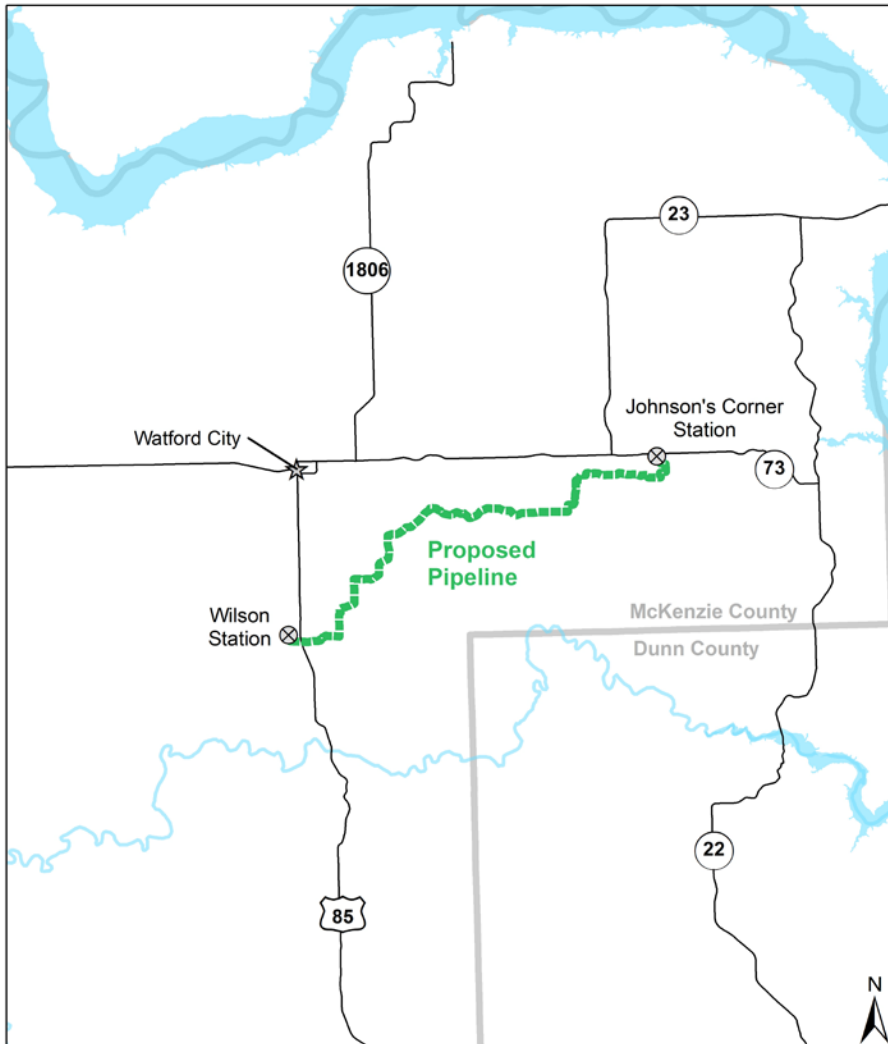


8-inch Johnson's Corner to Wilson Crude Oil Pipeline

McKenzie County

Consolidated Application for
Certificate of Corridor Compatibility & Route Permit



Bridger Pipeline LLC
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October 2020

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| <i>Chapter 49-22.1</i> | <i>CENTURY CODE – Title 49 ENERGY CONVERSION AND TRANSMISSION FACILITY</i> | |
| 49-22.1-06 | Application for a Certificate for a Corridor | |
| 1.a | Description of size and type of facility | 1.0, 2.1 |
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| 1.e | Preferred transmission (pipeline) corridor | 2.13, Exhibit A |
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| 1.g | Mitigating measures | 8.0 |
| 1.h | Corridor evaluation pursuant to 49-22.1-09 and 49-22.1-03 | 5.0, 7.0 |
| 1.i | Other relevant information | 7.0 |
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| 1.b | Description of the location | Intro, 1.4, 2.14, 2.15 |
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| AUTHORITY | DESCRIPTION | SECTION |
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| 69-06-05-01 | Application for a Transmission Facility Permit (Corridor Certificate) | |
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| 2.a.(7)(b) | The approximate length of facility | 1.3 |
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| 2.h. | Discussion of factors in Century Code 49-22-09.1 to aid NDPSC's evaluation | 6.0, 8.0 |

| AUTHORITY | DESCRIPTION | SECTION |
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| 2.l. | Mitigating measures | 8.0 |
| 2.m. | Qualifications of each person involved in location study | 10.0 |
| 2.n. | Map identifying criteria that led to the route location and new facilities | Exhibit A |
| 2.o. | 8 1/2 X 11 black and white map suitable for newspaper publication | Separate |
| 2.p. | Discussion of present and future natural resource development in the area | 9.1 |
| 2.q. | Maps and GIS data meeting NDPSC requirements | Exhibit A, electronic GIS data |
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Exhibit A: Project Route Maps

- A.1: Aerial Mapbook
- A.2: Topographic Mapbook

Exhibit B: Cultural Resources Report

Exhibit C: Agency Consultations

- C.1: NDIC Pipeline Authority
- C.2: ND State Water Commission
- C.3: ND Department of Environmental Quality
- C.4: ND DOT Williston District
- C.5: ND Department of Trust Lands
- C.6: McKenzie County Planning Department
- C.7: US Army Corps of Engineers
- C.8: ND Parks and Rec
- C.9: ND Game and Fish Department
- C.10: Lake Ilo National Wildlife Refuge
- C.11: U.S. Fish and Wildlife Service
- C.12: U.S. Air Force
- C.13: ND Soil Conservation Committee
- C.14: McKenzie County Commission
- C.15: USFS McKenzie Ranger District
- C.16: McKenzie County Weed Board
- C.17: ND Geological Survey
- C.18: ND Department of Agriculture

Exhibit D: ESRI ArcGIS Shapefiles

INTRODUCTION

Bridger Pipeline LLC (Bridger), submits this single consolidated application for a Certificate of Corridor Compatibility and Route Permit to the North Dakota Public Service Commission (NDPSC) for a 29.4 mile, eight (8)-inch crude oil transmission pipeline known as the Johnson's Corner to Wilson Pipeline (Project). The Project consists of two parts, the construction of an approximately 2.4 mile pipeline and the conversion of an approximately 27 mile gathering line.

Bridger is seeking approval for a Certificate of Corridor Compatibility for a 300-foot wide Project Corridor that will align with the centerline of the pipeline route. The pipeline is located within McKenzie County in North Dakota. The Project would transport crude oil from Eighty Eight Oil Company's (EEOC) existing Johnson's Corner Terminal in North Dakota to Bridger's existing Wilson Station approximately 7 miles south of Watford City, North Dakota.

The Project is located directly upstream of the Wilson to Bowline Pipeline owned and operated by Belle Fourche Pipeline Company, a company affiliated by common ownership with Bridger, and sited by the NDPSC in Case No. PU-18-404. In 2018, Bridger constructed the existing 27-mile segment of the Project known as the Kermit to Wilson gathering line to support continuing growth of production in the Johnson's Corner area. The Kermit to Wilson gathering line interconnected to existing gathering in the Johnson's Corner area that previously delivered crude into Bridger's Four Bears Pipeline. Bridger's Four Bears Pipeline, sited in Case No. PU-09-750, transports crude from the Highway 23 station to the South through the Johnsons Corner area and on to Baker Montana. A valve located on the Four Bears line, in the vicinity of Johnson's Corner blocked volumes from entering the Kermit to Wilson gathering line. In March 2020, Bridger requested interim authorization to open the valve so that Kermit to Wilson could accept a portion of Four Bear's volumes and provide additional capacity on Bridger's system. Bridger's request required no dirt disturbance or actual construction activities. The NDPSC granted Bridger's request and directed Bridger to file a siting application for the existing Kermit to Wilson gathering line. This application is submitted in accordance with the forgoing. In addition to the requested conversion of the 27 mile Kermit to Wilson segment, Bridger proposes to construct 2.4 miles of new transmission pipeline to connect the existing Kermit to Wilson pipeline segment directly to the Johnson Corner Terminal. The interconnection with Four Bears will stay in place to maintain flexibility and allow for maximum efficiency of the interconnected systems. No new installations will be required to convert the existing line.

Bridger seeks NDPSC approval for the Project in accordance with Chapter 49-22.1 and Section 69-06-08-02 of the North Dakota Administrative Code and the NDPSC's Energy Conversion and Transmission Facility Siting Guidelines.

1 DESCRIPTION OF PROPOSED FACILITY

1.1 Type

The Project originates at EEOC's Johnson's Corner Terminal located near Johnson's Corner, North Dakota and runs 29.4 miles southwest to Bridger's Wilson Station south of Watford City, ND. The pipeline would interconnect with Bridger's existing North Dakota facility at Wilson Station and their respective crude oil transmission network.

The proposed Project will result in a new crude oil transmission pipeline approximately 29.4 miles in length. The steel pipe utilized for construction of the Project will meet United States Department of Transportation ("US DOT") regulations, specifically the design criteria outlined in 49 C.F.R. Subpart 195(C). The Project will be constructed per 49 C.F.R. Subpart 195(D). The Project will be operated and maintained per 49 C.F.R. Subpart 195(F).

1.2 Size

Construction of the Project will involve the installation of 8-inch nominal diameter, steel, API-5L, FBE coated, Grade X-52 ERW Line Pipe with a nominal wall thickness of 0.312 inches. Bore pipe will have a nominal wall thickness of 0.5 inches. The maximum operating pressure (MOP) of the pipeline will be 1,440 pounds of pressure per square inch gauge (psig). Average operating pressure will be 250-500 psig.

Valves will be 8-inch ANSI 600 manufactured in accordance with American Petroleum Institute (API) Standard 6D "API Specification for Steel, Gate, Plug, Ball and Check Valves for Pipeline Service." Valves will be installed pursuant to US DOT regulations. The MOP of the valves will be 1,480 psig or greater. The pipeline will operate at or near ambient temperature.

1.3 Length

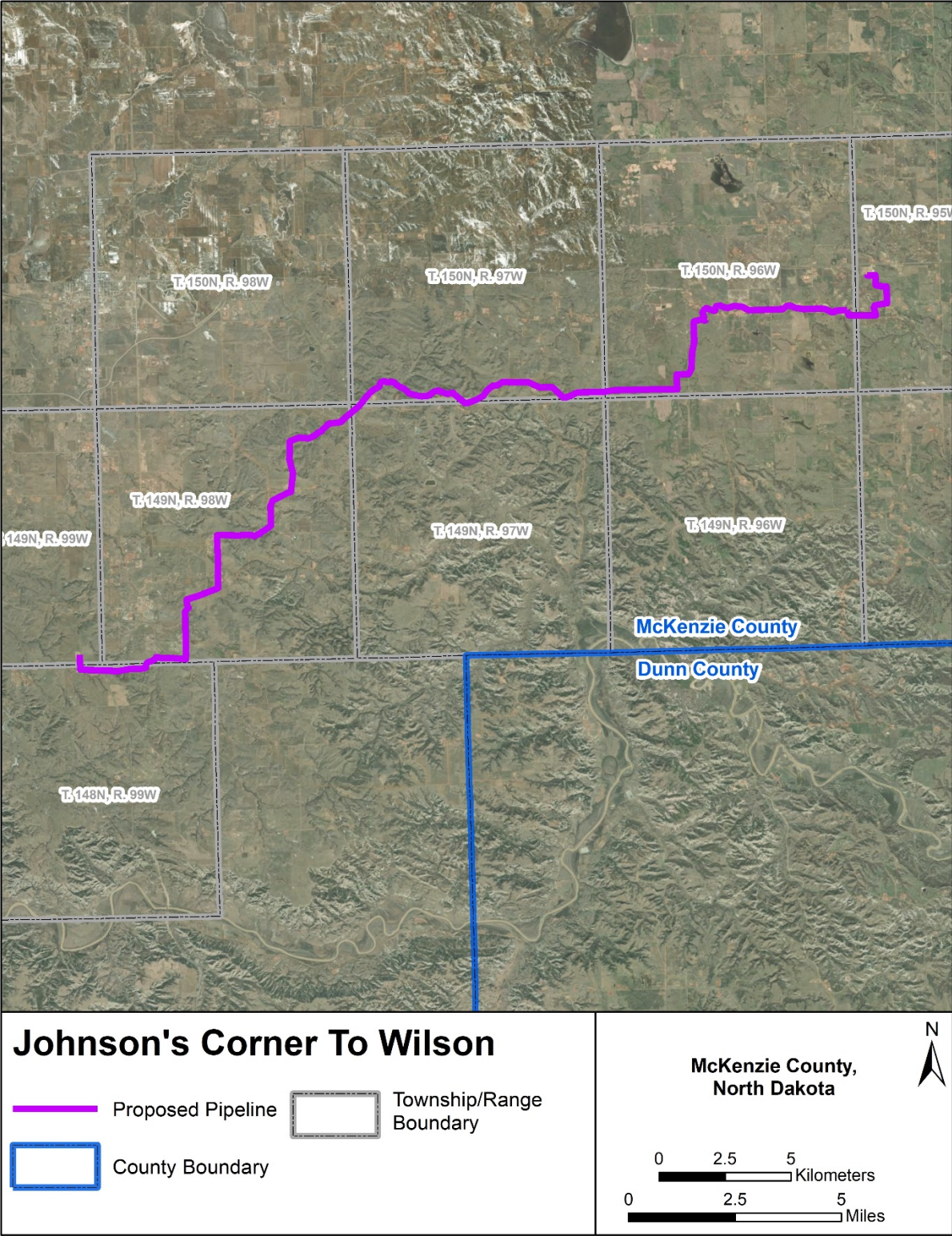
The Project will involve approximately 2.4 miles of pipe installation and 27 miles conversion of a gathering line into a transmission line already constructed in North Dakota.

1.4 Aboveground Facilities

The Project's segments will be buried underground. Surface structures are limited to pipeline markers, rectifier sites, pig launchers and receivers, and block valves. Some small fenced-in enclosures will be installed along the route and within the Project Corridor to house associated power, communication, and control systems to allow valves to be operated remotely.

The Project has 7 block valves. A launcher is located at Johnson Corner Station and the 7 block valves are located midline. See Exhibit A for valve locations.

Figure 1 – General Project Location Map



2 DESIGN OF THE PROPOSED FACILITY

2.1 Design

The Project is a 29.4-mile 8-inch diameter crude oil transmission pipeline extending from the Johnson's Corner Terminal to the Wilson Station. The project is designed to construct a 2.4-mile crude oil line and convert a 27-mile gathering line into a crude oil transmission pipeline. The steel pipe utilized for construction of the Project will meet United States Department of Transportation (US DOT) regulations, specifically the design criteria outlined in 49 C.F.R. Subpart 195(C). The Project will be constructed per 49 C.F.R. Subpart 195(D). The Project will be operated and maintained per 49 C.F.R. Subpart 195(F).

2.2 Purpose and Need of the Facility

The purpose of the Project is to transport crude oil produced in western and northwestern North Dakota to the Wilson Station near Watford City, ND eventually connecting into the Guernsey, Wyoming market for further marketing and transportation nationally.

The Project will provide needed capacity to transport increased petroleum from western North Dakota where oil production is expected to increase until 2025¹.

The Project will add: (1) additional pipeline shipping capacity in North Dakota; (2) more access to liquid market options for Bridger customers, specifically the oil trading center in Cushing, Oklahoma; and (3) a pipeline transportation alternative to trucking or railing crude oil to other shipping points and markets. This pipeline segment will be a vital part of an alternative route out of North Dakota in the event of a shutdown of the other pipelines leaving the Williston Basin.

2.3 General Area to be Served

The Project will provide needed capacity to transport increased petroleum from western North Dakota where oil production is expected to increase until 2025.

2.4 Capacity

The installed capacity of the Project is 25,000-50,000 bpd.

2.5 Technology to be Deployed/Employed

The Project will be designed, constructed, maintained, and inspected to the US DOT Pipeline and Hazardous Materials Safety Administration regulations utilizing industry standards and company policies. The system will be controlled and monitored 24 hours a day, 7 days a week, and 365 days a year by trained control room personnel. Additionally, the system will be equipped with a monitoring and alarm system that continuously monitors the flow and pressure of the system and readily signifies anything outside normal operating conditions.

¹ U.S. Energy Information Administration, "U.S. Crude Oil Production to 2025: Updated Projection of Crude Types," *available at* <https://www.eia.gov/analysis/petroleum/crudetypes/pdf/crudetypes.pdf> (accessed February 28, 2020).

2.6 Product

The Project will transport crude oil produced from the Bakken/Three Forks Formation. As a crude oil transmission facility, the Project will provide needed flexibility and capacity to transport petroleum crude oil from western North Dakota.

2.7 Final Destination of Product

The Project will transport crude oil produced from western and northwestern North Dakota eventually connecting into the Guernsey, Wyoming market for further marketing and transportation nationally. Markets served will be refineries in Utah, Wyoming and Colorado along with trading centers in Cushing, Oklahoma and Patoka, Illinois.

Bridger does not own any of the crude petroleum transported in its pipeline system. Bridger does not determine markets or destinations for petroleum commodities. Bridger's business is to provide a service which is available to anyone tendering commodities for transportation. Bridger attempts to anticipate the need for additional pipeline capacity by relying upon forecasts for throughput generated by shippers on the system.

Bridger's system of operating pipelines provides flexibility of transporting North Dakota's crude petroleum to multiple national markets.

2.8 Width of Right-of-Way (ROW)

The Project's construction ROW is approximately 100 feet wide. Additional temporary work space may be necessary during construction, maintenance, and inspection in areas such as steep slopes, and areas adjacent to streams and road crossings, for safety reasons, and construction activities associated with these features.

Bridger will notify landowners of normal operating modifications or maintenance to the Project that is carried out within the 50' permanent ROW. The width of the ROW was established based on the need to provide adequate space and line separation for construction and future line maintenance.

2.9 Estimated Distance between Surface Structures for Pipeline Facilities

The Project is largely underground. Unlike electrical transmission lines, no major features of this system will be installed aboveground. Aboveground features will be limited to minor features such as to pipeline markers, block valves, cathodic protection test sites, pig launchers and receivers, and rectifier sites, typically miles apart based on convenient access points along a public ROW. Operation and maintenance buildings are currently located at EEOC's Johnson's Corner Terminal.

2.10 Maximum Design Operating Pressure and Temperature for Pipeline Facilities

The maximum allowable operating pressure of the pipeline will be 1440 psig. The pipeline operates at or near ambient temperature.

2.11 Estimated Total Cost of Construction

Installed cost of the Project will be approximately \$21 million.

2.12 Preferred Location of Facility

The Project is located in McKenzie County. The Project originates at the Johnson's Corner Terminal in McKenzie County, and runs 29.4 miles to Bridger's Wilson Station which is located near Watford City, ND.

2.13 Preferred Location of Corridor

A majority of this Project (27 miles) is already constructed and would therefore avoid or minimize potential environmental and human impacts associated with installing a new pipeline. Bridger is seeking approval for a 300 foot wide Survey Area (Project Corridor).

Underground pipelines minimize potential impacts on human and animal welfare. Construction of the Project is expected to cause short term disruption to the environment, but will not result in long-term changes to the environment.

2.14 Description of ROW Preparation, Construction, and Reclamation Procedures

The construction ROW will be cleared, grubbed, and graded to allow for pipeline construction. Soil segregation will be completed to standard operating procedures. All trenching will be performed mechanically with either an excavator or a ditching machine to a depth allowing a minimum of four feet from the top of the pipe to the top of the cover. When rock is present, an excavator with rock teeth will be used. Boring and horizontal directional drilling pipe installation will be performed if crossing under a road, railroad, pipeline/utility, waterbody, or areas where trenching is deemed unsafe or impractical. Casing of the pipelines will not be used because it leads to corrosion issues. Typically, the ROW will be continuously cleared of all construction material, uncovered rocks, and compacted areas. Holes and ruts will be filled and graded. Reclamation of the ROW will be completed at the end of the pipeline construction. These procedures were used when construction the conversion line in 2018.

The majority of the Project involves converting the operation status of an approximately 27 miles of existing 8-inch pipeline within a previously acquired ROW and construction for 2.4 miles of the new 8-inch pipeline segment. No short-term or long-term impacts are associated with this project.

One of the unique aspects to a project involving a conversion of an existing gathering pipeline to transmission pipeline status, is the surface of the pipeline ROW can be surveyed for post construction impacts. As further detailed in other sections of this application, the field surveys performed by Keitu Engineers & Consultants, Inc. (Keitu) documented the effectiveness of Bridger's reclamation efforts.

Areas with cultivated crops have been completely returned to their prior land-use and production levels. The reclaimed ROW does contain areas of weedy vegetation. Bridger will be working to eliminate the weedy vegetation on the conversion line and prevent weedy vegetation in the new construction ROW. Of note, areas exist along the constructed ROW where vegetative cover does not yet exactly match the vegetative diversity outside of the impacted ROW surface, particularly in areas that are not under active

cultivation. It is expected with normal vegetation management conditions diversity will increase along ROW.

2.15 Landowner Notification, Easement Acquisition, and Compensation

Bridger is working to finalize easement agreements with all landowners along the new construction segment of the Project route. Updated easements for the conversion segment of the Project are completed.

Bridger is committed to providing landowners complete information about the pipeline and associated facilities and keeping them informed throughout the lifetime of the Project. Bridger will coordinate with landowners to discuss crop loss payments, and to address any unique property concerns, as needed.

3 SCHEDULE

3.1 Obtaining Certificate of Corridor Compatibility

The Certificate of Corridor Compatibility Application is being submitted in October 2020.

3.2 Obtaining Route Permit

The Route Permit Application is being submitted in October 2020.

3.3 Completing ROW Acquisition

Right-of-Way acquisition is ongoing and anticipated to be substantially complete by the time of hearing on the application.

3.4 Starting Construction

Construction is expected to begin 4th quarter 2020, contingent on approval from the Commission.

3.5 Completing Construction

Construction for the Project is anticipated to last approximately one month after construction begins.

3.6 Testing Operations

The pipeline will be hydro-tested in accordance with PHMSA part 195 regulations prior to being placed into service. Test operations will occur following construction of the Project.

3.7 Commencing Operations

Bridger anticipates placing the pipeline in service by the beginning of 2021 or as soon as construction and testing are complete.

4 ALTERNATIVES

The pipeline will be a permanent, ongoing system. As such, Bridger has a continuing commitment to conduct its operations in an environmentally responsible manner. Substantial, continual effort is placed on pipeline integrity, operational safeguards, emergency response, and landowner relationships, all of which reduce the impact of the pipeline on the environment. Bridger supplements the support from the existing internal environmental staff with engineering and environmental consultants as necessary to assure compliance with environmental regulations and applicable policy. A brief discussion of other possible alternatives is provided below.

4.1 No Action Alternative

The status quo could be allowed to continue, supported by trucking crude oil to existing pipeline unloading facilities and/or rail trans-ship facilities. Finding qualified cargo tank operators, already a critical issue, will continue to be difficult. Further, there will be additional wear and tear to county and state roads due to high truck traffic. Pipeline transportation (1) reduces truck traffic on the area's road network; (2) provides access to a wider range of markets; and (3) results in a more efficient and safer mode of transportation by reducing costs and the potential for accidents. A "no action" alternative is not preferred because it does not reasonably meet the needs of Bridger and its customers.

4.2 New Pipeline Route

The Project route is designed to limit construction and limit impacts to land and waterbodies. A new route is not a preferred alternative to the Project because it would create new environmental impacts, and would result in costs that could otherwise be avoided by re-purposing the existing pipeline.

5 ENVIRONMENTAL STUDIES

Studies were undertaken to evaluate the Project's potential impacts on recreational, environmental, and cultural resources. Environmental data collected to date includes information on soils, land use, wetland and water body crossings, protected species, and cultural resources. Bridger will continue to work with appropriate regulatory agencies and will continue to gather comprehensive information as required during the permitting process.

Analysis of the Project entailed both desktop studies and field surveys. A one-mile-wide study corridor was utilized for the entire 29.4-mile Project route in North Dakota (Study Area). Desktop studies for the Study Area reviewed items such as Class I archeological file search and a wildlife database search. Surveys were conducted along the entire route in the field on foot within the 300-foot-wide Project Corridor (Survey Area) and over larger areas as specified herein.

Bridger engaged Keitu Engineers & Consultants, Inc. (Keitu) and Beaver Creek Archaeology, Inc. (BCA) to perform the environmental and cultural resource siting studies for the Project.

BCA performed a Class I archeological file search in July of 2020 of the Study Area. A Class III field survey was performed on the Survey Area in August of 2020. The cultural resource location details are not presented in a publicly available document per the request of the State Historical Society of North Dakota.

BCA has provided a redacted version of the cultural resource report in Exhibit B. Additional details of these sites will be provided to NDPSC staff upon request.

In the summer 2020, Keitu conducted plant life field surveys within the Survey Area and wildlife and habitat field surveys within the one-mile wide Study Area to identify and assess the presence of wildlife and habitat for threatened and endangered species. An aerial raptor nest survey was conducted in January 2020 covering a two-mile-wide corridor (one mile on each side of the route). Additionally, a Sharp-tailed grouse lek survey was completed in April 2020 covering a two-mile wide corridor (one mile on each side of route).

Keitu conducted a database search for all other Exclusion or Avoidance Criteria outlined in the North Dakota Administrative Code within the Study Area. Items reviewed included federal, state, & county parks, protected and sensitive plants and animals, and civil and social structures such as recreational areas, businesses, rural homes, and farmsteads.

5.1 Wetland and Waterbody Inventory

Bridger, through its consultants, conducted a desktop survey using aerial photographs, U.S. Geological Survey (USGS) topographic maps, and the USFWS National Wetland Inventory to identify wetlands within the Project Corridor.

The U.S. Army Corps of Engineers (USACE) Regulatory program regulates work and structures that are located in, under or over navigable waters of the United States. Two groups of water bodies are regulated; "traditionally navigable waters" under Section 10 of the Rivers and Harbors Act of 1899 and "waters of the United States" under Section 404 of the Clean Water Act. In western North Dakota and eastern Montana "Section 10" waters include only the Missouri River and the downstream portion of the Yellowstone River. Neither of these rivers are being crossed by the proposed Project.

On April 21, 2020 the USACE in conjunction with the US Environmental Protection Agency and the US Department of Defense published a new definition of "Waters of the United States" (WOTUS) which became effective June 22, 2020. *See*, 85 Fed. Reg. 22250 (April 21, 2020) [1]. The revised definition of WOTUS is far narrower and more limited than the prior definition. "Waters of the United States" are now defined as territorial seas, traditional navigable waters and tributaries to those waters, lakes, ponds, and impoundments of jurisdictional waters, and wetlands adjacent to jurisdictional. Wetlands, unless directly adjacent to a traditional navigable water, tributary, or lake, pond or impoundment of a jurisdictional water, are no longer regulated by the USACE.

On April 21, 2020 Keitu held a telephone consultation with the USACE North Dakota Regulatory Office Program Manager Patricia McQueary to confirm the rule's new interpretation and application. Keitu forwarded Ms. McQueary a summary of the discussion via email to confirm key points of this discussion.

The Project does not cross a navigable water i.e. Section 10 waterbody; nor does it cross a tributary to a Section 10 water or their adjacent wetlands i.e. Section 404 waterbody under the new definition of WOTUS. Therefore, USACE permitting for waterbody crossings is not required for the Project.

[1]

https://www.epa.gov/sites/production/files/202001/documents/navigable_waters_protection_rule_publication.pdf.

With respect to wetlands and waterbodies non-jurisdictional to USACE, the Project crosses 5 named creeks and 35 other wetland or waterbodies according to the USFWS National Wetland Inventory accessed in March 2020. The table below describes the location of the named creeks within the Project Corridor. See the Mapbook in Exhibit A for the location of the wetland and waterbodies.

| Table 5.1.1 Creeks | | |
|-------------------------------|-------------------|----------------------|
| Stream ID | Creek Name | Length (Feet) |
| STR 1 | North Fork Creek | 20.31 |
| STR 2 | Seven Mile Creek | 3.82 |
| STR 3 | Spring Creek | 17.42 |
| STR 4 | Elkhorn Creek | 2.14 |
| STR 5 | Cherry Creek | 13.07 |

Construction of the Project will not result in the permanent drainage or filling of wetlands or waterbodies. Bridger previously has and will continue to horizontally directionally drilled (HDD) any waterbodies with standing water and adjacent wetlands in the Project Corridor.

5.2 Vegetation Inventory

Botany surveys were performed along the Survey Area in McKenzie County in August 2020. Two surveyors conducted a thorough inspection of private land, which consisted of cropland, rangeland, and pastureland.

The Project Corridor crosses predominantly agricultural land, which is discussed in detail in Section 6.18.1. Crested wheatgrass (*Agropyron cristatum*) and smooth brome (*Bromus inermis*) were primarily found in abundance throughout the majority of the route. Other grasses that were commonly identified were: blue grama (*Bouteloua gracilis*), side oats grama (*Bouteloua curtipendula*), little bluestem (*Schizachyrium scoparium*), western wheatgrass (*Agropyron smithii*), Indian grass (*Sorghastrum nutans*), prairie junegrass (*Koeleria macrantha*), and needle and thread grass (*Hesperostipa comate*). Other vegetation often found established in the Survey Area include alfalfa (*Medicago sativa*), big sagebrush (*Artemisia tridentata*), cudweed sagewort (*Artemisia ludoviciana*), fringed sagewort (*Artemisia frigida*), curlycup gumweed (*Grindelia squarrosa*), kochia (*Kochia scoparia*), yellow sweetclover (*Melilotus officinalis*), purple prairie clover (*Dalea purpurea*), purple coneflower (*Echinacea angustifolia*), prairie coneflower (*Ratibida columnifera*), prairie rose (*Rose arkansana*), prickly pear cactus (*Opuntia humifusa*), yucca (*Yucca glauca*), silver leaf scurfpea (*Pediomelum argophyllum*), common yarrow (*Achillea millefolium*), creeping juniper (*Juniperus horizontalis*), silver buffaloberry (*Shepherdia argentea*), chokecherry (*Prunus virginiana*), cottonwood (*Populus deltoides*), and western snowberry (*Symphoricarpos occidentalis*).

No sensitive, threatened, or endangered plant species were detected in the Survey Area.

5.3 Wildlife Inventory

Investigations were conducted on potential impacts the Project could inflict upon wildlife. Prior to field surveys, information was gathered from a variety of sources to compile data on the existing status of wildlife within the Survey Area. These sources included Geographic Information System (GIS) database review, literature, and personal communications with the North Dakota Game & Fish (NDGF), the USFWS, and the North Dakota Parks and Recreational Department (NDPRD). Prior to field surveys, Keitu reviewed in-house GIS data that includes information updated annually from the USFS, USFWS, and NDGF on known locations of sensitive species. Field surveys were conducted on the Study Area via foot and via all-terrain vehicle. Field data was collected with a Trimble GEOXH 6000 GPS.

Common terrestrial wildlife identified in the Study Area included coyote (*Canis latrans*), thirteen-lined ground squirrel (*Ictidomys tridecemlineatus*), ring-necked pheasant (*Phasianus colchicus*), sharp-tailed grouse (*Tympanuchus phasianellus*), Hungarian partridge (*Perdix perdix*), whitetail deer (*Odocoileus virginianus*), mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), various songbirds, migratory waterfowl, and raptors. Wildlife species on the North Dakota Species of Conservation Priority list that were documented during 2020 field surveys included bobolink (*Dolichonyx oryzivorus*), sharp-tailed grouse (*Tympanuchus phasianellus*), Northern harrier (*Circus cyaneus*), chestnut-collared longspur (*Calcarius ornatus*), grasshopper sparrow (*Ammodramus savannarum*), and black-tailed prairie dog (*Cynomys ludovicianus*).

The black-footed ferret is listed as an endangered species under the Endangered Species Act. The black-footed ferret was historically found across the Great Plains but has since been extirpated from North Dakota primarily due to poisoning of prairie dog colonies, conversion of native prairie to tilled agriculture, and disease. Black-footed ferrets rely on prairie dogs as their main source of sustenance and a single ferret may eat over 100 prairie dogs annually. It is estimated that a minimum 9,884 acres will support a viable population of black-footed ferrets. There were no prairie dog colonies located within the Study Area.

Sharp-tailed Grouse are a state species of Conservation Priority, Level II in North Dakota. A Level II species are those having a moderate level of conservation priority or a high level of conservation priority but a substantial level of non-state wildlife grant funding is available to them. A Sharp-tailed Grouse lek survey was completed in April 2020 to confirm the presence of one active lek within the study area, located on private land. Additionally, one historical lek location was determined to be inactive during the April 2020 survey. Both leks are located in the area of the conversion line, there will be no active construction and they are not located within the permanent ROW.

