B.2.3. Chapter 4

Table 4.1-1
Cumulative Impact Analysis Areas by Resource

Resource	Cumulative Impact Analysis Area
Air Quality	All counties crossed by the Project
Groundwater Hydrology	HUC 8 watershed crossing the five principal aquifers [a] within the regional aquifer system crossed by the Project
Surface Water Hydrology	HUC 8 watersheds crossed by the Project
Minerals and Geology	Project area
Soils	Project area
Vegetation	Project area
Fisheries	HUC 8 watersheds crossed by the Project
Wildlife	• 10-mile buffer of the Project area for sage grouse and terrestrial species [b] • 20-mile buffer of the Project area for migratory birds and eagles [c]
Public Health and Safety	• EMF: 100-foot buffer on either side of the proposed centerline and limits of disturbance surrounding all other proposed structures • Public access and traffic safety: Area within 0.5 mile of Project area
Land Use and Recreation	Area within 0.5 mile of Project area
Visual and Aesthetics	Area within 15–20 miles of Project infrastructure
Noise	Area within 0.5 mile of Project area
Socioeconomics [d]	All counties crossed by the Project and the following counties: • Montana: Big Horn, Treasure, Powder River, Prairie, McCone, Dawson, Carter • North Dakota: Adams, Bowman, Stark, Dunn, Burleigh • South Dakota: Harding County and Perkins County • Wyoming: Sheridan County
Cultural/Tribal/Historic Resources	Physical and non-physical APE

APE = Area of Potential Effects; EMF = electromagnetic field; HUC = hydrologic unit code

Notes:

[a] Unconsolidated Quaternary age deposit aquifers, and the Lower Tertiary, Upper Cretaceous, Lower Cretaceous, and Paleozoic aquifers

[b] This distance is consistent with individual greater sage-grouse home ranges in eastern Montana (MSGWG 2005). This distance was selected because sage grouse and other birds within the study area generally have home range daily flight distances of less than 10 miles.

[c] This distance is based on the average daily flight range of bald and golden eagles, which can vary from approximately 18 to 200 miles, and the Project's capacity to affect these species in cumulation with other projects, which would decrease with distance (Wheat et al. 2017).

[d] Socioeconomic analysis area includes counties crossed by the Project, as well as counties that have communities and transient housing (e.g., hotels, lodges, campgrounds) within an estimated 90-minute drive of the Project area.

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Table 4.1-2
Past, Present, and Reasonably Foreseeable Activities for the Cumulative Impact Assessment

Activity	Location(s) State: County	Distance to Project Area	Description	Timeframe	Overlapping Resources	Source
Oil and gas development	• Montana: Fallon • North Dakota: Golden Valley, Slope, Hettinger, and Morton	• Between MPs 148 and 153, Project is located within 200 feet of seven wells in the Cedar Creek production field in the oil-rich Williston Basin • HVDC Transmission Line crosses the Cedar Creek Anticline, a major hydrocarbon-producing geological feature • Additional crossings occur in Slope County, North Dakota, within areas actively operated by Chesapeake Energy	Activities associated with oil and gas areas include seismic surveys, clearing and grading the site for access roads and well pads, construction of associated infrastructure such as water supply and storage tanks, mobilizing drilling rigs and equipment, drilling and installing wells	Cedar Creek gas field in operation since 1929; oil production in operation since 1951; production ongoing	• Air Quality • Groundwater Hydrology • Surface Water Hydrology • Minerals and Geology • Soils • Vegetation • Fisheries • Wildlife • Public Health and Safety • Visual and Aesthetics • Cultural/Tribal/Historic Resources • Noise • Socioeconomics	MBOGC 2024; NDGS Undated
Rosebud Coal Mine	Montana: Treasure and Rosebud	Multiple coal mining operations in different stages in Areas A, B, C, D, and F north and west of the Colstrip Substation and Colstrip Powerplant	• Expansion of Area B, a 9,108-acre expansion approved 2022; permit vacated by Montana Supreme Court in 2023 • Partial Bond Release for Area C filed in 2025 • Partial Bond Release for Area D filed in 2023 • Expansion of Area F, a 6,773-acre area for coal mining in development	• In operation since 1968 • Expansion of Area F began in 2019 with estimated completion of the Proposed Alternative in 2039	• Air Quality • Visual and Aesthetics • Socioeconomics • Wildlife	OSMRE 2024; MTDEQ Undated_a; Davin 2022; Eggert 2023
BNI Center Mine	North Dakota: Oliver	At its closest proximity, the active mine site is between 1–2 miles from the transmission line	Coal mining operation	BNI has owned and operated the Center Mine since 1970; current life of mine is anticipated to extend through 2037	• Air Quality • Groundwater Hydrology • Surface Water Hydrology • Public Health and Safety • Cultural/Tribal/Historic Resources • Visual and Aesthetics • Socioeconomics • Wildlife	OSMRE 2023
Diamond Willow Wind Project	Montana: Fallon (Baker)	About 9 miles south of the HVDC Transmission Line at MP 151	30 MW wind farm with 12 wind turbines	In operation since 2007	• Air Quality • Visual and Aesthetics • Socioeconomics • Wildlife	GridInfo 2025

Activity	Location(s) State: County	Distance to Project Area	Description	Timeframe	Overlapping Resources	Source
Colstrip coal ash pond cleanup	Montana: Rosebud (Colstrip)	About 1 mile southwest of the EHV AC Rosebud Transmission Line at MP 3	• Remediation activities associated with groundwater contamination from leaking coal ash ponds at the Colstrip Steam Electric Stations • Activities include expanding the existing groundwater capture system, dewatering the ash ponds, and installing clean water injection wells to help flush contaminants and restore groundwater quality	Began in 2012 and ongoing as of 2025	• Air Quality • Groundwater Hydrology • Cultural/Tribal/Historic Resources • Socioeconomics • Wildlife	MTDEQ Undated_b
NextEra Clearwater Wind Energy Center	Montana: Rosebud, Custer, and Garfield	About 34 miles north of the HVDC Transmission Line at MP 43	750 MW wind farm	In operation since 2023	• Air Quality • Socioeconomics	NextEra 2025a
Pipeline Replacement Project	North Dakota: Hettinger	About 35 miles south of the HVDC Transmission Line at MP 259	Montana-Dakota Utilities Co. replacing existing natural gas mains and services in 2024	In operation since May 2024 and anticipated to be completed December 2024	• Air Quality • Public Health and Safety • Socioeconomics	Montana-Dakota Utilities Co. 2024
NextEra Oliver Wind IV Project	North Dakota: Oliver, Mercer, and Morton	About 9.5 miles northwest of the EHV AC Oliver Transmission Line at MP 50	202 MW wind farm with 71 wind turbines	In operation since fall of 2024	• Air Quality • Visual and Aesthetics • Socioeconomics • Wildlife	NextEra 2025c
I-94 Interchange (Exit 161) Reconstruction Project and NDDOT Statewide Transportation Improvement Program Projects	North Dakota: Burleigh (Dickinson and Bismarck NDDOT districts)	About 14 miles east of the EHV AC Oliver Transmission Line at MP 28	Interchange reconstruction on I-94 and major and minor rehab and preventive maintenance to major roads in all counties	• I-94 Interchange Reconstruction Project: Spring 2024 to summer 2026 • Maintenance projects: 2024 to 2027	• Air Quality • Socioeconomics • Wildlife	NDDOT 2023, 2025
Intermountain Infrastructure Group Buried Fiber Optic Telecom Project	• Montana: Multiple counties • North Dakota: Multiple counties	<u>Within Montana</u> • Installation from the southeast corner of the state to the Montana/Idaho border, loosely following the I-90 corridor and MT 200 route in northwest Montana • Crosses Wibaux, Custer, Prairie, Rosebud, Treasure, and Yellowstone counties • About 3 miles of the HVDC Transmission Line at MP 42 (closest proximity) <u>Within North Dakota</u> • Crosses Grant, Morton, Stark, Slope, Golden Valley, and Billings counties • Hettinger County also likely crossed by this project • Likely crosses at MP 30 of the EHV AC Oliver Transmission Line	Installation of new fiber optic lines	• Montana section under construction; anticipated completion in 2025 • North Dakota section in permitting process; construction not started	• Air Quality • Groundwater Hydrology • Surface Water Hydrology • Minerals and Geology • Soils • Cultural/Tribal/Historic Resources • Socioeconomics • Wildlife	Grant County 2025

Activity	Location(s) State: County	Distance to Project Area	Description	Timeframe	Overlapping Resources	Source
Silverthorn Wind Farm	Montana: Rosebud and Treasure	About 30 miles northwest of the EHV AC Rosebud Transmission Line at MP 5	Planned 600 MW facility south of I-94	Scheduled to begin construction in 2025	• Air Quality • Socioeconomics	Silverthorn Renewables 2023
Oliver County Substation	North Dakota: Oliver	Overlaps Project area (Project ties into the substation)	A 345-kV/230-kV facility being proposed and developed by Minnesota Power as a part of the Minnesota Power HVDC Modernization Project	Scheduled to begin construction in fall 2025	• Air Quality • Groundwater Hydrology • Surface Water Hydrology • Minerals and Geology • Soils • Fisheries • Wildlife • Public Health and Safety • Cultural/Tribal/Historic Resources • Land Use and Recreation • Visual and Aesthetics • Noise • Socioeconomics	Grid United 2024b; NDPSC 2024
Cabin Creek Lateral Pipeline Project and Cabin Creek EOR (Cabin Creek Project)	Fallon County, Montana	• Pipeline crosses at MP 148 • EOR project area is 10.5 miles north of HVDC Transmission Line at MP 144	• Approximately 25.8-mile-long liquid (dense phase) CO_2 pipeline and associated facilities and infrastructure areas encompasses 290.95 acres in Fallon County, Montana • Cabin Creek EOR Unit Development project area encompasses approximately 10,169 acres in Fallon County, Montana	• Construction concurrent with Project construction • North Plains Connector Project may occur between 2025 and 2029	• Air Quality • Noise • Groundwater Hydrology • Visual and Aesthetics • Socioeconomics • Wildlife • Socioeconomics • Cultural/Tribal/Historic Resources	BLM 2025
AES Sundog Solar Development	North Dakota: Bowman	About 20 miles south of the HVDC Transmission Line at MP 217	Approximately 1,600-acre, 250 MW solar development to be constructed on private land	• Scheduled to begin construction in 2026 • Scheduled to begin operation in 2027	• Socioeconomics • Visual and Aesthetics • Wildlife	AES 2025
NextEra New Salem Wind I&2 Project	North Dakota: Oliver, Mercer, and Morton	About 13 miles north of the HVDC Transmission Line at MP 323	200 MW wind farm with 110 wind turbines	Scheduled to begin operation in 2027	• Air Quality • Groundwater Hydrology • Surface Water Hydrology • Visual and Aesthetics • Socioeconomics • Wildlife	NextEra 2025d
NextEra Glendive Wind Project	Montana: Dawson (near the town of Glendive)	About 50 miles north of the HVDC Transmission Line at MP 133	800 MW wind farm	Scheduled to begin operation in 2028	• Socioeconomics	NextEra 2025b

Activity	Location(s) State: County	Distance to Project Area	Description	Timeframe	Overlapping Resources	Source
Colstrip Switchyard Upgrades	Montana: Rosebud (Colstrip)	Overlaps Project area (Project ties into the substation)	Addition of new breakers	Construction concurrent with Project construction (scheduled to begin in 2028), with completion by Project operations (scheduled completion in 2032)	• Air Quality • Groundwater Hydrology • Surface Water Hydrology • Minerals and Geology • Soils • Fisheries • Wildlife • Public Health and Safety • Cultural/Tribal/Historic Resources • Land Use and Recreation • Visual and Aesthetics • Noise • Socioeconomics	Amended NOI
Residential subdivisions	• Montana: Custer • North Dakota: Morton, Burleigh (Bismarck) • Wyoming: Sheridan	Nearest developed subdivision to the Project area is 7 miles away (Project does not cross it)	Eight residential subdivisions	Subdivisions in various stages of approval	• Air Quality • Socioeconomics • Wildlife	Custer County 2025; Morton County Undated_a, Undated_b
Various road construction projects	North Dakota: Burleigh (Bismarck)	About 14 miles east of the EHV AC Oliver Transmission Line at MP 24	Various road construction projects	Ranging from construction to planned for coming years	• Socioeconomics • Wildlife	Burleigh County 2025
Ranching/livestock grazing activities and vegetation monitoring studies	• Montana: Custer, Fort Keogh • North Dakota: All counties crossed	Project area crosses and adjacent to activities	Ongoing ranching/grazing activity and vegetation monitoring studies	Ongoing	• Groundwater Hydrology • Surface Water Hydrology • Minerals and Geology • Soils • Vegetation • Fisheries • Wildlife • Cultural/Tribal/Historic Resources	C. Mehaffie, Pers. Comm., April 14, 2025

AC = alternating current; CO_2 = carbon dioxide; EHV = extra-high voltage; EOR = enhanced oil recovery; HVDC = high-voltage direct current; I-94 = Interstate 94; kV = kilovolt; MP = Milepost; MT 200 = Montana Highway 200; MW = megawatt; NDDOT = North Dakota Department of Transportation; NOI = Notice of Intent

B.2.4. Chapter 5

Table 5-1
Comparison of Project Impacts by Alternative

Resource Area/Impact	No Action Alternative	Proposed Alternative
Air Quality		
Ambient Air Quality Standards	No change from current condition.	Air emissions resulting from the construction activities are expected to be localized and short-term, resulting in negligible direct and secondary impacts on air quality in the area. The Proposed Alternative would have negligible operational emissions and, therefore, is not expected to have impacts on air quality.
Regional Haze/Visibility	No change from current condition.	Haze precursor air emissions resulting from the construction activities are expected to be localized and short-term, resulting in negligible direct and secondary impacts on regional haze and visibility in the area and the closest Class I areas (Northern Cheyenne Reservation and Theodore Roosevelt National Park). No emissions are expected during operations; therefore, there would be no operational impacts on regional haze/visibility.
Chemical Deposition	No change from current condition.	Air emissions resulting from the construction activities are expected to be localized and short-term, resulting in negligible direct and secondary impacts on acidic deposition in the area and the closest Class I areas (Northern Cheyenne Reservation and Theodore Roosevelt National Park). No emissions are expected during operations.
GHG Emissions	No change from current condition.	GHG (CO_2e) emissions resulting from the construction activities and operations of the Project are expected to be negligible direct, secondary, and cumulative; localized; and short-term in nature.
Cultural/Tribal/Historic Resources		
Cultural Resources	No change from current condition.	The Project would avoid physical impacts on historic properties plus buffer areas to the extent practical. Whenever avoidance is not feasible, physical impacts would be direct, localized, permanent, and of varying degrees specific to the sensitivity of the resource and how its ongoing use and/or research value would be impacted. For physically impacted historic properties, mitigation measures would be developed through the Programmatic Agreement. The potential for non-physical impacts on historic properties are anticipated to be primarily visual and are in the process of being evaluated. Minor acoustic impacts are anticipated during construction and operations. Non-physical visual impacts would last for the duration of the Project, and the degree of significance would vary per resource. Should any significant non-physical impacts on historic properties be identified, they would be avoided if possible or reduced below the level of significance through strategies such as visual buffering with vegetation plantings. Should non-physical impacts on historic properties be unavoidable, mitigations would be developed through historic property treatment plans as described in the Programmatic Agreement.
Public Health and Safety		
EMFs	No change from current condition.	EMFs generated during the construction and operations of the Project would be localized, permanent (for the life of the Project), and negligible. No significant EMF impacts are expected from construction or operations of the Proposed Alternative. The EMF levels associated with the Project would result in no impacts on people with implantable medical devices, audible noise levels, or radio and television services. With the implementation of appropriate conductors across various routes, operational impacts due to radio interference would be direct and secondary, permanent, and localized.
Stray Voltage	No change from current condition.	Impacts due to stray or induced voltage would be reduced by proposed implementation of safety measures. Appropriate signage and fencing would result in no change in stray voltage hazards from the current conditions; therefore, no impacts from stray or induced voltage during construction or operations are anticipated.
Public Services	No change from current condition.	Public service impacts during construction would be direct, localized, and short-term. The Proposed Alternative may require temporary suspension of nearby utility services (e.g., water, cable, transmission) during construction. There would also be direct, localized, and short-term traffic disruptions for construction occurring near public roadways.
Corona and Surface Gradient	No change from current condition.	Corona analysis indicated that the permanent impacts of the Proposed Alternative would be localized, and negligible and, therefore, would not have an impact on public health and safety.
Erionite Features	No change from current condition.	The HVDC Transmission Line crosses erionite testing radii, and erionite is known to occur in the geologic formations crossed in Slope and Hettinger counties, North Dakota. Erionite could be encountered during ground disturbance during construction of the Proposed Alternative. If lands contaminated with erionite are encountered during construction, the Proponent would implement established BMPs, which include notifying contractors of the potential for erionite so that the contractor can implement the necessary measures to protect their employees, and using water to reduce dust, particularly when working within erionite testing radii. If erionite is encountered, impacts could be direct, localized, and short-term; however, impacts are anticipated to be mitigated through BMPs. During operations, there would be no ground disturbance and no impacts from erionite features are anticipated.

