belknap Indian Community of the Fort Belknap Reservation (Fort Belknap)	Montana
Little Shell Tribe of Chippewa Indians of Montana (Little Shell)	Montana
Northern Cheyenne Tribe of the Northern Cheyenne Reservation (Northern Cheyenne)	Montana
Cheyenne River Sioux Tribe of the Cheyenna River Reservation (Cheyenne River)	South Dakota
Crow Creek Sioux Tribe of the Crow Creek Reservation (Crow Creek)	South Dakota
Flandreau Santee Sioux Tribe of South Dakota (Flandreau Santee Sioux)	South Dakota
Lower Brule Sioux Tribe of the Lower Brule Reservation (Lower Brule)	South Dakota
Oglala Sioux Tribe (Oglala or Pine Ridge)	South Dakota
Rosebud Sioux Tribe of the Rosebud Indian Reservation (Rosebud Sioux)	South Dakota
Yankton Sioux Tribe of South Dakota (Yankton Sioux)	South Dakota
Standing Rock Sioux Tribe of North and South Dakota (Standing Rock)	North Dakota and South Dakota
Sisseton-Wahpeton Oyate of the Lake Traverse Reservation (Sisseton-Wahpeton)	North Dakota and South Dakota
Spirit Lake Tribe (Spirit Lake)	North Dakota
Three Affiliated Tribes of the Fort Berthold Reservation (Three Affiliated or MHA)	North Dakota
Turtle Mountain Band of Chippewa Indians (Turtle Mountain) (incl. the Indian Community of Trenton Indian Service Area)	North Dakota
Santee Sioux Nation (Santee Sioux)	Nebraska

In late 2021, North Plains established a dedicated Tribal Engagement Team to facilitate Tribal participation in Project surveys and the pre-application process. The Tribal Engagement Team is comprised of regionally located Tribal members who hold established relationships and maintain an internal advocacy position on behalf of potentially interested Tribal Nations. The Tribal Engagement Team carries out the bulk of the North Plains' Tribal engagement by directing regular communications with Tribal Nations, facilitating meetings with Tribal leaders and organizations, offering logistical support related to Tribal survey participation, elevating and addressing Tribal issues within the Project team, identifying potential partnership opportunities, and maintaining consistent relationships with coordinating Tribal Nations.

With the assistance of the Tribal Engagement Team, North Plains developed a contact list for coordinating Tribal Nations. North Plains then held meetings with Tribal Nations with a potential interest in the Project to introduce the Project and identify opportunities to coordinate with the Project. Meetings were held in late 2021 and early 2022, and regular coordination has followed.

6.2.6.2 Engagement With Landowner and Local Governing Units

North Plains held public engagement events that were accessible to potentially affected landowners, local government officials, and the general public. North Plains' staff presented the Project in detail, addressed questions and concerns raised by participants, presented the need for the Project, and gathered valuable feedback on the route. Table 6.2.4-2 lists the public engagement events in Montana.

TABLE 6.2.6-2

Public Engagement Events

Date	Event	Location	Attendance
June 08, 2022	Fallon County Landowner Open House	Baker	21
June 09, 2022	Custer County Landowner Open House	Miles City	23
June 09, 2022	Rosebud County Landowner Open House	Forsyth	17
October 25, 2022	Rosebud County Landowner Open House	Colstrip	20
October 25, 2022	Custer County Landowner Open House	Miles City	25
October 26, 2022	Fallon County Landowner Open House	Baker	20
April 29, 2024	Rosebud County Landowner Dinner	Colstrip	13
April 30, 2024	Rosebud County Public Information Breakfast	Colstrip	17
April 30, 2024	Custer County Landowner Dinner	Miles City	49
May 01, 2024	Custer County Public Information Breakfast	Miles City	6
May 01, 2024	Fallon County Landowner Dinner	Baker	42
May 02, 2024	Fallon County Public Information Breakfast	Baker	3
September 23, 2024	Rosebud County Landowner Open House	Forsyth	13
September 24, 2024	Custer County Landowner Open House	Miles City	14
September 24, 2024	Fallon County Landowner Open House	Baker	10

Consistent with Montana Code Annotated (MCA) 75-20-211(4), North Plains published public notice of availability of this application in each of the counties in which the Project is located. A copy of the public notice is included as Appendix D, which appeared in area newspapers as outlined.

6.3 ALTERNATIVE ROUTE DEVELOPMENT

North Plains developed potential Project routes from 2021 to 2024 to identify constructible alternatives that meet the Project's stated purpose, minimize impacts, and satisfy landowner concerns. As part of the initial route development process, North Plains used routing analysis software to identify colocation opportunities and routing constraints to develop initial routes between the Project end points (see Section 5.1).

The routing software incorporated publicly available GIS datasets that were weighted to generate multiple alternative routes. Weighting considerations included: Project specifications; MFSA preferred location criteria and avoidance areas; overall transmission line length; encroachment into sensitive or restricted areas such as subdivisions and GRSG lek buffers; consideration of topographical constraints (e.g., rugged terrain); and linear infrastructure colocation opportunities.

The list of GIS data layers is provided in Table 6.3-1. The following list describes the factors used by the software, which includes Exclusion Areas, Avoidance Areas, Constraints Areas, and Preferred or Opportunity Areas.

- Exclusion Areas: Unique, highly valued, complex, or legally protected areas. Constructing the Project in these areas could potentially cause significant conflict with current or planned land uses or pose substantial hazards to construction and operation of the Project.

- Avoidance Areas: Important and valued resources or resources assigned special status. Constructing the Project in these areas could cause some conflict with current or planned land use and may pose some hazard to construction and operation of the facility.

- Constraint Areas: Areas that offer some sensitive siting considerations but overall provide for the placement of the Project that would not conflict with the existing activities or the planned land use in the area. These areas typically provide adequate construction access and potential for future maintenance.

- Preferred or Opportunity Areas: Areas that present potential opportunities to accommodate new facilities within already developed corridors and boundaries.

TABLE 6.3-1

Factors Considered During Alternative Route Development

Resource Category/Siting Considerations	Exclusion	Avoidance	Constraint	Preferred/ Opportunity
Transportation Facilities				
State Highways			X	
Interstate Highways			X	
County Roads				X
Residential Roadways		X		
Airports		X		
Utilities				
Adjacent to Existing Transmission Lines				X
Adjacent to Existing Distribution Lines				X
Oil and Gas Pipelines (crossing or adjacent)		X		
Communication Towers		X		
Existing Land Use				
Residential Areas (Visual Resources)		X		
Municipal Boundaries		X		
City or County Parks	X			
State Parks	X			
Reservoirs, Campgrounds, Trails and Other High Use Recreation Areas	X			
Montana State Trust Lands				X
BLM Lands			X	
National Inventoried Roadless Areas	X			
USFWS Grassland Easements	X			
USFWS Wetland Easements	X			
NRCS Conservation Easements			X	
Prime Farmland			X	
National Wilderness Areas	X			
National Parks and Monuments	X			
Irrigation			X	
Wind Turbines		X		
Military Installations	X			
Existing and Abandoned Mines		X		
Wetlands and Waterways				
Section 10 River Crossings		X		
Wild and Scenic River Corridors	X			
Floodplains			X	
Floodways		X		

TABLE 6.3-1

Factors Considered During Alternative Route Development

Resource Category/Siting Considerations	Exclusion	Avoidance	Constraint	Preferred/ Opportunity
Other Wetland or Waterway Resources			X	
USDA Wetland Reserve Program Easements	X			
Wildlife Resources				
Greater Sage-Grouse Core Habitat	X			
Greater Sage-Grouse General Habitat			X	
Greater Sage-Grouse Leks (0.25-mile buffer)	X			
Greater Sage-Grouse Leks (2-mile buffer)		X		
Waterfowl Production Areas		X		
Big Game Winter Range			X	
Mountain Sheep or Goat Range			X	
Protected Species Critical Habitat	X			
Engineering Constraints				
Steep Slopes [a]		X		
Cultural Resources				
National Historic Landmarks	X			
Historic Districts			X	
Visual Resources				
Scenic Byways		X		
Scenic Sensitive Areas [b]		X		
Scenic Integrity Objective Low				X
Scenic Integrity Objective Moderate and High		X		

[a] The MFSA Circular 2 defines rugged topography as areas having slopes greater than 30%. Initial routing was performed using more conservative criteria; North Plains excluded areas greater than 20% slope and avoided areas with 7-20% slope. Subsequent alternative routes were assessed using the criteria of 30% slopes.

[b] Includes Little Missouri River National Grasslands Scenic Integrity Objective and Bureau of Land Management Visual Resource Management Class II lands.

Per Circular MFSA-2 Section 3.5, North Plains developed Project routing within the Study Area based on consideration of the GIS information gathered in accordance with MFSA requirements outlined in the previous sections.

These GIS layers were incorporated into the routing software to generate an initial least cost route. This initial software analysis route was used to generate a starting point for Project design and did not in itself identify a viable route. Beginning with the initial software derived route, North Plains made routing adjustments to address more detailed environmental resource concerns and engineering constraints identified through an iterative public and agency engagement strategy.

North Plains' "stakeholder first" strategy involved incorporating feedback into the routing development process to mitigate the pitfalls that have historically hindered interregional transmission development. The underlying philosophy seeks to address competing interests early in the process rather than selecting a route first and later sharing it with stakeholders through a formal public scoping process. With this approach, North Plains sought and incorporated early feedback from agencies and landowners to identify acceptable and constructable routing prior to applying for necessary county, state, and federal permits and approvals.

This approach yielded a range of routing alternatives that North Plains developed collaboratively with federal, state, tribal, and local agencies, as well as affected landowners. Several preliminary routes were shared with affected landowners multiple times between 2021 and 2024 to gather additional stakeholder feedback. Additional input was gathered through agency and tribal outreach; comments received during open houses; collection of updated resource information; and field survey and constructability reviews of potential routes.

6.3.1 Identification of Preliminary Routing Alternatives

The alternatives discussed below reflect the results of the route development process above. Figure 6.3-1 shows the least-cost route as well as the major revisions incorporated as stakeholder feedback was gathered. Major revisions included the following:

- Revision to avoid BLM Visual Resource Management (VRM) Class II lands and active GRSG lek buffers, as well as increase colocation with U.S. Highway 12 (see Box 3 in Figure 6.3-1; influencing development of Alternative B).

- Revision to avoid Tongue River, BLM VRM Class II lands, and active GRSG lek buffers (see Box 2 in Figure 6.3-1; influencing development of Alternative C).

- Revisions to avoid encumbrances from easements related to transmission line and solar development (energy easements), minimize impacts to BLM VRM Class II lands and active GRSG lek buffers, and increase colocation with U.S. Highway 12 while incorporating landowner feedback and field survey results throughout (see Box 4 in Figure 6.3-1; influencing development of Alternative D).

- Revision to parallel Tongue River Road on the east side of the Tongue River (see Box 1 in Figure 6.3-1; influencing development of Alternative E).

North Plains also developed one route option, Alternative A, based on feedback from the BLM that would maximize colocation with existing linear utilities near Interstate 94 and minimize routing within the General Habitat Management Area (GHMA) for GRSG in accordance with the BLM's Miles City Field Office ARMP and with updated data on GRSG leks from MFWP. This route was developed independently of the least-cost route and route revisions (see Box 5 in Figure 6.3-1).

Five preliminary routing alternatives were identified during this process and are described below. A base map of the five alternative routes is provided in Figure 6.3-2. More detailed maps are included in Appendix E, which also include environmental information specified in Circular MFSA-2 Section 3.4. Maps include section lines or corners and township and range locations. Environmental information required per Circular MFSA-2 Section 3.4(1) is discussed in Section 7 of this application.

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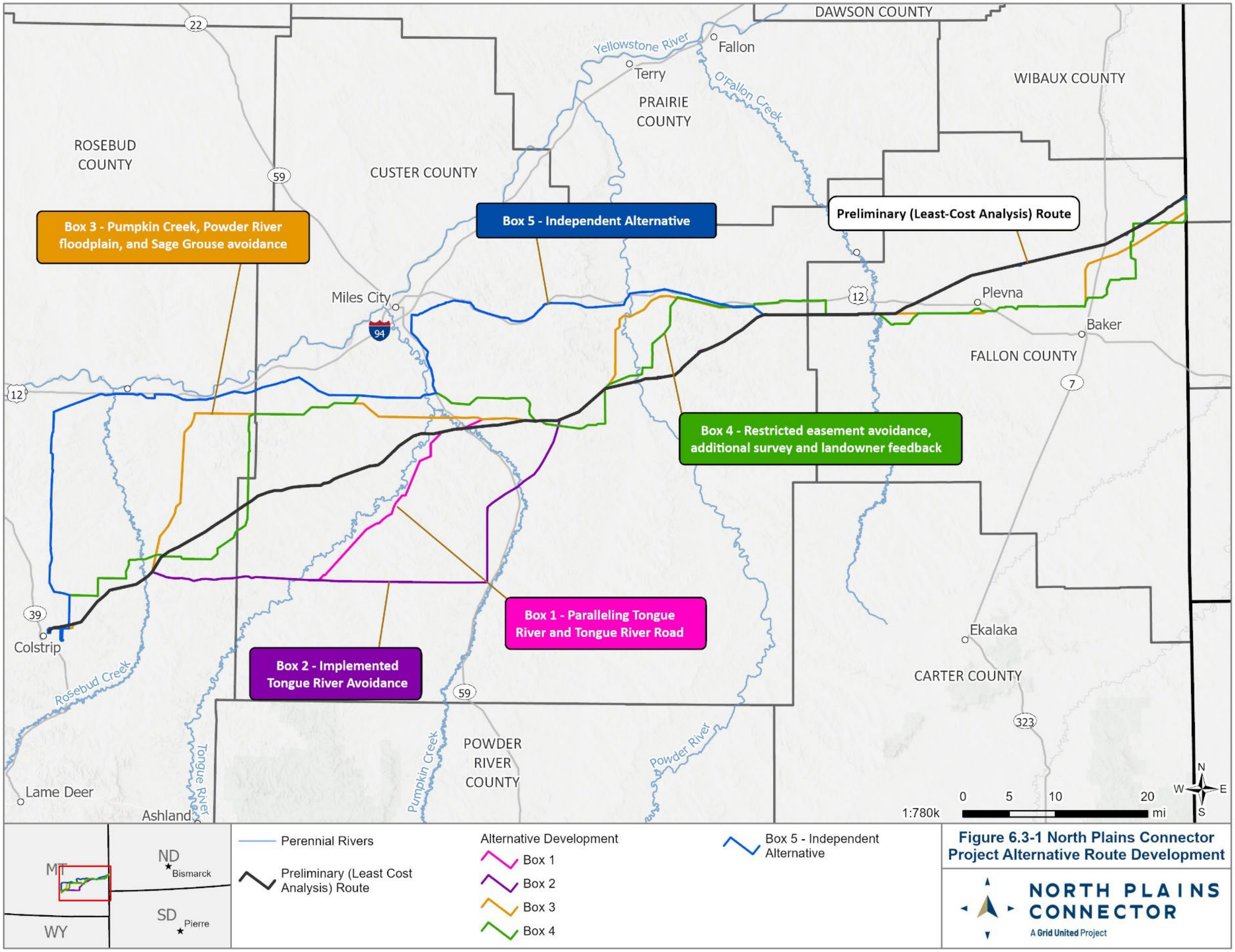

Figure 6.3-1 North Plains Connector Project Alternative Route Development

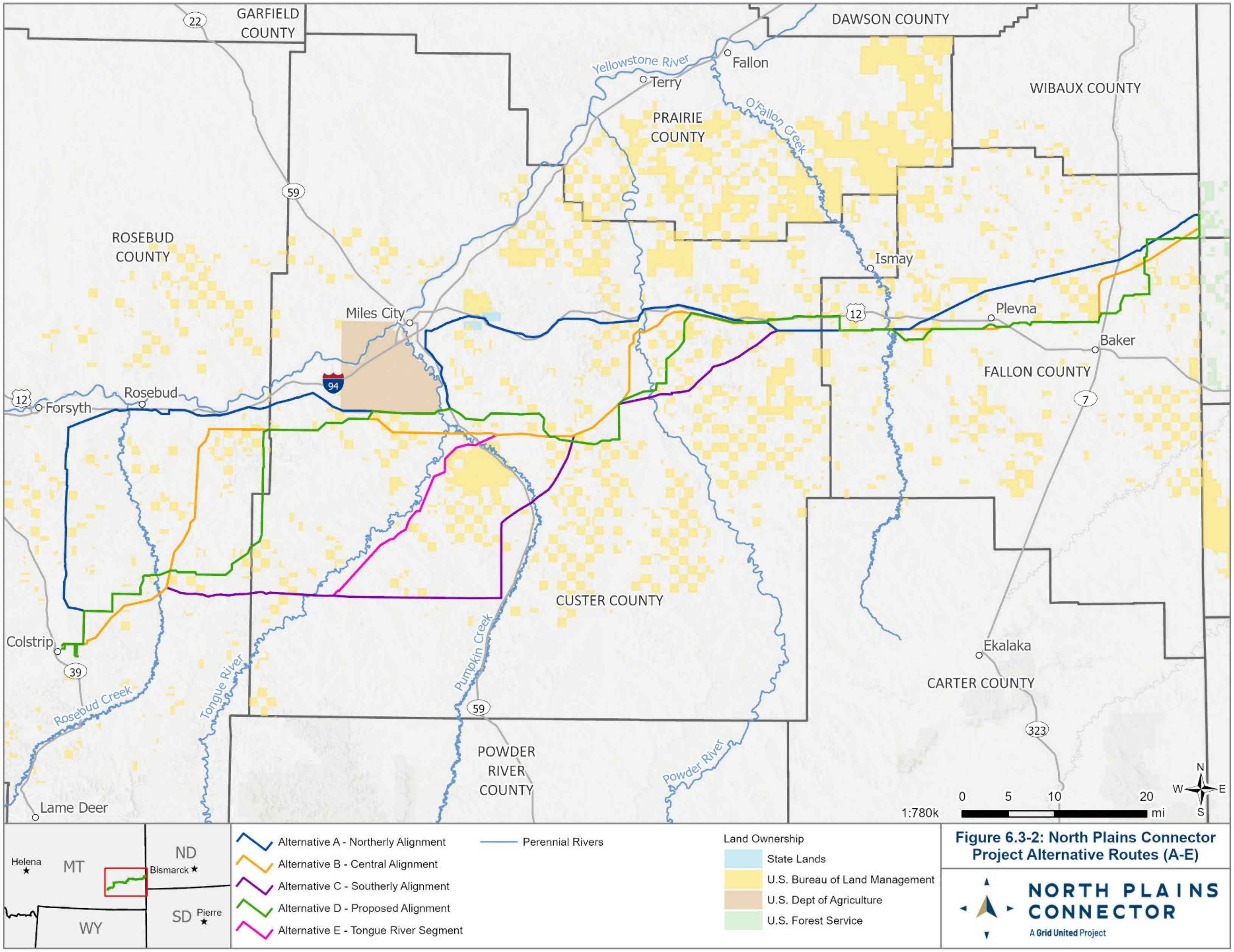

Figure 6.3-2: North Plains Connector Project Alternative Routes (A-E)

Alternative A – Northerly Alignment

Alternative A was developed based on a recommendation from the BLM to minimize routing within the GRSG GHMA in accordance with the BLM's Miles City Field Office ARMP, and to maximize colocation with existing linear utilities near Interstate 94. One of the potential benefits to paralleling existing infrastructure may be that it could minimize impacts on sensitive resources; however, paralleling a congested corridor can create safety hazards and greatly complicate construction and operation of new facilities. Further, the existing infrastructure has typically already used the most desirable terrain, resulting in adjacent obstructions and sensitive resources that cannot be avoided without diverting from the established corridor. While a corridor defined by one existing road or utility can be advantageous, a corridor with multiple roads and/or utilities often is not.

Alternative A is the only action alternative not initially identified by the iterative routing software exercises.

To achieve a route that parallels existing linear facilities near Interstate 94 and minimizes use within the GHMA, this alignment heads straight north out of the existing Colstrip substation, which is the most direct route to Interstate 94. This route takes the alignment through energy easements, including an area of exclusive transmission line easements north of Colstrip and a solar energy easement at another location in Rosebud County. Once along Interstate 94, near Forsyth, the route parallels Interstate 94, the Yellowstone River, and existing linear utilities such as transmission lines, natural gas pipelines, and fiber optic lines until it reaches the boundary of Fort Keogh. Once near the Fort Keogh boundary, the route deviates away from Interstate 94 to minimize crossing straight through Fort Keogh but does cross Fort Keogh for approximately 10.5 miles near the southern boundary. From the southeast corner of Fort Keogh, near the confluence of the Tongue River and Pumpkin Creek, the route begins to parallel U.S. Highway 59 and the Tongue River north-northwest to Miles City. From here, the route parallels Interstate 94 and skirts along the eastern side of Miles City and then heads east and parallels U.S. Highway 12 and an existing transmission line to roughly 9 miles west of Plevna. At this point, the route deviates from existing linear utilities and major roads to head straight northeast to the Montana-North Dakota state line.

Alternative B – Central Alignment

Alternative B was developed as an enhancement of the initial software analysis route and Alternative A. Unlike Alternative A, Alternative B strategically avoids the biological and cultural resource challenges associated with the Yellowstone River, congested highway corridors, and urban development areas near Miles City. Compared to the initial software analysis route, however, Alternative B is positioned closer to Interstate 94 and maintains a generally more central alignment between Alternative A and the initial software analysis route. While not directly parallel to Interstate 94, the route aims to strike a balance by incorporating agency feedback associated with colocation and integrating elements from the initial software analysis route.

To achieve this balance, Alternative B initially heads northeast from the existing Colstrip substation before diverting north near Rosebud Creek to avoid properties encumbered by the exclusive transmission line easement north of Colstrip crossed by Alternative A, and to align more closely with Interstate 94. Although Alternative B avoids the energy easements north of Colstrip, it crosses the same solar energy easement in Rosebud County as Alternative A, as well as a state conservation easement in Custer County held by the MFWP to conserve, protect, and enhance native wildlife habitat. As the route nears Interstate 94, it veers straight east, skirting just south of Fort Keogh. The route crosses the Tongue River just south of 12 Mile Dam, which is a state fishing access site and campground. This area also contains subdivisions for residential development and irrigated cropland. Continuing east, the route skirts north of the Pumpkin Creek Ranch Recreation Area along the Tongue River Road. From there, it heads north just west of the Powder River before paralleling U.S. Highway 12 and an existing transmission line eastward, reaching a point approximately 3 miles north of Baker. The route then begins to run parallel to Montana Highway 7 north of Baker before deviating from the highway to proceed straight northeast toward the Montana-North Dakota state line.

Alternative C – Southerly Alignment

Alternative C was designed as an enhancement of the initial software analysis route and is a more southern route to take advantage of the gentler topography in the region compared to the other routes that either head straight north out of the existing Colstrip substation (Alternative A) or head north or northeast near Rosebud Creek (Alternatives B and D).

To achieve a route that benefits from the gentler topography in the region (e.g., smaller temporary construction footprint, easier accessibility, and more cost effective), Alternative C was designed to head northeast from the Colstrip substation and then deviate east near Rosebud Creek, heading straight east to Pumpkin Creek and Montana Highway 59. From there, the route heads north generally parallel to Pumpkin Creek and Montana Highway 59 until it deviates northeast towards U.S. Highway 12 where it parallels the highway and an existing transmission line eastward, reaching a point approximately 3 miles north of Baker. The route then begins to run parallel to Montana Highway 7 north of Baker before deviating from the highway to proceed straight northeast toward the Montana-North Dakota state line.

The segment of Alternative C between the Colstrip substation and U.S. Highway 12 predominantly traverses open country characterized by limited opportunities for parallel alignment with existing linear features. Nonetheless, the route does parallel Cherry Creek Road for approximately 7 miles and briefly aligns with several other roadways for shorter distances. Alternative C avoids the GRSG No Surface Occupancy Zone; however, the route crosses within 2 miles of active leks.

Initially, North Plains considered an alignment of Alternative C that more closely followed Montana Highway 59 along Pumpkin Creek. However, this portion of the route was dismissed from consideration due to the increased likelihood of potential impacts to archeological and tribal cultural resources which are generally found at high densities near rivers and streams, consistent with the Pumpkin Creek watershed. An additional consideration was the wider biodiversity of plants and wildlife that are typically found near rivers and streams. Finally, setbacks to residences and farms located along the highway also reduce the routing options and parallel opportunities along Montana Highway 59.

Alternative C passes through the same solar easements encumbrances as the first two alternatives, along with the MFWP Bice conservation easement.

Alternative D – Proposed Route

Alternative D is North Plains' proposed route in Montana. One key goal was to minimize the fragmentation of GRSG GHMA in accordance with the BLM's Miles City Field Office ARMP and colocating as much as possible while also avoiding the congested utility corridors encountered by Alternative A.

To meet these goals, Alternative D begins in a northeast direction from the existing Colstrip substation, alternating north and east along parcel boundaries until near Rosebud Creek. From there, the route continues east and then eventually heads straight north along the Custer and Rosebud County lines to Graveyard Creek Road. The Alternative D Facility Location avoids the energy and conservation easements crossed by Alternatives A and B in Rosebud County, although it contains the same conservation easement as Alternative B in Fallon County. From there, the route heads east where it crosses the southern boundary of Fort Keogh for approximately 7 miles, exiting in the southeast corner. From the southeast corner of the Fort Keogh boundary, near the confluence of the Tongue River and Pumpkin Creek, the route continues east until near the Powder River where it turns north towards U.S. Highway 12. From there, the route generally parallels U.S. Highway 12 and an existing transmission line eastward, reaching a point approximately 3 miles north of Baker. The route then heads northeast of Baker in an alternating north and east direction generally along parcel boundaries until the Montana-North Dakota state line.

Alternative D avoids several biological and cultural resource constraints associated with the Yellowstone River and paralleling other river and creek corridors, congested utility corridors, and urban development areas. Alternative D also parallels existing roads and transmission lines where possible to facilitate easier access during construction and operations and to minimize environmental impacts.

Alternative E – Tongue River Segment

Alternative E is a variation of Alternative C where the route deviated to follow along the Tongue River Valley.

Alternative E deviates north of the route of Alternative C near the Tongue River and Tongue River Road where it begins to parallel both the road and the river northeast. Once it nears the west side of Pumpkin Creek Ranch Recreation Area, it turns east near the confluence of Pumpkin Creek and Tongue River. From there, it continues east and crosses Montana Highway 59, then parallels Road 538 before merging back with Alternative C. The route segment is approximately 30 miles long.

During discussions of the Project with various agencies, agency staff indicated to North Plains the presence of several tribal resources and protected species concerns related to nearby prairie dog towns along the Tongue River that had been identified during siting surveys for another project. Agency staff noted that it would be difficult to avoid these sensitive areas. As a result, agency staff recommended that North Plains consider an adjustment to the route that followed another path north, such as along Montana Highway 59 near Pumpkin Creek. This recommendation was incorporated into the development of Alternative C, and Alternative E was ultimately considered and eliminated from further consideration in accordance with ARM 17.20.1305(4).

6.3.2 Screening of Preliminary Routing Alternatives

North Plains evaluated a range of routing alternatives during Project development and considered landowner input on equal standing with other built and natural environmental constraints and regulatory requirements. This approach prioritized collaboration and cooperation with landowners, recognizing the importance of the relationship between the impacted landowners and the long-term operation of the Project.

Stakeholder input was considered during two distinct phases of development and screening of routing alternatives. The first phase of screening considered general natural resource siting constraints based on available databases and feedback from state and federal regulatory agencies. The results of this initial screening are summarized in Table 6.3.2-1; all route alternatives included in the screening were preliminary.

The second phase of screening considered smaller, micro-siting adjustments to the most promising route(s) based on landowner preferences, field survey findings, and more detailed coordination with regulatory agencies (see Section 6.3.3).

TABLE 6.3.2-1

Quantitative Screening of Preliminary Route Alternatives [a]

Factor	Alternative A (original)	Alternative B (original)	Alternative C (original)	Alternative D (original)
Centerline Length (miles)	174.7	160.4	153.6	154.6
Right-of-Way Area (acres)	4,213.5	3,867.8	3,702.5	3,747.8
Colocation/Overlap with Existing Rights-of-Way (miles)	47.2	21.5	7.7	25.3
GRSG General Habitat (miles)	100	138.2	127.6	132.3
GRSG Leks (within 2-mile Buffer) (miles)	18.3	32.6	19.4	29.6
GRSG No Surface Occupancy Zone (within 0.25-mile buffer)	0	0	0	0
Highly Erodible Soils (miles)	53.3	65.4	55.4	64.3
Prime Farmlands (miles)	59.3	34.7	36.2	34.5
Total Wetlands (miles)	2.9	2.5	2.5	2.4
Perennial Waterbodies (number)	11	16	16	13
Intermittent/Ephemeral Waterbodies (number)	307	266	256	252
BLM Visual Resource Management Class II Land (miles)	1.2	1.3	2.1	1.3
Tribal/Cultural Resources (number)	241	169	202	147
Irrigated Farmland (miles)	2.5	0.4	0.2	0.4
Open Land, Rangeland, & Pasture (miles)	174.6	160.3	153.5	154.5
Public Lands (miles)	22.4	31.2	20.9	31.5
Vicinity to Airports/Airstrips (within 1 mile)	0	0	0	1
Slopes <15% (miles)	152.5	134.8	130.6	129.3
Slopes 15 to 30% (miles)	19.2	20.5	19.3	20.1
Slopes >30% (miles)	3	5	3.7	5.1
New Access Roads (miles)	99.2	126.3	113	125.6
Residences within 1,000 Feet of the Centerline (number)[6]	17	4	10	4

[a] All route alternatives included in this screening were preliminary; thus, impacts observed in this table may not match the values calculated for later route versions provided in Section 7. Minor revisions to Alternatives A, B, and C included adjustments to align with the Rosebud County Converter Station and to resolve potential conflicts with existing structures and infrastructure along the routes. Refinements to Alternative D were more extensive and are discussed in Section 6.3.3.

The first phase of screening revealed the following for each alternative route[3]:

The original Alternative A avoided the greatest amount of GRSG general habitat and intermittent/ephemeral waterbodies, and provided the greatest opportunity for colocation with other linear infrastructure, but coincidentally sited the alignment within heavily congested utility corridors and dense developments around Miles City. This routing alternative also resulted in the greatest level of impact to:

- Prime farmlands
- Wetlands
- Intermittent/ephemeral waterbodies
- Tribal/cultural resources
- Irrigated farmland
- Open land, rangeland and pasture
- Residences
- Existing transmission line and solar easements
- Fort Keogh

The original Alternative B avoided the congested corridors and developments, as well as the energy (transmission line) easements and Fort Keogh encountered by Alternative A. It did, however, cross solar easements, require construction of the greatest length of new access roads, and have the greatest impact to:

- GRSG general habitat
- Active GRSG leks
- Highly erodible soils

The original Alternative C was the shortest in length and was generally sited in gentle terrain, however, it has the least opportunities for colocation, was located in proximity to the second greatest number of residences, and resulted in the greatest impact to:

- Perennial waterbodies
- BLM Visual Resource Management Class II areas

The original Alternative D was the shortest in length, provided the second greatest opportunity for colocation, and utilized the second greatest amount of public land; however, it required the second greatest length of new access roads and resulted in the greatest impact to:

- Rugged terrain (slopes from 15 to 30+ degrees)

From this screening analysis, original Alternatives C and D were preferrable to original Alternatives A and B and were carried forward for more detailed stakeholder coordination.

When comparing original Alternative C and original Alternative D, both alternatives appeared to encounter similar resources and may result in similar potential impacts. Where impacts differed, the type and magnitude of potential impacts were not substantive.

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3 Note, the preliminary screening was conducted using the original Alternative D, which was presented during public meetings in June 2022, and Alternatives A, B, and C from the original MFSA application submission.

Original Alternative C was preferrable to original Alternative D in light of:

- Less impact to GRSG general habitat and proximity to active leks
- Less impact to highly erodible soils and steep slopes
- Less impact to irrigated farmland

Original Alternative D was preferrable to original Alternative C when viewed in light of:

- Greater colocation opportunities with existing linear facilities
- Less impact to prime farmlands
- Less impact to wetlands and perennial waterbodies
- Less impact to tribal and cultural resources
- Less impact to private land by utilizing more public land
- Less impact to BLM visually sensitive areas
- Less impact to residential areas

This first phase of screening identified the original Alternative D as the most preferrable routing alternative. The following consideration of landowner input further demonstrated the differences between original Alternatives C and D.

Several landowners identified land use conflicts along Alternative C near where Alternative C and Alternative D diverge (extending from approximately 20 miles to 80 miles east of Colstrip). Landowners along Alternative C indicated that the route would negatively impact certain aspects of ongoing farming and ranching operations, whereas Alternative D avoids these land use conflicts. Additionally, Alternative C crosses about 6 miles of occupied subdivided property and about 3 miles of a MFWP conservation easement (Bice conservation easement) just west of the Tongue River. The conservation easement comprises an expansive, unavoidable patchwork of tracts that extends for a few miles in all directions. The purpose of the easement is to "preserve and protect in perpetuity the conservation values of the Land, particularly the habitat the Land provides for a variety of wildlife species." The easement prohibits the "removal of trees… the control, removal, or manipulations of any riparian vegetation… and any commercial or industrial use or activity." Further, portions of the easement are specifically managed to "maintain viable prairie dog colonies," which are essential to providing habitat for species like the burrowing owl, black-footed ferret, and certain other sensitive wildlife. Although the installation of a utility line is not specifically identified as prohibited, MFWP has indicated that granting a utility right-of-way across this and similar easements in the vicinity would be problematic. Alternative D has an important advantage because it does not cross either the subdivided land or the Bice conservation easement.

Alternative C crosses the Powder River at a location with constructability challenges and continues east across a steeply rolling landscape of pine forests where it traverses up and down multiple abrupt elevation changes of up to 800 feet.

Alternative C crosses four tracts of BLM land with a Visual Resource Management Class II rating in undisturbed areas. Alternative D, on the other hand, would cross the Powder River in an area that does not present the same constructability challenges and traverses much gentler terrain with a large portion of route colocated with an existing transmission line adjacent to Highway 12. Shorter, flatter new access roads would be required on Alternative D. Alternative D also crosses only two BLM tracts with a Class II rating, one of which involves running parallel with an existing powerline, and the other running parallel to an existing road.

Alternative C crosses several parcels where North Plains received strong public and landowner opposition to transmission development, whereas Alternative D has public and landowner support for siting of the transmission line. The combination of a number of affected landowners objecting on one route compared to landowner support for the other route presents a unique routing consideration consistent with the Project's overall goal and objective to avoid and minimize impacts to resources and land use while considering stakeholder input.

Based on this additional level of review, original Alternative D resulted in meaningful opportunities for avoidance and minimization of impacts, and fewer landowner and topographic constraints to implementation over Alternative C and was identified as the preferred route by North Plains.

6.3.3 Refinement of Alternative D (the Proposed Route)

After identifying Alternative D (original) as the preferred route, North Plains initiated comprehensive environmental surveys; conducted additional consultation with relevant Tribal, federal, state and local agencies; initiated preliminary engineering and constructability reviews; and continued to work with affected communities and individual landowners. Overall, the refinement process resulted in a longer Alternative D route, but one that has a lower likelihood of natural resource concerns and a higher likelihood of landowner, Tribal, and regulatory agency approval. The route refinement process resulted in more than 14,000 communications with stakeholders and more than 50 route adjustments spread throughout the alignment. The vast majority of adjustments were made based on site-specific information and requests provided by affected landowners, with just over a dozen modifications made based on new engineering considerations or environmental constraints discovered in the field.

While Alternatives A, B, and C were not refined to the same extent as Alternative D, they were retained for comparison to Alternative D in Section 8 of this application to ensure that the potential impacts from Alternative D do not rise to a level of significance compared to other potential options. The refinement of Alternative D has resulted in an incremental increase in length and potential resource impacts; however, similar or greater increases in length and associated impacts would be expected on Alternative A, B, or C if any one of those alternatives were to undergo the same route refinement process, especially considering the constraints described on each of those routes above. This is an important factor to keep in mind when attempting a side-by-side review of the alternative impacts presented in the remainder of this document.

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7.0 BASELINE STUDY AND IMPACT ASSESSMENT (75-20-211(1)(a)(iii) MCA, 75-20-211(1)(a)(iv) MCA, ARM 17.20.803(3)(f), ARM 17.20.803(3)(h), ARM 17.20.1305(1), ARM 17.20.1426(1 & 2) Circular MFSA-2, Section 3.0(1, 2, 3 & 4), Circular MFSA-2 Section 3.1(1, 3, 4, 6, 7, 8 & 9), Circular MFSA-2 Section 3.2(1, 2, 3 & 4), Circular MFSA-2 Section 3.4(1, 3, 4, 5, 6, 7, 8, 9 & 10), Circular MFSA-2 Section 3.6(1, 2, 3, 4, 5, 6 & 7) & Circular MFSA-2 Section 3.7(1))

7.1 ACTION ALTERNATIVES

In accordance with Circular MFSA-2 Sections 3.6 and 3.7, the following sections include baseline data for Alternatives A, B, C, and D, as described in Section 6.3 , along with an assessment of the projected short- and long-term impacts resulting from Project construction and/or operation and maintenance (DEQ, 2023a). North Plains assessed impact significance based on an impact's duration (short- to long-term), frequency of occurrence, severity, geographic extent, and the uniqueness or importance of the affected resource (Circular MFSA-2 Section 2). North Plains included mitigation measures in the assessment of impact significance. According to the definition in the Circular MFSA-2, mitigation includes all measures that avoid or minimize impacts or provide compensatory mitigation for impacts.

For this assessment, North Plains defined short-term impacts as those occurring during construction and up to three years after completion of construction. Long-term impacts are defined as those occurring for more than three years after construction. The frequency of occurrence will vary between a one-time event (e.g., installing a transmission structure during construction) and repetitive events carried out intermittently over time (e.g., regular transmission line inspections). The levels of severity vary for each resource and are described as applicable. Highly unique or important resources are identified throughout the assessment.

The geographic extent of potential impacts for each alternative route is quantified by the Facility Location of the alternative route and resource-specific Study Areas. The "Facility Location" consists of an approximately 500-foot-wide corridor containing the Project centerline and a 200-foot right-of-way, access roads ad described in Table 2.2.2-1, a 750-foot-radius for pulling and tensioning sites, and permanent facilities.[4] The full Facility Location will not be developed or disturbed but allows for minor line adjustments or additional workspace for construction activities and access road clearing and grading, as necessary. The Facility Location encompasses both the permanent operational areas and temporary construction areas. Since only a portion of the Facility Location will be altered or directly impacted by construction or operation (see Table 2.2.2-1 for Project workspace requirements), the quantification of resources within the entire Facility Location overestimates potential Project impacts. This does, however, provide a useful comparison between alternative routes.

Study Areas are defined for each resource. Study Areas include the Facility Locations and may include adjacent areas, depending on the resource, as dictated by Section 3.7 of the Circular MFSA-2. Sections 7.3 through 7.11 of this application provide baseline data and impact assessments of resources that could be affected within the Facility Location for each alternative route. Resource maps are provided in Appendix E for each Study Area; where the Study Area is the same as the Facility Location, the Study Area boundary is not called out. Appendix F provides

[4] Facility Locations do not include the locations of multi-purpose construction yards or fly yards that have not yet been determined. Yards will be sited in existing commercial/industrial areas or in agricultural or range lands temporarily leased by North Plains within 10 miles of the route, such that environmentally sensitive areas will be avoided and impacts of yard use minimized. Impacts from yards on all four alternatives would be expected to be similar.

baseline data tables for those resource-specific Study Areas that extend beyond the Facility Locations.

As discussed in Section 6.3.3, after identifying Alternative D as the preferred route, North Plains engaged in a refinement of the route to better ensure that the Project could be permitted and constructed. The calculations presented throughout the remainder of this document represent the refined Alternative D, which was developed to a much higher level of detail than Alternatives A, B and C. The refinement of Alternative D has resulted in an incremental increase in length and potential resource impacts; however, similar or greater increases in length and associated impacts would be expected on Alternative A, B, or C if any one of those alternatives were to undergo the same route refinement process, especially considering the constraints described on each of those routes above. This is an important factor to keep in mind when attempting a side-by-side review of the alternative impacts presented in the remainder of this document. Alternative E was eliminated from further consideration (see Section 6.3.2) and was not included in the impact assessment.

Table 7.1-1 shows the approximate mileage and Facility Location size of each of the four alternatives evaluated in full; alternative locations are also shown in Figure E-1a in Appendix E.

TABLE 7.1-1

Mileage and Permit Acreage for Route Alternatives

Route Alternative	Route Mileage	Facility Location Size (acres)
Alternative A	177.3	14,702
Alternative B	163.6	13,098
Alternative C	156.8	13,160
Alternative D [a]	180.1	15,159

[a] North Plains' preferred route.

7.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, the beneficial and adverse impacts associated with the Project as described throughout this application would not occur. See Section 5.7 for further discussion.

7.3 LAND OWNERSHIP, LAND USE, LAND COVER, AND RECREATION (Circular MFSA-2 Section 3.7(2 & 4) & Circular MFSA-2 Section 3.7(15 & 16))

The following section discusses land ownership, land use, land cover, and recreational or special interest areas within the Facility Location of each alternative route as defined in Section 7.0. Appendices E and F provide additional land ownership, land use, land cover, and recreational or special interest area baseline data (in maps and tables, respectively) within the required MFSA Study Areas. Per Circular MFSA-2 Section 3.7 (2,10,15), the Study Area for land use, land cover, and recreational or special interest areas is the area within 2 miles of each alternative route (4-mile-wide corridor) and the Study Area for individual residences and major farm support buildings not included within an urban or residential area within 0.5 mile of each alternative route (1-mile-wide corridor).

7.3.1 Baseline Data

7.3.1.1 Land Ownership

North Plains used land ownership baseline data from the BLM (BLM, 2022a), U.S. Environmental Protection Agency (EPA) and U.S. Department of Interior (DOI) (EPA and DOI, 2021), and Montana Cadastral Framework (Montana State Library [MSL], 2024).

All four alternative routes cross federal, state, and private lands (see Tables 7.3.1-1 and 7.3.1-2, and Figure E-2a in Appendix E). Alternative A is the only route that crosses local public land. No alternative route crosses tribal or reservation lands. North Plains prioritized siting the transmission line based on the preferred location criteria outlined in the Circular MFSA-2 Section 3.1. Under all alternative routes, the Project will primarily cross private lands, with the next highest land ownership groups crossed being federal and state lands followed by local lands, as described below.

TABLE 7.3.1-1

Land Ownership in the Alternative Facility Locations

	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
Land Ownership	acres	prop.	acres	prop.	acres	prop.	acres	prop.
FEDERAL [a]								
BLM	456	3%	1,189	9%	867	7%	1,003	7%
USDA ARS	834	6%	11	<1%	0	0%	610	4%
Subtotal	1,290	9%	1,201	9%	867	7%	1,613	11%
STATE [a]								
Montana State Trust Lands	617	4%	1,579	12%	1,195	9%	1,489	10%
State of Montana	90	1%	0	0%	0	0%	0	0%
Subtotal	707	5%	1,579	12%	1,195	9%	1,489	10%
LOCAL	15	<1%	0	0%	0	0%	0	0%
PRIVATE	12,690	86%	10,318	79%	11,098	84%	12,057	80%
TRIBAL	0	0%	0	0%	0	0%	0	0%
PROJECT TOTAL [a]	14,702	100%	13,098	100%	13,160	100%	15,159	100%

[a] Subtotals may not add up due to rounding.

[b] Data does not include rights-of-way.

Note: BLM = Bureau of Land Management; USDA ARS = U.S. Department of Agriculture - Agricultural Research Service; and prop. = proportion of total, in percent.

Sources: Montana State Library, 2024; Bureau of Land Management, 2022a; U.S. Environmental Protection Agency and U.S. Department of Interior, 2021

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TABLE 7.3.1-2

Private, Tribal, and Public Lands Crossed by Each Alternative Route (miles)

Land Ownership	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
Federal	17.0	14.7	10.0	17.6
State	8.2	19.3	13.7	16.9
Local	0	0	0	0
Private	152.1	129.6	133.1	145.5
Tribal	0	0	0	0
PROJECT TOTAL [a]	177.3	163.6	156.8	180.1

[a] Totals may not add up due to rounding.

Sources: Montana State Library, 2024; Bureau of Land Management, 2022a; U.S. Environmental Protection Agency and U.S. Department of Interior, 2021

Federal Lands

Federal lands include those under the jurisdiction of the Bureau of Land Management (BLM) and USDA ARS (see Tables 7.3.1-1 and 7.3.1-2). The Facility Locations of all four alternative routes contain BLM lands. Alternatives A, B, and D contain USDA ARS lands. BLM lands include dispersed parcels managed by the BLM's Miles City Field Office (BLM, 2015a). The USDA ARS property is Fort Keogh, a rangeland beef cattle research and education facility operated in cooperation with the Montana Agricultural Experiment Station (Vermeire, 2020).

North Plains has submitted a Standard Form 299 "Application for Transportation, Utility Systems, Telecommunications and Facilities on Federal Lands and Property" to the BLM for a right-of-way permit and to USDA ARS for a right-of-way easement on those respective federal tracts. North Plains will work with the agencies to ensure the Project adheres to permit and easement conditions.

State Lands

State lands contained in the Facility Locations include Montana State Trust Lands and/or those under the jurisdiction of the State of Montana. The Facility Locations of all alternative routes contain State Trust Lands under the jurisdiction of the DNRC. The Facility Location of Alternative A contains lands under the jurisdiction of the State of Montana.

The DNRC manages Montana State Trust Lands to generate revenue for trust beneficiaries while considering environmental factors and protecting the future income-generating capacity of the land (DNRC, no date [n.d.]). Each alternative route's Facility Location contains multiple parcels of State Trust Lands. For Montana State Trust Lands crossings, North Plains will coordinate with the State Board of Land Commissioners to obtain right-of-way easements and comply with easement conditions (DNRC, 2022).

North Plains will is proposing the Rosebud County Converter Station on an approximately 40-acre tract of purchased or state leased land east of the Colstrip Substation.

Local Public Lands

Local public lands include lands under the jurisdiction of a county government (i.e., Custer County). Only the Facility Location of Alternative A contains local public lands under the jurisdiction of Custer County.

Private Lands

The Facility Locations of the alternative routes are primarily on private land (see Tables 7.3.1-1 and 7.3.1-2).

7.3.1.2 Land Use and Land Cover

Recreation and special interest areas include lands under conservation easements and public lands managed by federal and state agencies, such as the BLM or the State of Montana. North Plains reviewed the BLM's Miles City Field Office ARMP to identify land use and activities allowed on public lands in the Facility Locations and Study Areas (BLM, 2015a). North Plains will coordinate with state agencies and the ARS to ensure consistency with specified land uses during the permitting process. Using baseline data from the USFS (2001, 2024), BLM (2017), Trust for Public Land (2020), MSL (2023a,b), USFS et al. (2024), NPS (2024), and USGS GAP (2024), North Plains avoided the following areas during siting of the alternatives, as identified in Circular MFSA-2:

- Avoidance areas identified in Section 6.2.2 (Circular MFSA-2 Section 3.2(1)(d)), include:
    - national wilderness areas
    - national primitive areas
    - national wildlife refuges and ranges
    - state wildlife management or wildlife protection areas
    - national parks and monuments
    - state parks
    - national recreation areas
    - national wild and scenic rivers
    - roadless areas of 5,000 acres or more
    - specially managed buffer areas surrounding national wilderness areas and national primitive areas
- Undeveloped land or water areas that contain known natural features of unusual scientific, educational, or recreational significance (Circular MFSA-2 Section 3.4(1)(r))
- Other recreation and special interest areas (Circular MFSA-2 Section 3.7(15)(c))
    - national trails (the Clark on the Yellowstone segment of the Lewis and Clark National Historic Trail is located within the Study Areas of Alternatives A and B but outside the Facility Location)
    - national natural landmarks
    - areas of critical environmental concern
    - research natural areas
    - research botanical areas
    - outstanding natural areas

Land use and land cover were evaluated using the Montana Landcover Framework (MLCF), which provides a baseline digital map of the natural and human land covers in Montana (Montana Natural Heritage Program [MNHP], 2017). Land use and land cover class acreages within the Facility Location of each alternative route are provided in Table 7.3.1-3 and shown on Figure E-3a in Appendix E. The crossing length in miles for each land use and land cover class and alternative route is provided in Table 7.3.1-4.

All four alternative routes would primarily cross rangeland and non-irrigated cropland. Forest and woodland systems make up less than 8 percent of the total Facility Locations crossed by an alternative route. Developed residential, commercial, and industrial areas make up less than 1 percent of the total Facility Locations crossed by an alternative route. No other land use makes up more than 5 percent of the total Facility Locations crossed by an alternative route. All alternative routes also cross areas of mining and resource extraction areas (e.g., quarries, strip mines, gravel pits and oil and gas extraction areas), wetland and riparian areas, recently disturbed or modified lands, and sparse and barren systems.

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TABLE 7.3.1-3

Land Use and Land Cover in the Facility Locations by Alternative Route

	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
Resource	acres	prop.	acres	prop.	acres	prop.	acres	prop.
RANGELAND [a,b]								
Grassland	6,690	46%	6,236	48%	5,662	43%	7,300	48%
Shrubland and Steppe	2,647	18%	2,928	22%	3,009	23%	3,377	22%
Subtotal	9,338	64%	9,164	70%	8,671	66%	10,677	70%
AGRICULTURE [b]								
Cultivated Crops	2,198	15%	1,379	11%	1,420	11%	1,446	10%
Hay / Pasture	499	3%	325	2%	265	2%	437	3%
Subtotal	2,697	18%	1,704	13%	1,686	13%	1,883	12%
FOREST AND WOODLAND	1,002	7%	562	4%	782	6%	737	5%
SPARSE AND BARREN	327	2%	386	3%	549	4%	551	4%
OPEN WATER / WETLAND AND RIPARIAN	445	3%	414	3%	565	4%	511	3%
RECENTLY DISTURBED OR MODIFIED [c]	79	1%	322	2%	232	2%	402	3%
DEVELOPED AREAS [b]								
Commercial / Industrial	27	<1%	26	<1%	26	<1%	11	<1%
High-Intensity Residential [d]	2	<1%	0	0%	0	0%	0	0%
Subtotal	29	<1%	26	<1%	26	<1%	11	<1%
LOW-INTENSITY RESIDENTIAL [e]	10	<1%	4	<1%	4	<1%	1	<1%
DEVELOPED OPEN SPACE (LANDSCAPED) [f]	4	<1%	1	<1%	1	<1%	1	<1%
ROADS AND RAILROADS [b]								
Other Roads	268	2%	395	3%	531	4%	196	1%
Major Roads	155	1%	33	<1%	30	<1%	61	<1%
Railroad	25	<1%	14	<1%	15	<1%	12	<1%
Interstate	192	1%	3	<1%	0	0%	0	0%
Subtotal	641	4%	446	3%	576	4%	269	2%
MINING AND RESOURCE EXTRACTION [b]								
Quarries, Strip Mines, and Gravel Pits	130	1%	67	1%	67	1%	115	1%
Oil and Gas Storage Areas	<1	<1%	1	0%	1	<1%	2	<1%
Oil and Gas Injection Wells	<1	<1%	<1	<1%	<1	<1%	<1	<1%
Oil and Gas Extraction Areas	0	0%	1	0%	1	<1%	1	<1%
Subtotal	131	1%	69	1%	69	1%	117	1%

TABLE 7.3.1-3

Land Use and Land Cover in the Facility Locations by Alternative Route

	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
Resource	acres	prop.	acres	prop.	acres	prop.	acres	prop.

[a] Potential rangeland includes data combined from Grassland Systems and Shrubland, Steppe, and Savanna Systems mapped by the Montana Landcover Framework.
[b] Subtotals may not add up due to rounding.
[c] Includes areas with introduced vegetation, where land cover is significantly altered due to introduced species and natural vegetation types are no longer recognizable, and recently burned areas.
[d] Defined as a mixture of constructed materials and vegetation, with impervious surfaces accounting for 50-80% of total cover. This land cover is primarily urban single-family housing units but may also include associated paved roads or other large areas of impervious surfaces.
[e] Defined as a mixture of constructed materials and vegetation, with impervious surfaces accounting for 20-50% of total cover. This land cover is primarily rural or suburban single-family housing units but may also include associated paved roads.
[f] Developed open space includes landscaped areas, defined as vegetation (primarily grasses) planted in developed settings for recreation, erosion control, or aesthetic purposes, where impervious surfaces account for less than 20% of total cover (e.g., highway and railway rights-of-way and graveled rural roads).
Note: prop = proportion of Facility Location, in percent.
Source: Montana Natural Heritage Program, 2017

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TABLE 7.3.1-4

Land Use and Land Cover Crossed by the Project Centerline by Each Alternative Route (miles)

Resource		Alternative A	Alternative B	Alternative C	Alternative D (Refined)
RANGELAND [a,b]					
Grassland		85.2	80.7	71.3	88.0
Shrubland and Steppe		34.0	38.0	36.2	40.9
	Subtotal	119.2	118.7	107.5	128.9
AGRICULTURE [b]					
Cultivated Crops		28.2	17.6	18.0	17.2
Hay / Pasture		7.0	4.9	3.6	5.2
	Subtotal	35.3	22.5	21.6	22.4
FOREST AND WOODLAND		10.1	7.2	9.6	8.8
SPARSE AND BARREN		3.0	4.1	6.4	5.9
OPEN WATER / WETLAND AND RIPARIAN		5.3	4.8	6.0	5.7
RECENTLY DISTURBED OR MODIFIED [c]		1.0	4.5	3.0	5.6
DEVELOPED [b]					
Commercial / Industrial		0	0	0	0
High-Intensity Residential [d]		<0.1	0	0	0
	Subtotal	<0.1	0	0	0
LOW-INTENSITY RESIDENTIAL [e]		0	<0.1	0	0
ROADS AND RAILROADS [b]					
Other Roads		1.2	0.7	1.7	1.0
Major Roads		0.3	0.2	0.2	0.2
Railroad		0.2	0.1	<0.1	0.1
Interstate		<0.1	0	0	0
	Subtotal	1.7	0.9	1.9	1.3
MINING AND RESOURCE EXTRACTION [b]					
Quarries, Strip Mines, and Gravel Pits		1.7	0.8	0.8	1.5

TABLE 7.3.1-4

Land Use and Land Cover Crossed by the Project Centerline by Each Alternative Route (miles)

Resource	Alternative A	Alternative B	Alternative C	Alternative D (Refined)

[a] Potential rangeland includes data combined from Grassland Systems and Shrubland, and Steppe, mapped by the Montana Landcover Framework.
[b] Subtotals may not add up due to rounding.
[c] Includes areas with introduced vegetation, where land cover is significantly altered due introduced species and natural vegetation types are no longer recognizable, and recently burned areas.
[d] Defined as a mixture of constructed materials and vegetation, with impervious surfaces accounting for 50-80% of total cover. This land cover is primarily urban single-family housing units but may also include associated paved roads or other large areas of impervious surfaces.
[e] Defined as a mixture of constructed materials and vegetation, with impervious surfaces accounting for 20-50% of total cover. This land cover is primarily rural or suburban single-family housing units but may also include associated paved roads.
[f] Defined as vegetation (primarily grasses) planted in developed settings for recreation, erosion control, or aesthetic purposes, where impervious surfaces account for less than 20% of total cover (e.g., highway and railway rights-of-way and graveled rural roads).
Source: Montana Natural Heritage Program, 2017

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Rangeland

The preferred location criteria for the Project include siting the alternative routes on rangeland rather than cropland (Circular MFSA-2 Section 3.1(1)(d)). Rangeland is land on which the vegetation is predominantly grasses, grass-like plants, forbs, or shrubs suitable for livestock forage, is generally unsuitable for cultivation, and are managed as native plant communities, although they may include naturalized species (Natural Resources Conservation Service [NRCS], n.d.a). Rangelands provide many ecological services, including forage production, wildlife habitat, and recreation (Western Association of Agricultural Experiment Station Directors, 2023). Grassland and shrubland and steppe systems identified in the MLCF (MNHP, 2017) were combined to evaluate rangeland located within the Facility Location of each alternative route. All four alternative routes would predominantly occupy grassland and shrubland and steppe systems (see Table 7.3.1-3) that may be used for grazing purposes. See Section 7.6.1 for more information on grassland and shrubland and steppe systems within the Facility Location.

Agriculture

Agricultural lands include cultivated crops and hay/pasture. Cultivated crops are areas used for the production of crops (e.g., alfalfa and other hay species, wheat, corn) (MNHP, 2017). Cultivated crop plant cover is variable depending on the season and type of farming. Hay/pasture typically has perennial herbaceous cover used for livestock grazing or the production of hay (MNHP, 2017). Management activities such as flood irrigation and haying distinguish hay and pasture from the natural grasslands described in Section 7.6.1.1. The Facility Locations of all four alternative routes include agricultural lands composed primarily of cultivated crops (see Table 7.3.1-3). All four alternative routes cross prime and unique farmland and Farmland of Statewide Importance, within cultivated and rangeland areas (see Section 7.4.2).

Cropland irrigation types were evaluated based on Revenue Final Land Unit Classification data from the Montana Department of Revenue (MDOR) (MDOR, 2019). Cropland irrigation types within the Facility Locations of the alternative routes are detailed in Table 7.3.1-5 and on Figure E-3b in Appendix E, and linear miles crossed by each alternative route are included in Table 7.3.1-6. North Plains prioritized siting the alternative routes on non-irrigated or flood-irrigated lands rather than mechanically irrigated lands, where practicable, per the state's preferred location criteria (Circular MFSA-2 Section 3.1(1)(d)). Alternative A, B, and C Facility Locations cross short segments of irrigated cropland (e.g., sprinkler, flood, or pivot irrigation systems) primarily associated with agricultural areas along the Powder, Tongue, and Yellowstone rivers in Rosebud and Custer counties. Small areas of flood- and pivot-irrigated cropland overlap the Facility Location of Alternative D. Both irrigated cropland types are associated with the Tongue River.

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TABLE 7.3.1-5

Cropland Types Located in the Facility Locations by Alternative Route

	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
Resource [a]	acres	prop.	acres	prop.	acres	prop.	acres	prop.
IRRIGATED CROPLAND [b]								
Flood	121	1%	31	<1%	0	0%	8	<1%
Pivot	30	<1%	6	<1%	14	<1%	5	<1%
Sprinkler	35	<1%	0	0%	0	0%	0	0%
Subtotal	186	1%	37	<1%	14	<1%	13	<1%
NON-IRRIGATED CROPLAND [b]								
Fallow cropland	2,017	14%	1,320	10%	1,391	11%	1,428	9%
Hay	515	4%	326	2%	264	2%	442	3%
Subtotal	2,532	17%	1,646	13%	1,655	13%	1,870	12%
POTENTIAL TIMBER PRODUCTION [b]								
Commercial [c]	518	4%	206	2%	507	4%	564	4%
Non-commercial [d]	12	<1%	7	<1%	55	<1%	28	<1%
Subtotal	531	4%	213	2%	563	4%	592	4%

[a] Cropland type based on the Revenue Final Land Unit Classification of private agricultural lands not classified as grazing.
[b] Subtotals may not add up due to rounding.
[c] Defined as contiguous land of 15 acres or more in one ownership that is capable of producing timber that can be harvested in commercial quantity and is producing timber unless trees have been removed by disaster.
[d] Forested land that does not meet the minimum forest productivity requirement and classified as non-commercial due to species (e.g., aspen, cottonwood, juniper, limber pine).
Note: prop. = proportion of Facility Location, in percent.
Source: Montana Department of Revenue, 2019

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TABLE 7.3.1-6

Cropland Types Crossed by Each Alternative Route (miles)

Resource [a]		Alternative A	Alternative B	Alternative C	Alternative D (Refined)
IRRIGATED CROPLAND [b]					
Flood		1.8	0.4	0	0
Pivot		0.3	0	0.2	0
Sprinkler		0.4	0	0	0
	Subtotal	2.5	0.4	0.2	0
NON-IRRIGATED CROPLAND [b]					
Fallow cropland		25.9	17.2	17.7	17.4
Hay		7.1	5.0	3.7	5.3
	Subtotal	32.9	22.2	21.4	22.7
POTENTIAL TIMBER PRODUCTION [b]					
Commercial [c]		5.4	2.4	5.7	7.2
Non-commercial [d]		0.1	0.1	0.7	0.4
	Subtotal	5.5	2.5	6.3	7.5

[a] Cropland type based on Revenue Final Land Unit Classification of private agricultural lands not classified as grazing.
[b] Subtotals may not add up due to rounding.
[c] Defined as contiguous land of 15 acres or more in one ownership that is capable of producing timber that can be harvested in commercial quantity and is producing timber unless trees have been removed by disaster.
[d] Forested land that does not meet the minimum forest productivity requirement and classified as non-commercial due to species (e.g, aspen, cottonwood, juniper, limber pine).
Source: Montana Department of Revenue, 2019

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Timber Production

The preferred location criteria for the Project include siting the alternative routes in logged areas rather than undisturbed forest (Circular MFSA-2 Section 3.1(1)(e)). The Facility Locations of all four alternative routes include forests and woodlands (see Tables 7.3.1-3 and 7.3.1-4), some of which could be used for forest production. Potential timber production is based on the Revenue Final Land Unit Classification data from the MDOR (MDOR, 2019). The state identifies potential harvestable forest as 15-acre forests with one owner that produces or could produce timber in commercial quantities (MDOR, 2019). Timber lands crossed by the Facility Location of each alternative route are primarily in Rosebud and Custer counties (see Figure E-3b in Appendix E) (MDOR, 2019). Acreages are likely an over-estimate based on a review of current aerial photography. See Section 7.6.1 for more information on forest vegetation within the Facility Locations of the alternative routes.

Developed Areas and Rural Residences

The Circular MFSA-2 Section 3.4 requires an analysis of developed residential, commercial, and industrial areas adjoining cities, towns, and unincorporated communities. Individual residences and major farm support buildings outside of urban and developed residential areas also need to be assessed. To approximate these areas, the analysis used three separate datasets: land use/land cover data from the MNHP (2017), municipal boundaries from the U.S. Census Bureau (2019), and individual structures from the Federal Emergency Management Agency (FEMA; 2024) structure inventory (FEMA, 2024), as described below (see Figure E-3c in Appendix E).

The land use/land cover data mapped by the MNHP (2017) as occurring in the alternative Facility Locations includes commercial/industrial and high- and low-intensity residential (see Tables 7.3.1-3 and 7.3.1-4). MNHP commercial/industrial land use includes areas used for businesses, industrial parks, hospitals, and utilities. MNHP residential areas include areas with a mixture of constructed materials, impervious surfaces, and vegetation such as single-family housing units, paved roadways, parking lots, or other impervious surfaces. Further, low-intensity residential is representative of rural and suburban single-family housing units such as rural farmsteads, and high-intensity residential is representative of urban single-family housing units. Only high-intensity residential areas were used to estimate developed residential areas in Table 7.3.1-9. Commercial/industrial and high-intensity residential areas are analyzed as developed areas adjoining the cities, towns, and unincorporated communities listed in Table 7.3.1-7, as required by Circular MFSA Section 3.7(2)(b).

Municipal boundaries located within the Facility Locations are from the U.S. Census Bureau (2019) database. The Facility Locations of all four alternative routes are located in the municipal boundary of the City of Colstrip at the western terminus of the transmission line. Additionally, the Facility Location of Alternative A crosses in the municipal boundaries of the Town of Plevna and the unincorporated community of Rosebud (See Table 7.3.1-7). None of the alternative Facility Locations overlap developed areas adjoining the cities, towns, and unincorporated communities[5] listed in Table 7.3.1-7 (MNHP, 2017; U.S. Census Bureau, 2019). Platted subdivisions are located within the Facility Locations of Alternatives A and C in Custer and Rosebud counties, respectively (MSL, 2024). According to data from the U.S. Department of Housing and Urban Development

[5] Developed areas adjoining communities were identified based on the presence of commercial/industrial and high-intensity residential land covers from MNHP (2017) that are located adjacent to, but not within, the boundaries of cities, towns, and unincorporated communities as mapped by U.S. Census Bureau (2019).

(HUD), no revitalization areas (designated residential growth area) are located within the Facility Locations of any alternative (HUD, 2024).

The FEMA (2024) structure inventory provided locations of individual buildings, including residential structures located outside of municipal boundaries and residential clusters, farm support buildings, and similar structures, based on analysis of satellite images. Residential clusters are defined in Circular MFSA-2 Section 3.7(2)(a) as 5 or more dwelling units per 20 acres, based on a circle of about 1,000 feet in diameter. No cellular towers are located within the Facility Locations of the alternatives (U.S. Department of Homeland Security, 2024).

The preferred location criteria for the Project include siting alternative routes in non-residential areas and at a safe distance from residences and other populated areas (Circular MFSA-2 Section 3.1(1)(c,j)). The Facility Locations of all four alternative routes would cross one or more municipalities containing a small amount of developed commercial/industrial lands, while only Alternative A contains developed residential areas (see Tables 7.3.1-7 and 7.3.1-8). None of the Facility Locations overlap residential clusters; however, at least one non-clustered residence can be found within all Facility Locations (see Table 7.3.1-9). One residence was identified with the Alternative D Facility Location; however, this residence was also located over 500 feet from the Alternative D centerline (outside the permanent right-of-way). Major farm support buildings (e.g., barns and sheds) also occur within the Facility Locations of each alternative. Unknown structure types within the Facility Locations were reviewed with aerial imagery and two unclassified structures were reclassified as major farm support buildings. The remaining structures within the Facility Location of each alternative route are structures of unspecified type based on the FEMA (2024) dataset (see Table 7.3.1-9). Based on aerial imagery, these structures appear to be operation and maintenance buildings and misclassified objects that are not buildings based on aerial photo review (Google Earth, 2024).

Once a route is approved, North Plains will coordinate with landowners to ensure there are no conflicts or unsafe conditions associated with residences and farm support buildings near the transmission line according to industry standards (see Section 2.1.1).

All alternatives cross land parcels with certain restrictions regarding the placement of the transmission line (see Table 7.3.1-7). These include land encumbered by energy easements, conservation easements, and/or other restrictive easements, such as those associated with underground communication lines. Easements with restrictions may not allow for siting of the proposed transmission line though the indicated area (see Table 7.3.1-7). Public conservation easements are discussed in more detail in the Recreational and Special Interest Areas Section below.

TABLE 7.3.1-7

Developed Residential, Commercial, and Industrial Areas in Alternative Route Facility Locations

Resource	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
	acres	prop.	acres	prop.	acres	prop.	acres	prop.
CITIES, TOWNS, AND UNINCORPORATED COMMUNITIES [a]								
City of Colstrip	110	1%	110	1%	110	1%	88	1%
City of Miles City	0	0%	0	0%	0	0%	0	0%
Unincorporated Community of Rosebud	6	<1%	0	0%	0	0%	0	0%
Town of Plevna	<1	<1%	0	0%	0	0%	0	0%

TABLE 7.3.1-7

Developed Residential, Commercial, and Industrial Areas in Alternative Route Facility Locations

Resource	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
	acres	prop.	acres	prop.	acres	prop.	acres	prop.
Subtotal	116	–	110	–	110	–	88	–
DEVELOPED AREAS ADJOINING COMMUNITIES [a,b]								
Industrial and Commercial Areas	0	0%	0	0%	0	0%	0	0%
Residential Areas [c]	0	0%	0	0%	0	0%	0	0%
Subtotal	0	0%	0	0%	0	0%	0	0%
AIRPORTS AND AIRSTRIPS [a]								
Public	0	0%	0	0%	0	0%	0	0%
Private	0	0%	0	0%	0	0%	0	0%
Subtotal	0	0%	0	0%	0	0%	0	0%
EASEMENTS WITH RESTRICTIONS [a,d]								
Energy Related Easements	1,421	10%	216	2%	151	1%	195	1%
Conservation Easements [f]	0	0%	205	2%	156	1%	1	<1%
Other Easements	0	0%	38	<1%	38	<1%	37	<1%
Subtotal	1,421	10%	458	3%	345	3%	233	2%
MILITARY INSTALLATIONS	0	0%	0	0%	0	0%	0	0%
SPECIAL USE AIRSPACE	6,781	46%	8,055	61%	10,049	76%	10,432	69%
PERMITTED MINES [a]								
Coal Mines	331	2%	356	3%	356	3%	332	2%
Hardrock Mines	0	0%	0	0%	0	0%	0	0%
Opencut Mines	0	0%	0	0%	0	0%	0	0%
Subtotal	331	2%	356	3%	356	3%	332	2%
SUBDIVISIONS [g]	88	1%	0	0%	46	<1%	0	0%

[a] Subtotals may not add up due to rounding.