The North Dakota raptor species of concern detailed by the NDPRD, Natural Heritage Inventory (NHI) with potential to be located in Golden Valley and McKenzie Counties include the following: bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), Swainson's hawk (*Buteo swainsoni*), merlin (*Falco columbarius*), prairie falcon (*Falco mexicanus*), turkey vulture (*Cathartes aura*), American peregrine falcon (*Falco peregrinus anatum*), and the burrowing owl (*Athene cunicularia*).

An aerial raptor and nest survey was conducted on January 20 and 21, 2020. During the aerial survey, three surveyors (seated in front-left, rear-left, and rear-right positions of the helicopter) thoroughly examined the area within a 2-mile-wide survey corridor to locate raptors and raptor nests. The survey methods were consistent with the USFWS survey protocols. Complete survey coverage was obtained by traversing the survey corridor focusing on areas likely to contain nests including woody draws and steep bluff faces while visually scanning all areas of potential nesting habitat. Locations of NDGF and USFS

shapefiles depicting previously known raptor nests were also focused on. When a possible nest was discovered, the helicopter would slow to a hover, at a distance great enough to prevent flushing if the nest was occupied and in the shortest amount of time needed to determine condition, type of nest, contents, and obtain accurate GPS location coordinates. The timing of the survey was conducive to locating nests in deciduous trees as "leaf out" had not occurred at this time.

No occupied nests were found during the survey. One unoccupied nest was recorded within the 2 mile corridor (see Exhibit A). While it is impossible to say with certainty that raptors will not occupy the recorded empty nests in the near future, based on the size and condition of the nest, it would be improbable. Per USFWS "Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances", short-term land use and human activities may progress near a nest or nest territory designated as unoccupied. For long-term use activities, unoccupied nests should be conserved as recommended by the USFWS (see Table 5.3). Unoccupied nests of species which are not raptors of concern should be conserved for a minimum of five years.

| Table 5.3 | | |
|---|---------------------------------|-----------------------|
| Recommended conservation periods for unoccupied nests of Raptor Species of Concern¹ | | |
| Species | | Years |
| Bald Eagle | <i>Haliaeetus leucocephalus</i> | 5 |
| Northern Harrier | <i>Circus cyaneus</i> | Habitat Conservation* |
| Northern Goshawk | <i>Accipiter gentilis</i> | 3 |
| Swainson's Hawk | <i>Buteo swainsoni</i> | 3 |
| Ferruginous Hawk | <i>Buteo regalis</i> | 5 |
| Golden Eagle | <i>Aquila chrysaetos</i> | 10 |
| Peregrine Falcon | <i>Falco peregrinus</i> | Indefinite |
| Flammulated Owl | <i>Otus flammeolus</i> | 5* |
| Burrowing Owl | <i>Athene cunicularia</i> | 5* |
| Short-Eared Owl | <i>Asio flammeus</i> | 3 |

*Species may not return to individual nest, but may nest in aggregates in suitable habitat
¹ U.S. Fish and Wildlife Service, Region 9. 2008. Guidelines for Raptor Conservation in the Western United States.

No raptor species of concern were observed during the survey. However, if an occupied nest is spotted during construction, a construction buffer zone will be required. The length of the buffer zone will be dependent on the species identified, consistent with USFWS guidance.

Findings are electronically presented as ESRI ArcGIS software compatible data files in Exhibit D.

5.4 Exclusion Areas

Exclusion Areas are geographic areas that must be excluded in the consideration of a route for a transmission facility. A corridor may contain an Exclusion Area; however, Exclusion Areas may not encompass more than 50 percent of the Project corridor width at any point, unless there is no reasonable alternative. Exclusion and Avoidance Areas are shown in Tables 5.4 and 5.8 below.

Exhibit A contains maps depicting Exclusion and Avoidance Areas along the Survey Area.

| Table 5.4 Exclusion Areas NDPSC Certificate of Corridor Compatibility and Route Permit | | | |
|--|--|-------------------------------------|--|
| Exclusion Area | Located within the Project Corridor | Crossed by Project Route | Description of Exclusion Area and Proposed Buffer |
| National Parks, Memorial Parks, Historic Sites and Landmarks, Natural Landmarks, Monuments, and Wilderness Areas | None | None | |
| State Parks, Historic Sites, Monuments, Historical Markers, Archaeological Sites, Nature Preserves | None | None | |
| County Parks and Recreation Areas, Municipal Parks, Parks Administered by other Governmental Subdivisions | None | None | |
| Areas Critical to the Life Stages of Threatened or Endangered Animal or Plant Species | None | None | |
| Areas Where Animal or Plant Species Unique or Rare to the State Would be Irreversibly Damaged | None | None | |
| Areas Within 1,200 Feet of an ICBM Launch or Launch Control Facility | None | None | |
| Areas Within 30 Feet of a Direct Line Between ICBM Launch or Launch Control Facilities to Avoid Microwave Interference | None | None | |

5.5 Federally Protected Species Review

Keitu consulted NDGF, USFWS, and the NDPRD NHI references to identify species and ecologically significant habitats within the Project Corridor. Possible areas of concern referenced were federally listed endangered, threatened, candidate, sensitive, or watch species, state-listed protected species, and critical habitat that is located on or within the Project Corridor.

The NDGF was provided with the proposed route and after review stated, "We do not believe this project will have significant adverse effects on wildlife or wildlife habitat, including species of conservation priority, provided these recommendations were implemented where appropriate during project construction."

Additional Comments

Field surveys were conducted in the summer of 2020 of the Survey Area for botany and in the one-mile Study area for wildlife. No sensitive wildlife or botany issues were identified. The results of this field survey are presented in Section 5 as part of this consolidated permit application.

5.5.1 Federally Listed Wildlife Species

The following are federally listed Wildlife Threatened and Endangered Species listed from the USFWS Information and Planning Consultation tool for the proposed project area.

Pallid Sturgeon

Pallid sturgeons inhabit the bottoms of large, shallow, silty rivers with sand and gravel bars of the Missouri and Yellowstone Rivers in North Dakota. The Project is located outside of Pallid sturgeon habitat. The Study Area does not encompass the Missouri and/or Yellowstone Rivers or shallow rivers with sand or gravel bars, to provide suitable habitat for this species.

Whooping Crane

The whooping crane migrates through the west central counties of North Dakota during the spring months of April through May and the fall months September through October. Primary breeding grounds are located at Wood Buffalo National Park in Canada's Northwest Territories and migrate to Aransas National Wildlife Refuge in Texas. Whooping crane detections are distributed over all 53 counties in North Dakota. Whooping cranes prefer shallow wetlands, such as prairie potholes, associated with cattails, bulrushes, and sedges and feed in cultivated fields. No whooping cranes were observed during the field survey. Cultivated land does exist within the survey corridor; however, wetland habitat is sparse.

Dakota skipper

In North Dakota, Dakota skippers can be found within two general habitat types classified by the USFWS, "Type A" and "Type B". Type A consists of low-lying, wet-mesic prairie with little topographic relief that occurs on near-shore glacial lake deposits. Type A habitat does not exist within the Survey Area. Type B habitat for the Dakota skipper typically supports a high diversity and abundance of native forbs in rolling dry prairies. Type B habitat occurs within the conversion line study area but not within the new construction, since no construction is taking place in these areas there will be no impact to Type B habitat. These two types of native prairie habitat are important for the Dakota skipper because they provide valuable nectar sources through native forbs and are difficult to re-establish once degraded or disturbed. The Dakota skipper in western North Dakota inhabits native prairie on rolling terrain over gravelly glacial moraine dominated by little bluestem, as well as big bluestem, needlegrasses, or porcupine grasses. Dakota skipper detections are distributed over five counties in North Dakota.

Northern Long-eared Bat

The northern long-eared bat is currently listed by the USFWS as threatened in North Dakota. On April 2, 2015, the USFWS published the final listing in the Federal Registrar with an effective date of May 4, 2015. The USFWS listed the northern long-eared bat as threatened and chose to exercise the option of issuing an interim 4(d) rule to allow for more flexible implementation of the ESA. The 4(d) rule reduces ESA conflicts by allowing some activities that do not harm the species to continue while focusing efforts on threats that make a difference in the species' recovery.

This bat species occupies a wide range of rocky and forested habitats. Summer day roosts include abandoned buildings, bridges, hollow trees, stumps, and under loose bark, and rock fissures. There are no known hibernacula for the northern long-eared bat in North Dakota, due to either no suitable hibernacula present or a lack of survey effort. Suitable winter habitat for northern long-eared bats consist of caves and abandoned mines of which neither occur in the Action Area. However, nearby trees and rocky outcrops can act as suitable summer day roosts.

Piping Plover

The piping plover is a small shore bird that inhabits barren sand and gravel shorelines of lakes and rivers

and avoids dense vegetation. The breeding season is from late April to early August in areas in North Dakota that include the shores of the Missouri and Yellowstone Rivers and the prairie wetlands in the Missouri Coteau. Piping plovers that summer in the northern plains, winter in the Gulf of Mexico. They rarely stop during migration and may travel from breeding to wintering grounds in as little as one nonstop flight. More than three-fourths of piping plovers in North Dakota nest on prairie alkali lakes, while the remaining are found along the Missouri River. Piping Plover Designated Critical Habitat consists of prairie alkali wetlands and surrounding shoreline; river channels and associated sandbars and islands; reservoirs and inland lakes and their sparsely vegetated shorelines, peninsulas and islands. Piping plover detections are distributed over 25 counties in North Dakota. The nearest Designated Critical Habitat is approximately 12.5 miles east of the Project. No piping plovers or active nesting sites were observed during the field surveys.

Red Knot

The rufa red knot utilizes North Dakota as migration stopover in the spring and fall. Migration occurs over long distances annually between its breeding ground in the Canadian Arctic and several wintering regions, including the southeast United States, the northeast Gulf of Mexico, northern Brazil, and Tierra del Fuego at the southern tip of South America. The Yellowstone River is 20 miles to the northwest of the project and the Missouri River is 12.5 miles to the east. Red knot detections are distributed over 25 counties in North Dakota. In North America, the red knot is commonly found along sandy, gravel, or cobble beaches, tidal mudflats, salt marshes, shallow coastal impoundments and lagoons, peat banks. The primary food items for the red knot in non-breeding habitats include blue mussels, juvenile mussels, clams, snails, polychaete worms, insect larvae, and crustaceans. Red knots migration is sporadic and uncommon but the potential exists that they may use wetlands found in the action area for stopover habitat. Potential stopovers for Red Knot are few, small, and distant with no known records in McKenzie County.

5.6 Areas Where Unique or Rare Species Would Be Irreversibly Damaged

Based upon agency correspondence and field surveys, the proposed Project will not result in irreversible impacts that are detrimental to sensitive plant and animal species or their habitats.

5.7 Areas within 1,200 Ft of ICBM Facility or 30 Ft of Direct Line of IBM Launch Facility

Based on available information, the Air Force has no Intercontinental Ballistic Missile (ICBM) launch or launch control assets within the Project area. An email was sent to the U.S. Air Force on April 14, 2020 and an email response was received on April 15, 2020 that there are no assets near the Project.

5.8 Avoidance Areas

Avoidance Areas are areas that may not be considered in the routing of a transmission facility unless it is shown that there is no reasonable alternative under the circumstances. A buffer zone of a reasonable width to protect the area must be included. A corridor may contain Avoidance Areas as long as the Avoidance Areas do not encompass more than 50 percent of the Project Corridor width at any point, unless no reasonable alternative exists. The following table identifies and discusses Avoidance Areas within the Study Area.

One category of Avoidance Areas was identified within the Project Corridor (see Table 5.7 below). Two (2)

historical resources were identified in the archeological report. The Avoidance Areas do not encompass more than fifty percent of the width of the corridor.

| Table 5.8 Avoidance Areas | | | |
|--|--|---------------------------------|---|
| Avoidance Area | Located within the Project Corridor | Crossed by Project Route | Description of Avoidance Area and Proposed Buffer |
| National Historic Districts, Wildlife Areas, Wild, Scenic, or Recreational Rivers, Wildlife Refuges, Grasslands | None | None | |
| State Wild, Scenic or Recreational Rivers, Game Refuges, Game Management Areas, Management Areas, Forests, Forest Management Lands, Grasslands | None | None | |
| Historical Resources not specifically designated as Exclusion or Avoidance Areas | Yes (2) | None | Will not affect project but should be aware of for maintenance. |
| Geologically Unstable Areas | Yes (1) | Yes (1) | Located in the conversion line area. |
| Within 500 Feet of a Residence, School, or Place of Business | None | None | |
| Reservoirs and Municipal Water Supplies | None | None | |
| Water Sources for Organized Rural Water Districts | None | None | |
| Irrigated Land | None | None | |
| Areas of Recreational Significance Not Designated as Exclusion Areas | None | None | |

5.9 Federal Resource Review

A review of public available data and field studies of the Project Corridor was conducted to confirm the presence or absence of registered historic districts, wildlife areas, wild, scenic or recreational rivers, wildlife refuges, or grasslands within the Study Area or crossed by the Project Route. This review confirmed the absence of designated or registered national historic districts, wildlife areas, wild, scenic or recreational rivers, and wildlife refuges within the Project Corridor or crossed by the Project route.

5.10 State Resource Review

A review of publicly available information was conducted and confirmed the absence of designated or registered state wild, scenic, or recreational rivers, forests, forest management lands, or grasslands within the Project Corridor or crossed by the Project route.

5.11 Local Resource Review

A review of publicly available information was conducted and confirmed the absence of designated or registered local (municipal and county) parks and recreational areas within the Project Corridor or crossed by the Project route.

5.12 Historical Resources Not Designated as Exclusion/Avoidance Areas

Keitu Engineers & Consultants, Inc. has hired Beaver Creek Archaeology, Inc. (BCA) on behalf of Bridger to conduct a Class I file search, a Class III intensive cultural resource inventory, and cultural resource survey report for submittal to the North Dakota State Historic Preservation Office (SHPO). The survey area is comprised of a 300' wide corridor mapped along the route of the planned pipeline. The survey corridor is 29-miles long (1,044 acres), of which 437 acres were previously surveyed for different projects. As a result, a total of 611 acres were inventoried during the current undertaking.

The Class I file search revealed 81 sites, seven site leads, and 75 isolated finds within a one-mile radius of the Project Corridor. Twelve of the previously recorded cultural resources were located within the Project Corridor and were revisited and updated during the current undertaking. These cultural resources include one historical/architectural site, four historical sites, one prehistoric stone feature site, and six prehistoric isolated finds. The 11 historical/architectural, historical, and prehistoric isolated finds are recommended to remain listed as ineligible for the National Register of Historic Places (NRHP). As such, no avoidance measures are deemed necessary. The prehistoric stone feature site, 32MZ3129, is recommended to remain listed as unevaluated for the NRHP and site avoidance is deemed necessary. As the site is located within 100' of the permanent easement, the distance between the site boundary and any potential future maintenance is sufficient avoidance and no additional avoidance measures are deemed necessary.

During the pedestrian survey, three new cultural resources were encountered and recorded within the Project Corridor, including one historical site, one prehistoric stone feature site, and one prehistoric isolated find. The historical site (32MZ3409) and isolated find (32MZx1777) have been recommended as not eligible for the NRHP and no avoidance measures are deemed necessary. Site 32MZ3410, the prehistoric stone feature site, has been recommended as unevaluated for the NRHP and site avoidance is recommended. As the site is located within 71' of the permanent easement, the distance between the site boundary and any potential future maintenance is sufficient avoidance and no additional avoidance measures are deemed necessary.

Consequently, as long as sites 32MZ3129 and 32MZ3410 are avoided by the aforementioned avoidance measures, BCA recommends a finding of No Historic Properties Affected for this project as currently planned. The Class III Cultural Resource Inventory report had been submitted to NDSHPO and a letter of concurrence was received from the NDSHPO.

A copy of BCA's report is presented in Exhibit B.

5.13 Geologically Unstable Areas

There are three major phenomena associated with seismic hazards: faults, seismicity, and ground motion. A fault is a fracture along which the blocks of crust on either side have moved relative to one another parallel to the fracture. Rapid slippage of blocks of crust past each other can cause energy to be released, resulting in an earthquake. No active faults have been identified in the Study Area, according to the USGS Geologic Hazards Science Center. An active fault is one in which movement can be demonstrated to have taken place within the last 10,000 years.

North Dakota historically contains little earthquake activity and is therefore not in an area of seismicity. The USGS ground motion hazard mapping indicates that potential ground motion hazard in the Project Study Area is low. The hazard map uses estimated peak ground acceleration expressed as a percentage of the acceleration due to Earth's gravity.

In North Dakota, most flooding occurs in the spring, when the winter snow cover melts. While flooding is generally considered a geologic hazard, the potential for a flood to negatively impact the Project is minimal. No part of this line is located in a ND floodplain.

The North Dakota Geological Survey offered a review of potential landslide areas along the proposed route, providing a map of susceptible areas. A desktop review based on GIS data, NRCS soil map data and topographic information identified 13 landslide areas within the Study Area, one is crossed by the proposed pipeline route. See Table 5.13 and subsequent discussion of each area.

One (1) area is within the Project Corridor and cannot be definitively eliminated based on this generalized data, this area is located within the conversion portion of the Project. If maintenance requires the line to be exposed this area will be evaluated at that time.

| Table 5.13 Landslide Prone Areas | | | |
|---|---------------------------------|-------------------------------------|------------------------------|
| Area | Latitude & Longitude | Crossed by Project Route | Initial Determination |
| A | 47.766133°, -103.128815° | Yes | Further Assessment Required |

5.14 Areas within 500 Feet of a Residence, School, or Place of Business

There are no inhabited residences within five hundred feet of the Project route.

5.15 Reservoirs and Municipal Water Supplies

The closest North Dakota cities to the Project are Watford City and Keene located in McKenzie County. These cities water is not supplied by aquifers. McKenzie County Water Resource District purchases its water from the Western Area Water Supply Authority (WAWSA). WAWSA is fed by the Missouri River and the water is treated at the Williston Treatment Plant.

Within the Study Area, the Cherry Creek aquifer system is the most common source of water supply wells. These water wells are most likely used for private domestic, livestock and industrial purposes.

This line does not cross any reservoirs or municipal water sources. The proposed Project will not adversely affect any reservoirs or municipal water supplies.

5.16 Water Sources for Organized Rural Water Districts

Within McKenzie County, groundwater uses are intended for domestic, livestock and industrial purposes. Most groundwater is derived from precipitation. Excess water infiltrates down until it reaches the zone of saturation, at which time it becomes accessible to wells. Most aquifers occur in the Fox Hills, Tongue River, Fort Union, and Sentinel Butte Formations. Maximum potential yields of these aquifers range from around 50 gal/min to as much as 500 gal/min. The water from these aquifers are commonly soft to very hard and contain sodium bicarbonate.

Per the ND DEQ Interactive Viewer of Wellhead/Source Water Protection Areas, this Project will not affect any wellhead or source water protection areas

This Project is not expected to impact North Dakota ground water quality.

5.17 Irrigated Land

The Project will not impact irrigated lands. Land that is most efficient for irrigation is relatively level and has soils that are well drained and highly permeable. The route crosses silt and clay soils which contain low permeability, making them unsuitable for irrigated agriculture. A desktop survey of Google Earth and field survey confirms the absence of irrigated lands within the Survey Area.

5.18 Areas of Recreational Significance but Not Designated Exclusion Areas

Areas of recreational significance are not located within the Project Corridor or crossed by the Project Route.

5.19 Selection Criteria

The NDPSC's rules specify Selection Criteria to be considered in designating a pipeline corridor or route. Specifically, the NDPSC considers whether adverse effects from the location, construction, and maintenance of the facility as they relate to these criteria, will be at an acceptable minimum, and whether these effects will be managed and maintained at an acceptable minimum.

The Selection Criteria that were considered for the Project include:

- Agricultural Production
- Family Farms and Ranches
- Land Suitable for Irrigation
- Surface Drainage and Groundwater Flow Patterns
- Sound Sensitive Areas
- Visual Effects
- Extractive and Storage Resources
- Wetlands, Woodlands, and Wooded Areas
- Communication or Electric Control Facilities
- Human Health and Safety
- Animal Health and Safety
- Plant Life

The following sections discuss the potential impacts and measures to avoid or minimize the impacts related to each of the Selection Criteria.

5.19.1 Agricultural Impacts

A small portion of the Project (2.4 miles) will be installed within a new ROW in McKenzie County in northwestern North Dakota. A significant portion of the Project route crosses agricultural and pasture lands where crop and livestock production are the extensive economic activity. Land use along the entire route is comprised of approximately 6 miles agricultural land and 23 miles pasture or rangeland. The primary crops cultivated in the area include hay fields, oats, sunflowers, and alfalfa.

Pipeline construction may result in minimal temporary effects on agricultural land use. However, Bridger will institute appropriate management practices to restore all areas to pre-construction conditions, to the extent reasonably practicable.

Bridger will require that construction equipment be cleaned before arriving on site to prevent the introduction of undesirable species to the surrounding ROW. Bridger will implement the following mitigation measures when undesirable species are found within the construction ROW:

- Bridger will make an effort to prevent the spread of noxious weed seeds during clearing and grading activities, and will use straw mulch and seed mix that are free of noxious weed seed to re-vegetate the ROW. Contractors and construction inspectors will receive information to help them identify noxious weeds. Bridger will also utilize environmental inspectors to help identify and prevent the spread of undesirable species.

- During pre-construction walkovers, Bridger's environmentally trained inspectors may flag and document areas containing noxious weeds. The construction crews are informed of these areas. Bridger instructs the contractors to minimize the amount of construction equipment and limit the number of passes by this equipment through infested areas. Construction mats are used to minimize the transport of weed seed or plant material via construction equipment.

- Equipment and construction mats are cleaned immediately after passing through infested areas. Cleaning consists of removing large soil clods and/or plant parts from the equipment and construction mats using shovels and brooms and, when necessary, washing the equipment with water or cleaning using compressed air. Soil and water from cleaning activities are not allowed to flow to non-infested areas.

The pipeline will be installed at a depth that exceeds the typical tillage depth. Following construction, agricultural lands will be returned to pre-construction conditions to the extent reasonably practicable. Therefore, the Project is not anticipated to interfere with normal agricultural operations on cropland after construction. Construction operations are expected to be conducted after the harvest season and prior to the growing season when feasible. Therefore, minimal disruption to agricultural production is anticipated.

Above-ground facilities on cropland are limited to line markers and cathodic protection rectifiers, valves, pig launchers, and receivers. Therefore, the Project will result in minimal long-term loss of farmland use. Bridger will consult with landowners to place above-ground appurtenances in areas that cause the least amount of disturbance to landowner operations. Landowners will be compensated by either long-term lease agreements or by the purchase of the land for these sites.

Prime farmland is not located within the project corridor and will not be affected by this project.

The Project will not generate negative effects for agricultural land use such as landscape modifications or an introduction of noxious weeds or invasive species when agricultural areas are reclaimed. Bridger will continue to implement mitigation post project construction

5.19.2 Family Farms and Ranches

The construction activity will not alter the patterns of landownership or create long-term disruptions of family farming operations. The construction zone will be located in the northern 2.4 miles of the total line. Bridger's crop loss compensation program will compensate landowners if any crop damage were to occur during construction. Crop damage resulting from future pipeline maintenance and repairs will also be addressed by Bridger. All maintenance equipment used will be limited to access routes in agreement with the landowners to minimize disruption to soil, drainage, and crops.

Construction of the Project pipeline will have maintenance activity required, which could have an indirect short-term disruption to livestock operations, and inconvenience to farm activities. Bridger will work to minimize interference while in operation.

5.19.3 Land Suitable for Irrigation

Land that is most efficient for irrigation is relatively level and has soils that are well drained and highly permeable. The route crosses silt and clay soils which contain low permeability, making them unsuitable for irrigated agriculture.

Both the desktop survey using information available on the North Dakota GIS system and as confirmed by a field on-foot survey of the route confirms the absence of irrigated lands within the Survey Area. No aboveground irrigation systems were identified along the route. No Landowners identified irrigation systems on their properties.

5.19.4 Surface Drainage and Groundwater Flow Patterns

Because the project consists almost exclusively of underground pipe, the Project will not alter surface drainage patterns. Aboveground apertures such as cathodic test stations, rectifiers and pig launchers and receivers are isolated along the route and have a minimal aboveground presence that they will not alter surface drainage. The underground depth of pipe is well above the local groundwater table elevation except in very limited areas where bored beneath standing water. Since pipe is placed well below standing water, no impact to flowing surface water that occurs relative to the minor protuberances into the topmost aquifers which intersects with streams, the overall cross section area of pipe through these areas is "de minimus" compared to the acres of hydraulic surface involved. Consequently, the Project will not have any measurable impact on the average flow rate nor pattern of groundwater flow.

In the unlikely case that streams, swales, ditches, or other natural drains were altered during the Project, they will be restored as best as practical to pre-construction conditions.

5.19.5 Sound-Sensitive Land Uses

There are no inhabited residences located within 500 feet of the Pipeline Route.

5.19.6 Visual Effect on Adjacent Areas

The aboveground structures associated with the pipeline will be finished with "earth-toned" painted surfaces. These structures are common throughout the landscape and not considered to be obtrusive.

Surface facilities to be installed along the route will be limited to valves, pig launchers and receivers, pipeline markers, and rectifiers.

Other than these permanent above-ground facilities, the Project's impacts to visual effects will be limited to periods of construction activities.

5.19.7 Extractive and Storage Resources

No extractive or storage resources were identified which would be affected by the Project. Due to the narrow and linear nature of the pipeline ROW, future extractive development will not be substantially affected by the Project.

5.19.8 Wetlands, Woodlands, and Wooded Areas

Bridger, through its consultants, conducted a desktop survey using aerial photographs and USGS topographic maps identifying wetlands along the Project Corridor.

No wetlands or waterbodies will be permanently drained or filled as part of the Project, and no future effects are anticipated. Construction of the Project will not result in the permanent drainage or filling of wetlands.

No fertilizer, lime, or mulch would be applied in wetlands as part of the Project. The long-term operation and maintenance of the pipeline will not have adverse effects on wetland function or value as all features through wetlands are underground.

During Keitu's work, 3 upland tree areas were geographically referenced within the 2.4 mile new construction Survey Area. Keitu recorded all trees with a diameter breast height of 1 inch or greater. It was determined that approximately 500 trees, saplings, or shrubs are located within the 300-foot-wide Survey Area.

Tree rows and woody areas occur in limited amounts, as isolated islands or rows throughout the Project area. The route crosses through wooded areas on rangeland. Wooded habitat provides shelter and safety for a number of wildlife species. Any trees will continue to be protected to the extent practicable in a manner compatible with safe operation, maintenance, and inspection of the pipeline.

Impacts to trees will be avoided to the extent practicable in a manner compatible with safe operation, maintenance, and inspection of the pipeline. It may become necessary to clear some mature trees during construction; however, Bridger will work with the appropriate state agencies and private landowners to determine appropriate replacement measures following construction.

Bridger will satisfy the tree replacement requirements agreed upon by the ND PSC.

5.19.9 Radio and TV Reception and Other Communication or Electronic Facilities

No impacts on television or radio reception or communication or electronic control facilities are anticipated as a result of the Project.

5.19.10 Human Health and Safety

Bridger Pipeline LLC is part of the True Companies of Casper, Wyoming operating in western North Dakota, eastern Montana and Wyoming. By building and operating this extensive network, Bridger has become one of the largest pipeline companies in North Dakota and is very experienced in managing construction and operating pipeline systems that protect the public's health and safety.

5.19.11 Animal Health and Safety

Construction activity within the Project Corridor will have temporary impacts on domestic animals and wildlife. The clearing of vegetation will temporarily reduce cover, nesting, and foraging habitat for some species. However, species will generally move into adjacent habitats, away from the disturbance area. Once habitat alterations are reclaimed, wildlife is anticipated to reestablish within the area.

Project trenching activities and associated spoil piles may result in a short-term barrier restricting the movement of some wildlife species (typically two to four weeks at any one area). Except for short-term interruptions during construction, existing public roads, farm lanes, and livestock crossings will be kept open, providing crossing access for wildlife. During construction, Bridger may erect temporary fencing, as necessary, to keep livestock and wildlife away from the pipeline trench, and will minimize the length of time the trench is left open.

5.19.12 Plant Life

The Project is not anticipated to permanently impact plant life, however in areas where vegetation has to be removed to perform inspection or maintenance activities, it will be reestablished to regulation standards from county agencies and the satisfaction of landowners. Permanent impacts on vegetation are not anticipated.

5.20 Policy Criteria

5.20.1 Location and Design

Bridger believes that the Project utilizes an optimal alignment.

Bridger engaged consultants to conduct environmental desktop studies, field studies, and a Class I and III archeological study. The purpose of these studies is to avoid known plants, wildlife habitats, or cultural resources to avoid damage to these areas.

Construction of the Project will involve the installation of 16-inch nominal diameter, steel, API-5L, PSL2, Grade X-52 ERW Line Pipe with a nominal wall thickness of 0.31 inches. Bore pipe will have a nominal wall thickness of 0.5 inches. The MOP of the pipeline will be 1,440 psig. Normal operating pressure will be 600 psig.

Valves will be 16-inch ANSI 600 manufactured in accordance with API Standard 6D "API Specification for Steel, Gate, Plug, Ball and Check Valves for Pipeline Service." Valves will be installed pursuant to US DOT regulations. The MOP of the valves will be 1,480 psig.

The steel pipe utilized for construction of the Project will meet US DOT criteria outlined in 49 C.F.R. § 195.100. The Project will be constructed per 49 C.F.R. § 195.200 and will be operated and maintained per 49 C.F.R. § 195.400.

The Project is designed and will be operated in a manner that meets or exceeds state and federal engineering, safety and operational design standards.

5.20.2 Training and Utilization of In-State Labor

During construction, skilled and unskilled labor, both local and non-local, will be employed to construct the pipeline. Bridger, as operator of the Project, has established a comprehensive orientation, technical, safety, emergency, and on-the-job training program that is in compliance with the Operator Qualification rules issued by PHMSA under 49 C.F.R. Part 195. As personnel progress in pipeline operation and maintenance positions, they receive hundreds of hours of formal and on-the-job training. Demonstrations of competence are shown through reviews of job performance, periodic pipeline control system simulations, emergency exercises, welding certification tests, and other functions required to continue safe pipeline operation and maintenance.

5.20.3 Economies of Construction and Operation

The Project is believed to be the most cost-effective and operationally sound means of meeting Bridger's delivery obligations.

5.20.4 Use of Citizen Coordinating Committees

No Citizen Coordinating Committee is anticipated as a result of the Project. Bridger does not believe that a Citizen Coordinating Committee is necessary given the Project is located in an area of the state where crude oil gathering and transmission pipelines already exist. As such, the public is familiar with the permitting, construction, and operation of pipeline facilities.

5.20.5 Commitment of Portion of Transmitted Product for Use In-State

Bridger does not own any of the crude petroleum transported in its pipeline system and does not determine markets or destinations for petroleum commodities.

5.20.6 Labor Relations

The Project will have no anticipated effect on labor relations within North Dakota.

5.20.7 Coordination of Facilities

The 8-inch line and associated pumping, control and operating systems is used in conjunction with other segments of the Bridger pipeline network to optimize system capacity.

5.20.8 Monitoring Impacts

Any construction-related impacts will be mitigated through the use of best management practices, appropriate construction techniques, and environmental inspection during and following completion of

construction. Following construction, a thorough inspection will be performed to ensure restoration efforts were successful. Monitoring and treatment of noxious weeds and/or invasive species will be conducted on an annual basis to ensure a high degree of control and maximize treatment effectiveness.

5.20.9 Using Existing and Proposed ROWs and Corridors

The Project will be constructed in a 100-foot wide temporary construction ROW. Bridger has acquired 50-foot wide permanent easements for the Project. Approximately 92% of the Project is an existing pipeline.

The conversion of the pipeline from a gathering to transmission function do not require the installation of additional pipe. Additional temporary workspace will be kept to the minimum necessary to safely conduct work for any future maintenance or construction.

For the remaining 8% of the Project, Bridger will acquire the right to utilize additional temporary workspace from the landowners, where necessary. The use of unauthorized workspace will be prohibited without the landowner's approval. In all cases, the amount of additional temporary workspace utilized will be kept to the minimum necessary to safely conduct work.