Resource Area/Impact	No Action Alternative	Proposed Alternative
Agricultural Operations	No change from current condition.	Project construction activities would have 3,958.2 acres (1,548.3 in Montana and 2,409.9 in North Dakota) of direct, localized, and short-term impacts on grasslands, shrublands, and agricultural lands, resulting in some temporary interruptions to farming and ranching activities. During operations, the Proposed Alternative would result in direct, localized, and permanent impacts on 405.1 acres of shrublands, grasslands, and agricultural lands (170.1 in Montana and 235.0 in North Dakota).
Floodplains	No change from current condition.	Floodplain impacts during construction would be direct, localized, and short-term to permanent. The implementation of construction best practices for floodplain areas would prevent impacts on public health and safety.
Extreme Weather Interactions	No change from current condition.	There is the potential for direct, localized, short-term to permanent health and safety hazards caused by extreme weather events during construction; however, these would be minimized through the implementation of safety practices, and no impacts are anticipated. During operations, the Proposed Alternative would be designed to prevent structural failure in the case of extreme weather and would be regularly inspected and maintained; therefore, impacts from extreme weather interactions would be short-term and localized.
Groundwater Hydrology		
Groundwater Quantity	No change from current condition.	Construction activities such as access road creation, surface grading, and excavation for foundation installation may temporarily affect groundwater by altering stormwater flow and precipitation infiltration, resulting in direct and secondary, medium- to long-term localized, impacts on groundwater quality during Project construction. Approximately 2.4 million gallons of water would be needed for concrete batching, and approximately 272,000 gallons of water per mile would be needed for dust control along access roads based on the anticipated construction duration, which would be obtained from municipal sources. If additional water is needed, it would be supplied by existing water rights holders via groundwater wells near the Project. By sourcing water from municipal sources or, if necessary, from existing water rights holders, use of groundwater in the Project area would mitigate impacts on groundwater quantity. Groundwater quantity impacts resulting from the construction activities would be direct, short-term, and localized. There are 58 private wells identified within 150 feet of Project impacts areas that could be damaged during construction. BMPs would be in place to avoid the wells and surface disturbance near wells would be monitored. If any wells are impacted, impacts would be direct, short-term, and localized. Dewatering may be necessary during construction, which would comply with necessary permits and water quality standards. Direct and secondary impacts on groundwater due to construction dewatering would be short-term, localized, and minimal. The Proposed Alternative would not result in operational groundwater quantity or quality impacts and, therefore, is not expected to have an impact on overall groundwater conditions in the region.
Groundwater Quality	No change from current condition.	Unintended leaks or spills of petroleum-based fluids during construction activities could potentially directly affect groundwater quality to varying degrees. With implementation of a Project-specific Spill Prevention and Response Plan and Hazardous Materials and Waste Management Plan (Appendix E), impacts due to a petroleum spill or other hazardous material spill would be avoided or mitigated and are not anticipated.
Surface Water Hydrology		
Watersheds	No change from current condition.	Temporary and permanent surface water impacts due to construction activities and changes in land cover would not be detectable at a watershed scale. Within each HUC 8 watershed crossed by the Project, the total impacts due to tree clearing and other construction activities would be <0.1% of the watershed areas. There are no watershed impacts anticipated during operations.
Floodplains	No change from current condition.	The Proposed Alternative would have direct, localized, medium- to long-term temporary impacts on approximately 13.4 acres of 100-year floodplains (approximately 9.2 acres in Montana and 4.2 acres in North Dakota) during the construction phase from overland travel, access roads, and temporary work areas. There would be approximately 19.2 acres (approximately 18.4 acres in Montana and 0.8 acres in North Dakota) of direct, localized, permanent impacts on 100-year floodplains during operations from tree removal, structure placement, and access roads. The Proposed Alternative would follow local floodplain ordinances and implement required BMPs to minimize impacts on floodplains.
Waterbodies	No change from current condition.	The Proposed Alternative would result in direct, localized, short- to long-term temporary impacts on approximately 0.8 acre of waterbodies (approximately 0.6 acre in Montana and 0.3 acre in North Dakota) during the construction phase from access roads and temporary work areas. There would be secondary, medium-term and permanent impacts on waterbodies from the clearing of trees adjacent to waterbodies within the maintained ROW and for temporary access roads and work areas. The Proposed Alternative would result in direct, localized, permanent impacts on approximately 0.4 acre of waterbodies (approximately 0.4 acre in Montana and less than 0.1 acre in North Dakota) through tree clearing and establishment of access roads, which would persist through Project operations. All waterbody impacts would occur under state and federal permit requirements.

Resource Area/Impact	No Action Alternative	Proposed Alternative
Wetlands	No change from current condition.	The Proposed Alternative would result in direct, localized, medium-term temporary impacts on approximately 10.1 acres of wetlands (approximately 10 acres on PEM wetlands [3.2 in Montana and 6.8 in North Dakota] and 0.1 acre of riverine wetlands [0.01 acre in Montana and 0.1 acre in North Dakota]) during the construction phase from temporary construction activities such as timber matting or culverts for construction work areas or access roads. There would be secondary, medium-term and permanent impacts on wetlands from the clearing of trees adjacent to wetlands for temporary access roads and work areas and within the maintained ROW. The Proposed Alternative would result in direct, localized, and permanent impacts on 3.3 acres of wetlands (2.9 acres of PEM wetlands in Montana and 0.1 acre of PEM wetlands in North Dakota, and the conversion of less than 0.1 acre of PFO and 0.3 acre of PSS wetland in North Dakota to PEM/PSS wetlands through tree removal within the maintained Project ROW), which would persist through Project operations. All wetland impacts would occur under state and federal permit requirements, including meeting compensatory mitigation requirements.
Public Surface Water Sources and Source Water Protection Areas	No change from current condition.	The Proposed Alternative would not result in impacts on public surface water sources and source water protection areas due to the location of Project impact areas relative to the surface water intake locations.
Minerals and Geology		
Geologic, Mineral, and Paleontological Resources	No change from current condition.	Impacts on mineral and paleontological resources resulting from the construction activities are expected to be direct, localized, and short-term, resulting in negligible impacts on access and development of existing mineral resources and the preservation of paleontological resources in the Project area. There would be direct, localized, permanent impacts on shallow bedrock, including a conservative maximum amount of blasting impacts on approximately 708 acres for construction of structures, facilities, and access roads. Operations would have minor impacts on geologic, mineral, and paleontological resources. However, ROW operations would not have an impact on the overall availability of these materials as they are abundant throughout surrounding areas. Any direct impacts on paleontological resources would be mitigated through implementation of the Paleontological Resources Management and Mitigation Plan (Appendix E). While mining activities would likely not be permitted within the maintained ROW and coal mining activities would be limited within 35 feet of the transmission line infrastructure, the Proposed Alternative construction and operational phases are not expected to have long-term impacts on the availability of construction materials or future mining activities in the region.
Geologic Hazards	No change from current condition.	Geologic hazards (faults, seismicity, and soil liquefaction) are not anticipated to affect the Proposed Alternative. Approximately 350.7 acres of Project impact areas cross terrain with a slope percentage of 30% or higher. To mitigate landslide risks, the Proponent would place structures to avoid slopes greater than 30% and areas along streams and drainages. Additionally, the Proponent would conduct geotechnical surveys to assess subsurface suitability to ensure that the subsurface is geotechnically suitable for construction and operations of the Proposed Alternative. The Proponent would design structures to withstand and not exacerbate landslide activity.
Land Use and Recreation		
Land Ownership and Land Cover	No change from current condition.	Lands crossed by the Proposed Alternative transmission lines would be subject to temporary easements for construction work areas and temporary access roads and permanent easements for the transmission line ROW and permanent access roads. Ownership of the land would remain with the current owner. Construction of the proposed converter stations and switchyard would result in both temporary and permanent conversion of land from Grassland/Shrubland or Agricultural land to Developed land. The Proposed Alternative would have permanent, direct, localized impacts on approximately 311.4 acres of land: 0.2 acre for the Rosebud Transmission Line (Montana), 270 acres in Montana and 17 acres in North Dakota for the HVDC Transmission Line, 7 acres for the Oliver Transmission Line (North Dakota), and 18 acres for the Morton County Transmission Line (North Dakota). Construction of the Proposed Alternative would have a medium-term, direct, localized impact on land cover categories. Operations would have a permanent, direct, localized impact on land cover categories. During operations, certain land use activities within the permanent ROW, such as grazing and farming, would generally be allowed to continue while structure placement may be restricted. Periodic disruptions to agricultural activities within the permanent ROW may occur during transmission line inspections, vegetation maintenance, or facility repairs.
Existing Residential and Commercial/ Industrial Development	No change from current condition.	The Project has been routed to avoid impacts on existing structures. Residences near the Project would be subject to direct and secondary, medium-term, localized noise, dust, visual impacts and road traffic during construction. Project operations would not disrupt or constrain residential land uses; however, depending on distance and topography, operations could result in a permanent, direct, and localized visual impact on existing residential developments. Construction and operations would have no impact on existing commercial or industrial development.
Planned Residential and Commercial Development	No change from current condition.	Based on county planning documents, the Proposed Alternative would not conflict with land use plans or policies.
Other Land Uses	No change from current condition.	Mining impacts are addressed in Section 3.7, Minerals and Geology. Air transportation/airports are addressed under Transportation in Section 3.10, Socioeconomics. The Project is not anticipated to affect the Gold Creek Cellular of Montana Limited Partnership/Verizon cell tower due to its distance from Project impact areas.

Resource Area/Impact	No Action Alternative	Proposed Alternative
Recreational and Managed Lands	No change from current condition.	Construction activities would result in short-term, direct, localized impacts on recreational and managed lands; however, the degree of impact would vary depending on the location of the users relative to construction activities. Construction activities may require users to avoid areas due to safety or site restrictions. Once construction activities are completed and temporary work areas are restored, recreational activities would be allowed to resume to the degree permitted prior to construction. The Project would permanently affect approximately 47 acres of Montana DNRC trust recreational lands and 2 acres of North Dakota trust recreational lands. While most recreation activities on trust lands would be able to continue during operations, some areas would be impacted where land uses are modified for Project infrastructure. In Montana, the Project would permanently affect approximately 20 acres of BLM recreational lands resulting in direct, permanent, localized impacts. In North Dakota, the Project would permanently affect approximately 4 acres of NFS recreational lands, resulting in direct, permanent, localized impacts.
U.S. Agriculture Research Lands	No change from current condition.	The Project would have direct, medium-term, localized impacts where it would permanently affect 18 acres of USDA ARS land at Fort Keogh in Custer County, Montana. The Proponent has coordinated with the USDA ARS to site Project components in areas where impacts on research activities would be limited. Impacts from operations would be permanent, direct, and localized to areas where Project components would alter existing land use within Fort Keogh.
Scenic Rivers	No change from current condition.	The HVDC Transmission Line crosses the Little Missouri River in Slope County, North Dakota, at approximately MP 187.5. Primary impacts from construction and operations would be changes to viewshed from the transmission infrastructure. Impacts would be direct, localized, and permanent.
Visual and Aesthetics		
Visual Resources	No change from current condition.	The Project's transmission line segments would permanently affect visual conditions along the Project corridor by introducing tall vertical structures and horizontal linear conductors that would be visible from up to approximately 20 miles away. While the impact on visual conditions would be permanent, visual impacts would diminish as distance away from the Project increases. The increased footprint of the Colstrip Substation would be noticeable from the town of Colstrip and surrounding municipal park areas. The HVDC Transmission Line crosses a total of 9.7 miles of BLM land, including 1.0 mile on BLM VRM Class II lands, 2.3 miles on BLM VRM Class III lands, and 6.8 miles on BLM VRM Class IV land. Project features (temporary and permanent access roads; turnaround areas; guard structure pads; pulling sites; structure footprints; and structure pads) cross a total of 164.9 acres on BLM land (31.7 acres on BLM Class II land, 27.2 acres on BLM VRM Class III land, and 106.0 acres on BLM VRM Class IV land). Additionally, the Project would introduce bare earth and/or gravel access roads to structures during construction and operations. The overall visual impact from the Project's transmission line segments would be characterized as a direct, permanent impact that would affect regional conditions. The overall visual impact from construction and operational phases of the Proposed Alternative would also be characterized as direct, permanent impacts that would affect regional conditions.
Socioeconomics		
Population Increase	No change from current condition.	The Proponent estimates a construction period of 3 to 4 years with a peak temporary workforce of 800 workers. Workers residing temporarily in the socioeconomic analysis area could produce a medium-term increase in population within socioeconomic analysis area towns and cities during construction. Workers assigned to the Rosebud County Converter Station, Morton County Converter Station, and Morton County Switchyard are anticipated to work at these sites for the full construction period, resulting in a medium-term population increase within commuting distance of these facilities. Given the current populations of Rosebud, Custer, and Morton counties, impacts on population levels are anticipated to be minimal. The remaining workers would be distributed along the proposed transmission lines, resulting in an insignificant population change among the multiple towns and cities along the routes. Thus, construction would have a direct, medium-term, regional impact on the socioeconomic analysis area population; and operations would have a direct, long-term, regional impact on the socioeconomic analysis area population. Population change would have both beneficial and adverse impacts, resulting in beneficial economic activity and labor force resources within the Project area, as well as impacts due to demand for public services and potential competition for strained housing resources.
Economy, Employment, and Income	No change from current condition.	Direct economic benefits within the socioeconomic analysis area would include wages paid to workers and purchase of Proposed Alternative supplies and services from socioeconomic analysis area businesses to support construction. The Proponent's Economic Impact Analysis estimates the Proposed Alternative would generate an average of 2,055 jobs annually in Montana and North Dakota during a 3-year construction period (Bureau of Business and Economics Research, University of Montana 2025). Construction may occur for an additional year with the total economic impacts distributed over the longer time period, as noted in the Proponent's Economic Impact Analysis. Operations would result in two to four full-time equivalent jobs within the socioeconomic analysis area, as well as periodic contracts or hiring of line crews for transmission line maintenance. Construction would result in beneficial, direct and secondary, regional, medium-term impacts on economics, employment, and income in the socioeconomic analysis area, while operations would result in negligible beneficial impacts.