[b] Includes industrial, commercial, and residential areas mapped adjacent to, but not within, mapped cities, towns, and unincorporated communities as identified by U.S. Census Bureau (2019).

[c] Includes lands mapped as high-intensity residential to represent highly populated areas.

[d] Acreages are based on the complete area of the tract containing the restrictive easement. The reported acreages for easements with restrictions are likely an overestimate, since the easement does encompass the entire associated tract's area.

[e] Energy related easements along Alternative A include transmission line easements north of Colstrip in Rosebud County. Specific easement documents were not available for these tracts; instead, the acreage calculations were approximated using Public Land Survey sections crossed by the utility.

[f] Includes acreages for conservation easements on private and public lands. See Table 7.3-12 for more information on conservation easements on public lands.

[g] Acres presented here may also be represented in the acreages for cities, towns, and unincorporated communities or developed areas adjoining those communities.

Note: prop = proportion of Facility Location.

Source: Montana Natural Heritage Program, 2017; U.S. Census Bureau, 2019; Montana State Library, 2024; U.S. Department of Transportation Federal Aviation Administration, 2024a,b; Digital Aviation LCC, n.d.a; Office of the Assistant Secretary of Defense for Energy, Installations, and Environment, 2024; Montana Department of Environmental Quality, 2024a,b; Smith, 2025; U.S. Army Corps of Engineers, 2024

TABLE 7.3.1-8

Developed Residential, Industrial, and Commercial Areas Crossed by Each Alternative Route (miles)

Resource		Alternative A	Alternative B	Alternative C	Alternative D (Refined)
CITIES, TOWNS, AND UNINCORPORATED COMMUNITIES [a]					
City of Colstrip		0.7	0.7	0.7	0.7
	Subtotal	0.7	0.7	0.7	0.7
DEVELOPED AREAS ADJOOINING COMMUNITIES [a,b]					
Industrial and Commercial Areas		0	0	0	0
Residential Areas [c]		0	0	0	0
	Subtotal	0	0	0	0
AIRPORTS AND AIRSTRIPS [a]					
Public		0	0	0	0
Private		0	0	0	0
	Subtotal	0	0	0	0
EASEMENTS WITH RESTRICTIONS [a,d]					
Energy Related Easements		16.1	2.6	1.6	1.7
Conservation Easements [f]		0	3.1	2.5	0.0
Other Easements		0	0.4	0.4	0.4
	Subtotal	16.1	6.1	4.5	2.0
MILITARY INSTALLATIONS		0	0	0	0
SPECIAL USE AIRSPACE		88	103	120	123
PERMITTED MINES [a]					
Coal Mines		5.0	4.7	4.7	5.0
Hardrock Mines		0	0	0	0
Opencut Mines		0	0	0	0
	Subtotal	5.0	4.7	4.7	5.0
SUBDIVISIONS [g]		1.0	0	0.5	0

[a] Subtotals may not add up due to rounding.

[b] Includes industrial, commercial, and residential areas mapped adjacent to, but not within, the boundaries of cities, towns, and unincorporated communities as identified by U.S. Census Bureau (2019).

[c] Includes lands mapped as high-intensity residential to represent highly populated areas.

[d] Mileages are based on the complete area crossed within tract entire containing the restrictive easement. The reported mileages for easements with restrictions are likely an overestimate, since the easement does encompass the entire associated tract's area.

[e] Energy related easements along Alternative A include transmission line easements north of Colstrip in Rosebud County. Specific easement documents were not available for these tracts; instead, the mileage calculations were approximated using Public Land Survey sections crossed by the utility.

[f] Includes mileages for conservation easements on private and public lands. See Table 7.3-13 for more information on conservation easements on public lands.

[g] Miles presented here may also be represented in the mileages for cities, towns, and unincorporated communities or developed areas adjoining those communities.

Source: Montana Natural Heritage Program, 2017; U.S. Census Bureau, 2019; Montana State Library, 2024; U.S. Department of Transportation Federal Aviation Administration [FAA], 2024a,b; Digital Aviation LCC, n.d.a; Office of the Assistant Secretary of Defense for Energy, Installations, and Environment, 2024; Montana Department of Environmental Quality (MDEQ) 2024a,b; Smith, 2025; U.S. Army Corps of Engineers (USACE), 2024

TABLE 7.3.1-9

Structures in the Facility Locations by Alternative Route (count)

Structure Type [a]	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
RESIDENCES				
Number of Residential Clusters [b]	0	0	0	0
Residences Outside of a Cluster [c]	12	2	4	1[d]
Subtotal	13	2	4	1
CELLULAR TOWERS	0	0	0	0
MAJOR FARM SUPPORT BUILDINGS (BARNS/SHEDS) [e]	6	3	2	8
OTHER STRUCTURES [f]	3	2	2	3

[a] Structures would be avoided during Project design to the extent feasible.

[b] Residential clusters are defined as five or more dwelling units per 20 acres based on a circle of about 1,000 feet in diameter outside of municipal boundaries (Circular MFSA-2 Section 3.7(2)(a)). Residential clusters are included if any residence making up the cluster is overlapped by the Facility Location of an alternative.

[c] Individual residences outside of a cluster and outside of municipal boundaries.

[d] Though this residence falls within the Alternative D Facility Location, it is located within a pulling and tensioning site area and is over 500 feet from the Alternative D centerline.

[e] Major farm support buildings included structures classified as Agriculture using the Federal Emergency Management Agency (2024) structure inventory.

[f] The FEMA (2024) structure inventory utilized satellite imagery to identify potential buildings and classify the building types (e.g., residential, agriculture, etc.). Other structures include structures of an unclassified type as classified by the FEMA (2024) dataset. Based on aerial imagery these structures appear to be operation and maintenance buildings, potential farm structures, and misclassified objects that are not buildings. For the Facility Locations, unclassified structures were confirmed and reclassified using aerial imagery where applicable.

Source: U.S. Department of Homeland Security, 2022, 2024; Federal Emergency Management Agency, 2024c

Airports, Airstrips, and Military Installations

None of the Facility Locations cross public or private airports, airstrips, runways, or military installations (U.S. Department of Transportation Federal Aviation Administration [FAA], 2024a,b; Digital Aviation LCC, n.d.a; Office of the Assistant Secretary of Defense for Energy, Installations, and Environment, 2024). Two private airports and their associated airstrips are within the larger Study Areas, with Holy Rosary Hospital airport and airstrip within Alternative A and Johny Creek Airport and airstrip within Alternatives B, C, and D (FAA, 2024a,b). Additionally, one private airstrip and hanger is located in the larger Study Areas of Alternatives B, C, and D (Aircraft Owners and Pilot Association, 2025). All Facility Locations cross within special use airspace, specifically Military Operations Areas (MOAs; USACE, 2024). Activities within MOAs can include, but are not limited to air combat tactics, air intercepts, aerobatics, formation training, and low-altitude tactics. MOAs are a nonregulatory special use airspace (FAA, 1995). Alternative D's Facility Location crosses within the most special use airspace, followed by C, B, and A (USACE, 2024).

Mining and Resource Extraction

Mining and resource extraction land cover data are from the MNHP (2017) and include oil, gas, and mineral extraction areas. Oil refers to crude petroleum oil and other hydrocarbons produced at a wellhead in liquid form, and gas refers to natural gases and all other fluid hydrocarbons, including methane gas and any other natural gas found in coal formation, produced at a wellhead (MCA 82-1-1). Minerals include any mineral that has a commercial value, such as gold, lead, or gravel (MCA 82-2-1).

The Facility Location for each alternative route was reviewed for the presence of refineries, tanks, or other facilities for the purpose of oil and gas storage, including underground gas storage reservoirs (gas and gas storage); oil and gas injection wells, drill pads, and equipment parking (injection); conventional oil and gas extraction areas consisting of structures, wells, pads, pumps, and equipment parking areas (oil and oil/gas); and mineral quarries, strip mines, and gravel pits based on state land cover data (MNHP, 2017; MNHP and MFWP, 2023). There are no permitted opencut mines present in any of the Facility Locations, and all hard rock mines within the counties crossed by the Project are exempt from permitting under the Small Miner Exclusion Statement. There is an active permitted coal mine, Rosebud Area D, within all Facility Locations near Colstrip (DEQ 2024a,b; Smith, 2025); however, the area crossed by the Project has been closed and reclaimed (MDEQ and Office of Surface Mining Reclamation and Enforcement, 2017). All four alternative Facility Locations contain oil and gas resources, including oil and gas storage areas and injection wells. Alternatives B, C, and D Facility Locations contain oil and gas extraction areas.

Roads, Railroads, and Other Rights-of-Way

Land use and land cover data from the MNHP (2017) was used to quantify the acreage of roads and railroads crossed by the alternative Facility Locations (see Table 7.3.1-3). The MNHP road land category includes interstate highways, major roads such as federal-aid and state highways, and other roads, such as county and city roads. The railroad land cover category includes railroad tracks, railroad berms, and rights-of-way. Linear miles of rights-of-way crossed by the Facility Locations are from the U.S. Census Bureau (2021, 2022f), Department of Homeland Security (2022), and U.S. Department of Transportation (2024) databases, as shown in Table 7.3.1-10 and on Figure E-3d in Appendix E.

Roads, railroads, and other rights-of-way occur both parallel and perpendicular to the alternative routes; however, only parallel rights-of-way are considered to be colocated. Linear distances presented in Table 7.3.1-10 represent the total miles of rights-of-way crossed by the Facility Locations of the alternative routes, respectively, regardless of orientation. North Plains considered collocating the Project with existing utility and transportation rights-of-way wherever practicable (Circular MFSA-2 Section 3.1(1)(b)), including along federal and state highways, county roads, and existing electrical transmission and distribution lines (see Section 2.1.7). For analysis, collocation included parallel routes within 250 feet of the centerline.

All Facility Locations cross pipelines of 8 inches or greater in diameter (see Table 7.3.1-10). Alternatives B and C cross the largest amount of pipeline right-of-way, followed by Alternative D, with Alternative A crossing the least (U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration, 2024). There are no right-of-way collocations between the Facility Locations and pipelines 8 inches or greater in diameter (see Table 7.3.1-11).

TABLE 7.3.1-10

Rights-of-Way in the Facility Locations by Alternative Route (miles)

	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
Electric Transmission Lines (50 kilovolt or greater)	50.6	29.4	14.7	20.1
Pipelines (8 inches or greater in diameter)	0.4	0.7	0.7	0.6
Federal Highways [a]	22.3	0.3	0.3	3.1
State Highways	3.2	3.6	3.4	1.5
Railroads	0.7	0.9	0.9	0.6
County Roads	0	0	0	0.3
Roads With Scenic Designation	0	0	0	0
PROJECT TOTAL	77.2	34.9	20	26.2

[a] Routes identified as interstate or U.S. highway.

Source: U.S. Census Bureau, 2021, 2022f; U.S. Department of Homeland Security, 2022; U.S. Department of Transportation, 2024

TABLE 7.3.1-11

Colocation [a] with Rights-of-Way in the Facility Locations by Alternative Route (miles)

	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
Electric Transmission Lines (50 kilovolt or greater)	41.8	24.2	10.2	11.7
Pipelines (greater than 8 inches in diameter)	0	0	0	0
Federal Highways [b]	5.2	0	0	1.2
State Highways	2.1	0	0	0
Railroads	0.7	0	0.7	0.7
County Roads	0	0	0	0
PROJECT TOTAL	49.8	24.2	10.9	13.6

[a] Includes parallel routes within 250 feet of the centerline.

[b] Routes identified as interstate or U.S. highway.

Source: U.S. Census Bureau, 2021, 2022f; U.S. Department of Homeland Security, 2022; U.S. Department of Transportation, 2024

Recreational and Special Interest Areas

Recreation and special interest areas within the Facility Locations and Study Areas are detailed in Tables 7.3.1-11 and 7.3.1-12, and in Figure E-3e in Appendix E, respectively.

Alternatives B, C, and D cross state land encumbered by conservation easements. The Facility Location of Alternative C contains land encumbered by conservation easements held by the MFWP, including the Bice and Hirsch Ranch conservation easements in Custer County. Bice and Hirsch Ranch conservation easements both provide opportunities for hunting and wildlife viewing, while Bice additionally provides opportunities for fishing and photography (MFWP, n.d.a, n.d.c.). Isolated parcels of BLM-administered public lands are located adjacent to and surrounded by the Bice and Hirsch Ranch conservation easements (MFWP, 2021b; MFWP, 2022a). Within the Bice conservation easement, activities that are consistent with the purpose of the easement include livestock grazing and related agricultural activities. The installation of utility structures within the Bice and/or Hirsch Ranch conservation easements would require prior written approval of MFWP.

Alternatives A also crosses the Lewis and Clark Trail SRMA. The Lewis and Clark Trail SRMA within the Facility Locations extends from the opposite side of Interstate 94, where the Lewis and Clark National Historic Trail is located, into the Facility Locations (BLM, 2025). However, the centerline does not cross the trail itself. The BLM designates SRMAs as areas that provide recreational opportunities, such as trailhead areas for hikers, mountain bikers or off-road vehicle users (BLM, 2015a).

The Facility Locations of Alternatives B and D overlap a Montana Land Reliance (MLR) conservation easement in Custer County, although only the Alternative B centerline crosses the easement. MLR is a private, nonprofit land trust that tailors activity allowances and restrictions of each easement it holds to the specific conservation goals of the landowner (MLR, 2024). Common examples of land uses allowed on MRL conservation easements include agricultural and silvicultural use, construction of agricultural infrastructure, and landowner control of access. Examples of land uses that may be restricted include substantial industrial or commercial activities, dumping of non-compostable or hazardous waste, surface mining, and other uses that may interfere with the protection of open spaces or habitat (MLR, 2024). The Facility Locations of Alternatives A and B overlap with a portion of the Lewis and Clark Trail SRMA that extends south of Interstate 94; however, the Facility Locations do not overlap the trail itself (BLM, 2025). Three other SRMAs occur in the wider Study Areas. The Study Area of Alternative A includes the Dean S. Reservoir and Strawberry Hill SRMAs, and the Study Area of Alternative B includes the Pumpkin Creek Ranch SRMA. None of these SRMAs are within the associated Facility Locations.

North Plains coordinated with landowners to identify private conservation or other existing easements in the Facility Locations of the alternative routes.

As noted in Section 7.3.1, the Facility Locations of Alternatives A, B, and D overlap Fort Keogh. Along with conducting research on livestock, the Fort Keogh is within a Block Management Area that allows hunting in some areas (MFWP, 2022b).

The MFWP classifies waterbodies used for recreational activities such as fishing, hunting, swimming, and boating as either Class I or II. Class I waters are surface waters other than lakes that are navigable or have been capable of supporting commercial activity (MCA 23-3-301(2)). Class II waters include all other recreational surface waters that are not Class I waters, except lakes (MCA 23-3-301 (3)). The four alternative routes cross a Class I water, the Tongue River, in Custer County. In addition to the Tongue River, the alternative routes also cross numerous perennial and intermittent streams that are classified as Class II waters. See Sections 7.5.1 and 7.8 for additional details on waterbodies that could be affected by the Project.

As noted in Section 7.3.1, the Study Areas cross various amounts of BLM lands. Recreational activities on BLM lands include camping, hiking, biking, climbing, hunting, fishing, shooting, and off-highway vehicle use (BLM, n.d.).

As noted in Section 6.4.1.2, Alternative B crosses the Tongue River just south of 12 Mile Dam, which is a state fishing access site and campground. This area also contains subdivisions for residential development and irrigated cropland.

Access roads are planned for Alternatives B, C, and D that cross conservation easements described above. The MLR conservation easement is crossed by an existing road needing improvements for Alternatives B and D, as well as a new, temporary access road for Alternative B. The MFWP conservation easements are crossed by access roads for Alternative C, including new, temporary access roads; existing roads needing improvements; and existing roads not needing improvements. Additionally, new permanent and new temporary access roads are planned for Alternatives A and D that cross the Fort Keogh.

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TABLE 7.3.1-12

Recreation and Special Interest Areas in the Facility Locations by Alternative Route

	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
Resource [a]	acres	prop.	acres	prop.	acres	prop.	acres	prop.
Fort Keogh [b]	840	6%	11	<1%	0	0%	617	4%
MLR Conservation Easements	0	0%	8	<1%	0	0%	1	<1%
MFWP Conservation Easements [c]	0	0%	0	0%	156	1%	0	0%
Hoodoo Land Conservation Easement	0	0%	197	2%	0	0%	0	0%
Lewis and Clark Trail SRMA	228	2%	3	<1%	0	0%	0	0%
PROJECT TOTAL	**1,068**	**7%**	**219**	**2%**	**156**	**1%**	**618**	**4%**

[a] Bureau of Land Management (BLM) lands are presented in Table 7.3.1-1.
[b] Fort Keogh, a research lab, is included as public lands in land ownership table.
[c] Acreages are based on the complete area of the tract containing the conservation easement. The reported acreages for conservation easements are likely an overestimate, since the easement does encompass the entire associated tract's area.
[d] Includes Bice and Hirsch Ranch conservation easements
Note: MFWP = Montana Fish, Wildlife and Parks; MLR = Montana Land Reliance; SRMA = Special Recreation Management Area ; and prop. = proportion of total Facility Locations, in percent.
Source: Montana State Library, 2023a,b.

TABLE 7.3.1-13

Recreation and Special Interest Areas Crossed by Each Alternative Route (miles)

Resource [a,b]	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
Fort Keogh [c]	11.3	0	0	8.1
MFWP (Bice) Conservation Easement	0	0	2.5	0
MLR Conservation Easement	0	0.1	0	0
Hoodoo Land Conservation Easement	0	3.0	0	0
Lewis and Clark Trail SRMA	2.1	0	0	0

[a] Bureau of Land Management (BLM) lands are presented in Table 7.3.1-1.
[b] Mileages are based on the complete area crossed within tract entire containing the conservation easement. The reported mileages for conservation easements are likely an overestimate, since the easement does encompass the entire associated tract's area.
[c] Fort Keogh, a research lab, is included as public lands in land ownership Table 7.3.1-2.
Note: MFWP = Montana Fish, Wildlife and Parks; MLR = Montana Land Reliance; and SRMA = Special Recreation Management Area
Source: Montana State Library, 2023a,b

7.3.2 Impact Assessment

7.3.2.1 Common Impacts and Mitigation Measures

North Plains will obtain short-term or long-term easements on private land or right-of-way approvals on public land in accordance with the law for construction workspaces, the transmission line right-of-way, and access roads. Easements and right-of-way approvals for the transmission line will give North Plains the right to construct, operate, and maintain the line in accordance with easement or approval conditions, and may include restrictions on other land uses during Project construction and operation. The easements would not result in a transfer of ownership but would remain with the property should it be sold to a new landowner. Following construction, landowners or land management agencies will continue to have use of the permanent right-of-way provided the use would not interfere with the easement or approval rights granted to North Plains for operation and maintenance of the transmission line.

Construction

While North Plains sited and designed Project infrastructure to minimize disruption to agricultural practices and other land use activities to the extent practicable, some direct impacts to land use and land cover will occur during construction. North Plains designed the Project to avoid impacts to existing farm support buildings. As noted, North Plains will establish construction or operational easements on private land that will result in some restrictions on land use (see below for a discussion about operational land use restrictions). North Plains will need to lease about 40 acres of Montana State Trust Lands for the construction and operation of the Rosebud County Converter Station, which includes the permanent 23-acre footprint.

North Plains will follow the mitigation measures / BMPs outlined in the CMRP or as required by applicable agency or permit requirements to avoid or minimize short- to long-term construction impacts on land cover and land use, including minimization of the construction footprint, restoration of temporary construction areas, and removal and proper disposal of construction debris.

Most of the land within the Facility Locations is used for rangeland and other agricultural uses. Existing agricultural activities, such as grazing and crop cultivation, will experience short-term and localized interruptions within the construction area until vegetation can be reestablished. North Plains will implement BMPs to avoid, minimize, and mitigate impacts to agricultural lands, as discussed in the Agricultural Impact and Mitigation Plan (AIMP) attached to the CMRP. The Rosebud County Converter Station will permanently alter the existing land use on approximately 23 acres from shrubland and steppe to industrial use (see Section 2.1.3.6). All four alternative routes would require the Rosebud County Converter Station; impacts and mitigation related to the converter station are the same for all alternatives.

Because most Project construction will be in rangeland and agriculture lands, minimal vegetation clearing will occur. Crops will be removed to ground-level unless landowners prefer to harvest them prior to construction. North Plains will compensate landowners for any damage to or loss of crops (see Section 7.10.1). Soil compaction from heavy equipment can reduce plant productivity and water infiltration; North Plains will decompact cultivated fields as needed to restore soils per the CMRP, landowner agreements, and permit conditions.

Construction may require existing irrigation systems to be temporarily discontinued or dismantled. Construction could also interfere with other agricultural activities, such as the movement of livestock and equipment, aerial pesticide spraying, or the temporary loss of livestock forage. However, potential impacts to agricultural lands are expected to be negligible following the BMPs discussed in the AIMP.

The USDA expressed concerns about potential impacts to fences, disruptions to research operations, and the creation of permanent roads that could provide illegal access to Fort Keogh. North Plains will coordinate with Fort Keogh personnel and other landowners and land managers with similar concerns to ensure potential impacts are avoided, minimized, or mitigated, as appropriate.

Additional mitigation measures outlined in the CMRP will be used to minimize adverse impacts to agricultural lands. General BMPs include minimizing disruption of active crops, shelterbelts and irrigation; maintaining fences and gates to manage livestock; and restoring range and pasture in accordance with the CMRP, easement agreements and permit conditions.

In timber production areas, construction could disrupt timber harvest or involve the removal of harvestable trees within the transmission line right-of-way, temporary workspaces, and improved existing or new access roads. North Plains will consult with the landowner or landowner's designee prior to tree removal, and salvage timber based on landowner preferences. If trees of commercial or other value to the landowner are present, North Plains will allow the landowner the right to retain ownership of the trees, with the disposition of the trees to be negotiated prior to the commencement of land clearing and included in the easement agreement. Other general BMPs are outlined in the CMRP including protocols for removal of vegetative debris.

In developed areas, construction noise, dust, visual disturbance, and limited access to construction areas may temporarily disrupt daily activities. North Plains will work with landowners to avoid and minimize impacts and notify landowners in residential and commercial areas prior to construction; limit the hours during which construction with high-decibel noise levels will be conducted; clean and maintain construction areas and roadways affected by construction activities; and minimize exposure to nuisance effects such as noise (see Section 7.11.3), lighting (see Section 7.9.3), and dust to those areas as outlined in the CMRP. The CMRP outlines additional mitigation measures specific to minimizing adverse impacts to developed areas, including safety protocols, minimization of traffic impacts, and implementation of a landowner complaint procedure.

Crossings of state highways under the jurisdiction of the Montana Transportation Commission are maintained by the Montana Department of Transportation (MDT) or local governments. Per the guidance received from the MDT, transmission line road crossings at state highways will be constructed perpendicular to the road being crossed, and structures will be located outside of the road right-of-way (MDT, 2024).

Construction vehicles could temporarily disrupt local traffic and track debris onto road surfaces, including in areas of recreation or special interest. North Plains will implement a Traffic and Transportation Management Plan, attached to the CMRP, to minimize impacts. No impacts to railroads will occur because North Plains will comply with the terms of railroad crossing permits.

North Plains will coordinate with the landowner of the Johny Creek Airport to address concerns regarding construction of the Project in line with the unpaved runway.

Project construction could interfere with mining and oil and gas extraction, injection, and storage activities based on the occurrence of mining and oil and gas resources in the Facility Locations of all alternatives. North Plains will work with mineral and oil and gas companies to avoid or minimize impacts to these activities. North Plains will ensure that placement of structures and the buried grounding system, including the counterpoise cable, will avoid impacts to existing infrastructure (e.g., underground storage tanks and wells).

North Plains may use helicopters to facilitate structure setting and/or wire pulling/tensioning of the lines (Section 2.2). While MOAs are a nonregulatory special use airspace, the FAA (1995) recommends contacting a Flight Service Station within 100 miles of the area to determine if the MOA is active. Other aircraft can use MOAs when they are active; however, prior to entering an active MOA, the FAA (1995) recommends contacting the controlling agency for traffic advisories. Following FAA and other applicable guidance, helicopter use during construction is not expected to affect special use airspace within the Facility Locations.

Construction activities could result in short-term disruptions to recreational activities such as hunting and fishing on private lands, Montana State Trust Lands, BLM-administered public lands, conservation easements and lands under Block Management, and public waterways. However, nearby State Trust Lands and BLM-administered public lands, areas of Fort Keogh, Bice and Hirsch Ranch conservation easements, and other easements located outside the Facility Locations will remain available for recreational activities. Hunting, fishing, and other recreational opportunities can occur outside of Project construction areas. North Plains will temporarily provide notice and install advisory signs during construction to ensure the safety of recreationists, including along waterways. BMPs described above also pertain to recreational activities on these lands. North Plains will coordinate with land managers and private landowners to appropriately manage access to recreational areas on public lands and private lands, respectively, based on the development of new access roads. Impacts on recreation will therefore be short-term and minimal given the limited areas of disruption and BMPs to be implemented.

Operation and Maintenance

The presence of transmission line infrastructure (e.g., transmission structures and access roads) will displace existing land uses. In the permanent transmission line right-of-way, however, existing land uses will not change substantially along the transmission line during operation and maintenance. Existing access to residences, businesses, recreational areas, and special interest areas will not be affected. Hunting, fishing, and other recreational opportunities can continue and operational impacts would mainly be limited to changes in the aesthetic appeal of the landscape as discussed in Section 7.9.3.2. As noted in Section 7.3, North Plains will establish permanent (operational) easements on private land and obtain right-of-way approvals on public land, which will result in some permanent restrictions on land use, as discussed below. The activities allowed or restricted will be unique to each easement agreement or right-of-way approval depending on compatibility with the Project.

No structures or trees that could reach within 35 feet of the transmission line will be allowed and the use of pivot irrigation may be limited within the 200-foot-wide permanent right-of-way, both due to safety concerns. However, grazing, dryland farming, farming with other types of irrigation, and most recreational and land management activities can likely be continued. The physical presence of the transmission line structures, converter station, and new access roads will exclude other uses within their permanent (operational) footprint. In addition, the need for multi-pole structures in specific areas would limit land use both in the structure footprints and between the structures.

North Plains will develop land easement agreements on private lands in close coordination with landowners, including those with existing restrictions to development, and coordinate with public land management agencies to identify permit conditions according to public land management plans and other requirements to ensure land use impacts are avoided, minimized, or mitigated. Similar to construction activities, Project operation and maintenance activities will primarily affect rangeland, followed by cultivated crops and hayfields.

7.3.2.2 Unique Impacts and Mitigation Measures

All alternative routes will generally affect the same types of land ownership, land uses, and land cover, as discussed above. The following discussion highlights key impacts that could occur under each of the alternative routes. Section 8.0 provides a comparison of like impacts by alternative route. The alternative routes would require no additional mitigation measures other than those discussed in Section 7.3.2.1.

The Alternative A Facility Location crosses the most private land, the only local public land, the least state public land, and the most cities, towns, and unincorporated communities. It crosses the most land encumbered by restrictive energy easements. It crosses the greatest amount of recreational and special interest areas, agricultural land including irrigated cropland and road and other rights-of-way, as well as the greatest amount of colocation opportunities. It is the only alternative that would overlap with developed residential areas.

The Alternative B Facility Location crosses the most state land. It also crosses land encumbered by restrictive energy easements and other restrictive easements associated with underground communication. It also potentially conflicts with its crossing of an MLR conservation easement. It crosses the least amount of private land, non-irrigated cropland, recreation and special interest areas, potential harvestable forest, and structures.

The Alternative C Facility Location crosses the least amount of federal public land and road and other rights-of-way. It crosses the greatest amount of conservation easements with its crossing of the MFWP Bice and Hirsch Ranch conservation easements. It also crosses the least land encumbered by restrictive energy easements. The alternative also crosses other restrictive easements associated with underground communication. Alternative C also has the lowest opportunity for colocation with other rights-of-way.

The Alternative D Facility Location crosses the most federal land. While the Facility Location crosses an MLR conservation easement, the 200-foot-wide permanent right-of-way does not cross the easement. Alternative D crosses the most rangeland, and potentially harvestable forest. It crosses the smallest amount of irrigated cropland, railroads, and conservation easements. It also crosses land encumbered by restrictive energy easements and other restrictive easements associated with underground communication.

7.4 EARTH RESOURCES (Circular MFSA-2 Section 3.7(8))

7.4.1 Geology

The following sections discuss the geologic resources and geologic hazards within the Facility Locations as defined in Section 7.0. In accordance with Circular MFSA-2 Section 3.7(8), Appendix E provides maps of additional geology baseline data within the required MFSA Study Area for geology which is a 1-mile-wide corridor that includes and is wider than the Facility Locations of the alternative routes.

7.4.1.1 Baseline Data

Geologic Resources

The physiography (physical geography) of the U.S. is defined using a tiered system of regions, provinces, and sections based on the shared topographic features, rock structures, and geologic histories of each area. The Project is located entirely within the Great Plains province, which is characterized as plateau-like with flat plains and little relief throughout with isolated mountains and lowlands included in portions on the province (National Park Service, n.d.).

All four alternative routes are in the Great Plains physiographic province (Fenneman, 1928). In eastern Montana, the Great Plains is divided into two major sections, the Glaciated Missouri Plateau and the Unglaciated Missouri Plateau. The Missouri Plateau is essentially a dissected plateau characterized by badlands, buttes and mesas, and exhumed mountain ranges such as the Black Hills. The Glaciated Missouri Plateau is covered by glacial deposits, but the boundary between the glaciated and non-glaciated sections is not distinct because the glacial deposits thin gradually.

The surficial geology (surficial geologic deposits) crossed by the alternative routes is primarily composed of Quaternary alluvium, colluvium, and glacial till. The alluvium primarily occurs in modern channels and floodplains but is also present in older river terraces or in glacial deposits.

The bedrock geology crossed by the alternative alignments consists of Upper Cretaceous and Tertiary bedrock units. Table 7.4.1-1 shows a description of the bedrock units that are crossed by all four alternative routes (see Figure E-4a in Appendix E). The Fox Hills Formation, Colgate Member, and the Pierre Formation were deposited under marine conditions and the Fort Union Formation, Ludlow Member, includes marine-influenced tongues (Condon, 2000). The Fox Hills Formation is a marginal marine sandstone that has widespread distribution throughout the Northern Rocky Mountain basins from northeast Colorado to Montana. Overlying the Fox Hills Formation is the Hell Creek Formation, which was deposited under non-marine conditions in depositional environments of river channels, floodplains, and lakes.

The Paleogene-age section is primarily represented by various members of the Fort Union Formation, which were deposited under nonmarine conditions like the Hell Creek Formation in river channels, floodplains, and lakes. Both the Hell Creek and Fort Union Formations appear to have been sourced by uplift and erosion of emerging Rocky Mountains to the west and south of the Facility Location (McDonald, 1971).

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Table 7.4.1-1

Bedrock Units Crossed by the Alternative Routes

Geologic Formation / Deposit (Map symbol)	Period	Description
Alluvium (Qal)	Quaternary	Gravel, sand, silt, and clay in channels of modern rivers and streams. Clasts generally subrounded to well-rounded, resistant rock. Thickness generally less than 10 meters (33 feet).
Alluvial terrace deposit (Qat)	Quaternary	Moderately sorted, moderately rounded to well-rounded sand and gravel. Underlies about 12 recognized terrace surfaces in Madison Valley. Bearizi (1987) recognized 11 geomorphic surfaces along Jack Creek. In Madison Valley, east of Madison River, includes all but the highest (and oldest) terrace-gravel deposit, which is shown separately (unit Qgc). Mantled by less than 2 meters (6.5 feet) of loess at most places, although loess on many higher surfaces is thick enough to support cultivation. Mostly less than 10 meters (33 feet) thick.
Fort Union Formation, Ludlow Member (Tfld)	Paleogene	Gray and brown shale, siltstone, silty or bentonitic claystone, sandstone, and coal. Alluvial plain with marine-influenced tongues. Thickness as much as 230 meters (755 feet).
Fort Union Formation, Lebo Member (Tfle)	Paleogene	Dark gray carbonaceous shale, bentonitic claystone, sandstone, and coal. Alluvial plain. Thickness as much as 185 meters (607 feet).
Fort Union Formation, Tullock Member (Tft)	Paleogene	Yellow sandstone interbedded with subordinate grayish brown and black shale and thin beds of coal. Alluvial plain. Thickness as much as 180 meters (590 feet).
Fort Union Formation, Tongue River Member (Tftr)	Paleogene	Yellowish orange sandstone, sandy and silty carbonaceous shale, and coal. Alluvial plain. Thickness as much as 300 meters (984 feet).
Fox Hills Formation, Colgate Member (Kfc)	Cretaceous	White to yellowish, fine- to medium-grained, porous sandstone. Brackish to marine shoreline. Only present near Glendive (eastern Montana) and in several other isolated areas. Thickness 0–40 meters (130 feet).
Fox Hills Formation, Timber Lake and Trail City Members (Kftt)	Cretaceous	Timber Lake-Yellowish orange, wavy-bedded siltstone and black shale with calcareous concretion zone. Thickness 10 meters (33 feet). Trail City-Yellowish orange to gray, fine- to medium grained, noncalcareous, hummocky-bedded sandstone. Thickness 15–22 meters (50–72 feet).
Hell Creek Formation (Khc)	Cretaceous	Light gray, bentonitic claystone that alternates with gray to brown sandstone interbedded with carbonaceous shale. Laterally equivalent to Lance Formation. Fluvial and flood plain. Thickness as much as 335 meters (1,100 feet).
Pierre Formation (Kp)	Cretaceous	Dark gray, partly silty shale with abundant bentonite beds and zones of gray, calcareous concretions. Marine. Thickness as much as 650 meters (2,133 feet). Only upper 50 meters (164 feet) exposed.

Source: Vuke, S.M., Wilde, E.M., Colton, R.B., and Stickney, M.C., 2001d, Geologic map of the Baker 30' x 60' quadrangle, eastern Montana and adjacent North Dakota: Montana Bureau of Mines and Geology Open-File Report 427, 9 p., 1 sheet, scale 1:100,000.

The Facility Locations do not contain federal or state-protected geological features; however, they cross two notable geological features. The Williston Basin is a major structural basin that covers east to northeastern Montana, most of North Dakota, and northwestern South Dakota (Peterson and MacCary, 1987). The Williston Basin also extends north into Saskatchewan and Manitoba in southern Canada. The basin was formed as part of the late Cretaceous/early Tertiary-aged Laramide orogeny, the mountain-building event responsible for the Rocky Mountains. At its thickest point, the basin is over 16,000 feet thick with Paleozoic through Tertiary sedimentary rock units. The center of the basin is located in western North Dakota. Although interpretation of the Williston Basin boundary lines vary significantly depending on the source, the alternative routes cross the southwestern fringe of the Williston Basin. As a result, the bedrock units tilt gently toward east and northeast.

The Cedar Creek Anticline is a northwest to northeast trending anticlinal structure associated with the Williston Basin. The Cedar Creek Anticline is located in southeastern Montana and extends into the southwestern corner of North Dakota and the northwestern corner of South Dakota (Clement, 1987) and is a major source of oil and natural gas production. The Cedar Creek Anticline is 145 miles long and 6 to 20 miles wide. The alternative routes cross the Cedar Creek Anticline at the locations shown in Table 7.4.1-2.

Table 7.4.1-2

Location of Cedar Creek Anticline Crossed by the Alternative Routes

Alternative Route	Milepost Range
Alternative A	148-152
Alternative B	137-143
Alternative C	129-135
Alternative D	147-153

Source: Vuke, S.M., Wilde, E.M., Colton, R.B., and Stickney, M.C., 2001d, Geologic map of the Baker 30' x 60' quadrangle, eastern Montana and adjacent North Dakota: Montana Bureau of Mines and Geology Open-File Report 427, 9 p., 1 sheet, scale 1:100,000.

Geologic Hazards

<u>Earthquakes</u>

An earthquake is caused by the sudden movement, or fracture, along a fault in the earth's crust, with the highest degree of seismic activity occurring at active tectonic plate margins such as the west coast of the US. Interior areas of tectonic plates, including the Study Area, generally experience low earthquake activity, although some intraplate areas such as the Intermountain Seismic Belt approximately 250 miles to the west of the Project experience increased seismicity.

Various scales have been used to describe the strength and effects of earthquakes. The Richter Scale and Moment Magnitude Scale are logarithmic scales that express the energy released during an earthquake (i.e., magnitude), where each whole number increase on the scale represents a ten-fold increase in the amount of energy released. For example, magnitude 4.0 earthquakes are minor events that can be felt by people but result in little or no damage, magnitude 6.0 earthquakes are moderate events with increased property damage, and magnitude 8.0 events are great earthquakes resulting in severe economic impact and large loss of life (USGS, 2025a).

Rosebud County has four recorded earthquakes and Custer County has one recorded event within the general project study areas (MBMG, 2023b, 2023c). These earthquakes were magnitude 3.35 or less, resulting in shaking similar to a passing truck. The Custer County earthquake and one Rosebud County earthquake occurred more than 35 miles from any of the alternative routes. No earthquakes have been recorded in Fallon County. Three of the Rosebud County earthquakes occurred near the Rosebud Mine near Colstrip and were likely associated with mine blasting and not indicative of tectonic earthquakes. Based on historical data, the risk of a significant, damaging earthquake affecting any Project alternative route is low.

The U.S. Geological Survey (USGS) has also assessed the risk of an earthquake for any location in the U.S. by estimating the peak ground acceleration (pga) expressed as a percent gravity (g) resulting from an earthquake during a given period (Rukstales, K.S., and Petersen, M.D., 2019). Project components to the east of approximately MP 58.5 on the HVDC Transmission Line occur in an area with a pga of 0.02 to 0.04 g with a 2 percent probability of exceedance in 50 years. Project components to the west of approximately MP 58.8 on the HVDC Transmission Line occur in an area with a pga of 0.04 to 0.06 g with a 2 percent probability of exceedance in 50 years. These ground motions would not be expected to damage modern structures built to code.

The USGS also assessed the combined hazard of natural and induced earthquakes in response to increased seismicity in some oil and gas producing areas (Petersen et. al, 2018). Eastern Montana has less than a 1 percent chance of experiencing an earthquake that causes minor damage in any given year, indicating a low risk of induced (and natural) seismicity near any alternative route.

Faults

Faults and lineaments are fractures in the earth's crust where sections of competent rock have moved relative to one another. The USGS developed its Quaternary Fault and Fold Database to locate and characterize fault sources across the U.S. as part of its seismic hazard mapping efforts. The database indicates that the nearest Quaternary fault to the Project, the Brokton Floyd Fault Zone, is approximately 115 miles from any alternative route at its nearest point (USGS and MBMG, 2025). Surface faulting is not expected to impact the Project due to the distance between any alternative route and the nearest documented Quaternary fault and the low seismicity of the region.

Soil Liquefaction and Landslides

According to the Montana Bureau of Mines and Geology (MBMG), soil liquefaction occurs when strong or prolonged seismic activity causes saturated soils to temporarily lose their strength. Soils along streams, rivers, and lakes, and other areas of shallow groundwater are susceptible to liquefaction. Soil liquefaction can also occur under prolonged wet conditions, such as springtime. Structures built over these areas could be damaged due to the loss of underlying soil strength during a significant earthquake.

MBMG has developed a soil liquefaction susceptibility map using geotechnical data from MDT Soil Penetration Test drilling investigations, coupled with the USGS Unified Hazard Tool. The western third of the state has the highest liquefaction risk. According to the MBMG Liquefaction Susceptibility map, liquefaction risk for all alternative routes is very low to moderate, with the moderate locations corresponding to alluvial deposits within stream floodplains (MBMG, 2022). None of the alternative routes cross high-risk locations (see Figure E-4b in Appendix E).

A landslide refers to the movement of soils, rock, or debris down a slope resulting from natural or manmade forces that exceed the strength of the materials composing the slope, causing them to give way to gravity. These forces can include rainfall, snowmelt, erosion, groundwater level changes, seismic or volcanic activity, and human activities such as excavation, drilling, or blasting. Generally, the greater the slope, the greater the landslide risk. Table 7.4.1-3 below outlines the mileage of each alternative route crossing slopes greater than 30 percent, between 20 and 30 percent, between 7 and 20 percent, and below 7 percent.

Table 7.4.1-3

Slopes Crossed by Each Alternative Route

Alternative Route	Slope Percentage	Total Mileage
Alternative A	<7%	109.7
	7-20%	55.6
	20-30%	8.7
	>30%	3.4
Alternative B	<7%	95.4
	7-20%	53.0
	20-30%	9.7
	>30%	5.5
Alternative C	<7%	88.6
	7-20%	55.5
	20-30%	8.6
	>30%	4.1
Alternative D (Refined)	<7%	98.1
	7-20%	63.2
	20-30%	13.0
	>30%	5.8

Source: Vuke, S.M., Wilde, E.M., Colton, R.B., and Stickney, M.C., 2001d, Geologic map of the Baker 30' x 60' quadrangle, eastern Montana and adjacent North Dakota: Montana Bureau of Mines and Geology Open-File Report 427, 9 p., 1 sheet, scale 1:100,000.

The USGS has developed a variety of inventory, susceptibility, hazard, and risk mapping to assess potential exposure to landslides across the U.S. According to the U.S. Landslide Inventory webmap, no landslides have been recorded by the USGS within 50 miles of the alternative routes (USGS, 2022b).

Karst Terrain and Ground Subsidence

According to the USGS Karst Map of the Conterminous United States database, none of the alternative routes cross any karst features (USGS, 2020b).

7.4.1.2 Impact Assessment

Common Impacts and Mitigation Measures

Construction

Geologic Resources

The effects of construction will include disturbances to the topography at structure locations and at other aboveground facilities due to grading activities. Upon completion of construction, North Plains will restore topographic contours and drainage patterns per the CMRP and accompanying SWPPP.

North Plains may conduct blasting in areas with near surface bedrock encountered during the drilling or excavation for foundations of structures where bedrock cannot be disaggregated by using truck-mounted auger rigs or other machinery. In the event blasting is necessary, North

Plains will follow the measures outlined in the Blasting Plan, included as an attachment to the CMRP.

The construction and blasting techniques outlined in the CMRP are sufficient to minimize impacts. No adverse impacts to topography are expected.

Geologic Hazards

Earthquakes

Based on historical events and future hazard, the Project is not expected to experience a significant, damaging earthquake. The Project will be constructed in a manner that can withstand expected seismic activity in the region, and North Plains will follow industry design practices and standards, including:

- ASCE 74, Guidelines for Electrical Transmission Line Structural Loading, which includes guidance on seismic considerations;
- ASCE 48, Design of Steel Transmission Pole Structures, which addresses the design of tubular steel poles used for transmission lines; and
- ASCE 10, Design of Latticed Steel Transmission Structures, which includes considerations for redundancy and evaluation of existing towers.

Faults

Construction of the Project is not likely to be impacted by faulting due to the low regional seismicity and because the Project does not cross any active Quaternary faults. Therefore, no specific fault mitigation measures are proposed.

Soil Liquefaction and Landslides

Project construction may impact soils with a higher likelihood for liquefaction; however, due to the low seismic hazard in the area, ground shaking is not expected to be strong enough to trigger soil liquefaction. Impacts to stream valleys with steep slopes may occur as a result of soil liquefaction and/or landslides. Several areas along each alternative cross slopes greater than 30 percent. Steep slopes are not always desirable from utility siting perspective; however, they cannot always be avoided because landowners and land managing agencies often prefer to site utilities and transmission lines in steep slopes to avoid terrain more preferred for other land uses such as grazing, cultivation, or recreation. To account for the Project's location in rough terrain, the Contractor will be expected to solicit the necessary geotechnical and/or geohazard reports for adequate construction. Depending on the soil conditions encountered, this may include site-specific slope stability assessments, cut/fill stability analyses, slope stability modeling, and/or landslide hazard rating analyses for the access roads and structure work pads. These evaluations are commonly required for slopes exceeding 30%. In rough terrain it is often impractical to install drilled pier foundations due to soil conditions or access considerations and for that reason, alternate foundation types may be required. A micropile foundation is a likely alternate and consists of multiple small-diameter, drilled and grouted deep foundations safely welded to a steel cap. Additionally, special construction practices described in the CMRP and SWPPP will minimize remaining slope stability concerns during construction and there will be no significant impacts as a result of constructing or operating the line in steep slopes. This includes following technology-based effluent limitations and best management practices for erosion and sediment controls, soil stabilization, dewatering, and pollution prevention, as well as routine site inspections, corrective actions, reporting, and recordkeeping in accordance with Montana DEQ requirements. Mitigating impact in this manner is consistent with Circular MFSA-2, Section 3.2(1)(d).

Karst Terrain and Ground Subsidence

The alternative routes do not cross areas with karst terrain or ground subsidence concerns.

Operations and Maintenance

Geologic Resources

Operation of the Project and associated aboveground facilities will not materially alter the geologic and topographic conditions. No adverse impacts to geological resources are anticipated due to operations.

Geologic Hazards

Earthquakes

Based on historical events and future hazard, the Study Area is not expected to experience a significant, damaging earthquake. The Project will be constructed in a manner that can withstand expected seismic activity in the region, and North Plains will follow industry design practices and standards described above.

Faults

Operation of the Project is not likely to be impacted by faulting due to the low regional seismicity and because the Project does not cross any active Quaternary faults. Therefore, no specific fault mitigation measures are proposed.

Soil Liquefaction and Landslides

Impacts resulting from soil liquefaction and landslides may occur during Project operations and maintenance activities at locations with steep slopes. To account for siting the Project in rough terrain, North Plains is designing this Project with engineering controls as described above to minimize soil liquefaction and landslide risk during operation. Additionally, by implementing the measures described in the CMRP and SWPPP there will be no significant impacts as a result of constructing or operating the line in steep slopes.

Karst Terrain and Ground Subsidence

The Project will not cross areas with karst terrain or ground subsidence concerns.

Unique Impacts and Mitigation Measures

Geological resources do not vary significantly for the four alternative routes and none of the alternative routes are located within areas where adverse impacts are expected from geological features or hazards. Therefore, comparisons in geologic impacts between alternative routes are not highlighted in Section 8.

7.4.2 Soils

The following section discusses soil resources within the Facility Location for each alternative route as defined in Section 7.0. In accordance with Circular MFSA-2, Appendix E provides maps of soils within the MFSA Study Area. For soil resources, an additional Study Area that extends outside the Facility Location is not required in the Circular MFSA-2, and the analysis determined impacts would be limited to the Facility Location. Therefore, the Study Area for soil resources is the Facility Location. Baseline data is provided in the following sections.

7.4.2.1 Baseline Data

The USDA NRCS Soil Survey Geographic (SSURGO) database (NRCS, 2019) categorizes soils in a hierarchy, starting with Land Resource Region (LRR) at the highest level, followed by Major Land Resource Area (MLRA) (NRCS, n.d.b). LRRs and MLRAs characterize soil suitability for farming, ranching, forestry, engineering, recreation, and other uses (NRCS, 2006). All alternative routes will cross the Western Great Plains Range and Irrigated Region LRR (NRCS, 2006), and the Northern Part of the Northern Rolling High Plains MLRA (NRCS, 2006).

Land in this region consists of rolling plains crossed by numerous east-flowing rivers. Soil composition is primarily shale, siltstone, and sandstone (NRCS, 2006). Soils generally have limited moisture during the growing season (Soil Information for Environmental Modeling and Ecosystem Management, 1998). Smectite, or swelling clays, are common, which can complicate construction and damage foundations, roads, and other structures (Virtual Museum of Minerals and Molecules, 2022). Soil resource concerns in this region include overgrazing by livestock and wind and water erosion where ground cover has deteriorated (NRCS, 2006). Soil characteristics are described below as they relate to farmland, erosion concerns, and soil productivity.

Prime and Unique Farmland and Farmland of Statewide Importance

The NRCS identifies Prime and Unique Farmland as land with high quality agricultural soils. Farmland of Statewide Importance is all other farmland that is of statewide or local importance for crop production. The Farmland Protection Policy Act (U.S.C. 73 §§ 4201–4209) requires federal agencies to minimize the conversion of farmland to non-agricultural uses as a result of federal actions, including federal permitting (NRCS, n.d.b). It further requires federal agencies to identify the impacts of a federal action on prime, unique, and other important farmland. Both Prime and Unique Farmland and Farmland of Statewide Importance are present in the Facility Locations of all alternative routes, with Farmland of Statewide Importance being more abundant than Prime and Unique Farmland. However, not all Prime or Unique Farmland of Statewide Importance would be affected (see Tables 7.4.2-1 and 7.4.2-2 below and Figure E-4c in Appendix E).

Erodible Soils

Erodible soils are prone to wind and/or water erosion and can result in the loss of topsoil, which can negatively impact reclamation and revegetation efforts. Cretaceous shales are listed as a highly erodible soil type in the Circular MFSA-2 Section 3.4 (1)(k) and are present across all alternative routes. A combination of factors, including permeability and texture, landscape position and slope, ground disturbance, time of year, and local climate conditions, contribute to wind and water induced soil erosion risk. The NRCS assigns a wind erodibility group (WEG) and wind erodibility index (WEI) to the soil layer or horizon to assess susceptibility to wind erosion. Soils that are loose, dry, and finely granulated are particularly susceptible to wind erosion. Additional field conditions particularly suitable for wind erosion include large areas of smooth soil surfaces lacking vegetation with sufficient wind velocity. This analysis considered soils with a WEG of 1 or 2, or a WEI of 134 or greater, as susceptible to wind erosion. Highly wind erodible soils are uncommon across the alternative routes (see Tables 7.4.2-1 and 7.4.2-2 below and Figure E-4d in Appendix E).

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TABLE 7.4.2-1

Soil Characteristics in the Alternative Facility Location (acres)

Soils Resource	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
	acres	prop.	acres	prop.	acres	prop.	acres	prop.
PRIME AND UNIQUE FARMLAND								
Prime Farmland [a]	1,232	8%	601	5%	626	5%	557	4%
Farmland of Statewide Importance [b]	3,795	26%	2,431	19%	2,630	20%	2,726	18%
ERODIBLE SOILS								
Highly Wind Erodible Soils [c]	42	<1%	15	<1%	50	<1%	26	<1%
Highly Water Erodible Soils [d]	5,978	41%	6,852	52%	6,246	47%	8,568	57%
Sloped Ground (≥9%) [e]	6,231	42%	7,423	57%	6,651	51%	9,110	60%
Sensitive Soils [f]	189	1%	859	7%	464	4%	658	4%
SOIL WITH LOW PRODUCTIVITY AND LOW REVEGETATION POTENTIAL								
Compaction Prone [g]	10,005	68%	9,862	75%	9,420	72%	10,954	72%
Hydric Soils	2	<1%	19	<1%	19	<1%	19	<1%
Shallow Bedrock [h]	13,162	90%	11,359	87%	10,949	83%	13,145	87%
Revegetation Concerns [i]	6,709	46%	7,951	61%	7,357	56%	9,810	65%

[a] Includes land listed by the Natural Resources Conservation Service (NRCS) that could be as valuable as prime farmland if managed according to acceptable farming methods.
[b] Includes land listed by the NRCS that is adequately managed against erosion and irrigated.
[c] Includes soils with wind erodibility index ranking of 134 or greater or wind erodibility group ranking of 1 or 2.
[d] Includes soils with a non-irrigated capability class of 4–8, a non-irrigated land capability subclass of "e," and an average slope gradient of greater than or equal to 9 percent.
[e] Includes slopes greater than or equal to 9 percent.
[f] Consists of Cretaceous shales (swelling clays).
[g] Includes fine-textured soils (clay-loamy or finer).
[h] Includes land with lithic bedrock within 20 inches of the soil surface.
[i] Includes coarse-textured soils (sandy loams and coarser) that are moderately well to excessively drained and soils with an average slope equal to or greater than 9 percent.

Source: Natural Resources Conservation Service, 2019

TABLE 7.4.2-2

Summary of Route-Specific Soil Resources Crossed by Each Alternative Route (miles) [a]

Resource	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
PRIME AND UNIQUE FARMLAND				
Prime Farmland [a]	14.7	7.8	7.0	5.1
Farmland of Statewide Importance [b]	45.4	28.6	30.8	30.7
ERODIBLE SOILS				
Highly Wind Erodible Soils [c]	0.5	0.2	0.6	0.5
Highly Water Erodible Soils [d]	72.6	87.3	75.6	105.0
Sloped Ground (≥9%) [e]	75.8	94.7	80.0	111.2
Sensitive Soils [f]	2.5	10.0	4.8	6.2
SOIL WITH LOW PRODUCTIVITY AND LOW REVEGETATION POTENTIAL				
Compaction Prone [g]	122.6	123.2	112.9	128.1
Hydric Soils	0	0.2	0.2	0.2
Shallow Bedrock [h]	158.6	141.6	130.1	155.8
Revegetation Concerns [i]	81.3	101.5	88.3	120.3

[a] Includes land listed by the Natural Resources Conservation Service (NRCS) that could be as valuable as prime farmland if managed according to acceptable farming methods.
[b] Includes land listed by the NRCS that is adequately managed against erosion and irrigated.
[c] Includes soils with wind erodibility index ranking of 134 or greater or wind erodibility group ranking of 1 or 2.
[d] Includes soils with a non-irrigated capability class of 4–8, a non-irrigated land capability subclass of “e,” and an average slope gradient of greater than or equal to 9 percent.
[e] Includes slopes greater than or equal to 9 percent.
[f] Consists of Cretaceous shales (swelling clays).
[g] Includes fine-textured soils (clay-loamy or fine).
[h] Includes land with lithic bedrock within 20 inches of the soil surface.
[i] Includes coarse-textured soils (sandy loams and coarser) that are moderately well to excessively drained and soils with an average slope equal to or greater than 9 percent.

Source: Natural Resources Conservation Service, 2019

This analysis considered soils with a non-irrigated land capability class of 4 to 8 and a non-irrigated land capability subclass “e,” soils with an average slope gradient greater than or equal to 9 percent, and compaction-prone soils (fine-textured soils) as susceptible to water erosion (NRCS, n.d.b). Capability classes identify soils with progressively greater limitations and narrower choices for practical use; classes 4 to 8 refer to soils with severe limitations to crop or vegetative cover choice or are unsuitable for cultivation altogether (SSURGO, 2019). Non-irrigated land capability subclass “e” refers to the soil limitation being risk of erosion unless plant cover is maintained (South Dakota Technical Guide, 2010). Areas with a relatively moderate slope, such as an average slope gradient of 9 percent or greater, can also be susceptible to water erosion if construction removes vegetative cover. Across all alternative routes, 40 percent or more of the Facility Locations have a relatively moderate slope. Most areas with a relatively moderate slope also contain highly water erodible soils (see Tables 7.4.2-1 and 7.4.2-2 above and Figure E-4d in Appendix E). Compaction-prone soils are also relatively abundant (equal to or greater than 68 percent of the Facility Locations) across all alternative routes (see Tables 7.4.2-1 and 7.4.2-2 above and Figure E-4e in Appendix E).

Additionally, Cretaceous shales, commonly referred to as “swelling clays,” are prone to water erosion. Mass movement or mass wasting (e.g., landslides) and soil instability are associated with saturated Cretaceous shales, which can result in downslope soil movement and high sedimentation (USGS, n.d.). In the Facility Locations, Cretaceous shales are represented by soils with a clayey particle size and montmorillonitic or smectic in their taxonomic class, which are relatively infrequent (7 percent or less of the Facility Locations) across all alternative routes (see Tables 7.4.2-1 and 7.4.2-2 above and Figure E-4f in Appendix E).

Soil with Low Productivity and Low Revegetation Potential

Soils with low productivity potential that may be more difficult to revegetate following a disturbance include compaction-prone soils, hydric soils, shallow soils, and course-textured soils on sloped ground. This analysis quantified the amount of fine textured soils as representative of compaction prone soils since they are more easily compacted than gravelly soils. These soils are less susceptible to compaction when dry and more susceptible when moisture is present from precipitation or runoff (NRCS, 2022a). In addition to increased erosion risks, compacted soils reduce water permeation into the soil available for plant roots, hinder plant root growth, and reduce nutrient cycling within the soil through the reduction of large pores critical to microbial soil activity (NRCS, 2022a). Compaction prone soils are abundant (equal to or greater than 68 percent of the Facility Locations) across all alternative routes (see Tables 7.4.2-1 and 7.4.2-2 above and Figure E-4e in Appendix E).

The NRCS identifies hydric soils as soils that are saturated or inundated long enough during the growing season to develop anaerobic conditions (NRCS, 2022b). These soils are often indicative of wetlands and are challenging to restore or revegetate after disturbance. Additionally, hydric soils would be at increased risk of compaction during construction activities. Hydric soils are relatively infrequent (less than 1 percent of the Facility Locations) along all alternative routes (see Tables 7.4.2-1 and 7.4.2-2).

This analysis considered shallow bedrock to include areas where soils have a minimum lithic[6] bedrock depth of 20 inches or less. Shallow soil less than 20 inches deep can limit crop yield and

[6] Lithic bedrock is the partially weathered bedrock (cracks in the rock are separated by at least 4 inches [10 centimeters]) that serves as an interface between the hard bedrock below and the soil profile above (Ditzler 2017).

vegetation growth due to decreased root support and restricted nutrient or water capacity, particularly for deep-rooted plants (University of Arizona Cooperative Extension, 1998; Virginia Cooperative Extension, 2023). A thin soil layer also increases the risk of mixing deeper, less fertile soil with topsoil during excavation activities, and may result in rock being introduced to the soil surface. The mixing of soil horizons and introduction of rocks can degrade soil fertility and soil structure, negatively affecting revegetation and soil reclamation efforts. Shallow bedrock is common (equal to or greater than 83 percent of the Facility Locations) along all alternative routes (see Tables 7.4.2-1 and 7.4.2-2).

This analysis considered soils with revegetation concerns to be coarse textured soils that are moderately well to excessively drained on a slope greater than or equal to 9 percent. These soils would be at an increased risk of erosion, and when disturbed could prevent seed germination and vegetation establishment. Soils identified as having revegetation concerns were relatively common (equal to or greater than 46 percent of the Facility Locations) along all alternative routes (see Tables 7.4.2-1 and 7.4.2-2 and Figure E-4g in Appendix E).

7.4.2.2 Impact Assessment

Common Impacts and Mitigation Measures

<u>Construction</u>

Construction could have both short- and long-term effects on soils depending on the extent of soil degradation and the implementation of effective mitigation measures. Excavation, grading, topsoil removal (cutting), vegetation removal, heavy equipment use, temporary access road use including overland travel, and lay-down areas for materials would have the greatest impacts to soils for this Project.

Excavation for and placement of structure foundations will require drilling up to 60 feet in depth and filling the space with engineered fill and then concrete. The substrate brought to the surface through this process could have a long-term impact on soil structure through the mixing of soil horizons. More than 80 percent of the Facility Locations along all alternative routes have shallow bedrock. The mixing of soil horizons can therefore not only introduce infertile subsoil to the surface, but rocks as well, degrading revegetation potential and soil structure in the area around each structure for the long-term. Cutting and grading could also mix soil horizons and result in topsoil loss. To reduce impacts, construction crews will implement the conservation measures outlined in the CMRP and accompanying SWPPP (see Appendix A). Some general examples of BMPs are also included in the following discussion.

The movement of heavy equipment throughout the Project workspace during construction would cause soil compaction. Soil compaction can have a short-term impact on soil structure by reducing the soil's capacity to hold water and reduces the rate of water movement through the soil (NRCS, 2022a). This leads to additional water runoff on the soil surface, which can result in increased erosion. Compaction also impacts nutrients along with water within the soil and can stunt root growth, limiting revegetation potential. Compaction-prone soils are relatively abundant across all alternative routes, resulting in a risk of soil degradation during construction.

Vegetation cover loss will also occur from the movement of heavy machinery, and along areas that must be built up to stabilize new and existing roads. Loss of vegetation from cutting, grading, and heavy machinery movement will leave soil exposed to increased wind and water erosion. The loss of topsoil from excavation, grading, and erosion is detrimental to soil fertility and structure and can result in a lost seed bank, further impacting revegetation of the disturbed land. Soils presenting revegetation concerns (including compaction-prone soils, soils identified as revegetation concern, and shallow bedrock) are relatively abundant across the alternative routes. Poor revegetation of disturbed areas could cause a long-term loss of topsoil by increased wind and water erosion. There are portions of the Facility Location on each alternative that have moderate to steep slopes and/or soils that are highly water erodible (cretaceous clays) or have revegetation concerns. Erosion and landslide concerns resulting from construction activities would be higher in these areas. With successful implementation of site-appropriate erosion controls and revegetation measures summarized in the CMRP and accompanying SWPPP, along with special design considerations in steep slope areas (see Section 7.4.1.2) impacts will be short-term, with erosion minimized and landslides avoided. Additional soil loss can occur as fugitive dust from vehicles and equipment moving through the construction area over exposed soils which will be readily minimized with dust control measures. North Plains will follow this and other BMPs outlined in the CMRP and accompanying SWPPP to avoid or minimize short-term to long-term construction impacts on soils. Mitigation includes measures such as erosion control, dust control, topsoil segregation, soil decompaction, and reestablishment of vegetative cover.

Operation and Maintenance

Routine operations and maintenance would have an impact on soils that would be localized, intermittent, and short-term. Localized disturbances from maintenance vehicles could cause compaction and dust, create ruts, disturb vegetation, and expose soil. North Plains will minimize these impacts by following similar BMPs discussed for construction, such as minimizing vehicle activities on wet soils, implementing soil erosion controls where soils have been disturbed in sloped areas, and ensuring disturbed soils revegetate.

Unique Impacts and Mitigation Measures

The four alternative routes would have similar impacts on soil resources. North Plains would apply the same mitigation measures under the alternative routes. The following discussion identifies key impacts that would be likely under each of the respective alternative routes. Section 8.0 provides a comparison of like impacts by alternative route. None of the alternative routes would involve additional mitigation measures beyond those presented in the CMRP and accompanying SWPPP.

Alternative A would affect the most Prime Farmland, Farmland of Statewide Importance, and shallow bedrock. Alternative A has nearly twice the acreage of Prime Farmland than the other alternative routes. However, Alternative A would affect the least amount of water erodible soil, sloped soil, Cretaceous shales, hydric soils, and soils of revegetation concern.

Alternative B would affect the most sensitive soils, but the least amount of Farmland of Statewide Importance and wind erodible soil.

Alternative C would affect the most wind erodible soil. However, it would affect the least amount of compaction prone soil and shallow bedrock.

Alternative D would affect the most water erodible soil, sloped soil, compaction prone soils, and soils of revegetation concern. To account for siting the Project in rough terrain, the alternative routes will be designed and constructed with engineering controls as discussed in Section 7.4.1.2 to minimize soil liquefaction and landslide risk. Additionally, special construction practices described in the CMRP and accompanying SWPPP will minimize remaining slope stability concerns during construction and there will be no significant impacts as a result of constructing or operating the line in steep slopes. However, Alternative D would impact the least amount of Prime Farmland.

7.5 WATER RESOURCES (Circular MFSA-2 Section 3.7(17 & 18))

The following sections discuss water resources within the Facility Locations. In accordance with Circular MFSA-2, Appendix E provides maps of water resources within the MFSA Study Area. An assessment of water resources as habitat is provided in Sections 7.6, 7.7, and 7.8.

7.5.1 Surface Water

This section provides an analysis of surface water features and quality within the alternative Facility Locations as defined in Section 7.0. For surface water, an additional Study Area that extends outside the Facility Location of each alternative is not required in the Circular MFSA-2, and the analysis determined impacts would be limited to the Facility Locations. Therefore, the Study Area for surface water is the Facility Location of each alternative route. Baseline data is provided in the following sections.

7.5.1.1 Baseline Data

Surface Water Features

Information on surface water features, including standing water and streams, along with their respective Hydrologic Unit Code (HUC) 4 watersheds, is from the MLCF (MNHP, 2017); Montana Wetland and Riparian Framework (MWRF) created by the University of Montana's Ecological Mapping, Monitoring and Analysis Group (University of Montana, 2022); USGS National Hydrography Dataset Plus High Resolution (NHDPlus HR) (USGS, 2022a); and the USGS Watershed Boundary Dataset (USGS, 2024a).

All alternative routes cross three HUC4 watersheds in Montana, including the Lower Yellowstone (HUC1010), the Powder-Tongue (HUC1009), and the Missouri-Little Missouri (HUC1011) watersheds from west to east (see Figure E-5a in Appendix E). Within these watersheds, the Facility Location of each alternative route crosses perennial and intermittent streams, standing waterbodies (i.e., any lake, wetland, or reservoir [Circular MFSA-2 Section 3.4(u)]), and internally drained basins at least 20 acres in size (see Table 7.5.1-1). Additionally, canals/ditches occur within the Facility Locations of Alternatives A and D. In the absence of specific internally drained basin data, this analysis considered all emergent wetlands mapped by the University of Montana (2022) and reaching 20 acres or more in size, regardless of the acreage within the Facility Location, to conservatively represent internally drained basins. All wetlands, including emergent wetlands greater than 20 acres, are described in Section 7.4.5.

Table 7.5.1-1 summarizes the surface waters crossings in the Facility Location of each alternative route by type. Perennial streams located in the Facility Locations of the alternative routes include Rosebud, O'Fallon, East Fork Armells, and Sandstone creeks in the Lower Yellowstone watershed, and the Powder and Tongue rivers and Pumpkin Creek in the Powder-Tongue watershed. Numerous intermittent streams occur in the alternative route Facility Locations as tributaries to the perennial waterbodies. Although the Yellowstone River occurs outside all four Facility Locations, Alternative A crosses Rosebud Creek near its confluence with the Yellowstone River, and subsequently lies close to the Yellowstone River for about 2 miles (see Figure E-5b in Appendix E). The closest point of the Alternative A Facility Location is about 0.25 mile from the river. For a list of rivers and streams with high conservation value or fishery resources in the Facility Location for each alternative route, see Section 7.8.

TABLE 7.5.1-1

Surface Waters in the Project Footprint and Surrounding Facility Location by Alternative Route [a]

	Alternative A			Alternative B			Alternative C			Alternative D (Refined)		
Surface Water Type	No.	acres	miles	No.	acres	miles	No.	acres	miles	No.	acres	miles
STANDING WATERS [b]	4	–	0.2	3	–	0.4	2	–	0.4	5	–	0.5
STREAM SEGMENTS [c, d]												
Canal/Ditch	3	–	1.4	0	–	0	0	–	0	1	–	0.4
Intermittent	145	–	28.6	146	–	24.2	146	–	25.5	139	–	26.3
Perennial	6	–	1.3	8	–	2.2	13	–	2.8	10	–	2.6
Subtotal	154	–	31.4	154	–	26.4	159	–	28.3	150	–	29.3
INTERNALLY DRAINED BASINS ≥ 20 ACRES [e]	1	<1	0	4	21	0.2	3	17	0.2	5	16	0.2

[a] For surface waters, the Study Area is equal to the Facility Location of each alternative route.