5.20.10 Other Existing or Proposed Transmission Facilities

Drilling activity in the service area of the pipeline has declined under current market conditions and as other areas in the state are currently more profitable. However, as oil prices have recovered from 2020 lows, production is expected to return to growth mode within 2 years. Bridger continues to evaluate the need for additional transmission facilities within the region and will pursue development as needed."

6 AGENCY NOTIFICATIONS AND PERMITTING

In April 2020, Keitu contacted federal, state, and local agencies within the one-mile Study Area that may be affected by the Project. Letters and/or emails were submitted with an accompanying overview map of the Project. A summary of these consultations is provided in Table 6, and further details on each consultation are included in the following sections. Sample notifications and responses are in Exhibit C.

| Table 6 Agency Notifications | | | |
|---|------------------------|------------------------|----------------------|
| Agencies Contacted | Form of Contact | Date of Contact | Date of Reply |
| US Army Corps of Engineers | Mailed Letter | 4/14/2020 | |
| ND Parks and Recreation | Mailed Letter | 4/14/2020 | |
| ND Game and Fish Department | Mailed Letter | 4/14/2020 | 5/14/2020 |
| Lake Ilo National Wildlife Refuge | Mailed Letter | 4/14/2020 | |
| U.S. Fish and Wildlife Service | Mailed Letter | 4/14/2020 | |
| McKenzie County Planning Department | Mailed Letter | 4/14/2020 | |
| McKenzie County Commission | Mailed Letter | 4/14/2020 | |
| Minot Air Force Base - Cable Affairs | Email | 4/14/2020 | 4/15/200 |
| NDIC Pipeline Authority | Mailed Letter | 4/14/2020 | |
| ND State Water Commission | Mailed Letter | 4/14/2020 | 5/13/2020 |

| Table 6 Agency Notifications | | | |
|---|---|------------------------|---------------------------------|
| Agencies Contacted | Form of Contact | Date of Contact | Date of Reply |
| ND Department of Env. Quality | Mailed Letter | 4/14/2020 | 5/15/2020 |
| ND DOT Williston District | Mailed Letter | 4/14/2020 | |
| ND Department of Trust Lands | Mailed Letter | 4/14/2020 | |
| ND Soil Conservation Committee | Mailed Letter | 4/14/2020 | |
| ND Department of Agriculture | Mailed Letter | 4/14/2020 | |
| USFS McKenzie Ranger District | Mailed Letter | 4/14/2020 | |
| McKenzie County Weed Board | Mailed Letter | 4/14/2020 | 4/20/2020 & Approved 10/12/2020 |
| ND Geological Survey | Mailed Letter | 4/14/2020 | |
| ND State Historic Preservation Office | Contacted by Beaver Creek Archaeology, Inc. | | 10/8/2020 |

6.1 U.S. Fish and Wildlife Service

The USFWS administers several programs designed to identify and protect plant and animal species listed under the Endangered Species Act, critical habitats for listed species, migratory birds, bald and golden eagles, as well as wetland and grassland easements. A notification letter was sent to the USFWS on April 14, 2020 which included a description of the project, site map, and a request for comments regarding issues under USFWS jurisdiction.

No formal written response was received from the USFWS.

6.2 U.S. Army Corps of Engineers

The USACE is responsible for administering federal laws that regulate certain activities in the waters of the United States. The authority applicable to this responsibility is Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344), which prohibits the discharge of dredged or fill material into waters of the United States without authorization in the form of a USACE permit. A notification letter was sent to the USACE on April 14, 2020 which included a description of the project, site maps, and a request for comments regarding issues under USACE jurisdiction.

No response was received from the USACE.

6.3 Department of Defense- Air Force Cable Affairs

The United States Department of Defense possesses assets associated with intercontinental ballistic missiles and launch facilities in North Dakota. A notification email was sent to the U.S. Air Force which included a description of the project, site map, and a request for comments regarding issues under U.S. Air Force jurisdiction.

The United States Department of Defense – Air Force Cable Affairs confirmed on April 15, 2020 they have no assets near the Project.

6.4 North Dakota State Historic Preservation Office

According to the North Dakota Energy Conversion and Transmission Facility Siting Act, among the “*factors to be considered [by the Commission] in evaluating applications and designation of sites, corridors, and routes,*” is the effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites. The agency responsible for these sites is the NDSHPO. BCA was contracted to conduct a Class III Cultural Resource Inventory of the Project corridor.

The NDSHPO reviewed BCA's I class III archeological study and issued a letter of concurrence on 10/8/2020.

6.5 North Dakota Game and Fish Department

The NDGF has oversight of the State's game species, State Conservation Priority Species, Wildlife Management Areas, and Private Land Open to Sportsman lands. A notification letter was sent to the NDGF on April 15, 2020 which included a description of the Project, site maps, and a request for comments regarding issues under NDGF jurisdiction.

A formal response was received on May 14, 2020. The NDGF's primary concern was disturbance of native prairie and wooded draws. It was recommended that aerial raptor surveys be conducted.

6.6 Lake Ilo National Wildlife Refuge

A notification letter was sent to the Lake Ilo National Wildlife Refuge on April 14, 2020 which included a description of the Project, site maps, and a request for comments regarding issues under Lake Ilo National Wildlife Refuge jurisdiction.

To date, no formal written response has been received from the Lake Ilo National Wildlife Refuge.

6.7 North Dakota Parks and Recreation Department

The NDPRD, Natural Resource Division has authority and expertise regarding recreation and biological resources in North Dakota, with a particular emphasis on rare species and ecological communities. The NDPRD maintains a database detailing the location and recorded occurrences of animal and plant species of special concern. The NDPRD is also responsible for the management of state park lands and Land and Water Conservation funded recreation projects. A notification letter was sent to the NDPRD on April 14, 2020 which included a description of the Project, site maps, and a request for comments regarding issues under NDPRD jurisdiction.

To date, no formal written response has been received from the NDPRD.

6.8 North Dakota Department of Trust Lands

The North Dakota Department of Trust Lands was sent a notification letter on April 14, 2020 which included a description of the Project, site map, and request for comments regarding the presence of Mineral Trust Lands and School Trust Lands in the Study Area.

To date, no formal written response has been received from the North Dakota Department of Trust Lands.

6.9 North Dakota State Water Commission

The NDSWC was sent a notification letter on April 14, 2020 which included a description of the Project, site map, and a request for comments regarding issues under NDSWC jurisdiction.

A written response was received from the NDSWC on May 13, 2020 that the project has been reviewed by NDSWC staff. The project does not require a conditional or temporary use permit.

6.10 McKenzie County Planning Department

A notification letter was sent to the McKenzie County Planning Department on April 14, 2020 which included a description of the Project, site map, and a request for comments regarding issues under the jurisdiction of the McKenzie County Planning Department.

To date, no formal written response has been received from the McKenzie County Planning Department.

6.11 McKenzie County Commission

A notification letter was sent to the McKenzie County Commission on April 14, 2020 which included a description of the Project, site map, and a request for comments regarding issues under the jurisdiction of the McKenzie County Commission.

To date, no formal written response has been received from McKenzie County Commission.

6.12 McKenzie County Weed Board

A notification letter was sent to the McKenzie County Weed Board on April 14, 2020 which included a description of the Project, site map, and a request for comments regarding issues under the jurisdiction of the McKenzie County Weed Board.

A response via email was received on April 20, 2020. The McKenzie County Weed Board requires a weed management plan to be submitted and approved prior to construction. The Plan was submitted on 10/2/2020 and approved on 10/12/2020.

6.13 North Dakota Industrial Commission Pipeline Authority

A notification letter was sent to the North Dakota Industrial Commission Pipeline Authority on April 14, 2020 which included a description of the Project, site map, and a request for comments regarding issues under the jurisdiction of the North Dakota Industrial Commission Pipeline Authority.

To date, no formal written response has been received from North Dakota Industrial Commission Pipeline Authority.

6.14 North Dakota Department of Environmental Quality

A notification letter was sent to the North Dakota Department of Environmental Quality on April 14, 2020 which included a description of the Project, site map, and a request for comments regarding issues under the jurisdiction of the North Dakota Department of Environmental Quality.

A written response was received on May 12, 2020. The Department believes the environmental impacts will be minor and provided comments with respect to construction. Comments include: aggregate to be used for roads, care during construction near water, discharge permits, aquifers in the construction area, solid waste management, and minimizing impacts to human health.

6.15 North Dakota Department of Transportation Williston District

A notification letter was sent to the North Dakota DOT Williston District on April 14, 2020 which included a description of the Project, site map, and a request for comments regarding issues under the jurisdiction of the North Dakota DOT Districts.

To date, no formal written response has been received from the ND DOT Williston District.

6.16 USFS McKenzie Range District

A notification letter was sent to the USFS McKenzie Range District on April 14, 2020 which included a description of the Project, site map, and a request for comments regarding issues under the jurisdiction of the North Dakota Soil Conservation Committee.

To date, no formal written response has been received from USFS McKenzie Ranger District.

6.17 North Dakota Soil Conservation Committee

A notification letter was sent to the North Dakota Soil Conservation Committee on April 14, 2020 which included a description of the Project, site map, and a request for comments regarding issues under the jurisdiction of the North Dakota Soil Conservation Committee.

To date, no formal written response has been received from the North Dakota Soil Conservation Committee.

6.18 North Dakota Geological Society

A notification letter was sent to the North Dakota Geological Society on April 14, 2020, which included a description of the Project, site map, and a request for comments regarding issues under the jurisdiction of the North Dakota Geological Society.

To date, no formal written response has been received from the North Dakota Geological Society.

6.19 North Dakota Department of Agriculture

A notification letter was sent to the North Dakota Department of Agriculture on April 14, 2020 which included a description of the Project, site map, and a request for comments regarding issues under the jurisdiction of the North Dakota Department of Agriculture.

To date, no formal written response has been received from North Dakota Department of Agriculture.

7 OTHER FACTORS CONSIDERED

7.1 Public Health, Welfare, Natural Resources, and the Environment

A discussion of the effects of the location, construction, and operation of the pipeline on public health and welfare, natural resources, and the environment is included in Section 6.

Keitu Engineers and Consultants, Inc. (Keitu) conducted field surveys within a 300-foot-wide survey botany corridor and a one-mile wide wildlife and habitat corridor in August 2020, to identify presence of wildlife and habitat assessment that covered threatened and endangered species, a tree, sapling, and shrub enumeration survey, and a noxious weed survey were also conducted by Keitu. A Class III Cultural Resource Inventory was conducted in August 2020. Refer to Sections 5, 6, and 7.

7.2 New Transmission Tech to Minimize Adverse Environmental Effects

The Project does not include new energy conversion or transmission technologies. The pipeline design is consistent with existing pipeline technologies. However, Bridger is constantly evaluating new energy conservation technologies to reduce the energy consumed in its operations.

Pipeline Control Center

Bridger control operators are trained in applied hydraulics and pipeline control. They are trained to operate the pipeline at a natural flow rate using efficient combinations of pumps, thereby minimizing energy consumption. Operators have the capability to start and stop pumps and monitor pipeline operating conditions to assist in achieving an energy efficient operation.

Energy Efficient Pumps and Motors

For new installations, Bridger purchases high efficiency pumps, motors and variable frequency/speed drives at a premium initial cost in an effort to conserve long range energy requirements. Pumps are hydraulically designed and selected to obtain a high best efficiency point (BEP) at the desired flow rates. The forecasts are continually being evaluated and if the flow rate is outside the BEP range, operational changes are typically implemented to improve efficiency. Installation of variable speed/frequency drives is used to minimize starting current and maximize pump efficiency in all operating conditions.

Drag Reducing Agents (DRA)

Bridger currently uses drag reducing agents in selected segments of its pipeline system. Injection of DRA reduces flow turbulence of liquid hydrocarbons which results in reduced pressure loss between stations.

This allows a high flow rate (increased throughput) at the same operating pressure, or a decrease in operating pressure while maintaining flow rate. These two scenarios allow increased throughput or decreased power use. The flexibility furthers opportunities to shift power use to improve economics or accommodate the utilities. In these cases, the economic benefits realized with the implementation of the DRA program have outweighed the material cost of the DRA. As a result, lower unit energy costs and greater efficiency have occurred.

7.3 Beneficial Uses of Waste Energy from a Proposed Energy Conversion Facility

The Project does not involve new energy conversion facilities; no usable waste energy will result from the Project.

7.4 Unavoidable Adverse Direct and Indirect Environmental Effects

Unavoidable adverse direct and indirect environmental effects of the 2.4 miles of construction for this Project include temporary construction-related effects on vegetation, wildlife, agricultural operations, transportation, and noise levels as described throughout the Application. Impacts to agricultural operations are anticipated to be minimal and impacts to transportation are anticipated to be short-term. Impacts on vegetation and wildlife will also be minimal. Vegetation will be removed from the ROW prior to construction, and the area will be restored and re-seeded following construction. Wildlife may temporarily avoid the ROW during construction, but no long-term impacts are anticipated. Noise level increases are associated only with construction. In addition, Bridger implements thorough mitigation measures to minimize construction-related impacts.

7.5 Corridor or Route Alternatives Developed During the Hearing that Minimize Adverse Effects

The route was selected based on the conversion of the transmission line and the construction of the new line to connect the transmission line into the pipeline system. The route is described in Section A. Keitu conducted field surveys within a 300-foot-wide Survey Area to determine the potential presence and extent of wetlands and water bodies proposed Project. Concurrently with the wetland/water-body determinations, Keitu conducted a wildlife survey and habitat assessment that covered threatened and endangered species; a tree, sapling, and shrub enumeration survey; and a noxious weed survey. All studies were done to select the route which would minimize adverse effects.

7.6 Irreversible and Irretrievable Commitments of Natural Resources if Designated

Bridger is not aware of any irreversible or irretrievable commitments of natural resources that would result from the requested approvals.

7.7 Direct and Indirect Economic Impacts of the Facility

Upon completion, the Project will present an optimization of new and existing pipeline capacity to meet the need for additional liquid petroleum transportation to the region.

Crude oil produced in North Dakota is generally shipped by pipeline to one of three market hubs: (1) Tesoro's Mandan, North Dakota refinery; (2) the Guernsey, Wyoming interconnection hub; and/or (3) the

Clearbrook, Minnesota interconnection hub. Crude oil can also be transported by truck to Canada, and by rail directly to refineries, or to East, West, and Gulf Coast markets.

The "geographical market risk" of limited transportation options suffered by oil producers in the rapidly expanding crude oil production market in northwestern North Dakota has caused millions of dollars per year in lost revenue. With constrained export capacity, local production lacks access to alternative markets, making it vulnerable to regional price swings.

Over the past several years, the North Dakota Pipeline Authority has been working with producers and regional pipeline companies to address the issues surrounding the safe transportation of the surge in crude oil volume.

The purpose of the Project is to provide "midstream" transportation alternatives for the expanding volumes of crude oil being produced in North Dakota and to facilitate efficient access to downstream takeaway markets. The pipeline system will be constructed to allow crude to flow in either direction. This feature allows for greater flexibility and access to more sales points depending on market conditions, and acts as a balancing point allowing the best price for North Dakota crude producers. The Project will also serve to displace trucking operations that seek to move barrels of crude oil. The Project will ultimately help bring North Dakota sweet crude to more markets in the United States, therefore allowing for a more competitive price.

In addition to increasing the crude oil transmission capacity within North Dakota, the Project will provide other benefits. For example, operation of the Project has the potential to increase the tax base of McKenzie County. Construction of the Project will offer job opportunities during construction, which will be partially filled with local contractors and/or personnel. Pipeline construction workers are hired from pipeline contractors, equipment contractors, suppliers, and regional testing firms.

In addition, environmental consultants and construction inspectors will be employed during construction and restoration. North Dakota-based consulting firms were selected to assist with the site selection and permitting process. Wages paid to non-local contractors and/or personnel benefit the regional economy through expenditures for supplies, lodging, fuel, and other services.

7.8 Existing Plans for Other Developments in the Vicinity

Bridger is not aware of any other development by state, local or governmental entities at or in the vicinity of the Project Corridor.

7.9 Effect of the Proposed Route on Existing Scenic Areas, Historic Sites, Structures, & etc.

In accordance with the results of the pedestrian inventory, 2 of the sites require avoidance or other mitigation efforts. Providing Bridger adheres to the BCA proposed reroutes and all avoidance measures BCA recommends a finding of *No Historic Properties Adversely Affected*. The SHPO will review the Class I and Class III Inventory Reports upon completion of the field study. Section 5.11 describes BCA's findings and a copy of BCA's report is presented in Exhibit B.

7.10 Effect of the Proposed Route on Areas Unique Because of Biological Wealth or Rare/Endangered Species Habitat

Studies have been completed to identify species and ecologically significant habitats within the ROW and the Project corridor.

The NDGF was provided with the proposed route and after review stated, "We do not believe this project will have significant adverse effects on wildlife or wildlife habitat, including species of conservation priority, provided these recommendations were implemented where appropriate during project construction."

The FWS was provided with the proposed route but did not respond. Areas that are analyzed by the FWS include federally listed endangered, threatened, candidate species, and designated critical habitat in North Dakota.

A field survey was conducted in August 2020 using a 300-foot-wide Survey Area for botany and a one-mile survey corridor for wildlife. No sensitive wildlife or botany issues were identified within the survey areas.

7.11 Problems Raised by Federal, State, and Local Agencies

No problems or concerns other than those identified in section 7.10 have been raised by commenters or identified by Bridger, or its consultants.

7.12 Policies and Commitments to Limit Environmental Impact

Bridger Pipeline LLC is all part of the True Companies of Casper, Wyoming. True Companies operates pipeline systems in western North Dakota, eastern Montana and Wyoming. The True Companies have been family owned and operated since 1948, and now have over 1,000 employees in Wyoming, Colorado, Montana, North Dakota, Utah, Texas, Louisiana, Mississippi, New Mexico, Missouri, Oklahoma and Arizona.

Bridger works to protect the environment, home to its employees and customers. Protection of the environment is an integral element in the conduct of Bridger. Environmental protection efforts will span the entire Project, from planning through conversion, and into full operation.

The major causes of pipeline leaks in the United States are corrosion (both internal and external), excavation damage, pipe and weld failure, incorrect operations, or natural causes (e.g. floods or outside force). To prevent these categories of failures, Bridger will improve or maintain the Project to meet or exceed industry and governmental requirements and standards. Specifically the steel pipe meets US DOT Pipeline and Hazardous Material Safety Administration federal codes under 49 CFR Part 195 (referred to hereafter as PHMSA regulations) and follow standards issued by the American Society of Mechanical Engineers, National Association for Corrosion Engineers and API. As a safety factor, the Project is designed to withstand pressures over and above its normal operating pressures and will operate according to codes and regulations. All pipe is inspected and integrity-tested at the factory and transported per the highest technical standards. PHMSA conducts regularly scheduled field inspections of the pipeline facilities to ensure compliance with federal regulatory requirements, including the integrity testing of the pipeline through the use of internal inspection devices.

The pipeline will be subjected to careful testing to verify its integrity and compliance with specifications. The line is subjected to hydrostatic testing per DOT/PHMSA regulations to an accurate and safe maximum allowable operating pressure.

As previously mentioned, the pipeline will be maintained and inspected according to PHMSA regulations, industry codes and prudent pipeline operating techniques and will continue to be examined under the same scrutiny. All of Bridger's mainline liquids pipelines are externally coated to resist corrosion, internally inspected at regular intervals using in-line inspection technology, and equipped with a cathodic-protection system to prevent external corrosion. Bridger's cathodic protection system and internal inspection program were implemented prior to these techniques becoming a regulatory standard.

The Bridger System ROWs are patrolled and inspected by air at least every three weeks but not less than 26 times per year to watch for abnormal conditions or dangerous activities, e.g., unauthorized excavation, along the routes of the lines. Bridger also conducts extensive public education and outreach programs that meet or exceed industry (API Recommended Practice 1162) and PHMSA (49 CFR 195.440) requirements concerning public awareness of pipelines and pipeline-safety matters. All Bridger lines are marked with signage and warnings, per federal regulations, at road and highway crossings, railroad crossings, and other locations to alert the public to the presence of underground lines and to provide information, contact numbers, and emergency data.

Pipeline workers and contractors performing critical tasks are qualified under Occupational Safety and Health Administration safety standards and PHMSA "operator qualification" rules and are subjected to federal drug and alcohol testing requirements. Bridger meets, and often exceeds, these requirements so that human error in construction and operation is minimized.

8 MITIGATION MEASURES

8.1 Measures to Preserve the Human Environment

Bridger requires its construction contractors to clean up and dispose of any trash deposited during ROW preparation and by construction crews on a daily basis. Waste and scrap produced during construction is always removed and properly disposed of in accordance with applicable regulations prior to the completion of construction.

Bridger minimizes noise and dust resulting from construction near residences to the maximum extent practicable.

Bridger will obtain all applicable permits for road crossings from McKenzie County. Bridger will also obtain permission from all owners of private roads, including oil lease roads, to cross said roads. Temporary signs will be posted at each crossing as appropriate to alert motorists of construction activity. Improved roads will be bored, minimizing interference with traffic flow caused by construction activities.

8.2 Measures to Protect Terrain and Geological Resources

Bridger will restore the area affected by construction to pre-construction contours to the greatest extent practicable. Measures such as slope breakers, erosion control blankets, and re-vegetation may be employed to maintain the stability of slopes along the ROW. No crown of backfill material will be left over the trench in wetlands.

Restoration following construction will be compatible with the safe operation, maintenance, and inspection of the Project.

Fuel and all other hazardous materials will be stored in accordance with the requirements of the contractor's SPCC Plan, if applicable. The SPCC Plan will describe response, containment, and cleanup measures. However, even for small quantities of oil-based liquids, containers and fueled equipment will not be stored within 100 feet of surface water.

8.3 Measures to Protect Soils

During construction or maintenance activities, temporary erosion and sedimentation control measures may include installation of silt fence, straw bales, slope breakers, trench breakers, erosion control fabric and mulch, in any areas of the Project deemed susceptible to soil erosion.

Construction is scheduled to begin in Fall 2020. Concern has been expressed previously by the ND Public Service Commission for Fall / Winter operations, specifically the ability to segregate topsoil from subsoil after the ground freezes. Conversely, a significant number of factors come into play when Spring/Summer construction schedules are pursued. Certain restrictions for threatened and endangered species (Golden and Bald Eagle) and migratory bird (such as Whooping Crane) issues are required for environmental impact mitigation measures during spring and early summer mating / nesting / spawning seasons.

Snow melt runoff, annual spring rains and subsequent high groundwater tables and swollen streams make for soggy ground conditions, bore pit overflows and other adverse impacts; resulting in both frequent construction delays and load restrictions on Project area highways. Fall construction, after the harvest and when irrigation activities are not occurring, tend to avoid or at least minimize impacts to fields and minimize impacts to wetlands & riparian areas.

If start of construction is delayed until winter months, every effort will be made including the use of specialized equipment, to complete topsoil segregation and storage before topsoil freezes in the late fall/ early winter to the point that frost inhibits proper soil segregation.

8.4 Measures to Protect Vegetation and Wildlife

Bridger and its contractors will effectively control or limit the spread of invasive plant species through control treatments and avoiding existing populations where possible. Treatments will be initiated prior to activity to disperse propagules in the area of disturbance. Monitoring and treatment should then be conducted on an annual basis to ensure a high degree of control and maximize treatment effectiveness.

Bridger will take appropriate precautions to protect livestock and crops affected by maintenance and inspection of this project. Operation of the pipeline is not anticipated to significantly affect terrestrial wildlife, fisheries resources, or other aquatic species.

Shelter belts and trees will be protected by Bridger to the extent possible in a manner compatible with the safe operation, maintenance, and inspection of the pipeline.

If an occupied raptor or migratory bird nest is spotted during construction, a construction buffer zone will be required. The length of the buffer zone will be dependent on the species identified, consistent USFWS guidance.

A sharp-tailed grouse lek survey completed in April 2020 confirmed one lek was present within the Study Area of the conversion line. Bridger will not construct within 1 mile (line-of-sight) of an active lek from March 1 – June 15 per USFS requirements.

8.5 Measures to Protect Land Use Permits

Bridger will obtain and comply with applicable county permits regulating zoning and land use for any necessary maintenance or future construction activities.

9 DEVELOPMENT

9.1 Present and Future Natural Resource Development in the Area

Bridger was not made aware of any current or future developments of natural resources in the area that would affect the proposed Project.

Qualifications of Preparers

The qualifications of the personnel who contributed to the consolidated application are as follows:

- (1) Tad True, Vice President – Bridger Pipeline Company

Degree: Bachelor of Business Administration, University of Notre Dame
Experience: 14-year experience in petroleum transportation field

- (2) Robert Stamp, Commercial/Engineering Supervisor – Bridger Pipeline Company

Degree: Bachelor of Mechanical Engineering, Valparaiso University
Experience: 29-year experience in petroleum transportation field as well as regulatory affairs and compliance.
Professional License
Registered Professional Engineer: Wyoming and Colorado

- (3) Ken Dockweiler, Director – Land, Government, and Compliance - Bridger Pipeline Company

Experience: 29-year experience in petroleum transportation field with 18 years focused in regulatory affairs and compliance.

- (4) Kathleen Spilman, Managing Director – Keitu Engineers & Consultants, Inc.

Degrees: Bachelor of Science - Chemical Engineering, University of North Dakota Masters in Management, University of Mary
Experience: 40-year experience in petroleum refining and fuels transportation field as well as regulatory affairs and compliance.
Professional License
Registered Professional Engineer: North Dakota, Montana

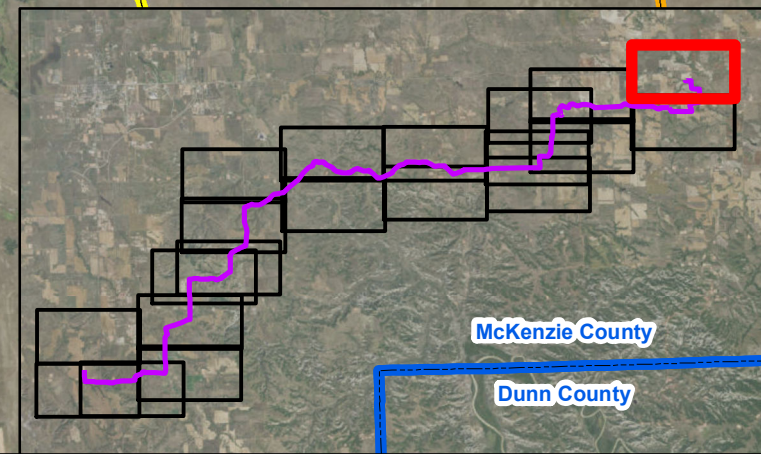
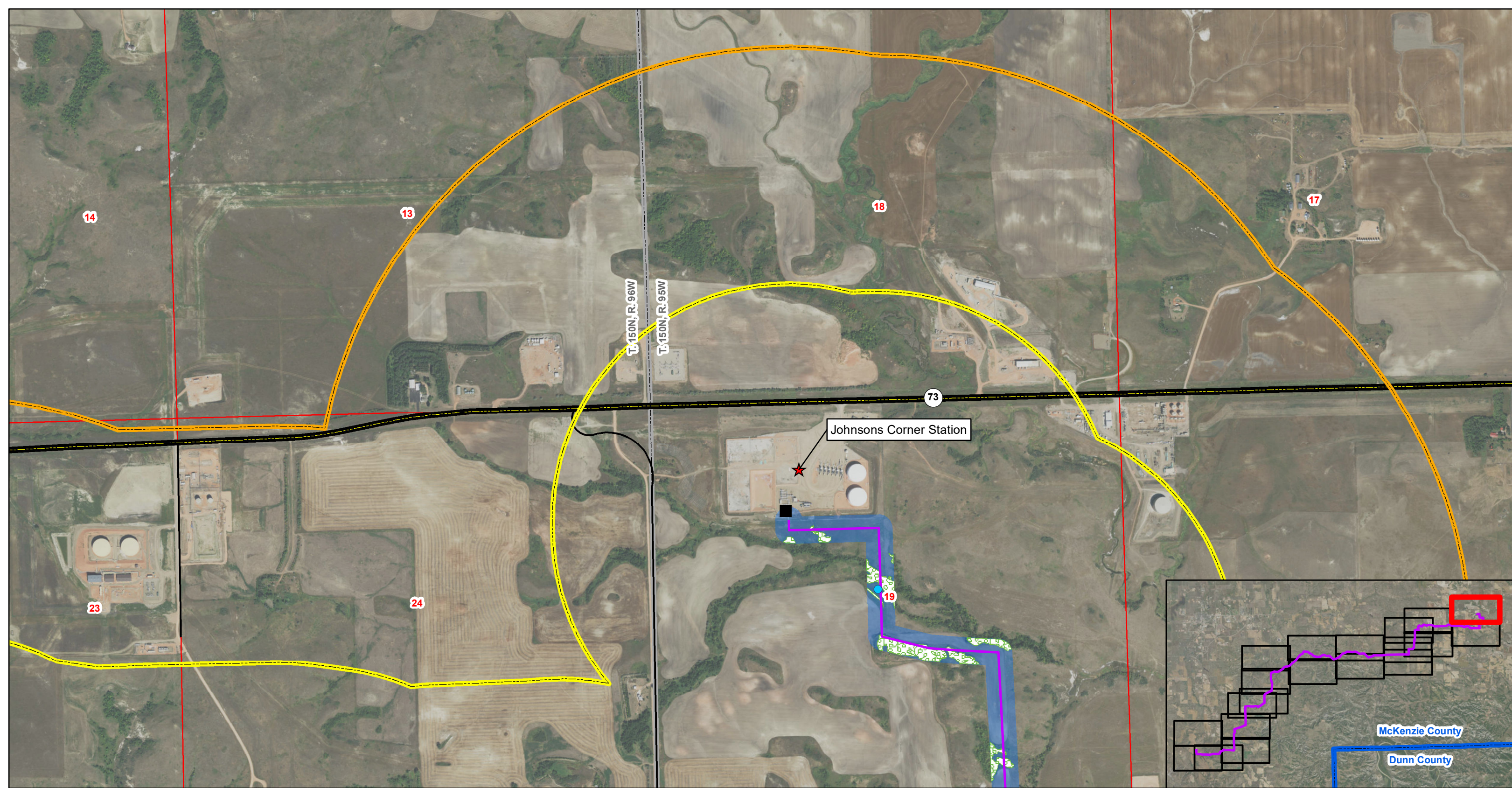
- (5) Karine Finken, Project Manager — Keitu Engineers & Consultants, Inc.

Degree: Bachelor of Science – Natural Resource Management, University of Minnesota - Crookston
Experience: 9-year experience in natural resource management

- (6) Jaimee Antognazzi, Operations Manager - Keitu Engineers & Consultants, Inc.