Resource Area/Impact	No Action Alternative	Proposed Alternative
Housing	No change from current condition.	Housing impacts would result from increased demand for rental or for-sale housing due to the influx of workers. Given the shortage of housing reported by state and local agencies, housing needs during construction could strain an already limited supply of affordable rental housing. The supply of hotel and motel rooms within the socioeconomic analysis area (supplemented by RV campgrounds) is sufficient to support the Proposed Alternative workforce that chooses this option. Operations would require only two to four full-time equivalent jobs plus periodic line maintenance workers and, therefore, would not affect regional demand for permanent or transient housing. The impact on hotels, motels, and campgrounds is likely to be beneficial in providing demand for the existing businesses. Construction would have a direct, regional, medium-term impact on housing supply and a potential beneficial, direct, regional, medium-term impact on businesses providing transient lodging in the socioeconomic analysis area. Proposed Alternative operations would have neither adverse nor beneficial negligible, direct, long-term impact on housing.
Public Services and Facilities	No change from current condition.	Impacts on schools would be small, as construction workers would most likely be residents of the socioeconomic analysis area or only relocate for short periods of time; thus, most construction workers would be unlikely to temporarily relocate with their families. Due to potential demands on emergency responders, medical services, and law enforcement resources, construction would have a medium-term, secondary, regional impact on public services and facilities. Operations would generate an imperceptible incremental demand for public services and facilities.
Taxes and Revenues	No change from current condition.	Taxes and revenues resulting from construction would include income taxes, goods and services taxes on certain items, and fees. Benefits would accrue to socioeconomic analysis area counties through revenue sharing by Montana or North Dakota or through the state facilities and services funded within the socioeconomic analysis area. Construction would have a beneficial, direct and secondary, regional, medium-term impact on taxes and revenues, while operations would have a beneficial, secondary, regional, long-term impact.
Transportation	No change from current condition.	Construction-generated traffic (e.g., commuting workers) would not result in significantly increased congestion on the highways serving the region. Area highways and roads have capacity to carry increased traffic volumes without congestion. Project construction traffic would be dispersed among the regional highways and even more dispersed on local roads to reach the worksites or contractor yards. The Proponent would provide mitigation for the delays by traffic management measures that include providing road improvements where required by road authorities, mapping authorized transportation routes, providing marking of these routes using signs or flagging, and providing training for field personnel that includes instruction to use only the approved roads and observe speed limits. Project construction would have medium-term, regional, and direct impacts on air traffic due to the use of helicopter transport. Project operations would have no impact on air traffic.
Public Health, Welfare, and Safety	No change from current condition.	Based on the relatively small influx of workers necessary for construction, construction would have a secondary, regional, medium-term impact on public health, welfare, and safety due to the introduction of transient workers from outside the area to small towns and rural areas. Operations would have a beneficial, secondary, regional, permanent impact on public health, welfare, and safety due to the generation of tax revenues that would accrue to county governments, fire districts, schools, and other public service authorities.
Property Value	No change from current condition.	The Project was routed to avoid proximity to residences with transmission line centerlines at least 600 feet from all residences. Construction and operations are generally not anticipated to affect property values for land use types crossed by the transmission lines. Proposed Alternative transmission lines could potentially have limited secondary, regional, long-term impact on property values for residential properties. The impact on residential properties would vary depending on proximity, topography, and intervening uses and vegetation; and the impact may dissipate with the length of time that the lines are in place.
Soils		
Prime Farmland and Farmland of Statewide Importance	No change from current condition.	Activities required to build the Proposed Alternative in Montana and North Dakota, including vegetation clearing, grading, structure and facility foundation excavations and installation, and movement of construction equipment and materials within the Project impact areas have the potential to affect soils designated as prime farmland or farmland of statewide importance. Approximately 62.5 acres of prime farmland in Montana and 66.4 acres in North Dakota, as well as 364.6 acres of farmland of statewide importance in Montana and 1,120.3 acres in North Dakota would be temporarily affected. Approximately 7.5 acres of prime farmland in Montana and 10.5 acres in North Dakota, as well as 56.6 acres in Montana of farmland of statewide importance and 34.6 in North Dakota would be permanently affected. Impacts from temporary construction activities on farmland soils would be direct, short- to medium-term, and localized. Where impacts are proposed for permanent structures, access roads, improvements, facilities, and vegetation clearing within the permanently maintained ROW, impacts would be direct, permanent, and localized.
Hydric Soils and Compaction-Prone Soils	No change from current condition.	Impacts on wet soils during periods of water saturation in Montana and North Dakota are expected to occur. Hydric or wet soils are at greater risk of rutting and compaction from movement of heavy equipment. The Proposed Alternative would temporarily affect approximately 2 acres in Montana and 21.6 acres in North Dakota and permanently affect approximately 2.9 acres in Montana and 0.1 acre in North Dakota of hydric soils. The Proposed Alternative would temporarily affect approximately 2.7 acres in Montana and 11.5 acres in North Dakota and permanently affect approximately 3.1 acres in Montana and less than 0.1 acre in North Dakota of compaction-prone soils. Soil impacts due to construction would be direct, short-term, and localized, and impacts due to operations would be direct, permanent, and localized.

Resource Area/Impact	No Action Alternative	Proposed Alternative
Highly Water Erodible and Wind Erodible Soils	No change from current condition.	Soil loss impacts caused by water and wind erosion in Montana and North Dakota are expected to occur. There would be direct, short-term, localized impacts in temporary work areas with highly erodible soils (approximately 714.2 acres in Montana and 448.4 acres in North Dakota) and wind (approximately 2.1 acres in Montana and 156.5 acres in North Dakota). There would also be direct, permanent, and localized impacts to highly erodible soils (approximately 109.1 acres in Montana and 10.1 acres in North Dakota) and wind (less than 0.1 acre in Montana and approximately 1.6 acres in North Dakota).
Soils with Low Revegetation Potential	No change from current condition.	Following ground-disturbing activities in Montana and North Dakota, successful restoration and revegetation efforts are essential in maintaining soil productivity by avoiding and minimizing impacts on soils, particularly erosion. The Proposed Alternative would temporarily affect approximately 1,273.1 acres in Montana and 960.2 acres in North Dakota and permanently affect approximately 175.8 acres in Montana and 18.4 acres in North Dakota of soils identified as having a low revegetation potential. Ground disturbance activities would generally be limited to vehicle travel, equipment and material staging, and vegetation clearing and grading that may be necessary for structure pads, wire pulling and tensioning areas, temporary access roads, overland travel paths, and facility sites. Soil impacts from temporary construction activities would be direct, short- to medium-term, and localized. The Proponent has identified specific areas within the ROW where vegetation clearing would be required. Where impacts are proposed for permanent structures, access roads, improvements, facilities, and vegetation clearing within the permanently maintained ROW, impacts would be direct, permanent, and localized.
Rocky and Shallow Bedrock Soils	No change from current condition.	During grading and excavation activities in Montana and North Dakota, construction crews could encounter shallow bedrock soils and rocks on the surface or within the surface soil horizon. The Proposed Alternative would temporarily affect approximately 157.4 acres in Montana and 18.2 acres in North Dakota and permanently affect approximately 9.7 acres in Montana and less than 0.1 acre in North Dakota of rocky soil. Approximately 1,082.8 acres of shallow to bedrock soil and 1,482.9 acres in North Dakota would be temporarily affected and approximately 147.5 acres of shallow bedrock soil in Montana and 27.4 acres in North Dakota would be permanently affected. These impacts are expected to be direct, short-term to permanent, and localized. However, most areas with temporary impacts on soils with shallow bedrock would not require blasting. While the soil itself may have shallow bedrock, the primary construction activity within the approximately 2,565.7 acres of soils with shallow bedrock would be overland travel.
Topsoil	No change from current condition.	Construction of the Proposed Alternative would disturb topsoil and subsoil where grading or excavation are required and where heavy equipment travels along access roads. These activities have the potential to cause mixing of topsoil and subsoil, which would result in a loss of soil productivity. With implementation of mitigation measures and BMPs, impacts on topsoil would be direct and secondary, short- to medium-term, and localized.
Slope Gradient	No change from current condition.	Steep slopes can affect constructability, water erosion potential, revegetation efforts, soil compaction, and rutting potential, in addition to other soil properties. The Proposed Alternative would temporarily affect approximately 3,449.0 acres (74.8%) of soils with a 0 to 15% slope, 453.8 acres (9.9%) of soils with a 15 to 30% slope, and 319.4 acres (6.9%) of soils with 30% or greater slope. The Proposed Alternative would permanently affect approximately 260.6 acres (5.7%) of soils with a 0 to 15% slope, 62.9 acres (1.4%) of soils with a 15 to 30% slope, and 31.2 acres (0.7%) of soils with 30% or greater slope. With implementation of mitigation measures and BMPs, impacts on soils with steep slope gradients from temporary construction activities would be direct, short- to medium-term, and localized. Where impacts are proposed for permanent structures, access roads, improvements, facilities, and vegetation clearing within the permanently maintained ROW, impacts would be direct, permanent, and localized.
Noise		
Sound Levels at Residential/Recreational Receptors	No change from current condition.	Construction activities could result in direct, short-term, localized increases in noise at residential locations that are in closer proximity to the ROW, although no residences were identified within 600 feet of the ROW. Helicopter use for line stringing would also result in direct, short-term, localized increases in noise. Blasting, if used, may also result in very short duration increases in noise at any one residence. Construction noise would only occur for brief periods in the vicinity of any residence, and no long-term impacts would occur. Operational noise along the transmission lines could consist of corona noise (i.e., crackling, hissing sound) or aeolian noise (whistling sound). While these noises are expected to be mostly limited to the edge of the ROW, they would be permanent impacts. Operational noise from the Morton County Converter Station would result in minor increases to noise at nearby noise sensitive locations. No increases in noise would occur at noise sensitive locations for the Rosebud County Converter Station. Projected noise levels due to operations of both converter stations would remain below the USEPA recommended noise level for noise sensitive areas. In addition, the cumulative noise level (converter station plus existing ambient) would also remain below the USEPA recommended level. Overall, noise increases from operations would result in direct, short-term to permanent, and localized impacts.

Resource Area/Impact	No Action Alternative	Proposed Alternative
Vegetation		
Vegetation Loss	No change from current condition.	During construction, the Proponent would remove trees, shrubs, and brush as necessary within the Project impact areas. Vegetation would be cut at or above the ground surface to leave the rootstock intact, which would help maintain soil stability and erosion control. Additionally, trees and tall shrubs would be permanently removed from the ROW for the entire duration of construction and operations of the Proposed Alternative. The Proposed Alternative would temporarily disturb approximately 10,556.1 acres (4,139.5 acres in Montana and 6,416.4 acres in North Dakota) and permanently affect 750.3 acres (662.9 acres in Montana and 87.4 acres in North Dakota) within the Project area due to aboveground infrastructure. These disturbances during construction would cause direct, localized, and permanent impacts on existing vegetation in the Project area. One RFSS plant was documented during surveys and has the potential to be impacted as a result. Other secondary impacts on vegetation could include changes in hydrology, changes in successional stage, and a decline in species structure. No vegetation loss is anticipated during operations aside from the initial clearing of the ROW and subsequent maintenance.
Noxious Weeds and Invasive Species	No change from current condition.	Grading and removal of grassland habitat could introduce invasive species that would decrease forage and habitat quality. Prior to construction, noxious weeds would be marked to limit the infestation to the construction area. Noxious weeds would be treated with herbicide or mowed as needed. BMPs would be installed to prevent the herbicide used from affecting other plants, wildlife species, or waterbody. The duration of impacts on vegetation communities would be influenced by the type of vegetation, the presence of noxious weeds, and growing conditions. Potential introduction of invasive species during construction and lasting into operations would be direct, localized, short-term impact on vegetation.
Dust Deposition	No change from current condition.	Construction of the Proposed Alternative would temporarily increase fugitive dust emissions, particularly in areas with erosion-prone soils where vegetation clearing and heavy equipment operations occur. Factors such as precipitation, wind, and soil disturbance from activities like vehicle movement, excavation, grading, and blasting would contribute to dust generation. As a result, construction activities would have secondary, localized, medium-term impacts on plants due to dust deposition. To mitigate these impacts, the Proponent would use water for dust control on unpaved roads, minimize sediment tracking, and promptly remove soil from paved roadways. In erosion-prone areas, the Proponent would minimize surface disturbances, use soil stabilization practices, and cover material stockpiles to minimize the potential of dust, implementing reclamation efforts to reduce erosion after construction activities. No dust deposition impacts are anticipated during operations.
Fisheries and Wildlife		
Threatened and Endangered Species	No change from current condition.	Fifteen terrestrial federally listed, proposed, or under review species were observed to potentially occur within 1 mile of Project impact areas. Of the 15 species, 5 were identified in or adjacent to Project impact areas during the field surveys. Impacts on threatened and endangered species due to construction and operations are varied and described in rows below.
Special Status Species	No change from current condition.	Montana classifies special status species as SOC, and North Dakota classifies special status species as SCP: Level I, II, or III. A total of 65 terrestrial wildlife species classified as Montana SOC have potential to occur in Project impact areas, of which 31 were identified during surveys. Similarly, four North Dakota SCP: Level I species and one SCP: Level II species were observed in Project impact areas. Populations of greater sage-grouse are overall declining due to habitat loss and degradation. The species is not listed by the ESA; however, states with known greater sage-grouse populations have formed management plans. There were 24 terrestrial BLM SSS species identified to have documented occurrences within Project impact areas. Additionally, there were eight documented RFSS species within Project impact areas. Impacts on special status species due to construction and operations are varied and described in rows below.
Habitat Loss and Degradation	No change from current condition.	Construction of the Proposed Alternative would lead to habitat loss/conversion and degradation through grading and vegetation removal. The Proposed Alternative would permanently affect approximately 780.6 acres and temporarily affect 10,963.8 acres. Approximately 428.5 acres of forest and woodland would be permanently removed due to clearing or conversion to herbaceous grassland in the ROW. The loss of trees could affect bat species that rely on trees for hibernacula. Additionally, 114.2 acres of shrubland would be permanently impacted and 1,377.4 acres would be temporarily impacted. The Project would remove 216 acres of potentially undisturbed (unbroken) grasslands in Montana and 24 acres in North Dakota leading to impacts on species that rely on this habitat. Habitat loss and degradation due to grading and vegetation removal could result in permanent or long-term impacts that would be direct and secondary, localized, and medium-term to permanent. Greater sage-grouse avoid transmission line corridors; transmission lines have an impact on habitat selection and survival due to avian predators using transmission lines near leks to perch (Lebeau et al. 2019). Impacts on nesting success have been demonstrated up to 1.6 miles from transmission lines (Kohl et al. 2019). Greater sage-grouse avoidance of maintained ROW would be a direct, permanent, and localized impact.