[b] Standing water includes any lake, wetland, or reservoir (Circular MFSA-2 Section 3.4(u)). Wetlands are not included here and are summarized separately in Tables 7.5-5-1 through -4. The mileage presented here represents the length of the standing waters as represented by the artificial path in the Facility Location.

[c] Features mapped as connector or artificial path and not identified as a lake/pond by the U.S. Geological Survey (2023) were reclassified as stream/river and assigned a flow regime based on stream order; features with a stream order of 1 to 3 are considered intermittent and features with a stream order of 4 to 6 are considered perennial.

[d] The mileage presented represents the total length of waterbodies within the Facility Location regardless of orientation.

[e] Represented by emergent wetlands mapped by the University of Montana (2022) with a total acreage ≥ 20 acres, regardless of total acreage within the Facility Location. Acreages presented here reflect the area that falls within the Facility Location (i.e., only a portion of a 20-acre wetland could fall inside the Facility Location). The number of internally drained basins ≥ 20 acres is based on the number of identified features within the Facility Locations. Therefore, the mileage presented here is of a subset of those features that are crossed by the centerlines of the alternative routes. These wetlands are also captured in Section 7.5.5.

[f] Totals may not add up due to rounding.

Note: No. = number; – = no data available

Sources: University of Montana, 2022; U.S. Geological Survey, 2022a

Surface Water Quality and Water Use

The DEQ water quality standards are fundamental regulatory and policy foundations to protect and restore water quality in Montana. Water quality standards and use classification systems for surface water and groundwater are defined in the Administrative Rules of Montana (ARM), Title 17, Chapter 30 and in Department Circulars DEQ-7.

The DEQ classifies surface waterbody uses according to the present and future beneficial uses a waterbody supports under ideal conditions (75-5-301, MCA). Montana's waterbody use classification system includes 17 classes (DEQ, 2020, 2021a). Each class is a combination of progressively lower quality waters (e.g., class C is lower than B) with a numerical classification based on temperature of the water for aquatic use (1, 2, and 3).

County-level conservation districts also regulate activities within and along the banks of perennial waterbodies. The three conservation districts crossed by the Facility Locations include Rosebud, Custer, and Little Beaver conservation districts. North Plains will coordinate with these conservation districts to acquire permits for construction activities (e.g., temporary or permanent bridge installation for access along the right-of-way) that will disturb the bed or banks of perennial waterbodies regulated by each district (310 Permit) in accordance with Montana's

Natural Streambed and Land Preservation Act (75-7-102, MCA). In addition, given ground disturbing activities during construction, North Plains will acquire a short-term water quality standard for turbidity permit (318 Authorization) from the DEQ where construction activities may cause an unavoidable short-term increase in turbidity within a state water.

The DEQ database was used to assess impaired waters (DEQ, 2021b). The *Montana 2020 Final Water Quality Integrated Report* defines an impaired waterbody as one that fails to meet one or more of the applicable water quality standards set by the DEQ to protect beneficial water uses (i.e., aquatic life and fish, recreation, human health, and agriculture and industry) in accordance with Sections 303(d) and 305(b) of the federal Clean Water Act (CWA) (DEQ, 2020, 2021a). Water quality standards are set by numeric standards, which represent the maximum amount of specific pollutants allowed in a body of water that maintains its beneficial uses, and narrative standards, which describe the desired or ideal condition of the waterbody (DEQ, 2021a). Numeric standards relevant to the Project include those for temperature; toxic, carcinogenic, radioactive, nutrient, and otherwise harmful pollutants; and dissolved salts (DEQ, 2021a). Narrative standards include descriptions related to the biological community such as the types and densities of benthic macroinvertebrates as an indicator of stream health (EPA, 2023a).

Table 7.5.1-2 below summarizes perennial streams and any 303(d) impaired water designations, as applicable, in the Facility Location of each alternative route (see Figure E-5c in Appendix E).

TABLE 7.5.1-2

Perennial and/or 303(d) Impaired Waterbodies or Waterbody Segments Located in the Facility Locations by Alternative Route [a]

Stream Name	Water Use Classification [b]	Water Quality Classification [c]	303(d) Designation	Impaired Area	Alternative routes
East Fork Armells Creek	C-3	5	Nitrogen, Aluminum, Iron, Phosphorus, Specific conductivity, Nitrate/Nitrite, Total dissolved solids	East Rosebud Mine outfall to mouth (Armells Creek)	A, D
Foster Creek	C-3	3	None	N/A	C
O'Fallon Creek	C-3	2	None	N/A	A, B, C, D
Pennel Creek	C-3	5 [e]	Total dissolved solids	Headwaters to mouth (O'Fallon Creek)	A
Powder River	C-3	5	Salinity	Mizpah Creek to mouth (Yellowstone River)	A, B, C, D
Pumpkin Creek	C-3	5	Salinity, Temperature	Little Pumpkin Creek to mouth (Tongue River)	B, C
Rosebud Creek	C-3	4C	Dam Construction and Physical Disturbance (Unspecified Pollutant)	Northern Cheyenne Reservation boundary to boundary at Sections 28 and 29 Township 6 North, Range 42 East	A, B, C, D
Sandstone Creek	C-3	5	Nitrogen, Nitrate/Nitrite	Headwaters to mouth (O'Fallon Creek)	A, B, C, D
Tongue River	B-3	5	Copper, Lead, Iron, Sediment, Nickel, Salinity, Cadmium, Zinc, Flow Regime Modification	Beaver Creek to mouth (Yellowstone River)	A, B, C, D

[a] For surface waters, the Study Area is equal to the Facility Location.

[b] Applicable water use classifications:
B-3 = Waters to be maintained suitable for drinking, culinary, and food processing purposes, after conventional treatment; bathing, swimming, and recreation; growth and propagation of non-salmonid fishes, waterfowl and furbearers; and agricultural and industrial water supply.
C-3 = Waters to be maintained suitable for bathing, swimming, and recreation, and growth and propagation of non-

TABLE 7.5.1-2

Perennial and/or 303(d) Impaired Waterbodies or Waterbody Segments Located in the Facility Locations by Alternative Route [a]

Stream Name	Water Use Classification [b]	Water Quality Classification [c]	303(d) Designation	Impaired Area	Alternative routes
	salmonid fishes and associated aquatic life, waterfowl, and furbearers. The quality of these waters is naturally marginal for drinking, culinary, and food processing purposes, agriculture, and industrial water supply.				
c	Applicable water quality classifications: 2 = Some, but not all, designated uses supported. 4C = At least one designated use is not supported or is threatened, but the impairment or threat is not caused by a pollutant, Therefore, a total maximum daily load (TMDL) is not required. 5 = 303(d) impaired water. One or more beneficial uses are impaired or threatened. Therefore, a TMDL is required to address the factors causing the impairment or threat.				
Source:	U.S. Geological Survey, 2022a; Montana Department of Environmental Quality, 2021a,b				

7.5.1.2 Impact Assessment

Common Impacts and Mitigation Measures

Construction

North Plains will set back transmission structures and their associated workspaces to avoid waterbodies by a minimum of 10 feet from the ordinary high water mark of surface waterbodies. However, access roads installed or improved during Project construction, including streambank stabilization materials, could alter physical characteristics of streams, including channel morphology and stream flow at waterbody crossing locations. Access roads could also contribute sediment or turbidity to waterbodies, affecting downstream water quality and aquatic life (see additional discussion in Section 7.8).

North Plains will use existing roads and disturbed two-tracks to access the Project workspace where possible. Where adequate access roads are not available and new or upgraded access roads are required, North Plains will site roads and minimize their overall road length and disturbance footprint to limit impacts to waterbodies. In addition, North Plains will install stable crossing structures, such as clear span bridges, span bridges with in-water supports, culverts/flumes, vented rock fords, or low water crossings, as described further in the CMRP. North Plains will construct these crossings to maintain flows within waterbodies in accordance with federal, state, and local permitting requirements, and federal and state land-managing agency specifications. Streambank stabilization materials may include rock rip-rap or bio-stabilization materials (e.g., brush layering logwalls). The USACE Omaha District requires that North Plains implement specific BMPs for culvert installation in Montana regarding sizing and specifications. North Plains will coordinate with permitting agencies if they cannot implement these measures in certain areas. Installation of crossings for equipment moving along the Project workspace will rely on industry standard crossing methods.

While North Plains will remove some access road improvements following construction and restore the waterbody, resulting in a short-term impact. North Plains will leave some new or upgraded crossings in place to allow necessary access to Project facilities during operations, resulting in a long-term impact. North Plains will acquire necessary permits for new or upgraded permanent crossings from the USACE, as well as state and local agencies (see Table 9.0-1).

Riparian trees and some tall riparian shrub vegetation will be removed for the life of the Project (see Section 7.3). The loss of tall riparian vegetation would alter habitat conditions for aquatic species, such as through the loss of temperature regulation (see additional discussion in Section

7.8). With mitigation, and since waterbody crossings will occur over a limited length of streambank at each crossing location, these short- to long-term changes to surface water from waterbody alterations would have a localized impact on aquatic life.

Stormwater runoff from exposed soils in construction areas could result in short-term increases in surface water turbidity and sedimentation. Impacts would primarily be localized since sediments would become diluted or fall out of the water column in moving downstream. There is also low potential for fuels and lubricants used during construction to come into contact with surface waters during refueling, equipment operation or maintenance, or storage during Project construction. While existing soil contamination could also be released to surface waters during ground disturbing activities, a search of the EPA contaminated sites database identified no existing soil contamination in any of the Facility Locations (EPA, 2021).

Construction within 303(d) impaired waterbodies could lead to increased levels of total suspended solids, sedimentation, and pollutants. In accordance with the requirements of the Storm Water Construction General Permits, North Plains will identify 303(d) impaired waters in the SWPPP along with the erosion and sediment control best management practices that North Plains will implement during construction to avoid affecting these sensitive waters.

To avoid and minimize potential impacts to all surface waters, including impacts to the beneficial water uses identified in the Facility Locations (see Table 7.5.1-2), the Project will adhere to the requirements of the General Permit for Storm Water Discharges Associated with Construction Activity (Storm Water General Permit) (75-5-101, MCA and ARM 17.30.1101, 17.30.1301 et seq., 17.30.601 et seq.) where at least one acre of ground would be disturbed by clearing, excavating, grading, or placement/removal of earth material, and where potential pollutants could be discharged to state surface waters through stormwater runoff (DEQ, 2023b). Requirements include the development of a SWPPP that must contain the BMPs listed in the Storm Water General Permit regarding:

- erosion and sediment control;
- temporary and final soil stabilization;
- dewatering;
- pollution prevention measures;
- surface outlets; and
- impaired waterbodies.

North Plains will also obtain and comply with construction site dewatering permits where needed, which may involve pumping water from disturbed surface areas (structure holes and other excavations associated with construction where sediment-laden ground water or surface water/storm water inflow must be removed) and areas of saturated ground water (via sumps, wells, and well-points). Adherence to permit requirements and implementation of measures outlined in the CMRP will help avoid or minimize impacts on surface waters.

There is a low potential for inadvertent spills or leaks of hazardous liquids during refueling, equipment operation or maintenance, or storage during Project construction. Small amounts of hazardous substances, primarily in the form of fuels and lubricants, will be present in equipment or storage containers at construction sites and material storage yards. North Plains will implement the mitigation measures outlined in the CMRP and the Spill Prevention and Response Plan to minimize the risk of hazardous materials encountering surface waters. North Plains will manage hazardous materials, chemicals, fuels, lubricating oils, and other petroleum products near wetlands and waterbodies in accordance with the CMRP and the Spill Prevention and Response

Plan. Should a spill occur, North Plains will notify the agency and/or emergency response authorities, as described in the Spill Prevention and Response Plan.

In addition, waterbody crossing design measures will be incorporated to reduce impacts to surface waters. Examples of BMPs included in the CMRP relevant to a SWPPP, Spill Prevention and Response Plan, and waterbody design measures include maintaining adequate drainage across the Project during flood events, minimizing removal of vegetation, and establishing erosion control measures at waterbody crossings.

North Plains will comply with federal and state permit requirements to minimize impacts of Project construction on surface waterbodies. Adherence to the CMRP and SWPPP will require temporarily installing erosion control devices such as silt fence, straw bales, erosion control blankets; workspace stabilization, and restoration using permanent erosion controls such as slope breakers; and reseeding of disturbed workspace. These measures will minimize surface water runoff and, thereby, minimize sedimentation in waterbodies crossed or adjacent to Project workspace. North Plains will acquire a 318 Authorization from the DEQ where construction activities may cause an unavoidable short-term increase in turbidity within state waters. This authorization will provide the DEQ an opportunity to provide input regarding specific mitigation measures or BMPs to be followed during Project construction and restoration.

Operations and Maintenance

As noted above for construction, any permanent new access road waterbody crossings, or permanent upgrades to an existing crossing, could alter waterbody channel morphology and flow. In addition, permanent access roads in proximity to waterbodies could serve as a long-term source of runoff that could carry sediment into streams, intermittently reducing water quality. With proper design, development of vegetative buffers, and proper road maintenance, impacts will be infrequent.

Unique Impacts and Mitigation Measures

All alternative routes could affect surface waters within their respective Facility Location. Mitigation measures will be applied consistently across the alternative routes. The surface water impacts would not differ substantially between alternative routes. Therefore, comparisons in surface water impacts between alternative routes are not highlighted in Section 8. Minor differences are described briefly below. None of the alternative routes would involve additional mitigation measures beyond those presented in the CMRP and accompanying plans.

The Alternative A Facility Location contains the fewest number of perennial waterbody crossings. Conversely, it contains the greatest extent of waterbodies, along with the most 303(d) impaired waterbodies. Runoff from construction areas could temporarily degrade waterbodies and result in additive impacts to existing impairments in 303(d) waters, including increased sedimentation and total suspended solids.

The Alternative B Facility Location has the greatest number of intermittent waterbody crossings along with Alternative C, as well as the largest acreage of internally drained basins greater than or equal to 20 acres, which could lead to temporary impacts to surface waters along the transmission line right-of-way from construction area runoff during high flow periods.

The Alternative C Facility Location has the greatest number of intermittent waterbodies along with Alternative B, as well as the greatest number of perennial waterbody crossings. Temporary impacts could occur to surface waters along the Project workspace from construction area runoff during high flow periods.

The Alternative D Facility Location has the greatest number of internally drained internally drained basins greater than or equal to 20 acres, though it does not have the greatest total area within Facility Locations.

7.5.2 Groundwater

This section provides an analysis of groundwater features within the Facility Location of each alternative route as defined in Section 7.0. For groundwater, an additional Study Area that extends outside the Facility Location is not required in the Circular MFSA-2, and the analysis determined impacts would be limited to the Facility Locations. Therefore, the Study Area for groundwater is the Facility Location for each alternative route. Baseline data is provided in the following sections.

7.5.2.1 Baseline Data

Groundwater refers to water that collects in saturated zones beneath the land surface, filling the pores and fractures of subsurface sand, gravel, and rock (USGS, 2021; USGS, 2024b). A groundwater aquifer occurs where groundwater is present in pore spaces, cracks, or fissures within bedrock or subsoil substrate. Where groundwater is available to flow from pore spaces in bedrock or subsoil, this water can be available for extraction into groundwater wells or to discharge to the ground surface as springs. Aquifers are generally characterized by the geologic formation or group of geologic formations that contain water where there are permeable materials to yield water to wells and springs. A principal aquifer is the largest geologic unit of aquifers mapped by the Regional Aquifer System Analysis program of the USGS, where a principal aquifer extends over a regional hydrologic system or aquifer system that has the potential to be used as a source of potable water (USGS, 2021).

The Facility Locations of all alternative routes are located within groundwater Segment 8, as defined in the Ground Water Atlas of the United States (Miller, 2000). Segment 8 stretches across Montana, North Dakota, South Dakota, and Wyoming, and spans across the continental divide. Several major rivers drain the aquifer systems of Segment 8, which ultimately drain into the Missouri River. The alternative routes are also positioned entirely within the Northern Great Plains regional aquifer system (Whitehead, 1996). Aquifers within the Northern Great Plains regional aquifer system is vertically stacked and vary in how connected they are based on the localized presence of confining layers. The Northern Great Plains regional aquifer system is primarily recharged by precipitation in the form of rain or snow melt that runs into streams and seeps into the ground. Flow within the aquifer system is based on elevation and generally flows southwest to northeast.

Within Segment 8, groundwater for human use is primarily obtained from privately owned wells in unconsolidated-deposit aquifers made up of sand and gravel, as well from wells in semi-consolidated and consolidated-rock aquifers in sandstone and limestone (Whitehead, 1996). In the Northern Great Plains, groundwater is primarily used for agricultural irrigation and is often the only source given limited surface water resources. Consequently, many of the aquifers in the area have declined due to excessive withdrawals, and state governments have enacted programs to either limit or prohibit new wells (Whitehead, 1996).

The Facility Locations of the alternative routes cross five principal aquifers within the Northern Great Plains regional aquifer system in Montana. From the most surficial to the deepest aquifers crossed by the Facility Locations, these include unconsolidated Quaternary age deposit aquifers, and the Lower Tertiary, Upper Cretaceous, Lower Cretaceous, and Paleozoic aquifers (Lloyd and Lyke, 1995).

In Rosebud, Custer and Fallon counties, unconsolidated-deposit aquifers generally occur along the Yellowstone River and its major tributaries as shallow alluvial aquifers composed of clay, silt, sand, and gravel deposited over time by flowing water. These aquifers are generally thin, narrow bands along stream valleys, consist primarily of sand and gravel and are permeable to groundwater (Whitehead, 1996; Smith et al., 2000). These shallow alluvial aquifers are considered sensitive groundwater resources, which are shallow groundwater areas that occur in permeable rock units or unconsolidated alluvium where the groundwater is used for domestic use and irrigation, or is susceptible to contamination (Smith et al., 2000).

Semi-consolidated and consolidated rock aquifers are present along the Project alternative routes in eastern Montana, consisting mostly of sandstone beds in both the Lower Tertiary and Upper Cretaceous aquifers (Whitehead, 1996). Most of the water in the sandstone aquifers is in pore spaces between individual grains of sand, but some of the aquifers contain fractures, bedding planes, and joints that provide openings that store and transmit water within the aquifer (Whitehead, 1996). Upper Cretaceous aquifers are a common source of groundwater for wells throughout Segment 8, including communities in southeastern Montana (Whitehead, 1996). Paleozoic aquifers are typically deeply buried, and not commonly used as a source of groundwater for wells (Whitehead, 1996). See Section 7.5.3 for additional details on groundwater wells.

The Facility Locations of the alternative routes have a low potential to encounter groundwater in shallow aquifers that could occur within 100 feet of the surface. Shallow groundwater flow in the area occurs where groundwater moves from higher elevations to nearby valley bottoms (Whitehead, 1996). The water table closely follows the land-surface topography; thus, Project activities would most likely encounter groundwater at locations in or near perennial or intermittent streams in flood-prone areas where the water table is closest to the surface. See Section 7.5.1 and Table 7.5.1-1 for details on streams.

7.5.2.2 Impact Assessment

Common Impacts and Mitigation Measures

<u>Construction</u>

In transmission line design, it is standard practice to span the line over surface water resources and flood-prone (high water table) areas whenever possible. By spanning water crossings, the alternative routes would generally avoid direct impacts to the streams that supply groundwater recharge and provide a connection to subsurface groundwater resources. Many of the mitigation measures discussed in Section 7.5.1.2 to protect surface waters would also protect groundwater. North Plains will comply with construction stormwater permits and the installation and maintenance of erosion control devices to further minimize impacts on surface waters and shallow groundwater aquifers from excessive runoff or increases in water turbidity from disturbed areas. With mitigation, the effects on groundwater will be short-term.

Installation of transmission structure foundations require deeper excavations of up to 60 feet deep, depending on the structure type. In areas where the groundwater table is shallow, these excavations may intercept the groundwater table. In areas where groundwater is present within the foundation excavations, dewatering may be required to successfully pour and cure concrete, which will result in temporary discharge of groundwater by pumping water into well-vegetated upland areas or into an energy-dissipating structure. North Plains will implement dewatering procedures, as discussed in Section 5.8.6 of the CMRP, to comply with water quality standards and state permit requirements. This dewatering could result in short-term, localized fluctuations in groundwater levels. After dewatering is completed, groundwater is expected to return to preexisting levels.

There is a low potential for inadvertent spills or leaks of hazardous liquids during refueling, equipment operation or maintenance, or storage during Project construction. If structure foundations extend below the water table, substances used in drilling could come into direct contact with groundwater during construction. Small amounts of hazardous substances, primarily in the form of fuels and lubricants, will be present in equipment or storage containers at construction sites and material storage yards. North Plains will implement the mitigation measures outlined in the CMRP and the Spill Prevention and Response Plan to minimize the risk of hazardous materials coming into contact with groundwater. North Plains will manage hazardous materials, chemicals, fuels, lubricating oils, and other petroleum products near wetlands and waterbodies in accordance with the CMRP and the Spill Prevention and Response Plan. Should a spill occur, North Plains will notify the agency and/or emergency response authorities, as described in the Spill Prevention and Response Plan.

The localized nature, disturbance of discrete areas, and implementation of BMPs described above will minimize impacts on groundwater due to ground disturbing activities during construction.

<u>Operations and Maintenance</u>

Operation and maintenance of the Project will not affect groundwater. Hazardous substances will be limited to typical fuels and lubricants found in vehicles and equipment. Structure repair and replacement could occur over the long-term but will be infrequent and have no impact on groundwater with the implementation of the same mitigation measures described for construction.

Unique Impacts and Mitigation Measures

The analysis identified no key impacts to groundwater or mitigation measures unique to any of the alternative routes. Therefore, comparisons in groundwater between alternative routes are not highlighted in Section 8.

7.5.3 Water Supplies and Wells (Water Users)

This section provides an analysis of water supplies and wells within the alternative Facility Locations as defined in Section 7.0. For water supplies and wells, an additional Study Area that extends outside the Facility Location is not required in the Circular MFSA-2, and the analysis determined impacts would be limited to the Facility Location of each alternative route. Therefore, the Study Area for water supplies and wells is the Facility Location. Baseline data is provided in the following sections.

7.5.3.1 Baseline Data

Bedrock aquifers are the primary source of groundwater for much of this region (see Section 7.5.2), and generally support low-producing domestic and stock wells that have relatively poor water quality. Alluvial unconsolidated-deposit aquifers along the Yellowstone River and its major tributaries represent the most reliably productive bedrock aquifers in the region (DNRC, 2015).

Alluvial unconsolidated-deposit aquifers can yield sufficient water for some uses in certain locations but are generally less productive than other unconsolidated-deposit aquifers. Average yields of wells completed in unconsolidated-deposit aquifers range from about 1 to 1,000 gallons per minute. However, yields of wells completed in thick sequences of coarse sand and gravel can exceed 3,500 gallons per minute. Wells in alluvium deposits along stream valleys are generally less than 100 feet deep (Whitehead, 1996).

Yields in the Lower Tertiary and Upper Cretaceous bedrock aquifers range from 1 to 50 gallons per minute in Montana, and locally can have yields up to 200 gallons per minute. These aquifers are deeply buried or overlain by fine-grained rocks in many places. Wells completed in the aquifers commonly are 300 to 900 feet deep and in some locations are up to 1,000 to 3,000 feet deep. Wells in the Lower Cretaceous aquifer vary, with most wells yielding 5 to 60 gallons per minute, but some wells can yield as much as 500 to 1,000 gallons per minute. Due to the depth of the formation in the Lower Cretaceous aquifer, wells are very deep and can reach 5,000 feet deep or more (Whitehead, 1996).

Table 7.5.3-1 below summarizes the number of known private, public, agricultural, and industrial water wells within the Facility Location of each alternative route based on data obtained from the MBMG Groundwater Information Center (MBMG, 2023).

TABLE 7.5.3-1

Water Wells in the Facility Location by Alternative Route (counts)

	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
Well Type / Well Use	Count	Depth Range [a] (feet)	Count	Depth Range [a] (feet)	Count	Depth Range [a] (feet)	Count	Depth Range [a] (feet)
BOREHOLE								
Geotechnical	5	18 – 96	0	–	0	–	0	–
Monitoring	1	74	1	74	1	74	1	74
Test Well	4	2 – 171	0	–	1	460	4	2 – 171
Unspecified [b]	0	–	0	–	0	–	1	240
Subtotal	10	–	1	–	2	–	6	–
PETWELL								
Unspecified [b]	4	0	6	0	4	0	6	0
Unused	1	0	0	–	0	–	0	–
Subtotal	5	–	6	–	4	–	6	–
SPRING								
Spring	0	–	0	–	0	–	1	0
Subtotal	0	–	0	–	0	–	1	–
WELL								
Domestic	4	120 – 1,200	3	110 – 550	3	50 – 500	1	500
Fire Protection	0	–	0	–	0	–	1	110

TABLE 7.5.3-1

Water Wells in the Facility Location by Alternative Route (counts)

Well Type / Well Use	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
	Count	Depth Range [a] (feet)	Count	Depth Range [a] (feet)	Count	Depth Range [a] (feet)	Count	Depth Range [a] (feet)
Industrial	0	–	1	485	1	485	1	485
Irrigation	1	500	0	–	0	–	0	–
Monitoring	18	14 – 148	16	14 – 125	16	14 – 125	19	14 – 148
Research	0	–	0	–	0	–	3	290 – 760
Stockwater	12	30 – 932	12	0 – 620	10	0 – 805	12	180 – 620
Unknown	1	330	0	–	0	–	2	135 – 180
Unspecified [b]	2	42 – 875	0	–	0	–	0	–
Unused	0	–	1	240	1	240	0	–
Subtotal	38	–	33	–	31	–	39	–
PROJECT TOTAL	**53**	**–**	**40**	**–**	**37**	**–**	**52**	**–**

[a] Range of total depths of wells by well type and use.
[b] No well use type specified in the dataset.
Source: Montana Bureau of Mines and Geology, 2023

The DNRC has the authority to designate a controlled groundwater area to prevent new appropriations or limit certain types of water appropriations due to water availability or water quality problems for the protection of existing water rights (85-2-501, MCA et. seq.). None of the alternative routes cross any controlled groundwater areas that would be applicable to construction and operation of a transmission line (DNRC, 2023, 2025). The Northern Cheyenne Tribe – Montana Compact involves water resources crossed by the Facility Locations of all four alternative routes within the Rosebud Creek drainage (DNRC, 2023, 2025). The compact recognizes and protects the water rights of the Northern Cheyenne Tribe of the Northern Cheyenne Indian Reservation, which include the use and diversion of a specified amount of water from Rosebud Creek and its tributaries for agricultural purposes (85-20-301, MCA).

According to the USGS database for public water supply locations in Montana, no public water supplies are crossed by the Facility Location of any alternative route (USGS, 2024). The DEQ designates Source Water Protection Areas as areas determined to be contributing to a drinking water supply and where pollution from human activities or natural sources poses the greatest threat to source water quality (DEQ, 1999). The DEQ conducts Source Water Assessments to identify SWPAs. SWPAs are crossed by the Facility Locations of Alternatives A, B, C, and D. They include two in Rosebud County, including one for the City of Colstrip crossed by the Facility Locations of all four alternatives (Public Water Source [PWS] ID MT0000180, Inventory Region [IR] 1537), along with one for the Hathaway Rest Area (PWSID MT0001972, IR 1863) crossed by the Facility Locations of Alternatives A and B. In Fallon County, the Facility Locations for Alternatives A, B, C, and D cross the SWPA for the city of Plevna (PWSID MT0000307, IR 267).

7.5.3.2 Impact Assessment

Common Impacts and Mitigation Measures

Construction

Measures outlined in the CMRP will avoid physical damage to water wells and their associated piping systems in the Facility Locations that could otherwise occur during construction and result in water availability issues for the local water user, as well as potential groundwater contamination through breaks or other openings in the system. Contamination of water wells from potential hazardous material runoff from construction areas will be avoided, as discussed in Section 7.5.2.

Water uses include, but are not limited to, water used to mix concrete at on-site batch plants for structure foundations, to help with soil compaction on access roads and at construction sites, to tackify topsoil piles during windy conditions, and to be sprayed for dust control. North Plains estimates that approximately 5,800 gallons of water per mile will be needed for concrete batching at structure foundations and approximately 272,000 gallons of water per mile for access road dust control, based on the anticipated construction duration. North Plains intends to acquire water from municipal sources for these purposes. North Plains will adhere to any permitting requirements for the batch plant under the federal Clean Air Act and Clean Air Act of Montana. Water use will occur at specific areas along the transmission line corridor and will therefore not result in excessive demand in any one area. Construction of the converter station may require a relatively higher amount of water per area than construction of the transmission line due to the construction of concrete foundation for buildings; however, the converter station will be located near Colstrip, where municipal water will be available. Water sourced by municipal providers for the Project will be from groundwater. Given the limited demand in any one area, water availability to other users will not be reduced, including water involved in the Northern Cheyenne Tribe – Montana Compact, and community water sources in Source Water Assessment Areas. Erosion and pollution control measures will be implemented according to the CMRP to avoid adverse effects to these water sources.

The mitigation measures that will be implemented to protect surface waters and groundwater will also help protect water supplies and wells (see Section 7.5.1.2). In addition, North Plains will implement avoidance and minimization measures outlined in the CMRP that will further reduce impacts to water supplies and wells.

Operations and Maintenance

Impacts ranging from none to short-term will occur to water supplies during operation. Water could be needed for dust control or as a tackifier during maintenance activities along the transmission line, but impacts would be intermittent and localized based on the small amount of water that would be needed.

Unique Impacts and Mitigation Measures

Mitigation measures will be applied consistently across the alternative routes to avoid potential impacts to water supplies and wells in each Facility Location, as established in the CMRP. The following discussion addresses key impacts that would be likely under each of the respective alternative routes. Section 8.0 provides a comparison of like impacts by alternative route. None of the alternative routes would involve additional mitigation measures beyond those presented above.

Alternative D contains the most known water wells in its Facility Location and therefore has the highest potential for impacts, followed by Alternatives A, C, and B, respectively.

7.5.4 Floodplains (Circular MFSA-2 Section 3.7(9))

This section provides an analysis of floodplains within the alternative Facility Locations as defined in Section 7.0. For floodplains, an additional Study Area that extends outside the Facility Location is not required in the Circular MFSA-2, and the analysis determined impacts would be limited to the Facility Location of each alternative route. Therefore, the Study Area for floodplains is the Facility Location. Baseline data is provided in the following sections.

7.5.4.1 Baseline Data

This section analyzes 100-year floodplains intersected by the Facility Location for each alternative route. Federal Emergency Management Agency (FEMA) floodplain maps are not available across all alternative routes to quantify the floodplain areas crossed by each alternative route. Due to the unavailability of FEMA floodplain spatial data for the majority of the Facility Locations, this analysis identified Great Plains Floodplains mapped by the MLCF and their associated waterbody mapped by the USGS (2022a) as likely 100-year floodplains (see Figure E-6a in Appendix E).

Floodplains are low-lying areas adjacent to rivers and streams that are susceptible to inundation during periods of high flow when the water in a stream overflows the bank. Floodplains are important in that they attenuate or spread out water during high flow and provide erosion and sediment control, nutrient input, and wildlife habitat. The 100-year floodplain is the area subject to inundation by the 1 percent annual chance flood event (i.e., a 100-year flood) (FEMA, 2005).

The Great Plains Floodplain system in Montana occurs along the Missouri and Yellowstone rivers and their larger tributaries, including the Powder and Tongue rivers (MNHP, 2017). Great Plains Floodplains are found at Project crossings of or near the Tongue and Powder rivers for all alternative routes; the Rosebud Creek, Smith Creek, and Yellowstone River for Alternative A; Sheep Creek for Alternatives C and D; and unnamed streams for Alternative A and C (see Table 7.5.4-1). The preferred location criteria for the Project include siting the alternative routes so that structures need not be located on a floodplain (Circular MFSA-2 Section 3.1(1)(h)). North Plains will avoid impacts to floodplains to the extent feasible by siting structures to span 100-year floodplains and design other infrastructure, such as permanent access roads, outside potential 100-year floodplains.

TABLE 7.5.4-1

Floodplains Crossed by Each Alternative Route

Waterbody Name	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
Powder River	<0.1 mile	0.2 mile	0.2 mile	0.1 mile
Rosebud Creek	0.1 mile	0 mile	0 mile	0 mile
Sheep Creek	0 mile	0 mile	0.1 mile	0.1 mile
Smith Creek	0.1 mile	0 mile	0 mile	0 mile
Tongue River	0.1 mile	0.1 mile	0.4 mile	0.1 mile
Unnamed	0.2 mile	0 mile	0.2 mile	0 mile
Yellowstone River	0.3 mile	0 mile	0 mile	0 mile
PROJECT TOTAL	**0.8 mile**	**0.3 mile**	**0.9 mile**	**0.4 mile**

TABLE 7.5.4-1

Floodplains Crossed by Each Alternative Route

Waterbody Name	Alternative A	Alternative B	Alternative C	Alternative D (Refined)

Source: Montana Natural Heritage Program, 2017; U.S. Geological Survey, 2022a

7.5.4.2 Impact Assessment

Common Impacts and Mitigation Measures

<u>Construction</u>

Floodplain function could be affected if transmission line structures, culverts and bridges, or new or upgraded access roads block or alter flood water flows; if the grade of the floodplain is changed such that water cannot spread out during high flow events; or if construction restricts the infiltration of flood waters into the soil (i.e., reducing the floodplain's capacity for water absorption or storage).

Structures are planned to be located outside of floodplains. However, if North Plains is unable to avoid siting structures within floodplains, they will not be located within a streambed or bank. They will otherwise not substantially alter water flow and floodplain function since water could flow around the 7- to 12-foot-diameter structure base. North Plains will obtain the necessary county and state permits and follow all required conditions for development in a floodplain, which may include the 318 Authorization (Short-Term Water Quality Standard for Turbidity), Montana Land-Use License or Easement on Navigable Waters, Stormwater Discharge General Permit, and a permit under the Streamside Management Zone Law (DNRC, 2024) (see Table 9.1.3-1 for additional permitting information). Given the small footprint of structures relative to overall size of floodplains, structure installation would have negligible impact or a long-term, localized impact on floodplains, such as permanent changes in hydrology or the storage capacity of the floodplain. New temporary roads and workspace will have short-term, localized impacts, such as erosion. New permanent roads will have long-term, localized impacts.

Road construction and use of temporary workspaces (e.g., pulling sites) in a floodplain can change the original grade and compact soil, which reduces water infiltration. Placement of impermeable or altered surfaces (e.g., concrete) would also reduce water infiltration. Culverts and bridges could alter water flow during flood events if not sized properly, resulting in streambank erosion and soil loss. In addition, vegetation removal, particularly of trees and shrubs in the transmission line right-of-way, could decrease the filtering and erosion control capacity of the floodplain, resulting in increased sedimentation and erosion. North Plains will obtain a Stream Protection Act 124 permit and follow all required conditions for road construction that will affect streambeds and banks.

As noted, North Plains will minimize construction activities in floodplains. Where floodplains cannot be avoided, North Plains will coordinate with the appropriate county floodplain administrator(s) to evaluate and minimize or mitigate potential floodplain impacts. North Plains will obtain floodplain development permits and follow permit conditions. In addition, the BMPs that North Plains will implement to protect surface waters and groundwater will also help protect floodplains (see Sections 7.5.1 and 7.5.2).

Operations and Maintenance

There would be no additional operational impacts to floodplains beyond those identified for construction above, including the presence of transmission line structures and new permanent access roads, culverts and bridges.

Unique Impacts and Mitigation Measures

Key impacts that would be likely under each of the respective alternative routes are discussed below. Section 8.0 provides a comparison of like impacts by alternative route. Mitigation measures will be applied consistently across the alternative routes. None of the alternative routes would involve additional mitigation measures beyond those presented above.

All four alternative Facility Locations would cross up to 1 mile of floodplains. All Facility Locations cross the Powder River and Tongue River floodplains. Alternatives C and D cross the Sheep Creek floodplain.

The Alternative A Facility Location could affect the most floodplains in the number of drainages crossed, as it is the only alternative route to cross the floodplains of the Yellowstone River along with the floodplains of Rosebud and Smith creeks and the Powder and Tongue Rivers.

The Alternative A Facility Location also crosses through a number of unnamed stream floodplains along with Alternative C. The Alternative B Facility Location could affect the least amount of floodplains in length and number of drainages crossed. The Alternative C Facility Location would affect the most floodplain area overall, with the longest crossing of the Tongue River floodplain. It also crosses through a number of unnamed stream floodplains and the Sheep Creek floodplain along with Alternatives A and D, respectively. The Alternative D Facility Location could affect the second least amount of floodplains, including both the number and overall length of floodplain crossings. It crosses the Sheep Creek floodplain along with Alternative C.

7.5.5 Wetlands and Riparian Areas

This section provides an analysis of wetlands and riparian areas within the alternative Facility Locations as defined in Section 7.0. For wetlands and riparian areas, an additional Study Area that extends outside the Facility Location is not required in the Circular MFSA-2, and the analysis determined impacts would be limited to the Facility Location of each alternative route. Therefore, the Study Area for wetlands and riparian areas is the Facility Location. Baseline data is provided in the following sections.

7.5.5.1 Baseline Data

Data on potential wetlands and riparian areas in this analysis are from the University of Montana MWRF (2022) in cooperation with the MNHP (see Tables 7.5.5-1 to 7.5.5-4 below). Wetland mapping follows the federal Wetland Mapping Standard and classifies wetlands according to the Cowardin classification system (Cowardin, 1979) also used by the USFWS National Wetlands Inventory. Riparian mapping follows the USFWS's System for Mapping Riparian Areas.

Wetlands

Wetlands are characterized by the presence of water at or near the land surface for all or part of the year, poorly drained soils with certain soil characteristics due to the presence of water and absence of oxygen, and the presence of plants adapted to or tolerant of water. In Montana, wetlands can be categorized as depressional wetlands, slope wetlands, or human-built/artificial wetlands, based on their position in the landscape. Herbaceous vegetation typical of wetlands in Montana can include cattails, bulrushes, sedges, grasses, and forbs (Ellis and Richard, 2008).

Mapped wetlands located in the Facility Locations are divided into three systems based on their Cowardin classification: palustrine, lacustrine, and riverine (see Tables 7.5.5-1 and 7.5.5-2). See Section 7.5.1 for more information on lacustrine (i.e., deepwater habitats, such as lakes and ponds) and riverine (i.e., flowing stream or river) features located within the Facility Locations. The palustrine system includes all non-tidal freshwater wetlands: palustrine forested (PFO) wetlands dominated by trees; palustrine shrub-scrub (PSS) wetlands dominated by shrubs; palustrine emergent (PEM) wetlands dominated by emergent herbaceous vegetation; and, palustrine unconsolidated bottom (PUB) or palustrine aquatic bed (PAB) wetlands, dominated by wetlands less than 20 acres in size, less than six feet deep, and lacking vegetation (Cowardin, 1979).

TABLE 7.5.5-1

Wetlands in the Project Footprint and Surrounding Facility Location (acres)

	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
Mapped Wetland Type [a]	acres	prop.	acres	prop.	acres	prop.	acres	prop.
PEM Wetland	49	<1%	84	1%	57	1%	51	<1%
PSS Wetland	3	<1%	0	0%	0	0%	0	0%
PFO Wetland	0	0%	0	0%	0	0%	0	0%
Riverine Wetland [b]	47	<1%	30	<1%	42	<1%	29	<1%
Lake / Pond [c]	32	<1%	24	<1%	22	<1%	34	<1%
PROJECT TOTAL [d]	**130**	**1%**	**139**	**1%**	**121**	**1%**	**114**	**1%**

[a] Excludes farmed wetlands.
[b] Riverine category is based off of the "R" system of the Montana Wetland and Riparian Framework.
[c] Pond category includes palustrine unconsolidated bottom (PUB), unconsolidated shore (PUS), and aquatic bed (PAB) wetland classes.
[d] Totals may not add up due to rounding.
Note: prop. = proportion of Facility Location, in percent; PEM = palustrine emergent, PSS = palustrine scrub-shrub, PFO = palustrine forested
Source: University of Montana, 2022

TABLE 7.5.5-2

Wetlands Crossed by Each Alternative Route (miles)

Mapped Wetland Type [a]	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
PEM Wetland	0.6	1.2	0.7	0.5
PSS Wetland	<0.1	0	0	0
PFO Wetland	0	0	0	0
Riverine Wetland [b]	0.5	0.5	0.5	0.4
Lake / Pond [c]	0.4	0.2	0.2	0.1
PROJECT TOTAL [d]	**1.5**	**2.0**	**1.4**	**1.0**

TABLE 7.5.5-2

Wetlands Crossed by Each Alternative Route (miles)

Mapped Wetland Type [a]	Alternative A	Alternative B	Alternative C	Alternative D (Refined)

[a] Excludes farmed wetlands.
[b] Riverine category is based off of the "R" system of the Montana Wetland and Riparian Framework.
[c] Pond category includes palustrine unconsolidated bottom (PUB), unconsolidated shore (PUS), and aquatic bed (PAB) wetland classes.
[d] Totals may not add up due to rounding.
Note: PEM = palustrine emergent, PSS = palustrine scrub-shrub, PFO = palustrine forested
Source: University of Montana, 2022

Riparian Areas

Riparian areas are defined as plant communities contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent lotic and lentic waterbodies (e.g., rivers, streams, lakes, or drainage ways) (USFWS, 2009). Riparian areas are usually transitional between wetland and upland areas and exhibit distinctly different vegetative species than adjacent areas and/or species similar to adjacent areas but exhibiting more vigorous or robust growth forms (USFWS, 2009). Riparian areas in Montana occur as streamside forests, streamside shrublands and herbaceous areas, and woody draws. Vegetation associated with riparian areas in eastern Montana may include trees such as conifers, cottonwood, and aspen (*Populus* spp.), shrubs such as hawthorn (*Crataegus* spp.), serviceberry (*Amelanchier* spp.), and chokecherry (*Prunus virginiana*), and herbaceous plants such as cattails, sedges, rushes, grasses, and forbs (Ellis and Richard, 2008).

Riparian areas in the Facility Locations fit into three classifications based on the MWRF: emergent (RpEM), scrub-shrub (RpSS), and forested (RpFO) (see Tables 7.5.5-3 and 7.5.5-4). RpEM includes areas with erect rooted herbaceous vegetation during most of the growing season. RpSS includes areas dominated by woody vegetation that is less than 20 feet tall and includes tree saplings and trees that are stunted due to environmental conditions. RpFO includes woody vegetation that is greater than 20 feet tall. Additionally, the Circular MFSA-2 defines mature RpFOs as riparian stands of cottonwood (*Populus* spp.) or mixed cottonwood-conifer forests greater than 300 feet long and 30 feet wide where average canopy height is 50 feet or more and average density of mature trees is greater than 20 stems per acre (Circular MFSA-2 Section 3.7(12)(b)(xxi)). However, for the purpose of this assessment, RpFOs are defined by the more conservative USFWS definition because there are no data sources for the Study Area that meet the more liberal definition in Circular MFSA-2.

TABLE 7.5.5-3

Riparian Areas in the Facility Location (acres)

	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
Mapped Type	acres	prop.	acres	prop.	acres	prop.	acres	prop.
RpEM	11	<1%	27	<1%	25	<1%	36	<1%
RpSS	5	<1%	1	<1%	1	<1%	7	<1%
RpFO	41	<1%	28	<1%	82	1%	32	<1%
PROJECT TOTAL [a]	**57**	**<1%**	**56**	**<1%**	**109**	**1%**	**75**	**<1%**

TABLE 7.5.5-3

Riparian Areas in the Facility Location (acres)

	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
Mapped Type	acres	prop.	acres	prop.	acres	prop.	acres	prop.

[a] Totals may not add up due to rounding.
Note: prop. = proportion of Facility Location, RpEM = riparian emergent, RpSS = riparian scrub-shrub, RpFO = riparian forest
Source: University of Montana, 2022

TABLE 7.5.5-4

Riparian Areas Crossed by the Alternative Routes (miles)

Mapped Type	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
RpEM	<0.1	0.1	0.2	0.2
RpSS	<0.1	<0.1	<0.1	<0.1
RpFO	0.3	0.4	0.8	0.3
PROJECT TOTAL [a]	**0.4**	**0.5**	**1.0**	**0.6**

[a] Totals may not add up due to rounding.
Note: RpEM = riparian emergent, RpSS = riparian scrub-shrub, RpFO = riparian forest
Source: University of Montana, 2022

All four alternative routes cross mapped wetlands and riparian areas (see Tables 7.5.5-1 to 7.5.5-4 and Figures E-7a and E-7b in Appendix E). The riparian areas are most commonly forested and occur adjacent to a stream or river system with intermittent or perennial flow. However, some forested riparian areas within the Facility Locations may occur along palustrine or lacustrine wetlands. All mapped RpEM and RpSS areas in the Facility Locations occur along streams or rivers. Mapped palustrine wetlands are PEM wetlands and freshwater ponds; no PFO wetlands occur within the Facility Location of any alternative route, and PSS wetlands occur in the Facility Location of Alternative A only. On BLM land, the BLM ARMP recommends that surface disturbing activities be avoided within 300 feet of wetlands and riparian areas. North Plains will delineate wetlands and riparian areas along the selected route in accordance with guidance from the USACE Omaha District and State of Montana to ensure compliance with applicable permitting.

7.5.5.2 Impact Assessment

Common Impacts and Mitigation Measures

<u>**Construction**</u>

Impacts to wetlands and riparian areas will be greatest during and immediately following construction. During construction, the diversion of surface water flows from grading and new access road construction could alter the local hydrology, leading to an increase or decrease in wetland size and function. As noted in the CMRP, North Plains will not place excess spoils in wetlands, waterbodies, and drainages that lead to waterbodies. Fill from temporary access roads in wetlands and riparian areas would result in short-term impacts.

North Plains plans to avoid locating permanent access roads and structures in wetlands. However, if the placement of permanent access roads or structures in wetlands should be needed, this would result in the long-term loss of wetlands. North Plains would comply with Section 404 permitting requirements under the Clean Water Act. Soil compaction, erosion, and contamination from accidental spills or oil from machinery could degrade wetlands. Vegetation removal could also degrade emergent wetlands and riparian areas by removing sources of food and shelter for wildlife in the short-term. Long-term effects would occur from the conversion of forested wetlands and riparian areas to shrub or emergent types in the transmission line right-of-way, where forested vegetation would not be allowed to reestablish for the life of the Project. For more information on potential impacts to streams, rivers, lakes, and ponds, see Section 7.5.1.2.

The extent and number of wetland and riparian areas are limited within the Facility Locations of all alternative routes (see Tables 7.5.5-1 to 7.5.5-4). North Plains will design the final Project layout to avoid or minimize construction impacts to the wetland and riparian areas, including siting structures and access roads outside of wetlands and waterbodies to the extent feasible. Implementation of BMPs described in Sections 7.4.2 and 7.5.1 will also help avoid or minimize impacts to these resources. In addition, North Plains will implement the measures outlined in the CMRP regarding wetlands, including minimizing vegetation removal, use of timber mats, and limiting construction during wet periods that could result in deep ruts. With these avoidance, minimization and mitigation measures, impacts from the Project will range from short- to long-term; however, not all wetland and riparian areas will be affected.

Operations and Maintenance

Maintenance vehicles will generally stay on established access roads and not impact wetland or riparian areas within the right-of-way. Vegetation maintenance within the maintained right-of-way will be required, including periodic mowing of saplings within previously forested wetlands or riparian areas along any of the alternative routes, and herbicide use to limit the potential spread of noxious weeds onto adjacent lands. During operations, North Plains will continue to follow vegetation control and spill prevention and containment BMPs outlined in the CMRP and accompanying plans.

Unique Impacts and Mitigation Measures

Key impacts that would be likely under each of the respective alternative routes are further discussed below. Section 8.0 provides a comparison of like impacts by alternative route. Mitigation measures would be applied consistently across the alternative routes. None of the alternative routes would involve additional mitigation measures beyond those presented above.

The Alternative A Facility Location has the second lowest potential to affect riparian areas. Alternative A is the only alternative route that could affect PSS wetlands.

The Alternative B Facility Location has the lowest potential to affect riparian areas. The Alternative B Facility Location has the highest potential overall to affect wetlands based on total area within the Facility Location.

The Alternative C Facility Location has the highest potential to affect riparian areas, including riparian forest, at nearly double the rate of the other three alternatives.

The Alternative D Facility Location has the lowest potential overall to affect wetlands based on total area within the Facility Location.

7.6 VEGETATION BIOLOGICAL RESOURCES (Circular MFSA-2 Section 3.7(12))

The following section presents information on the general vegetation communities and special status plant species that could occur within the Facility Location of each alternative route as defined in Section 7.0. In accordance with Circular MFSA-2, Appendix E provides maps of vegetation (land cover) within the MFSA Study Area. For general vegetation (Sections 7.6.1.1 through 7.6.1.6), an additional Study Area that extends outside the Facility Location is not required in the Circular MFSA-2, and the analysis determined impacts would be limited to the Facility Location of each alternative route. Therefore, the Study Area for general vegetation is the Facility Location. Baseline data is provided in the following sections.

For special status plant species (Section 7.6.1.7), MFSA requires a Study Area that is a 2-mile-wide corridor along each alternative route, 1 mile on either side of the centerline (Circular MFSA-2; Section 3,7(12)(a)). Appendix F provides additional baseline data tables within the MFSA required Study Area for special status plant species.

Section 7.5.5 addresses wetland and riparian areas, Section 7.3.1.2 addresses agricultural areas, and Section 7.7.1 addresses plant communities as wildlife habitat.

7.6.1 Baseline Data

The alternative Facility Locations are within the Northwestern Great Plains EPA Level III Ecoregion (EPA, 2013). This ecoregion generally consists of unglaciated rolling plains that may include buttes, badlands, native grasslands, seasonally flowing streams, and perennial rivers. Underlying rock structure generally consists of some combination of sandstone, siltstone, and shale (Woods et al., 2002).

Within the Northwestern Great Plains Level III Ecoregion, all four alternative routes cross five EPA Level IV Ecoregions (from most to least: the Central Grassland, River Breaks, Pine Scoria Hills, Missouri Plateau, and Sagebrush Steppe), and all but Alternative A cross a small portion of the Little Missouri Badlands. Alternative D crosses a slightly higher proportion of Little Missouri Badlands compared to Sagebrush Steppe, unlike the other alternatives (EPA, 2013). The River Breaks, Pine Scoria Hills, and Little Missouri Badlands share the most rugged terrain; vegetation generally varies from sparsely to heavily vegetated understories of grasses and overstories with a Rocky Mountain juniper component (Woods et al., 2002). The Central Grassland, Missouri Plateau, and Sagebrush Steppe offer flat to hilly terrain containing sagebrush and various types of grassy fields. The acreage and proportion of Level IV Ecoregions for the Facility Location of each alternative route are detailed in Table 7.6.1-1.

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TABLE 7.6.1-1

EPA Level IV Ecoregions in the Facility Location by Alternative Route (acres)

Level IV Ecoregion	Description	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
		Acres	Prop.	Acres	Acres	Acres	Prop.	Acres	Prop.
Central Grassland	Unglaciated plains with many small ephemeral-intermittent streams. Primary vegetation includes needlegrass (*Nassella viridula*) and wheatgrass (*Pascopyrum smithii*). Generally dominated by clayey frigid soils and fine grained sedimentary rock. Primary land use is rangeland; farmland occurs although less common than in other ecoregions.	9,015	61%	9,114	70%	8,291	63%	8,820	58%
River Breaks	Considerably more rugged than surrounding ecoregions with steep slopes and heavy soils that descend down into the Missouri and Yellowstone rivers. Typical vegetation includes wheatgrass, little bluestem (*Schizachyrium scoparium*), buffalograss (*Bouteloua dactyloides*), sedges, junipers (*Juniperus* spp.), and deciduous trees. This ecoregion is not ideal for livestock but provides excellent wildlife habitat.	3,583	24%	2,217	17%	2,096	16%	2,846	19%
Pine Scoria Hills	Consists of rugged, forested terrain with stony hills. Rocky substrates are common with soils being poorly developed overall. Rangeland is not common in this ecoregion due to rough terrain and low water. Higher elevations often consist of ponderosa pine (Pinus ponderosa) and Rocky Mountain juniper (J. scopulorum) forests, whereas drier areas generally consist of ponderosa pine savanna.	1,056	7%	542	4%	1,549	12%	1,641	11%
Missouri Plateau	Treeless, rolling hills and benches. Primarily used for rangeland and cropland. Common native vegetation type includes wheatgrass and needlegrass. Extends into North Dakota.	851	6%	544	4%	544	4%	886	6%
Sagebrush Steppe	Fairly flat to rolling hills with eroded buttes and sparsely vegetated cover of shortgrass prairie, big sagebrush (*Artemesia tridentata*), and Nuttall saltbush (*Atriplex nuttallii*). Much of the area is highly eroded due to a combination of overgrazing and having erosion-prone soils. This ecoregion type is considered to hold high concentrations of wildlife due to the landscape characteristics and low human population. Primarily land use is grazing.	196	1%	397	3%	397	3%	360	2%
Little Missouri Badlands	Highly dissected and sparsely vegetated. Ephemeral, flashy stream flow is typical and both erosion rates and drainage densities are high. Vegetation is typically shortgrass prairie, with Rocky Mountain juniper growing on north-facing hillslopes and floodplain forest growing along drainageways. This ecoregion provides havens for wildlife and land use is predominantly grazing and recreation.	0	0%	283	2%	283	2%	605	4%
PROJECT TOTAL [a]		**14,702**	—	**13,098**	—	**13,160**	—	**15,159**	—

[a] Totals may vary due to differences in rounding.
Note: prop. = proportion of Facility Location, in percent.
Sources: U.S. Environmental Protection Agency, 2013; Woods et al., 2002

Distribution of vegetation types is strongly influenced by variations in topography, elevation, aspect, moisture, and soil type. Data on vegetation types and community characterizations are from MLCF data (see Figure E-8a in Appendix E) (MNHP, 2017). This analysis categorized land cover into seven plant community types: 1) grassland; 2) shrubland and steppe; 3) forest; 4) recently disturbed or modified; 5) sparse and barren; 6) agriculture; and 7) wetland and riparian. Agriculture (i.e., cultivated crops and hay/pasture) is addressed in Section 7.3.1.2, and wetland and riparian systems are addressed in detail in Section 7.5.5. Table 7.6.1-2 summarizes the acres for each vegetation community type and Table 7.6.1-3 summarizes the miles for each vegetation community type within the four alternative route Facility Locations.

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TABLE 7.6.1-2

Vegetation Community Types in the Facility Location by Alternative Route (acres)

	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
Vegetation Community Type	acres	prop.	acres	prop.	acres	prop.	acres	prop.
GRASSLAND								
Lowland/Prairie Grassland	6,690	48%	6,236	50%	5,662	45%	7,300	49%
Subtotal	6,690	48%	6,236	50%	5,662	45%	7,300	49%
SHRUBLAND AND STEPPE								
Deciduous Shrubland	0	0%	0	0%	0	0%	<1	<1%
Sagebrush Steppe	2,647	19%	2,928	23%	3,009	24%	3,377	23%
Scrub and Dwarf Shrubland	0	0%	<1	<1%	0	0%	<1	<1%
Subtotal	2,647	19%	2,928	23%	3,009	24%	3,377	23%
AGRICULTURE								
Cultivated Crops	2,198	16%	1,379	11%	1,420	11%	1,446	10%
Hay/Pasture	499	4%	325	3%	265	2%	437	3%
Subtotal	2,697	19%	1,704	14%	1,686	14%	1,883	13%
FOREST								
Conifer-Dominated Forest (xeric-mesic)	949	7%	489	4%	686	5%	658	4%
Deciduous-Dominated Forest	53	<1%	73	1%	96	1%	79	1%
Subtotal	1,002	7%	562	4%	782	6%	737	5%
RECENTLY DISTURBED OR MODIFIED								
Introduced Vegetation	79	1%	67	1%	68	1%	113	1%
Recently Burned	<1	<1%	256	2%	164	1%	288	2%
Subtotal	79	1%	322	3%	232	2%	402	3%
WETLAND AND RIPARIAN								
Depressional Wetland	<1	<1%	<1	<1%	<1	<1%	1	<1%
Floodplain and Riparian	426	3%	394	3%	548	4%	484	3%
Herbaceous Marsh	<1	<1%	<1	<1%	<1	<1%	0	0%
Open Water	18	<1%	20	<1%	16	<1%	25	<1%
Subtotal	445	3%	414	3%	565	5%	511	3%
SPARSE AND BARREN								
Bluff, Badland, and Dune	327	2%	386	3%	549	4%	551	4%
Subtotal	327	2%	386	3%	549	4%	551	4%
PROJECT TOTAL [a,b]	13,887	—	12,552	—	12,485	—	14,760	—

TABLE 7.6.1-2

Vegetation Community Types in the Facility Location by Alternative Route (acres)

	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
Vegetation Community Type	acres	prop.	acres	prop.	acres	prop.	acres	prop.

[a] Totals reflect total acres of vegetation types within the Facility Location of each alternative route, not total acres of the alternative routes.
[b] Totals may not add up due to rounding.
Note: prop. = proportion of Facility Location, in percent.
Source: Montana Natural Heritage Program, 2017

TABLE 7.6.1-3

Vegetation Community Types Crossed by Each Alternative Route (miles)

Vegetation Type	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
Grassland	85.2	80.7	71.3	88.0
Shrubland and Steppe	34.0	38.0	36.2	40.9
Agriculture [a]	35.3	22.5	21.6	22.4
Forest	10.1	7.2	9.6	8.8
Recently Disturbed or Modified	1.0	4.5	3.0	5.6
Wetland and Riparian [b]	5.3	4.8	6.0	5.7
Sparse and Barren	3.0	4.1	6.4	5.9
PROJECT TOTAL [c]	173.9	161.9	154.2	177.4

[a] Agriculture includes lands mapped by the Montana Landcover Framework as cultivated crops and hay/pasture.
[b] Mileage presented here is representative of wetlands identified by the Montana Landcover Framework; wetland and riparian areas identified by the Montana Wetland and Riparian Framework (University of Montana, 2022) are presented in Section 7.5.5.
[c] Totals reflect total miles of vegetation types crossed by each alternative route, not the total mileage of the alternative routes.
Source: Montana Natural Heritage Program, 2017

7.6.1.1 Grassland

Grassland is the most common vegetation type crossed by all alternative routes (see Tables 7.6.1-2 and 7.6.1-3). In this region of Montana, grasslands are typically found along rolling hills dissected by intermittent drainages (MNHP and MFWP, 2023). According to Montana's State Wildlife Action Plan (SWAP), lowland/prairie grassland covers much of the eastern two-thirds of Montana, interrupted, steppe, forest, wetland and riparian areas (MFWP, 2015). Within this system, grasses typically comprise the greatest canopy cover and forb diversity is generally high (MFWP, 2015). Lowland/prairie grasslands are composed of mixed-grass prairie and, less commonly, sand prairie systems (MNHP and MFWP, 2023), both of which are located within the Facility Location of each alternative route (MNHP, 2017).

Vegetation characteristic of mixed-grass prairies is a mixture of mid- and short-grasses; western wheatgrass (*Pascopyrum smithii*) is typically dominant, but other species include thickspike wheatgrass (*Elymus lanceolatus*), green needlegrass (*Nassella viridula*), blue grama (*Bouteloua gracilis*), and needle-and-thread grass (*Hesperostipa comata*) (MNHP and MFWP, 2023). While grasslands are typically treeless, a shrub component may be present. Shrub species can include western snowberry (*Symphoricarpos occidentalis*), serviceberry (*Amelanchier alnifolia*), shrubby cinquefoil (*Dasiphora fruticosa*), creeping juniper (*Juniperus horizontalis*), silver sage (*Artemisia cana*), and Wyoming big sagebrush (*A. tridentata* var. *wyomingensis*).

Sand prairies constitute a unique system within the western Great Plains that are influenced by coarse-textured soils and grasses well-adapted to those soils (MNHP and MFWP, 2023). Sand prairies can be found in Rosebud, Custer, and Fallon counties and are associated with mixed-grass prairie, typically occupying a higher position in the local landscape. Needle-and-thread grass is the dominant graminoid, but other species may include prairie sandreed (*Calamovilfa longifolia*), sun sedge (*Carex inops*), threadleaf sedge (*C. filifolia*), sand bluestem (*Andropogon hallii*), little bluestem (*Schizachyrium scoparium*), and big bluestem (*A. gerardii*).

Characteristic forbs of grasslands in Montana vary by region, but can include yarrow (*Achillea millefolium*), scarlet globemallow (*Sphaeralcea coccinea*), western sagewort (*Artemisia ludoviciana*), scurf pea (*Psoralidium* spp.), Indian breadroot (*Pediomelum* spp.), among others (MNHP and MFWP, 2023).

7.6.1.2 Shrubland and Steppe

Shrubland and steppe systems are the second most common vegetation community type crossed after grasslands for each alternative route (see Tables 7.6.1-2 and 7.6.1-3). Shrubland shares many of the same vegetative components as grassland systems, with greater shrub cover (MNHP and MFWP, 2023). Shrub systems occurring within the Facility Locations include deciduous shrublands and sagebrush steppe (MNHP, 2017). Dominant shrubs vary by system and include shrublands dominated by sagebrush (*Artemisia* spp.) or saltbushes (*Atriplex* spp.) or a mixture of shrubs including serviceberry, skunkbush (*Rhus trilobata*), snowberry, silver buffaloberry (*Sheperdia argentea*), shrubby cinquefoil, silverberry (*Elaeagnus commutata*), creeping juniper, and silver sage (MNHP and MFWP, 2023).

While well-managed grazing can maintain plant community characteristics, current and historic overgrazing has resulted in a disclimax condition in many areas (MFWP, 2015). Disclimax habitats are relatively stable ecological communities where nonnative species have displaced the native climax species due to disturbance. For example, in areas where perennial grasses and forbs are stressed, the invasion and subsequent dominance of cheatgrass (*Bromus tectorum*) is more likely (MFWP, 2015). All alternative routes cross sagebrush steppe, as mapped by the MLCF (MNHP, 2017).

7.6.1.3 Forest

Forests are crossed by each of the alternative routes (see Tables 7.6.1-2 and 7.6.1-3). Forested areas are typically found interspersed within the matrix of the Great Plains grassland systems (MNHP and MFWP, 2023). Dominant tree species include ponderosa pine (*Pinus ponderosa*), Douglas fir (*Pseudotsuga menziesii*), limber pine (*Pinus flexilis*), and Rocky Mountain juniper (*Juniperus scopulorum*). Within wooded draws and ravines, overstories may be dominated by smaller tress and commonly include Rocky Mountain juniper, aspen (*Populus* spp.), paper birch (*Betula papyrifera*), box elder (*Acer negundo*), green ash (*Fraxinus pennsylvanica*), and chokecherry (*Prunus virginiana*).

Fire, grazing, and forestry practices are factors that can influence forest composition and condition. Intensive use and trampling from cattle can result in conversion to shrubland (MFWP, 2015). Fire and insects play a large role in maintaining xeric-mesic conifer-dominated forest and woodland communities. All alternative routes cross deciduous-dominated forest and woodland and xeric-mesic conifer-dominated forest and woodland communities, as mapped by the MLCF (MNHP, 2017).

7.6.1.4 Recently Disturbed or Modified

Recently disturbed or modified areas, as defined in Section 7.3, (see Table 7.3.1-1) are among the least-crossed vegetation community types for each of the alternative routes (see Tables 7.6.1-2 and 7.6.1-3). Within the Facility Locations of the alternative routes, recently disturbed or modified areas are characterized by either introduced vegetation or recent burns. Introduced vegetation, whether occurring in grassland, shrubland, forest, wetland, or riparian areas, typically results in landscapes dominated by non-native vegetation, sometimes to the point where natural vegetation types are no longer recognizable. Species characteristic of introduced vegetation include bromes (*Bromus* spp.), crested wheatgrass (*Agropyron cristatum*), knapweed (*Centaurea* spp.), oxeye daisy (*Leucanthemum vulgare*), Canada thistle (*Cirsium arvense*), leafy spurge (*Euphorbia esula*), Russian olive (*Elaeagnus angustifolia*), among others (MNHP and MFWP, 2023). Noxious and regulated weeds are discussed in more detail in Section 7.6.1.6.

7.6.1.5 Sparse and Barren

As with recently disturbed or modified vegetation communities, sparse and barren systems are among the least-crossed vegetation community types for each alternative route (see Tables 7.6.1-2 and 7.6.1-3). Of the sparse and barren systems present in Montana, Great Plains Badlands occurs within the Project and is characterized by highly eroded landforms and less than 10 percent vegetated cover. In areas with vegetation, species can include curlycup gumweed (*Grindelia squarrosa*), threadleaf snakeweed (*Gutierrezia sarothrae*), greasewood (*Sarcobatus vermiculatus*), Gardner's saltbush (*Atriplex gardneri*), buckwheat (*Eriogonum* spp.), plains muhly (*Muhlenbergia cuspidata*), bluebunch wheatgrass (*Pseudoroegneria spicata*), and Hooker's sandwort (*Arenaria hookeri*). Patches of sagebrush may also occur (MNHP and MFWP, 2023).

7.6.1.6 Noxious Weeds and Regulated Plants

ARM 4.5.201 designates certain exotic plants as noxious weeds under the Montana County Weed Control Act (Weed Control Act) and requires all counties in Montana to implement management guidelines. The Weed Control Act defines noxious weeds as, "any exotic plant species established or that may be introduced in the state that may render land unfit for agriculture, forestry, livestock, wildlife, or other beneficial uses or that may harm native plant communities," and that is designated as a statewide noxious weed by the Montana Department of Agriculture (MDA) or as a priority by a County Weed Board (Montana State Statute 7-22-2101–72-2-2154). The MDA classifies noxious weeds as Priority 1A, 1B, 2A, 2B; and regulated plants as Priority 3 according to the threats they pose and their distribution in Montana (Montana State University, 2022). The assigned priority level determines the required management criteria for the eradication or control of all species within a given priority level, defined below (ARM 4.5.206-210):

- Priority 1A – Weeds are not present or have very limited presence in Montana. Management criteria requires eradication if detected, education, and prevention.
- Priority 1B – Weeds have limited presence in Montana. Management criteria requires eradication or containment and education.
- Priority 2A – Weeds are common in isolated areas of Montana. Management criteria require eradication or containment where less abundant. Management of these weeds is prioritized by County Weed Boards.
- Priority 2B – Weeds are abundant in Montana and widespread in many counties. Management is prioritized by County Weed Boards and requires eradication or containment where less abundant.
- Priority 3 – Regulated plants not listed as a Montana noxious weed under ARM 4.5.102 but are recognized under ARM 4.5.210 as species with the potential to have significant negative impacts that may not be intentionally spread or sold other than as a contaminant in agricultural products. Recommended management includes research, education, and prevention, but control is not required, unless required by individual counties.

The Weed Control Act establishes weed management districts, also referred to as County Weed Districts (CWD), composed of one or more counties across the state, and assigns the responsibility of administering each CWD's noxious weed management program to their respective County Weed Board (7-22-2102, MCA). The CWDs are responsible for developing noxious weed management plans, implementing the Weed Control Act, designating additional noxious weeds relevant to each CWD, and coordinating with state and federal agencies on public lands (MDA, 2017). The County Weeds Boards crossed by the Project include the Rosebud County Weed Board, the Custer County Weed and Pest Board, and the Fallon County Noxious Weed Board. As noted above, management of Priority 2A and 2B noxious weeds may be prioritized by the County Weed Boards and additional noxious weeds may be county-listed.