Degree: Bachelor of Science – Environmental Health, Dickinson State University
Experience: 13 years' experience in regulatory affairs and compliance.
Professional Certification: Certified Safety Professional

Exhibit A.1
Aerial Mapbook

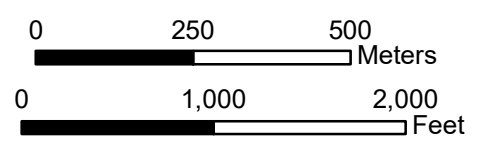


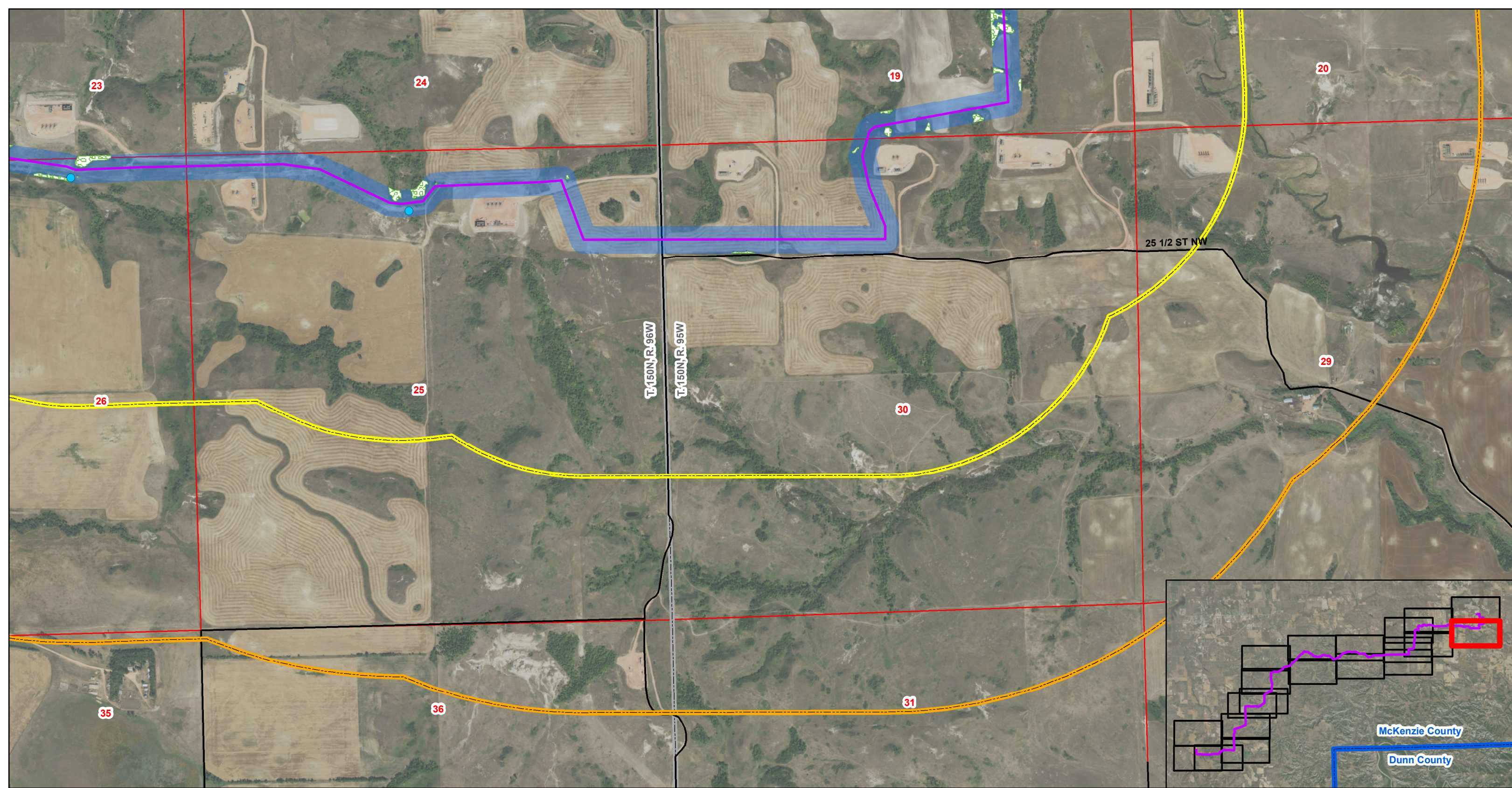
Johnson's Corner to Wilson Station

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| ■ Block Valve | ⊗ Landslide Prone Area | — Highway | ▭ Raptor Survey Area | ▭ Township/Range Boundary |
| ● Wetlands | — Proposed Alignment | — Roads | ▭ 1mile Study Area | ▭ Section Boundary |



Figure 1.A
T. 150N, R 95W and T. 150N, R. 96W
McKenzie County, North Dakota



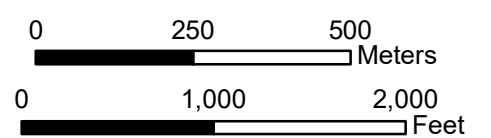


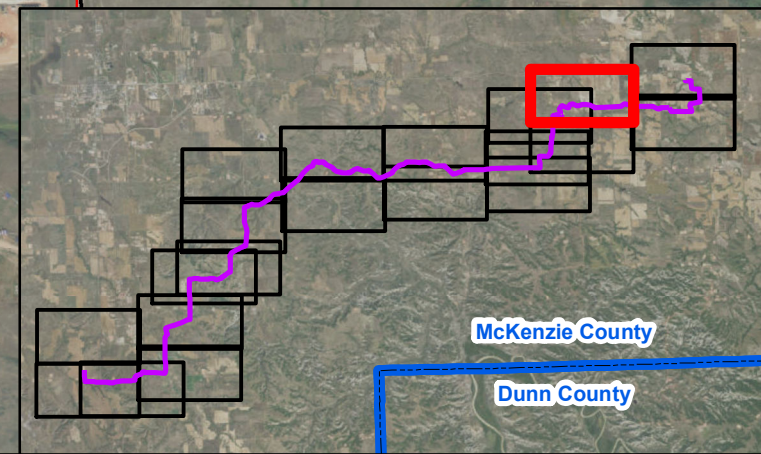
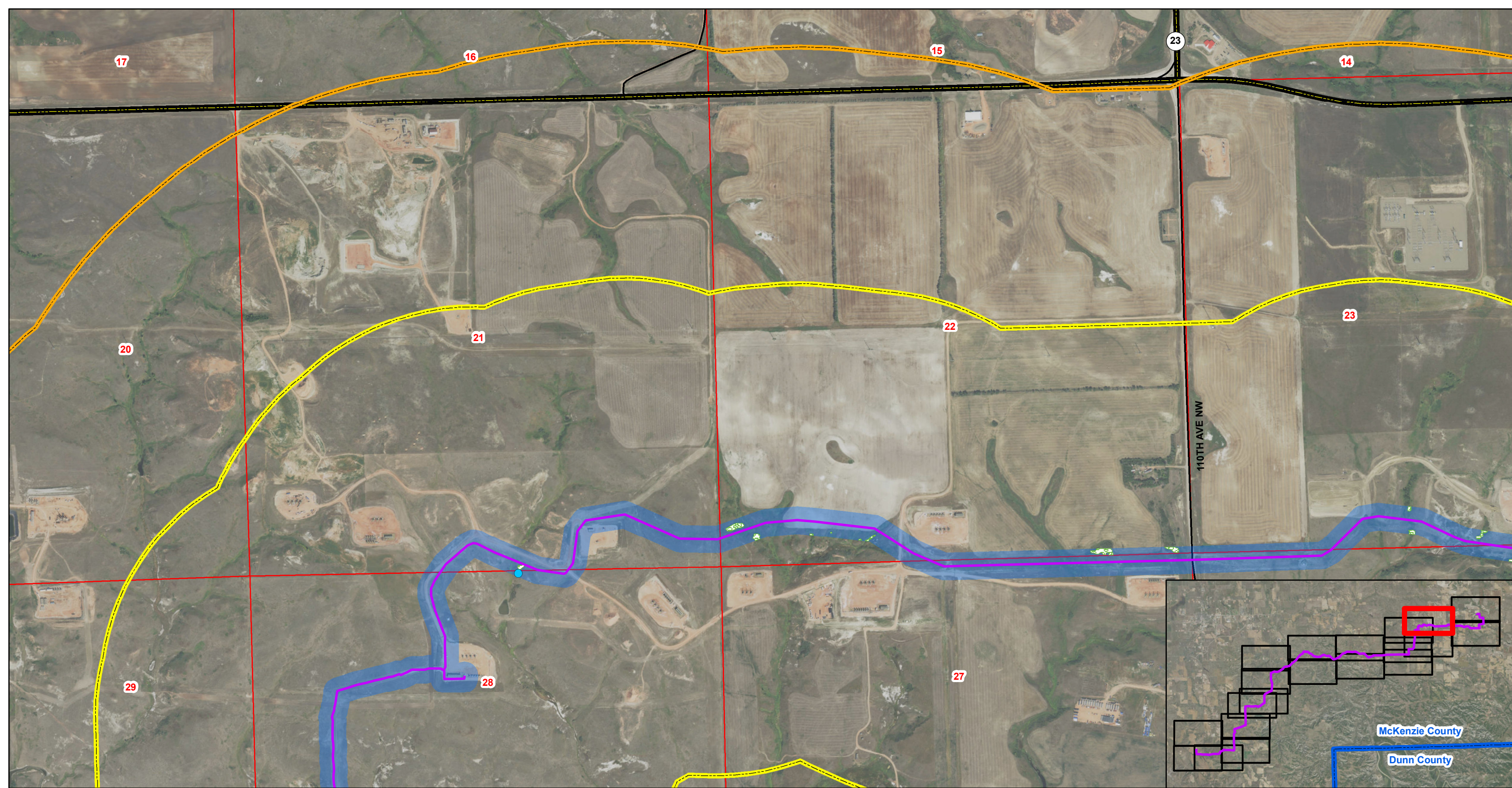
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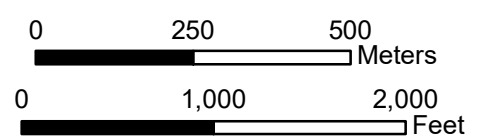


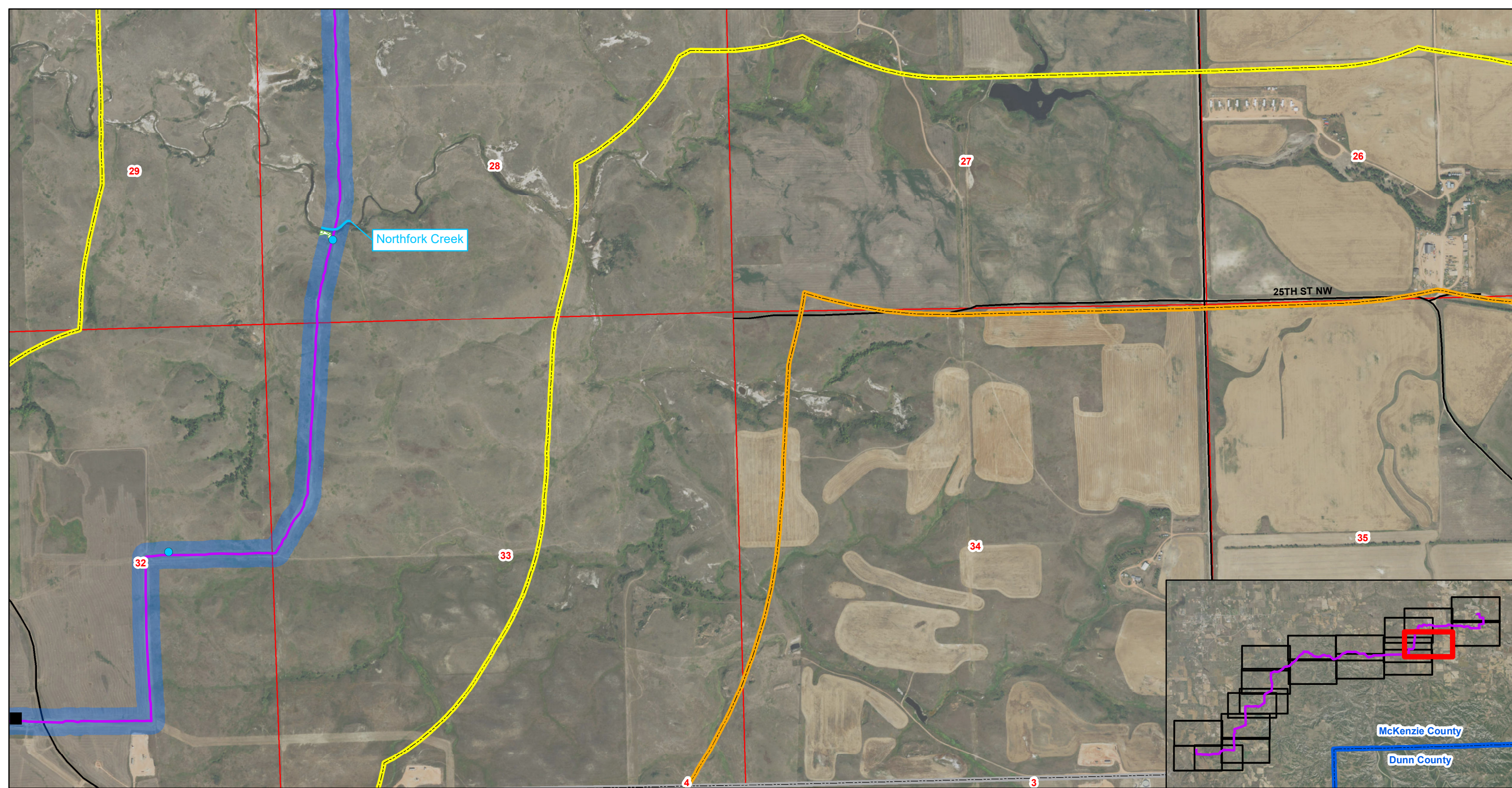
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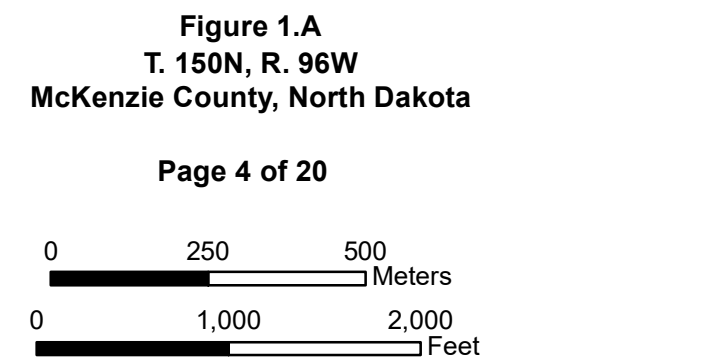
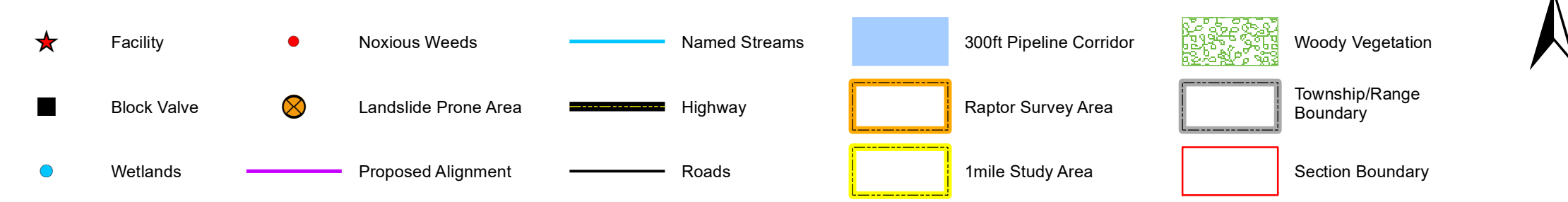


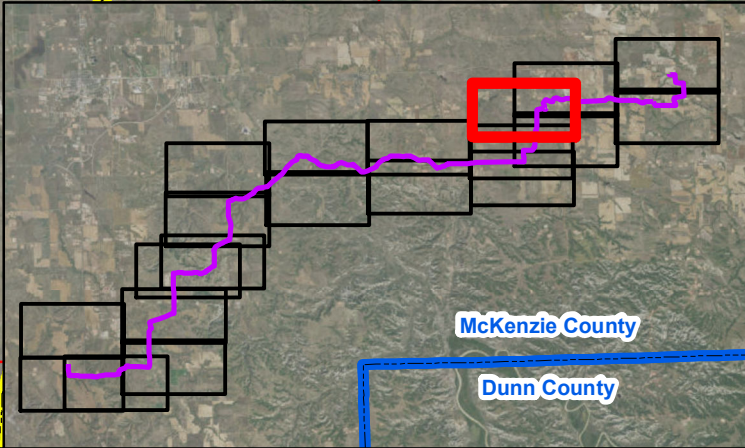
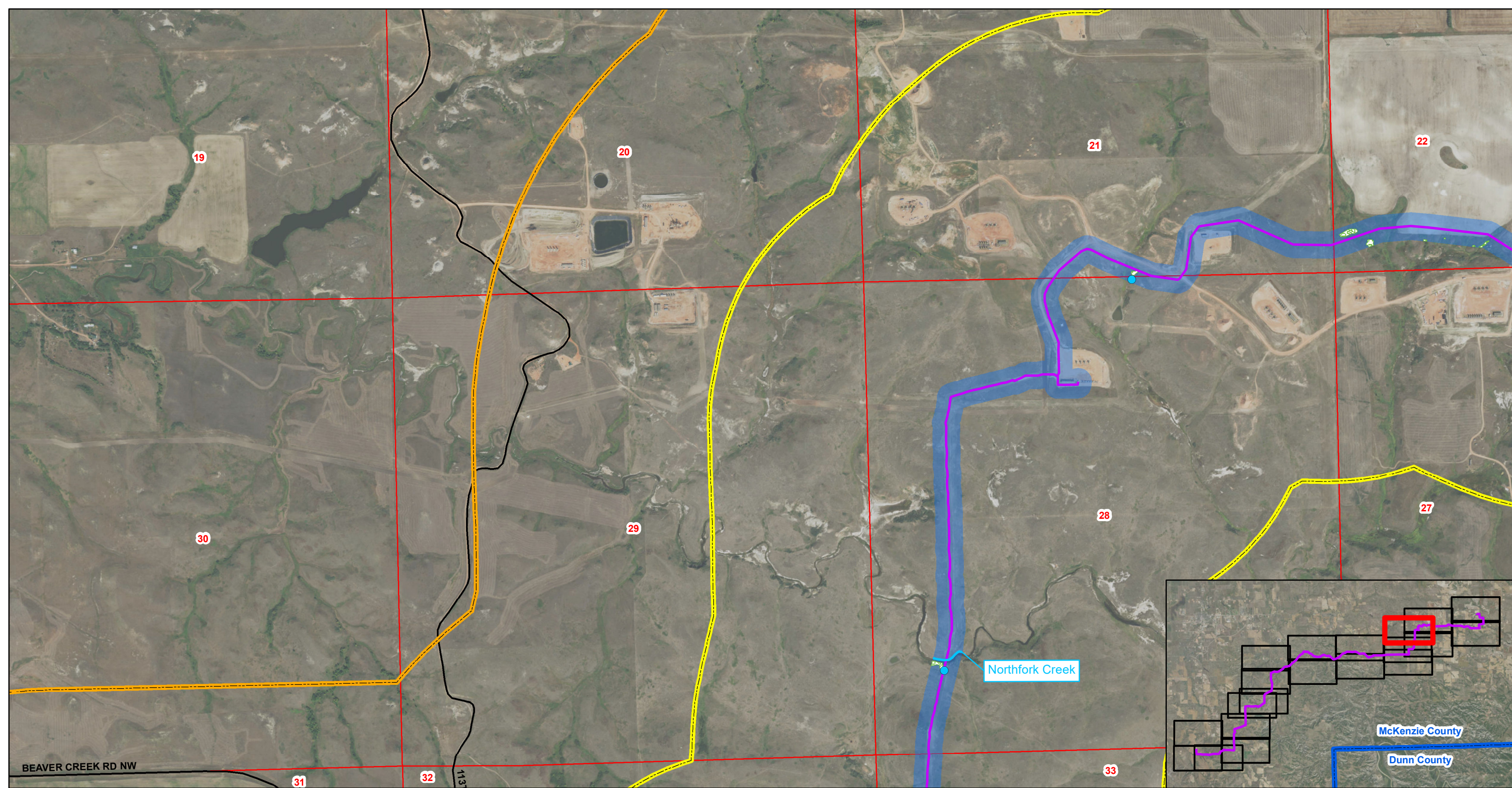
Figure 1.A
T. 150N, R. 96W
McKenzie County, North Dakota





Johnson's Corner to Wilson Station





Johnson's Corner to Wilson Station

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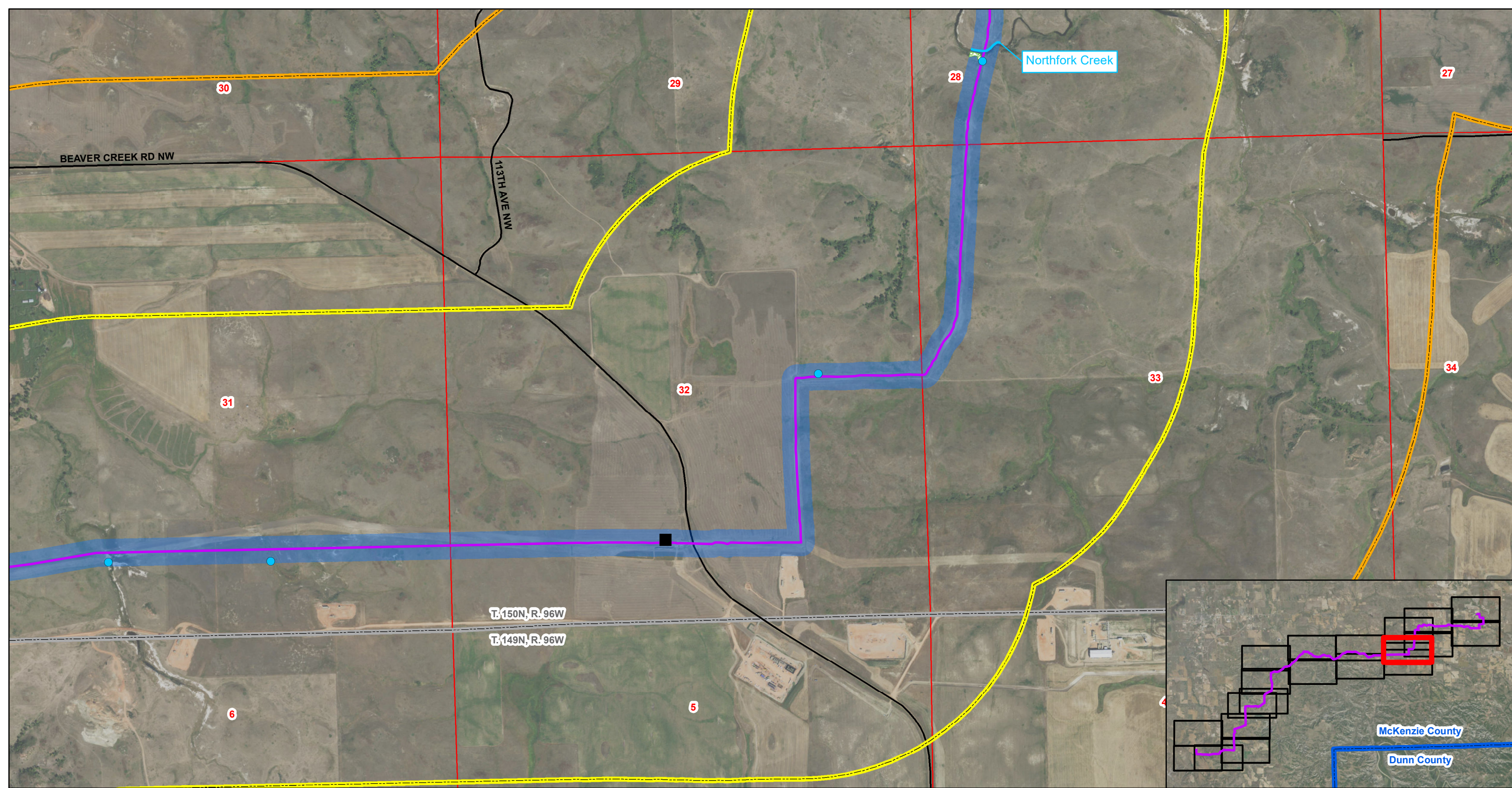


Figure 1.A
T. 150N, R. 96W
McKenzie County, North Dakota

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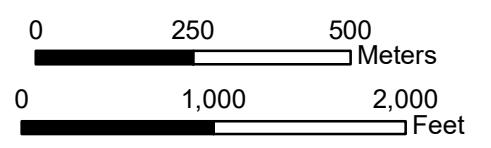


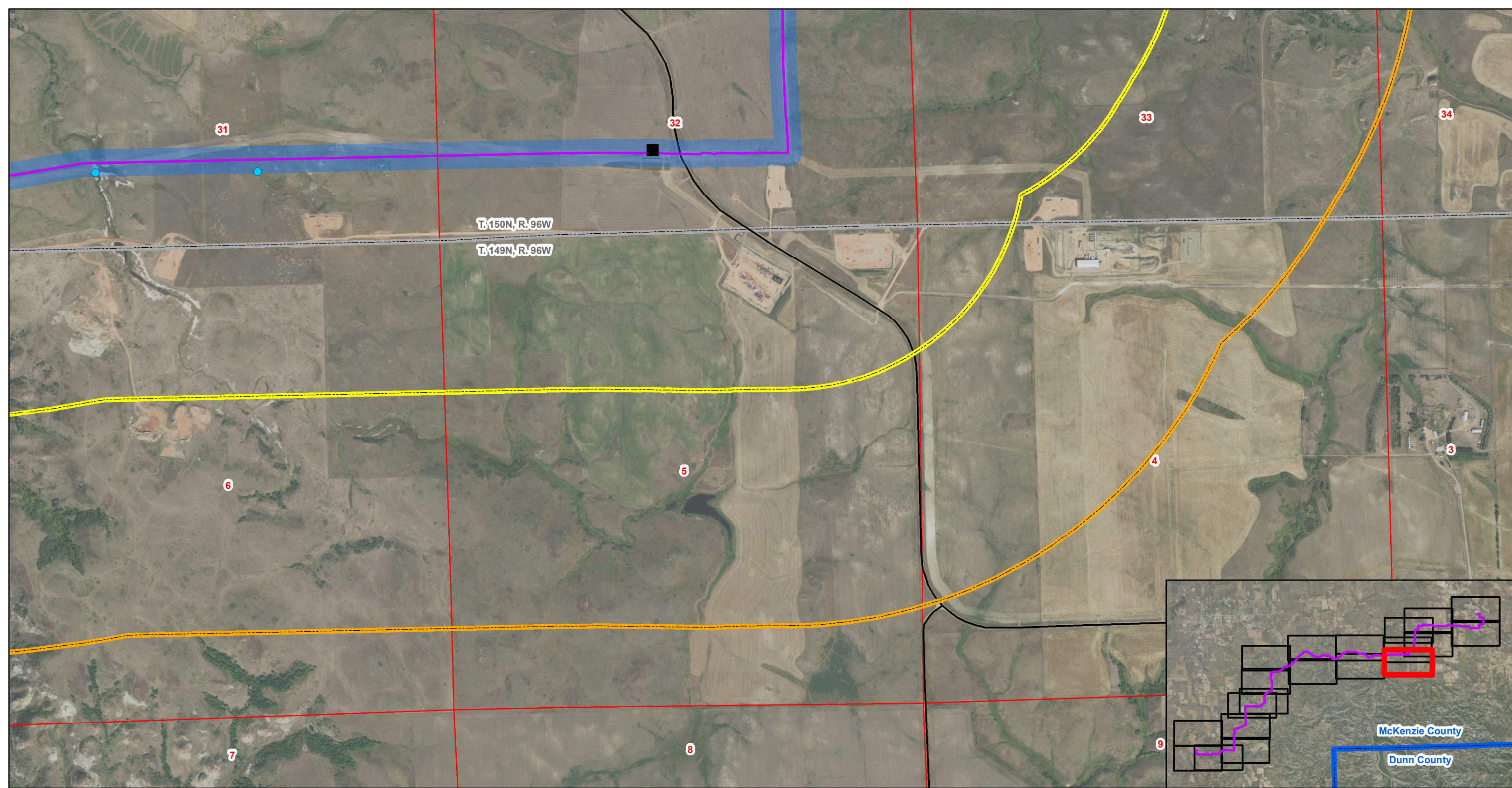
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Figure 1.A
T. 150N, R. 96W and T. 149N, R. 96W
McKenzie County, North Dakota



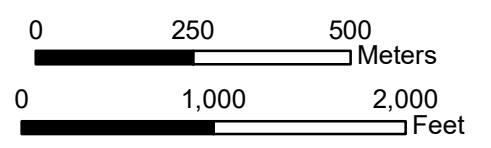


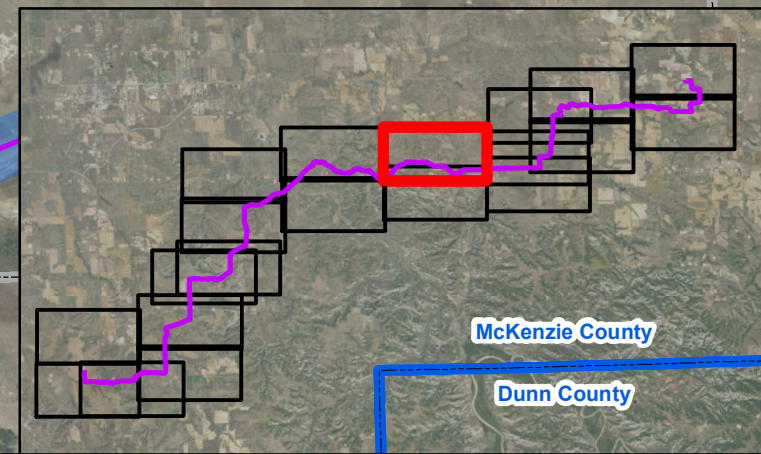
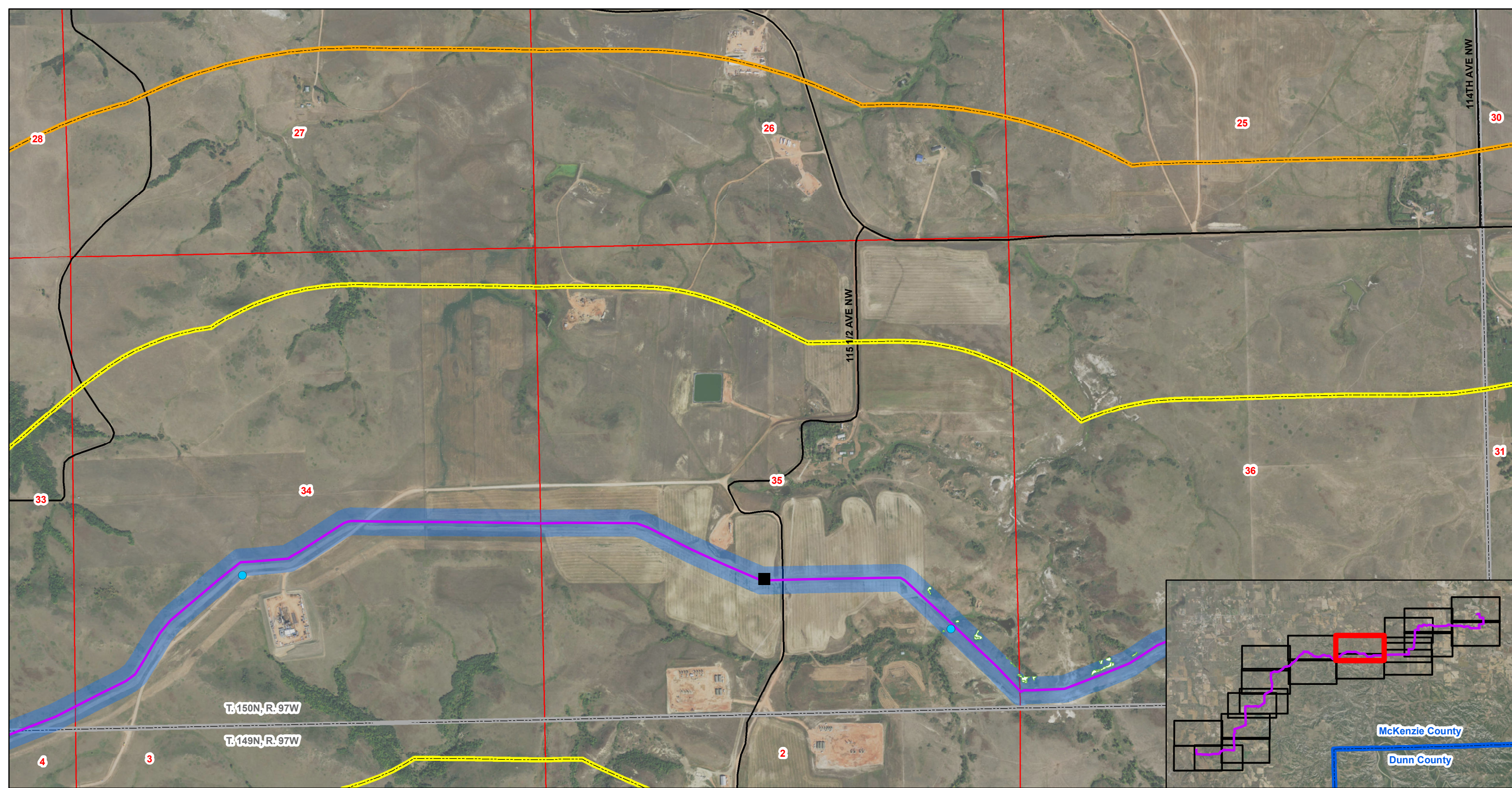
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Figure 1.A
T. 150N, R. 96W and T. 149N, R. 96W
McKenzie County, North Dakota