Resource Area/Impact	No Action Alternative	Proposed Alternative
Direct Mortalities	No change from current condition.	Grading and construction activities could lead to the mortality of ground dwelling species such as the black-tailed prairie dog and other small mammals, ground-nesting bird species, reptiles, and amphibians. Additionally, 800 workers would be mobilized across the Project during construction. The additional traffic due to commuting or direct activities could lead to vehicle strikes, resulting in severe injury or mortality of big game species. The Proposed Alternative operational phase could lead to bird species mortality, as they could collide in flight with the lines. Bird species with larger wingspans and slower maneuverability (e.g., cranes, herons, swans, pelicans, and geese) are more susceptible to power line collisions, as are smaller, heavy-bodied birds that are fast flyers (e.g., ducks). Eagles and other raptors are adept flyers, and collision incidents with overhead lines occur with much less frequency than collision incidents involving other bird species. Factors such as increased human activity may flush birds and result in collisions; inclement weather and low-light conditions during bird migration may also increase collision risk. Bat collisions are uncommon and are not listed as a current threat for the northern long-eared bat (*Myotis septentrionalis*). Increased mortalities resulting from construction and due to collisions with infrastructure during operations could cause direct, localized, and permanent impacts on fisheries and wildlife.
Fragmentation	No change from current condition.	The removal of vegetation and establishment of a maintained ROW would break up contiguous areas of habitat leading to fragmentation. Fragmentation can reduce habitat quality and affect wildlife behavior as some species avoid forest or habitat edges. The majority of Project impact areas are grassland and agricultural and would reestablish more quickly than woody vegetation; however, the permanent conversion of forest and shrubland habitat within the ROW could affect interior forest dwelling species. Habitat fragmentation resulting from construction and operations may result in direct and cumulative, regional, and permanent impacts.
Sensory Impacts from Light and Noise	No change from current condition.	Noise and light impacts would be anticipated from Project construction and operations. Construction-related noise from equipment would exceed ambient noise levels in some areas, potentially altering wildlife behavior and leading to increased stress and mortality. Helicopter use and blasting would generate the highest noise levels; however, they would only be used for brief periods. Noise impacts would be localized and expected to attenuate to ambient levels past 1,000 feet from construction. During operations, there are potentially corona noise (i.e., crackling, hissing sound) and aeolian noise (whistling sound) impacts along the proposed transmission line. Construction would potentially use artificial lighting temporarily, and the proposed converter and switchyard stations would have permanent lighting. Impacts resulting from construction-related noise from equipment, helicopters, and blasting would be direct, localized, and medium-term. Operational increases in noise and light could cause direct, localized, and permanent impacts on fisheries and wildlife.
Stream Crossings and Sedimentation	No change from current condition.	With the exception of Project access roads, Project impact areas have been designed to avoid placing permanent transmission line structures or temporary construction within waterbodies. Existing access roads would be used to the extent practicable. Where public or private roads are not available to access remote segments, the Proponent would construct new access roads, siting them to avoid impacts on waterbodies where possible. Proposed waterbody crossings could include clear span bridges, span bridges with in-water supports, culverts/flumes, vented rock fords, or low water crossings. The Proponent would comply with the design specifications required by federal and state agencies for waterbody crossings and acquire all necessary permits from federal, state, and local agencies in compliance with minimization and mitigation measures for permanent waterbody impacts. Access roads installed during construction could disturb the streambed and cause minor changes in water quality and instream habitat characteristics at the crossing location. These impacts could affect water quality and aquatic life downstream of the immediate location disturbed and thus are localized and regional. Impacts resulting from the waterbody crossings would begin with the start of construction and could be long-term and persist beyond construction throughout the life of the established crossing. If the crossing is one that is used within the streambed itself, there could be ongoing direct impacts on aquatic organisms, particularly benthic invertebrates, through injury or mortality. Secondary impacts may occur due to altered aquatic habitat and substrates, as long as the road is in use. Overall, the impacts of waterbody crossings on fisheries from construction and ongoing operations of access roads that cross waterbodies would be direct and secondary, localized and regional, and short-term to long-term.
Changes in Water Quantity	No change from current condition.	During construction, water would be withdrawn from municipal sources for dust suppression and batching of concrete during construction. If additional water is needed, it would be supplied by existing water rights holders via groundwater wells near the Proposed Alternative. There would be no water withdrawals during operations. No impacts on fisheries from water withdrawals are anticipated.
Changes in Water Quality	No change from current condition.	Unplanned spills or leaks of hazardous liquids during equipment refueling, operations, maintenance, or storage could cause localized, and medium-term impacts that could be direct, secondary, or cumulative. Access roads installed during construction could disturb the stream bed and cause minor changes in water quality and instream habitat characteristics at the crossing location. These impacts could affect water quality and aquatic life downstream of the immediate location of disturbance and are localized and regional. While no impacts on water quality during operations are anticipated, impacts on water quality from spills on fisheries during construction would be direct, localized and regional, and long-term.

< = less than; ARS = Agricultural Research Service; BLM = Bureau of Land Management; BMP = best management practice; CO_2e = carbon dioxide equivalent; DNRC = Department of Natural Resources and Conservation; EMF = electromagnetic field; ESA = Endangered Species Act; GHG = greenhouse gas; HUC = hydrologic unit code; HVDC = high-voltage direct current; MP = Milepost; NFS = National Forest System; PEM = palustrine emergent; PFO = palustrine forested; PSS = palustrine scrub-shrub; RFSS = Regional Forester's Sensitive Species (USDA Forest Service status listing); ROW = right-of-way; RV = recreational vehicle; SCP = Species of Conservation Priority (North Dakota status listing); SOC = Species of Concern (Montana status listing); SSS = Special Status Species (BLM status listing); USDA = U.S. Department of Agriculture; USEPA = U.S. Environmental Protection Agency; VRM = Visual Resource Management

B.2.5. Chapter 7

Table 7.1-1
U.S. Department of Energy

Name	Role	Education
Berke, Carly	Public Engagement Lead	BA International Relations BS Film & Television
Boyle, Rebecca J.	NEPA Document Manager	JD
Christopherson, Kirsten	Biological Resources Specialist	MS Biological Sciences BS Zoology
Dull, Daniel	Visual Resources and Aesthetics Specialist	AA Computer Science
Gomer, Christina	NEPA Compliance Officer	MS Environmental Management and Policy BS Environmental Science BS Environmental Policy
Larson, Jeffrey D.	Cultural Resources Specialist / Tribal Relations	MSc Classical Art & Archaeology BS History AA Business
Sherman, Ben	Water Resources Specialist	BS Environmental Science, concentration in Water Resources
Smith, Mitch	Geological Resources Specialist	BA Liberal Arts, concentration in Biology, Economics, Environmental Science, Peace Studies, and Justice Studies
Smith, Steve	Deputy NEPA Document Manager	MS Environmental Studies
Treich, Kira	Land Use and Recreational Resources Specialist	BS Electrical Engineering

AA = Associate of Arts; BS = Bachelor of Science; JD = Juris Doctor; MS = Master of Science; MSc = Master of Science; NEPA = National Environmental Policy Act

Table 7.1-2
Montana Department of Environmental Quality

Name	Role	Education
Gronda, Emma	Deputy Project Manager through June 2025	BA Political Science and Environmental Studies
Harbage, Rebecca	EIS Reviewer	MA Community and Regional Planning
Jones, Craig	MEPA/MFSA Coordinator Project Manager	BA Political Science
Langston, Jeremiah	Staff Attorney	JD Attorney
Tasker, Bailey	Deputy Project Manager July 2025– current	MS Ecological Restoration, BS Biology (Research), Minor in Environmental Studies

BA = Bachelor of Arts; BS = Bachelor of Science; EIS = Environmental Impact Statement; JD = Juris Doctor; MA = Master of Arts; MEPA = Montana Environmental Policy Act; MFSA = Major Facility Siting Act; MS = Master of Science

Table 7.2-1
U.S. Department of Agriculture Forest Service

Name	Role	Education
Anderson, Zoanne	NEPA, WO Coordination	BA Organization Management
Best, Steven	Public Affairs, Public and Regional Coordination	MS Conservation Social Sciences
Colburn, LeAnn	NEPA	MS Soil Science BS Animal and Dairy Science
Dahl, Jack	Botany, Invasives	MS Animal and Range Science BS Animal and Range Science Associate Wildlife Management
Grudniewski, Curt	Engineering	BS Civil Engineering
Haakenson, Wade	Archeology and Heritage	MS BS Archeology
Hays, Misty	Medora District Ranger	BS Range Science
Hunting, Mark	USDA Forest Service Team Lead	GED
Ihle, Beth	Grasslands Supervisor	MS Earth Sciences BS Geology
Kempenich, Brian	Paleo, Minerals	BS Animal and Range Science; Business Administration
Kenninger, Kate	Project Coordinator / NEPA Review	MS Environmental Science BS Fisheries and Wildlife Biology
Schonert, Greg	Wildlife Biologist	BS Fisheries and Wildlife Biology
Semenza, Nick	Hydrologist, Soil Scientist	BS Geology
Walsh, Cathy	Lands and Special Uses	BS Accounting

BA = Bachelor of Arts; BS = Bachelor of Science; GED = General Educational Development; MS = Master of Science; NEPA = National Environmental Policy Act; USDA = U.S. Department of Agriculture; WO = National Headquarters

Table 7.2-2
Bureau of Land Management

Name	Role	Education
Blundell, Phillip	BLM Project Manager, NEPA Review	JD
Buckmaster, Josh	Soils	MS Range Management BA Environmental Science
Carlson, Courtney	Cultural Resources	MA Applied Anthropology BA Anthropology
Doran, Dawn	Vegetation Resources, Livestock Grazing	BS Forestry, Minor Wildlife Biology
Fox, Dan	Management Review, Renewable Resources	BS Environmental Science – Renewable Resources

Name	Role	Education
Hickey, Whitney	Vegetation Resources, Livestock Grazing	BS Natural Resources – Rangeland Ecology
Keeran, Samantha	Geologist, Paleontology Permit Administrator	BS Wildlife Conservation and Ecology BS Environmental Geology
Kelly, Michael	Wildlife Biologist	BT Wildlife Management
Klempel, Beth	Management Review, Realty, Nonrenewable Resources	BS Range Science
Lang, Dena	Recreation, NCL, Visuals	BS Education and Health and Physical Education
Liggett, Greg	Paleontologist	MS Geology/Paleontology
Morris, Christopher	Hydrology	BS Geography
Peterson, Mark	Air Resources	MS Environmental Engineering BS Environmental Engineering
Reynolds, David	GIS Specialist	BS Biological Sciences
Rice, Benjamin	GIS Specialist	BS Criminology/Sociology
Shilling, Carissa	Solid Minerals Geology	MS Geology BS Geology, Minor in Geography
Stillings, Amy	Economist	MS Resource and Agricultural Economics BS Resource Economics
Stuart, Christina	Fisheries	BS Marine Biology
Undlin, Kent	Wildlife Biologist	BS Wildlife Management Technical 2 year—Natural Resources
Witkowski, Brenda	Invasive Species	Land Resource Analysis and Management

BA = Bachelor of Arts; BS = Bachelor of Science; BT = Bachelor of Technology; BLM = Bureau of Land Management; GIS = Geographic Information System; JD = Juris Doctor; MS = Master of Science; NEPA = National Environmental Policy Act

Table 7.2-3
U.S. Department of Agriculture, Agricultural Research Service

Name	Role	Education
David, Lindsey	Environmental Protection Specialist	MS Geology (Hydrogeology) BS Geology
Frank, Stephanie	Cultural Resources	PhD Policy, Planning and Development Certificate in Historic Preservation
Mehaffie, Carl	Realty Specialist	MBA BS Recreation Management
Welker, Elliott	Safety and Occupational Health Specialist	MS Microbiology BS Biotechnology

BS = Bachelor of Science; MBA = Master of Business Administration; MS = Master of Science; PhD = Doctor of Philosophy

Table 7.3-1
Third-Party Consultant Team

Name	Role	Education
Adams, Heather	Cultural Resources	MS Cultural Resource Management BS Liberal Arts in Archaeology/Anthropology
Agresti, Tony	Noise	BA Meteorology
Cano, Caitlyn	Public Health and Safety	BS Environmental Engineering
Cox, Mike	Partner in Charge	BS Geological Engineering
Davis, Ally	Noise	BS Biological Sciences
DeJoode, Daniel	Vegetation	PhD Ecology and Evolutionary Biology. MS Botany
Fickes, Morriah	Fisheries	MS Wildlife and Fisheries
Hall, Coby	Surface Water Hydrology	BS Geoscience (Hydrology)
Hegeman, Luke	Visuals/Aesthetics	Master of Landscape Architecture II
Hopson, Rosemary	Wildlife	MS Ecology BS Zoology and Botany
Huff, Jenifer	Land Use and Recreation Socioeconomics	BS Urban and Regional Planning
James, Lindsay	Purpose and Need Alternatives	BA Environmental Studies and Geography
Kolluru, Venkat	Public Health and Safety	PhD Ocean Engineering
Kuss, Landry	Groundwater Hydrology Geology and Mineralogy	BS Earth Sciences
Lee, Jennifer	Alternatives	BA Environmental Studies and Geography
Liger, Annika	Cultural Resources	MA History of Welfare and Medicine in Society BA History BS Anthropology
Lisson, Ryan	Project Manager Wildlife	BS Biological Sciences
Lium, Robin	Visuals/Aesthetics	MS Wildlife Conservation & Habitat Management BS Biology
Michalk, Zach	Land Use and Recreation Socioeconomics	BS Urban and Regional Planning
Payette, Jacquie	Cultural Resources	MS English
Pirela, Herbert	Soils	PhD Soil Chemistry
Quinn, Duncan	Soils	MS Forestry BS Atmospheric Sciences
Quiroz, Nadja	Visuals/Aesthetics	Master of Landscape Architecture BA Conservation & Restoration, Biology

Name	Role	Education
Rana, Anthony	Groundwater Hydrology Geology and Mineralogy	MS International Development Post-Graduate, Hydrogeology, Geology, Mineralogy and Organic and Inorganic Geochemistry BS Geology
Ronan, Allison	Air Quality Climate Change	MS Meteorology BS Meteorology
Samani, Olga	Air Quality Climate Change	MS Atmospheric Sciences
Semler, Ashley	Document Production	BA English
Sicora, Wayne	Public Health and Safety	BS Civil Engineering
Smith, Emily	Document Production	BA Journalism
Stueber, Renee	Document Production	BA Journalism and Mass Communication
Thorpe, Monika	Private Property	MS Engineering (GIS) BS Meteorology and Geography
Todorov, Melinda	Fisheries	MSc Aquatic Ecology BS Biology
Voeller, Erik	Vegetation	BS Biology
Weitzenkamp, Mariah	Deputy Project Manager	Bachelor of Bioproducts and Biosystems Engineering

BA = Bachelor of Arts; BS = Bachelor of Science; GIS = Geographic Information System; MS = Master of Science; MSc = Master of Science; PhD = Doctor of Philosophy