Fallon County provides priorities for this subset of the state-designated weeds as follows:

- Priority 1 – New Invader List: Abundant in other parts of the state but show up in Fallon County in small, isolated patches. Landowners with these plants will have the first $200 of control costs paid for by the County.
- Priority 2 – Control List: Established in Fallon County for many years; control is ongoing. Landowners with these plants will receive cost-share on control chemicals, per the County's cost-share program.
- Priority 3 – County Listed: Not found on the state list but Fallon County gives them as much priority as the County's control list. Landowners with these plants would receive cost-share per the County's cost-share program.
- Priority 4 – Non-Control List: State listed noxious weeds or regulated plants. Fallon County will not actively manage these plants. Landowners with these plants would be eligible for cost-share according to the County's cost-share program; however, the County will not offer labor for the control of these plants.

Table 7.6.1-4 includes the noxious weeds and regulated plants designated by the MDA or by CWDs with potential to occur along each alternative route. The CMRP includes, as an attachment, a Noxious Weed and Aquatic Invasive Species Management Plan, which contains the full list of state-designated noxious weeds and regulated plants.

Per 7-22-2152, MCA, developments that require state or local approval and may result in potential noxious weed spread, including major facility developments proposed under MFSA (70-20, MCA), must submit a written Restoration and Vegetation Management Plan to the relevant County Weed Board(s) for approval prior to construction.

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TABLE 7.6.1-4

State and County Enforced Noxious Weeds and Aquatic Invasive Species

Species Category / Common Name	Scientific Name	State Priority [a]	Habitat [b]	Enforcement Area
NOXIOUS AND REGULATED WEEDS				
Black henbane	*Hyoscyamus niger*	Not assigned	Terrestrial	Rosebud County, Montana
Blueweed	*Echium vulgare*	Priority 1B	Terrestrial	All counties in Montana
Brazilian waterweed [c,d]	*Egeria densa*	Priority 3	Aquatic	All counties in Montana
Canada thistle	*Cirsium arvense*	Priority 2B	Terrestrial	All counties in Montana
Cheatgrass	*Bromus tectorum*	Priority 3	Terrestrial	All counties in Montana
Common buckthorn	*Rhamnus cathartica*	Priority 2A	Terrestrial	All counties in Montana
Common burdock	*Arctium minus*	Not assigned	Terrestrial	Fallon County, Montana
Common reed	*Phragmites australis* ssp. *australis*	Priority 1A	Terrestrial	All counties in Montana
Common tansy	*Tanacetum vulgare*	Priority 2B	Terrestrial	All counties in Montana
Curlyleaf pondweed [c]	*Potamogeton crispus*	Priority 2B	Aquatic	All counties in Montana
Dalmatian toadflax	*Linaria dalmatica*	Priority 2B	Terrestrial	All counties in Montana
Diffuse knapweed	*Centaurea diffusa*	Priority 2B	Terrestrial	All counties in Montana
Dyer's woad	*Isatis tinctoria*	Priority 1A	Terrestrial	All counties in Montana
Eurasian watermilfoil [c]	*Myriophyllum spicatum, M. spicatum* x *M. sibiricum*	Priority 2A	Aquatic	All counties in Montana
Field bindweed	*Convolvulus arvensis*	Priority 2B	Terrestrial	All counties in Montana
Flowering rush [c]	*Butomus umbellatus*	Priority 2A	Aquatic	All counties in Montana
Hoary alyssum	*Berteroa incana*	Priority 2B	Terrestrial	All counties in Montana
Houndstongue	*Cynoglossum officinale*	Priority 2B	Terrestrial	All counties in Montana
Hydrilla [c,d]	*Hydrilla verticillata*	Priority 3	Aquatic	All counties in Montana
Knotweed complex	*Polygonum cuspidatum, P. sachalinense, P.* x *bohemicum, Fallopia japonica, F. sachalinensis, F.* x *bohemica, Reynoutria japonica, R. sachalinensis, and R.* x *bohemica*	Priority 1B	Terrestrial	All counties in Montana
Kochia	*Bassia scoparia*	Not assigned	Terrestrial	Rosebud County, Montana
Leafy spurge	*Euphorbia esula*	Priority 2B	Terrestrial	All counties in Montana
Meadow hawkweed complex	*Hieracium caespitosum, H. praealturm, H. floridundum,* and *Pilosella caespitosa*	Priority 2A	Terrestrial	All counties in Montana
Medusahead	*Taeniatherum caput-medusae*	Priority 1A	Terrestrial	All counties in Montana
Orange hawkweed	*Hieracium aurantiacum, Pilosella aurantiaca*	Priority 2A	Terrestrial	All counties in Montana
Oxeye daisy	*Leucanthemum vulgare*	Priority 2B	Terrestrial	All counties in Montana
Parrot feather watermilfoil [c,d]	*Myriophyllum aquaticum or M. brasiliense*	Priority 3	Aquatic	All counties in Montana
Perennial pepperweed	*Lepidium latifolium*	Priority 2A	Terrestrial	All counties in Montana
Poison hemlock	*Conium maculatum*	Not assigned	Terrestrial	Fallon and Rosebud counties, Montana
Puncture vine	*Tribulus terrestris*	Not assigned	Terrestrial	Rosebud County, Montana

TABLE 7.6.1-4

State and County Enforced Noxious Weeds and Aquatic Invasive Species

Species Category / Common Name	Scientific Name	State Priority [a]	Habitat [b]	Enforcement Area
Purple loosestrife	*Lythrum salicaria*	Priority 1B	Aquatic	All counties in Montana
Rush skeletonweed	*Chondrilla juncea*	Priority 1B	Terrestrial	All counties in Montana
Russian knapweed	*Acroptilon repens, Rhaponticum repens*	Priority 2B	Terrestrial	All counties in Montana
Russian olive	*Elaeagnus angustifolia*	Priority 3	Terrestrial	All counties in Montana
Saltcedar	*Tamarix* spp.	Priority 2B	Terrestrial	All counties in Montana
Scotch broom	*Cytisus scoparius*	Priority 1B	Terrestrial	All counties in Montana
Scotch thistle	*Onopordum acanthium*	Not assigned	Terrestrial	Rosebud County, Montana
Spotted knapweed	*Centaurea stoebe, C. maculosa*	Priority 2B	Terrestrial	All counties in Montana
St. Johnswort	*Hypericum perforatum*	Priority 2B	Terrestrial	All counties in Montana
Sulfur cinquefoil	*Potentilla recta*	Priority 2B	Terrestrial	All counties in Montana
Tall buttercup	*Ranunculus acris*	Priority 2A	Terrestrial	All counties in Montana
Tansy ragwort	*Senecio jacobaea, Jacobaea vulgaris*	Priority 2A	Terrestrial	All counties in Montana
Ventenata	*Ventenata dubia*	Priority 2A	Terrestrial	All counties in Montana
Whitetop	*Cardaria draba, Lepidium draba*	Priority 2B	Terrestrial	All counties in Montana
Yellow starthistle	*Centaurea solstitialis*	Priority 1A	Terrestrial	All counties in Montana
Yellow toadflax	*Linaria vulgaris*	Priority 2B	Terrestrial	All counties in Montana
Yellowflag iris	*Iris pseudacorus*	Priority 2A	Aquatic	All counties in Montana
AQUATIC INVASIVE SPECIES				
Brazilian waterweed [c,e]	*Egeria densa*	Priority 3	Aquatic	All counties in Montana
Curlyleaf pondweed [c]	*Potamogeton crispus*	Priority 2B/ Class 4	Aquatic	All counties in Montana
Eurasian watermilfoil [c]	*Myriophyllum spicatum, M. spicatum* x *M. sibiricum*	Priority 2A/Class 3	Aquatic	All counties in Montana
Flowering rush [c]	*Butomus umbellatus*	Priority 2A/Class4	Aquatic	All counties in Montana
Fragrant waterlily [d]	*Nymphaea odorata*	Not assigned	Aquatic	All counties in Montana
Hydrilla [c,e]	*Hydrilla verticillata*	Priority 3/ Class 1	Aquatic	All counties in Montana
Parrot feather watermilfoil [c,e]	*Myriophyllum aquaticum or M. brasiliense*	Priority 3	Aquatic	All counties in Montana
Yellow floating heart [d,e]	*Nymphoides peltata*	Not assigned	Aquatic	All counties in Montana

a Noxious weed priority levels include Priority 1A, Priority 1B, Priority 2A, Priority 2B, and Priority 3; aquatic invasive species priority levels include Class 1, Class 2, Class 3, and Class 4.
b For noxious weeds, the aquatic habitat descriptor includes both submerged and emergent aquatic plant species.
c Identified as a noxious weed or regulated weed by Montana Department of Agriculture (MDA) and an aquatic invasive plant by Montana Fish, Wildlife, and Parks (MFWP).
d Identified as an aquatic invasive plant by the MFWP but not listed as a statewide noxious or regulated plant by MDA.
e Aquatic invasive species currently undetected in Montana, according to MFWP.

Sources: MDA, 2019 and 2024; Fallon County Weed Board, 2021; MFWP, 2023a; Montana ANS Technical Committee, 2002.

7.6.1.7 Special Status Plant Species

Special status species are species that are protected or noted as species of concern (SOC) by federal and/or state regulation, law, or policy. Federally protected includes species that are listed with critical habitat designations under the Endangered Species Act of 1973 (ESA), as well as species listed as sensitive by the BLM. Additionally, species proposed for listing with critical habitat designations under the ESA are discussed. State special status plant species are described further below.

Federal Species

The ESA protects imperiled species and their ecosystems and aids in their recovery, including federally listed plants in areas under federal jurisdiction (16 U.S.C. §§ 1531 et seq.). A query of the USFWS Information for Planning and Consultation (IPaC) on April 8, 2024, identified no federally listed plant species with potential to occur within 1 mile of any of the Project alternative routes.

BLM sensitive species are protected on lands owned or managed by the BLM. The BLM designates species as sensitive if they are listed or proposed for listing under the ESA, or if special management considerations are needed to promote their conservation and reduce the likelihood and need for future listing under the ESA (BLM, 2008). According to the BLM Montana/Dakotas Sensitive Species List, the Miles City Field Office recognizes two plant species as sensitive: Visher's buckwheat (*Erigonum visheri*) and Nuttall desert-parsley (*Lomatium nuttallii*; BLM, 2020). However, only Nuttall desert-parsley has been documented to occur in Rosebud County, according to the MNHP (2023b).

Nuttall desert-parsley is regionally endemic to central Wyoming, western Nebraska, Colorado, South Dakota, and Montana (NatureServe, 2023). This species occurs on open, rocky mid- and lower-slopes on sandstone, siltstone, or clayey shale in open pine woodlands associated with drainages at elevations of 3,400 to 7,200 feet (MNHP and MFWP, 2023). This species was documented outside Facility Locations in the southern portion of Rosebud County in 2002, which is in the northern portion of its range (MNHP, 2023b; MNHP and MFWP, 2023). In addition, according to the MNHP (2025a), there are no documented occurrences of Nuttall desert-parsley or other BLM sensitive plants within the Facility Locations of the alternative routes.

State Species

Montana maintains a list of state plant SOC, as identified by the MFWP (2023d). Plant SOCs are species that have been identified as rare, threatened, and/or as having declining populations and as a result are at risk or potentially at risk of extirpation in the state. A SOC designation does not provide regulatory protections for the species; rather, it serves as an informative management tool for MFWP staff to aid in management prioritization (MNHP, 2023d). Table 7.6.1-5 summarizes the state plant SOCs that have been documented in the Facility Locations of the alternative routes and their last observation date based on MNHP (2025a) data. About half of the plant SOC with known occurrences in the Facility Locations are historical and were documented more than 30 years ago, suggesting that they are unlikely to be present in the Facility Locations (MNHP, 2025a).

TABLE 7.6.1-5

Montana Plant Species of Concern with Documented Occurrences in the Facility Locations by Alternative Route (count) [a]

Species	Habitat	State Rank	Date Last Observed [b]	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
Barr's milkvetch (*Astragalus barrii*)	Sparsely vegetated knobs and buttes.	S3	–	0	0	0	0
Bractless blazingstar (*Mentzelia nuda*)	Known from a few locations in the eastern half of the state on sandy or gravelly soil of open hills and roadsides.	S1S2	1941	1	1	1	1
Double bladderpod (*Physaria brassicoides*)	Known in Montana from a handful of populations in steep, sparsely vegetated habitat.	S3	–	0	0	0	0
Heavy sedge (*Carex gravida*)	Found at a few scattered locations in eastern Montana, including Rosebud and Fallon counties. Grows in woody draws under green ash and thickets of serviceberry, quaking aspen, and chokecherry.	S3	2005	0	1	1	1
Lead plant (*Amorpha canescens*)	Occurs in grasslands and woodlands, often on sandy soils.	S3	1983	1	1	1	1
Nine-anther prairie clover (*Dalea enneandra*)	In Montana, known from a few poorly documented occurrences in the eastern half of the state. Found on gravelly-soiled grasslands and slopes on the plains.	S2S3	1975	0	0	0	1
Persistent-sepal yellow-cress (*Rorippa calycina*)	Known in Montana from four records. Inhabits sparsely vegetated, moist sandy to muddy banks of streams, ponds, and manmade reservoirs near the high water line.	SH	–	0	0	0	0
Raceme milkvetch (*Astragalus racemosus*)	Small populations have been documented in Carter and Fallon counties in grasslands on heavy soils derived from shale.	S2S3	2006	0	1	1	1
Smooth goosefoot (*Chenopodium subglabrum*)	Known from a few locations in Montana in extremely loose, sandy soils, typically in early successional, sparsely vegetated habitats, on sand dunes and occasional river sandbars or sandy terraces.	S2	1973	1	0	0	0
Wood lily (*Lilium philadelphicum*)	Patchy, but wide distribution in Montana. Found in moist, usually calcareous meadows, grasslands, fens, woodlands; valleys.	S3	–	0	0	0	0
PROJECT TOTAL				**3**	**4**	**4**	**5**

[a] All species listed have documented occurrences within the Study Areas of at least one Alternative. For species data in the wider Study Area (a 2-mile-wide corridor), see Appendix F.

[b] Dates are provided only for species with documented occurrences within one or more of the Facility Locations.

Note: S1 = Critically Imperiled, S2 = Imperiled, S3 = Vulnerable, S4 = Apparently Secure, SH = Possibly Extirpated; FL = Facility Location.

Source: Montana Natural Heritage Program, 2025a; Montana Natural Heritage Program and Montana Fish, Wildlife, and Parks, 2023; NatureServe, 2023

7.6.2 Impact Assessment

7.6.2.1 Common Impacts and Mitigation Measures

Construction

Short- to long-term impacts to vegetation will occur from construction activities, vehicles, and equipment, depending on the disturbed vegetation community. Impacts will include vegetation clearing and trampling, as well as degraded growing conditions from soil disturbance and compaction. Impacts will occur along the selected route in construction areas and surrounding new structures, including counterpoise, pulling and tensioning sites, staging areas, and workspaces along the right-of-way. The majority of affected vegetation will occur in grasslands, followed by shrublands and then woodlands (see Tables 7.6.1-2 and 7.6.1-3 above).

Where vegetation in temporary construction areas can be successfully restored to pre-construction conditions, impacts will be short- to long-term, with herbaceous vegetation able to recover more quickly than woody vegetation. Under good growing conditions, and with appropriate reseeding and weed mitigation measures, grasslands could reestablish within three growing seasons (Humphrey and Schupp, 2002; Kulmatiski, 2006; Kulmatiski et al., 2006; Link et al., 2011; Prevey et al., 2010; Roos et al., 2010), while shrubland would generally take at least five years, and forest more than 10 years. North Plains plans to reseed using a seed mix based on input from local NRCS offices, County Weed Boards, affected landowners, permit and mitigation requirements, and the availability of seed at the time of reclamation, as described in the CMRP. Mitigation measures described for forests in Section 7.3.2.1 would also avoid or minimize impacts to woodland vegetation.

Construction activities could start fires that would result in the loss of vegetation, both within the Facility Locations and beyond. Because of higher fuel loads created by cheatgrass and similar species in disturbed grassland/shrubland communities present in the Facility Location of each alternative route, there would be a greater risk of fires igniting and spreading in these areas. Fire would act to further reduce the native components of the system and help the spread of weeds. However, North Plains will follow all federal, state, county, and local fire regulations pertaining to the prevention of uncontrolled fires and implement mitigation measures to prevent and control fires, as described in the CMRP and accompanying Fire Prevention and Suppression Plan. Mitigation measures outlined in the CMRP and accompanying Fire Prevention and Suppression Plan include making fire-fighting equipment available on-site, developing emergency response procedures for incidents such as fires, and proper handling of flammable materials and waste.

Disturbed areas would be vulnerable to weed infestations, and the ability for native vegetation to successfully reestablish would depend in part on the presence of non-native invasive or noxious weeds present in the area. Noxious weeds and other invasive species such as cheatgrass grow quickly and thrive in disturbed areas, outcompeting native grasses, forbs, and/or shrubs. Once established, weedy species are difficult to control. Areas vulnerable to noxious weeds would include soils exposed during construction and along access roads during construction, since vehicles can carry weed seeds from one area to another.

North Plains will follow noxious weed eradication and containment requirements established by the state and CWDs crossed by the Project, which would help reduce impacts to the plant community from weeds. To further minimize the potential to spread noxious weeds, North Plains will prepare a Noxious Weed and Aquatic Invasive Species Management Plan in accordance with the Montana County Weed Act and applicable county weed management plans. North Plains will include the measures outlined in the CMRP and in the accompanying Noxious Weed and Aquatic Invasive Species Management Plan to manage noxious weeds.

Using the BMPs described in the CMRP and accompanying Noxious Weed and Aquatic Invasive Species Management Plan to reestablish pre-construction vegetation and reduce the spread of weeds, impacts from noxious weeds as a result of the Project would be short-term.

Impacts would be short-term depending on the seed bank and reestablishment of pre-construction vegetation. Impacts to BLM-sensitive species on BLM land are unlikely along any of the alternative routes based on a lack of known occurrences, species range, and limited extent of any single BLM parcel. North Plains will coordinate with the BLM during the right-of-way permitting process to determine whether additional surveys or review are needed to verify the potential presence/absence of BLM-sensitive plants.

Operations and Maintenance

Permanent removal or alteration of affected plant communities will occur within the footprint of transmission structures and improved existing or new permanent access roads, resulting in permanent impacts. In addition, North Plains will permanently remove trees from the right-of-way, as well as tall shrubs that grow within 35 feet of the transmission line conductors. Permanent tree removal could fragment riparian woodlands and alter the more shade-tolerant understory plant community to include species that are less shade tolerant. In the Facility Location of each alternative route, some trees are associated with rivers or creeks and are located in deeply incised channels. Trees in these areas could be well below the conductors and would not require removal. Given the necessity of vegetation removal within the right-of-way for safe operation of the transmission line, impacts to vegetation during operation would be short- to long-term depending on the affected vegetation community.

In addition, habitat fragmentation can occur where new or expanded rights-of-way or access roads cross through plant communities, such as riparian woodlands and SOC populations that may occur over a restricted or reduced area. However, North Plains plans to avoid environmentally sensitive resources to the extent practicable, as discussed in the CMRP and accompanying plans. Fragmenting vegetation habitats can limit the spread of plant seeds and isolate plant communities, resulting in short- to long-term impacts depending on the extent of the affected vegetation and habitat fragmentation.

7.6.2.2 Unique Impacts and Mitigation Measures

Key impacts to vegetation that would be likely under each of the respective alternative routes are discussed below. Section 8.0 provides a comparison of like impacts by alternative route. Mitigation measures would be applied consistently across the alternative routes. None of the alternative routes would involve additional mitigation measures beyond those presented above.

The Facility Location of Alternative A could affect the most forest vegetation. The Facility Location of Alternative B has the most potential for impacts on wetland vegetation, while the Facility Location of Alternative C could affect the most riparian vegetation (also see Section 7.5.5). The Facility Location of Alternative D overlaps the most grasslands and shrublands, which generally make up rangeland (see Section 7.6.1) – a preferred location criteria (Circular MFSA-2 3.1(1)(d)). In addition, while Alternative D crosses the greatest amount of grassland, the route was sited to minimize impacts to Dakota skipper (DASK) (*Hesperia dacotae*), which included the avoidance of high-quality grassland habitat to the extent feasible.

7.7 WILDLIFE BIOLOGICAL RESOURCES (Circular MFSA-2 Section 3.7(12))

The following section presents information on wildlife that could occur along the Facility Location of each alternative route as defined in Section 7.0. Appendices E and F provide additional wildlife baseline data (maps and tables, respectively) within the MFSA required Study Area. In accordance with the Circular MFSA-2 Section 3.7(12)(a), the Study Area for wildlife is defined as a 2-mile-wide corridor along each alternative route (1 mile on either side of the centerline) unless otherwise defined for specific species.

Resources that are in the Study Area but outside of the Facility Location are only analyzed when impacts could occur and/or buffers are required (e.g., eagle nests and grouse leks), or for highly mobile wildlife that occur in the wider Study Area and could travel through or move into the Facility Location (e.g., big game).

7.7.1 Baseline Data

The following sections analyze habitats occupied at least seasonally that are critical to species of interest or concern, such as habitats designated as Community Types of Greatest Conservation Need (CTGCN), Aquatic Focal Areas (AFA), and Terrestrial Focal Areas (TFA), special interest areas, game and nongame species, and special status wildlife species (federally listed species, BLM sensitive species, and state SOCs).

This section describes the general wildlife habitats and special interest areas that could support wildlife in the Facility Locations of the four alternative routes, along with the specific species groups identified in the Circular MFSA-2 that could occur in these habitats, including big game, small game, nongame, and special status wildlife species.

7.7.1.1 General Wildlife Habitats and Nongame Species

None of the Alternative Facility Locations cross agency-designated state wildlife management areas, state parks, national wildlife refuges, or wildlife habitat protection areas. Rangeland, including grassland and shrubland, makes up the majority of general wildlife habitat types crossed by all four alternative routes, followed by areas disturbed by human land use such as agricultural, developed, and mining areas; forest; aquatic habitats such as open water, wetlands, and riparian areas; sparse and barren systems; and recently disturbed or modified areas (see Table 7.3.1-1).

Rangeland can support nesting, breeding, and foraging opportunities for many nongame wildlife groups, such as small mammals, birds, and reptiles. Common mammals include the black-tailed prairie dog (*Cynomys ludovicianus*), American badger (*Taxidea taxus*), and red fox (*Vulpes vulpes*) (MNHP and MFWP, 2023). Many species of bird use rangeland habitat for nesting, hunting, foraging, and cover, including the short-eared owl (*Asio flammeus*), lark sparrow (*Chondestes grammacus*), and western meadowlark (*Sturnella neglecta*) (MNHP and MFWP, 2023). Some common reptiles, such as the North American racer (*Coluber constrictor*), may be found in this habitat type (MNHP and MFWP, 2023). Common pollinators are supported in rangeland with a higher abundance of forbs.

Agricultural areas can support many of the same species, particularly with foraging habitat. Birds, such as the red-winged black bird (*Agelaius phoeniceus*) and mourning dove (*Zenaida macroura*), are commonly found near crop fields where grains and crop stubble can provide suitable forage (MNHP and MFWP, 2023).

Common species that use forested habitats within and adjacent to the Facility Locations include common bats, such as the big brown bat (*Eptesicus fuscus*) and silver-haired bat (*Lasionycteris noctivagans*), which use snags and trees with cavities for roosting (MNHP and MFWP, 2023). Various small mammal species use forests for forage or hunting grounds, shelter, and rearing of young, including the red fox and least chipmunk (*Neotamias minimus*). The black-capped chickadee (*Poecile atricapillus*) is a common passerine found in forests within the Study Areas, while common raptors may include the Cooper's hawk (*Accipiter cooperii*) and broad-winged hawk (*Buteo platypterus*) (MNHP and MFWP, 2023).

Aquatic habitats within and adjacent to the Facility Locations, including wetlands, ponds and lakes, streams, and riparian areas, serve as important habitat and water sources for a variety of species, while riparian areas can provide critical travel corridors. Many groups of common wildlife benefit from wetlands and riparian areas, including mammals, waterfowl, shorebirds, amphibians, reptiles, and insects. Aquatic habitats are generally high in biodiversity and are important at different stages of numerous species' life cycles, such as insects, amphibians, and reptiles (MFWP, 2015). The great blue heron (*Ardea herodias*), American avocet (*Recurvirostra americana*), Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), and American wigeon (*Mareca americana*) are examples of common waterbirds and waterfowl that may occur in these habitats. Other common species include the painted turtle (*Chrysemys picta*), boreal chorus frog (*Pseudacris maculata*), and North American beaver (*Castor canadensis*) (MNHP and MFWP, 2023). Aquatic habitat is discussed further in Section 7.8 in regard to fish habitat.

7.7.1.2 Unique Habitats and Natural Areas

Within the Facility Locations, there are no special interest areas, including:

- national trails (the Clark on the Yellowstone segment of the Lewis and Clark National Historic Trail is located within the Study Areas of Alternatives A and B but outside the Facility Location)
- national natural landmarks
- areas of critical environmental concern
- research botanical areas
- outstanding natural areas

Additionally, there are no unique habitats designated by state or federal agencies within the Facility Locations, including:

- ESA designated or proposed critical habitats
- State Wildlife Management Areas
- State Parks
- National Wildlife Refuges
- Wildlife Habitat Protection Areas

- Important Bird Areas (IBA) (closest IBA, Mussellshell Sage-steppe, is about 5.1 miles northwest of Alternative A (National Audubon Society, 2023)
- Waterfowl Protection Areas

Other areas that could be considered unique habitat and natural areas that could provide important wildlife habitat include conservation easements crossed by all four alternative routes, and Fort Keogh crossed by Alternatives A, B, and D, which primarily contain grassland and shrubland habitat (see Sections 7.3 and 7.6). Wildlife at Fort Keogh likely experience relatively high levels of disturbance from research activities with cattle.

7.7.1.3 Big Game Species

The Circular MFSA-2 requires review of potential Project impacts to the following big game species: elk (*Cervus canadensis*), white-tailed deer, mule deer, moose (*Alces alces*), pronghorn, mountain goat (*Oreamnos americanus*), and bighorn sheep (*Ovis canadensis*). As required, this analysis includes species' winter distribution, including severe winter concentration areas (Circular MFSA-2 Section 3.4 (1)(m)), major elk summer security areas, which are any forested areas greater than 0.5 mile in radius and more than 0.5 mile from an existing road (Circular MFSA-2 Section 3.4 (1)(n)), and habitats occupied at least seasonally by mountain sheep and mountain goats (Circular MFSA-2 Section 3.4 (1)(o)). Data on species distribution and general big game habitats is from MFWP (2022b) data. The spatial data shows potential severe winter concentration areas within Facility Locations for the two deer species (see Figure E-9b in Appendix E) (MFWP, 2022b). The following discussion addresses other important big game areas.

The primary big game species likely to occur along all four alternative routes include white-tailed deer, mule deer, and bighorn sheep. The Facility Locations of all four alternative routes cross both general habitat and winter distribution areas for both deer species (see Tables 7.7.1-1 and 7.7.1-2) (MFWP, 2022b). None of the Facility Locations contain state-designated bighorn sheep winter distribution or severe winter concentration areas (MFWP, 2022b). The species is deemed largely extirpated from eastern Montana except for a small population that was introduced in the Blue Hills of Custer County about 20 miles east of Miles City (see Table 7.7.1-1 and Figure E-9c in Appendix E) (MFWP, 2010). Preferred habitat in the Blue Hills area are forests (i.e., ponderosa pine and Rocky Mountain juniper breaks) west of the Powder River (MFWP, 2010). Bighorn sheep are assumed to concentrate within the Blue Hills in the winter and to use it as general habitat year-round (MNHP and MFWP, 2023). The Facility Locations of all four alternative routes cross the Blue Hills area (see Table 7.7.1-1 and Figure E-9c in Appendix E).

Pronghorn may occur along the Facility Locations of the four alternative routes, which contain general habitat (primarily grassland and shrubland) and winter distribution areas (see Tables 7.7.1-1 and 7.7.1-2 and Figure E-9a in Appendix E) (MFWP 2022b, 2023b).

TABLE 7.7.1-1

Big Game General Distribution in the Alternative Facility Locations [a]

	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
Resource	acres	proportion	acres	proportion	acres	proportion	acres	proportion
Mule Deer	14,698	100%	13,074	99%	13,137	99%	15,126	100%
White-tailed Deer	6,679	45%	4,880	37%	5,041	38%	4,678	31%
Pronghorn	6,397	44%	8,763	67%	8,252	63%	9,976	66%
Elk	0 [b]	0%	0 [b]	0%	722	5%	0 [b]	0%
Bighorn Sheep (Blue Hills Habitat)	3,142	21%	2,371	18%	2,145	16%	3,131	21%
SPECIES HABITAT TOTAL [c]	30,916	—	29,088	—	29,297	—	32,911	—

[a] For species data in the wider Study Area (a 2-mile-wide corridor) see Appendix F.
[b] General distribution can be found in the wider Study Area (see Appendix F).
[c] Species Habitat Total contains overlapping areas but has been summed to provide a relative comparison of species habitat supported by each alternative.
Note: proportion = proportion of the total acreage of the Facility Location
Source: Montana Fish, Wildlife, and Parks, 2022b

TABLE 7.7.1-2

Big Game Winter Distribution Areas in the Alternative Facility Locations [a]

	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
Resource	acres	proportion	acres	proportion	acres	proportion	acres	proportion
Mule Deer	4,527	31%	4,367	33%	5,890	45%	5,326	35%
White-tailed Deer	2,114	14%	323	2%	427	3%	301	2%
Pronghorn	4	0%	383	3%	876	7%	1,174	8%
SPECIES HABITAT TOTAL [c]	6,645	—	5,073	—	7,193	—	6,801	—

[a] For species data in the wider Study Area (a 2-mile-wide corridor) see Appendix F.
[b] Winter distribution can be found in the wider Study Area (see Appendix F).
[c] Species Habitat Total contains overlapping areas but has been summed to provide a relative comparison of species habitat supported by each alternative.
Note: proportion = proportion of the total acreage of the Facility Location
Source: Montana Fish, Wildlife, and Parks, 2022b

Elk are less likely to occur along the four alternative routes. Elk may be found in the Facility Location of Alternative C outside of winter based on the occurrence of general habitat (see Table 7.7.1-1) (MFWP 2022b, 2023b). Given the continued growth of elk populations, the general distribution appears to be expanding to areas near Colstrip in Rosebud County. General habitat is similar to that of deer. However, none of the alternative routes would cross winter distribution or summer security areas identified by the MFWP, BLM, or USFS (see Table 7.7.1-2) (MFWP, 2022b).

For moose, there are no winter distribution areas, severe winter concentration areas, or general habitat in the Facility Locations. However, the MFWP has noted that moose have been in the general habitat adjacent to the Facility Locations of the four alternative routes, and that their population seems to be expanding in the eastern counties of the state where prime summer habitat consists of high-elevation grassland (i.e., mountain meadows), riparian areas, wetlands, and forest clear cuts (MFWP, 2023a).

7.7.1.4 Small Game Species

The alternative routes extend relatively long distances and contain various habitat types that can support groups of small game that may be present year-round, including waterfowl, small mammals, and upland game birds. The blue-winged teal (*Spatula discors*), Canada goose, and sandhill crane (*Antigone canadensis*) are common examples of waterbirds associated with aquatic habitats that may occur within and adjacent to the Facility Locations (see Sections 7.5.1.1 and 7.5.5.1). Other species of small game that commonly associate more with grassland and shrubland habitats may also be present, such as the sharp-tailed grouse, greater sage-grouse, red fox, and white-tailed jackrabbit (*Lepus townsendii*).

Two small game species, the GRSG and sharp-tailed grouse (STGR), are of particular importance in Montana due to their state conservation rankings, legal protections, and/or state management concerns. Section 7.7.1.5 discusses GRSG and STGR in further detail, including habitat crossed, winter concentration areas, lek sites near the Project, and state population concerns.

7.7.1.5 Special Status Wildlife Species

For the purpose of this application, special status wildlife species are defined as species that are protected or may become protected by federal and/or state regulation, law, or policy or are identified by the State of Montana as a SOC. Federal special-status species include those that are listed, proposed for listing, candidates for listing, or under review for listing under the ESA; species identified as sensitive by the BLM, species protected under the Migratory Bird Treaty Act (MBTA), and species protected under the Bald and Golden Eagle Protection Act (BGEPA). The ESA, MBTA, and BGEPA provide protection for associated species nationwide (unless otherwise noted in the species listing), whereas BLM sensitive species regulations only apply on BLM-managed lands.

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Federally Listed Species and Critical Habitat

Thirteen federally listed, proposed, and petitioned or under review species, including 12 terrestrial and 1 aquatic species, could occur adjacent to the Facility Locations based on a query of the USFWS's IPaC system on April 17, 2025 (USFWS, 2025) and coordination with the USFWS Montana Field Services Office (USFWS 2021b; J. Berglund, USFWS, personal communication, December 1, 2022). This analysis used species' ranges, the presence of potential habitat based on desktop review, agency habitat modeling, and known or documented occurrences to evaluate the likelihood of the terrestrial species occurring in the Study Area for each alternative route. Section 7.8.1.2 provides an analysis of the aquatic species (pallid sturgeon). See Figures E-9d, E-9f, E-9g in Appendix E for maps showing habitat suitability modeled by the MNHP (2022) for specific species (as available).

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TABLE 7.7.1-3

Terrestrial Wildlife Species Protected Under the ESA, Under ESA Review, or Petitioned for ESA Listing in the Alternative Facility Locations

Species	Status (Year) [a]	Potential Habitat in the Facility Locations	Habitat Suitability [b, c, d] (acres) Alternative A	Alternative B	Alternative C	Alternative D (Refined)	Documented Occurrence in Facility Locations	Likelihood to Occur in Facility Locations [e]
MAMMALS								
Little brown bat (LBBA) (*Myotis lucifugus*)	UR (2026)	Roosting habitat includes manmade structures (e.g., attics, barns, bridges), trees, and occasionally rock crevices near water. There are no documented hibernacula (e.g., caves and mines) in the Facility Locations (MNHP and MFWP, 2023; Bachen et al. 2020).	LS: 12,542 MS: 1,243 OS: 0 All: 13,785	LS: 11,751 MS: 312 OS: 0 All: 12,063	LS: 11,914 MS: 177 OS: 0 All: 12,091	LS: 13,195 MS: 333 OS: 0 All: 13,528	A,B,D	Possible: A,B,C,D
Northern long-eared bat (NLEB) (*Myotis septentrionalis*)	E	Roosting habitat includes mature-growth forests (≥ 10 acres) with snags or trees with cavities and loose bark; occasionally will use manmade structures (e.g., barns or bat houses). There are no documented hibernacula (e.g., caves and mines) in Facility Locations (MNHP and MFWP, 2023; Bachen et al. 2020). The species is known to occur in wooded riparian areas of the Yellowstone River (USFWS 2021a).	LS: 0 MS: 0 OS: 0 All: 0	LS: 0 MS: 0 OS: 0 All: 0	LS: 0 MS: 0 OS: 0 All: 0	LS: 0 MS: 0 OS: 0 All: 0	None	Possible: A,B,C,D
BIRDS								
Pinyon jay (*Gymnorhinus cyanocephalus*)	UR (2028)	Relies on ponderosa pine and pine-juniper woodlands (MNHP and MFWP, 2023). Year-round resident of central and eastern Montana (MNHP and MFWP, 2023).	LS: 10,770 MS: 1,210 OS: 0 All: 11,980	LS: 9,111 MS: 1,010 OS: 0 All: 10,121	LS: 8,807 MS: 1,212 OS: 0 All: 10,019	LS: 10,039 MS: 1,367 OS: 0 All: 11,406	A, B, C	Possible: A,B,C,D
Piping plover (*Charadruis melodus*)	T	Stopover habitat in open areas with gravelly and/or sandy substrate with little to no vegetation; along shorelines and sandbars of rivers, alkaline waterbodies, and ponds (MNHP and MFWP, 2023; USFWS 2023a).	LS: 0 MS: 0 OS: 0 All: 0	LS: 0 MS: 0 OS: 0 All: 0	LS: 0 MS: 0 OS: 0 All: 0	LS: 0 MS: 0 OS: 0 All: 0	None	Unlikely: A,B,C,D
Whooping crane (*Grus americana*)	E	Stopover habitat in or near wetlands and croplands during spring and fall migration (MNHP and MFWP, 2023; Pearse et al. 2015). Two historic observations recorded in Custer County (1974) and Rosebud County (1985) (MNHP, 2025b). The western edge of the species' primary migration corridor is at the Montana–North Dakota boundary (Pearse et al., 2018).	LS: 2,152 MS: 0 OS: 0 All: 2,152	LS: 2,298 MS: 5 OS: 0 All: 2,304	LS: 2,119 MS: 5 OS: 0 All: 2,124	LS: 2,231 MS: 0 OS: 0 All: 2,231	None	Unlikely: A,B,C,D

TABLE 7.7.1-3

Terrestrial Wildlife Species Protected Under the ESA, Under ESA Review, or Petitioned for ESA Listing in the Alternative Facility Locations

Species	Status (Year) [a]	Potential Habitat in the Facility Locations	Habitat Suitability [b, c, d] (acres) Alternative A	Alternative B	Alternative C	Alternative D (Refined)	Documented Occurrence in Facility Locations	Likelihood to Occur in Facility Locations [e]
INVERTEBRATES								
Dakota skipper (*Hesperia dacotae*)	T	Type B reproductive habitat occurs in grasslands, including dense stands of bunchgrass and needlegrasses (USFWS, 2021b). Foraging habitat requires nectar-producing forbs, such as purple coneflower (*Echinacea angustifolia*), bluebell bellflowers (*Campanula rotundifolia*), and blanket flower (*Gaillardia aristate)* (Dana, 1991). No known occurrences in Montana, although USFWS habitat models indicate their range could extend into extreme eastern Montana (Barnes et al. 2024), and North Plains' 2023 field evaluations identified low quality habitat at the Montana/North Dakota state line. Based on the USFWS potentially undisturbed lands layer, there are between 5,866 and 7,315 acres of unbroken grasslands (UG) in the Facility Locations (Prairie Pothole Joint Venture, 2019).	UG: 5,866	UG: 6,878	UG: 6,776	UG: 7,315	None	Unlikely: A,B,C,D
Monarch butterfly (*Danaus plexippus*)	PT	Foraging and reproductive habitat in open habitat with flowering plants and milkweed (larval host plant) (MNHP and MFWP, 2023; USFWS 2020a). Two documented occurrences in Custer and Rosebud counties (MNHP, 2025b). Based on the USFWS potentially undisturbed lands layer, there are between 5,866 and 7,315 acres of unbroken grasslands in the Facility Locations (Prairie Pothole Joint Venture, 2019).	LS: 10,735 MS: 2,949 OS: 1 All: 13,685	LS: 9,825 MS: 1,149 OS: 0 All: 10,974	LS: 9,972 MS: 1,050 OS: 0 All: 11,022	LS: 11,503 MS: 1,276 OS: 7 All: 12,780	None	Possible: A,B,C,D
Western regal fritillary (*Argynnis idalia occidentalis*)	PT	Foraging and reproductive habitat in tall grass and dry or wet prairies, meadows, and wet fields with flowering plants and violets (larval host plant) (MNHP and MFWP, 2023; USFWS, 2020b). One historic observation made in Custer County in the late 1800s (MNHP and MFWP, 2023; MNHP, 2025b). Based on the USFWS potentially undisturbed lands layer, there are between 5,866 and 7,315 acres of unbroken grasslands in the Facility Locations (Prairie Pothole Joint Venture 2019).	UG: 5,866	UG: 6,878	UG: 6,776	UG: 7,315	None	Unlikely: A,B,C,D

TABLE 7.7.1-3

Terrestrial Wildlife Species Protected Under the ESA, Under ESA Review, or Petitioned for ESA Listing in the Alternative Facility Locations

Species	Status (Year) [a]	Potential Habitat in the Facility Locations	Habitat Suitability [b, c, d] (acres) Alternative A	Alternative B	Alternative C	Alternative D (Refined)	Documented Occurrence in Facility Locations	Likelihood to Occur in Facility Locations [e]
American bumble bee (*Bombus pensylvanicus*)	UR (2027)	Foraging and reproductive habitat in open habitat such as farmlands, fields, tall grasslands, and prairie with flowering plants (MNHP and MFWP, 2023). Based on the USFWS potentially undisturbed lands layer, there are between 5,866 and 7,315 acres of unbroken grasslands in the Facility Locations (Prairie Pothole Joint Venture 2019).	UG: 5,866	UG: 6,878	UG: 6,776	UG: 7,315	None	Unlikely: A,B,C,D
Suckley's cuckoo bumble bee (*Bombus suckleyi*)	PE	Foraging and reproductive habitat is the same habitat as its preferred host species, the Western bumble bee (see below). Based on the USFWS potentially undisturbed lands layer, there are between 5,866 and 7,315 acres of unbroken grasslands in the Facility Locations (Prairie Pothole Joint Venture 2019).	LS: 6,070 MS: 860 OS: 0 All: 6,930	LS: 3,558 MS: 982 OS: 0 All: 4,540	LS: 4,560 MS: 999 OS: 0 All: 5,559	LS: 5,257 MS: 1,095 OS: 0 All: 6,352	None	Unlikely: A,B,C,D
Variable cuckoo bumble bee (*Bombus variabilis*)	UR (2027)	Foraging and reproductive habitat is the same habitat as its preferred host species, the American bumble bee (see above) (NDGF 2019; Tyler 2021). Based on the USFWS potentially undisturbed lands layer, there are between 5,866 and 7,315 acres of unbroken grasslands in the Facility Locations (Prairie Pothole Joint Venture 2019).	UG: 5,866	UG: 6,878	UG: 6,776	UG: 7,315	None	Unlikely: A,B,C,D
Western bumble bee (*Bombus occidentalis*)	UR (2024)	Foraging and reproductive habitat in open habitat with flowering plants (e.g., open grasslands, parks, gardens, sagebrush steppe, and meadows), with nests occasionally found aboveground in abandoned ground-nesting bird nests, stumps, and logs (MNHP and MFWP, 2023; Washington Department of Fish and Wildlife, 2024). One historic recorded occurrence in Rosebud County in 1903 (MNHP, 2025b). Based on the USFWS potentially undisturbed lands layer, there are between 5,866 and 7,315acres of unbroken grasslands in the Facility Locations (Prairie Pothole Joint Venture 2019).	LS: 3,335 MS: 0 OS: 0 All: 3,335	LS: 2,351 MS: 0 OS: 0 All: 2,351	LS: 2,392 MS: 67 OS: 0 All: 2,459	LS: 2,843 MS: 0 OS: 0 All: 2,843	None	Unlikely: A,B,C,D

TABLE 7.7.1-3

Terrestrial Wildlife Species Protected Under the ESA, Under ESA Review, or Petitioned for ESA Listing in the Alternative Facility Locations

Species	Status (Year) [a]	Potential Habitat in the Facility Locations	Habitat Suitability [b, c, d] (acres)				Documented Occurrence in Facility Locations	Likelihood to Occur in Facility Locations [e]
			Alternative A	Alternative B	Alternative C	Alternative D (Refined)		

[a] Year = Anticipated decision year.
[b] LS = low suitability; MS = moderate suitability; OS = optimal suitability; UG = Unbroken Grasslands
[c] The Montana Natural Heritage Program (MNHP) conducts habitat suitability modeling for certain species.
[d] The USFWS potentially undisturbed lands layer was used when MNHP habitat suitability models were not available.
[e] Occurrence potential is based on a combination of a species being on a USFWS IPaC report, species range, and known occurrences.
[f] Historic occurrence, documented over 30 years ago.

Note: ESA = Endangered Species Act; C= candidate; E= endangered; T= threatened; P = proposed for federal listing; UR= currently under review by USFWS for potential listing; GR = general range; UG = unbroken grassland; LS = low suitability habitat; MS = moderate suitability habitat; ND = no data

Source: Dana, 1991; Pearse et al. 2015; Bachen et al. 2020; U.S. Fish and Wildlife Service (USFWS), 2020a,b, 2021a, 2023b,c, 2025; Montana Natural Heritage Program and Montana Fish, Wildlife, and Parks (MNHP and MFWP), 2023; Montana Natural Heritage Program (MNHP), 2022, 2025a,b; Barnes et al. 2024; eBird, 2025; Prairie Pothole Joint Venture, 2019; North Dakota Game and Fish (NDGF) 2019; Tyler 2021; and Washington Department of Fish and Wildlife, 2024.

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BLM Sensitive Species

The BLM Miles City Field Office published their ARMP in 2015. The ARMP provides guidance on land use and resource management and sets conservation objectives on BLM-administered lands. The management guidance includes identification of sensitive wildlife species whose populations are declining (BLM, 2015a).

The most recent BLM Sensitive Species List (2020) includes 45 wildlife species (including four fish species; see Section 7.8) known to occur in the Planning Area[7] of the BLM Miles City Office, which includes all three counties crossed by the Project (BLM, 2020). North Plains conducted a desktop review of state occurrence data to establish recent occurrences of these species within the alternative route Facility Locations (see Table 7.7.1-4) and Study Areas (see Appendix G) (MNHP, 2023a). A recent occurrence was defined as occurring in 1995 or later. Within the Facility Locations, Alternative A had the most recent occurrences, followed by Alternatives C and D, having the same number of recent occurrences, and Alternative B having the least (see Table 7.7.1-4).

BLM sensitive species depend on various habitat types, all of which are crossed in varying amounts by the alternative routes. Given that potential habitat is present, these species could occur along the alternative route Facility Locations, especially those species that have recent occurrences. North Plains will coordinate with the BLM during the right-of-way permitting process to determine whether additional surveys or review are needed to verify the potential presence/absence of BLM-sensitive wildlife.

It should be noted that the Project also crosses Fort Keogh. However, these federally owned lands do not maintain a list of protected species, so they will not be discussed further.

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[7] The Planning Area is defined as BLM-administered lands and minerals in eastern Montana in Carter, Custer, Daniels, Dawson, Fallon, Garfield, McCone, Powder River, Prairie, Richland, Roosevelt, Rosebud, Sheridan, Treasure, and Wibaux counties and portions of Big Horn and Valley counties (BLM, 2015a).

TABLE 7.7.1-4

BLM Sensitive Species with Recent Occurrences (1995 and later) in the Facility Locations [a,b,c]

Species	Habitat	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
MAMMALS					
Black-tailed prairie dog (*Cynomys ludovicianus*)	Open grasslands and shrublands with little vegetation	Yes	Yes	Yes	Yes
Swift fox (*Vulpes velox*)	Relatively flat, open prairie grasslands and arid plains	Yes	Yes	Yes	Yes
Hoary bat (*Lasiurus cinereus*)	Conifer and hardwood forests during the summer; open water and riparian corridors are important for foraging	Yes	No	Yes	Yes
Spotted bat (*Euderma maculatum*)	Generally found in open, arid habitats with juniper and/or sagebrush; forage near water and open meadows	Yes	Yes	Yes	Yes
Townsend's big-eared bat (*Corynorhinus townsendii*)	Variety of habitats where caves or abandoned mines are nearby; trees and foliage are important for foraging	Yes	No	Yes	No
BIRDS					
American bittern (*Botaurus lentiginosus*)	Freshwater wetlands with dense, emergent vegetation	Yes	Yes	Yes	Yes
Baird's sparrow (*Centronyx bairdii*)	Native prairie and grasslands with tame grasses	Yes	Yes	Yes	Yes
Bald eagle (*Haliaeetus leucocephalus*)	Forested and riparian areas near waterbodies such as lakes, rivers, and streams	Yes	Yes	Yes	Yes
Black tern (*Chlidonius niger*)	Wetlands, marshes, and ponds with emergent vegetation	Yes	No [e]	No	No [e]
Black-billed cuckoo (*Coccyzus erythropthalmus*)	Wooded draws, forest edges, thickets, and shelterbelts	No [e]	No [e]	No	No
Brewer's sparrow (*Spizella breweri*)	Shrubsteppe habitats dominated by sagebrush	Yes	Yes	Yes	Yes
Burrowing owl (*Athene cunicularia*)	Open grasslands where abandoned burrows are present	Yes	Yes	Yes	Yes
Chestnut-collared longspur [f] (*Calcarius ornatus*)	Native pastures and grasslands with short to medium grasses	No [e]	No [e]	No [e]	Yes
Common tern (*Sterna hirundo*)	Nests on islands of waterbodies; islands generally have little vegetation and sandy or pebbly soil	No [e]	No [e]	No [e]	No [e]
Ferruginous hawk (*Buteo regalis*)	Mixed-grass prairie, shrub-grasslands, and sagebrush steppe; sometimes mixed with trees such as cottonwoods, pines, and junipers	Yes	Yes	No [e]	No [e]
Franklin's gull (*Leucophaeus pipixcan*)	Prefers large, relatively permanent prairie marsh complexes	No [e]	No [e]	No [e]	No [e]
Golden eagle (*Aquila chrysaetos*)	Cliffs and large trees are important for nesting; open prairies and woodlands are used for foraging	Yes	No [e]	Yes	No [e]

TABLE 7.7.1-4

BLM Sensitive Species with Recent Occurrences (1995 and later) in the Facility Locations [a,b,c]

Species	Habitat	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
Greater sage-grouse [f] (*Centrocercus urophasianus*)	Adaptable to various habitats with sagebrush present such as riparian meadows, steppe, and shrubland	Yes	Yes	Yes	Yes
Loggerhead shrike (*Lanius ludovicianus*)	Open areas with short vegetation such as mowed roadsides, agricultural fields, and riparian areas	Yes	Yes	Yes	Yes
Long-billed curlew (*Numenius americanus*)	Nests in moist meadows and mixed grass prairies with short vegetation	No [e]	No [e]	No [e]	No [e]
Mountain plover [e] (*Charadrius montanus*)	Shortgrass prairie; often near prairie dog towns	No [e]	No	No	No
Peregrine falcon (*Falco peregrinus*)	Open landscapes with cliffs or vertical overhangs nearby for nesting; often near water	No [e]	No	No	No
Red-headed woodpecker (*Melanerpes erythrocephalus*)	Riparian forests, open savannah with sufficient trees and/or snags, and burned areas	Yes	No [e]	No	No
Sage thrasher (*Oreoscoptes montaus*)	Areas dominated by sagebrush with little to no grass cover	No	No	No	No
Sprague's pipit (*Anthus spragueii*)	Native prairie and grasslands with intermediate vegetation height	No [e]	No [e]	No [e]	No
Veery (*Catharus fuscescens*)	Willow thickets, disturbed cottonwood stands, and riparian habitats	No	No	No	No
AMPHIBIANS					
Great Plains toad [f] (*Anaxyrus cognatus*)	Upland grasslands, stream valleys, rainwater pools, and other floodplain habitats	Yes	Yes	Yes	Yes
REPTILES					
Greater short-horned lizard (*Phrynosoma hernandesi*)	Areas with open, sun-baked soil; often in short grass and/or sagebrush habitats	Yes	Yes	No	Yes
Smooth green snake (*Opheodrys vernalis*)	Mesic habitat such as wet prairies, meadows, marshes, open forests, and riparian corridors with lush shrubby and herbaceous cover	No	No	No	No
Snapping turtle (*Chelydra serpentina*)	Shallow waters of streams, creeks, and ponds; often with sandy or muddy bottoms	Yes	Yes	Yes	Yes
Spiny softshell (*Apalone spinifera*)	Large rivers and tributaries with sandy or muddy bottoms and slow moving water	Yes	Yes	Yes	Yes
Western milksnake [f] (*Lampropeltis gentilis*)	Open areas with sandy or rocky soils; often in sagebrush-grassland habitats	Yes	No	No	No

TABLE 7.7.1-4

BLM Sensitive Species with Recent Occurrences (1995 and later) in the Facility Locations [a,b,c]

Species	Habitat	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
Western (plains) hog-nosed snake [f] (*Heterodon nasicus*)	Open areas with sandy soils; often in sagebrush-grassland habitats but can also use farmlands and floodplains	Yes	Yes	Yes	Yes
INVERTEBRATES					
A mayfly [f] (*Raptoheptagenia cruentata*)	Large perennial streams and rivers with sandy and/or gravely substrate	Yes	No	No	No
Western bumble bee (*Bombus occidentalis*)	Open grasslands, prairie, meadows, and sagebrush steppe; can also be found in urban gardens	No	No	No	No
PROJECT TOTAL (count)		**23**	**16**	**17**	**17**

[a] Due to access roads in the Facility Location, the Study Area could lack a species found within the Facility Location if an access road reaches beyond the Study Area corridor.

[b] Occurrence information is based on publicly available data and natural heritage inventory data. If no observation date information was available, the occurrence was included within recent occurrences.

[c] For data on recent occurrence in (1995 and later) in the wider Study Area (a 2-mile-wide corridor), see Appendix F. If no date information was available, the occurrence was included within recent occurrence.

[d] For historic occurrences of BLM Sensitive species that could occur in the Facility Locations, see Appendix G.

[e] Species has a recent occurrence in (1995 and later) in the wider Study Area (see Appendix G). If no date information was available, the occurrence was included within recent occurrence

[f] These species are listed as SOC with ranks S1 or S2 and are further addressed under State Species of Concern.

Note: Yes = recent occurrence in the Facility Location (1995 and later); no = no recent occurrence in the Facility Location. Also, if no date information was available, the occurrence was noted as a recent occurrence.

Sources: Bureau of Land Management, 2020; Montana Natural Heritage Program, 2025a,b; eBird, 2025

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State Species of Concern

There are no state-listed species or state-designated critical habitats in Montana identified or protected under state law. However, the State of Montana applies a state SOC designation to native species based on the species state rank, which is a standardized numeric ranking system developed by NatureServe (NatureServe, 2023). An SOC designation does not serve a regulatory or statutory purpose; rather, it is used by MFWP staff to guide and prioritize management efforts, with a state rank of S1 having the highest conservation priority (MNHP, 2009). As part of this effort, the MFWP developed the SWAP to identify the species and their associated habitats most in need of conservation, including habitats occupied at least seasonally and critical to SOCs, referred to as SGCN and CTGCN (described in Section 7.7.1.2) (MFWP, 2015). All SOC are considered SGCN in the SWAP. However, conservation actions were developed only for CTGCN (i.e., Tier I) and SGCN (State Rank S1 and S2) (MFWP, 2015).[8]

Tier I CTGCNs are habitats with the greatest need for conservation that support at least 66.7 percent of all SGCN within an ecoregion, while Tier II CTGCNs are habitats with moderate conservation need that are associated with at least 10 percent, but less than 66.7 percent, of all SGCN within an ecoregion. The SWAP further identifies TFAs, which are specific areas within a CTGCN that have been identified as having a particular need for conservation (MFWP, 2015). Like CTGCNs, TFAs are designated as either Tier I or Tier II, with Tier I TFAs having the highest conservation priority. There are four Tier I TFAs within one or more of the alternative Facility Locations, including the Lower Powder River, Rosebud Creek, Yellowstone River, and Sheep Creek TFAs. The Alternative D Facility Location contains all four Tier I TFAs, while the other alternative Facility Locations contain three Tier I TFAs. It should be noted that an additional Tier I TFA, the Ingomar Tier I TFA, identified by the MFWP as one of the top two TFAs in MFWP Region 1 in regard to conservation priority, is located adjacent to the Alternative A Facility Location (MFWP, 2024c).

Occurrence data from the MNHP (2023a) identified 39 SOCs with recent recorded occurrences (i.e., within the last 30 years) in at least one of the alternative route Facility Locations. See Appendix F for information on SOC occurrence in the wider Study Area. A comprehensive list of these SOC with occurrences and years they were last observed is provided in Appendix G. Migratory birds account for 16 of the SOCs, 3 of which are raptors. Table 7.7.1-5 summarizes the number of recent SOC occurrences (all state ranks) by alternative route. A recent occurrence was defined as occurring in 1995 or later. Alternative A has the most SOCs with recent occurrences in the Facility Locations, followed by Alternative B and C, which have the same number of SOCs, then D. For information on historic SOC occurrences, see Appendix G.

Table 7.7.1-6 provides recent occurrences of species with the highest conservation priorities (S1 and S2 species) in the Facility Locations, along with their preferred habitats. See Appendix F for information on S1 and S2 SOC species occurrence in the wider Study Area. The species include one SOC with a state rank of S1/S2, eight with a state rank of S2, and one with a state rank of S2/S3, including one mammal, two insects, two birds, two reptiles, and three fish (see Section 7.8 for further information on fish SOCs). The SWAP does not address insect species' CTGCNs or TFAs. All of the S1 and S2 non-insect species, besides the gray-crowned rosy finch, are associated with at least one of the six CTGCNs and one of the four Tier I TFAs within the Facility Locations and/or the one Tier I TFA in the Alternative A Study Area (MFWP, 2015). This analysis

[8] This assessment refers to SOCs, with the understanding that they also represent SGCN status.

provides a more detailed discussion for the GRSG, an S2 species, and STGR, an S4 species, given their state status and/or MFWP conservation concerns.

TABLE 7.7.1-5

Number of Montana Wildlife Species of Concern (All State Ranks) with Recent Occurrences (1995 and later) in the Facility Locations (counts) [a,b,c]

Documented Occurrences	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
Recent Occurrences	36	28	28	27

[a] For historic occurrences of SOC species that could occur in the Facility Locations (pre-1995), see Appendix G.
[b] If no date information was available, the occurrence was included within recent occurrences.
[c] For species data in the wider Study Area (a 2-mile-wide corridor), see Appendix F.
Source: Montana Natural Heritage Program, 2025a,b, eBird 2025

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TABLE 7.7.1-6

Montana State Rank S1 and S2 Terrestrial Species of Concern with Recent Occurrences (1995 and later) in the Alternative Facility Locations [a,b,c]

Species	Montana State Rank	Associated Habitat (CTGCN / Tier 1 Terrestrial Focal Area)	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
MAMMALS						
Little brown bat (*Myotis lucifugus*)	S2/S3	Conifer-Dominated Forest and Woodland Floodplain and Riparian Sagebrush Steppe and Sagebrush-Dominated Shrubland Ingomar Focal Area Lower Powder Focal Area Rosebud Creek Focal Area Sheep Creek Focal Area Yellowstone Creek Focal Area	Yes	Yes	No	Yes
BIRDS						
Chestnut-collared longspur (*Calcarius ornatus*)	S2	Lowland/Prairie Grassland Ingomar Focal Area Lower Powder Focal Area Rosebud Creek Focal Area Sheep Creek Focal Area	No [d]	No [d]	No [d]	Yes
Gray-crowned rosy-finch (*Leucosticte tephrocotis*)	S2	No Tier 1 Focal Areas in the Facility Location	No [d]	No [d]	No [d]	No [d]
Greater sage-grouse (*Centrocercus urophasianus*)	S2	Floodplain and Riparian Wetlands Sagebrush Steppe and Sagebrush-Dominated Shrubland Ingomar Focal Area Lower Powder Focal Area Rosebud Creek Focal Area Sheep Creek Focal Area Yellowstone Creek Focal Area	Yes	Yes	Yes	Yes
Mountain plover (*Charadrius montanus*)	S2	Floodplain and Riparian Lowland/Prairie Grassland Sagebrush Steppe and Sagebrush-Dominated Shrubland Ingomar Focal Area Lower Powder Focal Area Rosebud Creek Focal Area Sheep Creek Focal Area Yellowstone Creek Focal Area	No [d]	No	No	No

TABLE 7.7.1-6

Montana State Rank S1 and S2 Terrestrial Species of Concern with Recent Occurrences (1995 and later) in the Alternative Facility Locations [a,b,c]

Species	Montana State Rank	Associated Habitat (CTGCN / Tier 1 Terrestrial Focal Area)	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
REPTILES						
Western milksnake (*Lampropeltis gentilis*)	S2	Conifer-Dominated Forest and Woodland Floodplain and Riparian Lowland/Prairie Grassland Sagebrush Steppe and Sagebrush-Dominated Shrubland Ingomar Focal Area Lower Powder Focal Area Rosebud Creek Focal Area Sheep Creek Focal Area Yellowstone Creek Focal Area	Yes	No	No	No
Western (plains) hog-nosed snake (*Heterodon nasicus*)	S2	Conifer-Dominated Forest and Woodland Wetlands Floodplain and Riparian Lowland/Prairie Grassland Sagebrush Steppe and Sagebrush-Dominated Shrubland Ingomar Focal Area Lower Powder Focal Area Sheep Creek Focal Area	Yes	Yes	Yes	Yes
INSECTS [e]						
A sand-dwelling mayfly (*Homoeoneuria alleni*)	S1/S2	NA	No [d]	No	No	No
A mayfly (*Raptoheptagenia cruentata*)	S2	NA	Yes	No	No	No
Gray comma (*Polygonia progne*)	S2	NA	Yes	Yes	Yes	No [d]
PROJECT TOTAL (count)			**6**	**4**	**3**	**4**

TABLE 7.7.1-6

Montana State Rank S1 and S2 Terrestrial Species of Concern with Recent Occurrences (1995 and later) in the Alternative Facility Locations [a,b,c]

Species	Montana State Rank	Associated Habitat (CTGCN / Tier 1 Terrestrial Focal Area)	Alternative A	Alternative B	Alternative C	Alternative D (Refined)

[a] If no date information was available, the occurrence was included within recent occurrences. For historic occurrences of SOC species that could occur in the Facility Locations (pre-1995), see Appendix G.

[b] Due to the inclusion of access roads in the Facility Location analysis, the Study Area could lack a species found within the Facility Location, if an access road reaches beyond the Study Area corridor.

[c] For species data in the wider Study Area (a 2-mile-wide corridor), see Appendix F;

[d] Species documented to occur in the wider Study Area (see Appendix F).

[d] The monarch butterfly (*Danaus plexippus*) is designated as S2/S3. However, the species is not discussed here since it is included in the federally listed, proposed, and under review species section.

Note: CTCGN = Community Type of Greatest Conservation Need, NA = No CTGCN or Tier 1/2 Focal Areas assigned in the Montana's State Wildlife Action Plan.

Source: Montana Fish, Wildlife, and Parks, 2015, 2024c; MNHP 2025a,b; eBird 2025

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Greater Sage-grouse and Sharp-tailed Grouse

The Circular MFSA-2 Section 3.4 (1)(p) and Section 3.7 (12)(b)(xviii) requires analysis of potential Project impacts to GRSG and STRG. All four alternative routes have potential for presence of these two species. The GRSG is considered to be one of the primary SOCs in Montana, with a state rank of S2. Although not federally protected, this species is protected under Montana State EO 12-2014, as amended by EO 12-2015, which requires projects undergoing state permitting to conduct a consistency review and follow requirements under the EO. The GRSG is also regulated under the Montana Greater Sage Grouse Stewardship Act and the BLM Miles City Field Office ARMP (BLM, 2015a). According to the ARMP, the BLM has certain land use restrictions for major rights-of-way (defined as at least 100-kV for high voltage (HV) transmission lines) in GRSG habitat management areas. The STGR is an important game bird closely monitored by the MFWP (MNHP and MFWP, 2023; MFWP, 2015). GRSG and STGR lek data were provided by the MFWP. The data were used to analyze the number of leks within the Facility Locations and Study Areas of the four alternative routes. The MFWP does not have winter distribution and/or concentration area data mapped for these species (B. Dorak, MFWP, personal communication, Feb. 22, 2023). General distribution data for the analysis is from the MFWP (2024a,b).

Greater Sage-grouse

Prime GRSG habitat includes sagebrush habitats inclusive of riparian meadows and grassland (MNHP and MFWP, 2023; Montana Sage Grouse Working Group [MSGWG], 2005). Males gather at breeding sites (i.e., leks) during mid-March to mid-April in open areas such as burned areas, ridgetops, grassy swales, dry lake beds, and cultivated fields. Leks are often surrounded by quality nesting habitat with sagebrush cover (MNHP and MFWP, 2023). Although sagebrush is important during all life stages, dense sagebrush with increased canopy cover is especially important for overwintering and nesting activities (MNHP and MFWP, 2023; MSGWG, 2005).

The Montana Sage-grouse Habitat Conservation Program (SGHCP) requires any new project activity occurring in known GRSG Core Area, Connectivity Area, or General Habitat to undergo DNRC review (MSGCP, 2023). Greater Sage grouse Core Area, Connectivity Area, and General Habitat are defined below (MSGCP, 2023).

- Core Area: sagebrush habitat that are of highest GRSG conservation priority and include about 76 percent of the breeding males in Montana.
- Connectivity Area: habitat that provide pathways between GRSG populations; primarily between Core Areas or other priority populations.
- General Habitat: habitat that is generally suitable for sage grouse but has not been identified as a Core Area or Connectivity Area.

Analyses were conducted to assess linear miles and total acreages of these areas in relation to the alternative Facility Locations and Study Areas (see Appendix F), as well as of leks that are confirmed active. Expanded Study Areas were used for the GRSG analysis, including 0.5-mile-, 4-mile-, and 8-mile-wide corridors for leks based on a No Surface Occupancy buffer of 0.25 mile from an active lek and prohibited activities and required protective measures within 2.0 miles of an active lek during the breeding season in General Habitat, and a No Surface Occupancy buffer of 1.0 mile in Core and Connectivity Areas (MSGCP, 2023) (see Appendix F).

No Connectivity Areas occur in the Facility Locations or Study Areas (MSGCP, 2023) (see Appendix F). The four alternative Facility Locations do not contain any confirmed active GRSG leks within General Habitat (see Table 7.7.1-7). However, the alternative Study Areas cross varying amounts of General Habitat that include confirmed active leks and their buffers (see Table 7.7.1-7 and 7.7.1-8; and Figures E-9i and E-9j in Appendix E). All Facility Locations contain General Habitat on BLM lands. None of the alternative Facility Locations contain Core Area habitat. Core Area habitat is located in the wider Study Area of Alternative A, north of the Yellowstone River. No alternative routes crossed confirmed active leks or their respective buffers in Core Area habitat within the Study Area (see Appendix F).

TABLE 7.7.1-7

Greater Sage-grouse Habitat in the Facility Locations (acres) [a]

Habitat Type	Alternative A acres (prop.)	Alternative B acres (prop.)	Alternative C acres (prop.)	Alternative D (refined) acres (prop.)
General Habitat	10,383 (71%)	11,879 (91%)	11,362 (86%)	13,665 (90%)
Core Area	0 [c]	0	0	0
Connectivity Area	0	0	0	0
PROJECT TOTAL [cd]	**10,383 (71%)**	**11,879 (91%)**	**11,362 (86%)**	**13,665 (90%)**

[a] For data on the wider Study Areas, see Appendix F.
[b] Core Habitat can be found in the wider Study Area (see Appendix F).
[c] Totals reflect total acres of habitat type crossed by each alternative route, not the total acres of the alternative routes.
Note: prop. = proportion of the total acreage of the Facility Location
Source: Montana Fish, Wildlife, and Parks, 2023e

TABLE 7.7.1-8

Linear Miles of Greater Sage-grouse Habitat Crossed by the Alternative Routes

Habitat Type	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
General Habitat	127.7	147.7	135.3	160.4
Core Area	0	0	0	0
Connectivity Area	0	0	0	0
PROJECT TOTAL	**127.7**	**147.7**	**135.3**	**160.4**

Source: Montana Fish, Wildlife, and Parks, 2023e

TABLE 7.7.1-9

Greater Sage-grouse Leks in General Habitat in the Alternative Facility Locations (count)

Lek Activity Status	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
Confirmed Active	0	0	0	0

Source: Montana Fish, Wildlife, and Parks, 2023f

Sharp-tailed Grouse

Analyses were conducted to assess linear miles and total acreages of these areas in relation to the alternative Facility Locations and the Study Area (see Appendix F), as well as of leks, regardless of activity status. A 2-mile-wide Study Area (see Appendix E) was used in the analysis for general habitat and leks in general habitat (regardless of activity status) in accordance with MFSA-2 Section 3.7(12).