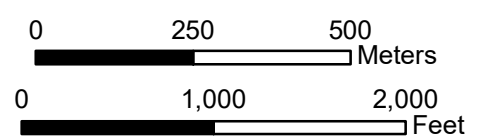


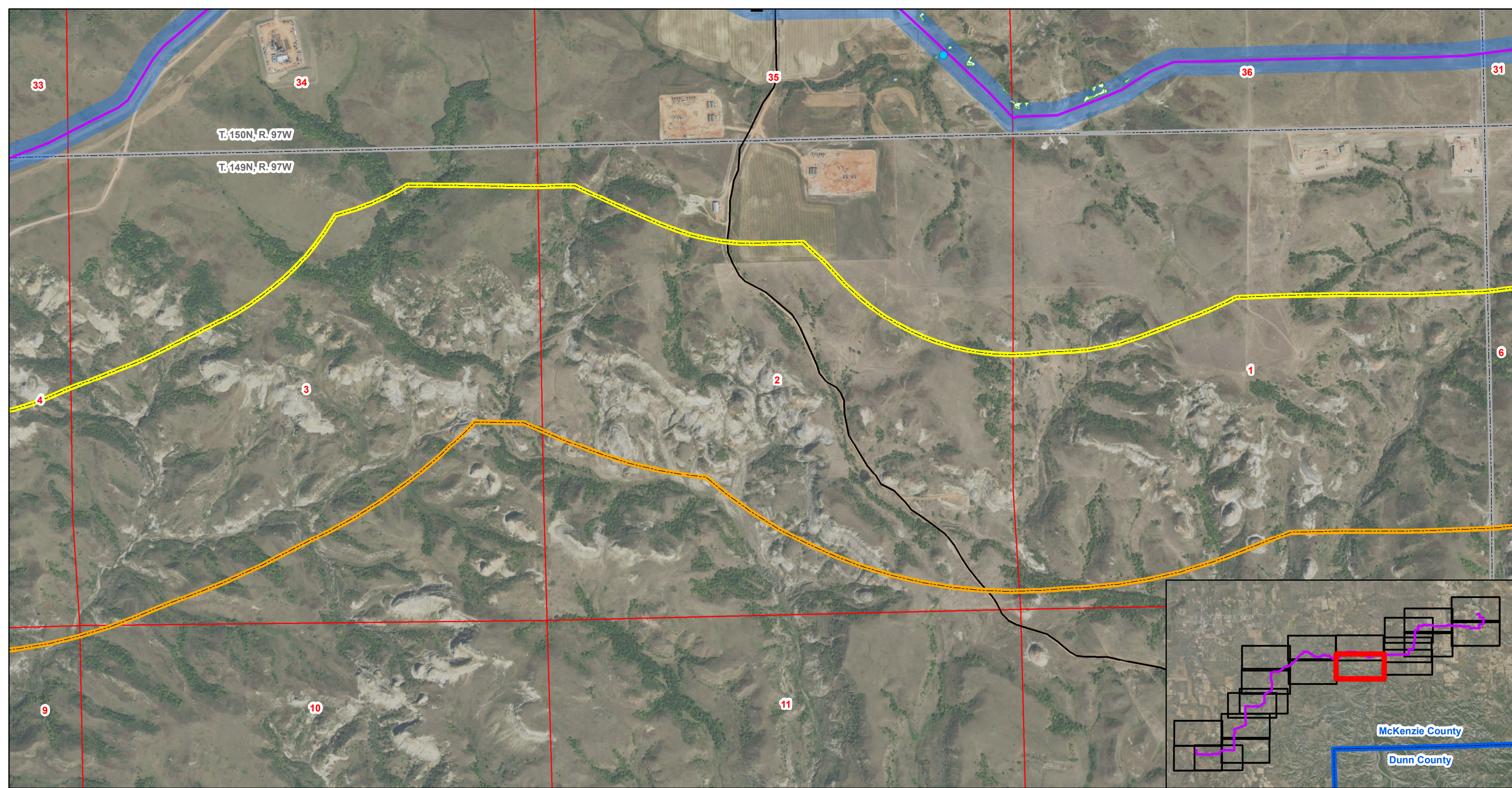
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Figure 1.A
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 and T. 149N, R. 97W
 McKenzie County, North Dakota
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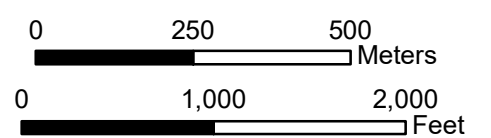


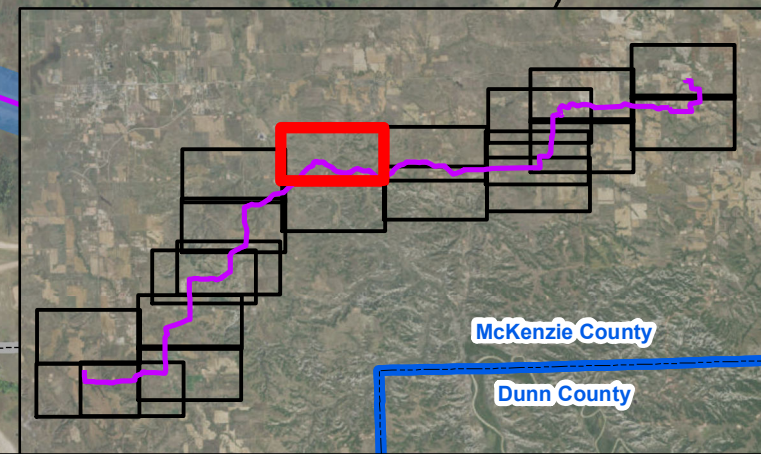
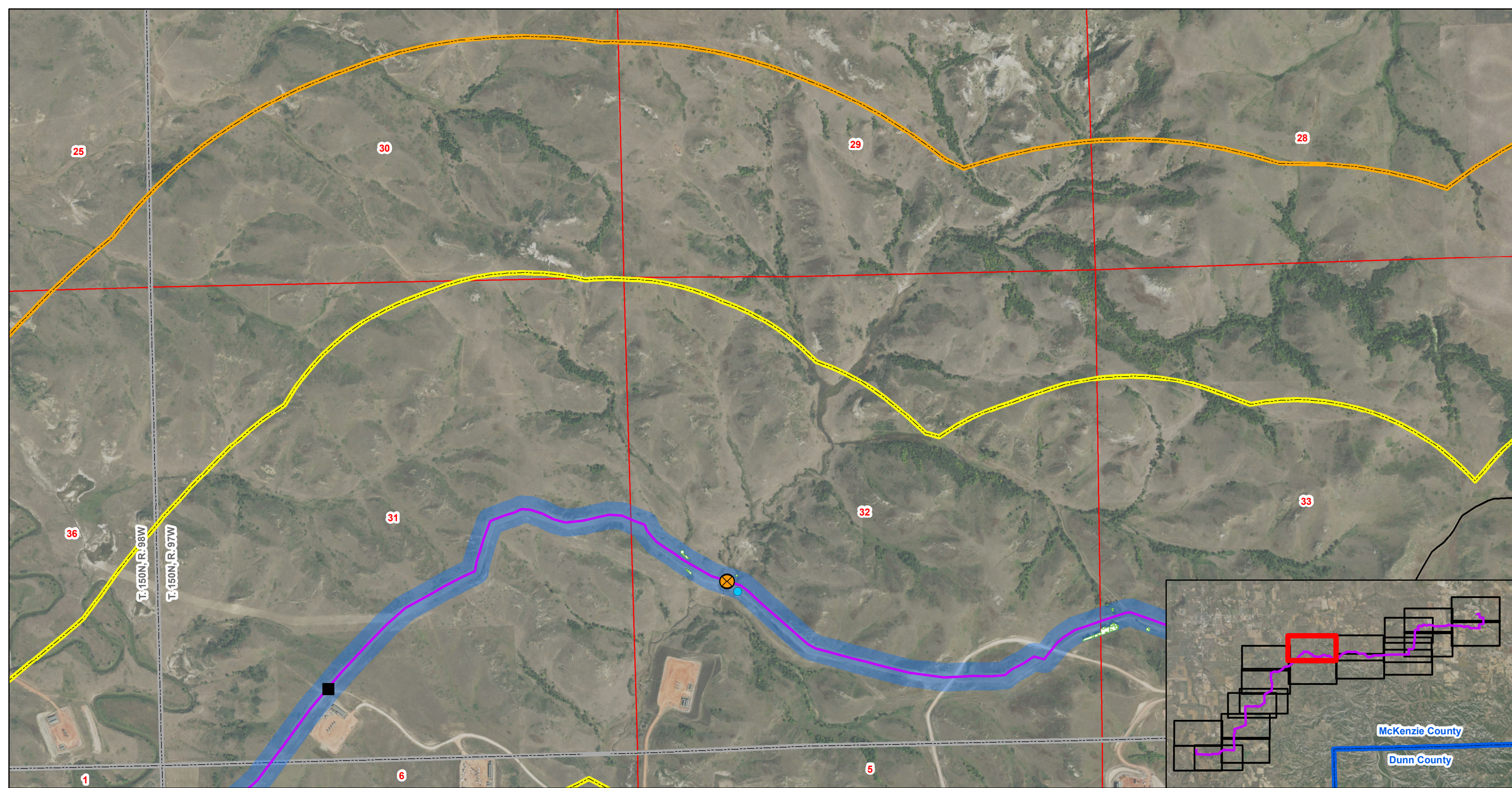
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Figure 1.A
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 and T. 149N, R. 97W
 McKenzie County, North Dakota
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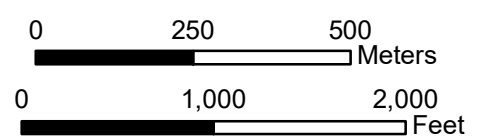


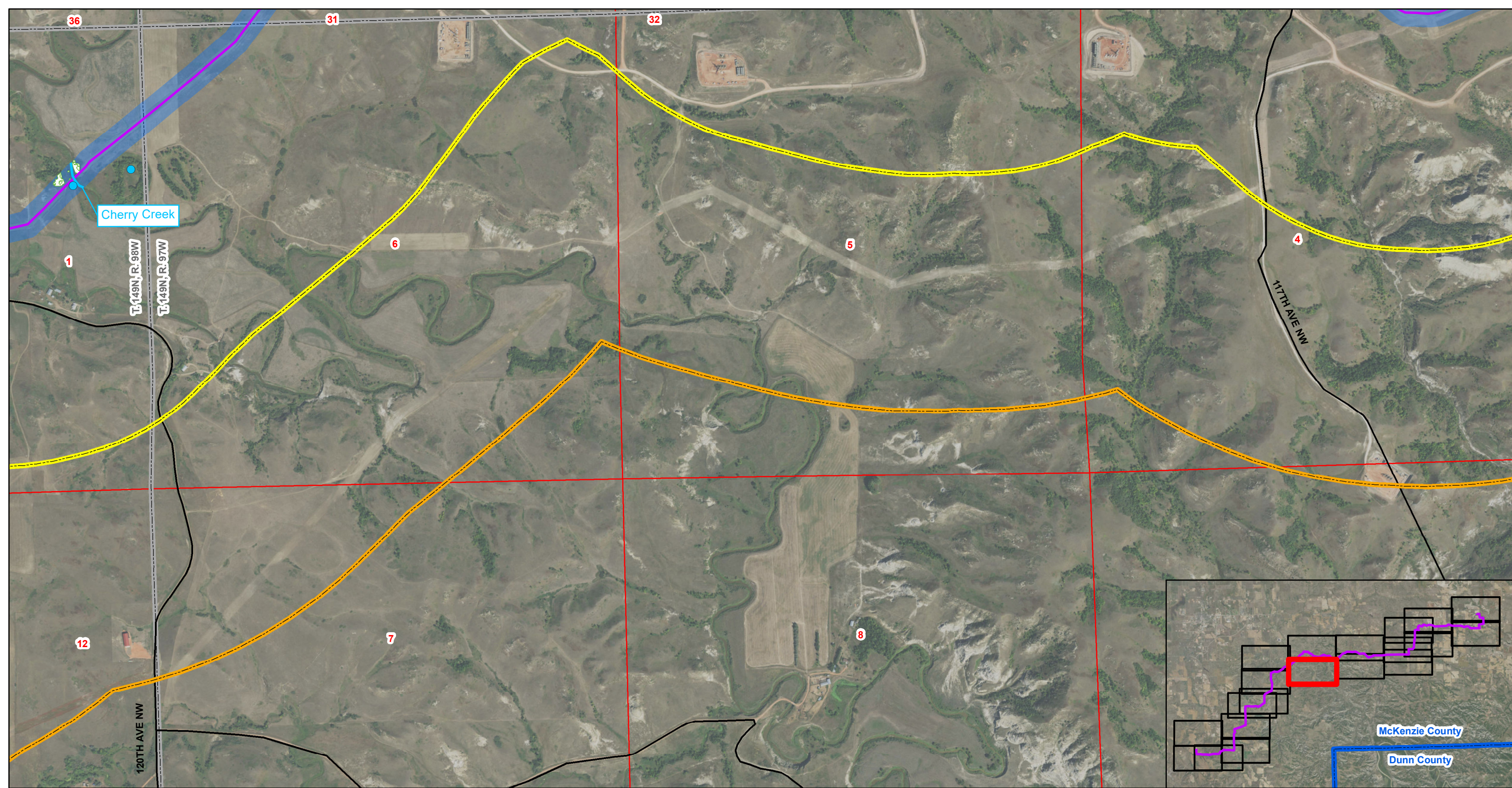
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Figure 1.A
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 and T. 149N, R. 98W
 McKenzie County, North Dakota
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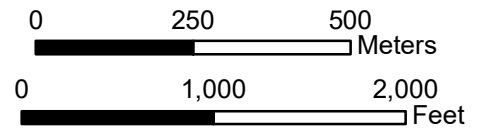


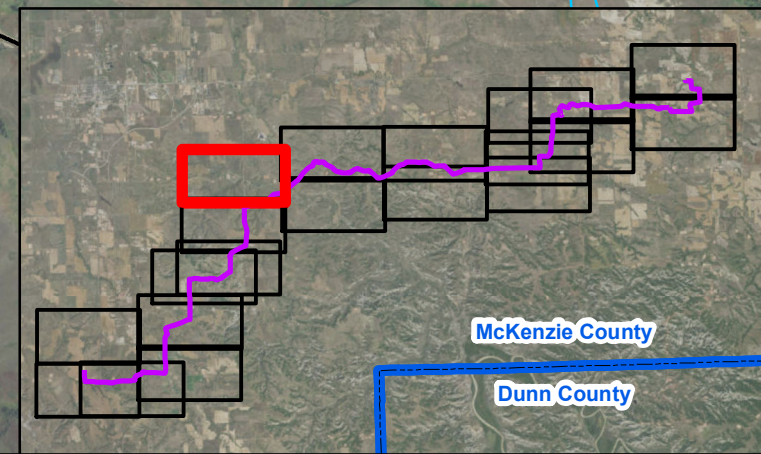
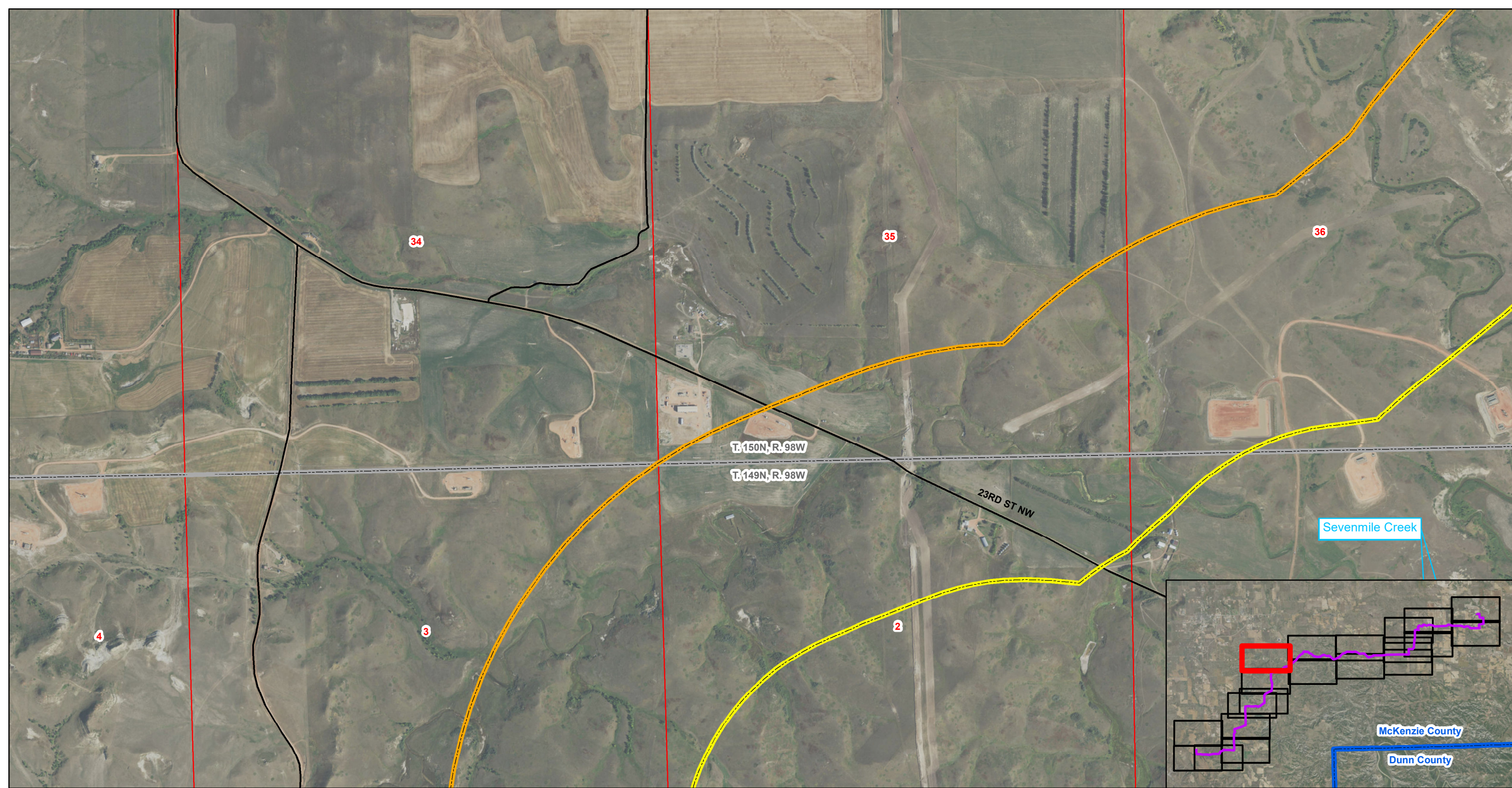
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Figure 1.A
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 and T. 149N, R. 98W
 McKenzie County, North Dakota
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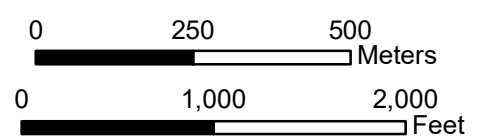


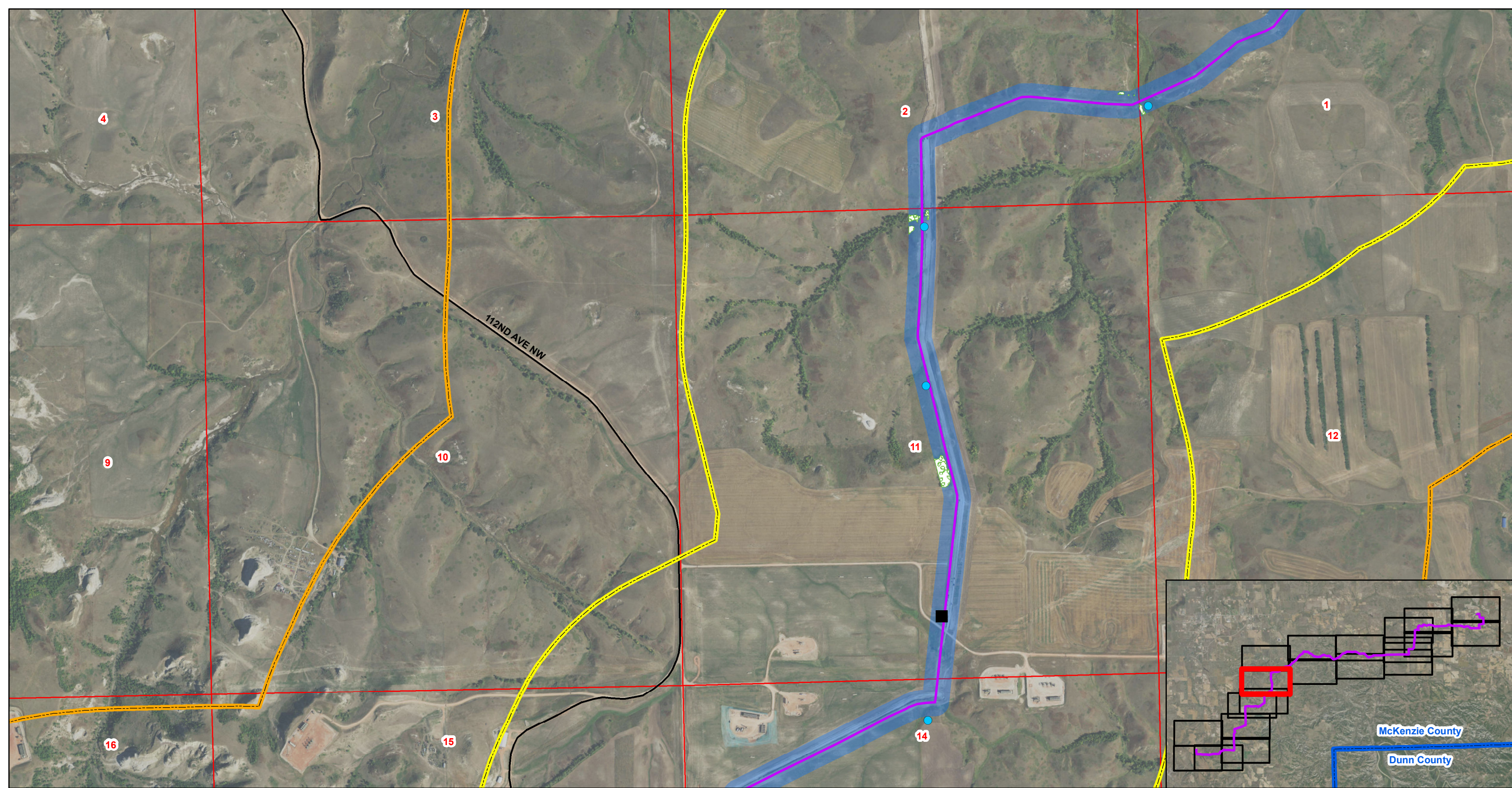
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Figure 1.A
T. 150N, R. 98W and T. 149N, R. 98W
McKenzie County, North Dakota





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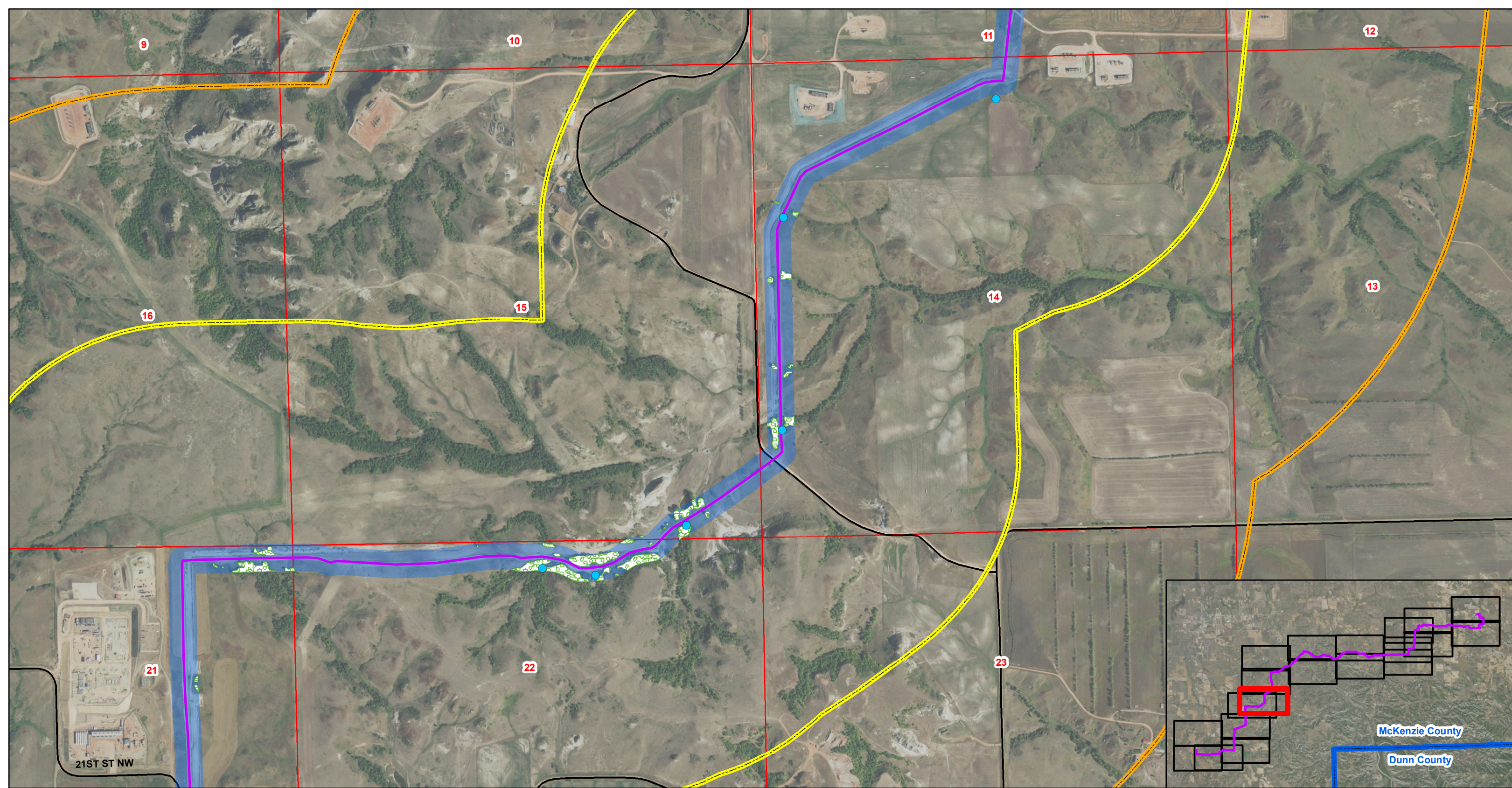


Figure 1.A
T. 149N, R. 98W
McKenzie County, North Dakota

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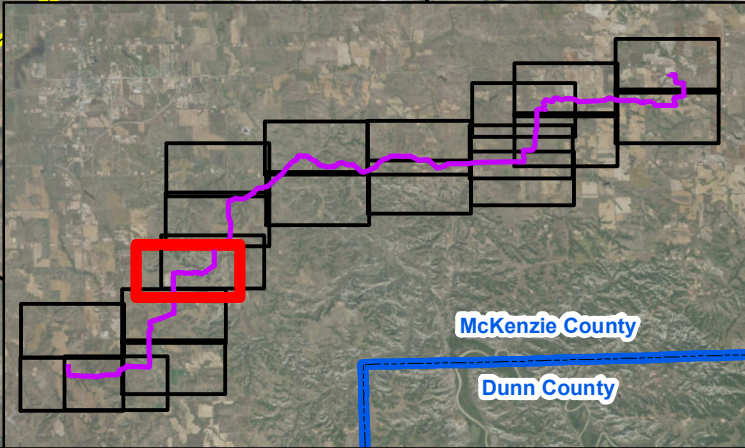
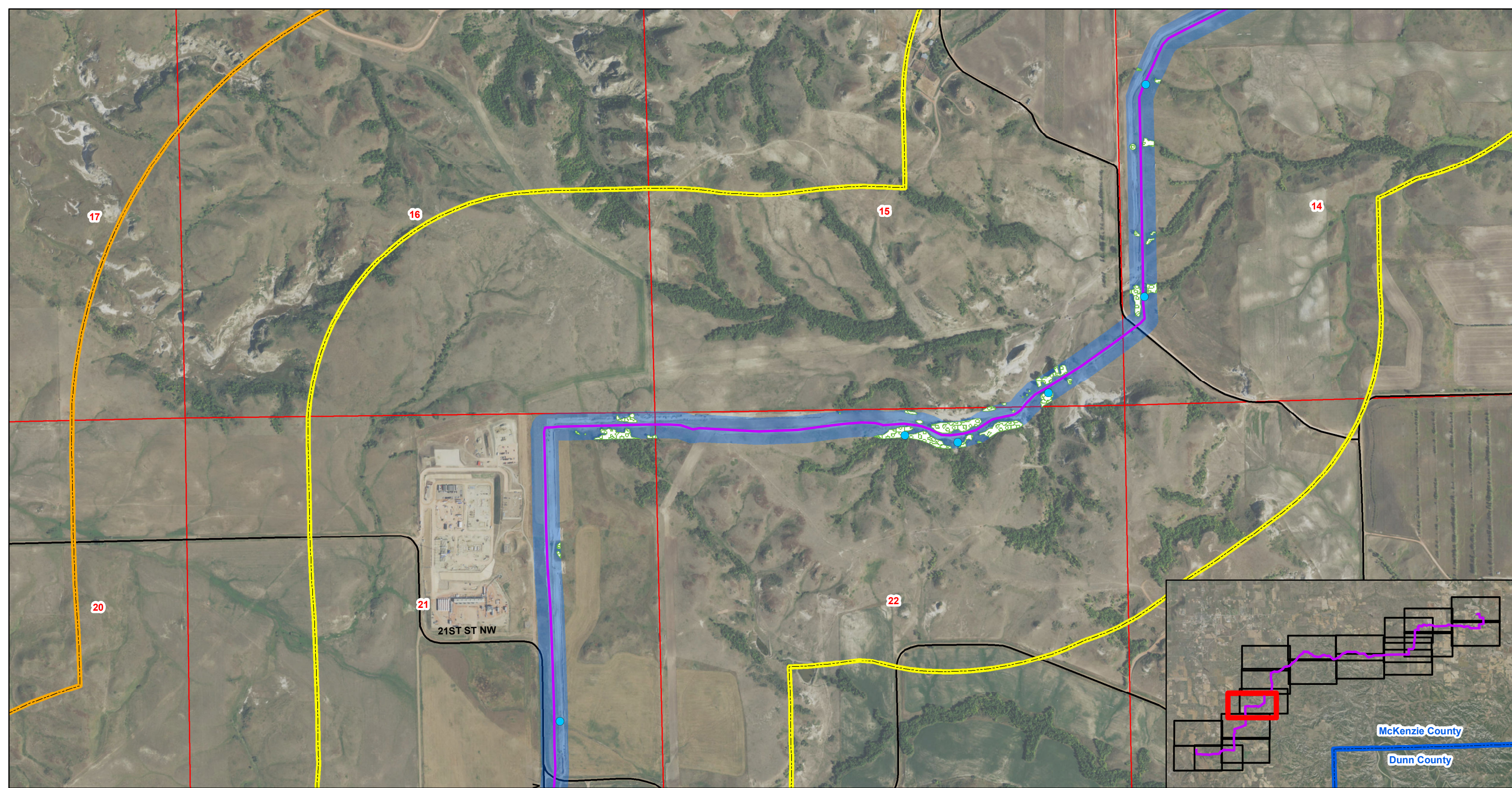


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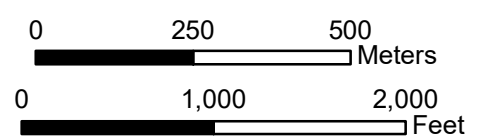