B.3. FIGURES

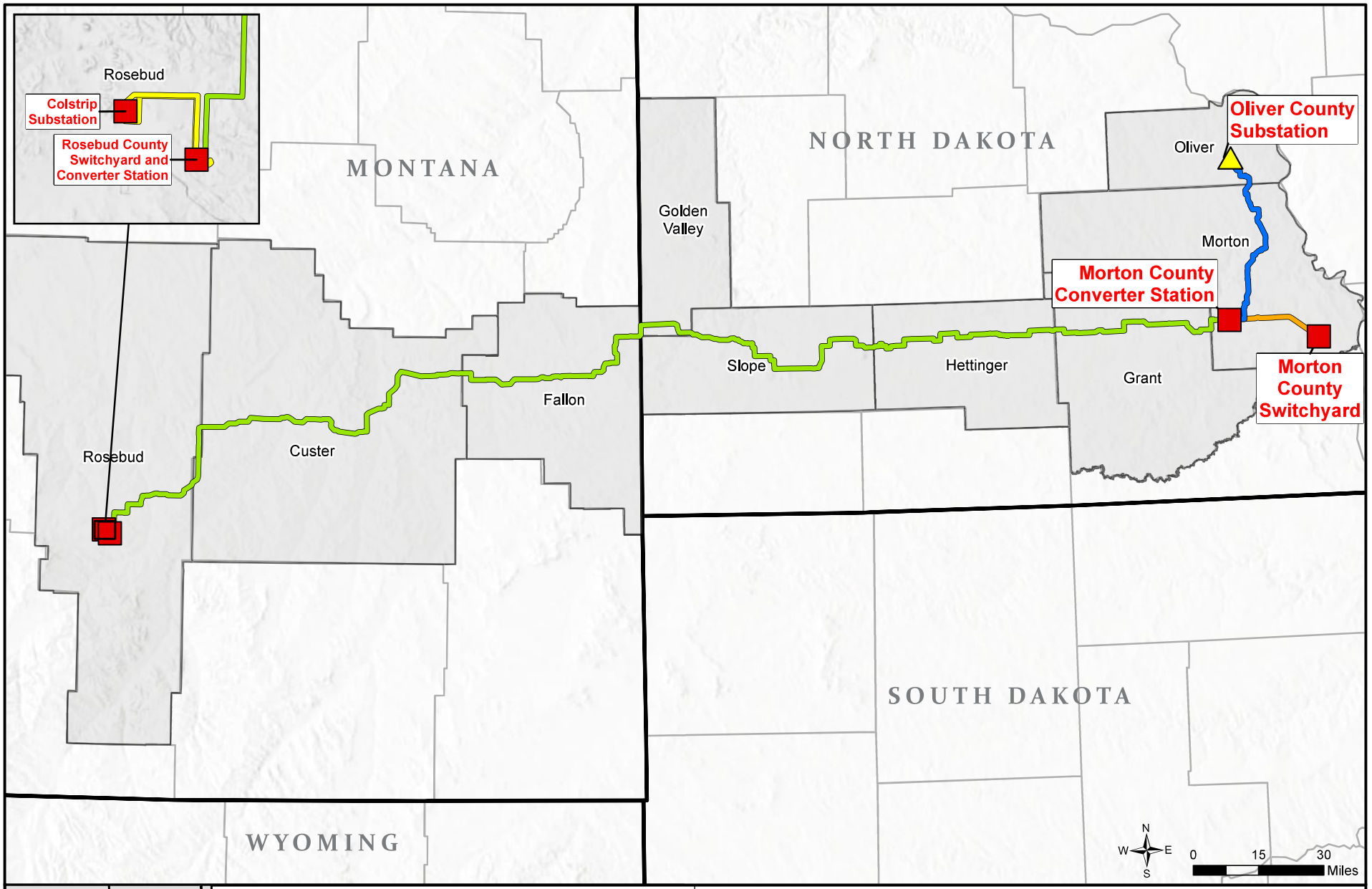
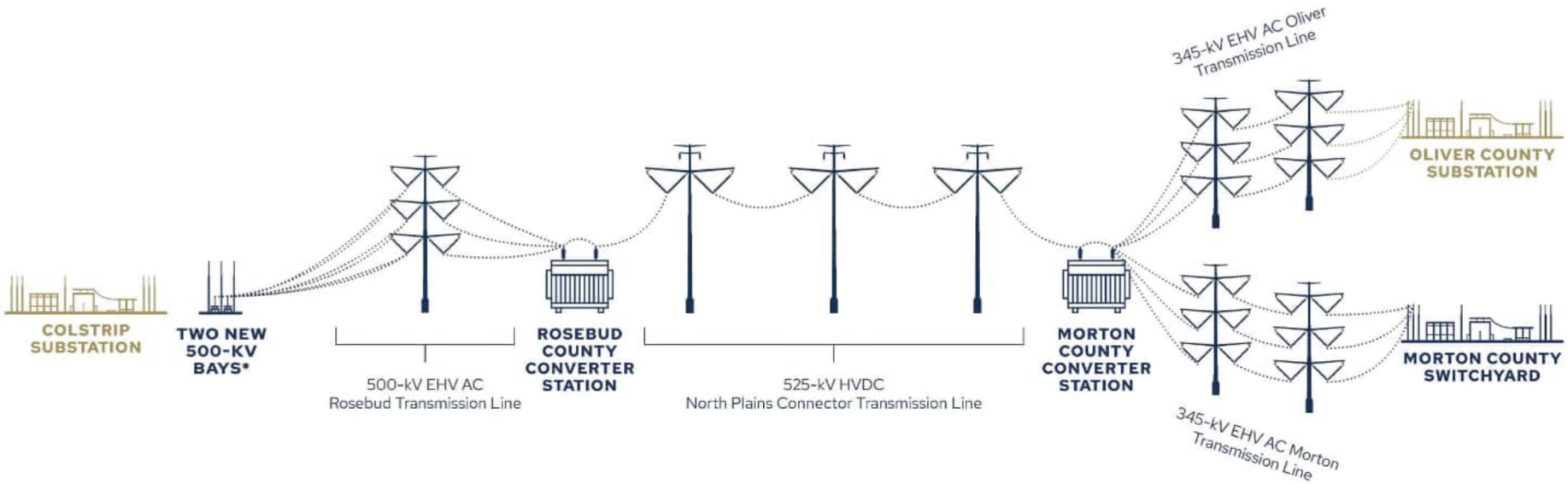
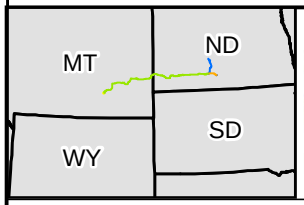


Figure 1.3-1
Project Overview Map
North Plains Connector
Montana and North Dakota

MPLS \\vmscuspgisfs01\Data\US\Projects\G-L\Grid United\Montana 3rd Party Supt\ArcGIS\Montana3rdParty.aprx\Figure 1.3.1 NPC Overview | REVISED: 09/18/2025 | SCALE: 1:2,000,000 DRAWN BY: EMH





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

Figure 1.3-2
Major Project Components
North Plains Connector
Montana and North Dakota

DEQ

MPLS M:\US\Projects\G-L\Grid United\Montana 3rd Party Supt\ArcGIS\Montana3rdParty.aprx\Figure 1.3-2 Major Project Components | REVISED: 08/12/2025 | SCALE: 1:2,000,000 DRAWN BY: EMH

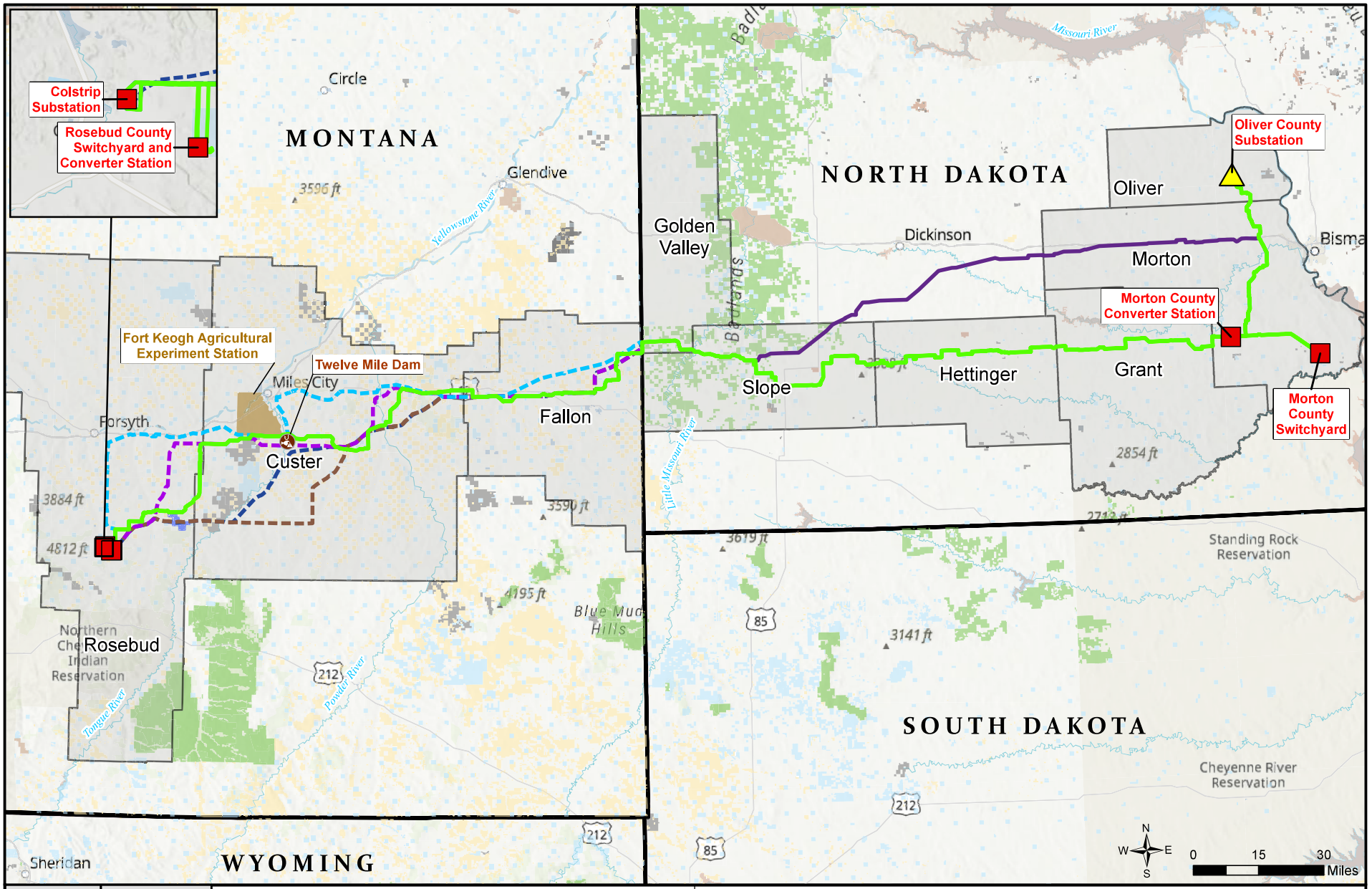


Figure 2.1-1
Route Alternatives
North Plains Connector
Montana and North Dakota

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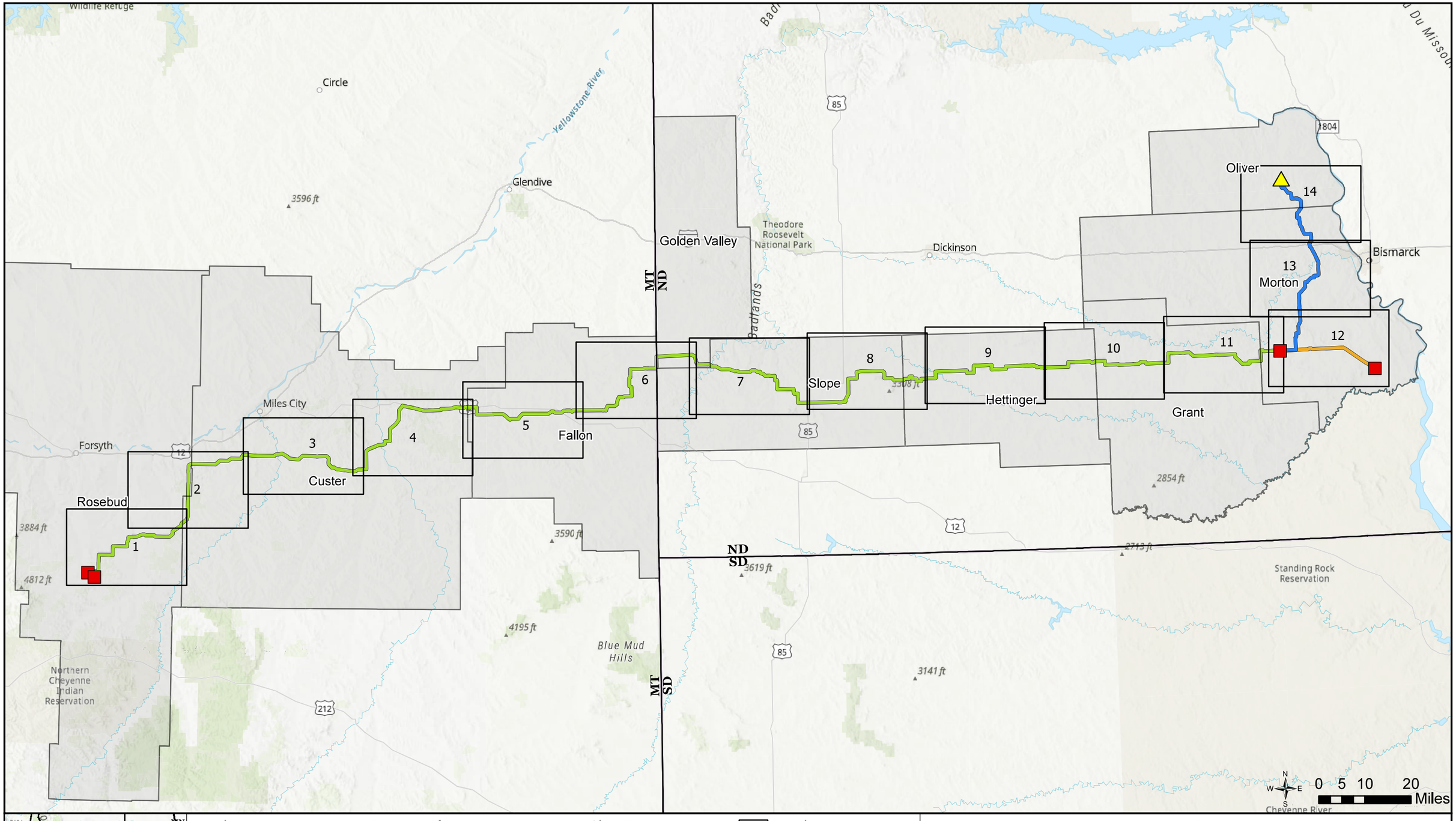

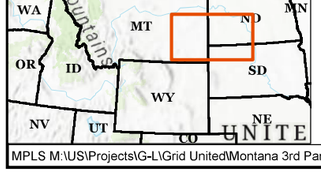

Interconnection Location (Not Part of Project)

Project Facility

Proposed Alternative

HVDC Transmission Line (525-kV)

Morton Transmission Line (345-kV)

Oliver Transmission Line (345-kV)