The Circular MFSA-2 requires an assessment of potential Project impacts to STGR. Although they are not protected under federal or state law, their populations are of increasing concern to MFWP. This species is distributed throughout Montana east of the Continental Divide (MNHP and MFWP, 2023). General STGR habitat consists of mixed grasslands, sometimes intermixed with shrubs, brushy ravines, and trees (MNHP and MFWP, 2023). These diverse landscapes offer varying amounts of canopy cover which provide essential cover for nesting, resting, feeding, and overwintering. STGR general habitat is within the Facility Locations of all four alternative routes, and STGR leks are within the Facility Locations of all alternatives (see Table 7.7.1-10).

TABLE 7.7.1-10

Sharp-tailed Grouse Leks in General Habitat in the Facility Locations (count) [a]

Habitat	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
Leks within General Habitat	2	1	1	4

[a] For data on the wider Study Area (a 2-mile-wide corridor), see Appendix F.
Source: Montana Natural Heritage Program, 2023a

Migratory Birds

The Circular MFSA-2 requires assessment of potential Project impacts to IBAs. IBAs are areas that have been identified as globally important for bird conservation via a partnership between the National Audubon Society and BirdLife International. Analysis of IBA locations revealed that no IBAs occur in the Facility Locations. The closest IBA, Mussellshell Sage-steppe, is about 5.1 miles northwest of Alternative A (National Audubon Society, 2023) and will not be affected by the Project. As this area is not within the Facility Locations and will not be affected by the Project, it is not discussed further in this document.

Migratory bird species are federally protected under the MBTA, which makes it illegal to take or kill these species without a permit. Additionally, the Fish and Wildlife Conservation Act was amended to require the USFWS to generate a Birds of Conservation Concern (BCC) list that includes bird species at risk of becoming threatened or endangered. The IPaC report identified numerous BCCs as having the potential to occur within or adjacent to the Facility Locations of each alternative route (see Table 7.7.1-11).

All of these species could have breeding populations within or around the Facility Locations, with the exception of the lesser yellowlegs, which only migrates through Montana (MNHP and MFWP, 2023). Baird's sparrow (*Ammodramus bairdii*), bobolink (*Dolichonyx oryzivorus*), chestnut-collared longspur (*Calcarius ornatus*), ferruginous hawk, lark bunting (*Calamospiza melanocorys*), grasshopper sparrow (*Ammodramus savannarum*), mountain plover (*Charadrius montanus*), northern harrier (*Circus hudsonius*), prairie falcon (*Falco mexicanus*), Sprague's pipit (*Anthus spragueii*), and thick-billed longspur (*Rhynchophanes mccownii*) all rely on prairie, grasslands, and/or open country as prime habitat (MNHP and MFWP, 2023). The black tern (*Chlidonias niger*), California gull (*Larus californicus*), Franklin's gull (*Leucophaeus pipixcan*), lesser yellow legs (*Tringa flavipes*), western grebe (*Aechmophorus occidentalis*), and willet (*Tringa semipalmata*) prefer habitats near wetlands and waterbodies. The red-headed woodpecker (*Melanerpes erythrocephalus*), black-billed cuckoo (*black-billed cuckoo*), and Pinyon jay (*Gymnorhinus cyanocephalus*) prefer forested woodlands (MNHP and MFWP, 2023). Given the extent of the Facility Locations, all these habitats would be crossed by each alternative route.

The four alternative routes would cross habitat suitable for a number of raptors. Along with the MBTA, raptors are protected by the state under 87-5-203, MCA, which makes it illegal to hunt, capture, kill, possess, purchase, or transport raptors. The Circular MFSA-2 Section 3.7 (12)(b)(xxiv) requires the assessment of raptor nests within 0.5 mile of a project and all alternative locations. There are 24, 19, 19, and 17 raptor nests, not including bald and golden eagle nests (see below), within 0.5 miles of the Facility Locations A, B, C, and D, respectively. Additionally, bald and golden eagles are further protected under the BGEPA (see below). Examples of common raptor species that could occur in the within or around the Facility Locations include the Cooper's hawk, merlin, prairie falcon, American kestrel (*Falco sparverius*), northern harrier, and osprey (*Pandion haliaetus*). As noted, there were three SOC raptor that have occurrence records within at least one alternative route Facility Location, including burrowing owl, ferruginous hawk, and golden eagle. This species may be found along the alternative routes in grassland/shrub-scrub habitats (MNHP and MFWP, 2023).

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TABLE 7.7.1-11

Migratory Birds of Conservation Concern with Recent Occurrences (1995 and later) in the Facility Locations [a]

Species	Habitat Requirements	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
Baird's sparrow (*Ammodramus bairdii*)	Prime nesting habitat is in native prairie with little to no grazing.	Yes	Yes	Yes	Yes
Black tern (*Childonias niger*)	Nesting habitat generally found in wetlands, marshes, and small ponds with emergent vegetation; occasionally on manmade islands.	Yes	No [e]	No	No [e]
Black-billed cuckoo (*Coccyzus erythropthalmus*)	Generally found in wooded draws, forest edges, shelterbelts, and deciduous woodlands in riparian areas.	No [e]	No [e]	No	No
Bobolink (*Dolichonyx oryzivorus*)	Found in hay fields and grasslands. Builds nests in tall grass and mixed-grass prairies.	Yes	Yes	Yes	Yes
California Gull (*Larus californicus*)	Found near large lakes but can also use rivers and ponds. Builds nests in colonies on islands; generally in low vegetation or bare ground.	No	No [e]	No [e]	No [e]
Chestnut-collared longspur (*Calcarius ornatus*)	Found in native prairie with short to medium grasses.	No [e]	No [e]	No [e]	Yes
Ferruginous hawk (*Buteo regalis*)	Found in mixed-grass prairie, grasslands, grass-sagebrush complex, and sagebrush steppe. Builds nests on rock outcrops, on ground, or elevated.	Yes	Yes	No [e]	No [e]
Franklin's gull (*Leucophaeus pipixcan*)	Generally found in prairie marsh habitats. Nests are built over water on emergent aquatic vegetation. Prime nesting sites have water levels that remain high throughout nesting season.	No [e]	No [e]	No [e]	No [e]
Grasshopper Sparrow (*Ammodramus savannarum*)	Prefers open prairie with intermittent brush.	Yes	Yes	Yes	Yes
Lark bunting (*Calamospiza melanocorys*)	Found in prairies and grasslands with short and mixed-grasses; occasionally in hayfields and along roadsides.	Yes	Yes	Yes	Yes
Lesser yellowlegs (*Tringa flavipes*)	Can be found in along mudflats and shallow ponds during migration. Prime breeding habitat is open woodlands, meadows, and muskegs.	No [c]	No	No	No
Mountain plover (*Charadrius montanus*)	Prime breeding season habitat is found in heavily grazed, shortgrass prairie; commonly uses prairie dog colony habitat.	No [e]	No	No	No
Northern harrier (*Circus hudsonius*)	Occupies open grasslands near water, such as wet meadows and marshes, Nests in dense vegetation in open, undisturbed grasslands. Diet primarily consists of voles, but may prey on birds, amphibians, reptiles, and insects.	Yes	No [e]	Yes	Yes
Pinyon jay (*Gymnorhinus cyanocephalus*)	Found in ponderosa pine and pine-juniper forests at lower elevations.	Yes	No [e]	Yes	No [e]

TABLE 7.7.1-11

Migratory Birds of Conservation Concern with Recent Occurrences (1995 and later) in the Facility Locations [a]

Species	Habitat Requirements	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
Prairie falcon (*Falco mexicanus*)	Nesting habitat is found on cliffs, often overlooking prairie habitat. Open grasslands/prairies are used for hunting grounds.	No [e]	No [e]	No [e]	Yes
Red-headed woodpecker (*Melanerpes erythrocephalus*)	Habitat not well understood in Montana, although thought to prefer forested areas near riparian habitat; occasionally in open savannah and burn areas provided there are sufficient canopy cover and snags.	Yes	No [e]	No	No
Sprague's pipit (*Anthus spragueii*)	Found in grassland prairies with medium height grasses; native prairie is preferred but can sometimes be found in non-native prairies. Breeding habitat is found in meadows near edges of alkaline lakes.	No [e]	No [e]	No [e]	No
Thick-billed longspur (*Rhynchophanes mccownii*)	Semi-arid shortgrass steppes, characterized by open space and sparse vegetation.	No	No	No	No
Western grebe (*Aechmophorus occidentalis*)	Large, open freshwater lakes and marshes with various species of fish, crustaceans, and insects for forage.	No [e]	No	No	No
Willet (*Tringa semipalmata*)	Associated with wetlands and grasslands near waterbodies; uses short, sparse vegetation cover.	No	No	No	Yes
PROJECT TOTAL (COUNTS)		**9**	**5**	**6**	**8**

[a] Due to access roads in the Facility Location, the Study Area could lack a species found within the Facility Location if an access road reaches beyond the Study Area corridor.

[b] If no date information was available, the occurrence was included within recent occurrences. For historic occurrences of SOC species that could occur in the Facility Locations (pre-1995), see Appendix G.

[c] For data on recent occurrence in (1995 and later) in the wider Study Area (a 2-mile-wide corridor), see Appendix F.

[d] For a full list of migratory birds of conservation concern species that could occur in the Facility Locations, including occurrences before 1995, see Appendix G

[e] Species has a recent occurrence in (1995 and later) in the wider Study Area (see Appendix F).

Source: U.S. Fish and Wildlife Service, 2023b; Montana Natural Heritage Program, 2025a,b; eBird, 2025

Bald and Golden Eagles

Bald and golden eagles can both be found in Montana and are afforded federal protections under the BGEPA and MBTA. Bald eagles are present throughout Montana as a year-long resident, although some may move to more temperate climates in the winter (Montana Bald Eagle Working Group [MBEWG], 1986). Nesting in Montana begins between March and April and typically occurs in the tops of mature trees near fish-bearing waterbodies, particularly cottonwood, ponderosa pine, and Douglas fir (MBEWG, 1986; MNHP and MFWP, 2023). Suitable habitat is limited to the five larger perennial streams outside of the Facility Locations (see Section 7.8). Nearby upland sites can also provide additional foraging opportunities. Live trees are generally preferred for nesting and found within timber stands with canopy closures less than 80 percent (MBEWG, 1986). Bald eagles exhibit high nest fidelity, using the same nest every year.

The golden eagle is a year-round resident throughout Montana and is identified as a state SOC (MFWP, 2015). Golden eagles primarily nest in rugged terrain (e.g., cliffs and rock faces) but have also been documented nesting in large, mature trees (MNHP and MFWP, 2023). Nests are similar in construction to that of the bald eagle: large in diameter and comprised of large sticks, grass, and dead vegetation. Eggs are laid between March and April and incubate for about 45 days (McGahan, 1968; MNHP and MFWP, 2023). Like bald eagles, golden eagles exhibit high nest fidelity. Golden eagles use rangeland habitat for hunting, which accounts for the vast majority of habitat in the Facility Locations and surrounding area for all alternative routes (see Table 7.3.1-3).

The Study Areas for bald and golden eagles were established as a 1-mile-wide corridor and a 2-mile-wide corridor, respectively, based on recommended nest disturbance set-back buffers in the 2024 Eagle Rule under the BGEPA (50 C.F.R 13 and 22). Both species are documented to occur within range of all four alternative routes based on state observation data, which includes occurrences of bald and golden eagles within 0.5 mile (1-mile-wide corridor) and 1 mile (2-mile-wide corridor) of the alternative centerlines, respectively (see Figure E-9k in Appendix E). Bald eagle nests have not been documented in any of the Facility Locations (see Table 7.7.1-12); however, three have been documented in the larger Study Area of Alternative B ranging from 879 to 2,021 feet from the centerline (see Appendix F). There are no documented golden eagle nests within the larger Study Area of any of the alternative routes. While no bald or golden eagle nests were documented in the alternative Facility Locations, historic data may underestimate nest occurrences along all four routes given the incomplete survey data available. Project-specific surveys will be carried out for the selected route to ensure the Project is in compliance with BGEPA.

TABLE 7.7.1-12

Eagle Nests and Individual Observations in the Facility Locations

	Alternative A		Alternative B		Alternative C		Alternative D (Refined)	
Species	Nests	Obs.	Nests	Obs.	Nests	Obs.	Nests	Obs.
Bald eagle	0	9	0	1	0	2	0	1
Golden eagle	0	2	0	0	0	3	0	0

[a] For species data in the wider Study Area (a 1-mile-wide and 2-mile-wide corridor for bald and golden eagles, respectively), see Appendix F

Note: Obs. = observations

Source: Montana Natural Heritage Program, 2025a,b

Waterfowl and Waterbirds

The Circular MFSA-2 Section 3.7(12)(b)(xxii) requires analysis of potential Project impacts to prime waterfowl habitat and nesting colonies of waterbirds (e.g., gulls, herons, double-crested cormorants, and terns), with a "nesting colony" defined as five or more pairs within 40 acres. Waterfowl and waterbirds are also considered migratory birds and are protected under the MBTA, with exceptions for regulated hunting of certain species.

Waterbirds and waterfowl rely on freshwater lakes, streams, and wetland habitat with aquatic invertebrates, small fish, and aquatic plants throughout their lifecycle. Grasslands and crop fields can also serve as important habitat for nesting and foraging for some species. There are many common waterfowl and waterbird species that may use these habitats in the Facility Locations as year-round residents or seasonal migrants. Some examples are provided with the State Species of Concern section above, and may also include American wigeon, red-breasted merganser (*Mergus serrator*), canvasback (*Aythya valisineria*), Wilson's snipe (*Tringa glareola*), great egret (*Ardea alba*), and American white pelican (*Pelecanus erythrohynchos*) (MNHP and MFWP, 2023).

A number of special status waterfowl and waterbird species have recent documented occurrences in the Facility Locations (see Table 7.7.1-13). For information on the wider Study Area (2-mile-wide corridor) and historic occurrences (see Appendices F and G). For this analysis, special status species include those protected under the ESA, BLM sensitive species, migratory BCC, and/or are a SOC with a state rank of S1 or S2.

For this assessment, prime waterfowl habitat was identified as waterbodies greater than 20 acres in or overlapping with the Facility Locations, as these would be capable of supporting high waterfowl densities. The Facility Locations of Alternatives A, B, C, and D overlap 3, 7, 6, 7 waterbodies 20 acres or larger, respectively (see Figure E-9I in Appendix E) (University of Montana, 2022; USGS, 2022). No agency-designated Waterfowl Protection Areas were documented in the Facility Locations.

The MNHP data (MNHP, 2025a,b) did not include nesting data for white pelicans, double-crested cormorants, or gulls. There are no recent (i.e., since 1995) documented occurrences of waterbird nesting colonies identified in the Facility Locations of any alternative route. Six great blue heron colonies, with varying numbers of nests, were identified in cottonwood groves within the Study Areas of Alternatives A, B, and C. Alternative B had the most rookeries at three, followed by Alternative A with two, and Alternative C with one (MNHP, 2025a,b). None occurred within the Alternative D Study Area (MNHP, 2025a,b).

TABLE 7.7.1-13

Recent Occurrences (1995 and later) of Special Status Waterbird Species in the Alternative Facility Locations [a,b]

Species	Protection Status	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
American bittern (*Botaurus lentiginosus*)	BLM-S	Yes	Yes	Yes	Yes
Black tern (*Chliodonias niger*)	BCC, BLM-S	Yes	No [e]	No	No [e]
California gull (*Larus californicus*)	BCC	No	No [e]	No [e]	No [e]
Common tern (*Sterna hirundo*)	BLM-S	No [e]	No [e]	No [e]	No [e]
Franklin's gull (*Leucophaeus pipixcan*)	BCC, BLM-S	No [e]	No [e]	No [e]	No [e]
Lesser yellowlegs (*Tringa flavipes*)	BCC	No [e]	No	No	No
Long-billed curlew (*Numenius americanus*)	BLM-S	No [e]	No [e]	No [e]	No [e]
Mountain plover (*Charadrius montanus*)	BCC, BLM-S, SOC	No [e]	No	No	No

TABLE 7.7.1-13

Recent Occurrences (1995 and later) of Special Status Waterbird Species in the Alternative Facility Locations [a,b]

Species	Protection Status	Alternative A	Alternative B	Alternative C	Alternative D (Refined)
Western grebe (*Aechmophorus occidentalis*)	BCC	No [e]	No	No	No
Willet (*Tringa semipalmata*)	BCC	No	No	No	Yes
PROJECT TOTAL (count)		**2**	**1**	**1**	**2**

[a] Due access roads in the Facility Locations, the Study Area could lack a species found within the Facility Location if an access road reaches beyond the Study Area corridor.
[b] Occurrence information is based on publicly available data and natural heritage inventory data. If no observation date information was available, the occurrence was included within recent occurrences.
[c] For data on recent occurrence in (1995 and later) in the wider Study Area (a 2-mile-wide corridor), see Appendix F.
[d] For historic occurrences of special status waterbird species that could occur in the Facility Locations (pre-1995), see Appendix G.
[e] Species has a recent occurrence in (1995 and later) in the wider Study Area (see Appendix F).
Sources: Montana Natural Heritage Program, 2025a,b; eBird, 2025; U.S. Fish and Wildlife Service, 2023b; Bureau of Land Management, 2020

7.7.2 Impact Assessment

7.7.2.1 Common Impacts Assessment and Mitigation Measures

Construction

General Wildlife Habitat and Nongame Species

The primary construction impacts to wildlife populations are disturbance, injury, mortality, displacement, and habitat fragmentation, which could occur in the short term. Disturbance from construction noise and human presence will cause the short-term displacement of more mobile wildlife in all habitat types crossed (e.g., small mammals, birds, and big game), which would increase competition for resources in adjacent areas. Construction noises can range from about 60 to 90 dBA, depending on activity and distance from the construction site (U.S. Department of Energy [DOE], 2011). Birds nesting in trees or on the ground near the activity may reestablish nests elsewhere and/or experience nesting failures due to stress. Raptor perching and nesting behaviors may be influenced by construction disturbance and result in short-term avoidance of the construction area. Species that exhibit large movement patterns, such as big game and birds, may adjust their migration routes around construction areas. This disturbance would be minor since an abundance of similar habitat occurs in areas adjacent to the Facility Locations (see Table 7.3.1-3 and Figure E-3a in Appendix E).

Less mobile species, such as amphibians, invertebrates, reptiles, and wildlife young, could be injured or killed by equipment. Impacts during construction would be localized and would not have population-level effects. Since transmission line construction occurs in stages, disturbance will occur intermittently in the same areas over about one to three years. Most wildlife would return to the area of disturbance once construction has ceased.

Habitat degradation caused by clearing vegetation, excavation, and grading, along with the introduction of invasive weeds, may result in less suitable foraging, nesting, and sheltering habitat for wildlife. These impacts would be short- to long-term depending on the species and success of site restoration after construction.

Habitat fragmentation results from the breaking up of continuous habitats into smaller, isolated fragments. This could occur during construction within portions of the 200-foot-wide transmission line right-of-way due to vegetation removal and construction activity. The fragmentation resulting from Project construction would generally be short-term since the majority of land cover class crossed by the alternative routes is herbaceous. These habitats will reestablish more quickly than woody vegetation, and wildlife populations will not experience mortality or population-level effect due to short-term fragmentation.

Impacts to wildlife will be minimized or avoided with mitigation measures described for soils (see Section 7.4.2.2), water resources (see Sections 7.5.1.2, 7.5.2.2, 7.5.3.2, 7.5.4.2, and 7.5.5.2), and vegetation (see Section 7.6.2.2) that reduce erosion, stormwater runoff, and weed infestation. In addition, North Plains will implement measures described in the CMRP and accompanying plans to further minimize impacts, such as providing environmental awareness training for all construction personnel, restricting construction vehicles and equipment to access roads and the Project workspace. The Project will also implement minimization measures established in coordination with applicable regulatory or land management agencies. These measures will be reflected in the National Environmental Policy Act (NEPA) / Montana Environmental Policy Act documents prepared by the regulatory agencies as well as North Plains final CMRP.

Unique Habitats and Natural Areas

The potential special interest areas that could be affected by the Project, Fort Keogh, MLR conservation easement, and MFWP (Bice and Hirsch Ranch) conservation easements, are mainly comprised of herbaceous and shrub/scrub habitat. Project construction could lead to short-term effects on species populations such as pronghorn, sharp-tailed grouse, or black-tailed prairie dog (see Figure E-9h in Appendix E). Construction could cause a temporary loss of habitat and injury to or mortality of less mobile species. With successful revegetation measures, no long-term impacts on wildlife would occur.

Big Game Species

Big game species that may be affected by Project construction are the same for all four alternatives and include primarily white-tailed deer, mule deer, pronghorn, and bighorn sheep, and elk. Elk impacts would likely be limited to Rosebud County. The Project is not likely to affect moose; although the Facility Locations overlap moose native range, there is no current known occupancy and habitat is sparse. It should be noted that the pronghorn population nearest to the Facility Locations are not known to be migratory (Millspaugh et al., 2021), so they are not expected to migrate through the Facility Locations. Primary impacts could include short-term loss of forage and displacement caused by construction disturbance. In addition to displacement, construction disturbances may also cause short-term, minor disruptions to normal activities (e.g., foraging, bedding, and migrating). In addition to hunting pressure, cumulative impacts from construction on big game will be negligible given the approximately 3-month period construction disturbance and the hunting season will overlap (generally September to November) in any given area (MFWP, 2023c). Species would return to normal patterns and movements once construction is complete. Herbaceous forage and some shrubs in the right-of-way will be allowed to reestablish. However, vegetation will not be allowed to grow within 35 feet of the bottom of the transmission line and trees generally will not be allowed to reestablish in the right-of-way due to safety reasons, which would lead to negligible, long-term reduction in available browse.

All four alternative routes cross designated winter range of white-tailed deer, mule deer, and pronghorn. Although MFWP does not currently designate the Blue Hills area as winter range for bighorn sheep (MNHP and MFWP, 2023), North Plains is evaluating this area as winter range since the population remains there year-round; therefore, it functionally provides winter range. Winter range is a crucial component of these species' survival by providing food sources and shelter.

Small Game Species

Most impacts to small game and nongame species from construction disturbance, habitat degradation, and fragmentation are covered under the general construction impacts described above. Similar to the impacts discussed for big game, construction disturbance coupled with hunting pressure on small game would be negligible and short-term, but for a longer period of time (generally September 1 through January 1) (MFWP, 2023c).

Federally Listed Species and Critical Habitat

No impacts to federally designated critical habitat would occur since it does not occur within or adjacent to the Facility Locations where it could be affected. Based on their potential to occur within or adjacent to the Facility Locations, Project construction could have short- to long-term adverse effects on four listed, proposed, or under review species, including the pinyon jay, northern long-eared bat (NLEB; *Myotis septentrionalis*), little brown bat (LBBA; *Myotis lucifugus*), and monarch butterfly (*Danaus plexippus)*. The remaining 10 under review, listed, or proposed species described in Section 7.7.1.5 are unlikely to be present and thus unlikely to be adversely affected.

Short-term, localized impacts to the pinyon jay could occur from tree felling and disturbance in forest habitat throughout the year since the species is a year-round resident. The risk of impacts would be minimized by following the Project's MBTA Compliance Plan, which includes tree clearing outside the general migratory bird nesting season (April 15 – July 15) or conducting nest searches and establishing no-disturbance buffers around active nests.

Potential impacts to the NLEB and LBBA would be similar to those for the pinyon jay, with higher potential impacts during the pup season in forest habitat from tree felling and disturbance when non-volant young could experience injury or mortality. While modeling showed no suitable habitat for the NLEB and low to moderately suitable habitat for the LBBA, both species could be present, although the NLEB in particular would likely be rare. The following minimization measures would be applied to minimize potential impacts to the NLEB and LBBA within summer habitat:

- During the pup season, North Plains will avoid construction, tree felling, and bridge repair within 1.5 miles of sites with NLEB or LBBA acoustic detections or potentially occupied bridges during the pup season (June 1 – August 15; USFWS, 2024a).

- If construction must occur in these areas during the pup season, presence / probable absence and telemetry surveys would be conducted to identify maternity roosts (to the extent possible) and would implement 150-foot avoidance buffers around identified maternity roosts.

- North Plains would also implement additional restrictions on burning and blasting activities within 0.25 mile of occupied bridges during the pup season when maternity roosts may be present.

North Plains will also implement conservation measures to minimize potential impacts to habitat adjacent to occupied or assumed occupied hibernacula, based on field surveys. North Plains will:

- Avoid tree felling within 5 miles of hibernacula during the active bat season (April 15 – October 31).
- Avoid burning and blasting activities within 0.25 mile of hibernacula between November 1 and April 14 when hibernacula may be in use.
- Develop site-specific blasting plans, if blasting is proposed within 0.5 mile of hibernacula.
- Avoid tree felling within 0.25 mile of hibernacula during staging and swarming (April 15 – May 14 and August 16 – October 31, respectively) and the pup season (June 1 – August 15) to minimize adverse effects to roosting bats during sensitive life stages.

The avoidance and minimization measures in the MBTA Compliance Plan would also help reduce impacts on bat species.

The monarch butterfly could experience mortality / injury, habitat loss, and displacement during construction within suitable habitat, which may include grasslands, shrublands, and forests. North Plains plans to minimize the use of herbicides and pesticides, which could harm the monarch butterfly. When applying herbicides and pesticides, North Plains would avoid aerial application to minimize potential impacts to non-targeted species and areas. Additionally, the implementation of speed limits within the Project would aid in minimizing collision fatalities. Habitat lost during construction would be revegetated using weed-free seed mixes that contain flowering plants, including milkweed, which is a larval host plant for the monarch butterfly. Potential impacts from displacement are anticipated to be minor since suitable habitat is abundant in the surrounding areas. Impacts are not anticipated for the other insect species described in Section 7.7.1.5 since they are not expected to occur within any of the Facility Locations. Though, if they were to occur, the conservation measures mentioned for monarch and the Project's proposed general conservation measures would also minimize potential impacts to these species.

Impacts on DASK, western regal fritillary, and the four bumble bee species are unlikely based on the lack of known occurrences in Montana. However, if present, impacts on these species would be similar to the monarch, and would benefit from the minimization measures described above.

Impacts to whooping cranes and piping plovers are also unlikely; however, both bird species may migrate through Montana and could utilize stopover habitat within the Facility Locations. Specifically, the primary impacts to whooping cranes could occur from disturbance and displacement during their spring and fall migrations should they require stopover habitat in open wetlands, grasslands, and/or fields in any Facility Locations. Impacts would be short-term, and localized, with available habitat in adjacent areas. Whooping crane presence is unlikely given the Montana portion of the Project is outside of the 95% confidence interval of the 95% band of the migration corridor (see Figure E-9e in Appendix E) (Pearse et al. 2018, 2020), and lack of recent occurrences within any of the Alternatives. North Plains would implement conservation measures should the species be observed during construction, including stopping work within 1 mile of a whooping crane until it has left the area.

Potential impacts to piping plovers would be similar to those of whooping cranes and be limited to spring and fall migration since neither species reproduces in the Study Area. The same conservation measures would be implemented for the species as those for the whooping crane, although construction would be stopped within a more limited distance—0.6 mile—of a piping plover should it be observed.

North Plains and DOE will coordinate and consult with the USFWS to assess potential impacts to federally listed, proposed, and under review species and identify appropriate avoidance and minimization measures to reduce impacts.

BLM Sensitive Species

Construction impacts to BLM sensitive species would be similar to those discussed in the above sections, particularly for bird, mammal, and reptile species, which make up the majority of the BLM Sensitive Species List with recent documented occurrences (see Table 7.7.1-4). North Plains will coordinate with the BLM during the right-of-way permitting process to determine whether impacts to sensitive species, including GRSG, could occur on BLM land, identify any necessary conservation measures, and ensure compliance with the BLM's ARMP.

State Species of Concern

All of the 39 SOC species that have documented occurrences in the Facility Locations may incur impacts during Project construction due to habitat availability and recent recorded occurrences within the Facility Locations. Construction impacts on SOCs would be similar to those discussed in the above sections, with impact severity generally greater in CTGCNs, particularly Tier I TFAs, and for the one S1/2 species, the *Homoeoneuria alleni* (a sand-dwelling mayfly), the eight S2 species, the mountain plover, chestnut-collared longspur, gray-crowned rosy-finch (*Leucosticte tephrocotis*), GRSG, Plains hog-nosed snake (*Heterodon nasicus*), western milksnake (*Lampropeltis gentilis*), *Raptoheptagenia cruentata* (a mayfly), and gray comma (*Polygonia progne*), and the one S2/S3 species, the LBBA (see Section 7.7.1). Impacts would be short- to long-term and localized depending on the species and habitat type present at the site of construction. Avoidance and minimization measures specified in the CMRP and the accompanying MBTA Compliance Plan; those described above for soils (see Section 7.4.2.2), water resources (see Sections 7.5.1.2, 7.5.2.2, 7.5.3.2, 7.5.4.2, and 7.5.5.2), and vegetation (see Section 7.6.2.2); and those identified in coordination with the MFWP and other agencies will help reduce impacts.

GRSG and STGR could be directly affected by construction disturbance and habitat degradation in general habitat for the two species, as described in Section 7.6.2.1, including confirmed active GRSG leks crossed by all four alternative routes' 0.5-mile, 4-mile, and 8-mile Study Areas (see Appendix F). While there are known active GRSG leks within 0.25 mile of the centerline of Alternative A, none of these leks are within core habitat. Therefore, there are no expected impacts from construction to active GRSG leks in core habitat.

Along with standard restoration in disturbed areas, specific mitigation and avoidance measures will be implemented for GRSG in accordance those established under EO 12-2015; in the Management Plan and Conservation Strategy for Sage-grouse in Montana (Grouse Management Plan) (MSGWG, 2005), the SGHCP (under Executive Order 10-2014), and the BLM Miles City Field Office ARMP (on BLM lands). North Plains will implement a Project-specific Greater Sage-grouse Mitigation Plan to minimize potential impacts to GRSG in Montana, and document compliance with EO 12-2015 and other applicable requirements for sage grouse conservation. Measures described in the Greater Sage-grouse Mitigation Plan include adherence to the 0.25-mile No Surface Occupancy buffer at active leks and restricting construction activity within 2 miles of active leks where breeding, nesting, rearing habitat is present between March 15 to July 15.

Operational maintenance activities may also be subject to seasonal noise restrictions between 4-8 am and 7-10 pm from March 15 and July 15.

EO 12-2015 also requires compensatory mitigation for loss of GRSG general habitat caused by development. To calculate this value, the Montana Mitigation Stakeholder Team (MMST) (comprised of the State of Montana and a multi-agency, multi-disciplinary, and citizen-based stakeholder group) developed a Habitat Quantification Tool (HQT) (MMST, 2018). North Plains is committed to providing the required compensatory mitigation, which is estimated at over seven million dollars for each alternative route according to HQT results (to be provided once completed).

Migratory Birds

Migratory birds that may be found along the alternative routes, including the BCCs described in Section 7.7.1.5, consist of both ground- and tree-nesting birds that could be affected by construction disturbance and habitat degradation, particularly during the nesting season, as described above. North Plains will implement the MBTA Compliance Plan to document the measures that will be implemented to avoid and minimize potential Project impacts on migratory birds, including bald and golden eagles, consistent with the MBTA and BGEPA. The MBTA Compliance Plan will focus on Project siting and design, construction, and post-construction reclamation phases, and is intended to facilitate development of an operations-focused Avian Protection Plan. The MBTA Compliance Plan will:

- identify potential impacts to migratory birds from Project construction;
- summarize known species occurrence data;
- identify species- and location-specific conservation measures, including species-specific time-of-year restrictions on certain construction activities; and
- consolidate Project commitments related to MBTA species, including applicable guidelines from APLIC's Suggested Practices for Avian Protection on Power Lines (APLIC, 2006), Reducing Avian Collisions with Power Lines (APLIC, 2012), and state and federal agency recommendations.

The avoidance and minimization measures described in the MBTA Compliance Plan will help reduce the potential for injury and mortality to migratory birds. By implementing these measures, the construction impacts to migratory birds are expected to be short-term.

Bald and Golden Eagles

Bald and golden eagles could be directly affected by construction based on documented occurrences adjacent to the Facility Locations of all four alternative routes. With evidence of abundant suitable habitat in the Study Areas of all four alternative routes, but few documented nests, disturbance and displacement of eagles from foraging habitat in numerous locations along the Facility Locations could occur. During construction, North Plains may use helicopters to facilitate structure setting and/or wire pulling/tensioning of the lines, which could potentially disturb and displace eagles from foraging habitat. However, eagles would have abundant available foraging habitat in adjacent areas such that the disturbance should not reduce their health or productivity.

Should breeding eagles be observed in proximity to a planned or existing construction site, North Plains will coordinate with the USFWS and MFWP to ensure activities are in compliance with BGEPA and applicable state guidance, respectively. Project coordination with these agencies regarding potential eagle disturbance permit needs is ongoing. In 2024, the USFWS revised the permit regulations for incidental take of eagles under 50 CFR Part 22 (1974) to streamline the permitting process (2024 Eagle Rule; USFWS, 2024b). The 2024 Eagle Rule follows the permitting approach previously defined in the National Bald Eagle Management Guidelines (USFWS, 2007) to create a general permit option and authorize bald eagle nest disturbance take associated with eligible activities (50 CFR 22.280 [2024]). Under the 2024 Eagle Rule, a general permit may be obtained for the following Project activities:

- linear infrastructure construction and maintenance within 660 feet of a bald eagle nest;
- aircraft operation, including helicopters and fixed-wing aircraft) within 1,000 feet of an in-use bald eagle nest; and
- blasting within 0.5 mile of an in-use bald eagle nest.

Per the 2024 Eagle Rule, activities occurring beyond these buffer distance "do not require a permit because they are unlikely to cause disturbance." If construction or blasting are necessary within these bald eagle nest buffer distances, North Plains will implement time-of-year restrictions during the breeding season (January 15 to August 31) to reduce impacts or seek a disturbance permit.

Golden eagle nest disturbance does not qualify for a general permit and would instead use a specific permit to authorize disturbance. Based on the 2024 Eagle Rule and coordination with USFWS to date, North Plains will seek a disturbance permit if construction or blasting are required within 0.6 mile or 0.5 mile of a golden eagle nest during the breeding season (January 1 to August 31), respectively. Additionally, North Plains will coordinate with USFWS to evaluate golden eagle nests within 1 mile of Project activities for potential disturbance permitting. North Plains will implement the Project's Blasting Plan (see Sections 2 and 5.8.3 of the CMRP), in accordance with industry accepted standards, applicable regulations, and permit requirements.

Pre-construction raptor nest surveys and appropriate permitting and mitigation measures will help ensure impacts are minimized.

<u>Waterfowl and Waterbirds</u>

Project construction will have the same localized, short-term disturbance and displacement impacts on waterfowl and other waterbirds (including two BCCs described above), particularly where there are larger waterbodies in the Facility Location of each alternative route. With the implementation of mitigation measures described for soils (see Section 7.4.2.2), water resources (see Sections 7.5.1.2, 7.5.2.2, 7.5.3.2, 7.5.4.2, and 7.5.5.2), and vegetation (see Section 7.6.2.2) to minimize erosion and runoff and quickly clean up spills, impacts would be localized and short-term.

Operations and Maintenance

General Wildlife Habitat and Nongame Species

The primary operational impacts could include long-term wildlife habitat alteration, degradation, loss, and forest fragmentation. The presence of the transmission line and structures would alter habitat by creating perches for passerines and raptors, which could alter predator/prey dynamics throughout the Facility Location of each alternative route. The increased perching opportunities for raptors may lead to higher chances for predation of smaller birds and mammals. The transmission line would also create a collision risk to larger birds including waterbirds, waterfowl, and raptors where the transmission line is adjacent to wetlands and waterbodies and between roosting/nesting and foraging habitat (APLIC, 2023a). Most collisions involve waterfowl, pelicans, and cranes associated with the OPGW (APLIC, 2023a). Wires will be marked with bird diverters in areas of higher risk to avoid impacts, as determined in coordination with the USFWS and MFWP. Electrocution from the conductors will not occur given the distance between lines meets the APLIC recommendations (60 inches of horizontal separation and 40 inches of vertical separation), which preclude even a large bird from touching two lines at once (APLIC, 2023b).

Inadequate revegetation and weed control could result in degraded habitat through soil erosion and weed infestation. North Plains will implement revegetation measures in accordance with the CMRP and accompanying SWPPP and Noxious Weed and Aquatic Invasive Species Management Plan, permit conditions, 7-22-2152, MCA, or as requested by the landowner.

Maintenance of the transmission line right-of-way could fragment forest habitat over the long-term where tall shrubs and trees are not allowed to reestablish. Fragmentation can cause less mobile species populations to become separated, or reduce biodiversity where habitat size is reduced (Andren, 1994; Keyghobadi, 2007; Berglund, 2004; Drinnan, 2005). Conversely, fragmentation can benefit species that rely on forest edge habitats (Mullu, 2016). These impacts may be less pronounced in woodland and forest that has a more open canopy and less dense tree cover, such as some western ponderosa pine forest; where the transmission line right-of-way passes along the edge of a forest, where the resulting fragments are both large enough to maintain the existing biodiversity, or where the line segment passing through the forest is short. Based on desktop analysis, Alternative A includes the largest individual forest crossing at 0.5 mile, followed by Alternatives D (0.4 mile), with Alternatives C and B having the smallest individual forest crossing (0.2 mile). Most crossings are much smaller, with an average crossing length of 0.05 mile for all alternatives. It should be noted that these values are likely overestimates, as recent aerial images show that some of these areas are either sparsely forested or no longer forested at this time. As such, fragmentation due to the transmission line right-of-way is not expected to measurably affect wildlife populations or biodiversity.

Both routine and unanticipated maintenance and repair activities will be needed infrequently throughout the life of the Project (e.g., re-stringing wires, tensioning lines, and repairing weather damage). In addition, the transmission line will be surveyed semi-annually by vehicles or aircraft. These activities can result in wildlife disturbance and displacement. Impacts will be short-term with greater impacts occurring during breeding/nesting seasons. Operation and maintenance work will be done following the BMPs in the MBTA Compliance Plan and any conservation measures established through Section 7 consultation and permitting, which may also benefit general wildlife species where implemented.

Unique Habitats and Natural Areas

Impacts on wildlife in special interest areas, including conservation easements and CTGCN from Project operation and maintenance activities are covered in the general wildlife and nongame impacts above.

Big Game Species

Primary impacts include intermittent, short-term human and noise disturbance during operation and maintenance activities, including regular aerial or ground-based line inspections. The existence of new access roads may also contribute to increased hunter access long-term impact based on the general remoteness of the Project.

Small Game Species

Most impacts to small game species are covered in the general wildlife and nongame impacts above. As for big game, increased access to hunters would have short-term impacts on small game species based on the general remoteness of the Project. Increased predation of small game species from increased perching opportunities on the transmission line would be primarily limited to the maintained right-of-way, resulting in a localized long-term impact (Sarasola et al., 2018).

Federally Listed Species and Critical Habitat

The same ESA species that could experience construction impacts described above may experience varying levels of Project operation and maintenance impacts. These wildlife groups include large birds, nesting birds, bats, and insects. The primary impacts to whooping cranes could occur from the presence of the transmission line near potential stopover habitat in the far eastern portion of the Project in Montana, which could result in injury or mortality due to collisions with the conductors. However, impacts are unlikely given the Montana portion of the Project is outside of the 95% confidence interval of the 95% band of the migration corridor (Pearse et al. 2018, 2020), and lack of recent occurrences within any of the Route Alternatives. Small birds like pinyon jay or piping plover are unlikely to collide with transmission lines.

Long-term, localized impacts to the pinyon jay could occur due to the loss of forest habitat in the transmission line right-of-way. Impacts would be minor given the abundant forest habitat in adjacent areas. Line inspections and maintenance activities could have intermittent impacts due to disturbance and temporary displacement of pinyon jays in adjacent forest, with a greater chance for mortality or reduced productivity during the nesting season should eggs or young be lost. Implementation of the MBTA Compliance Plan will help minimize impacts.

Potential impacts to the NLEB and LBBA would be similar to those for the pinyon jay, with higher disturbance impacts during the pup season in adjacent forest habitat from line inspection and maintenance activities. LBBA could also experience direct impacts through the long-term loss of forest habitat. Like for the pinyon jay, impacts would be long-term but intermittent and localized.

The primary long-term impact to monarch would result from habitat degradation due to erosion and weed infestation. To minimize potential negative impact to monarchs and other insect species, North Plains plans will avoid aerial herbicide and pesticide application during construction and O&M activities. As with construction, operational impacts to the DASK are not expected based on the lack of known occurrences in Montana, and since the low-quality habitat identified near the state line with North Dakota is located far from any documented occurrences. Impacts on the other five insect species are also unlikely, based on species ranges and lack of known occurrences; however, general impacts to insects would be avoided or minimized with implementation of the erosion and revegetation measures summarized in the CMRP and accompanying SWPPP.

BLM Sensitive Species

Operation and maintenance impacts that BLM sensitive species may experience are similar to those discussed in previous sections (e.g., loss of habitat due to fragmentation, increased chance of predation by raptors, and degraded or altered habitat). The groups of BLM sensitive wildlife include birds, mammals, reptiles, amphibians, and invertebrates. As with construction impacts, North Plains will coordinate with the BLM during right-of-way permitting to determine whether impacts could occur to sensitive species on BLM land and if specific conservation measures are needed.

State Species of Concern

Operation and maintenance impacts to state SOCs and SGCNs, particularly Tier I TFAs, are similar to those discussed in previous sections. These wildlife groups include birds, small mammals, amphibians, and reptiles.

GRSG and STGR populations could experience long-term impacts due to the existence of transmission structures in general habitat. Studies indicate declined habitat usage up to 600 meters (2,000 feet) from transmission lines and reduced lek attendance for up to 3 miles away (Braun, 1998; Rodgers, 2003). Additionally, the existence of transmission structures can incur negative effects as grouse exhibit an inherent avoidance of tall structures, which offer perching opportunities for raptors (Manes et al., 2002). The GRSG could also experience increased predation pressure because of increased perching opportunities on the transmission line. This would be primarily limited to the maintained right-of-way, resulting in a localized long-term impact.

North Plains will coordinate with the MFWP for recommendations to avoid and/or minimize adverse impacts on SOCs. North Plains will also implement the conservation measures outlined in the Project's Greater Sage-Grouse Mitigation Plan to minimize potential impacts to the GRSG, which incorporate recommendations from the MSGWG Grouse Management Plan (MSGWG, 2005).

Migratory Birds

Impacts on migratory birds and relevant conservation measures are addressed in the general wildlife habitat and nongame discussion above, including implementation of the MBTA Compliance Plan.

Bald and Golden Eagles

Foraging and nesting eagles may be affected by Project operations and maintenance activities, as described for other large birds above. Impacts would be short-term or intermittent, and localized as North Plains will abide by National Bald Eagle Management Guidelines and the MBTA Compliance Plan, and other mitigation measures discussed above for construction impacts.

Waterfowl and Waterbirds

The primary long-term impacts on waterfowl and waterbirds from Project operation includes the risk of collision with transmission lines and the increased chance for predation by perching raptors. Transmission line collisions are most frequent in areas where larger waterbodies are within the Facility Location of each alternative route. As described for general wildlife habitat and nongame species above, bird divertors will be installed in areas with higher collision risk to avoid or minimize impacts.

7.7.2.2 Unique Impacts and Mitigation Measures

Key impacts to wildlife that would be likely under each of the respective alternative routes are discussed below. Section 8.0 provides a comparison of like impacts by alternative route. Mitigation measures would be applied consistently across the alternative routes, as applicable. None of the alternative routes would involve additional mitigation measures beyond those presented above. North Plains will ensure impacts are minimized and compliant with federal law by implementing measures required by the USFWS and EO 12-2015.

Based on the analysis, Alternative A has the potential to affect the most acreage of suitable habitat for five federally listed (and potentially listed) wildlife species that could occur within the Facility Locations, as well as forest habitat. It has the most potential to affect the NLEB given its proximity to the Yellowstone River and known NLEB habitat. Similarly, it has the most recent documented occurrences of BLM sensitive species, state SOCs (all ranks), migratory BCCs, and special status waterbird species (tied with Alternative D). It is the only Facility Location adjacent to the Tier 1 TFA, the Ingomar Focal Area, which supports a high number of SGCN and is one of the two top priority TFAs in MFWP Region 1. Alternative A is the only alternative route with documented GRSG leks within 0.25 mile of the centerline. Alternative A has the most observations of bald and golden eagles within its Facility Location.

Alternative B is the only alternative route with documented bald eagle nests within 0.5 mile of the centerline (see Table I-19 in Appendix F). However, the Facility Location of Alternative B contains the least amount of big game winter distribution areas and, along with Alternative D, the fewest bald and golden eagle, migratory BCCs, and special status waterfowl observations.

The Facility Location of Alternative C contains the highest amount of big game winter distribution areas. The Alternative C Facility Location contains the lowest amount of suitable habitat for four federally protected or potentially protected species. Alternative C has the fewest documented occurrences of BLM sensitive species (tied with Alternative D) and S1 and S2 ranked state SOCs.

The Alternative D Facility Location has the most GRSG general habitat, confirmed active GRSG leks in general habitat within 4 miles of the centerline, and the most STGR leks in general habitat in the Facility Location. Alternative D also has the most recent documented occurrences of special status waterbird species (tied with Alternative A). It also contains the most potential undisturbed grassland, important habitat for two federally protected or potentially protected butterflies, and four bumble bee species under review for federal listing. Furthermore, it crosses the most Tier I TFAs, which are habitat critical to SOCs. However, Alternative D has the fewest recent state SOC occurrences (all ranks) and, along with Alternative B, the fewest bald and golden eagle observations.

7.8 FISHERIES BIOLOGICAL RESOURCES (Circular MFSA-2 Section 3.7(12))

This section discusses fish species and habitat baseline data for the Facility Locations of each alternative route as defined in Section 7.0. See Figure E-5b in Appendix E for surface waters shows aquatic habitats within the Fisheries Study Area, and Appendix F provides additional fisheries baseline data tables within the MFSA required Study Area. In accordance with Circular MFSA-2, Section 3.7(12), the Study Area for fisheries includes streams within 1 mile of the centerline (a 2-mile-wide corridor) to account for fish movement and migratory pathways.

7.8.1 Baseline Data

The MFWP online fisheries mapping tool (MFWP, 2023e) and MNHP species occurrence data (MNHP, 2025a) were reviewed to determine potential species presence. High value habitats (CTGCNs), specific areas identified as AFA by the MFWP, and special status aquatic species (federally listed species, BLM sensitive species, and state SOC), that could be affected by the Project are described in the following sections.

7.8.1.1 High Value Fish Habitats

For all four alternative routes, fish habitat occurs in perennial and intermittent waterbodies within the three HUC-4 watersheds: the Lower Yellowstone, Powder-Tongue, and Missouri-Little Missouri watersheds (see Section 7.5.1.1). This analysis used the Aquatic Ecological Systems classifications outlined in the MNHP's *Aquatic Ecosystem Guide* to categorize fish habitat within the Facility Locations of all four alternative routes (MNHP, 2023e). The SWAP designates all streams and rivers and select lakes and reservoirs in Montana as aquatic Tier I CTGCN and open water (i.e., natural and manmade lakes, reservoirs, large ponds, and the surface areas of rivers) as terrestrial Tier I CTGCN to recognize the importance of conserving aquatic habitat in the state (MFWP, 2015). Most threats to aquatic CTGCNs involve disruptions to natural flow, such as dams, diversions, irrigation withdrawals, and bank armoring. Within the CTGCNs, the MFWP identifies specific waterbodies and/or watersheds as AFAs to further pinpoint areas of greatest conservation need. These waterbodies are referred to as Tier I and Tier II AFAs, with Tier I AFAs having the highest conservation priority. None of the Facility Locations include any AFA designated streams. However, one or more of the Facility Locations cross a total of 10 AFA watersheds, including three Tier I (Powder River, Tongue River, and Yellowstone River watersheds) and five Tier II (Beaver Creek, Mizpah Creek, Pumpkin Creek, Rosebud Creek, and Upper O'Fallon Creek watersheds). The Facility Locations of Alternatives B and D contain the largest number of AFA watersheds, at eight, followed by Alternatives C and A, with seven and six, respectively (MFWP, 2024e). However, Mizpah Creek is not within the Facility Locations or wider Study Areas, so it is not discussed further.

The Facility Locations of all four alternative routes contain perennial and intermittent waterbodies that make up four aquatic ecological systems categorized under three CTGCN categories (Mixed Systems Rivers, Prairie Rivers, and Prairie Streams) (see Table 7.8.1-1) (MFWP, 2015). No lakes, reservoirs, or streams classified as an aquatic Tier I AFA occur in the vicinity of the alternative routes. Other wetlands and open water systems, which may also provide general fish habitat, are discussed in Section 7.5.

TABLE 7.8.1-1

Descriptions of Community Types of Greatest Conservation Need (CTGCN) and Associated Aquatic Ecological Systems Crossed by the Alternative Routes

CTGCN / Aquatic Ecological System	Stream Description
MIXED SYSTEMS RIVERS	
Large Valley Rivers	7th order rivers and larger
PRAIRIE RIVERS	
Large Prairie Rivers	5th order streams and larger, greater than 200 river miles long; 35-m [115-ft] average wetted width
Medium Prairie Rivers	4th and 5th order perennial warmwater rivers; greater than 100 river miles long; 15-meter (49 foot) average wetted width
PRAIRIE STREAMS	
Great Plains Prairie Streams	3rd to 4th order warm-water perennial streams, greater than 100 river miles long, 5-meter (16 foot) average wetted width
Great Plains Intermittent Streams	1st to 3rd order small, warm-water, intermittent streams

Source: Montana Natural Heritage Program, 2023e

The following sections describe, in order of largest to smallest, the waterbodies located along the alternative routes, including those designated as AFAs (MFWP, 2015). The waterbodies and aquatic ecological system descriptions provided are summarized from the MNHP's *Aquatic Ecosystem Guide* (see Table 7.8.1-1) (MNHP, 2023e). The length of each stream occurring in the Facility Locations of the alternative routes are provided in Table 7.8.1-2. Table 7.8.1-3 details the fish habitat and associated waterbodies, fish assemblages, and indicator species that may be found in the perennial waterbodies and intermittent waterbodies.

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TABLE 7.8.1-2

Streams in the Facility Locations by Aquatic Ecological System and Community Types of Greatest Conservation Need [a]

Aquatic Ecological System – Community Types of Greatest Conservation Need	Tier I or II AFA (Watershed) [b]	Stream Lengths (miles)			
		Alternative A	Alternative B	Alternative C	Alternative D (Refined)
LARGE VALLEY RIVERS – MIXED SYSTEMS					
Yellowstone River	I	0 [c]	0	0	0
LARGE PRAIRIE RIVERS – PRAIRIE RIVERS					
Powder River [d]	I	0.1	0.1	0.5	0.2
Tongue River	I	0.2	0.2	0.4	0.2
Subtotal	–	0.3	0.3	0.8	0.4
MEDIUM PRAIRIE RIVERS – PRAIRIE RIVERS					
Rosebud Creek	II	0.4	0.4	0.4	0.2
GREAT PLAINS PRAIRIE STREAMS – PRAIRIE STREAMS					
East Fork Armells Creek [e]	–	<0.1	0	0	<0.1
O'Fallon Creek	II [f]	0.4	0.4	0.4	0.4
Pumpkin Creek	II	0	0.4	0.4	0
Sandstone Creek	–	0.2	0.8	0.8	1.5
Subtotal	–	0.6	1.6	1.6	2.0
GREAT PLAINS INTERMITTENT STREAM – PRAIRIE STREAMS					
Beaver Creek	II	0.4	0.4	0.4	0.2
Cabin Creek	II [g]	0	0	0.3	0
Other Intermittent Streams	–	28.2	23.8	24.8	26.1
Subtotal	–	28.6	24.2	25.5	26.3
PROJECT TOTAL [h]		**29.9**	**26.4**	**28.3**	**28.9**

[a] This table does not include waterbody segments identified as canal/ditch by USGS (2022). For data in the wider Study Area (a 2-mile-wide corridor), see Appendix F.
[b] No AFA (streams) are located within the Facility Location of any alternative (MFWP, 2024d).
[c] Waterbody can be found in the wider Study Area (see Figure E-5b in Appendix E).
[d] The Powder River supports Large Valley River fish assemblages during the spring runoff (MNHP, 2023f).
[e] Classified as perennial within the Facility Location along an access road outside of the Study Area and classified as intermittent within the Study Area. Mileage within the Study Area is included in the totals for "Other Intermittent Streams".
[f] Upper O'Fallon Creek Tier II AFA.
[g] The portion of Cabin Creek within the Facility Locations is not included in the Cabin Creek Tier II AFA.
[h] Totals may not add up due to rounding.
Note: AFA = Aquatic Focal Area
Sources: Montana Fish, Wildlife, and Parks, 2015; MFWP, 2024d,e; U.S. Geological Survey, 2022a

TABLE 7.8.1-3

Fish Assemblages in Waterbodies Located in the Facility Locations of the Alternative Routes

Fish Habitat	Fish Assemblage [b]	Fish Species
Yellowstone River [a] and Powder River (spring only)	Large Mainstem River Assemblage	blue sucker (*Cycleptus elongatus*) [c,d] freshwater drum (*Aplodinotus grunniens*) [c] paddlefish (*Polyodon spathula*) [c,d] shovelnose sturgeon (*Scaphirhynchus platorynchus*) [c] pallid sturgeon (*Scaphirhynchus albus*) [c,d] sicklefin chub (*Macrhybopsis meeki*) [c,d] sturgeon chub (*Macrhybopsis gelida*) [c,d] shortnose gar (*Lepisosteus platostomus*) [d]
Yellowstone, Powder [a], and Tongue Rivers; and O'Fallon, Pumpkin, and Rosebud Creeks	Large Warmwater River Assemblage	sauger (*Stizostedion canadense*) [c,d] stonecat (*Noturus flavus*) [c] channel catfish (*Ictalurus punctatus*) [c] emerald shiner (*Notropis atherinoides*) [c] northern pike (*Esox lucius*) [d] plains killifish (*Fundulus zebrinus*) [e] smallmouth bass (*Micropterus dolomieu*) [e] walleye (*Stizostedion vitreum*) [e] yellow perch (*Perca flavescens*) [e]
Yellowstone, Powder [a], and Tongue Rivers; and O'Fallon, Pumpkin, Rosebud, and Sandstone Creeks	Medium Warmwater River Assemblage	goldeye (*Hiodon alosoides*) [c] river carpsucker (*Carpiodes carpio*) [c,d] shorthead redhorse (*Moxostoma macrolepidotum*) [c] flathead chub (*Platygobio gracilis*) [c] green sunfish (*Lepomis cyanellus*) [c,d] plains minnow (*Hybognathus placitus*) [c] sand shiner (*Notropis stramineus*) [c] common carp (*Cyprinus carpio*) [e] black bullhead (*Ameiurus melas*) [e] spottail shiner (*Notropis hudsonius*) [e]
O'Fallon, Pumpkin, Rosebud, and Sandstone Creeks	Core Prairie Stream Assemblage	fathead minnow (*Pimephales promelas*) [c] longnose dace (*Rhinichthys cataractae*) [c] white sucker (*Catostomus commersoni*) [c] lake chub (*Couesius plumbeus*) [b]
O'Fallon, Pumpkin, and Rosebud Creeks	Warmwater Sunfish Assemblage	black crappie (*Pomoxis nigromaculatus*) [e] bluegill (*Lepomis macrochirus*) [e] golden shiner (*Notemigonus crysoleucas*) [e] largemouth bass (*Micropterus salmoides*) [e] rock bass (*Ambloplites rupestris*) [e] white crappie (*Pomoxis annularis*) [e]
Beaver Creek, Cabin Creek, and other intermittent streams	Lake Chub and Core Prairie Stream Assemblage	lake chub (*Couesius plumbeus*) fathead minnow (*Pimephales promelas*)

[a] The Yellowstone River is not within the any of the Facility Locations but is found in the Study Area of Alternaitve A.
[b] Species lists for the Lake Chub and Core Prairie Stream assemblages are not provided by the Montana Natural Heritage Program.
[c] Indicator species
[d] Special status species (see Section 7.8.1.2)
[e] Non-native species
Source: Montana Natural Heritage Program, 2023f

Yellowstone River

The Yellowstone River is an eighth order perennial river (USGS, 2022a) classified as a Tier I AFA in the Mixed System River CTGCN (MNHP, 2023e). The fish community is composed of Large, Medium, and Large Mainstem Warmwater River assemblages (see Table 7.8.1-3) (MNHP, 2023f). While not located within the Facility Locations of any of the alternative routes, the Yellowstone River is located in the vicinity of the Facility Location of Alternative A, running parallel to Alternative A for about 2 miles, with its closest point about 1,000 feet from the Facility Location. The Yellowstone River is greater than 1 mile from the remaining alternative routes (see Figure E-5b in Appendix E).

Powder River

The Powder River is a Tier I AFA in the Mixed System Rivers CTGCN during spring run-off when at high flow, and the Prairie Rivers CTGCN the remainder of the year (MNHP, 2023e). It is a sixth to seventh order perennial river, and a tributary to the Yellowstone River (USGS, 2022a). It contains Large Warmwater, Medium Warmwater, and Creek Chub fish assemblages during most of the year, along with the Large Mainstem Warmwater River assemblages during spring run-off (see Table 7.8.1-3) (MNHP, 2023f). The Powder River is crossed by the Facility Locations of all four alternative routes (see Table 7.8.1-2; Figure E-5b in Appendix E).

Tongue River

The Tongue River is a Tier I AFA in the Prairie Rivers CTGCN (MNHP, 2023e). It is a sixth order perennial river and tributary to the Yellowstone River (USGS, 2022a). The fish community consists of Large Warmwater River, Medium Warmwater River, and Creek Chub assemblages (see Table 7.7.1-3) (MNHP, 2023f). The Tongue River is crossed by the Facility Locations of all four alternative routes (see Figure E-5b in Appendix E and Table 7.8.1-3).

Rosebud Creek

Rosebud Creek is a Tier II AFA in the Prairie Rivers CTGCN (MNHP, 2023e). It is a fifth order perennial stream and tributary to the Yellowstone River (USGS, 2022a). The fish community consists of Large and Medium Warmwater, Sunfish, Creek Chub and Core Prairie Stream assemblages (see Table 7.8.1-3). Fish habitat is found in large woody debris, deep pools, and undercut banks in the lower reaches of the rivers where there is spawning and nursery habitat. Rosebud Creek is crossed by the Facility Locations all four alternative routes (see Figure E-5b in Appendix E).

East Armells, O'Fallon, Pumpkin, and Sandstone Creeks

The East Armells, O'Fallon, Pumpkin, and Sandstone creeks are Great Plains Prairie Streams in the Prairie Streams CTGCN (MNHP, 2023e). O'Fallon and Pumpkin creeks' watersheds are also classified as Tier II AFAs (see Table 7.8.12). These streams are third to fifth order perennial streams. The East Armells Creek is classified as perennial within the Facility Locations of Alternatives A and D. However, the East Armells Creek is primarily classified as intermittent within the vicinity of the Study Areas of the alternative routes and is discussed within the Great Plains Intermittent Streams section. Within the O'Fallon, Pumpkin, and Sandstone creeks, diverse fish habitat is found in side-channel vegetation, undercut banks, and woody debris within lower reaches of the streams. The fish community is dominated by the Core Prairie Stream assemblage with members of the Medium Warmwater and Creek Chub assemblages occasionally appearing (see Table 7.8.1-3). O'Fallon and Sandstone creeks are crossed by the Facility Locations of all four alternative routes. Pumpkin Creek is within the Facility Locations of Alternatives B and C (see Figure E-5b in Appendix E).

Intermittent Streams

Intermittent streams crossed by the alternative routes are classified as Great Plains Intermittent Streams in the Prairie Streams CTGCN. Great Plains Intermittent Streams include coulees (i.e., dry ravines that were cut by water action), small warm-water streams (first to third order), and the headwaters of Medium Prairie Rivers and Great Plains Prairie Streams. Stream sections will lose flowing water connections and become interrupted pools, which could be absent of fish. These pools provide amphibian breeding and rearing habitat, typically with toads (*Bufo* spp.) and northern leopard frog (*Rana pipiens*). Fish communities are dominated by the Lake Chub and Core Prairie Stream assemblages (see Table 7.8.1-3).

Numerous Great Plains Intermittent Streams would be crossed by the alternative routes (see Table 7.8.1-2 and Figure E-5b in Appendix E-5). Two of these streams' watersheds are Tier II AFAs: Beaver Creek and Cabin Creek. Beaver Creek is found in the Facility Locations of all four alternative routes, while Cabin Creek is only found in the Alternative C Facility Location.

7.8.1.2 Special Status Fish Species

Special status fish species include those species federally listed as threatened or endangered, proposed for listing, or candidates for listing under the ESA; BLM sensitive species; and Montana SOCs. Regulatory details are provided in Section 7.7.1.5.

A query of the USFWS IPaC (USFWS, 2025) identified one federally listed species, the endangered pallid sturgeon, as potentially occurring in waterbodies along all four alternative routes (see Table 7.8.1-4). State data included documented occurrences within the Facility Locations of all four alternative routes.

Five BLM sensitive species could be found at the Project based on habitat suitability and range. Of these, the paddlefish has been documented in the Facility Locations of Alternatives A and D, and the Iowa darter, sauger, and sturgeon chub have been documented in the Facility Locations of all four alternative routes.

Ten state SOCs could be found at the Project based on habitat suitability and range, which include the pallid sturgeon, paddlefish, sauger, and sturgeon chub discussed above. Of the other six state SOCs, the blue sucker has been documented in the Facility Locations of all four alternative routes.

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TABLE 7.8.1-4

Special Status Fish Species with Suitable Habitat and Documented Occurrences in the Facility Locations of the Alternative Routes [a]

Species	Status [b]	State Rank [c]	Preferred Habitat	Associated CTGCN [c] and Waterbodies with Suitable Habitat	Alternative routes with Documented Occurrences in the Facility Location [d]
FEDERALLY LISTED SPECIES					
Pallid Sturgeon (*Scaphirhynchus albus*)	FE, SOC	S1	Large, turbid rivers and impoundments of these rivers over sand and gravel bottoms, usually with a strong current. They use all channel types, primarily straight reaches with islands, and areas with substrates containing sand (especially bottom sand dune formations) and strong currents. Documented in the Powder River and lower 20 miles of the Tongue River (M. Backes, MFWP, pers. comm. August 31, 2023).	Mixed Systems; Prairie Rivers • Lower Yellowstone River • Powder River • Tongue River	Alternative A Alternative B Alternative C Alternative D
BLM SENSITIVE AND/OR MONTANA SPECIES OF CONCERN					
Blue Sucker (*Cycleptus elongatus*)	SOC	S2	Areas with swift currents areas of large rivers, feeding on insects in cobble habitat. In the spring, they migrate upriver and congregate in fast, rocky areas to spawn.	Mixed Systems; Prairie Rivers • Lower Yellowstone River • Powder River • Tongue River • O'Fallon Creek • Pumpkin Creek • Rosebud Creek	Alternative A Alternative B Alternative C Alternative D
Iowa Darter (*Etheostoma exile*)	SOC, BLM	S3	Small streams and reservoirs. Prefer clear slow-flowing streams with solid bottoms, but have a wide tolerance for changes in water flow rates and can be found in reservoirs. They occur in the far eastern and northern Great Plain Prairie Streams. Documented to occur in Fallon County, but no documented occurrences in the Study Areas.	Mixed Systems; Prairie Rivers; Prairie Streams	Alternative A Alternative B Alternative C Alternative D
Northern Redbelly Dace (*Chrosomus eos*)	SOC	S2	Clear, cool, slow-flowing creeks, ponds and lakes with aquatic vegetation, including filamentous algae, and sandy or gravelly bottoms interspersed with silt. In Montana, this species is an indicator species of the Northern Glaciated Prairie Stream Ecological System and may occur in the intermittent prairie stream systems.	Mixed Systems Prairie Rivers; Prairie Streams	None
Northern Redbelly X Finescale Dace (*Chrosomus eos* x *Chrosomus neogaeus*)	SOC	S1/S2	Habitat can be similar to that of the northern redbelly dace described above, or that of the finescale dace which includes larger lakes.	Prairie Rivers; Prairie Streams	None
Paddlefish (*Polyodon spathula*)	BLM	S3/S4	Slow or quiet waters of large rivers or impoundments. They spawn on the gravel bars of large rivers during spring high water. Paddlefish tolerate, or perhaps seek, turbid water. They are found in the Yellowstone River and a portion of the Tongue River near their confluence.	Mixed Systems; Prairie Rivers • Yellowstone River • Tongue River	Alternative A Alternative D

TABLE 7.8.1-4

Special Status Fish Species with Suitable Habitat and Documented Occurrences in the Facility Locations of the Alternative Routes [a]

Species	Status [b]	State Rank [c]	Preferred Habitat	Associated CTGCN [c] and Waterbodies with Suitable Habitat	Alternative routes with Documented Occurrences in the Facility Location [d]
Sauger (*Sander canadensis*)	SOC, BLM	S2	Large rivers and reservoirs, but is mainly a river fish, inhabiting the larger turbid rivers and the muddy shallows of lakes and reservoirs. They spawn in gravelly or rocky areas in shallow water in spring. In Montana, historical distribution included the Yellowstone River and its major tributaries downstream of the Clark Fork. Known to occur in stream reaches located within the Facility Locations Study Areas of all alternative routes.	Mixed Systems; Prairie Rivers; Prairie Streams • Yellowstone River • Tributaries of Yellowstone River	Alternative A Alternative B Alternative C Alternative D
Shortnose Gar (*Lepisosteus platostomus*)	SOC	S3	Large rivers, quiet pools, backwaters, and oxbow lakes.	Mixed Systems Prairie Rivers • Yellowstone River	None
Sicklefin Chub (*Macrhybopsis meeki*)	SOC	S2	Large, turbid streams in the plains region of Montana. Sicklefin chub are strictly confined to the main channels of large, turbid rivers where they live in a strong current over a bottom of sand or fine gravel.	Mixed Systems Prairie Rivers • Lower Yellowstone River	None
Sturgeon Chub (*Macrhybopsis gelida*)	SOC, BLM	S3	Typically found in the rapid, gravelly turbid waters of larger, plains rivers with moderate to strong currents over bottoms ranging from rocks and gravel to coarse sand.	Mixed Systems Prairie Rivers; Prairie Streams • Lower Yellowstone River • Powder River	Alternative A Alternative B Alternative C Alternative D

[a] Due to the inclusion of access roads in the Facility Location analysis, the Study Area could lack a species found within the Facility Location, if an access road reaches beyond the Study Area corridor.

[b] FE = Federally endangered, BLM = BLM sensitive species, SOC = species of concern

[c] State (Conservation) Ranks:

S1: At high risk because of extremely limited and/or rapidly declining population numbers, range and/or habitat, making it highly vulnerable to global extinction or extirpation in the state.

S2: At risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state.

S3: Potentially at risk because of limited and/or declining numbers, range and/or habitat, even though it may be abundant in some areas.

S4 – Apparently secure, though it may be quite rare in parts of its range, and/or suspected to be declining.

[d] Documented or predicted occurrences in the MNHP data include stream reaches where the species presence has been confirmed through direct capture or where they are believed to be present based on the professional judgement of a fisheries (Montana Natural Heritage Program, 2023a,b).

Note: CTGCN = Community Type of Greatest Conservation Need; MFWP = Montana Fish, Wildlife, and Parks; MNHP = Montana Natural Heritage Program

Sources: Brown, 1971; Pflieger, 1975; Holton, 1980; Flath, 1981; Moss et al., 1983; Tews, 1994; Bramblett, 1996; McMahon and Gardner, 2001; Holton and Johnson, 2003; MNHP, 2022; MNHP 2024a,b; MNHP, 2025a,b; MNHP and MFWP, 2023

7.8.2 Impact Assessment

7.8.2.1 Common Impacts Assessment and Mitigation Measures

Construction

There is potential for impacts to general and special status fish species during construction from the introduction of pollutants from accidental oil or gas spills from construction vehicles, or from increased turbidity and sedimentation due to stormwater runoff from construction areas. The mitigation measures from the CMRP and accompanying SWPPP that will be implemented to protect surface waters will also help protect fisheries, including measures to minimize erosion and stormwater runoff, avoid or contain spills or leaks of pollutants, direct dewatering to upland areas, and reduce impacts from waterbody crossings (see Section 7.5.1.2).