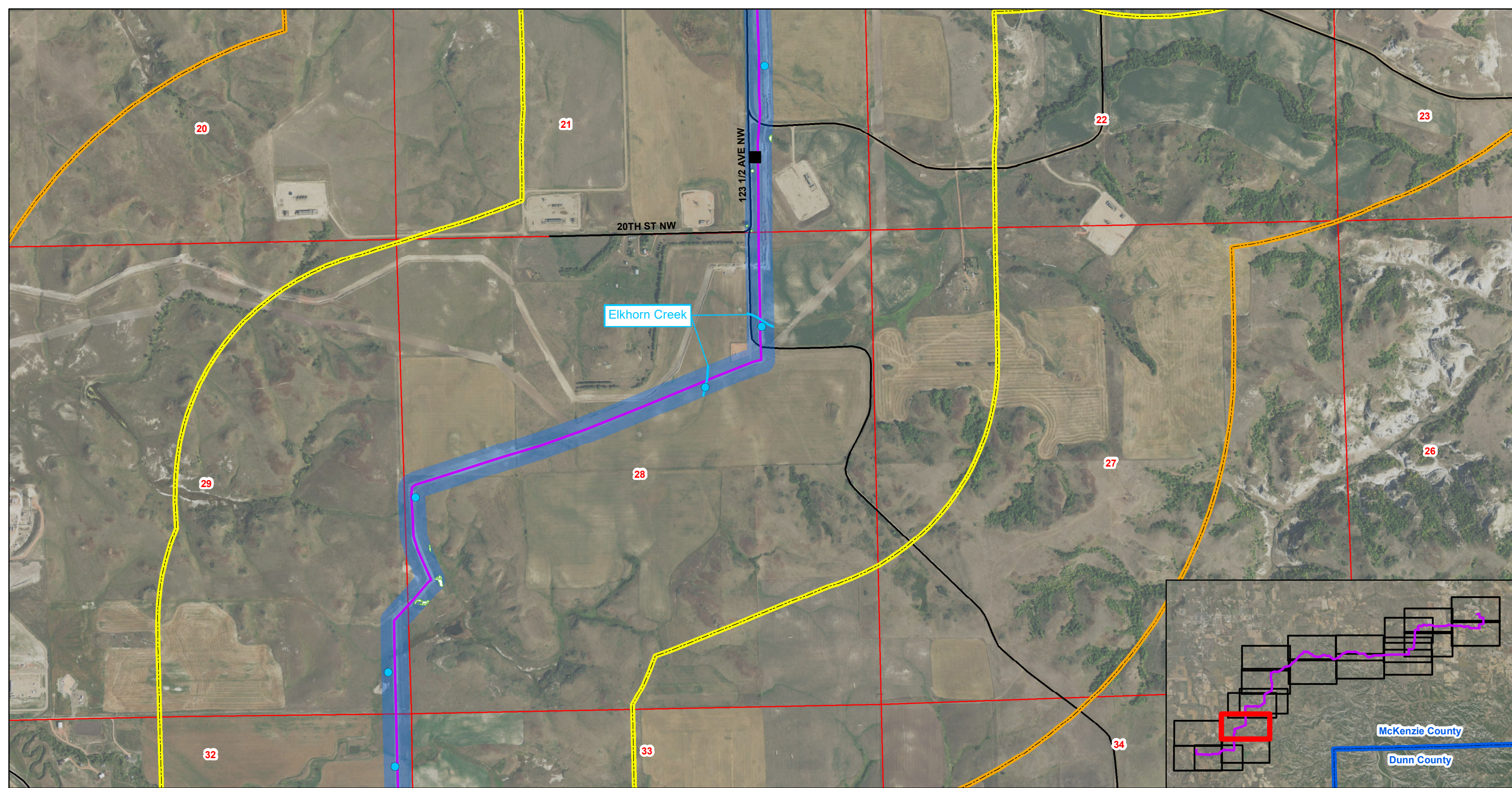
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McKenzie County, North Dakota





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| ★ Facility | ● Noxious Weeds | — Named Streams | ■ 300ft Pipeline Corridor | ▨ Woody Vegetation |
| ■ Block Valve | ⊗ Landslide Prone Area | — Highway | ▨ Raptor Survey Area | ▨ Township/Range Boundary |
| ● Wetlands | — Proposed Alignment | — Roads | ▨ 1mile Study Area | ▨ Section Boundary |

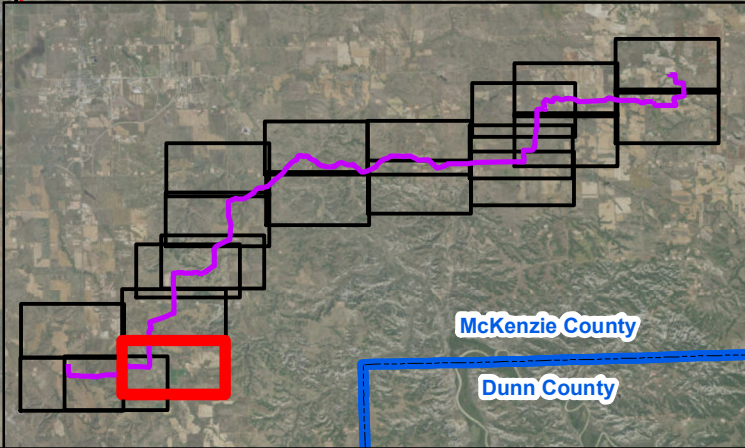
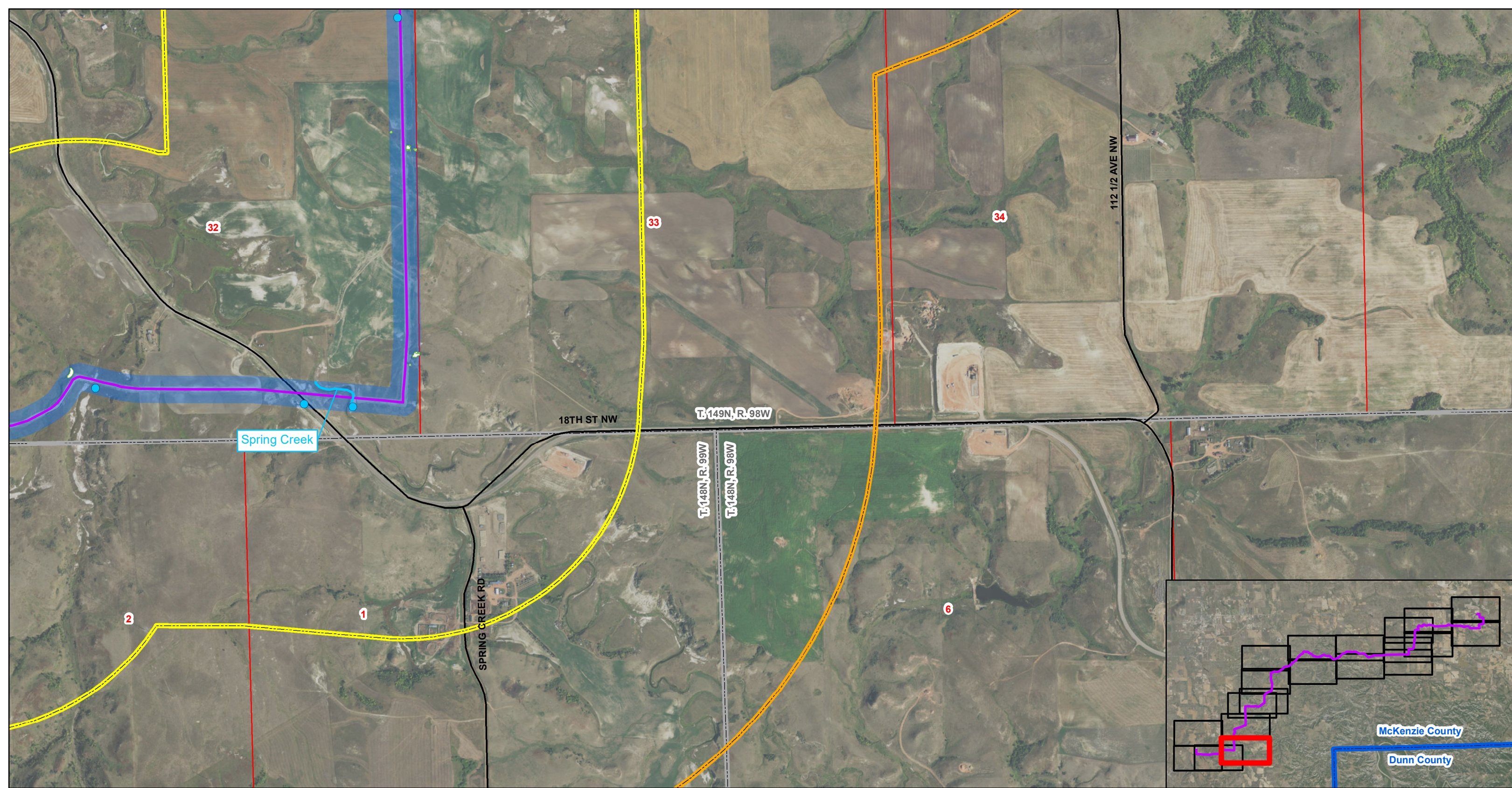


Figure 1.A
T. 149N, R. 98W
McKenzie County, North Dakota

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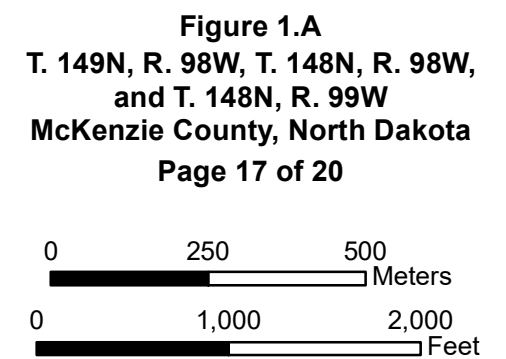
0 250 500
Meters

0 1,000 2,000
Feet



Johnson's Corner to Wilson Station

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|---------------|------------------------|-----------------|---------------------------|---------------------------|
| ★ Facility | ● Noxious Weeds | — Named Streams | ■ 300ft Pipeline Corridor | ■ Woody Vegetation |
| ■ Block Valve | ⊗ Landslide Prone Area | — Highway | ■ Raptor Survey Area | ■ Township/Range Boundary |
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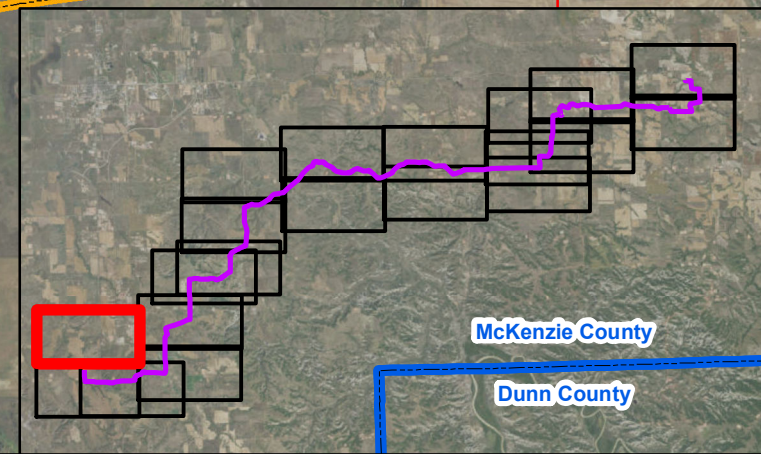
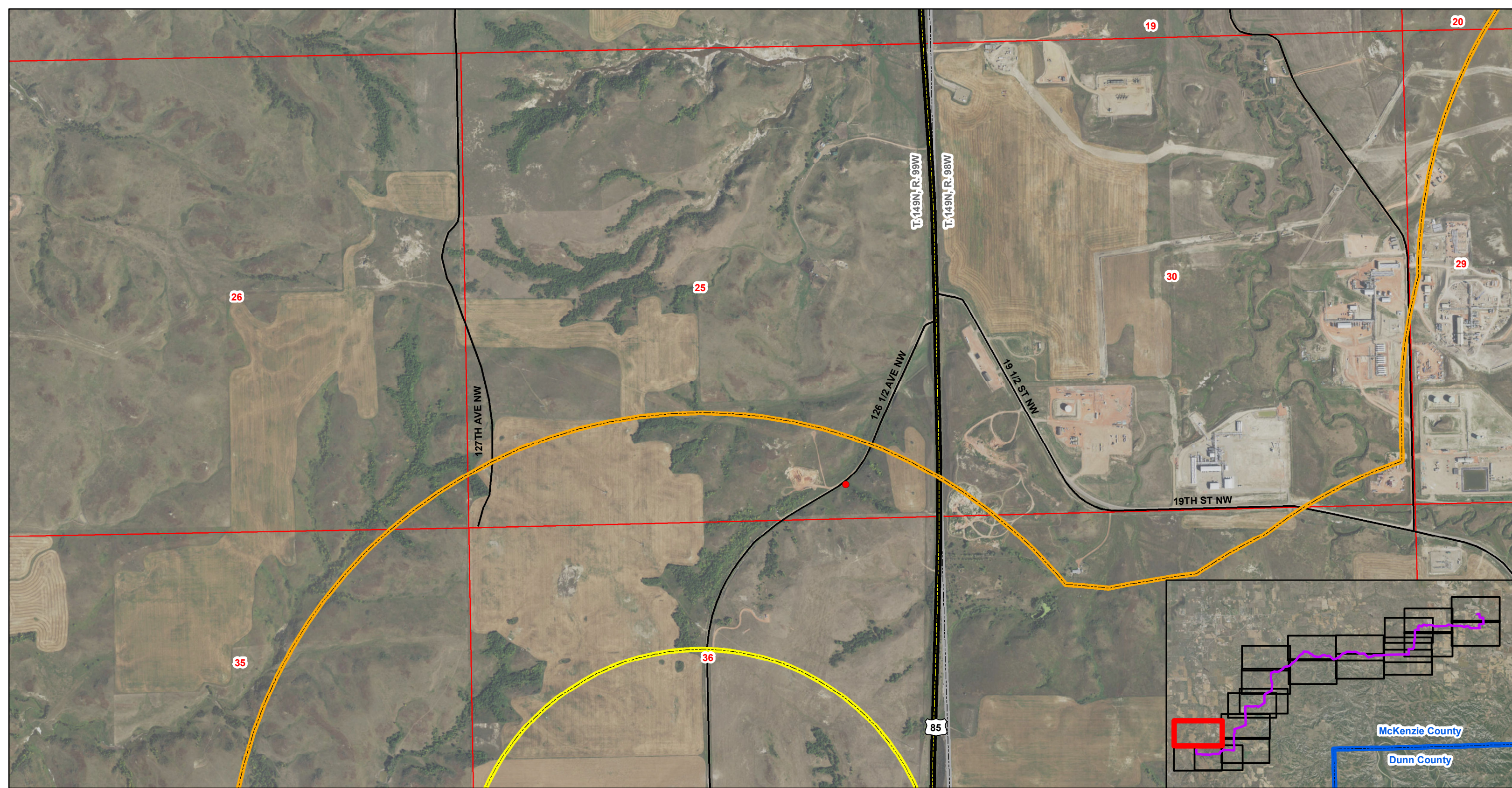


Figure 1.A
 T. 149N, R. 98W and T. 149N, R. 99W
 McKenzie County, North Dakota

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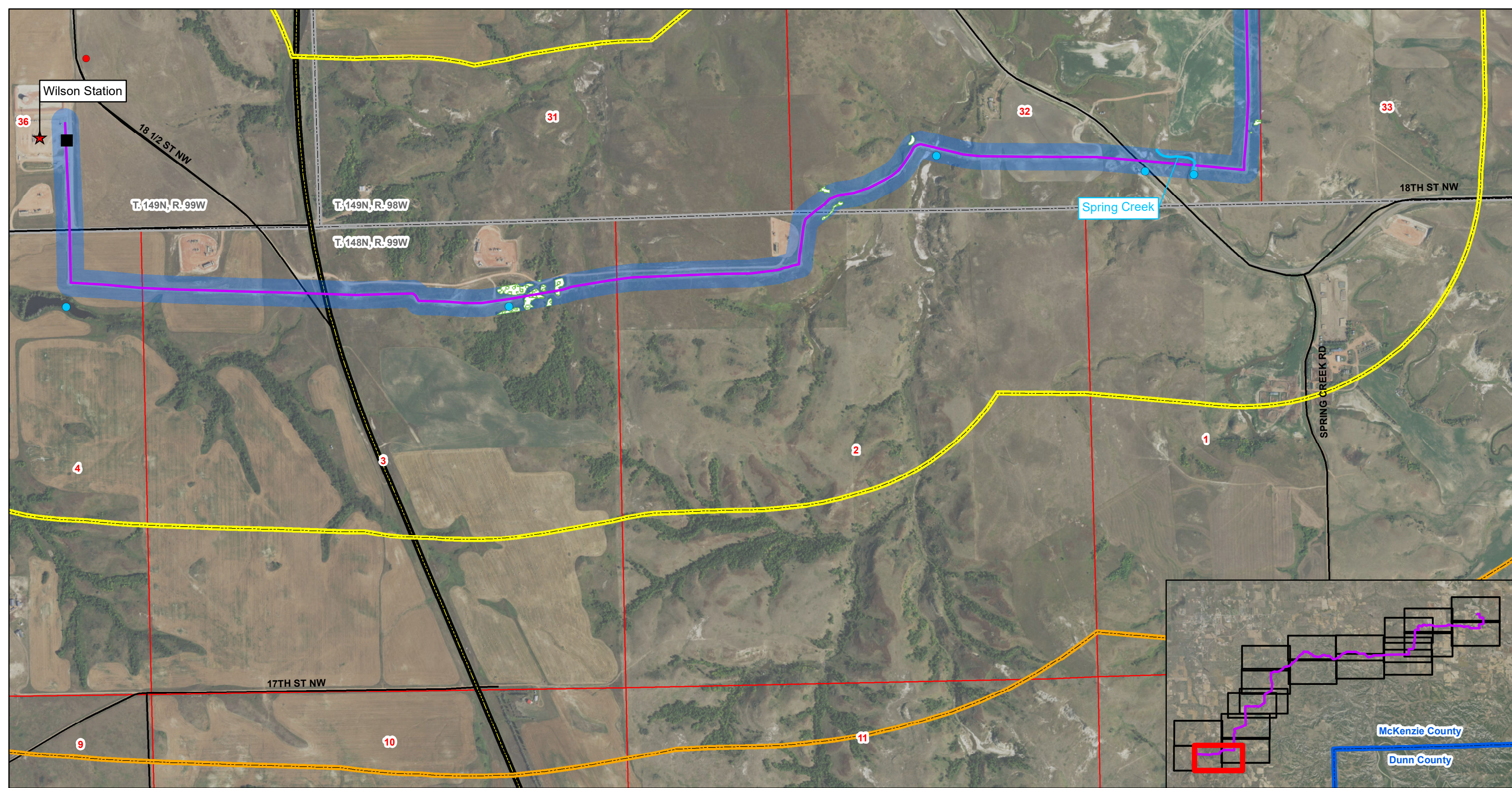
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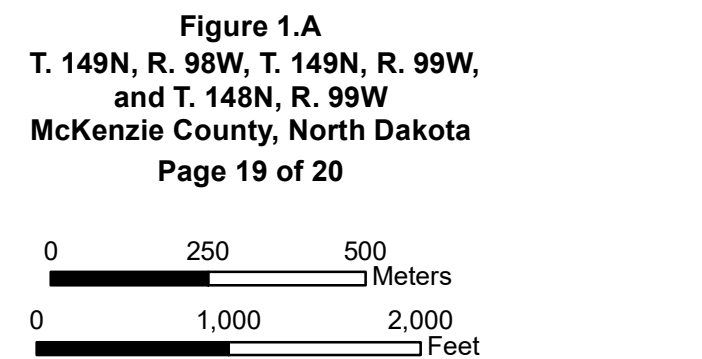
Johnson's Corner to Wilson Station

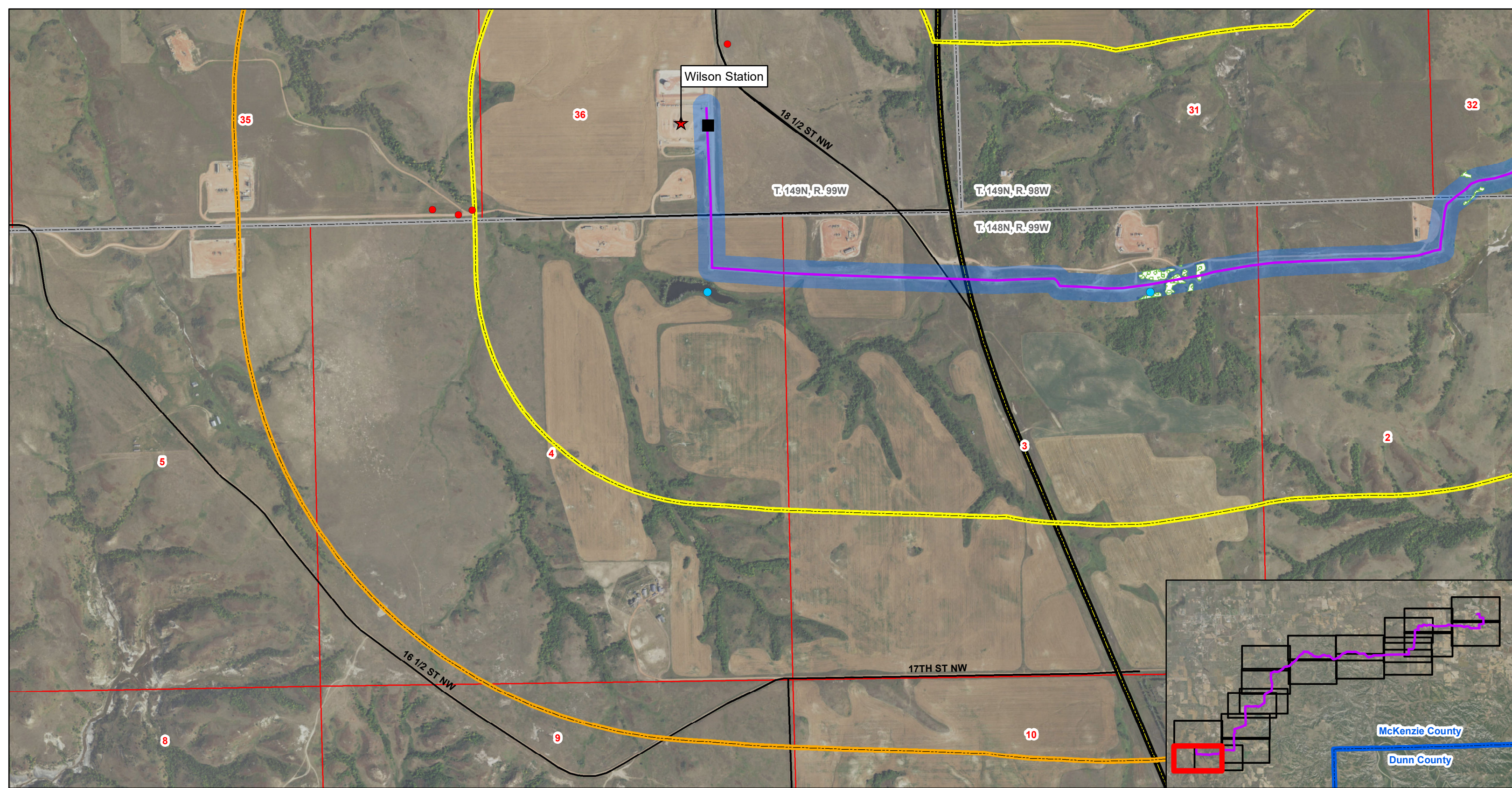
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- Noxious Weeds
- Named Streams
- 300ft Pipeline Corridor
- Block Valve
- ⊗ Landslide Prone Area
- Highway
- Raptor Survey Area
- Wetlands
- Proposed Alignment
- Roads
- 1mile Study Area
- Woody Vegetation
- Township/Range Boundary
- Section Boundary





Johnson's Corner to Wilson Station





Johnson's Corner to Wilson Station

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|---------------|------------------------|-----------------|---------------------------|---------------------------|
| ★ Facility | ● Noxious Weeds | — Named Streams | ■ 300ft Pipeline Corridor | ▨ Woody Vegetation |
| ■ Block Valve | ⊗ Landslide Prone Area | — Highway | ▭ Raptor Survey Area | ▭ Township/Range Boundary |
| ● Wetlands | — Proposed Alignment | — Roads | ▭ 1mile Study Area | ▭ Section Boundary |

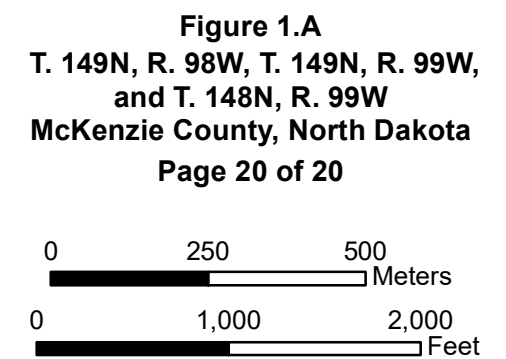
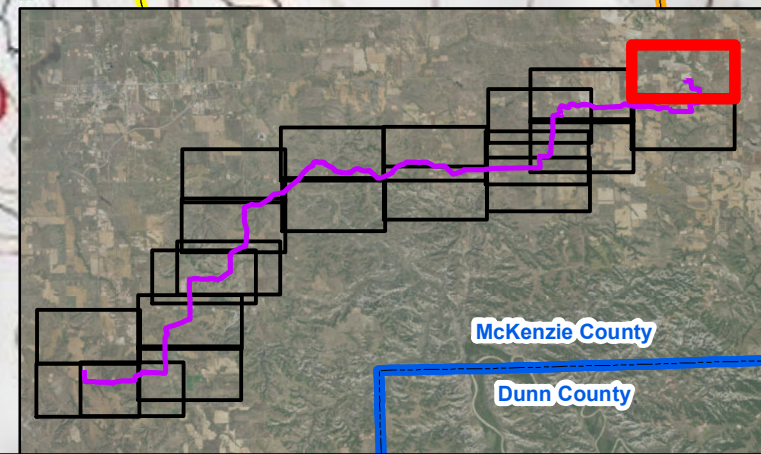
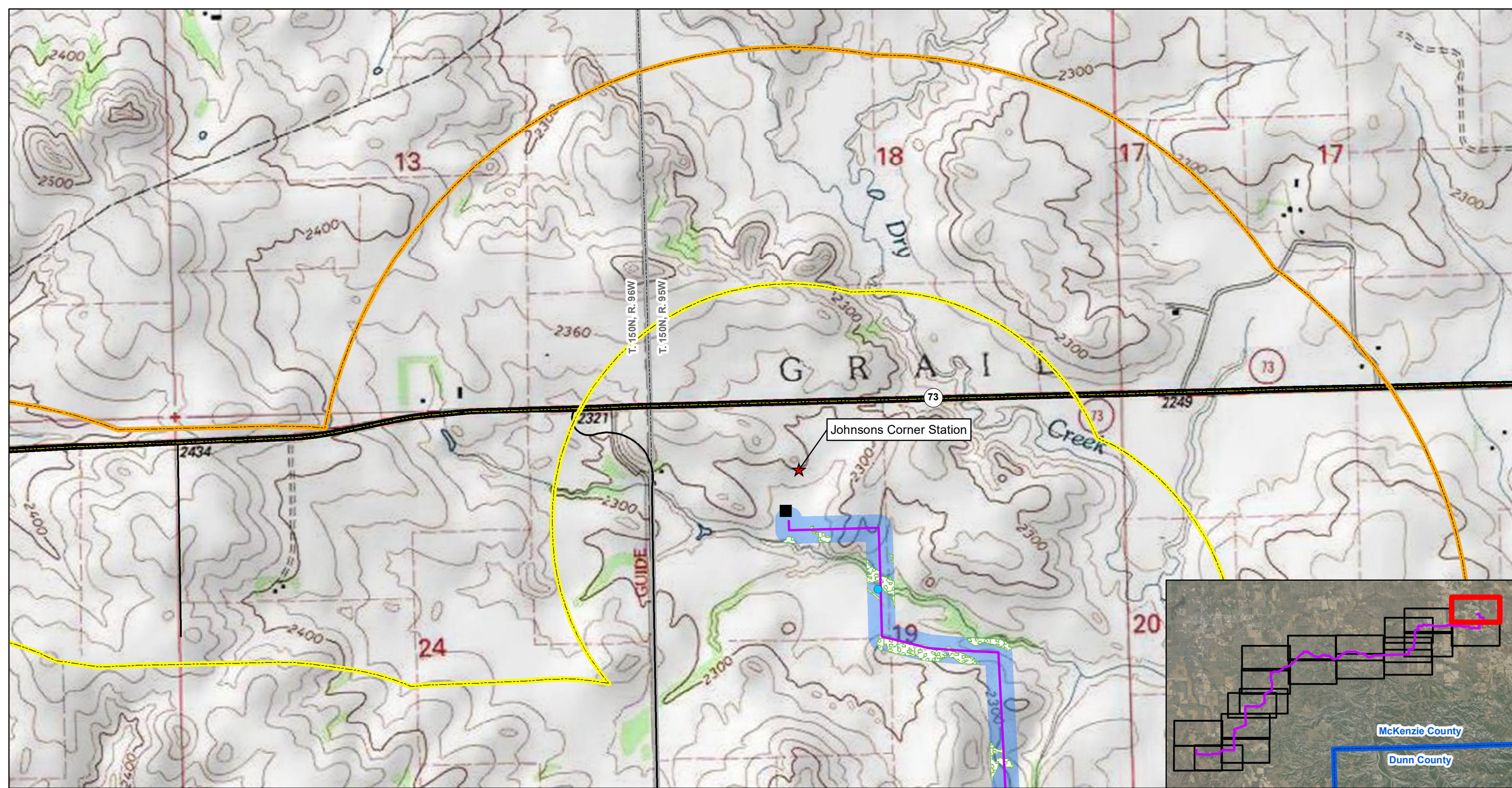
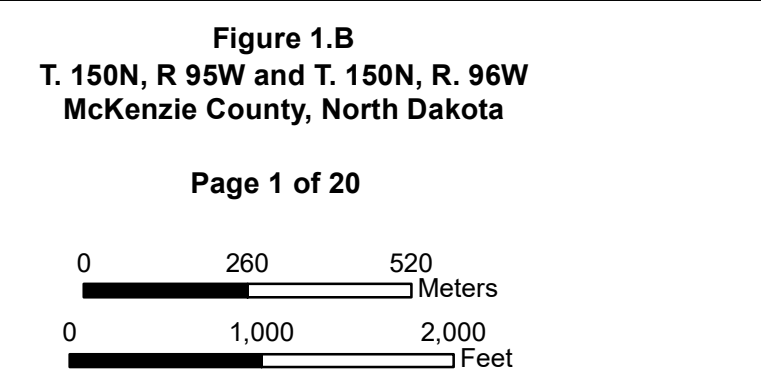
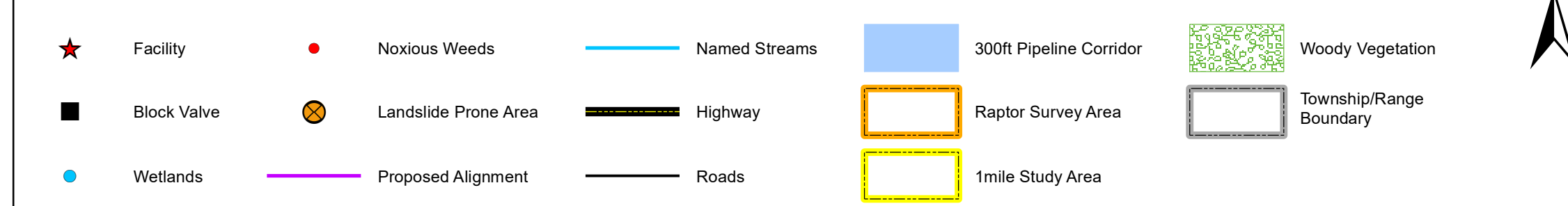
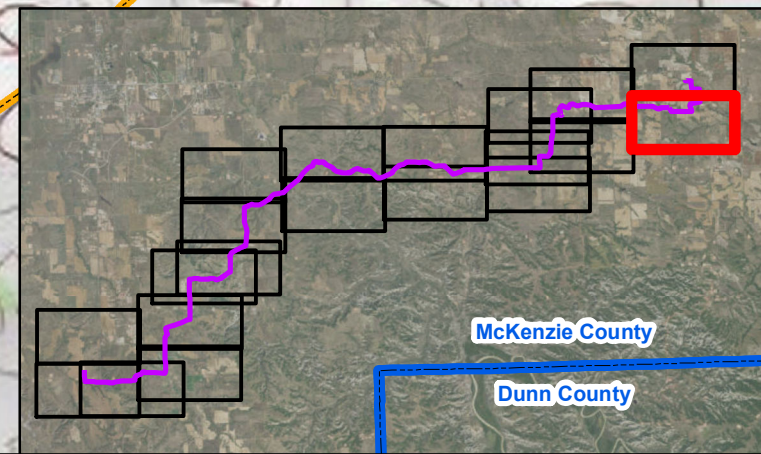
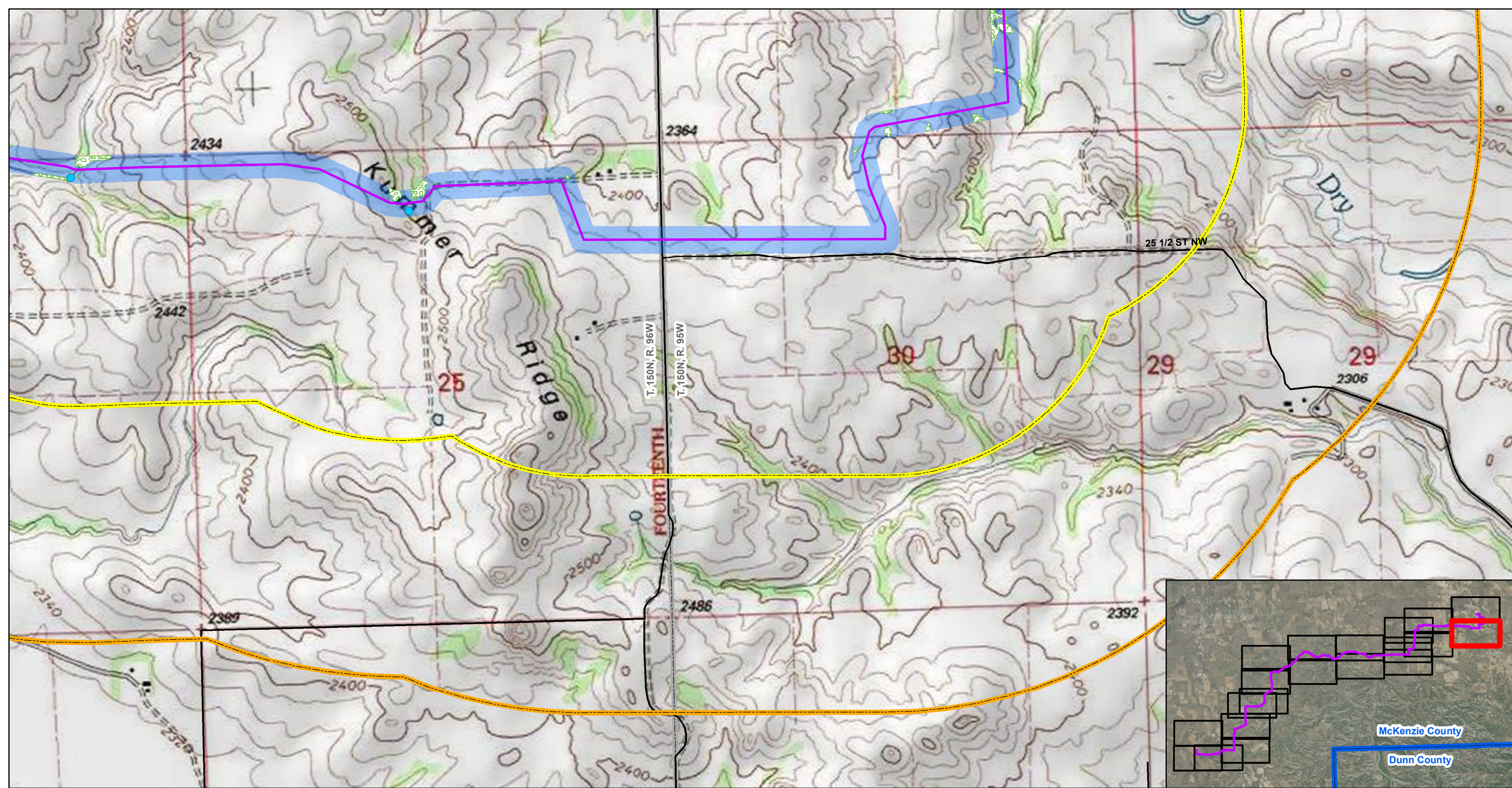