Page Index

County Boundary

State Boundary

Figure 2.3-1
Proposed Alternative
North Plains Connector
Montana and North Dakota
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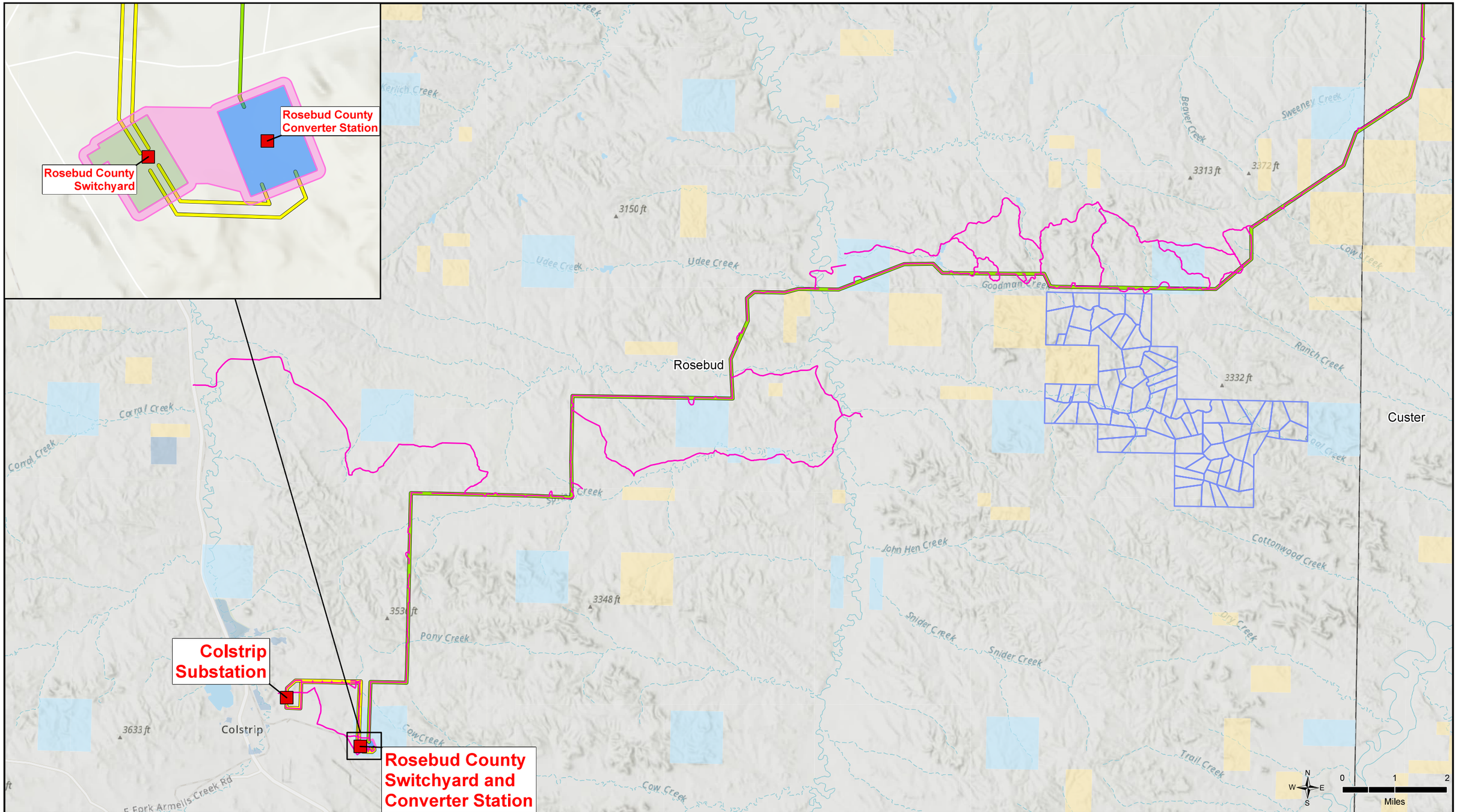

Project Facility

Proposed Alternative

HVDC Transmission Line (525-kV)

Rosebud Transmission Line (500-kV)

Access Road

County Boundary

Subdivided Parcels

Project Facility

Project Converter Station

Temporary Impact Area

Project Switchyard

Federal/State Land Owner

Bureau of Land Management

Local

State

Figure 2.3-1
Proposed Alternative
North Plains Connector
Montana and North Dakota
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Hathaway
Rosebud
Custer
Runaway Creek
Iron Jaw Creek
Coal Creek
Buffalo Creek
Indian Creek
Indian Creek
Beaver Creek
Bell Creek
Sweeney Creek
Beaver Creek
Miles Creek
Sixmile Creek
North Fork
Forest Creek
Horse Creek
North Fork
Horse Creek
Moon Creek
Corral Creek
Plunket Creek
West Fork Lake
West Fork Moon Lake
Moon Pond
2865 ft
2924 ft
3209 ft
3121 ft
3117 ft
3361 ft
3310 ft
N
W
E
S
0
1
2
Miles

Proposed Alternative

- HVDC Transmission Line (525-kV)
- Access Road

- County Boundary

Federal/State Land Owner

- Agriculture Research Service
- Bureau of Land Management
- Montana State Conservation Easement
- State

Figure 2.3-1
Proposed Alternative
North Plains Connector
Montana and North Dakota
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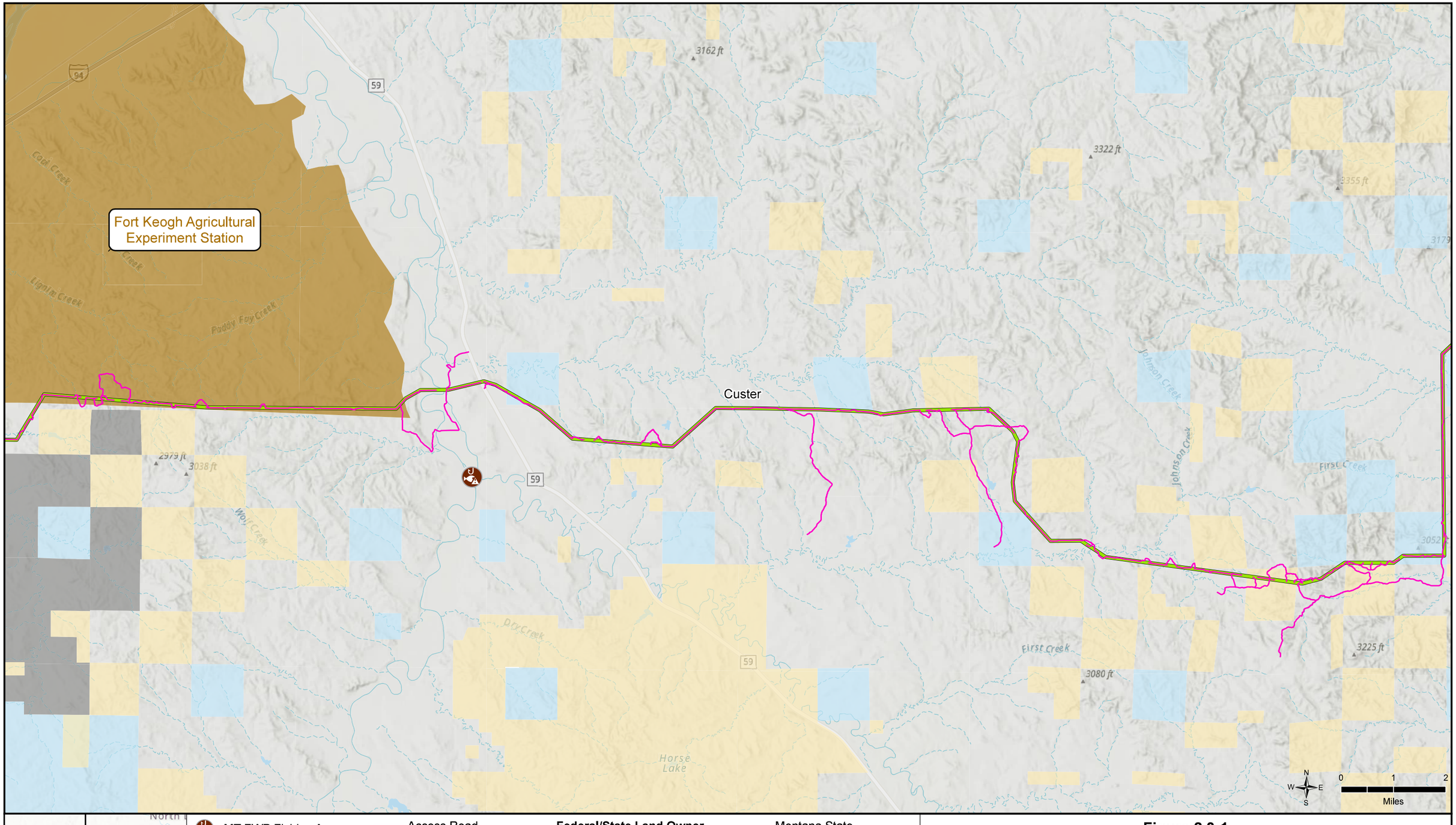

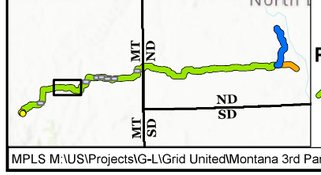

MT FWP Fishing Access

Proposed Alternative

HVDC Transmission Line (525-kV)

Access Road

County Boundary

Federal/State Land Owner

Agriculture Research Service

Bureau of Land Management

Montana State Conservation Easement

Other Federal

State

Figure 2.3-1
Proposed Alternative
North Plains Connector
Montana and North Dakota
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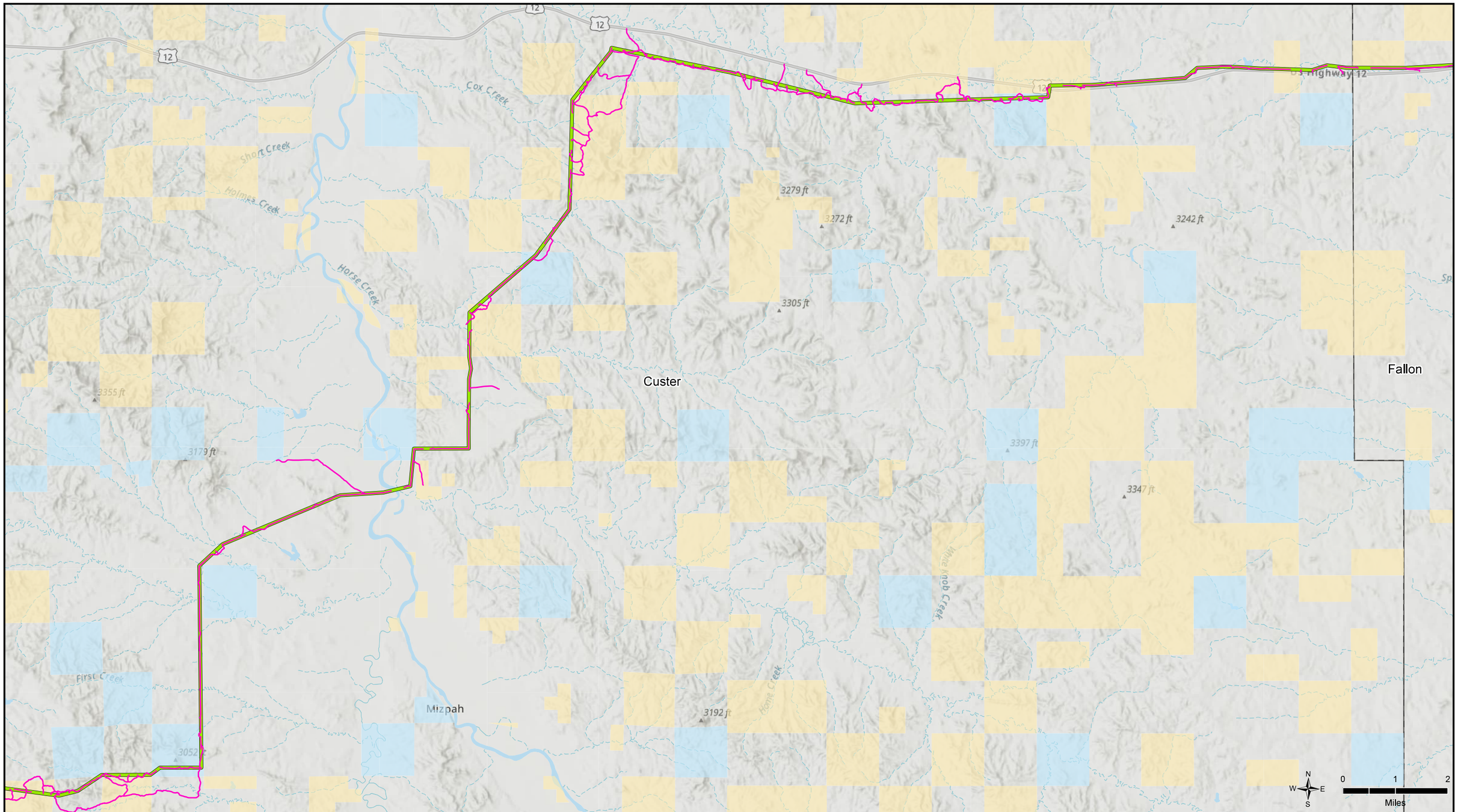

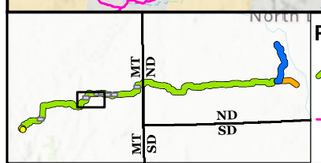

Proposed Alternative

HVDC Transmission Line (525-kV)

Access Road

County Boundary

Federal/State Land Owner

Bureau of Land Management

State

Figure 2.3-1
Proposed Alternative
North Plains Connector
Montana and North Dakota
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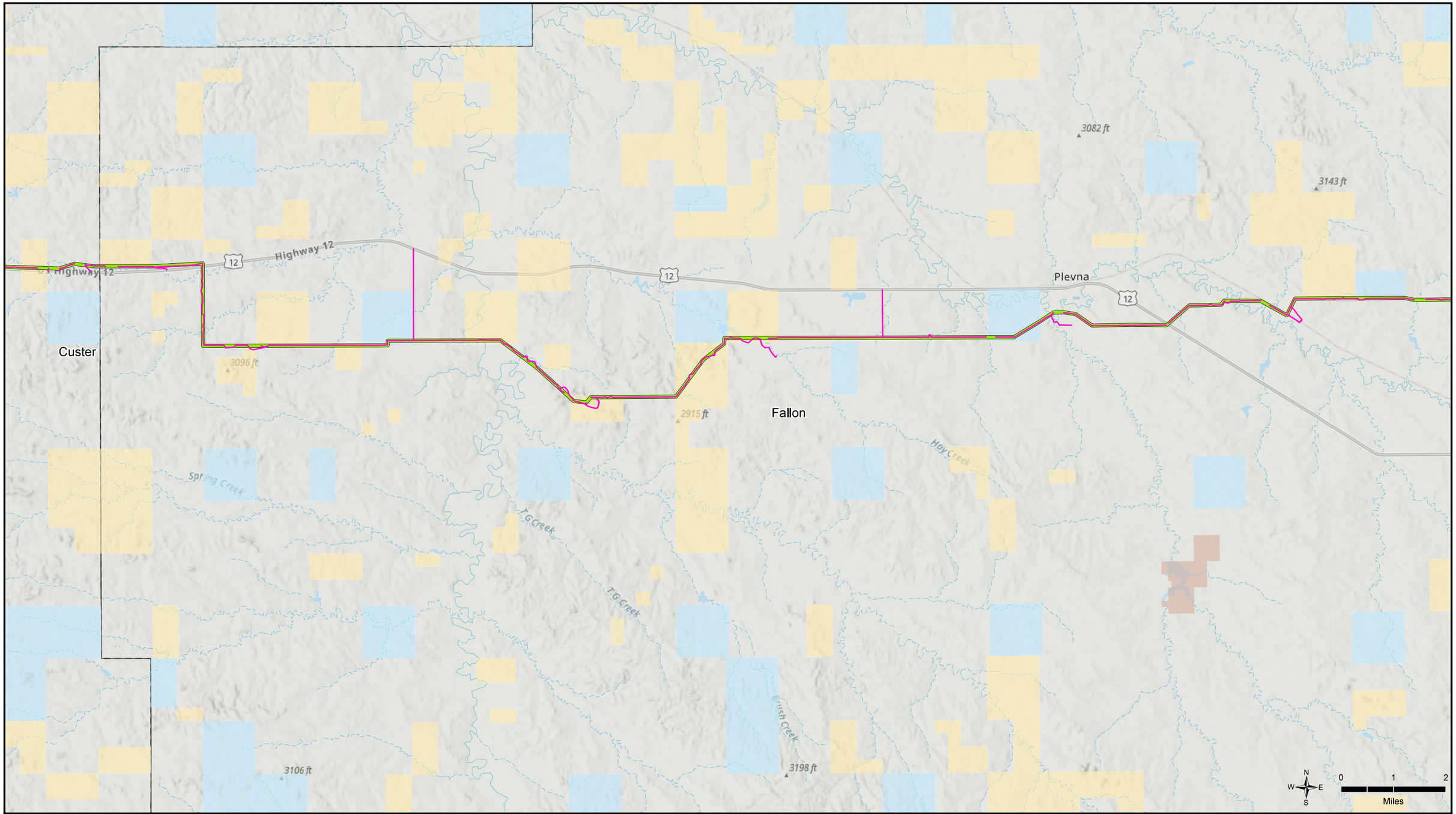