The installation of temporary and permanent access road waterbody crossings has the potential to temporarily or permanently alter stream habitat, as discussed in Section 7.5.1.2. Rock rip-rap would displace riparian vegetation, which would remove or reduce the benefits riparian vegetation provides for aquatic species. Benefits include shading and decreasing water temperatures, filtering water and reducing turbidity and contaminants, increasing habitat complexity through large woody debris input to the stream, stream bank stabilization, and erosion control. Bio-stabilization materials, conversely, would enhance fish habitat by allowing riparian vegetation to grow. North Plains will construct these crossings to maintain flows within waterbodies and movement of aquatic species in accordance with federal and state permitting requirements, and federal and state land-managing agency specifications. The streambed and bank will be reestablished according to permit requirements after the removal of temporary structures.

The construction and removal of stream crossings could result in harm and mortality of less mobile aquatic species during installation from equipment and from increased turbidity. North Plains will coordinate with the MFWP to identify and implement any required in-water work timing restrictions, including those for special status species and Tier I and II AFAs.

To protect fishery resources on BLM land, the BLM ARMP recommends that surface disturbing activities be avoided within 300 feet of wetlands and riparian areas, and that construction design features that maintain the functionality of pallid sturgeon habitat be implemented for activities in and within 0.25 mile of the water's edge of the Yellowstone River (BLM, 2015a), which could include activities along Alternative A. North Plains will work with the BLM to address these measures during the right-of-way permitting process for crossings on BLM land, as appropriate. Per USFWS and MFWP recommendations, no in-water work or water withdrawal is planned at the Powder or Tongue rivers. The Project will coordinate with the agencies if in-water work becomes necessary.

With implementation of the measures described above, stream crossings will have highly localized impacts and will not result in long-term mortality or substantially reduced productivity of aquatic species, including special status species and Tier I and II AFAs.

Operations and Maintenance

While routine maintenance around waterbodies and streams will be limited, it could cause an increase in sedimentation and removal of riparian habitat. To offset this potential, the CMRP lists mitigation measures including sediment barriers at waterbody crossings, carefully controlled grubbing of vegetation for vehicle access, and the preservation of vegetation whenever possible along waterbody banks. As a result, impacts would be intermittent, and short-term. However, tree and shrub riparian vegetation will be removed for the life of the Project if it grows too closely to the transmission line (i.e., within 35 feet), or where rock rip-rap is permanently placed for streambank stabilization. The loss of riparian trees and tall shrubs in the transmission line right-of-way would have a long-term but localized effect on fish habitat and will not result in mortality of aquatic species or measurably reduce productivity of aquatic species, including special status species and Tier I and II AFAs.

7.8.2.2 Unique Impacts and Mitigation Measures

Key impacts to fisheries that would be likely under each of the respective alternative routes are discussed below. Section 8.0 provides a comparison of like impacts by alternative route. Mitigation measures would be applied consistently across the alternative routes. None of the alternative routes would involve additional mitigation measures beyond those presented above.

Alternative A could affect two Tier I AFAs in the Facility Location, the Powder and Tongue rivers, as well as three Tier II AFAs. It is also the only alternative with the Yellowstone River, A Tier I AFA, within the fisheries study area. Alternative A and Alternative D could result in impacts to more special status fish species than other route alternatives based on known recent occurrences crossed by the Facility Locations.

Alternative B could affect two Tier I AFAs in the Facility Location, the Powder and Tongue rivers, as well as four Tier II AFAs. Alternative B and Alternative C could result in impacts to the fewest number of special status fish species, based on known recent occurrences crossed by the Facility Location.

Alternative C could affect two Tier I AFAs in the Facility Location, the Powder and Tongue rivers, as well as five Tier II AFAs. Alternative C could result in impacts to the fewest number of special status fish species, tied with Alternative B, based on known recent occurrences crossed by the Facility Location.

Alternative D could affect two Tier I AFAs in the Facility Location, the Powder and Tongue rivers, as well as three Tier II AFAs. Alternative D could result in impacts to the most number of special status fish species, tied with Alternative A, based on known recent occurrences crossed by the Facility Location.

7.9 CULTURAL, HISTORICAL, PALEONTOLOGICAL, and VISUAL RESOURCES

7.9.1.1 Archaeology and Tribal Resources and Concerns (Circular MFSA-2 Section 3.7(13 & 14))

The following section discusses the cultural and historic resources within the Facility Locations as defined in Section 7.0. Appendices E and F provide additional baseline data (maps and tables, respectively) of cultural and historic resources within the MFSA required Study Area. In accordance with Circular MFSA-2 Sections 3.7(10) and 3.7(13), the Study Area for cultural and historic resources is the Facility Location of each alternative route plus any lands with known cultural sites from which the facility would be clearly visible where the value of cultural resources may be significantly affected by the visual presence of the facility (see Figure E-10a in Appendix E). To determine if a facility would be clearly visible from a cultural resources site, the Study Area includes those areas where eligible or National Register of Historic Places (NRHP)-listed historic properties are located within 5 miles of an alternative route per the guidance in Circular MFSA-2 Sections 3.7(10) (see Figures E-10b and E-10f in Appendix E).

7.9.1.2 Baseline Data

Archaeology

Eastern Montana contains a rich and varied cultural history which can be categorized into four prehistoric periods and one later historic period. Of the prehistoric periods, these four divisions can be expounded into many human complexes associated with different food procurement strategies and technological advances; however, this overview does not provide that level of detail.

Prehistory regarding human occupation in Montana begins with the Paleoindian Period, which ranges from 12,000 Before Present and continues until 8,000 Before Present. During this time span, humans residing on the Plains of eastern Montana led a highly migratory lifestyle. This was largely due to these populations' need to follow and exploit late Pleistocene animals and harvest associated plant resources (Frison, 1991).

The Clovis complex (Clovis) constitutes the most well recognized Paleoindian group. A distinct, basally fluted projectile point categorizes the Clovis complex, which; along with associated material, composes the earliest unequivocal evidence of a Paleoindian complex in North America (Waters and Stafford, 2014). Well-known locations that contain Clovis projectile points include the Colby mammoth kill site in Wyoming. Other complexes of the period comprise Goshen, Folsom, Agate Basin, Hell Gap, Alberta, and Cody, among others. The previously mentioned Paleoindian complexes mark technological or style changes through time (Frison, 1991).

The Paleoindian Period precedes the Archaic Period. This period, marked by a shift from stemmed lanceolate projectiles to the use of large side-notched forms, ranges from 8,000 Before Present to 1,500 Before Present. This indicates a drastic change in technology from utilizing hand thrown spears toward the use of a propelled dart by atlatl (MacDonald, 2012). Additionally, the climate changed dramatically during the Archaic Period with continued warming and expansion of the Great Plains as we know them today. This paleoclimatic change in turn triggered differing subsistence strategies, including migratory hunting (following herds and flocks) and limited horticulture (some planting and harvesting of local fruits and vegetables), which may have emphasized an increased dependence on floral resources throughout the Plains (Frison, 1991).

The invention of the bow and arrow marks the Late Prehistoric Period (Frison, 1991). This period ranged from 1,500 Before Present to 250 Before Present. During this time, human populations increased dramatically across the region, which is evidenced by an increase in radiocarbon dating localities. Subsistence strategies carried along the same routes as the two earlier periods. The Late Prehistoric Period also offers a diverse palate of rock art examples both painted and carved (Francis, 1996). This art ranges from fertility representations to grandiose depictions of bison hunts strewn across rock shelter walls.

Major population migrations and significant material cultural changes categorize the Protohistoric Period (250 to 130 Before Present). There are a paucity of material remains in eastern Montana dating to this period resulting in its poor representation in the archaeological record. People living during this period acquired Euro-American goods such as the horse and increasing numbers of firearms and began to use both (Frison, 1991). The introduction of the horse catalyzed the mobile ethnohistoric cultures of the Plains. Other Euro-American trade goods became very common during this period including metal tools, glass beads, and textiles (USFS, 2023).

There is ample documentation of the history (Post-1800 Before Present Day) of the region in relation from early expansion and the fur trade to Euro-American settlement in the form of homesteads and the expansion of agriculture. These interactions directly resulted in multiple treaties between the U.S. government and various tribal entities. The construction of railroads, highway systems, the interactions between the native populations, and expanding Euro-American groups shaped the area (MacDonald, 2012).

North Plains conducted a Class I file search through a database file search request submitted to the Montana Historical Society Historic Preservation Office (MTSHPO) which was updated as alternative route adjustments were developed (Circular MFSA-2, Section 3.4.10(a)). The file search focused on previously identified archaeological sites within the Facility Location and Study Area of each alternative route (Circular MFSA-2, Section 3.7(10 and 13)). Federal undertakings require the lead federal agency to identify historic properties that could be adversely affected by the undertaking and avoid, minimize, or mitigate the potential effects (36 Code of Federal Regulations [CFR] 800). Historic Properties, also referred to as sites in this document, which do not meet the National Park Service's criteria of eligibility for listing on the NRHP are referred to as being not eligible for listing on the NRHP and no further work or avoidance measures are required. Sites that meet at least one of the NRHP criteria are considered eligible for listing on the NRHP. Sites that need additional research or evaluative archaeological testing to establish NRHP listing eligibility, referred to as unevaluated, require avoidance or further work (National Park Service, 1997).

North Plains analyzed the file search data within the Facility Locations of the four alternative routes based on the type and number of previously recorded archaeological sites crossed by each alternative route. Table 7.9.1-1 and Appendix E provide the results of the analysis. The following sections include details about the previously identified sites located along each alternative route. This section also includes a description of sites that have been recommended eligible or are listed on the NRHP.

TABLE 7.9.1-1

Class I File Search Results in the Alternative Facility Locations

Alternative	Prehistoric Sites	Historic Sites	Unknown or Multi-Component Sites	**Total**
Alternative A	13	25 (4 eligible)	1	**39**
Alternative B	19	13 (1 eligible)	0	**32**
Alternative C	18	15 (1 eligible)	0	**33**
Alternative D (Refined)	14	11 (2 eligible)	1	**26**

The Alternative A Facility Location contains 39 previously identified sites or portions of sites (see Table 7.9.1-2). Sites 24CR0771, 24CR0772, 24FA0382, and 24RB2234 are recommended eligible for the NRHP. Site 24CR0771 consists of a historic irrigation system. Site 24CR0772 consists of a vehicular and footbridge. Site 24FA0382 consists of a segment of the Chicago, Milwaukee, and St. Paul Railroad. Site 24RB2234 consists of a segment of the Northern Pacific Railroad. Twenty-nine of the previously recorded sites are unevaluated regarding their eligibility potential for listing in the NRHP. About half of the unevaluated sites consist of historic resources related to historic wagon trails or travel corridors that include bridges and energy development as well as the Lewis and Clark National Historic Trail and a potential campsite for the U.S. 7th Cavalry under the command of Lieutenant Colonel George Armstrong Custer prior to the 1876 Battle of the Little Bighorn. The other half are prehistoric sites that include lithic material concentrations, two bison kill sites, and a stone feature site. Stone features sites and bison kill sites may hold significance to Tribes. The remaining six sites are recommended as not eligible for listing in the NRHP.

TABLE 7.9.1-2

Previously Identified Cultural Resources Directly Crossed by the Facility Location on Alternative A

Site Number	Site Name	Temporal Affiliation	Site Type	NRHP Eligibility Status
24CR0005	N/A	Prehistoric	Bison kill	Unevaluated
24CR0081	N/A	Prehistoric	Lithic procurement and workshop	Unevaluated
24CR0238	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24CR0302	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24CR0306	N/A	Historic	Historic Mining	Unevaluated
24CR0350	N/A	Prehistoric	Buffalo Jump	Unevaluated
24CR0626	N/A	Prehistoric	Rock Cairn(s) and Lithic Material Concentration	Unevaluated
24CR0627	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24CR0634	N/A	Historic	Bridge	Unevaluated
24CR0636	N/A	Historic	Architectural	Unevaluated
24CR0638	N/A	Historic	Bridge	Unevaluated
24CR0639	N/A	Historic	Bridge	Unevaluated
24CR0644	N/A	Historic	Historic Vehicular/Foot Bridge and Historic Road/Trail	Unevaluated
24CR0767	N/A	Historic	Farmstead	Not Eligible
24CR0771	N/A	Historic	Historic Irrigation System	Eligible
24CR0772	N/A	Historic	Vehicular/Foot Bridge	Eligible
24CR0794	N/A	Prehistoric	Rock Cairn(s)	Not Eligible
24CR0831	N/A	Historic	Historic Road/Trail	Unevaluated
24CR1025	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24CR1264	Lewis and Clark National Historic Trail on the Yellowstone	Historic	Historic Road/Trail	Unevaluated
24CR1316	N/A	Historic	Historic Energy Development	Unevaluated
24CR1327	N/A	Historic	Historic Agriculture	Unevaluated
24CR1328	N/A	Historic	Historic Road/Trail	Unevaluated
24CR1617	Old Highway 312 / 59	Historic	Historic Road/Trail	Not Eligible
24FA0012	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0154	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0303	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0349	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0382	Chicago, Milwaukee, and St. Paul Railroad (Fallon)	Historic	Historic Railroad	Eligible
24FA0421	N/A	Historic	Historic Material Concentration	Unevaluated
24FA0963	N/A	Historic	Butte Pipeline	Not Eligible
24FA0985	N/A	Historic	Historic Energy Development	Not Eligible
24FA1037	N/A	Historic	Monarch Oil Field	Unevaluated
24RB0789	N/A	Historic	Terry-Custer Exp. Possible Camp Before Little Bighorn	Unevaluated
24RB1041	N/A	Unknown	Other	Unevaluated

TABLE 7.9.1-2

Previously Identified Cultural Resources Directly Crossed by the Facility Location on Alternative A

Site Number	Site Name	Temporal Affiliation	Site Type	NRHP Eligibility Status
24RB2011	N/A	Historic	Historic Residence	Not Eligible
24RB2234	Northern Pacific Railroad (Rosebud)	Historic	Historic Railroad	Eligible
24RB2742	N/A	Historic	Historic Irrigation System	Unevaluated
24RB2798	U.S. Highway 12	Historic	Historic Road/Trail	Unevaluated

Note: N/A = not available and NRHP = National Register of Historic Places

The Alternative B Facility Location contains 32 previously identified sites or portions of sites (see Table 7.9.1-3). Site 24FA0382, a segment of the Chicago, Milwaukee, and St. Paul Railroad, is recommended eligible for the NRHP. Twenty-four of the previously recorded sites are unevaluated regarding their eligibility potential for listing in the NRHP. Sixteen of the unevaluated sites are prehistoric in nature and are lithic material concentrations and bison kill sites. The bison kill site may hold significance to Tribes. The other eight unevaluated sites are historic in nature and consist of trails that include the Tongue River Road and the Lewis and Clark National Historic Trail, energy development, camp sites, and a trash dump. The remaining seven sites are recommended as not eligible for listing in the NRHP.

TABLE 7.9.1-3

Previously Identified Cultural Resources Directly Crossed by the Facility Location on Alternative B

Site Number	Site Name	Temporal Affiliation	Site Type	NRHP Eligibility Status
24CR0238	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24CR0451	N/A	Prehistoric	Kill Site/Trap and Buffalo Jump	Unevaluated
24CR0452	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24CR0781	N/A	Prehistoric	Lithic Material Concentration	Not Eligible
24CR1253	Tongue River Road	Historic	Historic Road/Trail	Not Eligible
24CR1264	Lewis and Clark National Historic Trail on the Yellowstone	Historic	Historic Road/Trail	Unevaluated
24CR1316	N/A	Historic	Historic Energy Development	Unevaluated
24CR1617	N/A	Historic	Historic Road/Trail	Unevaluated
24FA0011	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0012	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0154	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0155	N/A	Prehistoric	Surface Stone Quarry	Unevaluated
24FA0286	N/A	Historic	Historic Campsite	Unevaluated
24FA0287	N/A	Historic	Historic Trash Dump	Unevaluated
24FA0303	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0322	N/A	Prehistoric	Lithic Material Concentration and Fire Hearths or Roasting Pit	Not Eligible
24FA0334	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0352	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0382	Chicago, Milwaukee, and St. Paul Railroad (Fallon)	Historic	Historic Railroad	Eligible
24FA0390	N/A	Historic	Historic Farmstead	Unevaluated
24FA0608	N/A	Historic	Historic Energy Development	Not Eligible

TABLE 7.9.1-3

Previously Identified Cultural Resources Directly Crossed by the Facility Location on Alternative B

Site Number	Site Name	Temporal Affiliation	Site Type	NRHP Eligibility Status
24FA0764	N/A	Prehistoric	Lithic Material Concentration and Fire Hearths or Roasting Pits	Unevaluated
24FA0765	N/A	Prehistoric	Lithic Material Concentration and Fire Hearths or Roasting Pits	Not Eligible
24FA0963	Butte Pipeline	Historic	Historic Energy Development	Not Eligible
24FA0985	N/A	Historic	Historic Energy Development	Not Eligible
24RB0986	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24RB0994	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24RB1724	N/A	Prehistoric	Rock Cairn(s)	Unevaluated
24RB1737	N/A	Prehistoric	Lithic Material Concentration and Fire Hearths and Roasting Pits	Unevaluated
24RB1742	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24RB2729	Tongue River Road	Historic	Historic Road/Trail	Unevaluated
24RB2798	N/A	Historic	Historic US Highway 12	Unevaluated

Note: N/A = not available and NRHP = National Register of Historic Places

The Alternative C Facility Location contains 33 previously identified sites or portions of sites (see Table 7.9.1-4). Site 24FA0382, a segment of the Chicago, Milwaukee, and St. Paul Railroad, is recommended eligible for the NRHP. A total of 23 sites on Alternative C are unevaluated for listing in the NRHP. Fifteen of the unevaluated sites are prehistoric lithic material concentrations. The remaining unevaluated sites are historic trails including the Lewis and Clark National Trail, with two segments of the Tongue River Road, a segment of irrigation canal, historic mining activity, a farmstead, and a trash dump. Nine of the sites on Alternative C are recommended not eligible for listing in the NRHP.

TABLE 7.9.1-4

Previously Identified Cultural Resources Directly Crossed by the Facility Location on Alternative C

Site Number	Site Name	Temporal Affiliation	Site Type	NRHP Eligibility Status
24CR0238	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24CR0313	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24CR0655	N/A	Historic	Historic Vehicular/Foot Bridge	Unevaluated
24CR0782	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24CR0836	S H Canal	Historic	Historic Canal	Not Eligible
24CR0841	N/A	Prehistoric	Lithic Material Concentration and Fire Hearths or Roasting Pits	Unevaluated
24CR1064	N/A	Prehistoric	Lithic Material Concentration	Not Eligible
24CR1253	Tongue River Road	Historic	Historic Road/Trail	Not Eligible
24CR1264	Lewis and Clark National Trail	Historic	Lewis and Clark National Trail on the Yellowstone	Unevaluated
24CR1366	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24CR1370	N/A	Prehistoric	Lithic Material Concentration	Not Eligible
24CR1383	N/A	Prehistoric	Lithic Material Concentration and Fire Hearths and Roasting Pits	Unevaluated
24CR1384	N/A	Prehistoric	Lithic Material Concentration	Unevaluated

TABLE 7.9.1-4

Previously Identified Cultural Resources Directly Crossed by the Facility Location on Alternative C

Site Number	Site Name	Temporal Affiliation	Site Type	NRHP Eligibility Status
24CR1617	Old Highway 312 / 59	Historic	Historic Road/Trail	Not Eligible
24CR1624	N/A	Historic	Historic Road/Trail	Unevaluated
24FA0011	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0012	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0154	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0286	N/A	Historic	Historic Camp Site	Unevaluated
24FA0287	N/A	Historic	Historic Trash Dump	Unevaluated
24FA0303	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0322	N/A	Prehistoric	Lithic Material Concentration and Firehearths or Roasting Pits	Not Eligible
24FA0334	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0352	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0382	Chicago, Milwaukee, and St. Paul Railroad (Fallon)	Historic	Historic Railroad	Eligible
24FA0390	N/A	Historic	Historic Farmstead	Unevaluated
24FA0608	N/A	Historic	Historic Energy Development	Not Eligible
24FA0963	Butte Pipeline	Historic	Historic Energy Development	Not Eligible
24FA0985	N/A	Historic	Historic Energy Development	Not Eligible
24RB0986	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24RB0994	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24RB1206	N/A	Historic	Historic Mining	Unevaluated
24RB2729	Tongue River Road	Historic	Historic Road/Trail	Unevaluated

Note: N/A = not available and NRHP = National Register of Historic Places

The Alternative D Facility Location overlaps 26 previously identified sites or portions of sites (see Table 7.9.1-5). Sites 24CR0771, a historic irrigation system, and 24FA0382, a segment of the Chicago, Milwaukee, and St. Paul Railroad, are recommended eligible for the NRHP. There are 15 sites on Alternative D that are unevaluated regarding their eligibility status for listing in the NRHP. Five of the unevaluated sites are historic and consist of trails, including the Lewis and Clark National Historic Trail, a campsite, trash dump, and farmstead. Ten of the unevaluated sites are prehistoric and consist mostly of lithic material concentrations. Nine sites on Alternative D are recommended not eligible for listing in the NRHP.

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TABLE 7.9.1-5

Previously Identified Cultural Resources Directly Crossed by the Facility Location Alternative D (Refined)

Site Number	Site Name	Temporal Affiliation	Site Type	NRHP Eligibility Status
24CR0350	N/A	Prehistoric	Buffalo Jump	Unevaluated
24CR0739	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24CR0771	N/A	Historic	Historic Irrigation System	Eligible
24CR0907	N/A	Multi-Component	Lithic Material Concentration/Historic	Not Eligible
24CR0908	N/A	Prehistoric	Lithic Material Concentration	Not Eligible
24CR0909	N/A	Prehistoric	Lithic Material Concentration and Fire Hearths or Roasting Pits	Not Eligible
24CR1264	N/A	Historic	Lewis and Clark National Historic Trail- Clark on the Yellowstone	Unevaluated
24CR1277	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24CR1617	Old Highway 312 / 59	Historic	Historic Road/Trail	Not Eligible
24CR1624	N/A	Historic	Historic Road/Trail	Unevaluated
24FA0011	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0154	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0286	N/A	Historic	Historic Campsite	Unevaluated
24FA0287	N/A	Historic	Historic Trash Dump	Unevaluated
24FA0334	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0348	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24FA0382	Chicago, Milwaukee, and St. Paul Railroad (Fallon)	Historic	Historic Railroad	Eligible
24FA0390	N/A	Historic	Historic Homestead/Farmstead	Unevaluated
24FA0608	N/A	Historic	Historic Energy Development	Not Eligible
24FA0765	N/A	Prehistoric	Lithic Material Concentration and Firehearths or Roasting Pits	Not Eligible
24FA0963	N/A	Historic	Butte Pipeline	Not Eligible
24FA0985	N/A	Historic	Historic Energy Development	Not Eligible
24RB0860	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24RB0991	N/A	Prehistoric	Lithic Material Concentration	Not Eligible
24RB0993	N/A	Prehistoric	Lithic Material Concentration	Unevaluated
24RB0994	N/A	Prehistoric	Lithic Material Concentration	Unevaluated

Note: N/A = not available and NRHP = National Register of Historic Places

Tribal Resources and Concerns

From Project inception, North Plains sought to identify and engage with interested Tribal Nations in the Project design and permitting process. This included early review of the proposed Study Area in relation to areas of Tribal interest, outreach to Tribal governments and cultural offices, and inclusion of Tribal input and interests (typically through Tribal Historic Preservation Offices) in field surveys and resource protection. North Plains made specific efforts to create regular and meaningful opportunities for Tribal Nations and their relevant departments and officials to participate in the pre-application routing and design processes – including offering an open invitation for Tribal participation on field survey teams, holding regular virtual and in-person meetings to reviews survey findings and Project status, the opportunity for site visits to identified areas of Tribal interest, and continuing communication regarding and participation in the creation of supporting documents for the Project application, most notably a Tribal Resources Report. Additionally, North Plains has engaged with Tribal government officials regarding Project-related economic development and partnership opportunities, including those made available through DOE grant funding.

Through these initial and continued efforts (as described more fully below), North Plains has developed a Project that seeks to minimize disturbance to Tribal resources and cultivates strong, multi-faceted relationships with Tribal Nations that will be maintained throughout the Project application and permitting process.

To highlight the key role of Tribal Nations in the pre-application process, North Plains is developing (in coordination with Tribal Nations) a Tribal Resources Report for its federal environmental review process as required under 216(h) of the Federal Power Act. This report will centralize information regarding Tribal interests in and potential impacts from the Project.

North Plains has discussed the creation of the Tribal Resource Report with coordinating Tribal Nations and has secured Tribal Nation consensus on the development of the document. Specifically, Tribal Nations may be interested in contributing their own writings about their unique connection to the Project area and any applicable Tribal laws. North Plains is currently working with the Tribal Nations to develop the Tribal Resource Report to include information specific to the Project while maintaining confidentiality of data and individual sovereignty of participating Tribes.

North Plain's coordination with Tribal Nations has focused largely on the early identification of Tribal interests in the Study Area. In April 2022, Tribal Historic Preservation Officers (THPOs) from all Tribes in Montana, North Dakota and South Dakota were invited to attend a meeting to introduce North Plains, and the key team members to seek participation by the Tribes in cultural surveys. North Plains created various ways for Tribal Nations to participate in the Project surveys, including:

- providing Tribal Cultural Specialists (TCSs) an opportunity to participate in field surveys and identify sites of interest;
- receiving monthly reports of Tribally identified sites of interest (including any description of the sites provided by the TCS and North Plains' proposed avoidance or mitigation measures) and reviewing the reports on monthly calls;
- conducting site visits to certain sites of interest; and
- remaining informed of survey findings and overall Project status via periodic emails.

Tribal Nations elected to participate to varying degrees in the Project including coordination, survey, and monthly calls (see Table 7.9.1-6).

Table 7.9.1-6

Tribal Nations Participation in Survey and Fieldwork

Tribal Nation	Elected to Participate in Coordination	TCSs in the field 2022 Survey Season	TCSs in the field 2023 Survey Season	TCSs in the field 2024 Survey Season	THPO Participated in Monthly Calls [a]
Fort Peck	Yes	Yes	Yes	Yes	Yes
Blackfeet	Yes	Yes	Yes	Yes	Yes
Rocky Boy	Yes	No	No	No	Yes
CSKT	Yes	No	No	No	Yes
Crow Tribe	Yes	Yes	Yes	Yes	Yes
Fort Belknap	Yes	Yes	Yes	Yes	Yes
Little Shell	Yes	Yes	Yes	Yes	Yes
Northern Cheyenne	Yes	Yes	Yes	Yes	Yes
Cheyenne River	Yes	Yes	Yes	Yes	Yes
Crow Creek	Yes	No	Yes	Yes	Yes
Flandreau	Yes	No	No	Yes	Yes
Lower Brule	Yes	No	No	No	Yes
Oglala	Yes	Yes	Yes	Yes	Yes
Rosebud	Yes	Yes	Yes	Yes	Yes
Yankton	Yes	No	No	Yes	Yes
Standing Rock	Yes	Yes	Yes	Yes	Yes
Sisseton-Wahpeton	Yes	No	No	Yes	Yes
Spirit Lake	Yes	Yes	Yes	Yes	Yes
Three Affiliated	Yes	Yes	Yes	Yes	Yes
Turtle Mountain	Yes	Yes	Yes	Yes	Yes
Santee Sioux	Yes	No	No	No	Yes

[a] THPO participation in some (but not necessarily all) monthly Project calls.

During the field survey season, each THPO (or other Tribally delegated official) received regular updates and was invited to attend monthly Project update meetings. In advance of the monthly meeting, the THPOs received a report of sites identified by all TCSs. Reports included a summary of the preceding month of survey activity, sites identified, and brief site descriptions. Respecting the data sovereignty of Tribal Nations, site information was shared only to the extent allowed by the identifying TCS and Tribal law. During the meetings, the North Plains reviewed the identified sites on a route map (showing the transmission line, structures, and access) and proposed avoidance or minimization measures, as well as considerations and/or challenges for alternate routes. By utilizing Tribal expertise, the Project was able to refine the Project design to largely avoid or minimize physical disturbance to Tribal resources.

Overall, the Project's coordination with Tribal Nations over four survey seasons in the pre-application and route design process resulted in:

- 88 TCSs reviewing the Study Area in the field and approximately 46,000 hours of TCS survey participation, expertise, and guidance;
- 580 identified sites of Tribal interest identified from 2022 through July 2025;
- 18 monthly Project update meetings with THPOs and Tribal representatives, conducted over three survey seasons during 2022, 2023, and 2024;

- two site visits with officials from eight Tribal Nations (One Tribe participated in 2022 and eight participated in a 2023 site visit), to view Tribally identified sites of interests within the Study Area, including sites on private land;
- the creation of standard avoidance measures for Tribally identified sites, including up to 150-foot buffers from ground disturbance; and
- more than 100 reroutes, micro-reroutes, and site barriers identified in the route design, such that no sites in Montana that have, or may have, religious or heritage significance and value to Native Americans would be adversely affected through direct disturbance by the Project.

Notably, North Plains completed the coordination in advance of formal government-to-government consultation to ensure a more robust and early mechanism for Tribal participation in the study and development of the Project.

7.9.1.3 Impact Assessment

North Plains considered the location of previously documented cultural resources sites during initial route design (Circular MFSA-2, Section 3.4.10(c)). Alternative A has the highest number of previously recorded cultural sites of all alternative routes within the Facility Location with 39. Alternatives B, C, and D have between 26 to 32 previously recorded cultural sites within the Facility Locations, with Alternative D having the lowest number of sites at 26. North Plains completed an analysis on the percentage of each alternative route's Facility Location, and each has had less than 1 percent previously subjected to Class III pedestrian survey (Circular MFSA-2, Section 3.4.10(b)). This lack of previous survey is an inadequacy in existing prehistoric and historic data that could complicate efforts to fully define all significant classes of sites or properties and to anticipate their occurrence. The most common type of sites within previously surveyed areas include cultural material scatters from previous ranching or farming operations; historic remnants of irrigation systems; historic roads; cultural and lithic material scatters from the precontact period; precontact stone feature sites; camp sites associated with major rivers and freshwater tributaries; military camp sites; and architectural sites associated with nearby towns and farming and ranching operations.

For this Project, North Plains is conducting a Class III Intensive Cultural Resource Investigation along with a similar tribal cultural resources survey and will work cooperatively with the MTSHPO and THPO to recommend management strategies for potential site impacts. The Class III Intensive Cultural Resource Investigation and tribal cultural resources survey focus on areas proposed for Project construction, including transmission structure locations, associated construction access roads, and workspace areas. The investigation is led by principal investigators meeting the Secretary of the Interior's Standards for Archaeology as published in 36 CFR 6 along with tribal cultural specialists under the direction of THPOs participating in the Project. Survey strategies (pedestrian and/or shovel testing and/or deep testing) depend on surface exposure and the characteristics of the landforms proposed for development. North Plains will assess an architectural history report, prior to construction, that will examine the potential visual impacts of the Project to NRHP-eligible or listed sites and will avoid adverse effects to the resources based upon the specific eligibility criteria that cause the site to be eligible for, or listed on, the NRHP.

North Plains is in ongoing discussions with MTSHPO concerning the Project and potential impacts on historic properties. These discussions are summarized in Appendix I. North Plains is also in discussions with the DOE, BLM, and USDA regarding potential impacts on Montana historic properties per Section 106 of the NHPA. A Class III report of findings for the 2022-2023 survey seasons is presently under review by the DOE (lead federal agency) and MTSHPO. North Plains also anticipates that a Class III addendum report for the 2024-2025 survey seasons will be submitted to the agencies by the end of 2025.

Common Impacts and Mitigation Measures

A transmission line project has the potential for the creation of ground disturbance through construction of access roads, structure locations, and facilities, which can affect site preservation, along with visual or auditory effects. Those potential effects can be avoided or mitigated in several ways, through project design and pre-construction planning, which are outlined below. Construction and operation of the Project inherently has the potential to affect NRHP-eligible properties such as prehistoric or historic archaeological sites, Traditional Cultural Properties (TCP), districts, buildings, structures, and objects. Cultural resources identified as a result of the Class III investigation will be avoided by ground disturbing activities as the primary mitigation measure to avoid impacts during construction of the Project. Avoidance of resources will include adjustments to the Project design and designation of culturally sensitive areas to be left undisturbed or spanned by the Project.

Construction

Construction and operation of the Project could potentially affect NRHP-eligible sites. These could include prehistoric or historic archaeological sites, districts, buildings, structures, objects, and locations with traditional cultural value to Native Americans or other groups. Project impacts could include physical disturbance during construction on archaeological sites and the introduction of visual or audible elements that could alter the site's setting. Impacts to NRHP-eligible sites would be avoided when possible or minimized or mitigated through MTSHPO-approved data recovery techniques. Mitigation may include avoidance using route adjustments, data recovery, and the use of landscaping or other techniques that would minimize or eliminate effects on the historic setting or ambiance of standing structures.

North Plains will avoid unevaluated and NRHP-eligible sites identified within the Facility Locations. As discussed above, North Plains is in ongoing discussions with regulatory agencies regarding potential impacts on historic properties through Section 106 of the NHPA (see Section 9.0 and Appendix I). North Plains will continue to work with DOE, MTSHPO, participating THPOs, and DEQ to identify measures to avoid adversely affecting these sites as practicable. As part of this process, it is possible that additional treatment measures, including special construction methods and/or topographic screening, may be identified to eliminate or reduce impacts, though none have been identified to date. Measures identified to date involve spanning, avoidance of ground disturbance, realignment around existing sites, and monitoring during construction.

Construction and operations can adversely affect undiscovered archaeological sites. If previously undocumented sites are discovered within the construction corridor by a construction crew member, archaeologist, or tribal monitor during construction activities, all work that might adversely affect the discovery will be halted by the construction supervisor, in coordination with North Plains, until North Plains, in consultation with the lead federal agency, THPOs, and MTSHPO, can evaluate the site's eligibility and the probable effects. If the previously unidentified site is recommended as eligible to the NRHP, North Plains will follow the steps outlined in the Unanticipated Discovery Plan to mitigate impacts. The Unanticipated Discovery Plan is included in the Programmatic Agreement prepared by the DOE.

<u>Operations and Maintenance</u>

Previously identified historic properties will be avoided during operations and maintenance activities, including the process outlined above for construction activities. The primary impact of the operation phase of the Project are visual elements that can alter the setting associated with historic properties, including TCPs. North Plains will use mitigation strategies outlined in the Visual Impacts section of this document (see Section 7.9.3).

Unique Impacts and Mitigation Measures

Key impacts to historic properties that would be likely under each of the respective alternative routes are discussed below. Section 8.0 provides a comparison of like impacts by alternative route. Mitigation measures would be applied consistently across the alternative routes, as applicable. None of the alternative routes would involve additional mitigation measures beyond those presented above.

Based on the analysis, Alternatives A, B, C, and D trend through the boundary of the Lewis and Clark National Historic Trail, which follows the route taken down the Yellowstone River by explorers Captain Merriweather Lewis and Lieutenant William Clark and the Corps of Discovery during their journey to and from the Pacific coast in 1804 and 1805.

Alternative A has the highest number of previously recorded sites within or partially within the Facility Location. Alternative A also has the highest number of NRHP-eligible or NRHP-listed historic properties within the Facility Location. There are four historic properties recommended as eligible for listing on the NRHP within the Facility Location for Alternative A.

Alternative B has the third highest number of previously recorded sites within or partially within the Facility Location. Alternative B has one NRHP-eligible historic property directly crossed by the alternative route.

Alternative C has the second highest number of previously recorded sites (one more than Alternative B) that are within or partially within the Facility Location. Alternative C has one NRHP-eligible historic property directly crossed by the alternative route.

Alternative D has the lowest number of previously recorded sites that are within or partially within the Facility Location. Alternative D has two historic properties recommended as eligible for listing on the NRHP directly crossed by the alternative route.

7.9.2 Paleontology (Circular MFSA-2 Section 3.7(13 & 14))

Paleontological resources, or fossils, are defined as the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partially mineralized, or un-mineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. Fossils include not only themselves, but also the associated rocks or organic matter and the physical characteristics of the fossils' associated sedimentary matrix (Murphey and Daitch, 2007). The following section discusses the paleontological resources within the Facility Location of each alternative route as defined by Section 7.0 which encompasses lands where construction and operation of the facility, including construction of access roads, may directly affect the integrity of paleontological resources (Circular MFSA-2, Section 3.7(13)). Appendix E provides additional baseline data maps of areas with geologic units or formations that show a high probability of including important paleontological resources within the MFSA required Study Area (see Figure E-10c in Appendix E). In accordance with Circular MFSA-2 Section 3.4(s), the Study Area for paleontology is a 10-mile-wide corridor, which includes the Facility Locations, of the surrounding geographic area (MFSA-2 Section 3.3(3)).

7.9.2.1 Baseline Data

The BLM utilizes the Potential Fossil Yield Classification (PFYC) system to identify and classify geologic formations for their potential to bear paleontological resources on federal lands (BLM, 2015b; BLM, 2016; BLM, 2022b). In accordance with MFSA, the DEQ follows the BLM PFYC system to classify geologic formations on state and private lands as this system has the most protective methodology (DEQ, 2011). The State of Montana formally recognizes this definition and determines their ownership to the surface estate (1-4-112, MCA). Occurrences of fossils are closely tied to the geologic units (i.e., formations, members, or beds) that contain them. The probability of finding fossils can be broadly predicted from the geologic units present at or near the ground surface. Therefore, geologic mapping can be used for assessing the potential for fossils.

North Plains conducted a desktop review to determine what formations underlay the alternative routes. This review occurred by overlaying GIS data of the alternative routes with geologic maps of various scales to discern the fossiliferous formations and then determine the PFYC value of each formation.

The PFYC system classifies geologic units based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts. The scale ranges from 1 to 5, where Class 1 units have the lowest potential for fossils and Class 5 has the highest potential for fossils. The BLM applies this system to the geologic formation, member, or other distinguishable unit, preferably at the most detailed mappable level. This system is a general screening tool and is not intended to be applied to specific paleontological localities or small areas within units. Within a geologic unit, class assignment is mostly determined by the relative abundance of significant localities therein.

Descriptions of the potential fossil yield classes, considered as BLM guidelines, are presented below (BLM, 2022b).

- Class 1 – Very Low. Geologic units that are not likely to contain recognizable fossil remains.
    - Units that are igneous or metamorphic, excluding air-fall and reworked volcanic ash units; and
    - Units that are Precambrian in age or older.
- Class 2 – Low. Geologic units that are not likely to contain paleontological resources.
    - Vertebrate or significant invertebrate or plant fossils not present or very rare;
    - Units are generally younger than 10,000 years before present;
    - Recent Aeolian deposits; and

  - Sediments that exhibit significant physical and chemical changes (i.e., diagenetic alteration).

- Class 3 – Moderate. Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence.
  - Marine in origin with sporadic known occurrences of vertebrate fossils;
  - Vertebrate fossils and scientifically significant invertebrate or plant fossils known to occur intermittently; predictability known to be low; and widely scattered.

- Class 4 – High. Geologic units containing a high occurrence of significant fossils.
  - Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented but may vary in occurrence and predictability;
  - Paleontological resources may be susceptible to adverse impacts from surface disturbing actions; rare or uncommon invertebrate or plant fossils; and
  - Areas possibly impacted by illegal collecting activities.

- Class 5 – Very High. Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils.
  - Important fossils have been documented and occur consistently;
  - Paleontological resources highly susceptible to adverse impacts from surface disturbing activities; and
  - Unit is frequently targeted for illegal collecting activities.

- Class U – Unknown. Geologic units unable to receive a PFYC assignment.
  - Possibility of significant paleontological resources based on features and preservational conditions but little information is known about the unit or area;
  - Geological units represented on a map based on lithologic character or basis of origin without detailed study;
  - Scientific literature does not exist or reveal the nature of the paleontological resources;
  - Unverified or anecdotal reports of paleontological resources;
  - Area or geological unit is poorly or under-studied; and

  - BLM has not yet assessed the nature of the geological unit.

- Class W – Water. Although bodies of water do not normally contain paleontological resources,
  - Shorelines along water bodies should be considered for uncovered or transported fossils;
  - Reservoirs should be considered due to water fluctuations exposing important fossils;
  - Karst sinkholes may preserve paleontological resources; and
  - Dredging of rivers may disturb fossiliferous sediments.

- Class I – Ice. Any area mapped as ice or snow.
  - Receding glaciers may reveal recently exposed paleontological resources; and
  - Melting of snow fields with possible exposure of fossils with soft-tissue preservation.

The BLM Permanent Instruction Memorandum (PIM2022-009) for the PFYC system is found in Appendix H. Table 7.9.2-1 summarizes the paleontological fossil yield class types crossed by Alternatives A through D.

TABLE 7.9.2-1

Fossil Yield Class Types Crossed by the Alternative Routes

Fossil Resource Type	Alternative A (miles)	Alternative B (miles)	Alternative C (miles)	Alternative D (Refined) (miles)
Nonsignificant Fossil Resources	10	6	4	3
Scientifically Significant Fossil Resources	126	139	140	162
Unknown	30	12	6	10

Multiple geologic formations are crossed by the alternative routes. These include the Fort Union Formation [Class 4] (Ludlow, Tongue River, Lebo, and Tullock Members), Fox Hills Formation [Class 4] (Trail City, Timber Lake, and Colgate Members), Pierre Shale [Class 4], and Hell Creek Formation [Class 5] (BLM, 2015b and 2022b).

Table 7.9.2-2 summarizes the sensitivity of geologic formations with significant fossils crossed by Alternatives A through D.

TABLE 7.9.2-2

Sensitivity of Geologic Formations with Significant Fossils Crossed by the Alternative Routes

Sensitivity	Alternative A (miles)	Alternative B (miles)	Alternative C (miles)	Alternative D (Refined) (miles)
Low	10	6	4	3
Moderate	0	0	0	0
High	119	137	138	156
Very High	7	2	2	6
Unknown	30	12	6	10
PROJECT TOTAL	**166**	**157**	**150**	**175**

Note: prop. =proportion of total in miles
Source: Vuke et al., 2001a; Vuke et al., 2001b; Vuke et al., 2001c; Vuke et al., 2001d; Vuke and Colton, 2003a; Vuke et al. 2003b

Alternative A Facility Location crosses 7 miles of geologic formations that have a very high potential to yield significant fossils based on previously documented resources. These very high potential areas occur in the Hell Creek Formation, which is present in three non-contiguous segments covering a total of approximately 255 acres. Typical fossils within the Hell Creek Formation include dinosaurs such as *Tyrannosaurus* and *Triceratops* and assemblages of mammals, reptiles, amphibians, fish, invertebrates, and plants.

Alternative B Facility Location crosses 2 miles of geologic formations that have a very high potential to yield significant fossils based on previously documented resources. This very high potential area occurs in the Hell Creek Formation, which is present in one contiguous 71-acre area.

Alternative C Facility Location crosses 2 miles of geologic formations that have a very high potential to yield significant fossils based on previously documented resources. This very high potential area occurs in the Hell Creek Formation, which is present in one contiguous 73-acre area.

Alternative D Facility Location crosses 6 miles of geologic formations that have a very high potential to yield significant fossils based on previously documented resources. This very high potential area occurs in the Hell Creek Formation, which is present in one contiguous 218-acre area.

7.9.2.2 Impact Assessment

Impact potential for the disturbance or loss of paleontological resources is directly tied to the PFYC system. The system provides an overall potential for fossils to be found in each formation and geologic maps define the underlying bedrock for the potential for fossils to be uncovered. The increasing values in classification also represent an increase in potential for scientifically significant specimens to be found. In addition, locality searches, performed before and during a pedestrian survey, provide locations of previously discovered localities.

Common Impacts and Mitigation Measures

Construction

Construction of the Project inherently has the potential to affect scientifically significant fossils during grading, excavation, and/or drilling. North Plains will minimize adverse impacts to scientifically important paleontological resources by conducting field surveys for paleontological resources on federal lands within the final, approved construction right-of-way. Additionally, North Plains developed a Paleontological Resources Management and Mitigation Plan that establishes procedures for identifying, reporting, and minimizing risk of damage to fossils on federal and State of Montana lands in coordination with regulatory agencies during construction (see Attachment F of the CMRP).

North Plains will not remove fossils from private lands for any reason, including curation, without the written consent of the landowners. Private landowners will be notified of fossil discoveries and provided with the following options. The fossils will:

- be collected and donated to the Project's designated repository or museum;
- be collected and ownership retained by the landowner, with the fossils returned to the main residence; or
- be allowed to be disturbed and reburied during construction with the landowner's consent.

Overall potential impacts to fossils are expected to be short term. Fossils could only be disturbed during ground disturbing activities such as access road clearing, pad construction, and drilling. During structure construction, monitoring will be unnecessary.

Operations and Maintenance

Any potential effects to fossils from maintenance activities would be isolated due to the probable disbursed nature of maintenance activities. Potential impacts during operations and maintenance will be minimized since activity will occur in previously disturbed sediments within the right-of-way.

Normal operation of the Project will not disturb important paleontological resources. Maintenance activities will result in surface disturbance within the right-of-way. Since no new disturbances will occur from maintenance activities (i.e., maintenance activities will occur within previously disturbed areas, or no ground disturbance would occur), impacts to paleontological resources will be minimized.

If maintenance requires a ground disturbing activity that is known to cut into high to very high potential bedrock, a paleontological monitor would be needed on federal and state lands and recommended on private lands at the landowner's request.

Unique Impacts and Mitigation Measures

Key impacts to paleontology that would be likely under each of the respective alternative routes are discussed below. Section 8.0 provides a comparison of like impacts by alternative route. Mitigation measures would be applied consistently across the alternative routes, as applicable.

None of the alternative routes would involve additional mitigation measures beyond those presented above.

Based on the PFYC system, North Plains analyzed each of the four alternative routes for the potential to cross fossil resources in Tables 7.9.2-1 and 7.9.2-2. Alternative D crosses the most miles of geologic formations that have a high or very high potential to yield scientifically significant fossils and Alternative A crosses the least miles of geologic formations that have a high or very high potential to yield scientifically significant fossils based on previously documented resources.

Paleontological resources along Alternatives B and C are not relatively unique; therefore, comparisons are not highlighted in Section 8.

7.9.3 Visual Resource Considerations (Circular MFSA-2 Section 3.7(10 & 11))

7.9.3.1 Baseline Data

Visual resources are those characteristics of the landscape visible to residents and visitors. Descriptions of visual resources include the aesthetic value of the natural and developed landscape, the public value of viewing the natural landscape, and the visibility of the landscape from sensitive viewpoints (e.g., recreation areas, rivers, and highways). The following section discusses the visual resources assessed along the centerline of each alternative route. Appendices E and F provide additional visual resource baseline data (tables and maps, respectively) within the MFSA required Study Area. In accordance with Circular MFSA-2 Section 3.7(10), the Study Area for visual resources is 5 miles from the centerline and within the view of the alternative route (i.e., a 10-mile-wide corridor along each of the alternative routes). This is determined by distance recommendations scaling by a project's capacity provided in Circular MFSA-2 Section 3.8(10).

There are no formal guidelines for managing visual resources for private or state-owned lands in Montana or visual regulations specific to Project counties. The BLM is responsible for identifying and protecting scenic values on federal lands under its administration in accordance with the Federal Land Policy Management Act. The BLM VRM system was developed to facilitate the effective discharge of that responsibility in a systematic, interdisciplinary manner.

North Plains used the VRM system, documented by the BLM in the 8400 series VRM Manual (BLM, 1986), as the basis for both the visual resources inventory and the assessment of visual impacts on BLM lands. The VRM system includes an inventory process, based on a matrix of scenic quality, viewer sensitivity to visual change, and viewing distances, which leads to classification of public lands and assignment of visual management objectives. The BLM established four VRM classes. The classes serve two purposes: as an inventory tool portraying relative value of existing visual resources and as a management tool portraying visual management objectives for the respective classified lands to establish the guidelines for the level of acceptable visual change allowed in the landscape. Table 7.9.3-1 shows the management objectives for each VRM class.

TABLE 7.9.3-1

BLM Visual Resource Management Class Objectives

Class I Objective	The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
Class II Objective	The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic (design) elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
Class III Objective	The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
Class IV Objective	The objective of this class is to provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic (design) elements.
Rehabilitation Areas	Areas in need of rehabilitation from a visual standpoint should be flagged during the inventory process. The level of rehabilitation will be determined through the resource management planning process by assigning the VRM class approved for that particular area.

Source: BLM, 1986

In addition to Management Class Objectives identified above, the VRM system also includes a contrast rating procedure for evaluating the scenic quality of an area. There are three classes of scenic quality under the BLM VRM contrast rating procedure, differentiated as Class A, Class B, and Class C. Ratings assigned through an evaluation of seven design factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. Each of the factors is evaluated in the context of, and in comparison with, the characteristic landscape of the physiographic province in which the Facility Location of each alternative route resides. Class A scenery is considered distinctive, with considerable variety in form, line, color, and texture. Class B scenery has enough variety in form, line, color, and texture to attract interest and is above average in the regional context, though not unique or highly distinctive. Class C scenery is considered common, not necessarily unattractive, but typical throughout the region.

The BLM has mapped its VRM system for all land (public and private) on all alternative routes. As such, the BLM VRM system provides a convenient and objective tool for assessing visual impacts across all lands on all alternative routes. However, BLM requirements apply only to BLM-administered lands and do not apply to non-BLM lands.

Visual sensitivity is based on a mixture of the type of users, the quantity of users, the level of interest in the landscape, the duration of views, the land use context, and the proximity of viewers to a proposed change in the landscape. Viewers within the foreground viewing distance (0.5 mile) are likely to be more sensitive to a visual modification than someone with a middle ground viewing distance (0.5 mile to 4 mile) or more.

The following general description of the landscape sets the context for evaluating the potential visual effects of the alternative routes.

The visual environment of the Project occurs in, and is characterized by, the visual resources of the Missouri Plateau section of the Great Plains Physiographic Province (Fenneman, 1931). The Facility Locations are in the unglaciated section, generally south of the Yellowstone River. Topography tends to be generally flat to gently rolling with undulating, rolling hills in places, some bluffs, and hummocky areas. The rolling prairie lands are interspersed with uplands, wet vegetation, streams, and rivers. A few areas are deeply eroded. The southern region of the Facility Locations are primarily an elevated plain with gently rolling slopes and flat-topped, steep-sided buttes, and badlands.

One major river, the Yellowstone River, comprise the dominant water features of the region. General vegetation types consist mostly of grasslands, riparian/wetlands, developed, barren, forest, and agriculture. Natural landscapes are predominantly rangeland/grasslands. Disturbed areas are largely dryland wheat and hay fields, with widely disbursed community settlements.

Alternative A

Scenic Quality

The scenic quality for Alternative A is rated 58.5 percent Class C – Common and 41.5 percent Class B – Above Average. Scenic quality is shown on maps in Figure E-10e in Appendix E. Terrain is generally high valley grasslands separated by rolling hills and prominent formations including rock outcrops, cliffs, and badlands. Alternative A also parallels the Yellowstone River Valley between Forsyth and Miles City, adding to the Class B total due to the flat river valley surrounded by steep side slopes and escarpments. Vegetation is a mix of high valley grasslands and conifer-dominated forested hills. Row crops are present within 5 miles of the Facility Location in the Yellowstone River valley, and briefly at the crossings of Rosebud Creek, and Tongue River, as well as the flat plains in Fallon County portion of the route leading up to the Montana and North Dakota state line.

Cultural modifications near Alternative A include a few widely disbursed communities, residences, agricultural facilities, agricultural lands, highways, and other roads.

Alternative A would cross two areas that the BLM has designated VRM Class II. The first is an area from Mileposts 27.6 to 46.9, where Alternative A would parallel the Yellowstone River and Interstate 94. Alternative A parallels the existing interstate, railroad, and power transmission infrastructure, minimizing new visual impacts across the designation. The route would be in view of multiple scenic overlooks and official rest areas, but not in the direct path of their intended views of the river valley.

The second area occurs around land formations east of the Powder River containing irregular pyramidal to trapezoidal landforms and areas of badlands within the viewshed of the Knowlton BLM Recreation Area. The route parallels U.S. Highway 12 the duration of the Class II designation as well as an existing electrical transmission line.

Visual Sensitivity

Residential Viewpoints

Alternative A has an origin point in Colstrip (population 2,096) (U.S. Census, 2020a). The prominent features of the immediate area are power generation and transmission infrastructure and multiple mining sites.

The next significant residential areas are the various municipalities between Forsyth and Miles City along the Yellowstone River. Visibility of the Project will vary, and many areas will benefit from shielding by topography. These locations are the only areas of substantial habitation on the route within a BLM Class II designation.

Recreation and Transportation Viewpoints

Alternative A parallels Interstate 94 for approximately 22 miles along the Yellowstone River. This section of Interstate 94 carried an annual average of 4,590 daily vehicles in 2024 (MDT, 2025). On average, there are 1.5 people in a car at any given time in Montana (FHA, 2022), which equates to about 6,885 viewers per day. Railroad and electrical transmission line infrastructure exist along the corridor. This section of the alternative route is designated BLM Class II.

The route crosses State Highway 59 and moves east of Miles City along U.S. Highway 12 and crosses into the viewshed of the Strawberry Hill Recreation Area, a SRMA, with the most substantial visual impact occurring at the entrance parking lot and the southern high points of the hiking trail loop. This section of U.S. Highway 12 carried an annual average of 638 daily vehicles in 2024 (MDT, 2024), which equates to about 957 viewer per day. Electrical transmission infrastructure currently parallels U.S. Highway 12 in a similar route to Alternative A and is currently visible at these locations.

Continuing east parallel to U.S. Highway 12 after crossing the Powder River, Alternative A crosses the route's second BLM Class II designated area within the viewshed of the Knowlton BLM Recreation Area. There is a U.S. Highway 12 rest area near milepost 112 of the route. The existing electrical transmission line that Alternative A parallels can be plainly seen looking south from the rest stop.

Lastly, prior to reaching the North Dakota border, Alternative A crosses State Highway 7 which is also a transportation viewpoint. All highway crossings occur in BLM designated VRM Class IV and C – Common.

<u>VRM Classes</u>

Portions of Alternative A cross areas that are designated VRM Class II, III, and IV. Table 7.9.3-2 and Figure E-10d in Appendix E shows the VRM Class distribution for Alternative A.

TABLE 7.9.3-2

BLM Visual Resource Management Class Alternative A

Approximate Location	From Milepost	To Milepost	Alternative Route Miles by VRM Class			
			Class II	Class III	Class IV	Total
Colstrip to Forsyth	0.0	14.6		14.6		14.6
	14.6	21.1			6.5	6.5
	21.1	27.6		6.5		6.5
Parallel to I-94 and Yellowstone River	27.6	47.0	19.4			19.4
	47.0	52.2		5.2		5.2
Fort Keogh to Pumpkin Creek and Tongue River and parallel to U.S. Highway 59	52.2	72.3			20.1	20.1
SE of Miles City	72.3	81.5		9.2		9.2
Miles City to Powder River	81.5	98.3			16.8	16.8
Powder River Crossing and formations east of flood plain	98.3	104.2		5.9		5.9
	104.2	116.9	12.7			12.7
	116.9	123.7		6.9		6.9
Powder River formations to Montana / North Dakota state line	123.7	166.3			42.5	42.3

TABLE 7.9.3-2

BLM Visual Resource Management Class Alternative A

Approximate Location	From Milepost	To Milepost	Alternative Route Miles by VRM Class			
			Class II	Class III	Class IV	Total
PROJECT TOTAL			**32.1**	**48.3**	**85.9**	**166.3**
Percent of Total			19%	29%	52%	100%

Source: Bureau of Land Management, 2024

Alternative B

Scenic Quality

The scenic quality for Alternative B is rated 69.5 percent Class C – Common and 30.5 percent Class B – Above Average. Scenic quality is shown on maps in Figure E-10e in Appendix E. Terrain is generally high valley grasslands separated by rolling hills and prominent formations including rock outcrops, cliffs, and badlands. Vegetation is a mix of high valley grasslands and pinyon/juniper covered hills. Row crops are present near the Yellowstone River valley, and briefly at the crossings of Rosebud Creek, Tongue River, and Pumpkin Creek, as well as the flat plains in the Fallon County portion of the route leading up to the Montana and North Dakota state line.

Cultural modifications near the Alternative B include a few widely disbursed communities, residences, agricultural facilities, agricultural lands, highways, and other roads.

Alternative B would cross two areas that the BLM has designated VRM Class II. The first Class II area is an area from mileposts 32.5 to 33.5, where Alternative B briefly enters the designated area along the Yellowstone River and Interstate 94. Alternative B turns east 1.6 miles south of the I-94 Hathaway Eastbound Rest Area. The topography that this corner traverses is visible on the southern horizon of the rest area. The south facing view from the rest area is currently obstructed by electrical transmission infrastructure 0.25 mile in the same direction as Alternative B.

The second area occurs around land formations east of the Powder River containing irregular pyramidal to trapezoidal landforms and areas of badlands. The route parallels U.S. Highway 12 for the duration of the Class II designation.

Visual Sensitivity

Residential Viewpoints

Alternative B has an origin point in Colstrip (population 2,096) (U.S. Census, 2020a). The prominent features of the immediate area are power generation and transmission infrastructure, and multiple mining sites.

The route avoids concentrated residential areas and keeps to agricultural crop and grazing use lands until milepost 126 when the route paralleling U.S. Highway 12 passes 0.75 mile south of Plevna (population 179) (U.S. Census, 2020b).

Recreation and Transportation Viewpoints

Alternative B briefly enters the Class II area along the Yellowstone River and Interstate 94. Alternative B turns east 1.6 miles south of the I-94 Hathaway Eastbound Rest Area. The topography that this corner traverses is visible on the southern horizon of the rest area. The south facing view from the rest area is currently obstructed by electrical transmission infrastructure 0.25 mile in the same direction as Alternative B. This section of the alternative route is designated BLM Class II.

Alternative B crosses Tongue River Road and State Highway 59 near the confluence of the Tongue River and Pumpkin Creek. This section of State Highway 59 carried an annual average of 975 daily vehicles in 2024 (MDT, 2025), which equates to about 1,463 viewers per day. These crossings both occur in BLM designated VRM Class IV and C – Common.

Continuing east in parallel to U.S. Highway 12 after crossing the Powder River, Alternative B crosses the route's second BLM Class II designated area within the viewshed of the Knowlton BLM Recreation Area. This section of U.S. Highway 12 carried an annual average of 638 daily vehicles in 2024 (MDT, 2025), which equates to about 957 viewers per day. There is a U.S. Highway 12 rest area near milepost 98 of the route. The existing electrical transmission line that Alternative B parallels can be plainly seen looking south from the rest stop.

Alternative B crosses U.S. Highway 12 southeast of Plevna, Montana and State Highway 7 north of Baker. This section of State Highway 7 carried an annual average of 756 daily vehicles in 2024 (MDT, 2025), which equates to about 1,134 viewers per day. These crossings both occur in BLM designated VRM Class IV and C – Common.

<u>VRM Classes</u>

Portions of Alternative B cross areas that are designated VRM Class II, III, and IV. Table 7.9.3-3 and Figure E-10d in Appendix E shows the VRM Class distribution for Alternative B.

TABLE 7.9.3-3

BLM Visual Resource Management Class Alternative B

Approximate Location	From Milepost	To Milepost	Alternative Route Miles by VRM Class			
			Class II	Class III	Class IV	Total
Colstrip to Rosebud Creek	0.0	4.5		4.5		
	4.5	7.4			2.9	
	7.4	21.5		14.0		
	21.5	29.6			8.1	
Near Yellowstone River at Hathaway	29.6	32.5		2.9		
	32.5	33.6	1.1			
	33.6	40.4		6.9		
Hathaway to Powder River	40.4	79.6			39.2	
Powder River Crossing and formations east of flood plain	79.6	89.9		10.3		
	89.9	103.1	13.2			
	103.1	109.9		6.9		
Powder River formations to Montana / North Dakota state line	109.9	157.0			47.1	
PROJECT TOTAL			**14.3**	**45.5**	**97.2**	**156.8**
Percent of Total			9%	29%	62%	100%

TABLE 7.9.3-3

BLM Visual Resource Management Class Alternative B

Approximate Location	From Milepost	To Milepost	Alternative Route Miles by VRM Class			
			Class II	Class III	Class IV	Total

Source: Bureau of Land Management, 2024

Alternative C

Scenic Quality

The scenic quality for Alternative C is rated 65.1 percent Class C – Common and 34.9 percent Class B – Above Average. Scenic quality is shown on maps in Figure E-10e in Appendix E. Terrain is generally high valley grasslands separated by rolling hills and prominent formations including rock outcrops, cliffs, and badlands. Vegetation is a mix of high valley grasslands and pinyon/juniper covered hills. Row crops are present briefly at the crossings of Rosebud Creek, Tongue River, and Pumpkin Creek, as well as the flat plains in the Fallon County portion of the route leading up to the Montana and North Dakota state line.

Cultural modifications near Alternative C include a few widely disbursed communities, residences, agricultural facilities, agricultural lands, highways, and other roads.

Alternative C would cross two areas that the BLM has designated VRM Class II.

The first is an area from mileposts 24 to 57, where Alternative C intermittently moves between Class II and Class III while traversing an irregular grouping of Class II areas around the BLM managed Pumpkin Creek Ranch and Recreation Area and the State of Montana managed Tongue River Ranch and Recreation Area. The overlap of terrain-based evaluations and the designated area around the recreation sites result in a patchwork of Class II areas, of which Alternative C moves through a cumulative 6.3 miles in this specific location.

The second area occurs around land formations east of the Powder River containing irregular pyramidal to trapezoidal landforms and areas of badlands within the viewshed of the Knowlton BLM Recreation Area. Alternative C deviates from the other routes by going northeast after crossing the Powder River instead of north to parallel U.S. Highway 12. This takes the route directly through an otherwise undisturbed Class II area the BLM has marked as heavy use year-round for hunting and camping.

Visual Sensitivity

Residential Viewpoints

Alternative C has an origin point in Colstrip (population 2,096) (U.S. Census, 2020a). The prominent features of the immediate area are power generation and transmission infrastructure, and multiple mining sites.

The route avoids concentrated residential areas and keeps to agricultural crop and grazing use lands until milepost 126 when the route paralleling U.S. Highway 12 passes 0.75 mile south of Plevna (population 179) (U.S. Census, 2020b).

Recreation and Transportation Viewpoints

After going east from Colstrip, Alternative C crosses into the Southern edge of the designated high sensitivity area around the BLM managed Pumpkin Creek Ranch and Recreation area and State of Montana managed Tongue River Ranch and Recreation area. This area is marked for hunting and dispersed recreational use.

Alternative C briefly parallels and then crosses State Highway 59 and Pumpkin Creek near the Beebe Historical Marker in BLM designated VRM Class IV and C – Common. State Highway 59 at this crossing point carried an annual average of 638 daily vehicles in 2024 (MDT, 2025), which equates to about 957 viewers per day.

After crossing the Powder River, Alternative C deviates from the other routes by going northeast through land containing irregular pyramidal to trapezoidal landforms and areas of badlands within the viewshed of the Knowlton BLM Recreation Area. This takes the route directly through an otherwise undisturbed Class II area the BLM has marked as heavy use year-round for hunting and camping.

Alternative C crosses U.S. Highway 12 southeast of Plevna, Montana and State Highway 7 north of Baker. These crossings both occur in BLM designated VRM Class IV and C – Common.

VRM Classes

Portions of Alternative C cross areas that are designated VRM Class II, III, and IV. Table 7.9.3.4 and Figure E-10d in Appendix E shows the VRM Class distribution for Alternative C.

TABLE 7.9.3-4

BLM Visual Resource Management Class Alternative C

Approximate Location	From Milepost	To Milepost	Alternative Route Miles by VRM Class			
			Class II	Class III	Class IV	Total
Colstrip to Rosebud Creek	0.0	4.5		4.5		
	4.5	7.4			2.9	
	7.4	18.3		10.9		
Rosebud Creek to Highway 59 S and Pumpkin Creek	18.3	20.1			1.8	
	20.1	24.8		4.7		
	24.8	28.5	3.7			
	28.5	32.6		4.1		
	32.6	33.8	1.3			
	33.8	36.2		2.3		
	36.2	54.8			18.7	
	54.8	56.2	1.4			
	56.2	61.9		5.7		
Custer County line to Powder River	61.9	77.8			15.9	
Powder River and formations east of flood plain to U.S. Highway 12	77.8	83.1		5.3		
	83.1	96.2	13.1			
	96.2	102.7		6.5		
Custer and Fallon County line to Montana / North Dakota state line	102.7	149.7			47.0	
PROJECT TOTAL			**19.4**	**44.0**	**86.5**	**149.7**
Percent of Total			13%	29%	58%	100%

TABLE 7.9.3-4

BLM Visual Resource Management Class Alternative C

Approximate Location	From Milepost	To Milepost	Alternative Route Miles by VRM Class			
			Class II	Class III	Class IV	Total

Source: Bureau of Land Management, 2024

Alternative D (Refined)

Scenic Quality

The scenic quality for Alternative D is rated 66.5 percent Class C – Common and 33.5 percent Class B – Above Average. Scenic quality is shown on maps in Figure E-10e in Appendix E. Terrain is generally high valley grasslands separated by rolling hills and prominent formations including rock outcrops, cliffs, and badlands. Vegetation is a mix of high valley grasslands and pinyon/juniper covered hills. Row crops are present near the Yellowstone River valley, and briefly at the crossings of Rosebud Creek, and Tongue River as well as the flat plains in the Fallon County portion of the route leading up to the Montana and North Dakota state line.

Cultural modifications near the Alternative D route include a few widely disbursed communities, residences, agricultural facilities, agricultural lands, highways, and other roads.

Alternative D would cross one area that the BLM has designated VRM Class II. The area occurs around land formations east of the Powder River containing irregular pyramidal to trapezoidal landforms and areas of badlands within the viewshed of the Knowlton BLM Recreation Area. The route parallels U.S. Highway 12 the duration of the Class II designation.

Visual Sensitivity

Residential Viewpoints

Alternative D has an origin point in Colstrip (population 2,096) (U.S. Census, 2020a). The prominent features of the immediate area are power generation and transmission infrastructure, and multiple mining sites.

The route avoids concentrated residential areas and keeps to agricultural crop and grazing use lands until milepost 126 when the route paralleling U.S. Highway 12 passes 0.25 mile south of Plevna (population 179) (U.S. Census, 2020b).

Recreation and Transportation Viewpoints

Alternative D crosses Tongue River Road and state Highway 59 near the confluence of the Tongue River and Pumpkin Creek. At this crossing point, State Highway 59 carried an annual average of 975 daily vehicles in 2024 (MDT, 2025), which equates to about 1,463 viewers per day. These crossings both occur in BLM designated VRM Class IV and C – Common.

Continuing north-northeast after crossing the Powder River, Alternative D enters its only BLM Class II designated area within the viewshed of the Knowlton BLM Recreation Area and begins to parallel U.S. Highway 12. There is a U.S. Highway 12 rest area near milepost 108 of the route. The existing electrical transmission line that Alternative D parallels can be plainly seen looking south from the rest stop.

While paralleling U.S. Highway 12, Alternative D will cross the road three times before turning north towards the Project's Montana and North Dakota crossing. Alternative D also crosses State Highway 7 north of Baker. These crossings occur in BLM designated VRM Class IV and C – Common.