Exhibit A.2
Topographic Mapbook



Johnson's Corner to Wilson Station





Johnson's Corner to Wilson Station

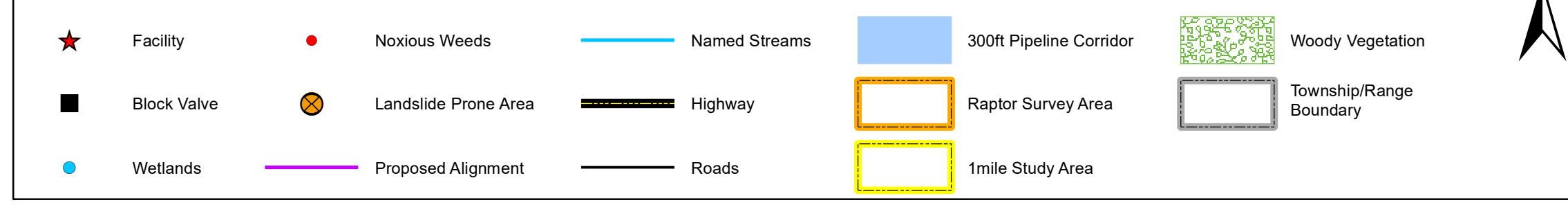
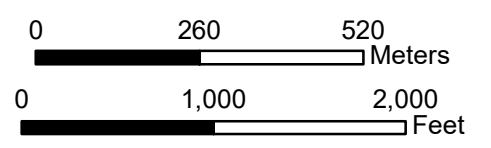
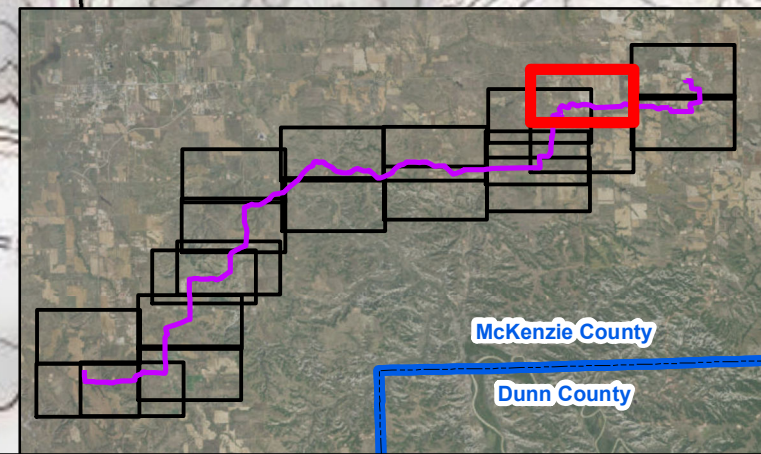
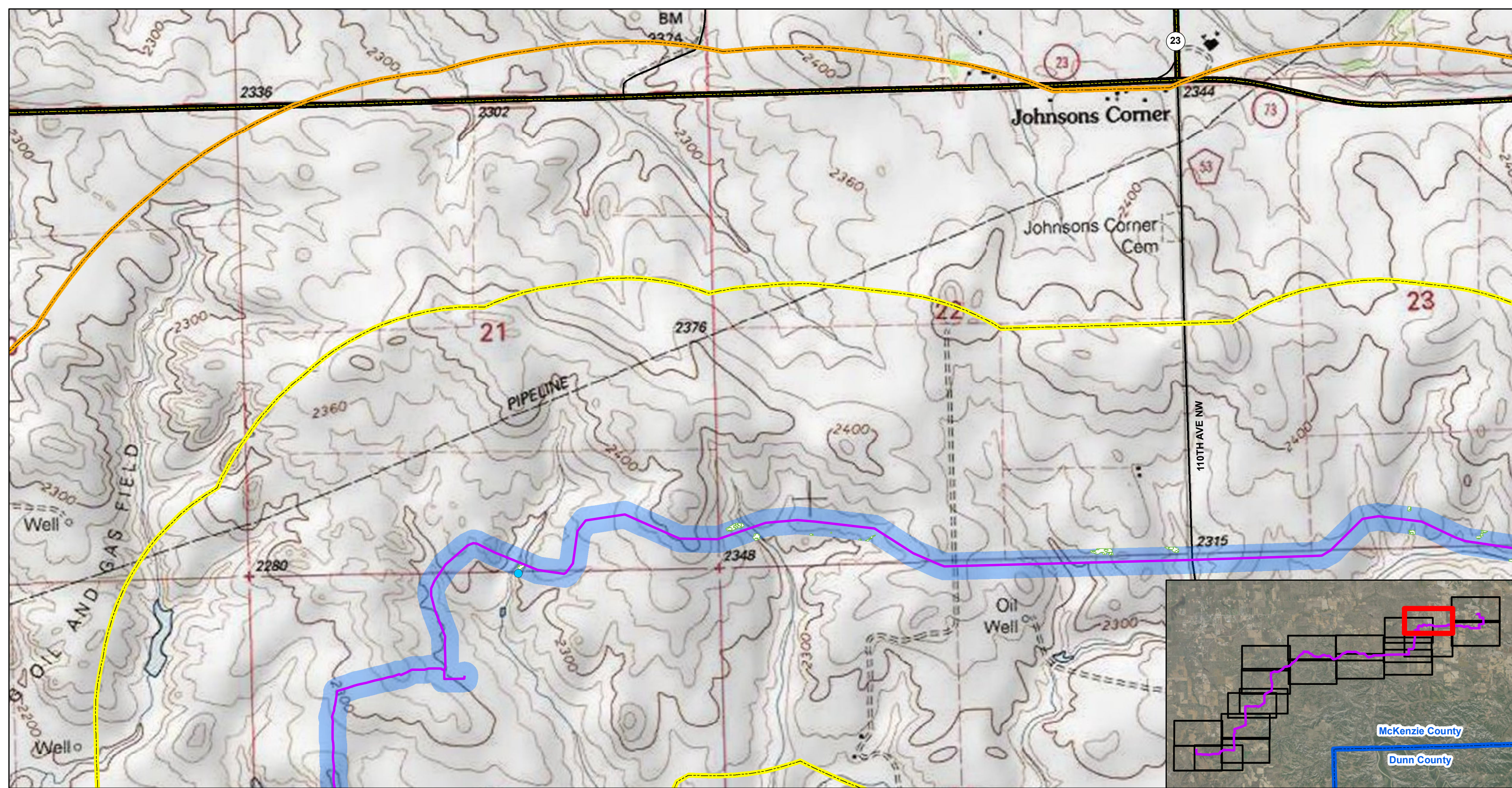
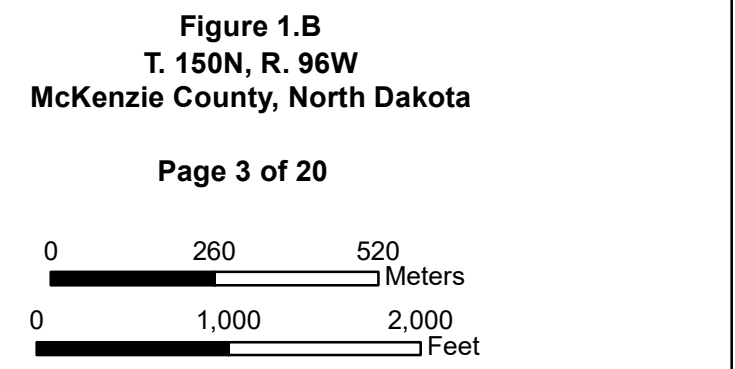
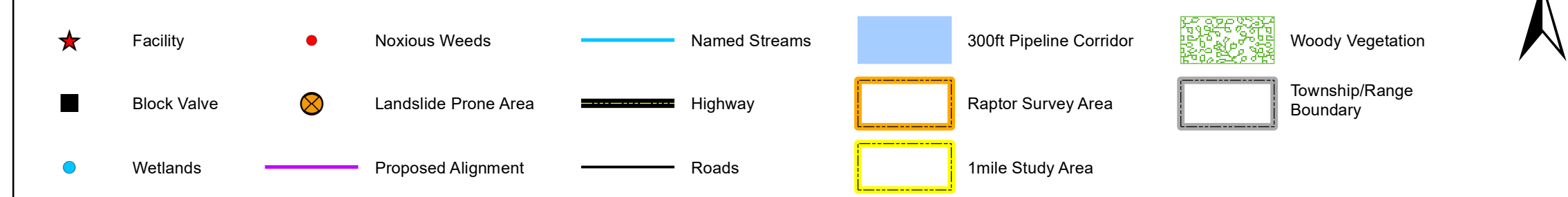


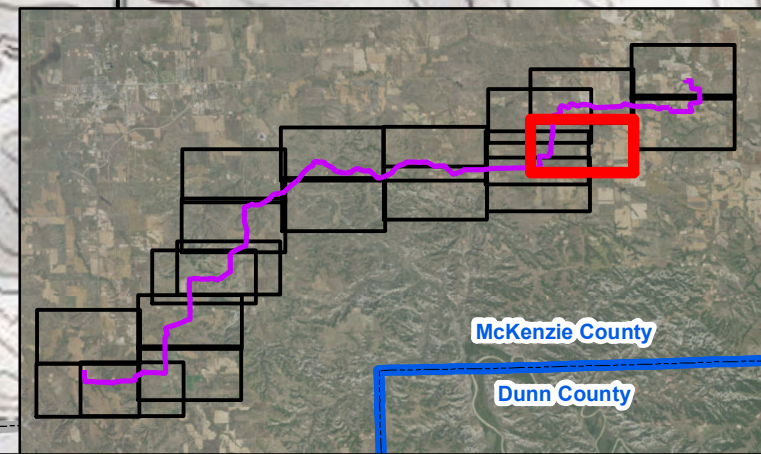
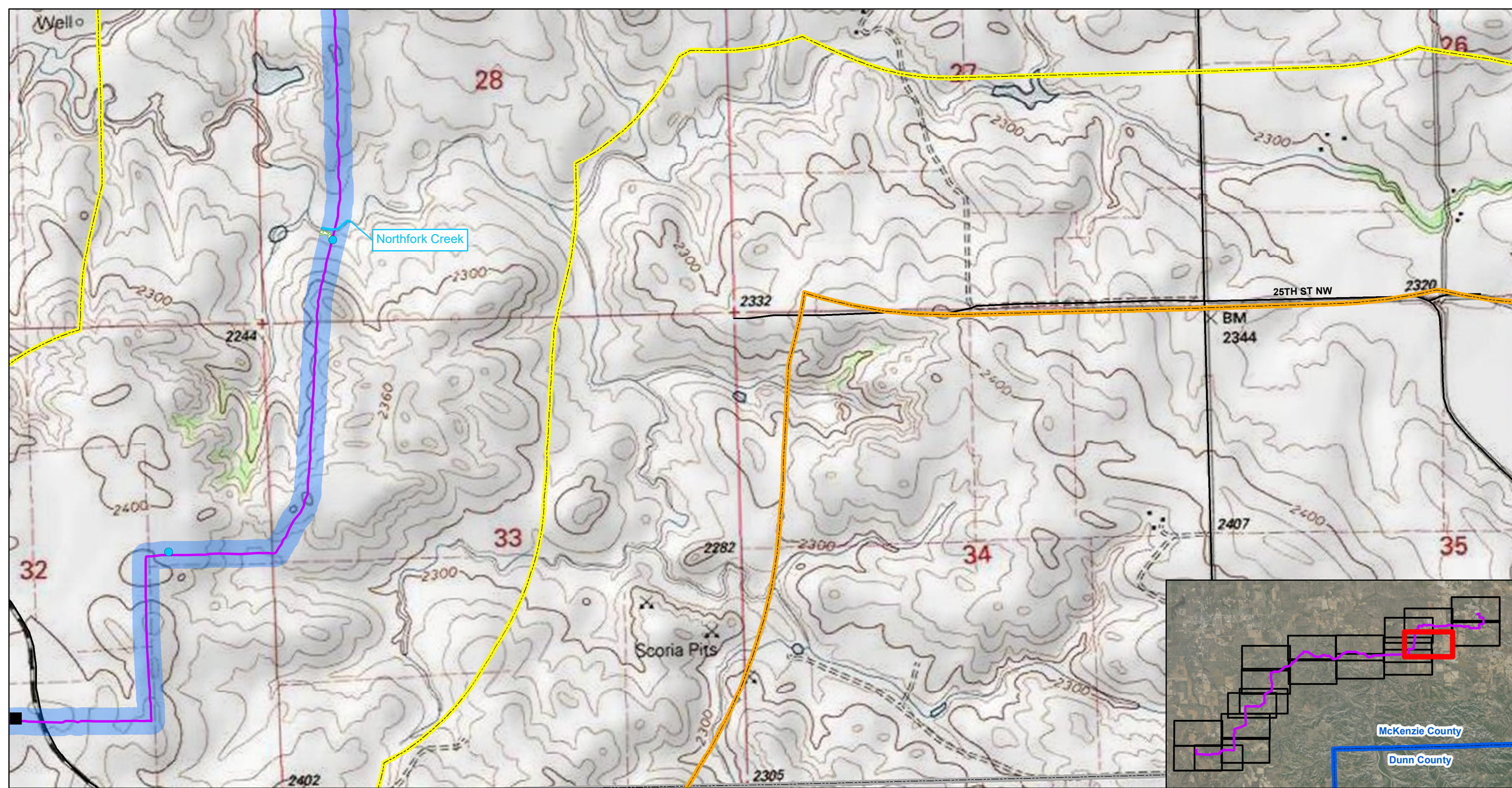
Figure 1.B
T. 150N, R. 95W and T. 150N, R. 96W
McKenzie County, North Dakota





Johnson's Corner to Wilson Station





Johnson's Corner to Wilson Station

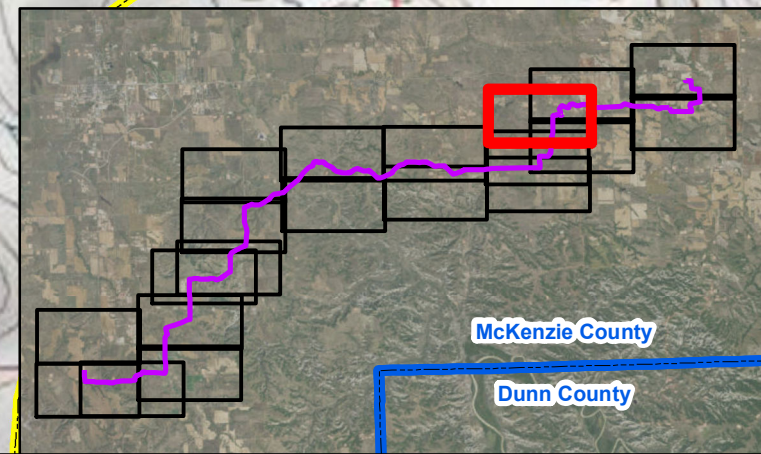
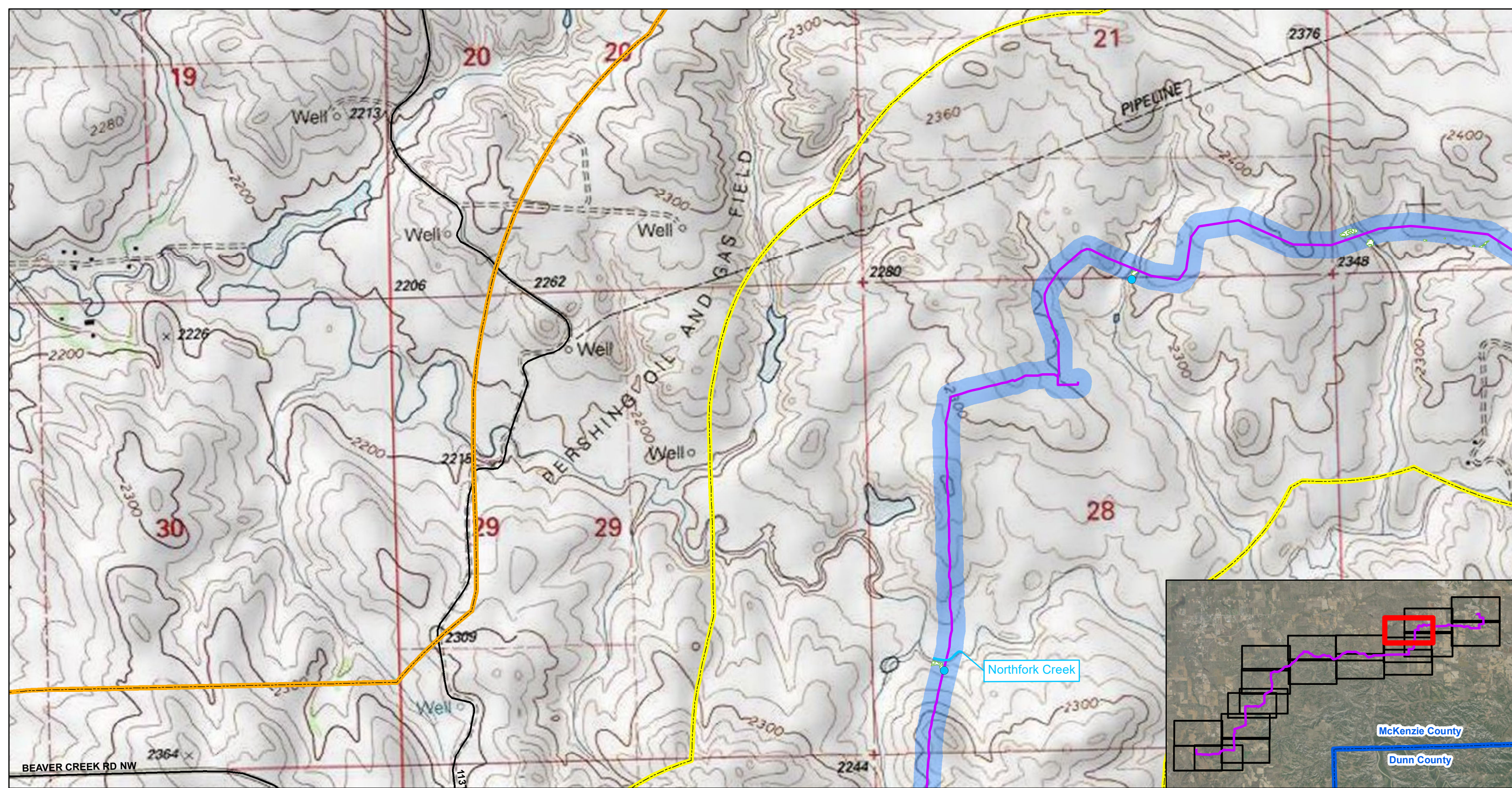
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|---------------|------------------------|-----------------|---------------------------|---------------------------|---------------|
| ★ Facility | ● Noxious Weeds | — Named Streams | ■ 300ft Pipeline Corridor | ▨ Woody Vegetation | ▲ North Arrow |
| ■ Block Valve | ⊗ Landslide Prone Area | — Highway | ▭ Raptor Survey Area | ▭ Township/Range Boundary | |
| ● Wetlands | — Proposed Alignment | — Roads | ▭ 1mile Study Area | | |

Figure 1.B
T. 150N, R. 96W
McKenzie County, North Dakota

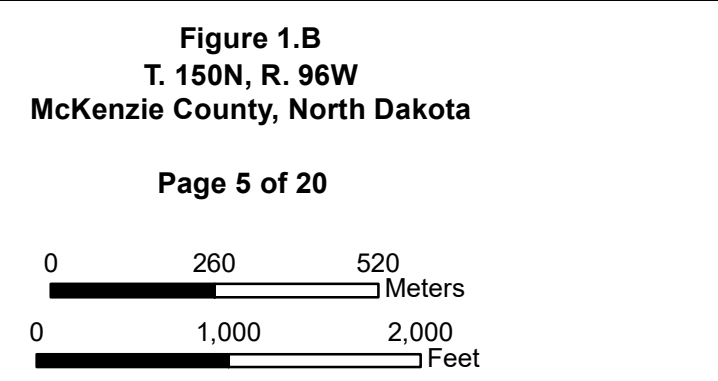
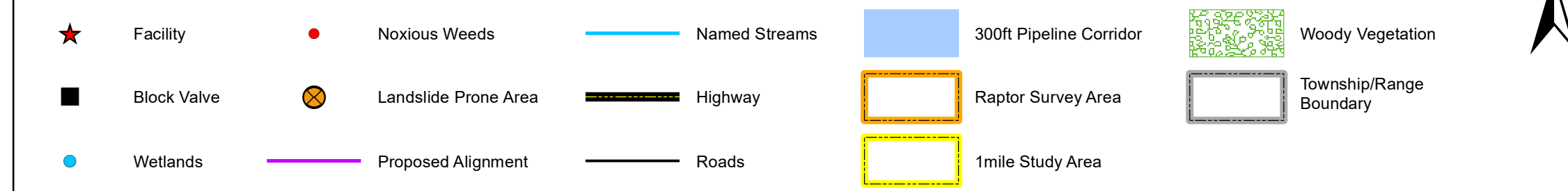
Page 4 of 20

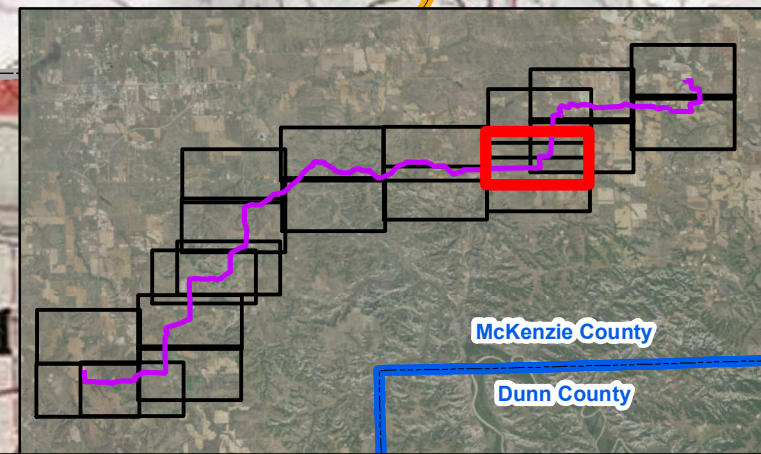
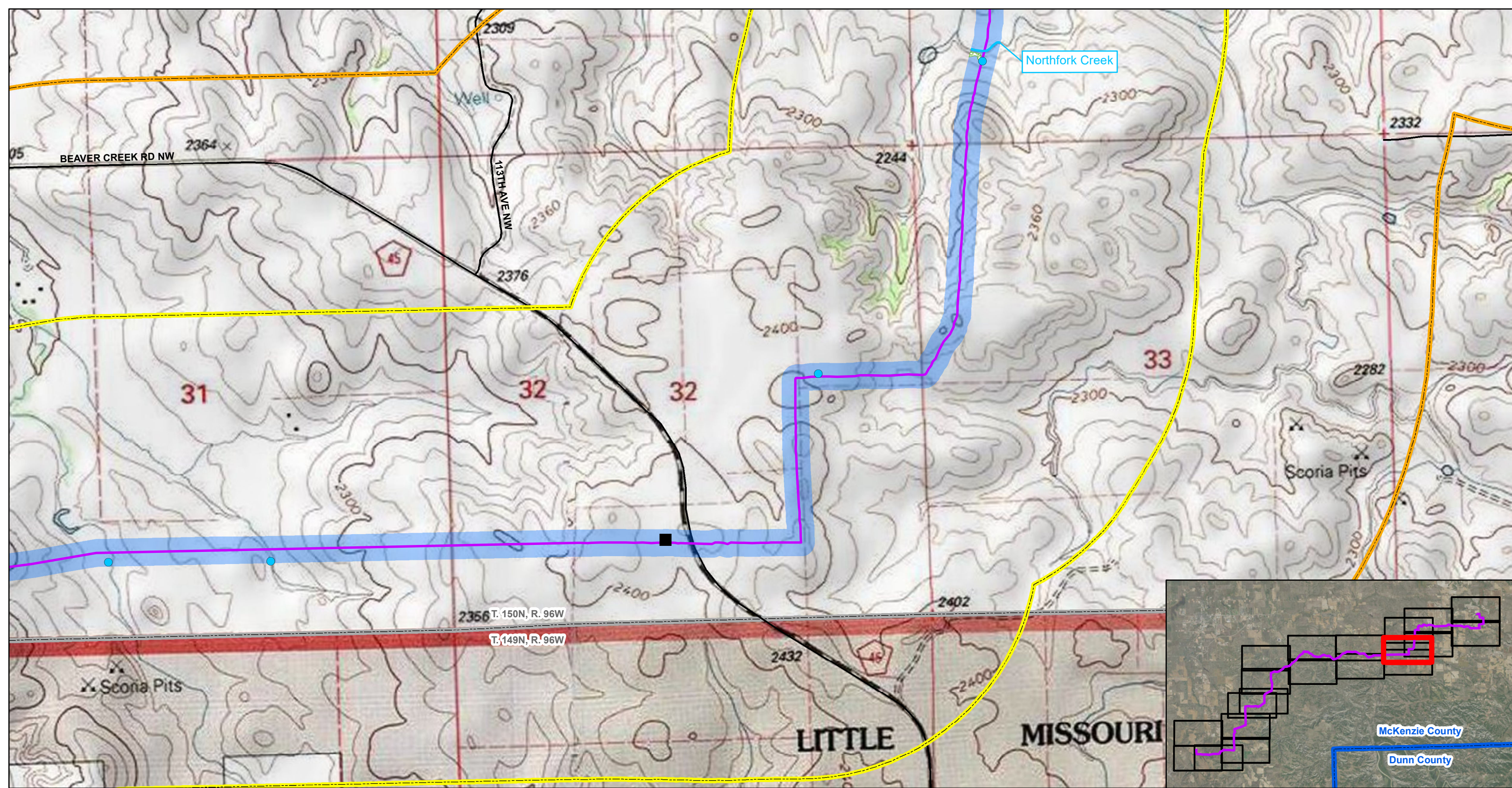
0 260 520 Meters

0 1,000 2,000 Feet

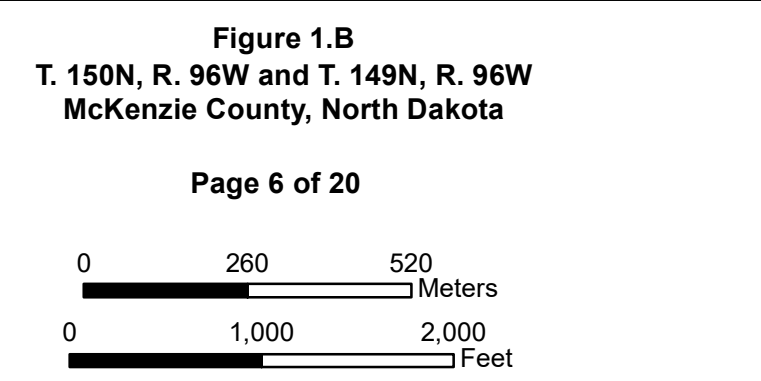
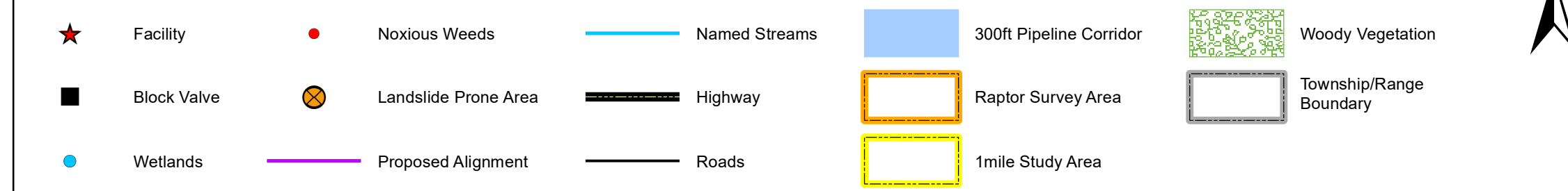