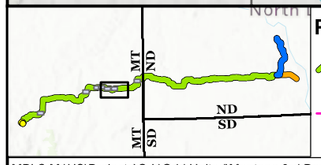

Proposed Alternative

HVDC Transmission Line (525-kV)

Access Road

County Boundary

Federal/State Land Owner

Bureau of Land Management

Local

Other Federal

State

Figure 2.3-1
Proposed Alternative
North Plains Connector
Montana and North Dakota
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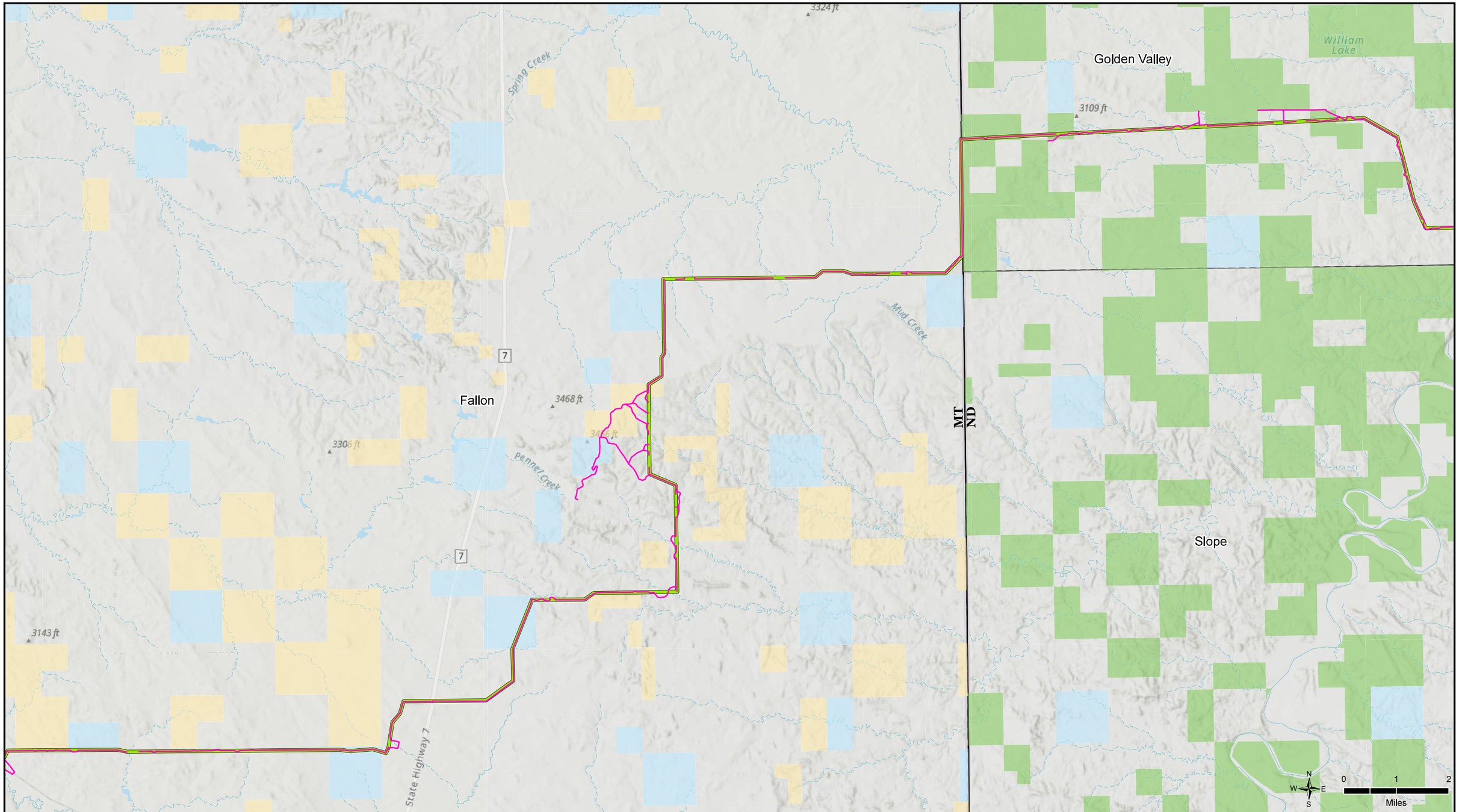

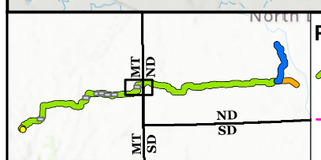

Proposed Alternative

HVDC Transmission Line (525-kV)

Access Road

County Boundary

Federal/State Land Owner

Bureau of Land Management

State

US Forest Service

Figure 2.3-1
Proposed Alternative
North Plains Connector
Montana and North Dakota
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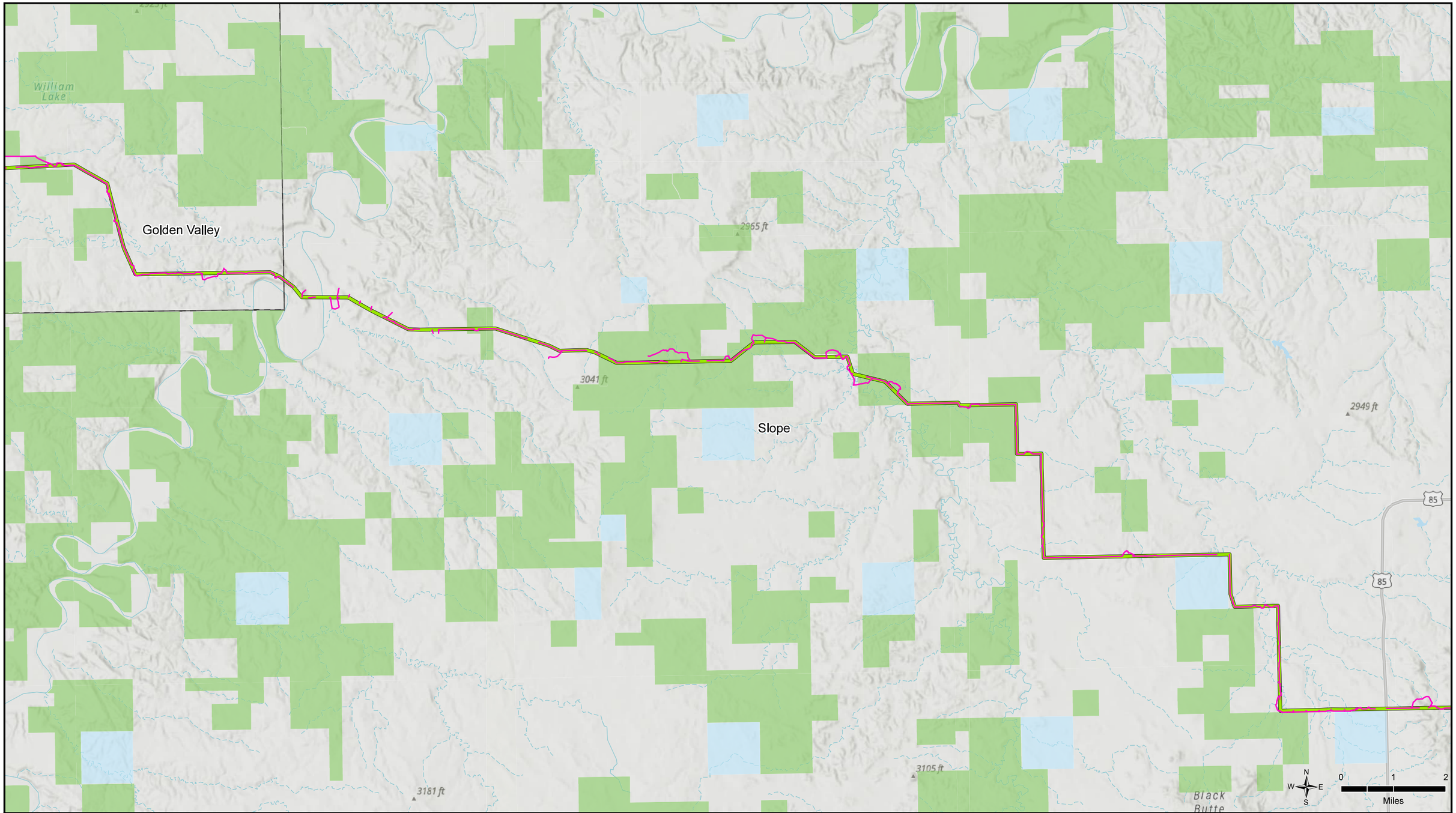

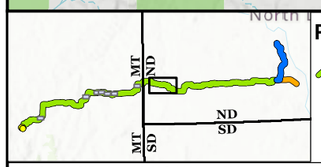

Proposed Alternative

HVDC Transmission Line (525-kV)

Access Road

County Boundary

Federal/State Land Owner

State

US Forest Service

Figure 2.3-1
Proposed Alternative
North Plains Connector
Montana and North Dakota
Page 7 of 14

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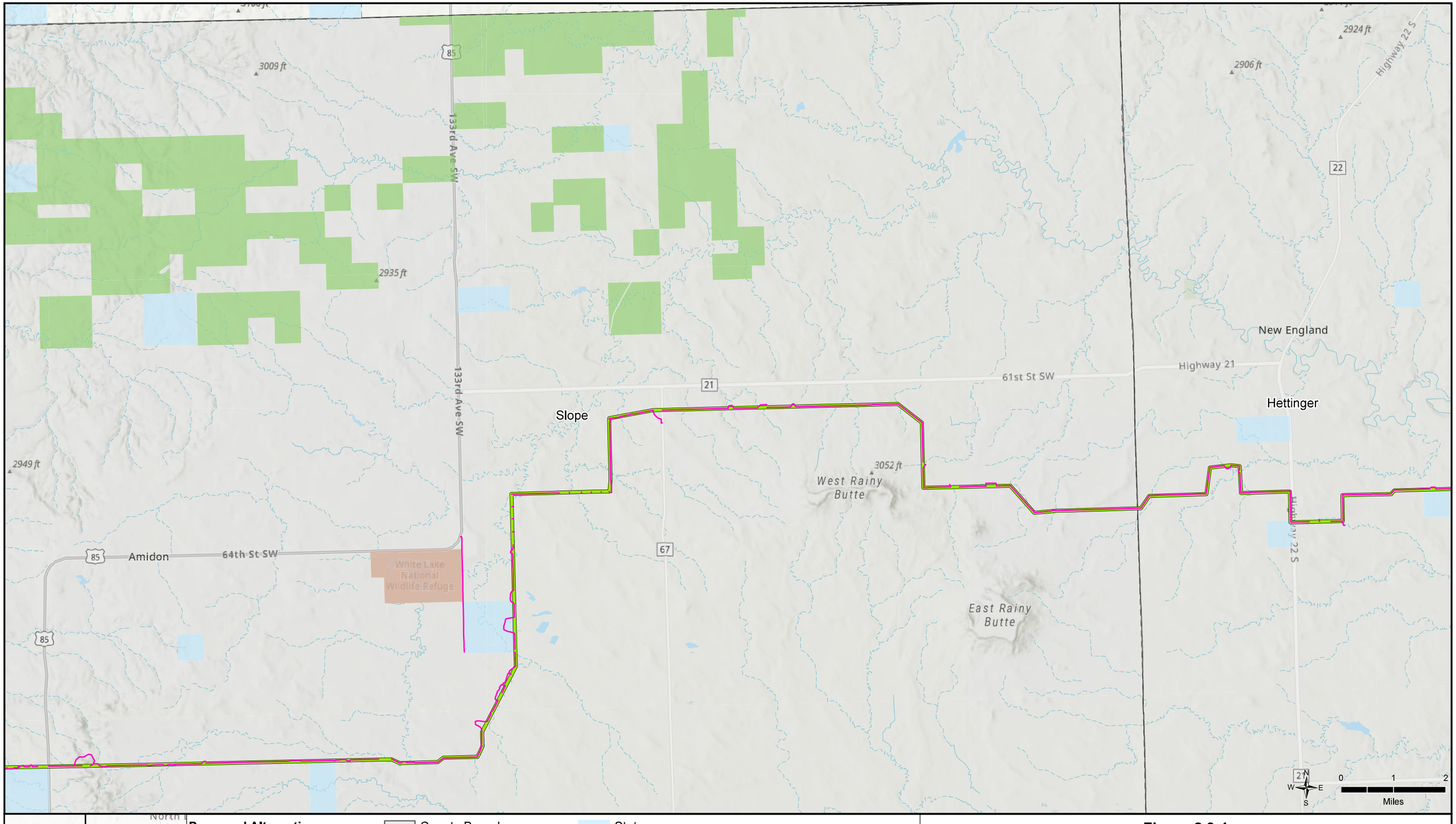

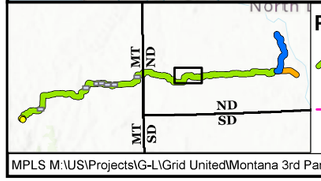

Proposed Alternative

- HVDC Transmission Line (525-kV)
- Access Road
- County Boundary

Federal/State Land Owner

- Other Federal
- State
- US Forest Service

Figure 2.3-1
Proposed Alternative
North Plains Connector
Montana and North Dakota
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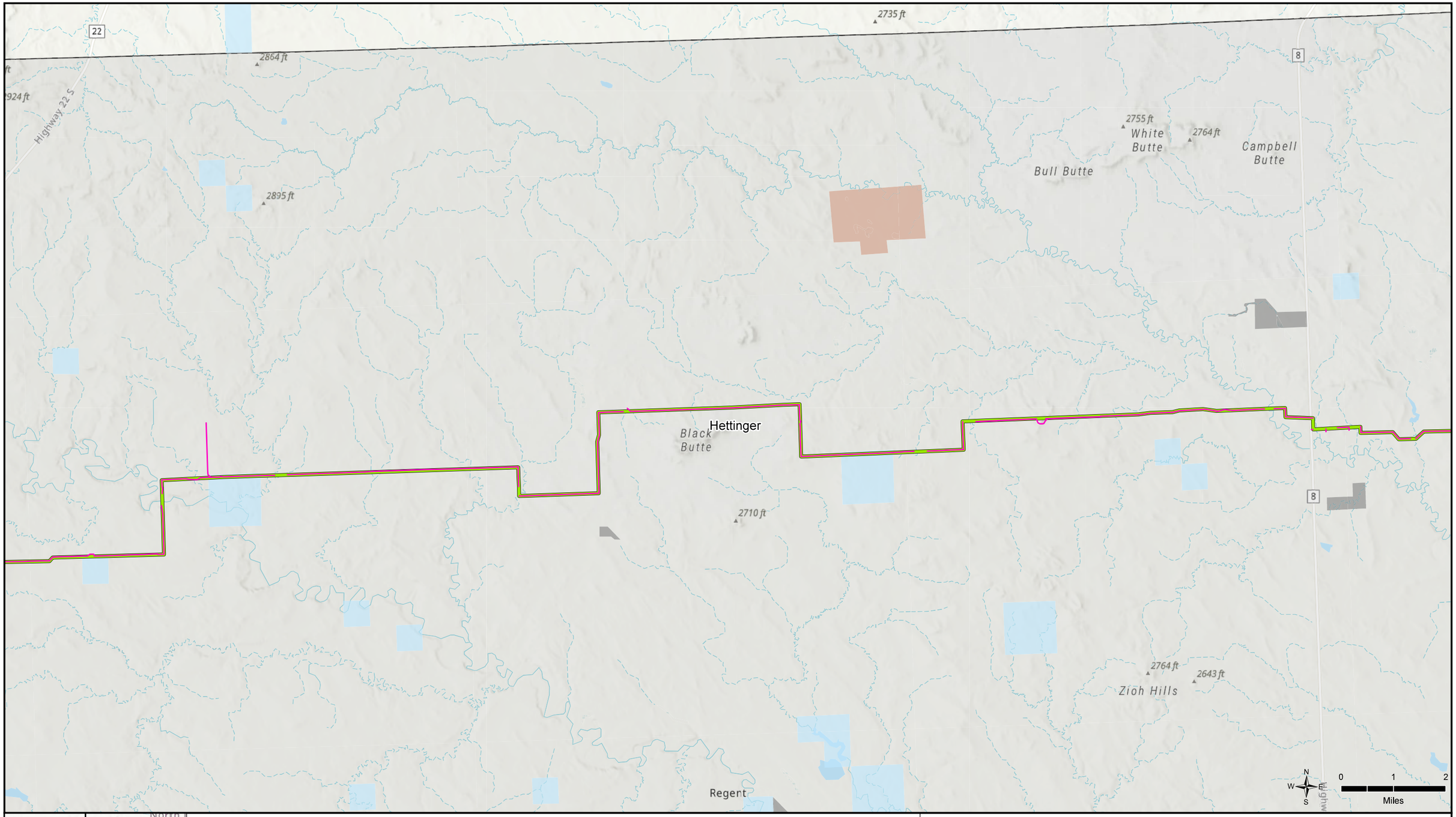