<u>**VRM Classes**</u>

Portions of Alternative D cross areas that are designated VRM Class II, III, and IV. Table 7.9.3-5 and Figure E-10d in Appendix E shows the VRM Class distribution for Alternative D.

TABLE 7.9.3-5

BLM Visual Resource Management Class Alternative D (Refined)

Approximate Location	From Milepost	To Milepost	Alternative Route Miles by VRM Class			
			Class II	Class III	Class IV	Total
Colstrip to Rosebud Creek	0.0	4.8		4.8		
	4.8	9.3			4.4	
	9.3	21.2		12.0		
	21.2	23.1			1.9	
Rosebud and Custer County line from Ranch Creek to Graveyard Creek Road	23.1	27.4		4.3		
	27.4	28.2			0.9	
	28.2	28.6		0.3		
	28.6	28.6		0.1	<0.1	
	28.6	28.7		<0.1		
	28.7	30.0			1.3	
	30.0	31.5		1.5		
	31.5	33.0			1.5	
	33.0	35.0		2.0		
	35.0	38.5			3.5	
	38.5	43.1		4.6		
South of Fort Keogh to near Powder River	43.1	87.8			44.7	
Crossing Powder River	87.8	95.9		8.0		
Parallel to Powder River and U.S. Highway 12	95.9	111.5	15.6			
	111.5	117.4		6.0		
Custer and Fallon County line to Montana / North Dakota state line	117.4	174.8			57.4	
PROJECT TOTAL			**15.6**	**43.6**	**115.6**	**174.8**
Percent of Total			9%	25%	66%	100%

Source: Bureau of Land Management, 2024

7.9.3.2 Impact Assessment

Common Impacts and Mitigation Measures

<u>**Construction**</u>

Views may have long-term impacts from the addition of monopole, lattice, or multi-pole structures, conductors, and cleared rights-of-way, as well as short-term impacts from temporary buildings and shelters, fences, construction-related equipment, and material storage. In addition, ground areas cleared for construction may be visible, such as for Project access roads, transmission line structure work areas, conductor stringing and tensioning sites, communication sites, material storage yards, batch plants, fly yards, and staging areas. Figures 7.9-1 7.9-8 are illustrations in the context of the Project depicting a typical finished construction.

Direct, short-term, and long-term impacts to people and scenery will occur from visual changes to the context of the human environment, or modifications of the characteristic landscape, and/or from introductions of contrasting forms, lines, colors and textures of landform, vegetation, and structures needed to accommodate Project construction activities.

Views will contrast between the Project and existing electrical transmission line structures, other above-ground industrial development, and ground disturbances. Where the transmission line is not colocated with other infrastructure, Project Facilities and individual structures will contrast with existing characteristic landscapes to a greater degree.

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NORTH PLAINS CONNECTOR
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Figure 7.9-1
Alternative A Visual Simulation - Hathaway I-94 Eastbound Rest Area
North Plains Connector Project
North Plains Connector LLC

NORTH PLAINS CONNECTOR
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Figure 7.9-2
Alternative A Visual Simulation - US Highway 12 Near Strawberry Hill
North Plains Connector Project
North Plains Connector LLC

NORTH PLAINS CONNECTOR
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Figure 7.9-3
Alternative B Visual Simulation - Rosebud Creek Road Crossing
North Plains Connector Project
North Plains Connector LLC

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Figure 7.9-4
Alternative B Visual Simulation - Montana Highway 59 Crossing
North Plains Connector Project
North Plains Connector LLC

For Environmental Review Purposes Only

Figure 7.9-5
Alternative C Visual Simulation - Tongue River Road Crossing
North Plains Connector Project
North Plains Connector LLC

For Environmental Review Purposes Only

Figure 7.9-6
Alternative C Visual Simulation - Montana Highway 59 Crossing
North Plains Connector Project
North Plains Connector LLC

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Figure 7.9-7
Alternative D Visual Simulation - Parallel to US Highway 12
North Plains Connector Project
North Plains Connector LLC

NORTH PLAINS CONNECTOR
A Grid United Project
For Environmental Review Purposes Only

Figure 7.9-8
Alternative D Visual Simulation - Parallel to Graveyard Creek Road
North Plains Connector Project
North Plains Connector LLC

Operations and Maintenance

Direct, long-term impacts to views similar to those discussed for the construction phase will be expected for permanent structures and cleared rights-of-way. Construction-related impacts will be replaced by occasional transmission line and right-of-way maintenance. The human presence for this maintenance will be less impactful in areas the route is colocated with other infrastructure than any remote or infrequently trafficked areas the Project passes through.

Unique Impacts and Mitigation Measures

Key impacts to visual resources that would be likely under each of the respective alternative routes are discussed below. Section 8.0 provides a comparison of like impacts by alternative route. Mitigation measures would be applied consistently across the alternative routes, as applicable. None of the alternative routes would involve additional mitigation measures beyond those presented above.

Although Alternative A has a larger percentage of Class II rated area, 60 percent of it is accrued parallel to the Yellowstone River where it is colocated with existing transportation, railroad, and electrical transmission infrastructure. Alternative A does have the unique impact of affecting Rosebud and Miles City (the largest municipality for all route alternatives), and Alternative A is only alternative route that is within the viewshed of the Strawberry Hill Recreation Area.

Alternative C has the unique impact of being within the viewshed of two separate areas of VRM Class II (Pumpkin Creek Ranch and Tongue River Ranch) with no colocation or other screening, resulting in long-term visual impacts. Alternative C is also routed directly through an otherwise undisturbed VRM Class II area the BLM has marked as heavy use year-round for hunting and camping.

Visual resources along Alternatives B and D are not relatively unique; therefore, comparisons are not highlighted in Section 8.

7.10 SOCIOECONOMIC CONSIDERATIONS (Circular MFSA-2 Section 3.7(3 & 5))

7.10.1 Baseline Data

The following section discusses the socioeconomic resources within the Montana counties crossed by each alternative route. Each of the four alternative routes cross the same counties: Custer County, Fallon County, and Rosebud County. These counties comprise the Study Area for the socioeconomic evaluation below. Baseline data is provided in the following sections.

7.10.1.1 Population and Demographics

Table 7.10.1-1 summarizes the 2010 and 2020 population statistics for the counties that are crossed by the alternative routes. The affected counties are rural communities with population densities of less than 3.1 persons per square mile. All three counties crossed are experiencing a lower population growth rate than that of the State of Montana.

TABLE 7.10.1-1

Populations in the Counties Crossed by the Alternative Routes

State/County	Total Population 2010	Total Population in 2020	Percent Change (2010 to 2020)	Population Density in 2020 (persons per square mile)
MONTANA	**989,415**	**1,084,225**	**9.6**	**7.4**
Custer	11,699	11,867	1.4	3.1
Fallon	2,890	3,049	5.5	1.9
Rosebud	9,233	8,329	- 9.8	1.7

Source: U.S. Census Bureau. 2025. QuickFacts. Available online at: https://www.census.gov/quickfacts/fact/table/rosebudcountymontana,falloncountymontana,custercountymontana,MT/PST045223. Accessed January 2025.

The population of cities and towns in the Study Area are included in Table 7. 10.1-2 below. Data on unincorporated communities was not available, but the total population of unincorporated areas within each county can be inferred by comparing Table 7.10.1-1 and 7.10.1-2.

TABLE 7.10.1-2

Populations of Communities in the Counties Crossed by the Alternative Routes

County	City/Town	Total Population
Custer	Ismay Town	19
	Miles City	8,438
Fallon	Baker City	1,800
	Plevna Town	169
	Willard	370
Rosebud	Ashland CDP	956
	Birney CDP	81
	Colstrip City	2,055
	Forsyth City	1,616
	Lame Deer CDP	1,939
	Rosebud CDP	53

Source: Montana Demographics. 2025. Montana Demographics. Available online at: https://www.montana-demographics.com/. Accessed January 2025.

Table 7.10.1-3 summarizes the demographics of the Project area based on the percentage of the population.

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TABLE 7.10.1-3

Minority, Low-Income, and Limited English-Speaking Populations in the Counties Crossed by the Alternative Routes

State/County	% White	% Black/ African American	% American Indian or Alaskan Native	% Asian	% Native Hawaiian/ Pacific Islander	% Some Other Race	% Two or More Races	% Hispanic or Latino	% Total Minority [a,b]	% Below Poverty Level [c]	% Limited English-Speaking Households [d]
MONTANA	**84.1**	**0.5**	**5.5**	**0.8**	**0.0**	**0.4**	**4.3**	**4.4**	**15.9**	**12.0**	**0.4**
Custer	89.5	0.4	1.2	0.4	0.1	0.2	4.9	3.3	10.5	14.1	0.4
Fallon	92.8	0.0	2.4	0.0	0.0	0.0	4.2	0.6	7.2	17.1	0.0
Rosebud	52.7	0.2	38.4	0.5	0.0	0.2	4.5	3.5	47.3	19.1	0.0

[a] Minority refers to people who reported their ethnicity and race as something other than non-Hispanic White.

[b] U.S. Census Bureau. 2023a. "Hispanic or Latino Origin by Race." American Community Survey, ACS 5-Year Estimates Detailed Tables, Table B03002, 2023, Available online at: https://data.census.gov/table/ACSDT5Y2022.B03002?q=b03002. Accessed on January 2025.

[c] U.S. Census Bureau. 2023b. "Poverty Status in the Past 12 Months by Household Type by Age of Householder." American Community Survey, ACS 5-Year Estimates Detailed Tables, Table B17017, 2023. Available online at: https://data.census.gov/table/ACSDT5Y2022.B17017?q=b17017. Accessed January 2025.

[d] U.S. Census Bureau. 2023c. Household Language by Household Limited English Speaking Status. American Community Survey, ACS 5-Year Estimates Detailed Tables, Table C16002. Available online at: https://data.census.gov/table/ACSDT5Y2022.B16002?q=b16002. Accessed January 2025.

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7.10.1.2 Employment and Income

Tables 7.10.1-4 and 7.10.1-5 show key economic, employment, and income statistics from the U.S. Census Bureau's 2019 2023 American Community Survey 5-year estimates (U.S. Census Bureau, 2023d) and unemployment statistics from the U.S. Bureau of Labor Statistics (U.S. Bureau of Labor Statistics, 2023). These statistics describe the current employment and income status of Montana and the three counties crossed by the Project.

Unemployment rates for counties crossed by the alternative routes ranged from 1.6 to 3.5 percent. Custer County has the largest labor workforce, at 6, 380 individuals, and Fallon County has the smallest labor workforce, at 1, 672 individuals.

TABLE 7.10.1-4

Annual Average Labor Force Statistics for Montana and the Counties Crossed by the Alternative Routes

State/County	Civilian Labor Force	Employed	Unemployed
MONTANA	**574,096**	**557,509**	**16,587**
Custer	6,380	6,212	169
Fallon	1,672	1,644	27
Rosebud	3,554	3,437	117

Source: U.S. Bureau of Labor Statistics. 2023. Local Area Unemployment Statistics. Available online at: https://data.bls.gov/cgi-bin/dsrv?la. Accessed January 2025.

The greatest percentage of civilian workers are employed within education/public administration and agriculture sectors. The percentage of workers employed in the construction sector is between 6.3 and 9.9 percent.

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TABLE 7.10.1-5

Percent of Employed Civilian Labor Force in the Counties Crossed by the Alternative Routes by Industrial Sector

State/ County	Agriculture, forestry, fishing and hunting, and mining	Construction	Manufacturing	Wholesale trade	Retail trade	Transportation and warehousing, and utilities	Information	Finance and insurance, and real estate rental and leasing	Professional, scientific, and management, and administrative and waste management services	Educational services, and health care and social assistance	Arts, entertainment, and recreation, and accommodation and food services	Other services, except public administration	Public administration
MONTANA	**6.1**	**9.0**	**4.8**	**2.2**	**11.9**	**5.0**	**1.5**	**5.5**	**9.6**	**23.3**	**10.3**	**5.1**	**5.6**
Custer	7.9	6.3	2.0	1.1	18.8	5.4	1.4	5.3	6.0	25.4	7.6	5.2	7.7
Fallon	31.8	9.9	0.3	0.0	10.2	7.3	0.3	2.3	6.3	15.4	5.7	2.8	7.7
Rosebud	13.4	7.8	1.5	0.1	6.1	13.2	2.0	4.7	6.1	27.3	7.6	4.0	6.4

Source: U.S. Census Bureau. 2023d. Selected Economic Characteristics. American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP03, 2023. Available online at: https://data.census.gov/table/ACSDP5Y2022.DP03?q=dp03. Accessed January 2025.

Table 7.10.1-6 shows the 2023 per capita income, median household income, and percentage of residents living below poverty in the Facility Locations.

TABLE 7.10.1-6

Per Capita Income, Median Household Income, and Percent of Residents Living Below the Poverty Level in the Counties Crossed by the Alternative Routes

State/County	Per Capita Income	Median Household Income	Percent Below Poverty Threshold
MONTANA	**$39,842**	**$69,922**	**12.0**
Custer	$35,864	$63,585	11.7
Fallon	$42,214	$72,284	12.1
Rosebud	$28,291	$56,430	21.6

Source: U.S. Census Bureau. 2023d. Selected Economic Characteristics. American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP03, 2023. Available online at: https://data.census.gov/table/ACSDP5Y2022.DP03?q=dp03. Accessed January 2025.

As shown in Table 7.10.1-6, the per capita income and median household income of Custer and Rosebud counties are lower than the state average. Fallon and Rosebud counties have a percentage of individuals living below the poverty level greater than the state average of 12.0 percent.

7.10.1.3 Housing Supply

North Plains anticipates that construction of the Project will take approximately 3 to 4 years to complete. The workforce will be spread throughout the counties crossed by the alternative routes and the transient workforce will require temporary housing. A key element of local housing markets for the purposes of the Project is available inventory and short-term accommodations. Such accommodations may include rental units, hotel / motel rooms, recreational vehicle sites, and campgrounds. Table 7.10.1-7 provides selected housing characteristics for the counties crossed by the alternative routes.

TABLE 7.10.1-7

Vacant and Temporary Housing Statistics for the Counties Crossed by the Alternative Routes

State/County	Total Housing Units [a]	Vacant Housing Units for Rent [b]	Monthly Median Gross Rent [a]	Number of Hotels / Lodges [c]	Number of RV / Campgrounds [d]
MONTANA					
Custer	5,770	1	$918	10	2
Fallon	1,451	2	$772	1	2
Rosebud	3,785	5	$644	1	3

a U.S. Census Bureau. 2023e. Selected Housing Characteristics. American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP04, 2023. Available at: https://data.census.gov/table/ACSDP5Y2022.DP04?q=dp04 . Accessed on January 2025.

b Zillow. 2024a. Vacant Housing Units for Rent. Available online at: https://www.zillow.com/homes/for_rent/. Accessed March 2024.

c Hotels.com. 2024. Hotels in Custer County, Fallon County, Rosebud County. Available online at: https://www.hotels.com/. Accessed March 2024.

d Miles City Area Chamber of Commerce. 2024. Discover Miles City, Lodging. Available online at: https://milescitychamber.com/lodging/. Accessed March 2024.

Note: RV = recreational vehicle

Custer County has the greatest number of housing units and hotels/lodges of the three counties.

7.10.1.4 Public Services and Facilities

Table 7.10.1-8 shows an inventory of the major public services counties crossed by the alternative routes, including hospitals, fire and rescue units, law enforcement agencies, and schools. Unique characteristics of each county, such as its population distribution and organizational structure, influence the number of agencies and facilities per service.

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TABLE 7.10.1-8

Public Services and Facilities Located in the Counties Crossed by the Alternative Routes

State/County	2020 Total Population [a]	Total Hospitals [b]	Number of Hospital Beds [b]	Fire and Rescue Stations [c,d]	Law Enforcement Agencies [e,f]	Total Public Schools [g]
MONTANA	**1,084,225**	**15**	**2,273**	**281**	**117**	**847**
Custer	11,867	1	109	5	2	14
Fallon	3,049	1	25	2	2	7
Rosebud	8,329	1	35	5	3	15

[a] U.S. Census Bureau. 2025. QuickFacts. Available online at: https://www.census.gov/quickfacts/fact/table/rosebudcountymontana,falloncountymontana,custercountymontana,MT/PST045223. Accessed January 2025.

[b] American Hospital Directory. 2024. Individual Hospital Statistics by State. Available online at: https://www.ahd.com/state_statistics.html. Accessed March 2024.

[c] County Office.org. 2024. Fire Departments by County. Available online at: https://www.countyoffice.org/fire-departments/. Accessed March 2024.

[d] U.S. Fire Administration. 2024. National Fire Department Registry Quick Facts. Available online at: https://apps.usfa.fema.gov/registry/summary#c. Accessed March, 2024.

[e] USACOPS. 2023. Law Enforcement Agencies. Available online at: https://www.usacops.com. Accessed December 2023.

[f] Montana Board of Crime Control. 2022. Montana Law Enforcement Employment Survey. Available online at: https://dataportal.mt.gov/t/MBCC/views/LawEnforcementEmploymentSurvey_16438432463640/Dash_LEEmain?iframeSizedToWindow=true&%3Aembed=y&%3AshowAppBanner=false&%3Adisplay_count=n&%3AshowVizHome=n&%3Aorigin=viz_share_link. Accessed March, 2024.

[g] Montana Office of Public Instruction (OPI). 2024. Montana School Directory. Available online at: https://opi.mt.gov/Leadership/Management-Operations/Montana-Schools-Directory/Directory-Advanced-Search. Accessed March 2024.

The counties have multiple law enforcement providers, including the county sheriffs and local police departments. Fire protection and suppression services are in place and staffed through official fire stations and volunteer departments. Each county also has at least one health care facility, helping to ensure coverage for emergency medical and transport services throughout the Project region.

A network of interstate highways, state and county routes, local roads, and railroads traverse the counties and will facilitate access to the transmission line. Access routes will be established and bonded by North Plains prior to construction. The construction contractor will be responsible for heavy haul permits, traffic management, and road repair.

7.10.1.5 Land Acquisition and Displacements

The Project is in predominantly rural, agricultural areas, where the predominant land uses are ranching and farming. No residences or businesses are expected to be permanently displaced as a result of construction or operation of the Project. Prior to land acquisition, independent sources, such as county deed and tax records, local appraisers, real estate brokers, and other real estate professionals will determine the value of real property and easements by the market value of land in the area. The valuation will consider factors such as the existing use of property and comparable property/land sales in the area. Effects on the remaining property may also be considered. North Plains will ensure there are no existing federal, state or local government land use plans, or other local legal restrictions that limit land use for construction and operation of the Project.

7.10.1.6 Fiscal Benefits

In Montana, the major revenue sources for the local and state governments include property taxes, income taxes, and licenses taxes. Table 7.10.1-9 provides basic fiscal data, including total revenues, total expenditures, and the amount of local tax revenues generated for the counties. Table 7.10.1-10 shows the amount of revenues and expenses for the school districts located in the Project area.

TABLE 7.10.1-9

2022 Fiscal Data for the Counties Crossed by the Alternative Routes

State / County	Total Revenues	Tax Revenues	Total Expenditures
MONTANA [a]			
Custer [b]	$11,383,357	$5,764,617	$11,350,329
Fallon [b]	$19,083,145	$8,569,938	$15,119,841
Rosebud [b]	$14,686,114	$6,098,760	$14,820,106
Subtotal	$9,695,767,000	$4,143,225,000	$8,019,855,000

a Montana Department of Administration. 2024a. Annual Comprehensive Financial Reports. Available online at: https://sfsd.mt.gov/SAB/acfr/Documents/Final-Montana-ACFR-2022-wo-signature.pdf. Accessed March 2024.

b Montana Department of Administration. 2024b. Local Government Services, Annual Financial Reports. Available online at: https://svc.mt.gov/doa/lgs/publicinfo/allafrs. Accessed March 2024.

TABLE 7.10.1-10

2023 Fiscal Data for the Public School Districts in the Counties Crossed by the Alternative Routes

State / County	Total Revenues	Total Expenditures
Montana		
Custer		
Custer County HS	$9,896,860	$9,682,105
Kinsey Elementary	$615,617	$586,492
Kircher Elementary	$682,620	$612,087
Miles City Elementary	$13,158,118	$12,527,317
SH Elementary	$1,831	$18,143
SY Elementary	$142,471	$105,787
Trail Creek Elementary	$131,211	$124,725
Fallon		
Baker K-12 Schools	$10,540,009	$9,302,138
Plevna K-12 Schools	$3,056,627	$3,246,534
Rosebud		
Ashland Elementary	$2,788,701	$2,526,366
Birney Elementary	$179,595	$249,778
Colstrip Elementary	$7,365,287	$7,317,567
Colstrip High School	$5,123,529	$5,255,844
Forsyth Elementary	$3,394,297	$3,248,816
Forsyth High School	$2,307,846	$2,150,936
Lame Deer Elementary	$8,643,766	$8,495,144
Lame Deer High School	$5,005,033	$4,784,380
Rosebud K-12	$1,945,079	$1,655,869

Source: Growth and Enhancement of Montana School. 2025. Financial Data. Available on-line at: https://gems.opi.mt.gov/finance-data. Accessed January 2025.

Property used to support utilities, such as transmission infrastructure, is subject to property tax in Montana. Property taxes collected in Montana were 40 percent of the total state and local tax revenue in fiscal year 2020, with 82 percent of local property tax revenue invested in local government responsibilities including local schools, public safety, roads, and infrastructure. The Montana Department of Revenue administers the valuation, appraisal, and classification of property for purposes of taxation. The property of a multistate utility located in Montana is valued as an operating unit, with a portion of the unit value allocated to Montana according to the cost or amount of the property located in the state. A taxable percentage rate determined based on the class of the property (there are 16 classes with rates ranging from 1.35 percent for residential to 12 percent for certain electric transmission) is applied to the state allocated valuation resulting in a taxable value. The taxable value is then divided among the local tax districts where the property is located. State and local governments annually establish tax rates such as levy mills, which vary widely depending on local revenue needs and taxing districts' property values and tax base. Those rates are applied to the taxing district's taxable value from the state and the counties assess and collect the resulting taxes.

7.10.2 Impact Assessment

The following sections discuss the various socioeconomic impacts and mitigation efforts of the Project, per the requirements in Circular MFSA-2 Section 3.7(5) and Section 3.4(7), respectively.

7.10.2.1 Common Impacts and Mitigation Measures

Construction

Population and Demographics

Section 2.2 discusses construction schedule and workforce requirements. Various activities will occur concurrently during the construction process, with several construction crews operating simultaneously at different locations along the transmission line. Each crew will pass through a given area at least once. Different crews work at different paces, but as a rule of thumb, assembly and erection of structures is the slowest activity, which is conducted at an average pace of about 1 to 2 miles per day. The Project will require a peak temporary workforce of about half of the total peak workforce of 800 workers. This includes an estimated 150 workers at the Rosebud County Converter Station and various construction crews along the transmission line route. Construction of the transmission line is expected to take approximately 3 to 4 years.

North Plains will endeavor to hire local workers; however, utilization of a local workforce will depend on union agreements and the hiring methods the selected construction contractor uses to hire subcontractors. Local is defined as a county crossed by or adjacent to the Project. The total peak construction workforce is less than 2 percent of the total population of the counties crossed by the alternative routes. Construction of the Project will result in a minor temporary increase in local and regional population for the duration of construction.

North Plains will construct the Project in predominantly rural, agricultural areas, where land uses such as ranching and farming are the main economic industries. General construction disturbances (e.g., noise, dust) to nearby landowners and residents will occur. Construction effects will not be disproportionately felt by any particular subgroup of the population. No long-term negative impacts on social structures, values or lifestyle will occur given the short-term nature of construction. North Plains did not select the Project Facility Locations and design based on demographics; rather, North Plains designed the Project based on the purpose and need as outlined in Section 4.

Employment and Income

Money spent on Project construction will generate jobs in two ways: direct employment by vendors and suppliers to the Project who will employ people to design, supply, and build the Project and indirect and induced economic activity related to the construction of the proposed improvements. North Plains and their contractors will follow the prevailing wage processes outlined by the Montana Department of Labor for public projects, including those processes described as certified payroll.

North Plains anticipates that workers will spend a portion of their earnings in the counties crossed by the alternative routes. Workers will support local economies by purchasing goods and services, thereby generating indirect and induced economic benefits. The duration of employment contracts will vary depending on the nature of the work.

Construction of the Project will require spending on construction materials, labor, site acquisition and preparation, engineering, civil work, legal work, electrical work, and many other expenditures. The total estimated economic outputs in Montana are included in Table 7.10.2-1. The reported dollars are based on a Project in-service year of 2031.

TABLE 7.10.2-1

Economic Impact of Project Construction in Montana

State	Economic Output	Personal Income
MONTANA		
Construction	$392.5 million	$158.0 million

The counties crossed by the alternative routes will experience an increased demand for labor and materials during Project construction. The Project will result in the local purchase and lease of construction equipment and machinery, including cranes, lifts, pump trucks, flatbed trucks, dump trucks, excavators, and front-end loaders. Additionally, locally procured services will include limited design and engineering services, waste disposal, sanitary services, food services, and security. Local distributors will supply fuel to operate Project equipment, earth moving equipment, trucks, and diesel generators. Locally hired general contractors will source civil labor and materials. North Plains will hire specialized labor as available from a national labor pool including journeymen labor and has also engaged with local colleges to develop workforce development partnerships with their line worker programs.

Working with Tribally owned businesses and community members, North Plains has developed and implemented an inclusive tribal engagement approach to employ tribal cultural specialists. In addition, North Plains is exploring opportunities to collaborate with tribal colleges to develop certificate programs and job opportunities for students in the areas of environmental and tribal surveys and monitoring. North Plains commits to implementing a plan to reduce barriers and improve access to jobs for Tribal members from communities more distant from the Project area and those with disabilities.

Overall, Project construction will generate employment and income benefits in the socioeconomic impact area.

Housing Supply

Short-term effects on the local and regional housing markets will occur during construction of the Project. As discussed above, North Plains estimates a peak temporary workforce of approximately 400 workers. This includes an estimated 150 workers at the Rosebud County Converter Station and various construction crews along the transmission line route. While North Plains will use locally hired workers to the extent possible, the workers that are not local to the region will require temporary housing.

The Rosebud County Converter Station is located near the town of Colstrip and south of the city of Forsyth. Along the Project route Miles City and Baker have the largest city centers with the most housing options.

The increase in demand for temporary housing will temporarily reduce the vacancy rates for such properties throughout the counties crossed by the alternative routes. Construction activities will be completed concurrently, requiring the workforce to be dispersed. Due to the remote nature of the Project, workers may need to stay outside of the counties crossed by the alternative routes and commute to the work site. The increase in demand for temporary housing will temporarily reduce the vacancy rates for such properties within the socioeconomic impact area and nearby communities.

Public Services and Facilities

An influx of transient construction workers to the Project will potentially increase the demand for community services and facilities in the region. Although North Plains will endeavor to hire local workers, utilization of a local workforce will depend on availability of skilled labor, union agreements and the hiring methods the selected construction contractors use to hire subcontractors. The total peak construction workforce is less than 2 percent of the total population of the counties crossed by the alternative routes.

Public services such as road maintenance and emergency response will see a slight increase in demand during construction. Additional traffic, the influx of workers, site security, and the use of heavy equipment may generate a need for emergency services. North Plains will obtain the necessary access permits and road use agreements with the appropriate governing agencies and jurisdictions prior to construction. As part of the Project, North Plains will also develop a Construction Emergency Preparedness and Response Plan that outlines communication protocols with public responders, fire departments and local law enforcement. There is at least one medical center available within each county.

Impacts on public schools are expected to be negligible. Due to the transient nature of transmission line construction, it is not anticipated that construction workers will re-locate their children to attend schools. If school-aged children are re-located to the counties crossed by the alternative routes, there are multiple public-school options available for consideration.

As outlined in Table 7.10.1-8, various public services are available in the counties crossed by the alternative routes. As construction commences, there will be an increase of North Plains personnel's demand for public and recreational services. These impacts would be reduced by the short duration of each construction phase and the large area over which the workforce would be dispersed. The communities in the Project vicinity presently have and are presumed to continue to have adequate infrastructure and services to meet the potential needs of non-local workers who enter the area temporarily. It is not anticipated that there will be a significant impact on other public services, including sanitary services.

Construction of the Project may result in short-term effects on traffic near the Project. Construction activities associated with road crossings, right-of-way access points, and additional traffic generated by commuting construction workers will potentially affect local traffic flow and volume. North Plains will develop a Traffic and Transportation Management Plan to mitigate these effects and will provide the plan prior to construction.

The initial staging of construction and the daily transport of materials and equipment to the work areas may cause minor disruptions in the local transportation systems. Large multi-lane highways will be used, where available, to transport heavy construction equipment and large deliveries of materials to minimize disruptions to traffic on local roads. When it is necessary for construction equipment to cross roadways, traffic flow may be temporarily interrupted. Traffic flow interruptions will be temporary and managed as described in accordance with the Project Traffic Management Plan.

Commuting construction workers will generate a temporarily increased traffic volume in the counties crossed by the alternative routes. However, most construction activities will not coincide with peak traffic times and will be spaced-out through multiple construction areas and activities along the Project. This variation, and since the Project spans predominantly rural areas, will limit some of the effects on local commuters. The largest number of workers commuting to a single area will be for the construction of the Rosebud County Converter Station with a peak workforce of 150 workers. Commuter traffic interruptions will be temporary and managed as described in the Project Traffic and Transportation Management Plan.

North Plains will reclaim and revegetate temporary access roads, although cut and fill contours may be retained to allow for future safe overland travel during operation. Roadways utilized for construction and hauling activities will be monitored, documented, and repaired as outlined in the Project Traffic Management Plan. No long-term effects on traffic volume, traffic flow, rail service, or rail transport are expected to occur during construction of the Project.

Land Acquisition/Displacement

Both public and private land will be acquired for the project (see Section 7.3), including the Rosebud County Converter Station, which is proposed on an approximately 40-acre tract of purchased or state leased land east of the Colstrip Substation. The Project is in predominantly rural, agricultural areas, where land uses such as ranching and farming are the main economic industries. Where North Plains acquires easements, those landowners will be reimbursed with due compensation. Similarly, North Plains will restore damage to land infrastructure (e.g., irrigation systems, access roads) caused by the Project. North Plains will establish provisions for monetary compensation regarding damages to private property in the easement agreement and/or negotiated on a case-by-case basis with the individual landowner. Land use will return to pre-construction conditions once construction is completed.

Fiscal Benefits

Major revenue sources for the local and state governments in Montana include property taxes, income taxes, and licenses taxes. North Plains anticipates that workers will spend a portion of their earnings in the counties crossed by the alternative routes, paying selected sales taxes. Workers will support local economies by purchasing goods and services. Construction of the

Project will require spending on construction materials, labor, site acquisition and preparation, engineering, civil work, legal work, electrical work, and other expenditures. Income tax is another way the Project will fiscally benefit the state and the counties crossed by the alternative routes. Worker earnings within Montana are estimated to be over $348 million during construction. The total estimated economic output in Montana during construction of the Project is over $847 million.

In addition to the direct economic benefits from the construction and operation of the line, North Plains is actively engaging local communities with economic development and infrastructure needs.

Through its partnership with the Montana Community Foundation, North Plains launched the North Plains Community Investment Program (CIP). North Plains has made a corporate commitment of $3.85 million to be split amongst Rosebud, Custer, and Fallon counties on a per-mile, per-county allocation basis. Since its inception in 2022, North Plains has granted $1.2 million of its total CIP commitment, awarded in individual grants to over 80 organizations across the three counties. Award decisions are made by a community advisory committee from each county, composed of residents and local leaders.

In 2023, the U.S. Department of Energy also launched the Transmission Siting and Economic Development Grants Program designed to support economic development efforts in communities hosting new transmission projects. North Plains assisted the Montana Department of Commerce to develop their application In July 2024, a grant totaling $47.5 million was awarded to the Montana Department of Commerce's Southeastern Montana Transmission Siting and Economic Development Initiative which will fund projects in Rosebud, Custer, and Fallon counties and the North Cheyenne Tribe. Grant monies will be distributed to eligible projects that involve the development, modernization, and/or maintenance of public infrastructure and public services. Eligible projects can apply for grant money starting in early 2026 when construction of the North Plains Connector Project starts. Additionally, the towns of Mott and Amidon were awarded $15 million combined for community projects.

Operations and Maintenance

<u>Population and Demographics</u>

North Plains anticipates two to four new full-time equivalent jobs for the operation of Project facilities. Thus, operation of the facilities will have a negligible effect on population in the Project area. The Project will be located in predominantly rural, agricultural areas, where land uses such as ranching and farming are the main economic industries. Operational effects on social structures, values and lifestyle will not be disproportionately felt by any particular subgroup of the population.

<u>Employment and Income</u>

In addition to the two to four full-time equivalent jobs, North Plains will contract or direct hire line crew to maintain the transmission line. The line crew will be sourced from the local lineman labor pool as available. North Plains and their contractors will follow the prevailing wage processes outlined by the Montana Department of Labor for public projects, including those processes described as certified payroll.

Once active, the Project will require ongoing spending on operation and maintenance. Overall impacts to the economy, employment, and income will be positive. The total estimated economic outputs in Montana are included in Table 7.10.2-2. The reported dollars are based on a Project in-service year of 2031.

TABLE 7.10.2-2

Economic Impact of Project Operation in Montana

State	Economic Output	Worker Earnings
MONTANA		
Operation [a]	$45.0 million	$5.9 million

[a] Based on the first 30 years of the Project operation.

Housing Supply

Operation of the Project will not have a significant impact on housing supply within the counties crossed by the alternative routes.

Public Services and Facilities

Operation of the Project will not result in a significant population increase within the counties crossed by the alternative routes. It is not expected that Project will increase the demand for community services and facilities in the region.

Land Acquisition/Displacement

No residences or businesses are expected to be permanently displaced as a result of the Project. In the event North Plains acquires easements on private land, North Plains will restore damage caused to private land infrastructure (e.g., irrigation systems, access roads).

Fiscal Benefits

Property used to support utilities, such as transmission infrastructure, is subject to property tax in Montana. Property taxes collected in Montana were 40 percent of the total state and local tax revenue in fiscal year 2020 with 82 percent of local property tax revenue invested in local government responsibilities, including local schools, public safety, roads and infrastructure. The amount of property taxes that will apply to the North Plains Connector will depend on determinations that will be made by the Montana Department of Environmental Quality based criteria in state law. The department will need information about the Project that is not yet available to make their determinations. North Plains will also be subject to Montana Corporate Income Tax. North Plains expects the taxes to be in the tens of millions in the first 30 years of operations.

North Plains anticipates that operation of the Project will generate over $45 million in new long-term economic output in the State of Montana (see Table 7.10.2-2). New long-term worker earnings within Montana are estimated to be over $5.9 million. Overall, the Project will generate short-term and long-term economic benefits in the counties crossed by the alternative routes. Unique Impacts and Mitigation Measures

Since the alternatives routes cross the same Montana counties, Custer, Fallon, and Rosebud, there is no distinct difference in the economic, social, or public and private service impacts between the alternative routes, and comparisons in socioeconomic impacts between alternative routes are not highlighted in Section 8.

7.11 ELECTRIC AND MAGNETIC FIELDS, NOISE, AND RADIO AND TELEVISION INTERFERENCE (Circular MFSA-2 Section 3.7(19))

Electric fields arise naturally from electrical storms (e.g., approaching and overhead storm clouds), from the separation of charges on clothing (e.g., static electricity) or wind-blown sand, and can sometimes be detected due to static shock (e.g., a carpet shock). Electric fields also arise from voltages applied to electrical conductors and equipment. Measurements of both AC and DC electric fields are expressed in units of volts per meter (V/m) or kV/m, where 1 kV is equal to 1,000 volts. Most grounded conductive objects including fences, shrubbery, and buildings will attenuate and shield electric fields. This prevents outside sources, such as power lines, from contributing significantly to the electric field level indoors where people spend a large portion of their time.

The electric field at the surface of the conductors of transmission lines is responsible for a phenomenon called corona. Corona refers to the partial electrical breakdown of the air into charged ions and particles. Corona only occurs if the electric field exceeds a certain threshold. Corona can occur at the conductors of both AC and DC transmission lines. During fair weather, the corona activity on the proposed lines may be sporadic depending on conductor surface contamination but will be fairly continuous in foul weather due to raindrops on the conductor surface. The effects resulting from corona include audible noise, radio interference, and the generation of electrical charges in the air (space charge). The space charges of a DC transmission line create a DC electric field in addition to that from the energized conductors, but the space charge released from an AC transmission line is minimal.

It should be recognized that because the space charge, audible noise, and radio interference are strongly affected by environmental factors, their impacts are highly variable phenomena. That is, the levels of space charge, audible and radio noise will change with site conditions such as altitude and weather conditions including precipitation, insect activity, dust accumulation, humidity, and wind and.

Magnetic fields are produced by the flow of electric currents, but unlike electric fields, they are not as readily blocked by most materials. Magnetic field strength is often expressed in units of Tesla (T), according to the modern International System of Units. A more common expression of magnetic field strength is in units of G or mG.

A background static magnetic field originates from the core of the earth and the electrical currents flowing in the upper layer of the earth's crust. The strength of this geomagnetic field is highest at the magnetic north and south poles (about 700 mG) and lowest at the equator (about 300 mG). The physics of the geomagnetic field are so well known and confirmed by measurements across the world that the intensity and direction of this field can be calculated by the World Magnetic Model (National Centers for Environmental Information [NCEI], 2024). Within the Study Area in Montana the calculated magnetic field from the World Magnetic Model varies from approximately 540 mG at the beginning of the route to 546 mG at the Montana-North Dakota state line (NCEI, 2024).

It should be noted that electric and magnetic field strengths associated with the converter station are not discussed in detail in this section. Because the converter station is to be installed on a large tract of land mostly within a metal building away from the property boundary, the highest electric and magnetic fields at the boundary of the site will be due to the AC and DC transmission lines coming into the converter station as opposed to the station itself. The AC and DC electric and magnetic fields from equipment within the converter site will be negligible outside its boundaries and so were not modeled.

The following sections provide independent analysis of electrical fields, magnetic fields, noise, and television and radio interference associated with both the AC and DC portions of the Project.

7.11.1 Electrical Fields

7.11.1.1 AC Electrical Field Characteristics

The majority of the United States' electrical grid distributes AC electricity. The electric field from AC electricity changes direction and magnitude in a continuous cycle that repeats 60 times per second, that is, at 60 Hz. The strength of the electric field produced by an AC line is measured in units of V/m or kV/m.

For AC transmission lines, the IEEE C95.6-2002 defines the Maximum Permissible Exposure limit on the electric field within power line rights-of-way as 10 kV/m for public access under normal load conditions. C95.6-2002 also defines 5 kV/m as the maximum permissible electric field at the edge of the right-of-way.

The ICNIRP has developed guidelines for limiting exposure to electric fields for the protection of humans against adverse health effects of non-ionizing radiation. The ICNIRP recommended and non-binding reference level for electric field strength for occupational and public exposure to AC power frequency (50 Hz or 60 Hz) electric fields are 8.33 kV/m and 4.16 kV/m, respectively.

7.11.1.2 AC Electrical Field Regulations and Anticipated Impacts

The magnitude of the AC current induced in an object by a 1 kV/m 60 Hz electric field varies with the object's size and height, as shown in Figure 7.11-1.

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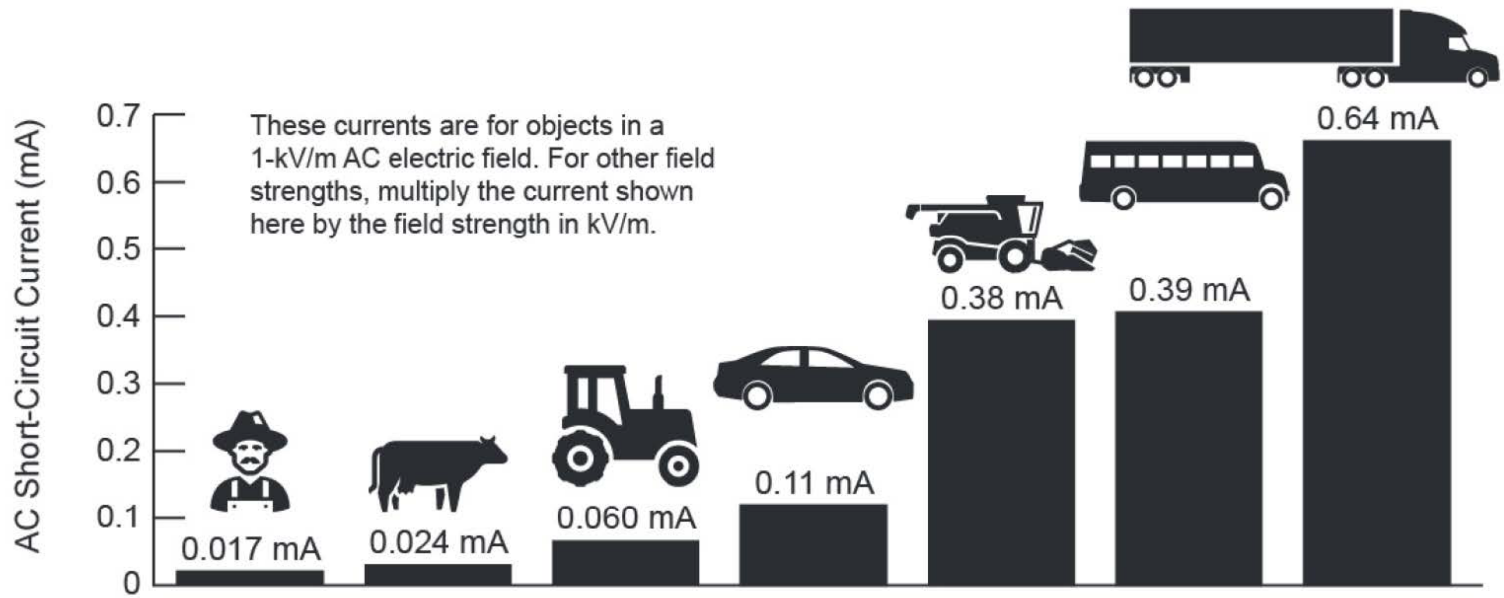

Figure 1.13. Short-circuit current in a person, a cow, and various vehicles in a transmission line 1-kV/m 60-Hz electric field. Source Deno and Zaffanella (1982).

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Figure 7.11-1
AC Short-Circuit Current Examples
North Plains Connector Project
Source: Exponent, 2024 – Adapted from Deno and Zaffanella, 1982

Guidelines for public and occupational exposure to AC electric and magnetic fields have been set by two international scientific organizations based on their review of the body of relevant health research and review by other health and scientific agencies. These guideline limits were set to prevent the only known and established health effects of exposure, which are short-term effects, such as stimulation of nerves and muscles and annoyance by spark discharges that occur at levels much higher than those experienced in our everyday lives. Both organizations determined that the scientific evidence does not establish a causal relationship between AC electric and magnetic fields and long-term health effects. ICES recommends limits for the general public of 9,040 mG for 60 Hz magnetic fields and 5 kV/m for 60 Hz electric fields (10 kV/m on the right-of-way). The ICNIRP recommends limits for exposure to the general public to 60-Hz fields as 2,000 mG for magnetic fields and 4.2 kV/m for electric fields (ICES, 2020; ICNIRP, 2010).

The AC electric field calculated along a transect perpendicular to the Rosebud Transmission Line is shown in Figure 7.11-2.

As shown, the highest AC electric field calculated on the right-of-way is 8.9 kV/m. The preliminary design results in an electric field that slightly exceeds the MFSA limit of 1 kV/m at the edges of the right-of-way. As discussed in Section 7.3.1.2, the preferred location criteria for the Project include siting alternative routes in non-residential areas and at a safe distance from residences and other populated areas (Circular MFSA-2 Section 3.1(1)(c, j)). None of the Facility Locations overlap residential clusters, although at least one non-clustered residence can be found within all alternative Facility Locations (see Table 7.3.1-9). The right-of-way comprises a smaller corridor contained within the larger Facility Location footprint, and North Plains will align the right-of-way within the Facility Location footprint so that it will not cross any residential or subdivided areas such that the electric field at the edge of the right-of-way will not exceed 1 kV/m measured 1 meter above the ground in any residential or subdivided areas in compliance with ARM 17.20.1607(2)(d).

7.11.1.3 DC Electrical Field Characteristics

In DC transmission lines, rather than rapidly changing direction like an AC line, the DC electric field is made up of two electric fields. The first is a static electric field which is due to electric charge on the conductors with a frequency at a constant 0 Hz. The second is the ion-enhanced electric field, which is a variable component caused by charged ions in the air surrounding the DC transmission line pole conductors.

Static electric fields from DC transmission lines cannot induce currents or voltage (e.g., electric charge or shock) in nearby conductive objects. Static electric fields occur as the result of voltage and are produced by DC transmission line conductors and airborne charge. Electric fields are measured as the force per unit charge at a given point, expressed in kV/m. A common, natural source of static electric fields is static electricity, which is caused by a difference in electric potential between two points that can result in a discharge of energy. Typical sources are the charge on the human body produced by shuffling across a carpet (up to 100 kV/m), the static cling of clothing (up to 500 kV/m), and the charges built-up in thunderstorm clouds (20-40 kV/m) (Johnson, 1982; Barnes, 1986). Other examples of static electric fields from common sources as well as the expected static electric fields produced by a DC transmission line are shown in Figure 7.11-3.

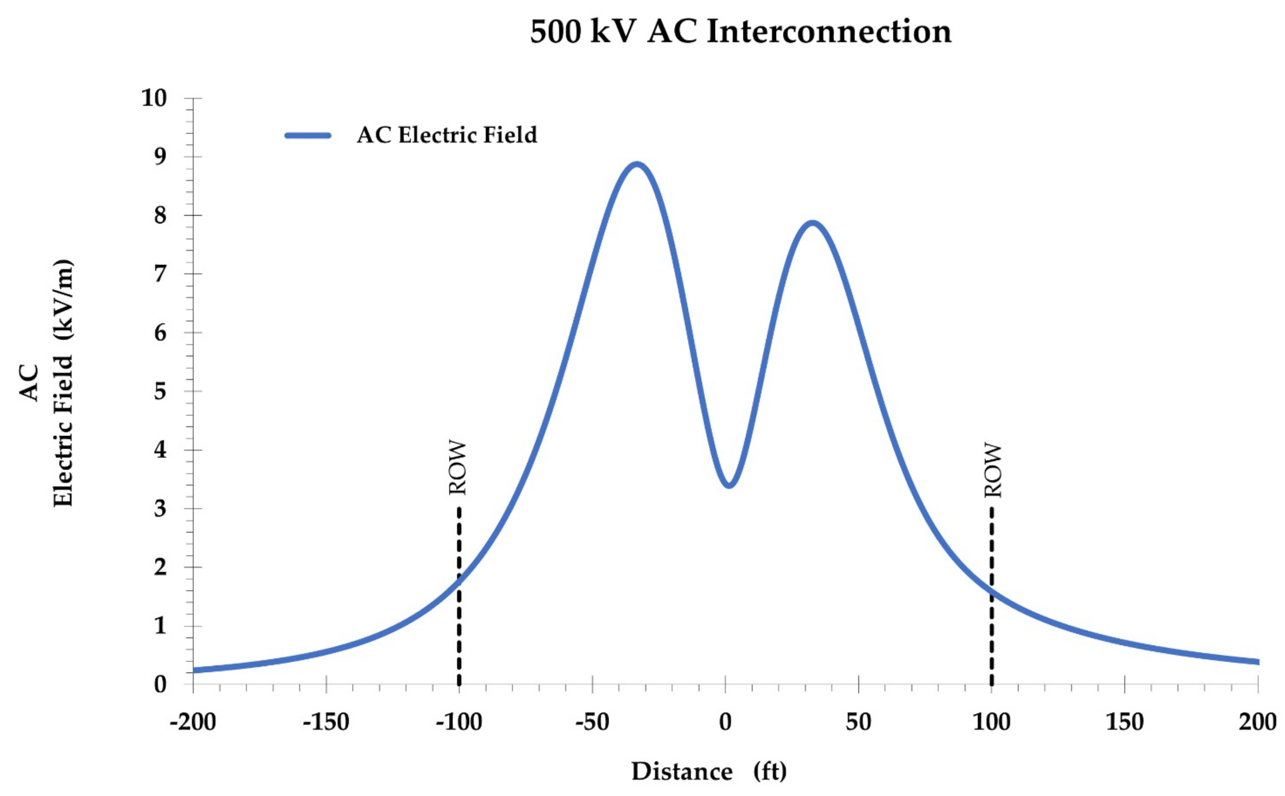

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Figure 7.11-2
Calculated AC Electric Field
North Plains Connector Project
Source: Exponent, 2024

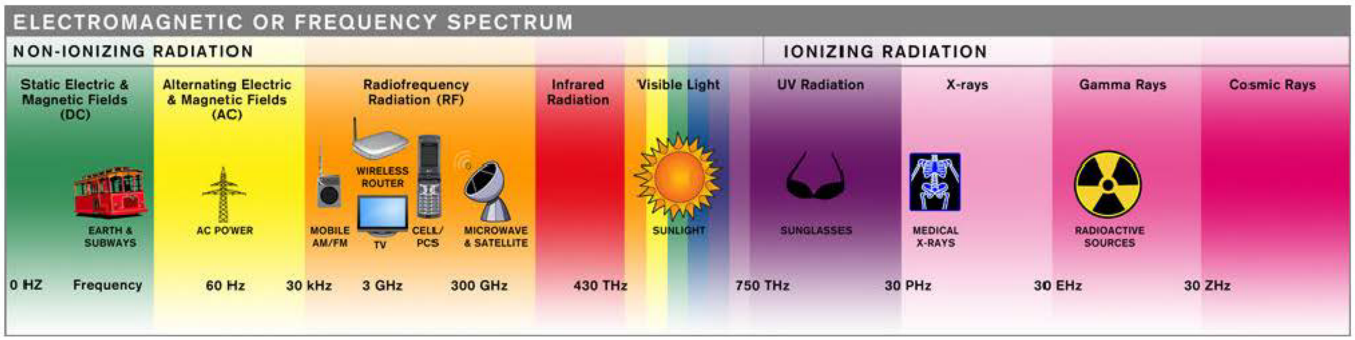

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Figure 7.11-3
Common Elements Along the Electric and Magnetic Frequency Spectrum
North Plains Connector Project
Source: emfrf.com

For DC transmission lines, the EPRI suggest keeping the ion-enhanced electric field magnitude to less than 25 kV/m within the right-of-way and 10 kV/m at the edge of right-of-way during average fair-weather conditions and 45 kV/m within the right-of-way during worst case foul weather conditions (EPRI, 1978).

7.11.1.4 DC Electrical Field Regulations and Anticipated Impacts

The IEEE limits cited above for AC transmission lines are not applicable to DC lines (IEEE, 2002), and there are no federal environmental or health criteria for DC electric fields. MFSA (at ARM 17.20.1607(2)(d)) specifies that for electric transmission facilities, the electric field at the edge of the right-of-way shall not exceed 1 kV/m measured 1 meter above the ground in residential or subdivided areas unless the affected landowner waives this condition. As discussed in Section 7.11.1.2 above, the right-of-way will not cross any residential or subdivided areas.

Neither the ICES nor the ICNIRP have recommended limits for DC electric fields. As stated by ICNIRP:

> *Static electric fields do not penetrate the human body. They interact only indirectly through surface charge effects .... In relation to static electric fields no specific exposure limit is recommended, as they only interact at the surface of the body*. (ICNIRP, 2024).

The American Conference of Governmental Industrial Hygienists (ACGIH) also reported no convincing evidence that exposure to static electric fields leads to adverse health effects. They referenced sensory perception of static electric field at levels between 25-40 kV/m; a very conservative threshold limit value was listed only to minimize annoyance from surface fields and nuisance shocks (ACGIH, 2024).

A systematic review of research on DC electric fields concluded:

> *The weight of the evidence from the literature reviewed did not indicate that static electric fields have adverse biological effects in humans or animals. The evidence strongly supported the role of superficial sensory stimulation of hair and skin as the basis for perception of the field, as well as reported indirect behavioral and physiological responses* (Petri et al, 2017, p. 1).

A companion review to Petri et al. (2017) concluded that data, “do not provide evidence for adverse effects of static [electric field] on other biological functions in invertebrates and plants,” (Schmiedchen et al., 2018).

The calculated electric field along a transect perpendicular to the Project is shown in Figure 7.11.1-4. The polarity of the voltage on poles determines the polarity of the electric field. In this view the negative pole is on the north side of the Project and so the field below has a negative polarity. On the south side of the Project the positive pole creates an electric field with a positive polarity, a portion of the electric field is produced by the voltage differential between the poles and the earth while a larger portion arises from positive and negative charges in the air created by corona activity. During foul weather, rain drops or snow increases corona activity and therefore the portion of the electric field arising from space charge increases. The DC electric field diminishes with distance from the Project. In fair weather, the background static field is about -130 V/m but can become higher to levels shown in Figure 7.11-4. The highest calculated DC electric field level at the edge of the right-of-way in fair weather is 7.8 kV/m.

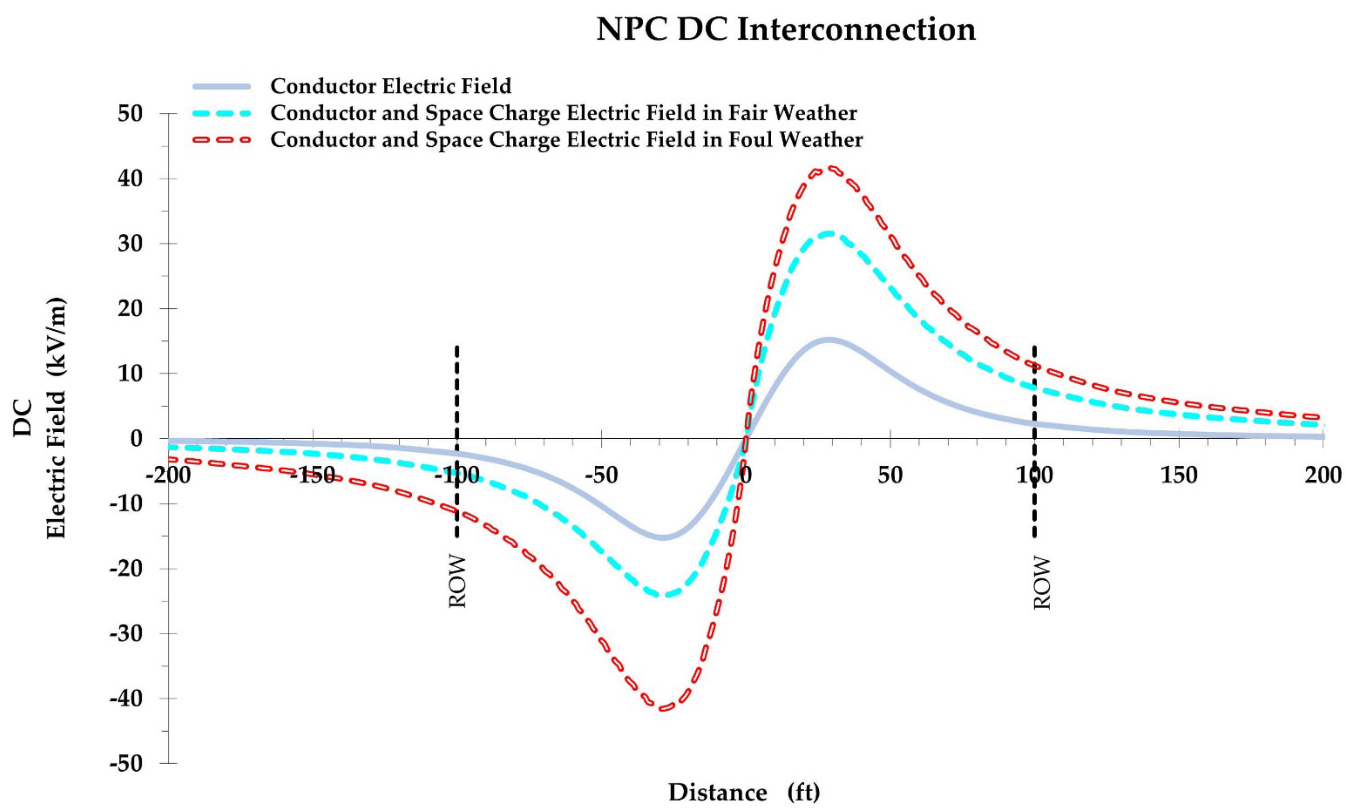

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Figure 7.11-4
Calculated DC Electric Fields for the North Plains Connector Project
North Plains Connector Project
Source: Exponent, 2024

7.11.2 Magnetic Fields

Magnetic fields are expressed as magnetic flux density in units of G or mG. The size of the magnetic field for both AC and DC is directly proportional to the current in the cable and decreases with distance from the conductor. The major source of a naturally occurring static magnetic field is caused by the steady flow of currents deep in the Earth’s outer liquid core and from metallic elements in the Earth's crust.

7.11.2.1 AC Magnetic Field Regulations and Anticipated Impacts

The ICNIRP reference level for magnetic field strength for occupational and public exposure to AC power frequency magnetic fields are 4,166 mG and 833 mG, respectively (ICNIRP, 2010).

Figure 7.11-5 shows the calculated level of the AC magnetic field. The magnetic field level on the right-of-way and outside the right-of-way are both well below the lowest health-based reference level of 2,000 mG and much lower than the ICES limit of 9,040 mG.

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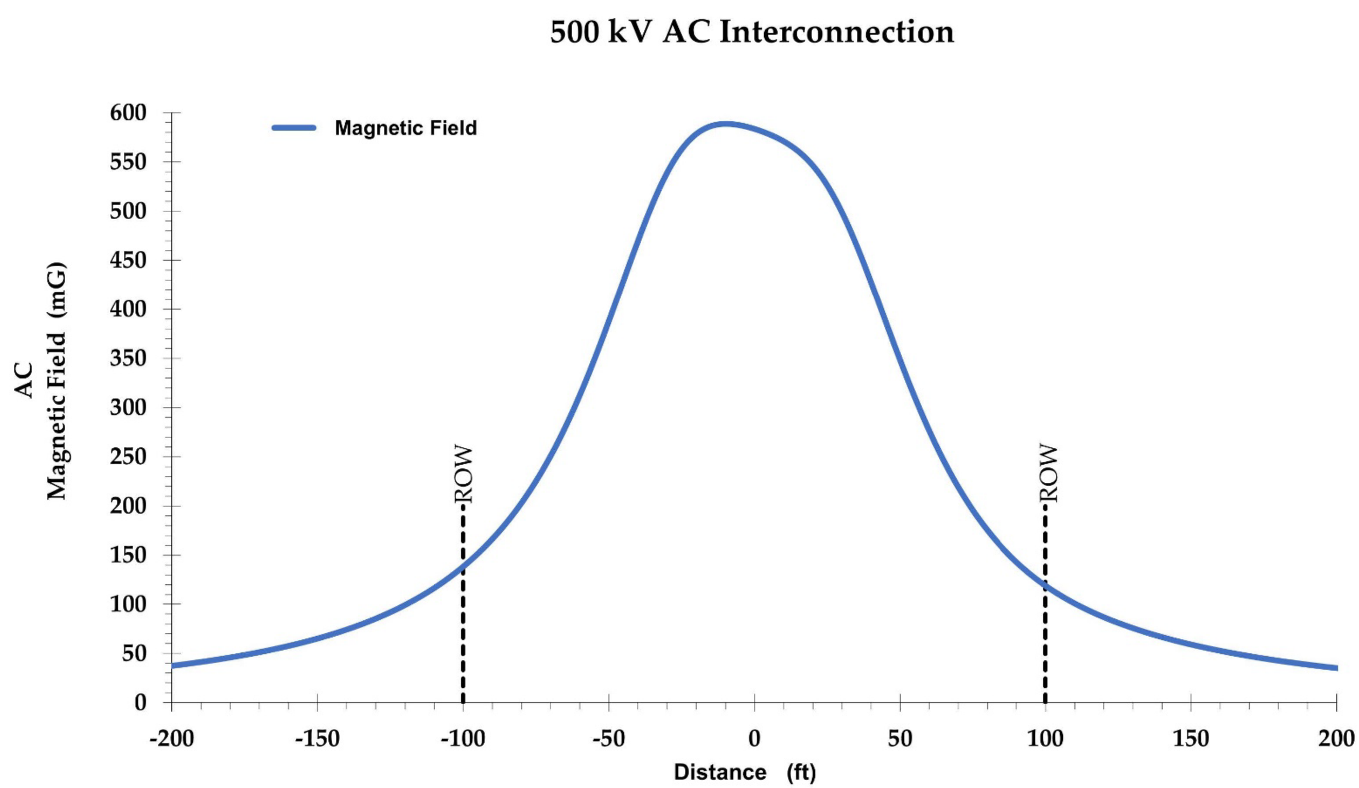

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Figure 7.11-5
Calculated AC Magnetic Fields for the North Plains Connector Project
North Plains Connector Project
Source: Exponent, 2024

7.11.2.2 DC Magnetic Field Regulations and Anticipated Impacts

Research on DC magnetic fields, including those related to DC transmission lines, has not confirmed that exposure to these fields, even at high levels, has any long-term health effects on people. Extremely high static magnetic-field levels, such as those produced by diagnostic magnetic resonance imaging machines, can produce minor sensory effects, so ICNIRP recommends a limit of 4,000 G for exposure of the general public (ICNIRP, 2009). This recommendation was based on a review of the literature of laboratory studies in human volunteers, laboratory studies in animals, and in vitro research. The ICNIRP only identified direct biological effects at levels above 20,000 G (2 T) that included mild sensory stimulation responses, although if the work environment is strictly controlled, and exposure is restricted to the limbs, a maximum exposure level of 8,000 G (0.8 T) is acceptable (ICNIRP, 2009, p. 511). Exposure to static magnetic fields for the general public should not exceed 4,000 G (0.4 T) at any part of the body.

ICNIRP also recommended special consideration for static magnetic-field exposures of individuals with cardiac pacemakers, other electronic medical devices, and ferromagnetic implants, but noted that no adverse effects are expected at exposure levels below 5,000 mG (0.5 T) (ICNIRP, 2009).

The calculated DC magnetic field of the Project carrying a maximum load of 3,000 MW is shown in Figure 7.11-6, which is well below the ICNIRP recommended limits.

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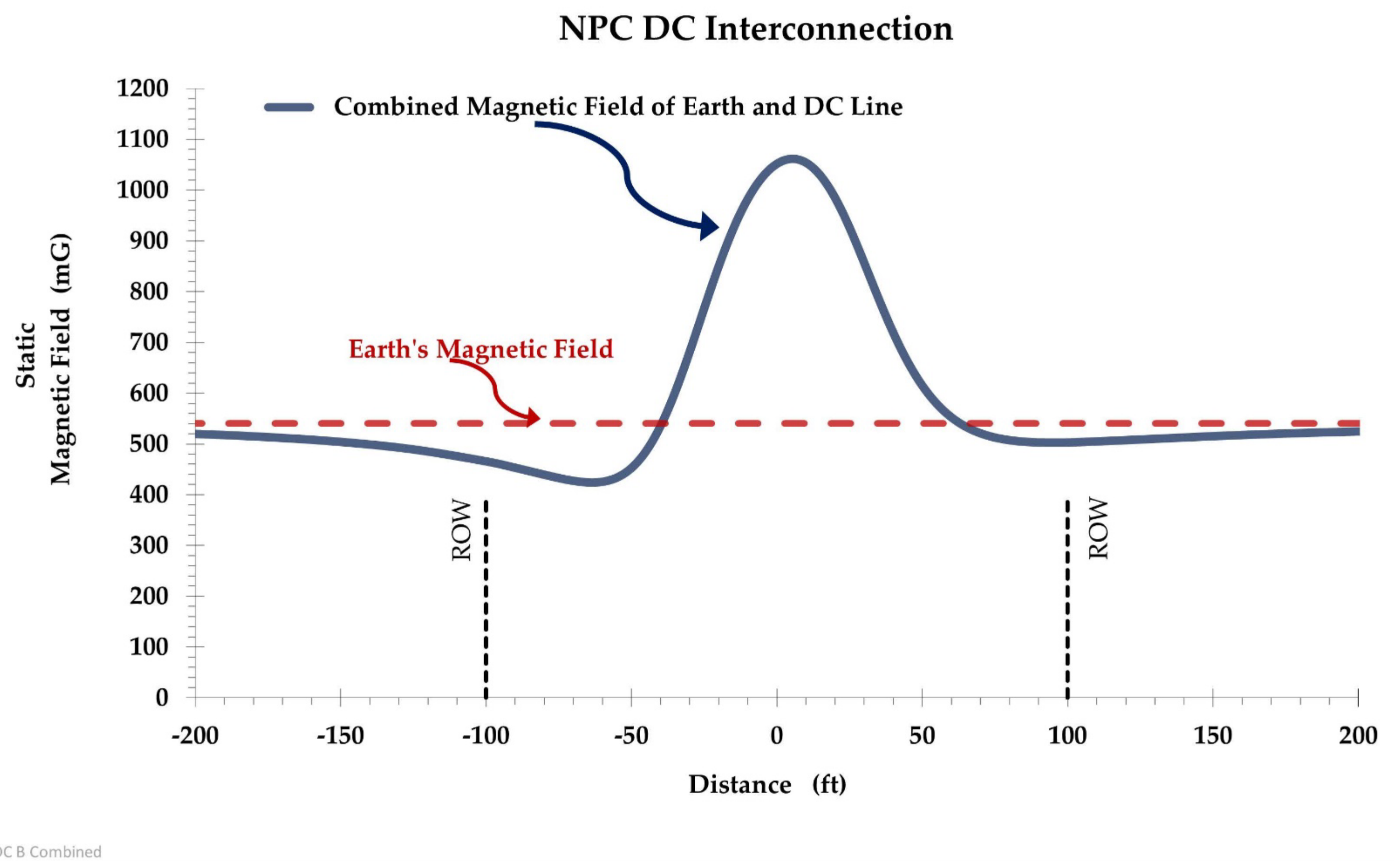

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Figure 7.11-6
Calculated DC Magnetic Field (combined with Earth magnetic field) for the North Plains Connector Project
North Plains Connector Project
Source: Exponent, 2024

For about 40 feet on either side of the centerline of the monopole structure, the resulting magnetic field is greater than the geomagnetic field level. For roughly another 160 feet, the magnetic field is slightly lower than the geomagnetic field value of 540 mG. Like the DC electric field, the levels of the DC magnetic field diminish with distance from the poles. Except for about 40 feet to either side of the centerline depending on power flow, the level of the magnetic field falls within the range of geomagnetic field levels between the equator and the north and south magnetic poles of the Earth. At the edge of the right-of-way, the greatest deviation from the geomagnetic field is approximately 80 mG.

7.11.3 Audible Noise

7.11.3.1 Background

The ambient sound level of a region is defined by the total noise generated within the specific environment and is comprised of natural and manmade sounds. At any location, both the magnitude and frequency of environmental noise may vary considerably over the course of a day and throughout the year. This variation is caused in part by changing weather conditions and the effect of seasonal vegetation cover. Noise is measured in units of decibels (dB) on a logarithmic scale. Human hearing is less sensitive to low and high frequencies. The A-weighted decibel (dBA) is the designated scale used for the range of human hearing.

The A-weighted equivalent sound level (L_{eq}) is an average sound level measured during a period of time and includes any fluctuations in sound levels during that period. The daytime A-weighted equivalent sound level (L_d) is the equivalent sound level for the time between 7 a.m. and 10 p.m. The nighttime A-weighted equivalent sound level (L_n) is the equivalent sound level for the time between 10 p.m. and 7 a.m. The day-night average sound level (L_{dn}) is a 24-hour average L_{eq} of the L_d and L_n with 10 dB added to sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m. to account for people's greater sensitivity to sound during the nighttime. For a source that operates at a continuous sound level over a 24-hour period, the L_{dn} is approximately 6.4 dB above the measured L_{eq}. Consequently, a L_{dn} of 55 dBA corresponds to a L_{eq} of 48.6 dBA.

The electric field at the surface of conductors of both AC and DC transmission line can be a source of corona activity that allows for the generation of audible noise under specific conditions. Background levels of audible noise in rural environments with trees, shrubs, and ground cover are about 30 to 40 dBA. Sparse arid regions may have lower levels of background noise. Specific identifiable noises, such as bird or animal calls, local activity noise, and local traffic noise can easily produce audible noise levels of 50 to 60 dBA. Given the Project's mostly rural and modestly populated nature, ambient noise levels in the Project area likely fall within the 30 to 60 dBA range (EPA, 1974) (NPS, 2021).

The EPA set recommended thresholds for human exposure to noise in dBA, which suggest a threshold of 55 dBA L_{dn}. ARM 17.20.1607(2)(a) sets maximum audible sound limits from the edge of transmission right-of-way in residential and subdivided areas at 50 dBA L_{eq}. Northern Plains did not identify any county level noise ordinances in Montana.

The most common source of audible noise from transmission lines is due to corona and is heard as a crackling or hissing sound. Transmission lines are designed to be smooth and thus minimize corona discharges. During foul weather, however, droplets of precipitation on the conductor surface form conductive protrusions that result in increased electric fields and more readily generate corona. Debris on the surface of conductors such as insects or pollen can also result in corona. Another factor that affects corona (and thus audible noise and radio interference) is altitude. At higher altitudes, the breakdown strength of air decreases and thus corona is likely to increase.

When evaluating transmission lines for audible noise, it is important to note that AC lines typically generate maximum audible noise in foul weather during storms or rain events. This is due to additional corona generated as a function of conductor surface anomalies and water droplets.

In DC transmission lines, the presence of surface irregularities such as scratches, nicks, and contamination of the conductors can increase the local surface gradients and the levels of audible noise. The static electric field causes the worst-case audible noise to occur in the summer months during fair-weather conditions. Audible noise from DC transmission lines is often barely distinguishable from general background noise.

Table 7.11.3-1 shows the audible noise levels in the right-of-way for the selected conductors in dBA scale. The fair weather values represent a predicted average noise level when rain is not present. The foul weather value represents a predicted average noise level present when rain is present. The actual audible noise value is expected to be at or below the calculated foul weather value 50% of the time and above the value the other 50% of the time.

Table 7.11.3-1

Calculated Audible Noise for AC and DC Lines (in dBA)

	AC Transmission Line [a]		DC Transmission Line [b]	
Location	Fair	Foul	Fair	Foul
Right-of-way edge minus 100 feet	21	46	41	35
Maximum on right-of-way	26	51	46	40
Right-of-way edge plus 100 feet	22	47	43	37

[a] Modeling assumptions for AC transmission line: Operating Conditions: 3000 MW Load; +10% Overvoltage; 39’ minimum ground clearance; 3,375’ Elevation
[b] Modeling assumptions for DC transmission line: Operating Conditions: 3000 MW Load; + 5% Overvoltage; 36’ minimum ground clearance; 3,490’ Elevation
Note: dBA = A-weighted decibel
Source: Exponent, 2024

As shown in Table 7.11.3-1 and Figure 7.11-7, the audible noise from the AC transmission line is similar to that of the DC line in that noise levels decline with distance. Unlike the DC line, however, the audible noise levels from the AC line are higher in foul weather (by approximately 9 dBA) and lower in fair weather (by approximately 20 dBA). All predicted values in fair weather are below the EPA’s 55 dBA threshold, and MFSA’s 50 dBA threshold in residential and subdivided areas. Furthermore, as discussed in Section 7.11.1.2, the Project right-of-way along the preferred route will not cross any residential or subdivided areas.

In foul weather, the audible noise from the AC line slightly exceeds the evening guideline level of 45 dBA that includes a 10 dBA night-time penalty but would still result in the L_{dn} level for the AC line in foul weather being below 55 dBA. In addition, during foul weather, the presence of noise from wind and rain would help mask audible noise from the line. (Miller, 1978).

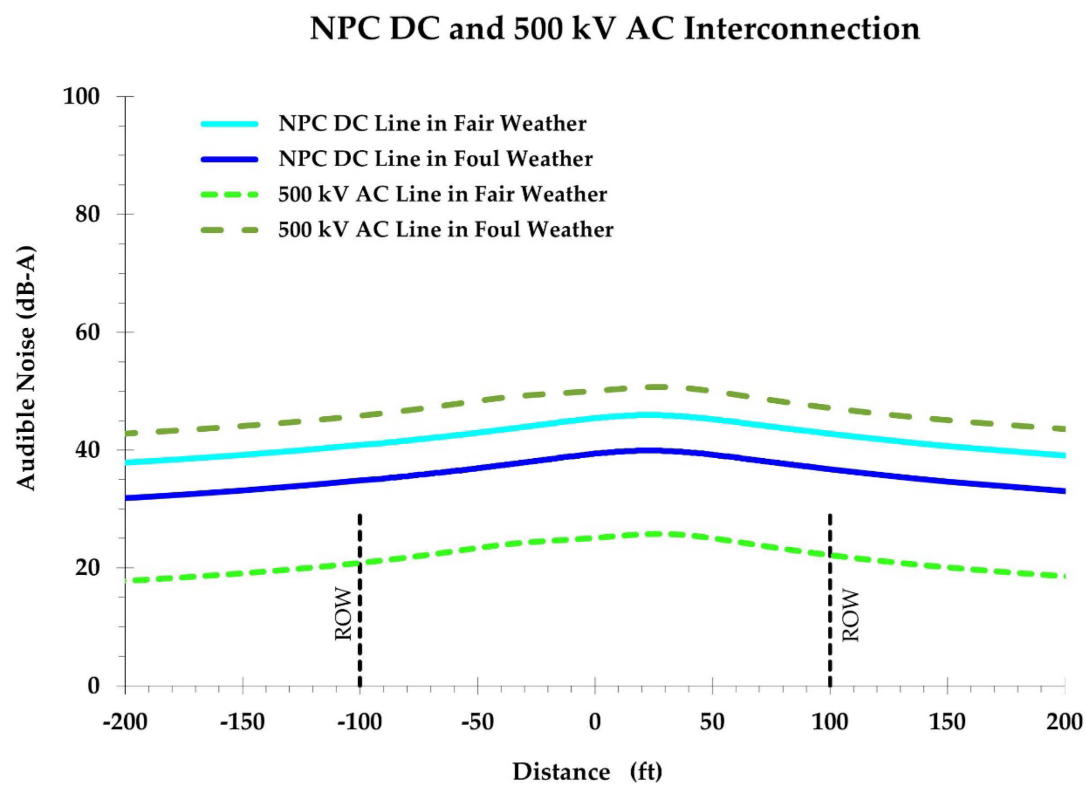

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Figure 7.11-7
Calculated Audible Noise for the North Plains Connector Project AC and DC Lines
North Plains Connector Project
Source: Exponent, 2024

7.11.4 Radio and Television Interference

7.11.4.1 Background

Corona discharges from electric transmission can result in the degradation of radio signals and cause radio interference. Broadcast television signals employ frequencies that are beyond the band that could be interfered with by corona noise effects of AC or DC transmission lines. Thus, direct interference to broadcast television signals would not occur.

Corona discharges generate high frequency currents in the conductors and produce electromagnetic radiation in the vicinity of the lines. Irregularities on the surface of a conductor such as scratches, nicks, contamination, or moisture (rain droplets) can increase the amount of corona discharged. Electromagnetic radiation is often measured on a logarithmic scale in dB above 1 microvolt per meter (μV/m). The signal-to-noise ratio is the radio signal strength minus the calculated interference level in db.

The effects of radio and television interference are based on both the radio signal strength and the level of interference (noise) produced by the transmission line.

Radio and Television Interference Regulations and Anticipated Impacts

Guidance provided by IEEE indicates that the amount of radio interference should be below 56 dB μV/m at 100 feet from the outermost conductor (IEEE, 1971). This is only a rough guideline to evaluate relative performance of transmission line conductors. Actual radio and television interference effects depend on the actual broadcast frequency and the location of the radio receiver as the signal strength can vary significantly. Therefore, the amount of interference that is tolerable varies.

The median levels of radio interference across the right-of-way of the DC line in fair and foul weather are shown in Table 7.11.4-1 and Figure 7.11-8. The calculated values of radio noise at the edge of the right-of-way are 56 dB(μV/m) or below in fair weather and 58 dB(μV/m) or below in foul weather. Both the AC and DC lines meet the design level in the IEEE Radio Noise Design Guide (IEEE, 1971) of 56 dB(μV/m) at 100 feet from the outside conductor in fair weather.

Table 7.11.4-1

Calculated Radio and Television Interference for AC and DC Lines (in dB(μV/m))

	AC Transmission Line [a]		DC Transmission Line [b]	
Location	Fair	Foul	Fair	Foul
Right-of-way edge minus 100 feet	36	53	50	44
Maximum on right-of-way	53	70	71	65
Right-of-way edge plus 100 feet	41	58	56	50

[a] Modeling assumptions for AC transmission line: Operating Conditions: 3000 MW Load; +10% Overvoltage; 39' minimum ground clearance; 3,375 feet elevation

[b] Modeling assumptions for DC transmission line: Operating Conditions: 3000 MW Load; + 5% Overvoltage; 36' minimum ground clearance; 3,490 feet elevation

Note: dB(μV/m) = decibel above 1 microvolt per meter

Source: Exponent, 2024

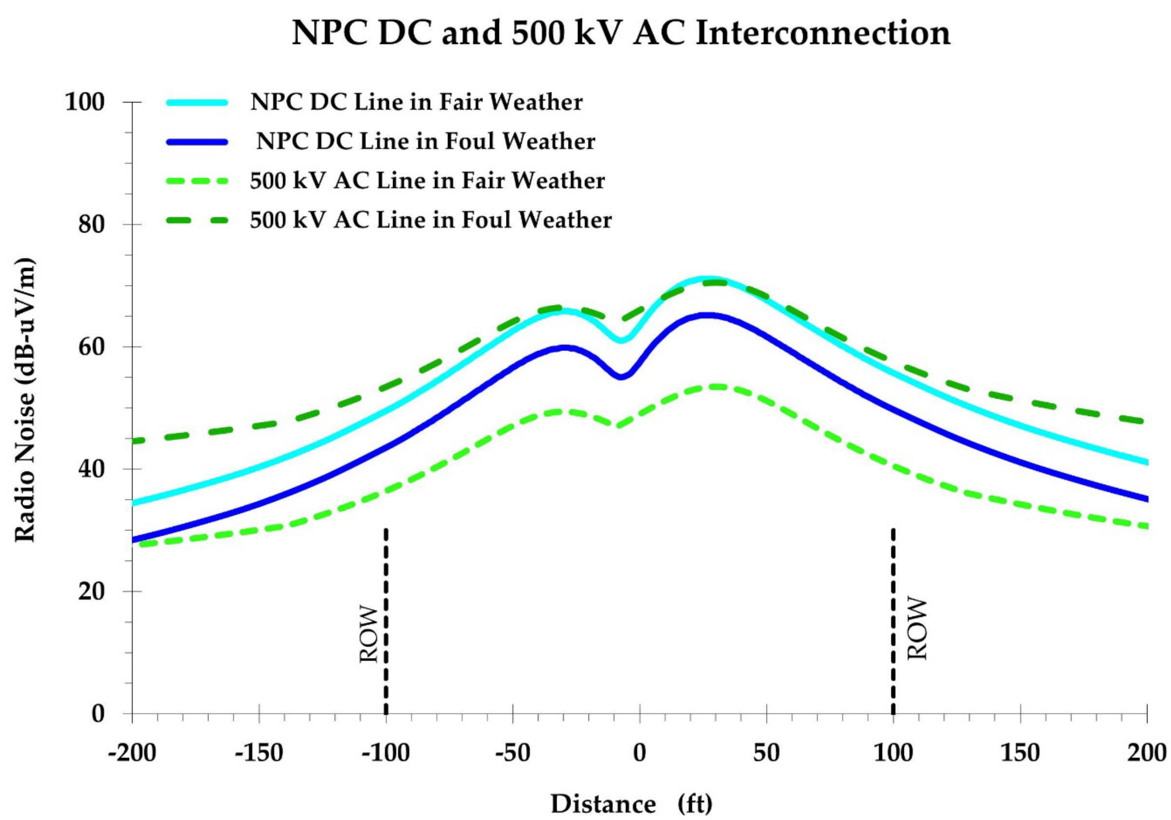

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Figure 7.11-8
Calculated Audible Noise for the North Plains Connector Project AC and DC Lines
North Plains Connector Project
Source: Exponent, 2024

The frequencies of corona-generated radio noise and the 0 and 60 Hz fields around the lines are too low to interfere with the vast majority of today's electrical devices and appliances such as cell phones and global positioning system units that operate at higher frequencies than transmission lines and corona. The reception of AM radio stations is an exception and where under or very close to a transmission line, static can sometimes be heard on the radio receiver. If persons with implanted medical pacemakers or other devices that may be susceptible to AC electric field interference from the AC interconnection have concerns, they should consult their physicians for guidance.

7.11.5 Construction Impact Assessment and Mitigation Effects

With the exception of short-term increases in daytime noise levels in close proximity to the Project during construction, the Project will not cause noise, radio and television interference, or electrical effects in the Project area.

7.11.6 Mitigation

7.11.6.1 Summary of Independent Studies

AC Electric and Magnetic Field Studies

For several decades, numerous national and international scientific and health agencies have reviewed the scientific literature on Extremely Low Frequency electric and magnetic field exposure from AC fields and health, including the National Institute of Environmental Health Sciences (1998), the International Agency for Research on Cancer (IARC) (2002), the World Health Organization (WHO) (2007), and the Scientific Committees of the European Commission (SCENIHR, 2015); Scientific Committee on Health, Environmental and Emerging Risks, 2023), among others. These agencies evaluate evidence from all relevant studies, including observational studies of human health (epidemiology studies) and controlled laboratory experiments conducted with animals (*in vivo*) or cells (*in vitro*). Agencies consider the totality of research due to the inherent strengths and weaknesses that each type of study possesses.

Agencies have been quite consistent in their analysis of the literature on electric and magnetic fields and health. After reviewing the totality of literature, none of the agencies cited has concluded that electric and magnetic fields cause adverse health effects to humans or animals at the levels to which people are routinely exposed to in their daily lives. The most recent weight-of-evidence review published by SCENIHR in 2015 states, "no mechanism that operates at levels of [electric and magnetic fields] exposure found in the everyday environment has been firmly identified and experimentally validated," as a cause of "biological effects or epidemiological associations" (SCENIHR, 2015; p. 225)

DC Electric and Magnetic Field Studies

Over the past 30 years, state, national and international scientific organizations and regulatory agencies have reviewed the scientific literature on static magnetic fields, static electric fields, and air ions from various sources, including DC transmission lines. These reviews include evaluations performed by the Minnesota Environmental Quality Board in 1982 and 1986, Oak Ridge National Laboratory, the IARC in 2002, the Advisory Group on Non-Ionizing Radiation for the National Radiation Protection Board in 2004 and for the Health Protection Agency of the United Kingdom in 2008, and the WHO in 2006. In addition, several scientific organizations and governmental agencies reviewed research on the effects of static fields and air ions that resulted in evaluating the need for guidelines or standards for exposure to DC electric and magnetic fields. These include the U.S. Food and Drug Administration in 1998 and 2003; ICES in 2019; the ACGIH in 2015 and 2016; and ICNIRP in 2009.

Since DC transmission lines typically are used to transmit power over long distances, by their nature, they tend to traverse forested and woodland locations with substantial wildlife and rural farmlands with livestock, dairy cattle, and other farm animals. Small mammals and ground-dwelling species such as mice, salamanders, snakes, rabbits, and foxes are largely shielded from electric fields by surrounding vegetation. Other species such as moles and woodchucks that live underground are totally shielded from the electric field by the soil. Only larger species, such as deer, elk, and moose, and domestic livestock, such as sheep and dairy cattle, have potential exposure since typically they stand higher than surrounding vegetation. Their duration of exposure, however, tends to be limited to foraging or the time it takes to cross under the transmission line. Since electric fields do not couple with the body, interactions with animals near the lines would be limited to the perception of fields and charges on the surface of the body.

The effect of a ±400 kV DC transmission line on plant and animal communities was studied by Griffith (1977). He performed systematic sampling of these populations with primary emphasis on crops, natural vegetation, songbirds, raptors, small mammals, pronghorn antelope and mule deer. Some of the species were influenced, either positively or negatively, by the presence of the transmission line and were attributed by the researchers to the physical presence and clearing of the right-of-way rather than the electrical environment associated with the line.

Investigators at Oregon State University compared the health and productivity of 200 cow-calf pairs randomly assigned to pens directly under the transmission line or 615 meters away from it. The exposure and control groups were evaluated for breeding activity, conception rate, calving, calving interval, body mass of calves at birth, body mass at weaning, or mortality over a 3-year period. No differences between the animals in the exposed and control pens were noted for any of these categories (Angell et al., 1990) or in the time spent in various activities (Ganskopp et al., 1991). Investigators at the University of Minnesota evaluated the effects of the electrical environment around the ± 400-kV Cooperative Power Association and United Power Association transmission line. Martin et al. (1986) used the records of the Dairy Herd Improvement Association to study the health and productivity of about 24,000 cows (approximately 500 dairy herds) from farms located near the transmission line. They examined 6 years of veterinary records that spanned a period from 3 years before the line was energized in 1979 to 3 years after energization. The herds were grouped according to distance of the farm from the transmission line, with the closest herds less than 0.25 mile from the line, and the farthest between 6 and 10 miles away. Milk production per cow, herd average of milk production, milk fat content, and measures of reproductive efficiency and herd health were found to be the same before and after energization and also was found to be unrelated to distance of the herds from the transmission line.

7.11.6.2 Mitigation Recommendations

Given the findings of numerous previous studies that the projected strength of the electric and magnetic fields, noise, and radio and television interference levels are within all established guidelines, no mitigation is necessary or proposed for the Project.

7.12 ENGINEERING (Circular MFSA-2 Section 3.7(9))

North Plains designed the Project in line with good utility practices as described in Section 2.1.1. The design features; major facility components; structure types and technologies; construction methods; and operation and maintenance procedures described in Section 2.0 would be the same regardless of the alternative route selected. In all cases, the width of the proposed right-of-way will be sufficient only to accommodate the proposed transmission line and any future transmission lines would need to be constructed in new rights-of-way. A discussion of floodplains crossed by the alternative routes is included in Section 7.5.4.

7.12.1 Engineering Differences Among the Alternative Facility Locations as they Relate to the Feasibility of Expanding the Transmission Capacity of the Facility through Multiple Circuiting or Design Modifications, or Relating to Whether the Width of the Proposed Right-of-Way is Sufficient to Accommodate Future Transmission Lines (Circular MFSA-2 Section 3.7(9)(a))

North Plains planned all alternatives using the same design parameters and nominal right-of-way width as discussed in Section 2.1. North Plains does not expect that additional transmission lines will be able to be constructed within that same right-of-way, and additional right-of-way would need to be acquired for future facilities. Extra capacity could be explored by way of alternative conductor selection; however, such upgrades at this time are not based on expected loads.

Of all the alternatives, Alternative A would likely be the most difficult alternative to expand in the future because Alternative A is located parallel to Interstate 94 and US Highway 12 for substantially greater distances than the other alternatives (see Table 7.3.1-10). Proximity of the interstate and highway would limit expansion of the transmission line, particularly where other buildings and infrastructure have already been developed in the corridor. As discussed in Section 2.1.7, paralleling an already well-developed corridor can create safety hazards and greatly complicate construction and operation of new facilities. The existing buildings and infrastructure have typically already used the most desirable terrain, resulting in adjacent obstructions and sensitive resources that cannot be avoided without diverting from the established corridor. While a corridor defined by one existing road can be advantageous, highly developed corridors, like those associated with Interstate 94 and US Highway 12, are typically not. Further, future expansion of the interstate or highway, or the associated buildings and other infrastructure next to the interstate or highway, would limit the ability to expand the transmission line.

Although all alternatives parallel other infrastructure to some extent, Alternative A presents the greatest challenges to future expansion (see Table 7.3.1-10). All other alternatives have substantially fewer challenges.

7.12.2 Alternative Structure Types and Technologies that Would Be Necessary to Address Physical Constraints, Impacts and Engineering Differences Among Alternative Facility Locations, if Any (Circular MFSA-2 Section 3.7(9)(b))

There are no specific physical constraints along any of the alternatives that would prohibit a viable design using the structure types and technologies presented in Section 2.1.

7.12.3 Compatibility or Interference Problems the Facility May Impose on Existing Transmission, Transportation or Communication Facilities in Close Proximity to an Alternative Facility Location, if Any (Circular MFSA-2 Section 3.7(9)(d))

North Plains sited each alternative to minimize compatibility and interference problems. Apart from the potential right-of-way constraints discussed in Section 7.12.1, North Plains has not identified any compatibility or interference problems with existing transmission, transportation, or communication facilities. North Plains will coordinate the design, construction, and operation of its transmission line with affected third-party utility operators and transportation agencies to ensure proper clearance between the proposed transmission line and the other facility. As part of this process, North Plains will also work with the utilities to determine whether any special mitigation, such as corrosion or grounding modifications on buried pipelines, may be required. This type of coordination is typical of all transmission line projects.

7.12.4 Problems or Concerns Associated with Crossing Highways or Encroachment on Highway Rights-of-Way (Circular MFSA-2 Section 3.7(9)(e))

North Plains is in ongoing discussions with MDT regarding the Project as summarized in Appendix I. North Plains provided MDT with information necessary to begin an analysis of highway crossings and right-of-way encroachments. North Plains will provide the results of MDTs analysis once it is available, including a summary of any problems or concerns identified by MDT and the proposed resolution.

7.12.5 Aeronautical Hazards and Mitigating Measures (Circular MFSA-2 Section 3.7(9)(e))

North Plains reviewed aeronautical charts as well as FAA and MDT airport directories and GIS data of airports and runways. Based on this review, North Plains determined that none of the alternatives are within Airport Affected Areas regulated by the FAA or MDT. However, as a result of public scoping for the Project, North Plains was made aware of one private airstrip near the city of Baker about 0.5 miles from Alternative D. North Plains is working with the owner of the airstrip to address concerns associated with the location and design of the Project relative to the airstrip. North Plains will inform DEQ of resolution once completed. Additional information regarding airports, airstrips, and military installations within the Study Area is included in Section 7.3.1.2.

8.0 PREFERRED FACILITY LOCATION (75-20-211(1)(a)(iii) MCA)

Sections 3.9 and 3.10 of Circular MFSA-2 require a summary comparison of the various alternatives under consideration, as well as identification of the applicant's preferred facility location. The following provides a summary of information contained in Section 7 of this application, and North Plain's identification of and rationale for the preferred facility location.

8.1 SUMMARY COMPARISON OF ALTERNATIVE FACILITY LOCATIONS

8.1.1 Treatment of Avoidance Areas

As discussed in Section 6.2 of this application, North Plains mapped the 11 MFSA avoidance areas (defined in Circular Section 3.2) and used those areas to delineate the general boundaries within which to develop and assess alignment alternatives.

As noted in Section 7.6.1 of this application, one avoidance area (rugged terrain) is crossed by each alternative facility location. The routing of the alternatives on slopes greater than 30 percent grade was regarded as unavoidable due to landowner preferences to locate the Project outside of flat, cultivated fields and onto steeper, less productive land, particularly along Alternative D. In accordance with MFSA requirements, North Plains has committed to measures to mitigate any significant adverse impacts on steep slopes with erodible soils. The Project will be constructed, operated, and maintained in accordance with these commitments outlined in the CMRP.

The No Action and each of the alternative facility locations avoid impacts to all other 10 listed avoidance areas, as discussed in Section 7.3.1.2 of this application.

8.1.2 Treatment of Preferred Location Criteria

Circular Section 3.1 explains that preferred locations will conform to the statutory requirement to "minimize adverse environmental impacts, considering the state of available technology and the nature and economics of the various alternatives," (75-20-301(1)(c), MCA) and that these locations will achieve the best balance among 11 specific criteria. As discussed in Section 6. -3 of this application, these criteria helped guide the development and analysis of all route alternatives, and selection of the preferred facility location as summarized below.

The MFSA preferred location criteria do not apply to the No Action alternative.

Each of the alternative facility locations adhere to the preferred location criteria to substantially the same degree. The discussion below highlights substantive differences in impacts relevant to the criteria.

8.1.2.1 Greatest Potential for General Local Acceptance of the Facility

While built and natural environmental constraints were used to develop the broad analysis area, landowner input was held in equal regard as alternative facility locations began to take shape. During preliminary property ownership investigations and early, informal discussions with landowners, North Plains identified energy easements that may restrict the location of an additional transmission right-of-way and received objectionable feedback from some landowners that redirected North Plains efforts onto other routes.

Based on landowner objections and/or the existence of lands encumbered by energy easements along Alternatives A, B and C, North Plains refocused landowner engagement along Alternative D. As of the date of this application, Alternative D has substantial local acceptance from landowners and local officials.

8.1.2.2 Utilize or Parallel Existing Utility and/or Transportation Corridors

While Alternative A parallels existing utility and transportation rights-of-way for the greatest length compared to the other alternatives, this route also crosses dense residential and commercial developments. Alternative D parallels other rights-of-way for the greatest length possible while also minimizing impacts to already congested corridors and residential / commercial development.

8.1.2.3 Selection of a Location in Nonresidential Areas

Alternative A has the most conflicts with developed areas as it is the only alternative that would overlap with developed residential areas and affects the most cities, towns, and unincorporated communities. Alternative D was sited to reduce conflicts with congested development and avoids residential areas.

8.1.2.4 Location on Rangeland Rather Than Cropland and on Non-Irrigated or Flood Irrigated Land Rather Than Mechanically Irrigated Land

Alternative A has the greatest length located in mechanically irrigated cropland, while Alternative C has the greatest length on non-irrigated or flood-irrigated land, and Alternative D has the greatest length in rangeland but the smallest amount of irrigated cropland.

8.1.2.5 Location in Logged Areas Rather Than Undisturbed Forest in Timbered Areas

Data on logged/timbered areas was not readily available for any alternative; however, North Plains estimates a similar amount of commercially harvestable timber on Alternatives A, C and D, while Alternative B crosses less than half as much.

8.1.2.6 Location in Geologically Stable Areas with Non-Erosive Soils in Flat or Gently Rolling Terrain

Geological resources do not vary materially for the four alternative routes and none of the alternative routes are located within areas where adverse impacts are expected from geological features or hazards. All alternatives cross substantive acreages of steep terrain and erodible soils which were virtually unavoidable without increasing impacts to other resources.

8.1.2.7 Located in Roaded Areas Where Existing Roads Can Be Used for Access to the Facility During Construction and Maintenance

All alternatives were routed to use of existing roadways for construction, operation and maintenance of the Project to the greatest extent possible. There is no material difference in the need for additional temporary or permanent access roads across the various alternatives.

8.1.2.8 Located So That Structures Need Not Be Located on a Floodplain

All four alternative facility locations would cross up to 1 mile of floodplain associated with the Powder River and Tongue River floodplains. Alternative A also crosses the Yellowstone River floodplain. Alternative D crosses the second least number of floodplains after Alternative B.

8.1.2.9 Located Where the Facility Will Create the Least Visual Impact

Alternative A has the greatest potential for impact to VRM Class II lands, while Alternative B and D have the least potential for impact.

8.1.2.10 Located a Safe Distance from Residences and Other Areas of Human Concentration

Alternative A conflicts with the greatest amount of developed areas as it is the only alternative that would overlap with residential areas and the most cities, towns, and unincorporated communities. Alternative D was sited to reduce conflicts with congested development and avoids residential areas and other areas of human concentration.

8.1.2.11 Located in Accordance with Applicable Local, State, or Federal Management Plans When Public Lands Are Crossed

None of the alternatives cross any lands controlled by local management plans. All alternatives cross land managed by the DNRC, MFWP and BLM, and Alternative A crosses Fort Keogh while Alternatives B and D skirt immediately south of but avoid right-of-way encroachments on the site.

All crossings of DNRC, MFWP, BLM, and USDA will require further coordination with their respective management agencies.

8.1.2.12 Preferred Location Criteria Summary Conclusion

Given the lack of material difference in impacts between alternatives relative to the preferred location criteria, and the fact that Alternative D is able to avoid impacts to developed commercial and residential areas and minimizes impacts to Class II VRM sites and other state and federally managed special use areas, Alternative D achieves the best balance among the above preferred location criteria outlined in MFSA-2 Circular Section 3.1.

8.1.3 Applicant's Selection Criteria

Circular Section 3.10(1)(a) provides an opportunity for the applicant to identify additional selection criteria. North Plains approached each alternative route objectively and with an equal application of the explicit avoidance areas and preferred location criteria, and this process identified what could be considered an optimal route from a cost perspective. This process by itself did not provide the desired flexibility to work with affected landowners to identify a locally preferred route. With the "stakeholder first" approach, North Plains added criteria to help refine route alternatives based on their ability to:

- balance and incorporate affected landowner input where feasible;
- avoid overly-congested utility corridors and built environments;
- avoid lands encumbered by private easements; and
- obtain voluntary easement agreements.

Alternatives A, B, and C presented more challenges in meeting these applicant selection criteria than Alternative D. While none of the challenges would be considered fatal flaws, Alternatives A, B, and C may have required substantial reroutes to satisfy the applicant selection criteria. Alternative D ultimately showed more promise in meeting the applicant selection criteria with only small modifications requested by directly affected landowners; however, the refinements in the route to address landowner preferences and provide balance among all selection criteria results in a longer route with a corollary increase in potential resource impacts. When comparing potential impacts across all alternatives as outlined in Section 7.0, it may appear that Alternative D has greater conflicts with some resources than other alternatives. While none of the potential impacts would be considered significant in either magnitude or intensity, these incremental differences in potential impacts are a direct result of accommodating micrositing requests from affected landowners, and the same incremental increase in potential impacts would be highly likely to occur on the other alternatives were they to undergo this same exercise.

Overall, Alternative D is able to best balance consideration of avoidance areas, preferred location criteria, and North Plains' selection criteria, even with its greater length and impact on a limited range of resources.

8.1.4 Summary of Most Important Impacts

Section 7 of this application provides an exhaustive overview of potential impacts from each alternative facility location. In accordance with MFSA Circular-2, Section 3.9, the following provides a summary of the most important impacts associated with each alternative facility location as discussed in the previous analysis. Given that most of the alternative facility locations impact multiple resources to very similar degrees, this discussion focuses on those areas with notable differences in impact between alternatives.

8.1.4.1 No Action

The selection of a No Action Alternative would avoid the potential environmental impacts associated with the various alternative facility locations but fail to meet the Project purpose and need.

8.1.4.2 Alternative A

Alternative Facility Location A is the only alternative that would overlap with developed residential areas, a school, and major farm support buildings. It also crosses the greatest amount of recreational areas, including Fort Keogh, and could also have the most long-term restrictions on hunting and other recreational opportunities. It crosses nearly double the amount of VRM Class II lands as compared to Alternatives B and D, more than double the amount of prime farmland and irrigated cropland compared to all other alternatives. It crosses the least amount of greater sage grouse habitat.

8.1.4.3 Alternative B

Alternative Facility Location B crosses lands encumbered by conservation easements and a small portion of Fort Keogh, crosses the greatest amount of erodible soils, the second highest amount of greater sage grouse habitat and irrigated cropland, and third highest amount of prime farmland. It crosses the least amount of VRM Class II lands and floodplains, but by very small margins as compared to Alternatives C and D.

8.1.4.4 Alternative C

Alternative Facility Location C crosses recreational lands including Fort Keogh and the Bice and Hirsch Ranch conservation easements, the second highest amount of prime farmland and VRM Class II land, virtually the same amount of greater sage grouse habitat as Alternative B, the third highest amount of erodible soils and irrigated cropland.

8.1.4.5 Alternative D

Alternative Facility Location D crosses the greatest amount of greater sage grouse habitat and erodible soils, the second least amount of VRM Class II lands, and a conservation easement. Alternative D crosses the least amount of irrigated cropland and prime farmland.

8.1.5 Degree to Which Impacts Can Be Mitigated

No mitigation is planned under the No Action Alternative.

While no impacts are anticipated to be significant for any resource crossed by the various alternative facility locations, mitigation measures outlined in this application and the accompanying CMRP would reduce all impacts to a minimal level for each of the build alternatives.

8.2 COMPARATIVE RANKING

MFSA outlines the need for two separate comparative analyses of alternatives. The first is outlined in ARM 17.20.1305(2), which requires a comparison of alternatives which have significant environmental advantages over the proposed facility. As presented in previous discussions in Sections 6.0 and 7.0 of this application, there are no substantive environmental differences between the various route alternatives, thus no need for additional comparative analysis in this Section. Circular Section 3.9(1)(c) requires an indication of the relative differences and favorability among the alternatives based on consideration of the following 12 categories.

8.2.1 Levelized Annual Costs, Including Environmental and Mitigation Costs

The costs for each alternative would be approximately the same, although final routing, design, and permitting will influence final costs. None of the alternatives would result in significant impacts; therefore, environmental and mitigation costs would be approximately the same.

8.2.2 Reliability

The reliability of each build alternative would be the same. With the exception of the non construction alternatives presented in Section 5 of this application, there are no unique conditions or design features particular to any alternative that would substantially influence reliability of one route alternative as compared to another.

8.2.3 Land Use

Alternative A is the least favorable based on the highest level of conflict with irrigated cropland; commercial/industrial properties; cities, towns, unincorporated communities; and recreational and special interest areas. Alternative A is also the only alternative to overlap with developed residential areas and local public land. Alternatives B, C, and D are all similar to one another relative to conflicts with existing land use and are equally favorable.

8.2.4 Socioeconomics

There would be no material difference in the socioeconomic impacts related to each alternative as all alternatives cross Rosebud, Custer, and Fallon Counties and would have similar needs and expenditures within those three counties.

8.2.5 Earth Resources

Alternative A is the most favorable based on the least amount of crossings of water erodible soil, sloped soil, Cretaceous shales, hydric soils, and soils of revegetation concern. Alternatives B and C are moderately favorable, and Alternative D is the least favorable based on the most erodible soil, sloped soil, compaction prone soils, hydric soils (tied with Alternatives B and C), and soils of revegetation concern. However, Alternative D does have less prime farmland than the other three alternatives.

8.2.6 Engineering Considerations

The engineering considerations for each alternative would be approximately the same. No alternative has a unique condition or design feature beyond those discussed under the other resources in this section that would substantially influence engineering design for one alternative as compared to another.

8.2.7 Visual Resources

Alternatives B and D are the most favorable based on minimization of visual concerns, while Alternatives A and C encounter a greater amount of viewpoints and VRM Class II lands.

8.2.8 Biological Resources

Alternatives B, C, and D are the most favorable but cross some forest, some deer and pronghorn winter range, some bighorn sheep habitat, the fewest documented eagles, the most grouse habitat, fewest special status species with recent occurrences, some birds of conservation concern with recent occurrence, and some high value fisheries. Alternative A is the least favorable due to crossing the most forest, bighorn sheep and white-tailed deer habitat, documented eagles, special status species with recent occurrences, including BLM sensitive species, state SOCs (all ranks), migratory BCCs, and special status waterbird species (tied with Alternative D, and high value fisheries. Additionally, Alternative A is the only alternative route with documented GRSG leks within 0.25 mile of the centerline.

8.2.9 Historic, Archeological and Paleontological Resources

All alternatives vary with anticipated impacts on previously recorded archeological sites, and potential to yield fossils. On balance, there is no material difference in anticipated impacts between the alternatives.

8.2.10 Recreation

Alternatives C and D avoid conflicts with recreational areas, while the Alterative A Facility Location crosses the Lewis and Clark Trail SRMA and Alternative B Facility Location crosses the Tongue River just south of 12 Mile Dam, a fishing access site and campground, and the Lewis and Clark Trail SRMA.

8.2.11 Water Resources

Alternatives D is the most favorable due to its limited crossing of and forested riparian land, wetlands, and perennial and intermittent streams. Alternative B contains the most acres of wetlands. However, Alternative B has the least amount of riparian areas in its Facility Location while Alternative C has the most. Alternative A crosses a moderate amount of floodplains, forested riparian land, and wetlands. However, Alternative A Facility Location crosses the largest number of 303(d) waters. The Alternative C Facility Location has the greatest number of intermittent waterbodies along with Alternative B, as well as the greatest number of perennial waterbody crossings. Alternative B also has the largest acreage of internally drained basins equal to or greater than 20 acres.

8.2.12 Noise, Radio and Television Interference and Electrical Effects

The electric and magnetic field and related effects from each alternative would be similar given that each alternative uses the same engineering design. Alternative D is most favorable because only 1 residence is within the Facility Location and is more than more than 500 feet from the proposed centerline. Alternatives B and C would be less favorable with 2 and 4 residences within the Facility Locations, respectively. Alternative D would be the least favorable with 12 residence within the Facility Location.

8.2.13 Summary

Based on this comparative summary, Alternative D is the most favorable when considering all of the categories outlined in Circular Section 3.9. Alternatives B and C would be the next most favorable, respectively, while Alternative A would be the least favorable.

8.3 SELECTION OF ROUTE ALTERNATIVE D AS THE PROPOSED FACILITY LOCATION

8.3.1 Selection of the Proposed Facility Location

Based on the summary analysis contained in this section, North Plains identifies Alternative D as the Proposed Facility Location based on the ability to satisfy the Project purpose and need, to balance the preferred location criteria and applicant selection criteria, and demonstration of the ability to meet the minimum impact standard outlined in ARM 17.20.1607.

This application demonstrates that no other transmission alternative, alternative energy resource or energy conservation, alternative transmission technology, or alternative level of transmission reliability can satisfy the purpose and need for the Project as a stand-alone alternative; thus, the cost of Alternative D is not a factor in this determination.

Additionally, this application demonstrates that Alternative D successfully achieves the following in accordance with ARM 17.20.1607:

- Anticipated and unquantified environmental impacts are not significantly adverse;
- Mitigation measures contained in the CMRP are included in the Project cost calculations;
- Provides the best balance among the preferred location criteria;
- Does not cross national wilderness areas or national primitive areas;
- Considered reasonable alternative locations;
- Will result in less cumulative adverse environmental impacts and economic cost than siting the facility in any reasonable alternative location based on the fact that no significant adverse impacts have been identified, reasonable mitigation has been identified, a mitigation plan (CMRP) has been established as a condition to the certificate, including a monitoring and reclamation plan; and

- The crossing of steep slopes of over 30 percent will not result in significant adverse environmental impacts, that reasonable mitigation has been identified, that a mitigation plan has been developed, and a monitoring and reclamation plan has been identified and will be included as a condition to the certificate.

Additionally, the Preferred Facility Location will:

- Satisfy noise limit requirements and will not exceed 50 decibels at the edge of right-of-way in residential and subdivided areas, or 55 decibels at the edge of property boundaries of substations in residential areas;
- Mitigate any unanticipated interference with stationary radio, television or other communication systems;
- Adhere to applicable sections of the National Electric Safety Code;
- Satisfy electric field limit requirements and will not exceed 1 kV per meter measured one meter above the ground in residential or subdivided areas; and
- Comply with identification and marking standards established by the Federal Aviation Administration.

Based on all of the summary analysis in this section, as well as the detailed analyses contained in Section 7 of this application, North Plains selects Alternative Facility Location D as the Proposed Facility Location for certification by the Montana DEQ under the Major Facility Siting Act.

8.3.2 Project Studies of the Proposed Facility (75-20-211(1)(a)(ii) MCA, ARM 17.20.804(1) & Circular MFSA-2, Section 3.0)

In addition to the publicly available GIS data summarized in Sections 6.0 and 7.0, North Plains initiated a number of studies and field surveys specific to the proposed Facility Location.

Project desktop studies and field surveys include a variety of biological, cultural, tribal, paleontological, and engineering-related surveys. Surveys conducted or planned along the proposed Facility Location prior to construction are provided in Table 8.3-1. The survey reports cited in Table 8.3-1 will be provided separately in a confidential filing.

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TABLE 8.3-1

Summary of Pre-construction Desktop Studies and Field Surveys Conducted or Planned along the North Plains Connector Project in Montana

Survey Type	Survey Method	Location	Survey Area [a]	Survey Years and Current Status	Survey Report(s)
BIOLOGICAL SURVEYS					
HABITAT MAPPING AND ASSESSMENT					
Aquatic resource surveys	Ground	Project-wide	Typical Survey Area	Ongoing, 2022-2025	2022-2024 Aquatic Resource Inventory Survey Report
General habitat mapping	Ground	Project-wide	Typical Survey Area	Ongoing, 2022-2025	2022-2025 General Habitat Survey Report (in progress)
Noxious weed surveys	Ground	Project-wide	Typical Survey Area	Ongoing, 2022-2025	2022-2025 General Habitat Survey Report (in progress)
Black-tailed prairie dog colony mapping	Ground	Project-wide	Typical Survey Area	Ongoing, 2022-2025	2022-2025 General Habitat Survey Report (in progress)
Northern long-eared bat habitat assessment	Ground	Project-wide	Typical Survey Area	Complete, 2022-2023	2023 Bat Survey Report
Non-forested bat habitat assessment	Ground	Project-wide	Typical Survey Area	Ongoing, 2022-2024	2023 Bat Survey Report 2024 Bat Survey Report 2025 Bat Survey Report (in progress)
Bat hibernacula assessment surveys	Ground	Potential hibernacula Project-wide	Typical Survey Area, plus 0.5-mile centerline buffer	Ongoing, 2023-2025	2023 Bat Survey Report 2024 Bat Survey Report 2025 Bat Survey Report (in progress)
Preliminary Dakota skipper habitat assessment	Ground	Fallon County, Montana	Typical Survey Area, plus 0.6-mile buffer on BLM lands	Complete, 2022-2024	2023 Dakota Skipper Survey Report 2024-2025 Dakota Skipper Habitat Assessment Survey Report (in progress)
Dakota skipper reproductive and foraging habitat assessment	Ground	Select locations in Fallon County, Montana	Typical Survey Area	Ongoing, 2023-2025	2023 Dakota Skipper Survey Report 2024-2025 Dakota Skipper Habitat Assessment Survey Report (in progress)
SPECIES OCCUPANCY SURVEYS					
Acoustic presence/ probable absence bat surveys	Ground	Project-wide	Typical Survey Area [b]	Ongoing, 2023-2025	2023 Bat Survey Report 2024 Bat Survey Report 2025 Bat Survey Report (in progress)
Bat hibernacula presence/probable absence surveys	Ground	Suitable hibernacula	Typical Survey Area	Pending survey in 2025	None
Mist-netting bat surveys (supplemental)	Ground	Selected areas (highest quality bat habitat along Project)	Typical Survey Area	Complete, 2023	2023 Bat Survey Report
Dakota skipper presence/ probable absence surveys	Ground	Selected areas in North Dakota	Typical Survey Area	Ongoing, 2024-2025	2024-2025 Dakota Skipper Occupancy Survey Report (in progress)

TABLE 8.3-1

Summary of Pre-construction Desktop Studies and Field Surveys Conducted or Planned along the North Plains Connector Project in Montana

Survey Type	Survey Method	Location	Survey Area [a]	Survey Years and Current Status	Survey Report(s)
Greater sage-grouse and sharp-tailed grouse lek surveys	Aerial	Project-wide (2022), Montana only (2023)	2-mile centerline buffer	Complete, 2022-2023	2022 Greater Sage-Grouse and Sharp-tailed Grouse Lek Survey Report 2023 Greater Sage-Grouse and Sharp-tailed Grouse Lek Survey Report
Raptor nest and wading bird rookery surveys	Aerial	Project-wide	1- to 2-mile centerline buffer [c]	Complete, 2022-2023	2022 Raptor Nest Survey Report 2023 Raptor Nest Survey Report
Incidental wildlife observations	Ground	Project-wide, BLM species on BLM lands only	Coincident with other ground surveys [d]	Ongoing, 2022-2025	2022-2025 General Habitat Survey Report (in progress)
Pre-construction raptor nest surveys	Aerial	Project-wide	1- to 2-mile centerline buffer [c]	Pending survey 2027	None
CULTURAL AND TRIBAL RESOURCE SURVEYS					
Class I literature search	Desktop	Montana	5-mile centerline buffer	Ongoing, 2022-2025	To be included in 2022-2023 Survey Report and 2024-2025 Addendum Survey Report
Class III cultural resources inventory	Ground	Montana	Typical Survey Area	Ongoing, 2022-2025	2022-2023 Survey Report, 2024-2025 Addendum (in progress)
Tribal resources inventory	Ground	Montana	Typical Survey Area	Ongoing, 2022-2025	2022-2023 Survey Report, 2024-2025 Addendum (in progress)
Architectural history survey	Ground	Project-wide [e]	1-mile centerline buffer	Ongoing, 2022-2025	2022-2025 Visual Impacts Analysis Report (in progress)
OTHER SURVEYS					
Paleontological survey	Ground	Montana	Typical Survey Area	Complete, 2022-2025	2023 Report, 2024 Report, 2025 Report (in progress)
Geotechnical investigation	Ground	Selected areas	25- to 50-foot access road corridor and 50-foot boring site buffer	Ongoing, 2025-2026	None
Occupied receptor survey	Ground	Project-wide	500-foot centerline buffer		

[a] The typical Project-wide survey area includes the 300-foot-wide transmission line survey corridor, 50-foot-wide access road survey corridors, pulling and tensioning sites, laydown yards, facility footprints, and additional construction areas, as needed.

[b] Bat presence/probable absence acoustic surveys were conducted at selected points in suitable habitat within the typical survey area.

[c] A 2-mile buffer was used in areas with high predicted golden eagle nest density.

[d] Incidental wildlife observations were recorded during wetland/waterbody and general habitat surveys but did not include a specific target area or separate mobilization.

[e] Architectural history surveys conducted from public rights-of-way.

Note: BLM = Bureau of Land Management

9.0 CONSULTATION AND COORDINATION (ARM 17.20.1426(1 & 2) & Circular MFSA-2 Section 3.0(1, 2, 3 & 4))

This section provides an overview of the federal and state regulations, permitting requirements, and agency coordination considered during the evaluation of impacts along the four alternative routes in Section 7.0. An environmental permitting matrix summarizing anticipated Project permitting need is provided in Table 9.0-1.

TABLE 9.0-1

Major Environmental Authorizations and Consultations for the North Plains Connector Project

Agency/Tribe	Description of Permit, Approval, or Consultation	Submittal (Anticipated)	Approval (Anticipated)
FEDERAL			
U.S. Department of Energy (Lead Federal Agency)	National Environmental Policy Act (NEPA) Review	August 2024	(March 2027)
Bureau of Land Management	Right-of-Way Grant and Temporary Use Permit with Plan of Development	September 2024	(March 2027)
U.S. Department of Agriculture – Agricultural Research Service	Revocable Right-of-Way Permit	September 2024	(March 2027)
U.S. Forest Service	Special Use Permit	September 2024	(March 2027
	Applicant-Prepared Biological Evaluation	(February 2026)	(March 2027)
U.S. Fish and Wildlife Service	Endangered Species Act Consultation Applicant-Prepared Biological Assessment / USFWS Issues Biological Opinion	(October 2025)	(April 2026)
	Non-Purposeful Take Permit for Bald/Golden Eagles	(December 2026)	(October 2027)
U.S. Army Corps of Engineers – Omaha District	Section 404 Permit	(October 2025)	(August 2026)
Federal Lead Agency, Federal and State Land-Managing Agencies, State Historic Preservation Offices, Tribal Historic Preservation Offices, and Consulting Parties	Section 106 of the National Historic Preservation Act Consultation	February 2025	(November 2026)
Federal Lead Agency, Tribal Governments	Government-to Government Consultation	February 2025	(November 2026)
Federal Aviation Administration	Notice of Construction or Alteration	(at least 45 days prior to Construction)	NA
MONTANA			
Montana Department of Environmental Quality	Certificate of Compliance	September 2024	(March 2027)
	Water Quality Certification under Section 401 of the Clean Water Act (associated with Section 404 Permit)	(October 2025)	(August 2026)
	Short-Term Water Quality Standard for Turbidity Related to Construction Activity (318)	(October 2025)	(August 2026)
	General Permit for Storm Water Discharges Associated with Construction Activity (MTR100000)	(June 2027)	(July 2027)
	Construction Dewatering General Permit (MTG070000)	(June 2027)	(July 2027)
	Air Quality Registration – Concrete Batch Plants	(July 2028)	NA

TABLE 9.0-1

Major Environmental Authorizations and Consultations for the North Plains Connector Project

Agency/Tribe	Description of Permit, Approval, or Consultation	Submittal (Anticipated)	Approval (Anticipated)
Montana Sage Grouse Habitat Conservation Program, Montana Sage Grouse Oversight team	Sage Grouse Avoidance and Mitigation Plan	(October 2025)	(April 2026)
Montana Department of Natural Resources and Conservation (DNRC), State Board of Land Commissioners	Right-of-way grant or easement for DNRC State Trust Land crossings	September 2024	(August 2026)
	Natural Streambed and Land Preservation Act (310 Law)	(October 2025)	(August 2026)
	Montana Land-Use License or Easement on Navigable Waters	NA	NA
Montana State Historic Preservation Office	Section 106 of National Historic Preservation Act Consultation	February 2025	(October 2026)
Montana Department of Transportation (MDOT)	Utility Occupancy, Driveway, Oversize / Overweight Permits	(November 2026)	(December 2027)
LOCAL			
County Weed Boards	Noxious Weed and Aquatic Invasive Species Management Plan Approval	(August 2025)	(February 2026)
County Road Authorities	Utility, Driveway, Oversize / Overweight Permits	(July 2027)	(December 2027)
Rosebud County Floodplain Administrator	Floodplain Development Permit	(November 2027)	(April 2028)
Rosebud County Conservation District	310 Perennial Water Crossing Permit	Prior to Construction	Prior to Construction
Custer County Conservation District	310 Perennial Water Crossing Permit	Prior to Construction	Prior to Construction
Little Beaver Conservation District	310 Perennial Water Crossing Permit	Prior to Construction	Prior to Construction

9.1 SUMMARY OF CONSULTATION WITH GOVERNMENT

A number of federal, state, and local agencies have permitting and regulatory roles with respect to the Project. The roles of the applicable agencies and summary of Project agency coordination to date are summarized in Table 9.0-1 and described below. A list of agency coordination to date is included in Appendix I.

9.1.1 Federal Agencies

9.1.1.1 U.S. Department of Energy

The DOE is authorized under Section 216(h) of the Federal Power Act to serve as the lead agency in coordinating all federal authorizations and associated NEPA reviews necessary to site an electrical transmission facility. The Project is going through the 216(h) process with DOE as the lead agency. The Project began coordinating with the DOE's Grid Deployment Office in March 2022.

9.1.1.2 Bureau of Land Management

As discussed in Section 7.3.1.1, the alternative route Facility Locations contain parcels of BLM land managed by the Miles City Field Office (BLM, 2015a). The Project will need a federal right-of-way permit to cross BLM land. North Plains initiated coordination with the BLM in October 2021 to identify BLM sensitive species and other potential resource concerns related to the development and operation of an electric transmission line on BLM property. Following this preliminary coordination, North Plains submitted a Standard Form-299 right-of-way permit application and Project plan of development to the Miles City Field Office on July 21, 2022. After further coordination, a revised Standard Form-299 right-of-way permit application and draft plan of development was submitted to the Miles City Field Office on July 10, 2023. This same Standard Form-299 right-of-way grant application and draft plan of development was submitted to USDA ARS Fort Keogh on July 10, 2023 (see Section 9.1.2.5 below). North Plains is also facilitating coordination with other agencies to address related concerns, including for species protected under the ESA, BGEPA, MBTA, and GRSG.

The BLM is reviewing the right-of-way grant application to determine if it conforms with the ARMP for the area and has no conflicts with other authorizations or valid existing rights. Since the decision to issue a permit is a major federal action, the BLM will need to carry out a NEPA review of the Project. To fulfill its obligations under NEPA, the BLM will act as a cooperating agency to the DOE as the lead agency in carrying out the NEPA process. North Plains will continue to coordinate with the BLM as Project development progresses, to ensure the Project will qualify for a right-of-way permit and comply with its conditions.

9.1.1.3 U.S. Army Corps of Engineers

Clean Water Act

The Clean Water Act (CWA) (33 U.S. Code [USC] 1344) is the primary federal statute regulating the protection of Waters of the U.S. (WOTUS), as administered by the USACE. The portions of the Project that affect WOTUS are under the jurisdiction of the Omaha USACE district. Project activities affecting WOTUS are regulated under Sections 404, 401, and 402 of the CWA. Authority to administer Section 402 of the CWA is granted to the DEQ by the USACE, as discussed in Section 9.2. Compliance with Sections 404 and 401 are discussed below.

The USACE has the authority under Section 404 of the CWA to issue or deny permits for proposed discharges of dredged and/or fill material into WOTUS. WOTUS includes traditional navigable waters, territorial seas, and interstate waters. Adjacent wetlands and tributaries to these waters that meet the relatively permanent standard or significant nexus standard are also protected under Section 404 (40 CFR 120). In Montana, impacts to wetlands and waterbodies are permitted through a joint application process with the USACE and DEQ. Section 401 of the CWA requires that an applicant for a federal permit that will authorize an activity resulting in a discharge to WOTUS provide the federal regulatory agency with a Section 401 Water Quality Certification. In Montana, Section 401 of the CWA is administered by the DEQ. The Section 404/401 reviews are completed concurrently. North Plains will ensure the Project complies with Sections 404 and 401 by carrying out wetland and waterbody delineations and complying with applicable permit conditions. Section 404 and 401 authorizations will be obtained prior to Project construction. North Plains initiated communication with USACE staff in Montana in the spring of 2022, and again in the winter of 2023 and early summer 2025 to discuss the Project's CWA permitting strategy. Coordination is ongoing.

Rivers and Harbors Act Section 10

Pursuant to Section 10 of the Rivers and Harbors Appropriation Act (33 USC 403), temporary or permanent construction of any structure within the ordinary high-water mark, under, or over a federally listed navigable water requires a permit from the USACE. The four alternative routes do not cross any Section 10 waterbodies, so Section 10 approval is not needed.

9.1.1.4 U.S. Fish and Wildlife Service

Endangered Species Act

Federal law protects endangered and threatened species listed under the ESA (16 USC 1531-1544), as administered by the USFWS. Federally listed species and their designated critical habitats are protected under Sections 4 and 9 of the ESA, which prohibits the take of endangered or threatened animals; the take of endangered or threatened plants on federal property; and damage to federally designated critical habitat from a federal action. Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. As the lead federal agency, DOE will engage in interagency consultation with USFWS under Section 7 of the ESA to assess the effects of the proposed Project on federally listed species. There is a mechanism under Section 7 of the ESA authorizing the USFWS to grant permission for certain take that is incidental to an otherwise lawful activity and would not jeopardize the continued existence of the species. Proposed and under review species are not protected under the ESA but could become listed if the USFWS determines the species is in danger of extinction throughout all or a significant portion of its range (ESA §3(6,20)).

North Plains initiated contact with the USFWS Montana Field Office to request technical assistance in identifying federally protected, proposed, candidate, or under review species that could be affected by the Project in October 2021. Since that time, North Plains has attended numerous meetings with the USFWS and MFWP for guidance on species and habitat surveys and assessments, along with potential conservation measures to avoid, minimize, and mitigate potential impacts. North Plains has regularly queried the USFWS IPaC to ensure all species were identified that could occur in the Study Areas of the four alternative routes. In addition, North Plains requested and received state species occurrence and habitat data from the MNHP and MFWP (see Sections 7.6 and 7.7). North Plains has developed a Biological Assessment in compliance with Section 7, and will continue to coordinate with the USFWS regarding Project effects on federally listed, proposed, and under review species.

Migratory Bird Treaty Act

The MBTA (16 USC 703−712 [1918]) prohibits take of migratory bird species, as administered by the USFWS. The USFWS maintains a list of over 1,000 species protected by the MBTA at 50 CFR 10.13. The MBTA prohibits the, "taking, killing, possession, transportation, import and export of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior," (16 USC 703). Take under the MBTA means, "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect," (50 CFR 10.12).

The USFWS's position on incidental take of migratory birds has fluctuated in recent years. On May 7, 2021, the USFWS issued a proposed rule for regulations governing take of migratory birds (Docket No. FWS-HQ-MB-2018-0090) to reinstate prohibitions for incidental take of migratory birds listed under the MBTA and use prosecutorial discretion to determine violations (86 Federal Register [FR] 24573 [2021]).

On October 4, 2021, the USFWS published an Advanced Notice of Proposed Rulemaking that announced the agency's intent to, "seek to better protect migratory bird populations through addressing human-caused mortality with common-sense regulations that are not unduly burdensome," (86 FR 54667). The USFWS is currently planning to implement legal codification to prohibit and manage incidental take of migratory birds under the law and is developing an environmental impact statement analyzing a potential general permit authorization permitting program for incidental take of migratory birds (86 FR 54667).

Project coordination with the USFWS regarding MBTA species and conservation measures has occurred concurrently with coordination on species protected under the ESA (see above), including the identification of migratory BCCs that could be affected by the Project based on the Project's IPaC queries and state occurrence data. BCCs are species identified by the USFWS as being at risk of becoming listed under the ESA. North Plains will develop a MBCP in coordination with the USFWS and MFWP to ensure Project construction and operation do not result in the take of migratory birds.

Bald and Golden Eagle Protection Act

In addition to the MBTA, bald (*Haliaeetus leucocephalus*) and golden (*Aquila chrysaetos*) eagles are afforded protection the BGEPA (16 USC 668-668d). The BGEPA, along with its implementing regulations, provides additional protection to bald eagles and golden eagles. In this statute, the definition of "take" is to, "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, or molest, or disturb." The term "disturb" is defined in regulations found at 50 CFR 22.3 (1974) to include, "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

The USFWS published the Eagle Permit Rule on September 11, 2009, under the BGEPA authorizing limited issuance of permits to take bald eagles and golden eagles, ''for the protection of other interests in any particular locality,'' where the take is compatible with the preservation of the bald eagle and the golden eagle, is associated with and not the purpose of an otherwise lawful activity and cannot practicably be avoided (74 FR 46836).

The USFWS published a revision to the Eagle Permit Rule on May 6, 2016 (81 FR 27933), which was finalized on August 30, 2017 (82 FR 41177). The rule included changes to the permit issuance criteria and permit duration, compensatory mitigation standards, criteria for eagle nest removal permits, permit application requirements and fees, as well as definitions intended to add clarity to the Eagle Permit Rule.

Revisions to the eagle incidental take permit regulations were published in the FR on February 12, 2024, and took effect April 12, 2024. The revisions include the creation of general permits authorizing incidental take for powerline infrastructure, certain wind energy facilities, certain activities that may cause bald eagle nest disturbance, and certain categories of bald eagle nest take.

North Plains initiated communication with the USFWS in October 2021 regarding known or potential bald and golden eagle use of the alternative route Facility Locations, Project survey needs, and potential conservation measures to avoid, minimize, and/or mitigate impacts. In addition, North Plains identified documented occurrences of eagles and eagle nests from state occurrence data and state habitat modeling by the MFWP. North Plains will continue to coordinate with the USFWS and MFWP to ensure the Project is in compliance with BGEPA.

9.1.1.5 U.S. Department of Agriculture

As noted in Section 7.3 of this document, the Facility Locations of Alternatives A, B, and D include the Fort Keogh Research Lab, a USDA ARS property. The Project will need a federal right-of-way permit to cross USDA ARS land. North Plains initiated communication with the USDA in July 2022. A Standard Form-299 right-of-way permit application and draft plan of development was submitted to USDA ARS Fort Keogh on July 10, 2023. North Plains will coordinate with Fort Keogh personnel throughout the permitting process, and during construction and operation, to ensure potential impacts would be avoided, minimized, or mitigated, as appropriate.

9.1.1.6 Tribal Governments

As noted in Section 6.2.4.1 and Section 7.9.1.1, North Plains recognizes the importance of engaging with Tribal Nations in the Project development and permitting process. While, as a private developer, North Plains cannot directly fulfill the government-to-government communication directed under various statutes, regulations, executive orders and federal policies, North Plains has performed extensive engagement with Tribal Nations in a way that acknowledges Tribal sovereignty, seeks to minimize potential Project impacts, and encourages broad Tribal participation. As the Project progresses into the permitting process, North Plains will build on its foundational commitment to foster long term, transparent communications with Tribal Nations by maintaining an open and active dialogue.

Separately, the Department of Energy, along with three federal land managing agencies, USDA, USFS, and BLM, will formally consult with Tribal Nations on a government-to-government level pursuant to Section 106 of the National Historic Preservation Act of 1966 (NHPA). The MTSHPO will also be involved in this consultation as described in Section 9.1.3.1. As the Project proponent, North Plains anticipates invited engagement in the formal consultation through which it will continue to carry forward its active engagement with Tribal Nations as well as its commitment to the avoidance, minimization, or mitigation of disturbance to Tribal resources.

North Plains' early coordination with Tribal Nations in the pre-application process has not only allowed the inclusion of important Tribal expertise in the development of the Project route but also created relationships with potentially impacted Tribal Nations that improve Project partnerships and create strong community benefits in Montana. In this regard, North Plains anticipates ongoing coordination with Tribal Governments to support community engagement.

9.1.2 State and Local Policies, Plans, and Programs

9.1.2.1 Montana State Historic Preservation Office

Section 106 (36 CFR 800) of the NHPA found in Title 54 of the U.S. Code Section 306108, as amended, requires federal agencies such as the DOE to identify and assess the effects of the Project on historic properties and to afford the MTSHPO an opportunity to comment if a Project would adversely affect historic properties. Historic properties are defined in the NHPA (36 CFR 60) as district, building, structure, site, or object that is eligible for listing in the NRHP. The DOE is the lead federal agency responsible for compliance with the NHPA.

The regulations for implementing Section 106 (36 CFR 800) require federal agencies to:

- consult with SHPOs, federally recognized Native American tribes, and other consulting parties for undertakings with the potential to affect historic properties;

- identify any historic properties that may be affected by an undertaking; and
- avoid, minimize, or mitigate adverse effects on historic properties.

To assist DOE in meeting its obligations under the NHPA, North Plains conducted a Record Search and is in the process of completing Class III archaeological and architectural surveys to identify cultural resources that may be affected by the Project, including archaeological sites, architectural properties, and cemetery/burial areas. North Plains is conducting the surveys in accordance with the U.S. Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716), and with the state-mandated guidelines for archaeological investigations in Montana (MTSHPO, 2023).

Montana Fish, Wildlife and Parks

There are no regulations under the purview of the MFWP related to special status species. However, the MFWP provides necessary species and habitat location data, as well as an environmental review of projects and survey and conservation measures recommendations. North Plains initiated communication with the MFWP in October 2021. Coordination since that time has included meetings along with North Plains and the USFWS and data requests to the agency, as noted above in regard to federally protected species.

Montana Sage Grouse Oversight and Mitigation Stakeholder Teams

Although not federally protected, the GRSG is protected through the Sage Grouse Conservation Strategy under the Montana State EO 12-2014, as amended by EO 12-2015. EO 12-2015 requires projects undergoing state permitting to conduct a consistency review and follow requirements under the EO. The GRSG is also regulated under the Montana Greater Sage Grouse Stewardship Act and the BLM Miles City Field Office ARMP (BLM, 2015a). The Montana Sage Grouse Oversight Team (MSGOT) oversees the implementation of the Greater Sage Grouse Stewardship Act and EOs 12-2014 and 12-2015.

EO 12-2015 also requires compensatory mitigation for loss of GRSG general habitat caused by development. To calculate this value, the MMST (comprised of the State of Montana and a multi-agency, multi-disciplinary, and citizen-based stakeholder group) developed a HQT (MMST, 2018). North Plains is committed to providing the required compensatory mitigation, which is estimated at over seven million dollars for each alternative route according to the most recent HQT results from December 2023.

North Plains held initial meetings with the DNRC Sage Grouse Program between October 2021 and April 2022 to request information on potential Project impacts, survey needs and methods, and conservation measures, such as TOYR, for the GRSG. Following an assessment of potential impacts to the species and its habitats, North Plains obtained initial mitigation estimates with assistance from the DNRC. North Plains will continue to coordinate with the MSGOT and DNRC to ensure potential impacts are identified and addressed in compliance with Montana executive orders and Montana Greater Sage Grouse Stewardship Act.

Montana Department of Environmental Quality

Section 402 of the CWA (40 CFR 122) requires any project involving greater than one acre of ground disturbance to obtain a storm water permit under the EPA's National Pollutant Discharge Elimination System Program. In Montana, construction activities are permitted by the DEQ under the Montana Storm Water Discharges Associated with Construction Activity (Storm Water General Permit) (75-5-101, MCA and ARM 17.30.1101, 17.30.1301 et seq., 17.30.601 et seq.), including the development of a SWPPP that includes measures to minimize erosion and stormwater runoff from construction areas into wetlands and waterbodies.

North Plains initiated communication with the DEQ in October 2021 to request input on the Project related to impacts to water resources and recommendations for conservation measures. North Plains will develop a SWPPP and submit notification to the DEQ prior to construction in compliance with Storm Water General Permit requirements.

Montana Department of Natural Resources and Conservation

North Plains initiated communication with the Montana DNRC in October 2021 to request input on the Project and potential impacts to natural resources managed by the Montana DNRC, including floodplains. North Plains will continue to reach out to the Montana DNRC as needed to ensure impacts to natural resources are avoided and/or minimized, and to help ensure Project construction and operation are carried out in compliance with state natural resource regulations.

Montana Natural Heritage Program

North Plains received species and habitat occurrence and distribution data from the MNHP in March 2022 and July 2023. North Plains will continue to request updated species occurrence data as Project development progresses.

Montana Local Conservation Districts and County Floodplain Administrators

Montana requires a permit from the local conservation district to authorize any activity that physically that would alter or modify the bed or banks of a perennially flowing stream. Montana also requires a permit from the county floodplain administrator for any development within a designated Special Flood Hazard Area. North Plains will initiate local and county permit coordination in the near future.

9.1.3 Public Attitudes and Concerns (Circular MFSA-2 Section 3.7(6))

North Plains initiated development of the Project with a “Stakeholder First” approach that included proactive engagement with affected landowners and communities to ensure that the Project has an overall positive impact and is considered a productive asset in southeast Montana.

As part of this approach, North Plains has been continuously engaged with stakeholders along the preferred route since 2022. This engagement has included multiple meetings with individual stakeholders, annual landowner informational meetings, annual Project updates at County Commissioner meetings, and public open-house meetings to discuss Project status in April and May of 2024.

Throughout this engagement, North Plains has taken general public comment and explicit input on common issues around siting the Project along property lines that limited disruption to agricultural activities, outside of cultivated fields, outside of individually-specified viewsheds, and with minimal disruption of irrigation systems. Common concerns also included an assurance that the Project would maintain fences and gates (or install new gates for access to the right-of-way) during construction and permanent operation and maintenance of the line, plan the timing of construction to minimize loss of agricultural production or appropriate compensation for unavoidable losses, design the Project to minimize impacts associated with electric and magnetic fields (potential radio interference with GPS-guided agricultural equipment) and visual impacts, and agreement to utilize monopoles structures whenever possible to minimize operational and visual impacts and agreeing to compensate for the placement of multi-pole or lattice structures wherever their use is necessary.

From the outset of the preliminary Project siting exercises, North Plains entertained numerous routing requests from individual landowners and routed the line and access roads on mutually agreeable locations. From the specific centerline included in the Proposed route to individual commitments included in landowner agreements, North Plains has been focused on addressing impacted landowner concerns to the greatest extent practicable. This approach has allowed the Project to acquire easements on a mutually agreeable basis and North Plains anticipates broad public support for the Project from local officials to impacted landowners.

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