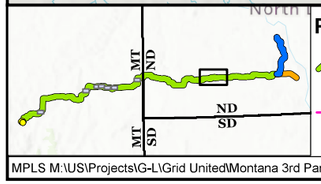

Proposed Alternative

HVDC Transmission Line (525-kV)

Access Road

County Boundary

Federal/State Land Owner

Montana State Conservation Easement

Other Federal

State

Figure 2.3-1
Proposed Alternative
North Plains Connector
Montana and North Dakota
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Morton
Cannon Hill
Rattlesnake Point
Sled Creek
49
2482 ft
Clark Butte
Stone Hills
Grant
2564 ft
2574 ft
2425 ft
2305 ft
Hettinger
2657 ft
North Star Butte
Antelope Butte
2514 ft
2575 ft
Frey Hills
N
W
E
S
0
1
2
Miles

Proposed Alternative
- HVDC Transmission Line (525-kV)
- Access Road

- County Boundary

Federal/State Land Owner
- Montana State Conservation Easement
- Other Federal
- State

Figure 2.3-1
Proposed Alternative
North Plains Connector
Montana and North Dakota

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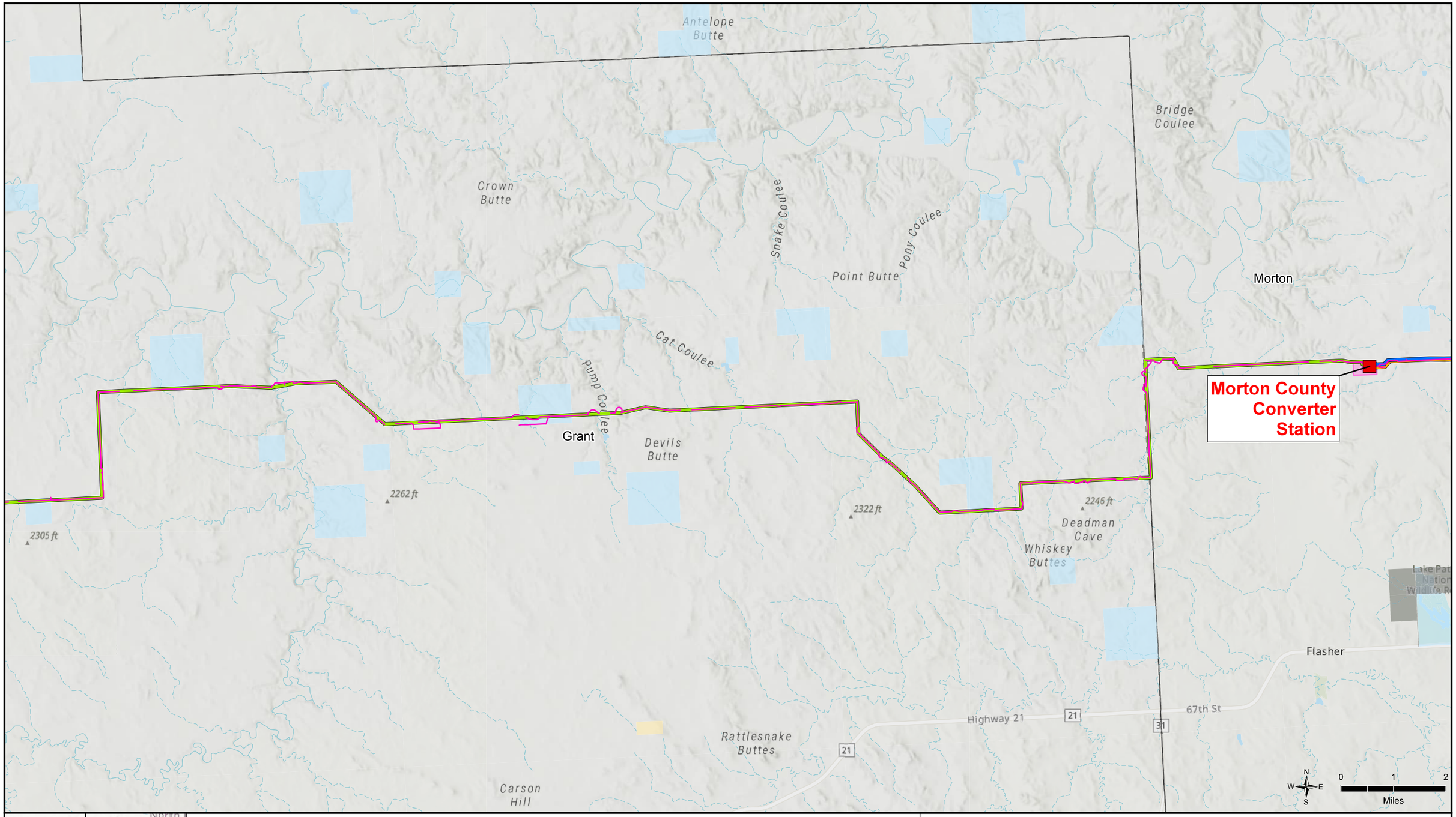

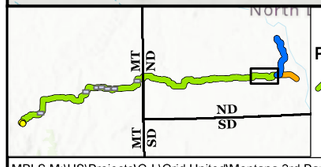

Project Facility

Proposed Alternative

HVDC Transmission Line (525-kV)

Morton Transmission Line (345-kV)

Oliver Transmission Line (345-kV)

Access Road

County Boundary

Project Facility

Project Converter Station

Temporary Impact Area

Federal/State Land Owner

Bureau of Land Management

Montana State Conservation Easement

State

Figure 2.3-1
Proposed Alternative
North Plains Connector
Montana and North Dakota

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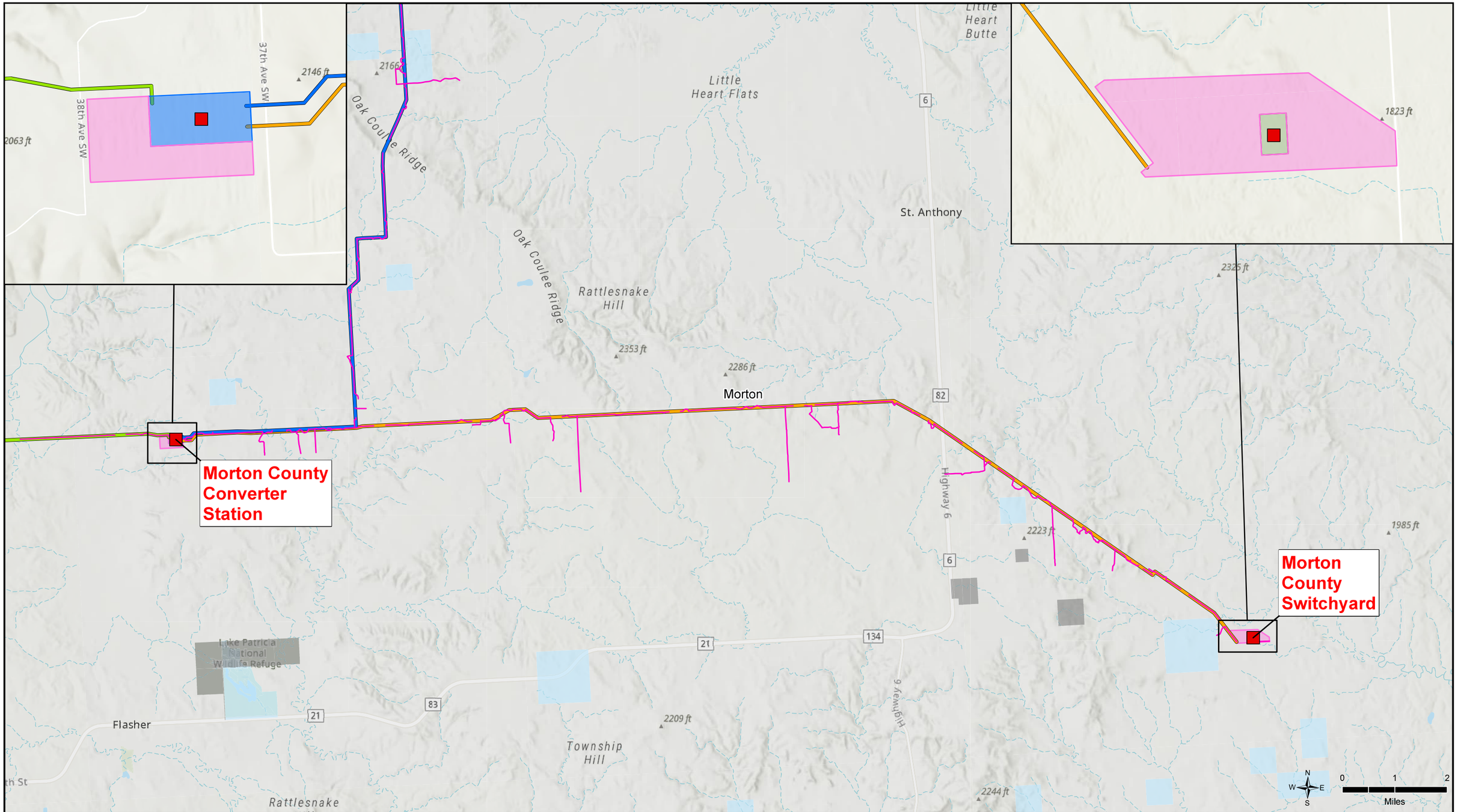

Project Facility

Proposed Alternative

HVDC Transmission Line (525-kV)

Morton Transmission Line (345-kV)

Oliver Transmission Line (345-kV)

Access Road

County Boundary

Project Facility

Project Converter Station

Temporary Impact Area

Project Switchyard

Federal/State Land Owner

Montana State Conservation Easement

Other Federal

State

Figure 2.3-1
Proposed Alternative
North Plains Connector
Montana and North Dakota

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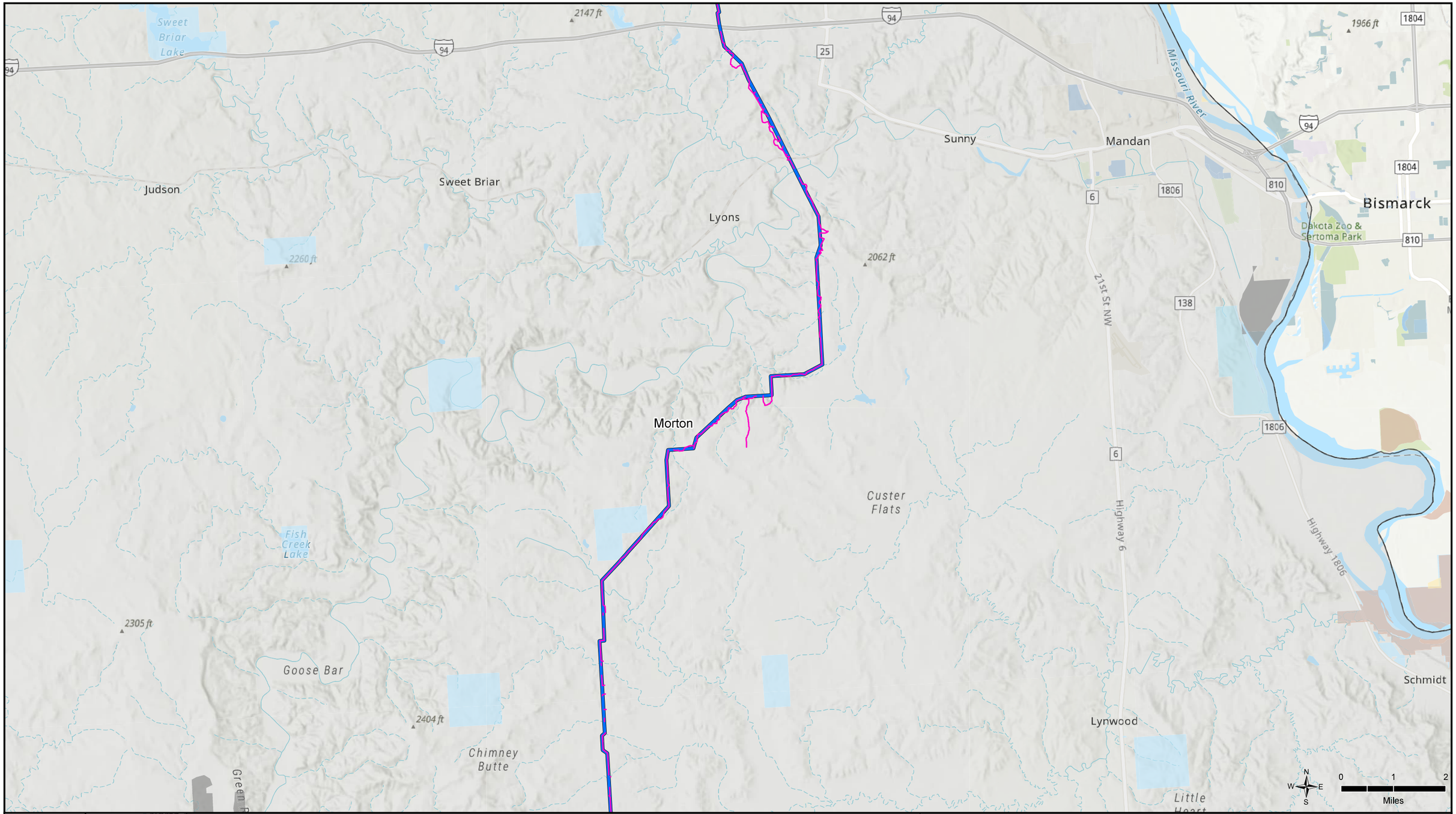

Figure 2.3-1
Proposed Alternative
North Plains Connector
Montana and North Dakota
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