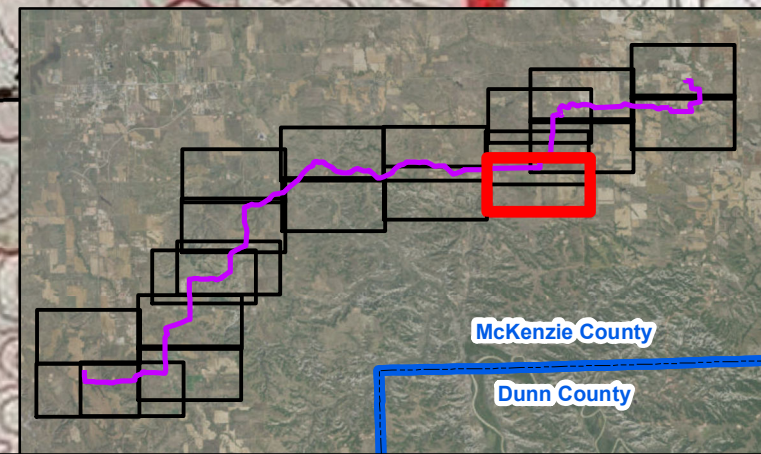
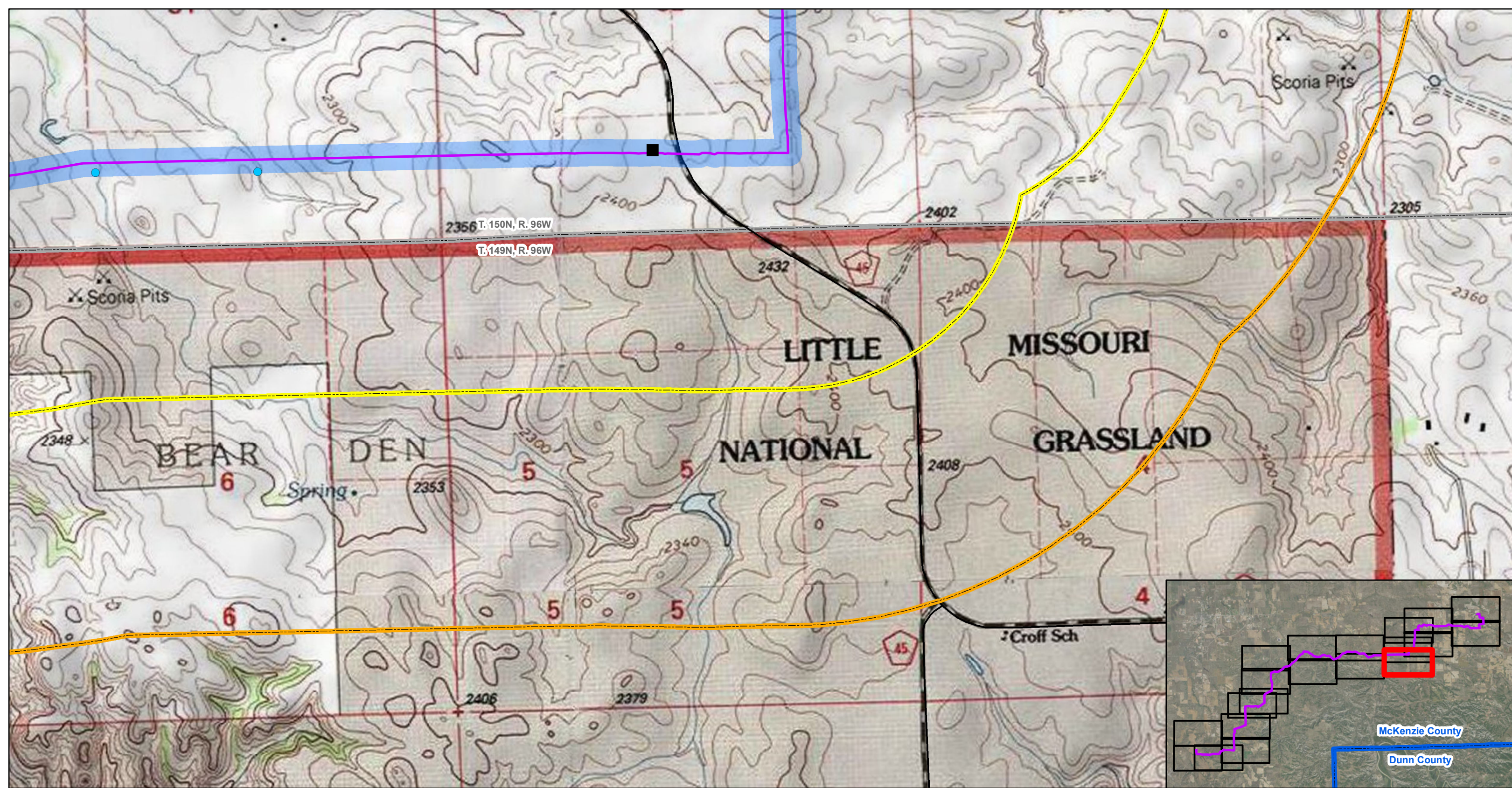
Johnson's Corner to Wilson Station





Johnson's Corner to Wilson Station



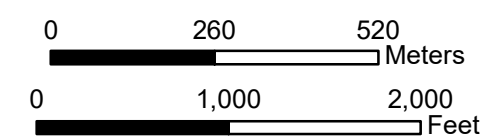


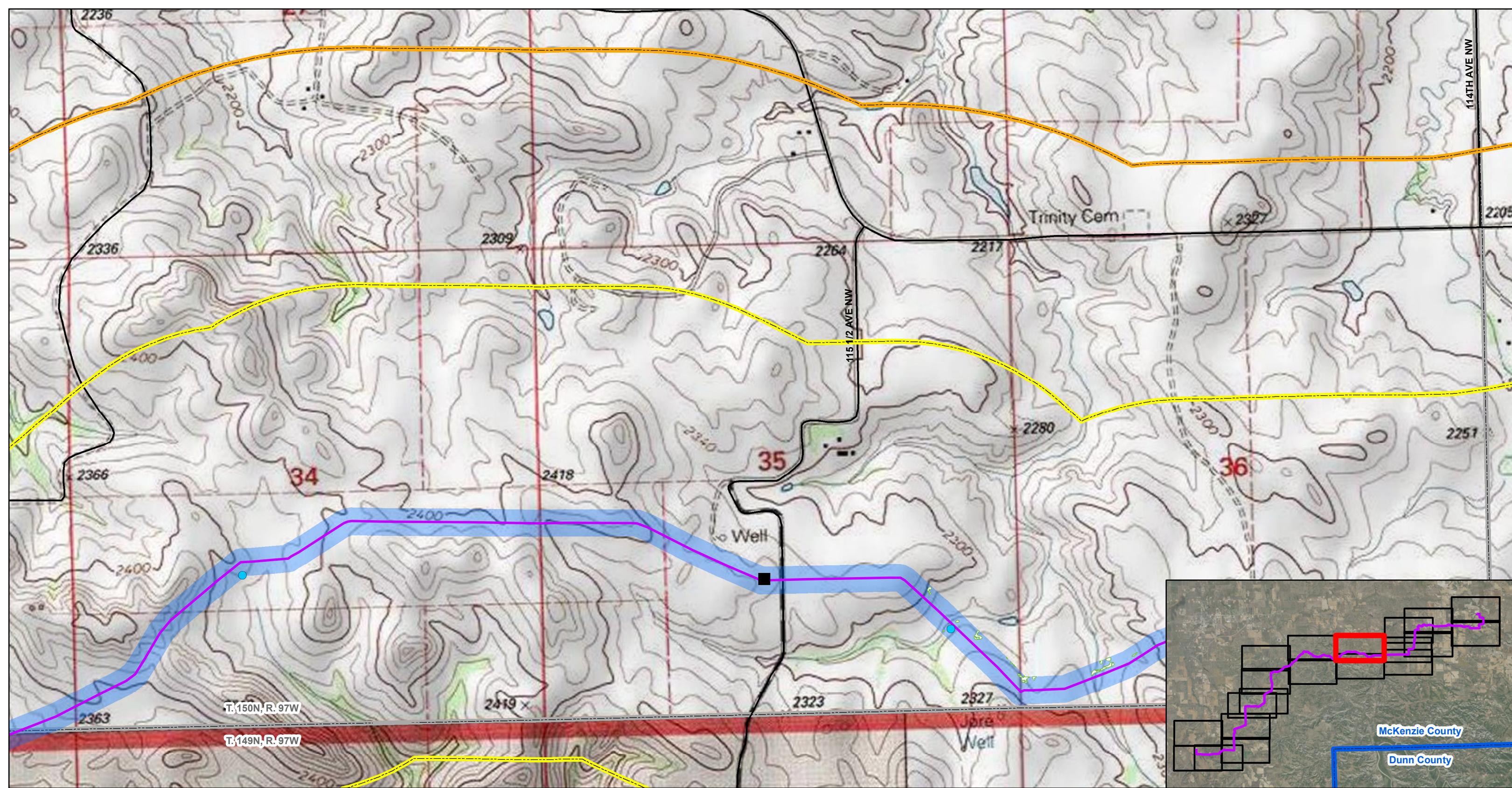
Johnson's Corner to Wilson Station

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|---------------|------------------------|-----------------|---------------------------|---------------------------|
| ★ Facility | ● Noxious Weeds | — Named Streams | ■ 300ft Pipeline Corridor | ▨ Woody Vegetation |
| ■ Block Valve | ⊗ Landslide Prone Area | — Highway | ▨ Raptor Survey Area | ▨ Township/Range Boundary |
| ● Wetlands | — Proposed Alignment | — Roads | ▨ 1mile Study Area | |



Figure 1.B
T. 150N, R. 96W and T. 149N, R. 96W
McKenzie County, North Dakota

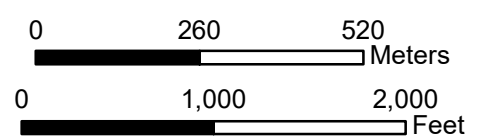


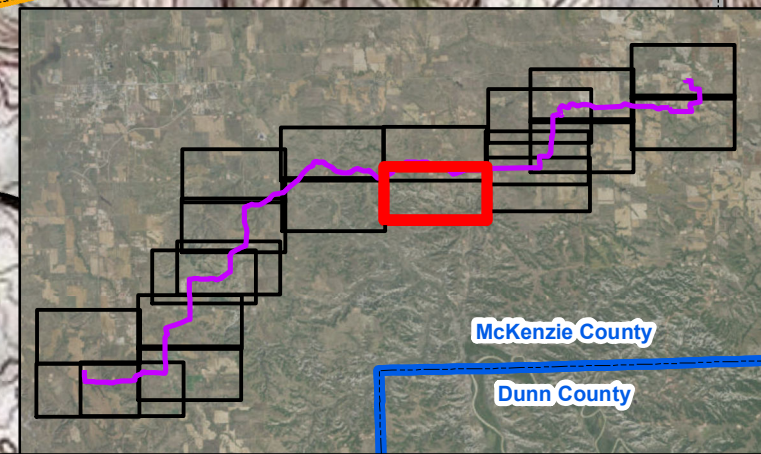
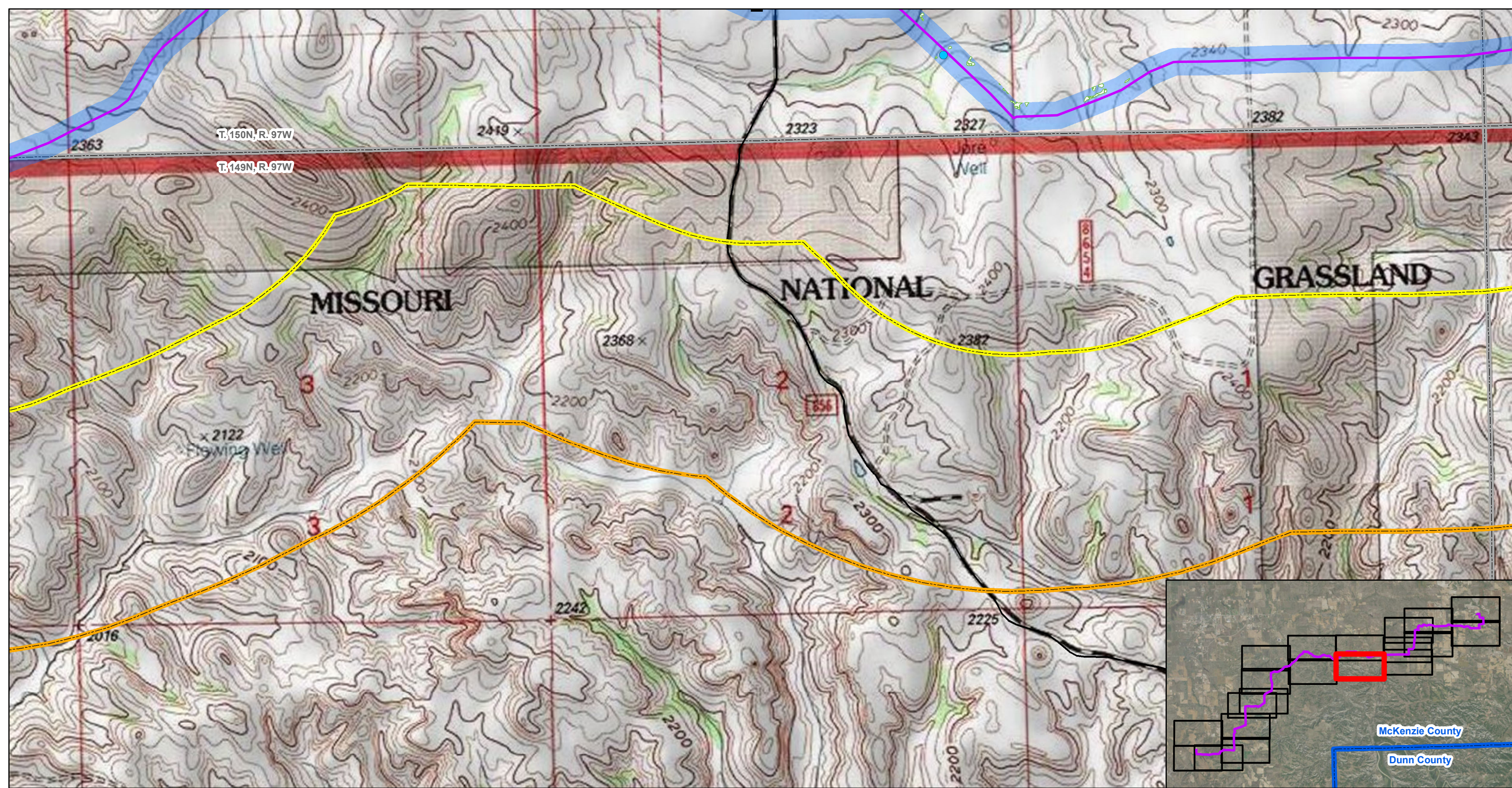


Johnson's Corner to Wilson Station

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|---------------|------------------------|-----------------|---------------------------|---------------------------|---------------|
| ★ Facility | ● Noxious Weeds | — Named Streams | ■ 300ft Pipeline Corridor | ▨ Woody Vegetation | ↑ North Arrow |
| ■ Block Valve | ⊗ Landslide Prone Area | — Highway | ▨ Raptor Survey Area | ▭ Township/Range Boundary | |
| ● Wetlands | — Proposed Alignment | — Roads | ▨ 1mile Study Area | | |

Figure 1.B
 T. 150N, R. 96W, T. 149N, R. 96W, T. 150N, R. 97W,
 and T. 149N, R. 97W
McKenzie County, North Dakota
 Page 8 of 20





Johnson's Corner to Wilson Station

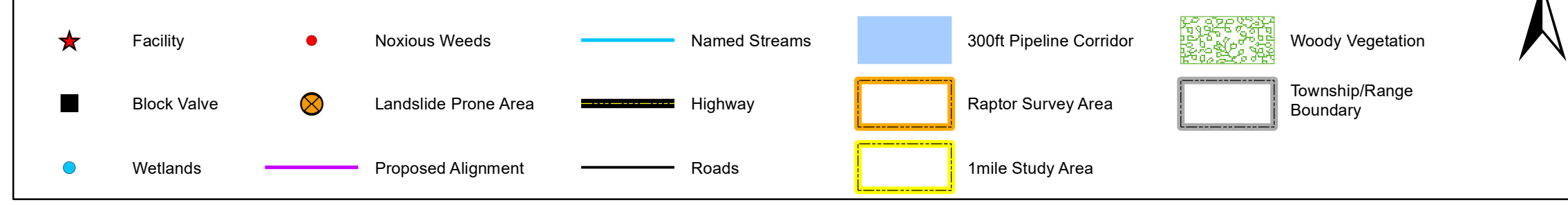
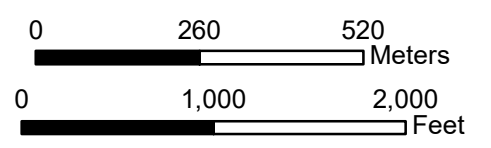
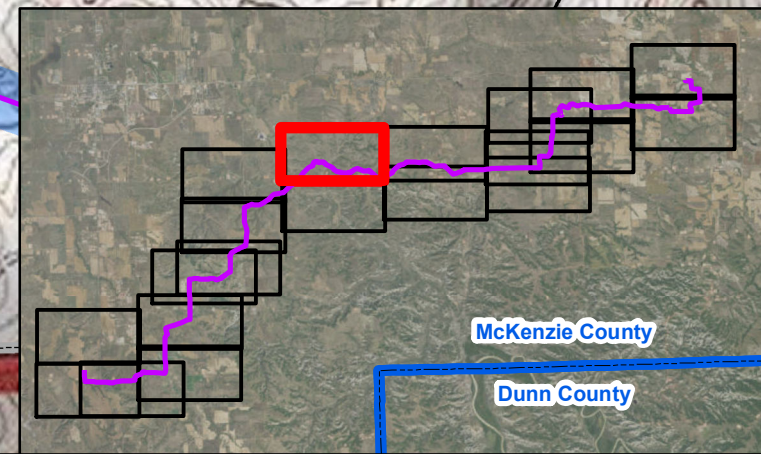


Figure 1.B
 T. 150N, R. 96W, T. 149N, R. 96W, T. 150N, R. 97W,
 and T. 149N, R. 97W
 McKenzie County, North Dakota
 Page 9 of 20





Johnson's Corner to Wilson Station

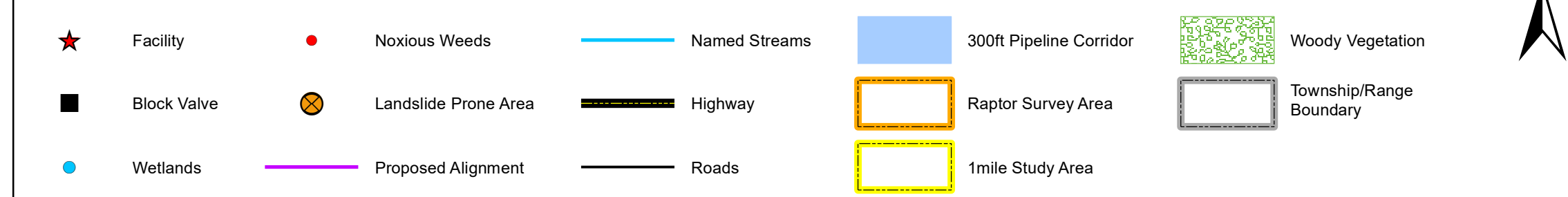
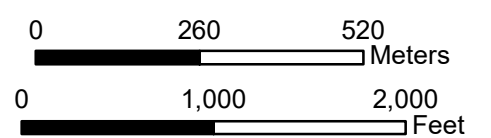
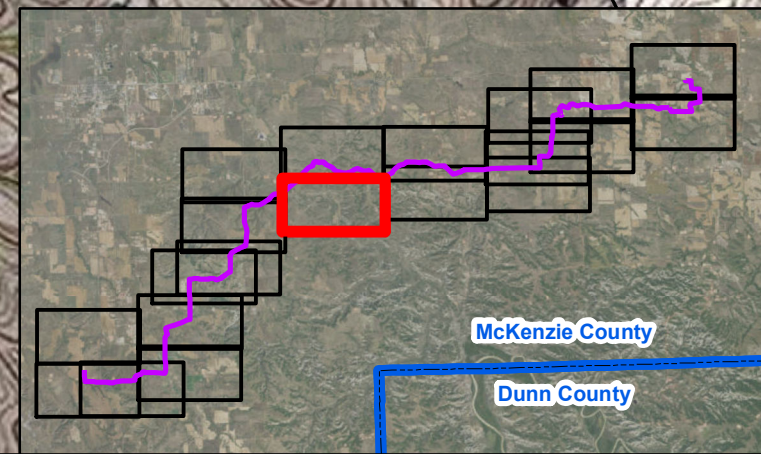
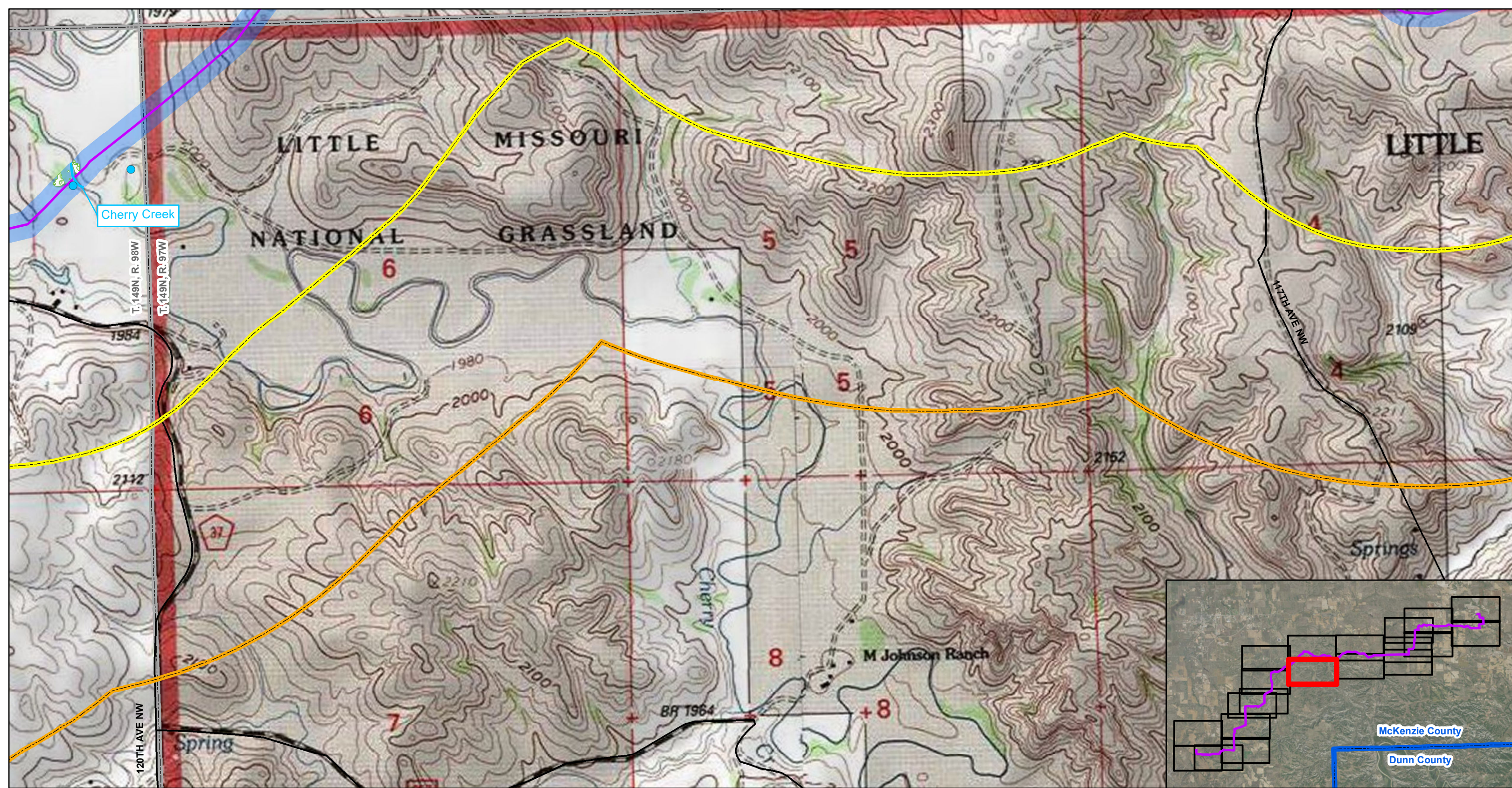


Figure 1.B
 T. 150N, R. 97W, T. 149N, R. 97W, T. 150N, R. 98W,
 and T. 149N, R. 98W
 McKenzie County, North Dakota
 Page 10 of 20





Johnson's Corner to Wilson Station

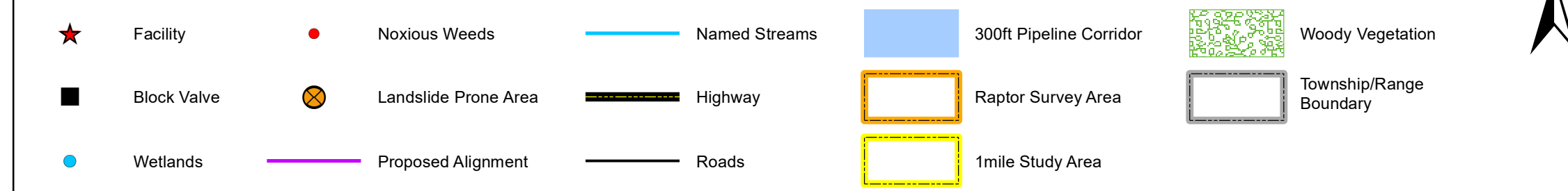
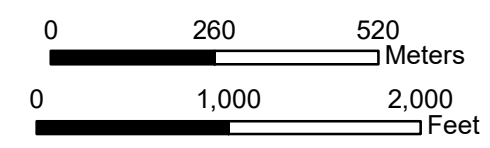
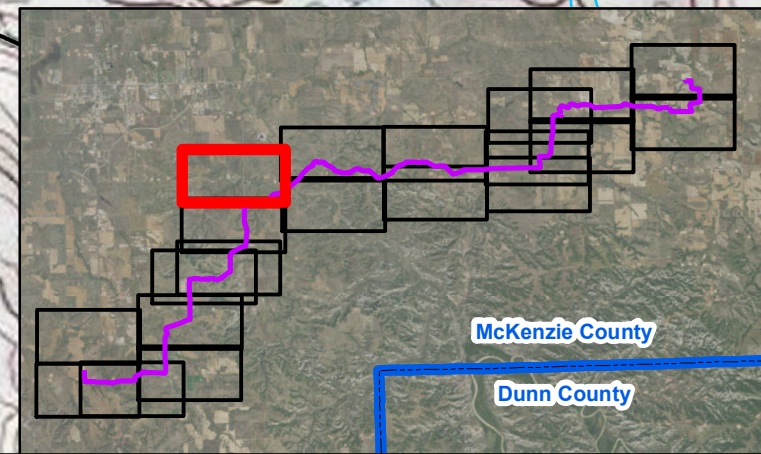
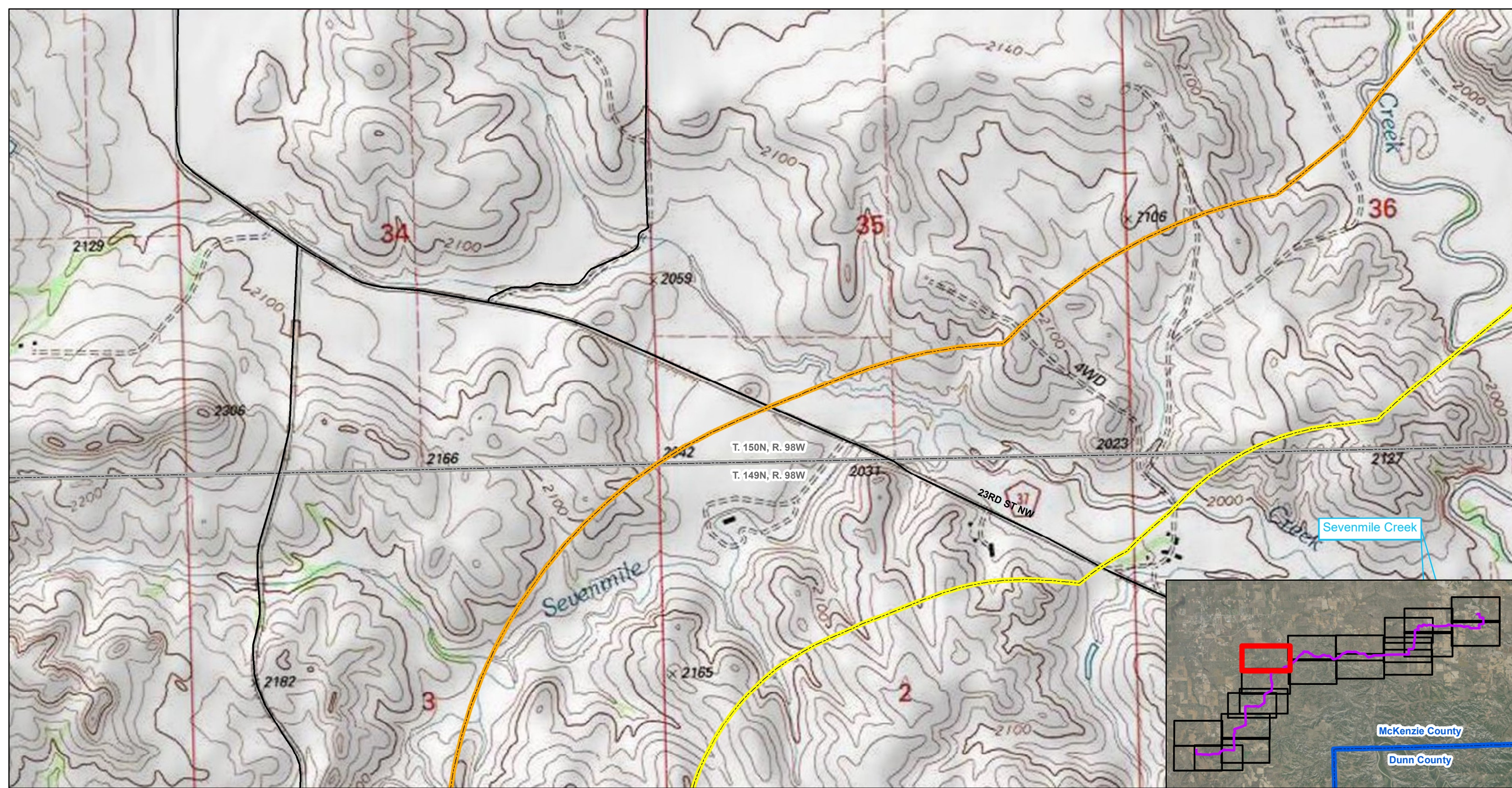


Figure 1.B
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 and T. 149N, R. 98W
 McKenzie County, North Dakota
 Page 11 of 20



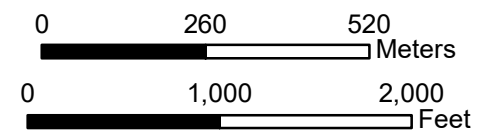


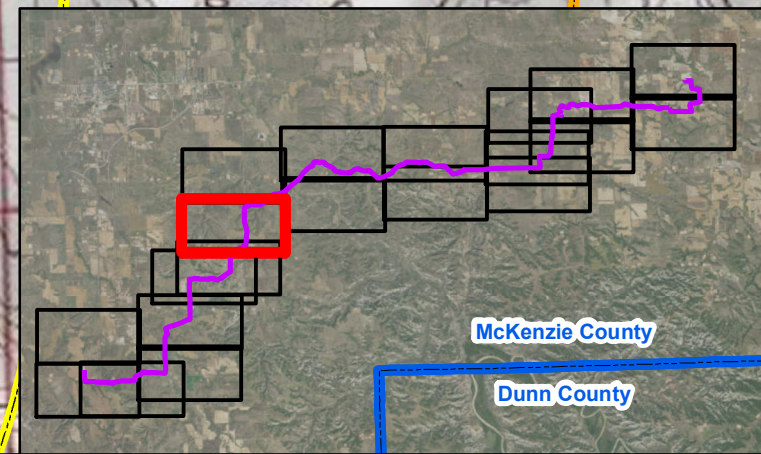
Johnson's Corner to Wilson Station

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|---------------|------------------------|-----------------|---------------------------|---------------------------|
| ★ Facility | ● Noxious Weeds | — Named Streams | ■ 300ft Pipeline Corridor | ▨ Woody Vegetation |
| ■ Block Valve | ⊗ Landslide Prone Area | — Highway | ▨ Raptor Survey Area | ▨ Township/Range Boundary |
| ● Wetlands | — Proposed Alignment | — Roads | ▨ 1mile Study Area | |



Figure 1.B
T. 150N, R. 98W and T. 149N, R. 98W
McKenzie County, North Dakota





Johnson's Corner to Wilson Station

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|---------------|------------------------|-----------------|---------------------------|---------------------------|
| ★ Facility | ● Noxious Weeds | — Named Streams | ■ 300ft Pipeline Corridor | ■ Woody Vegetation |
| ■ Block Valve | ⊗ Landslide Prone Area | — Highway | ▭ Raptor Survey Area | ▭ Township/Range Boundary |
| ● Wetlands | — Proposed Alignment | — Roads | ▭ 1mile Study Area | |

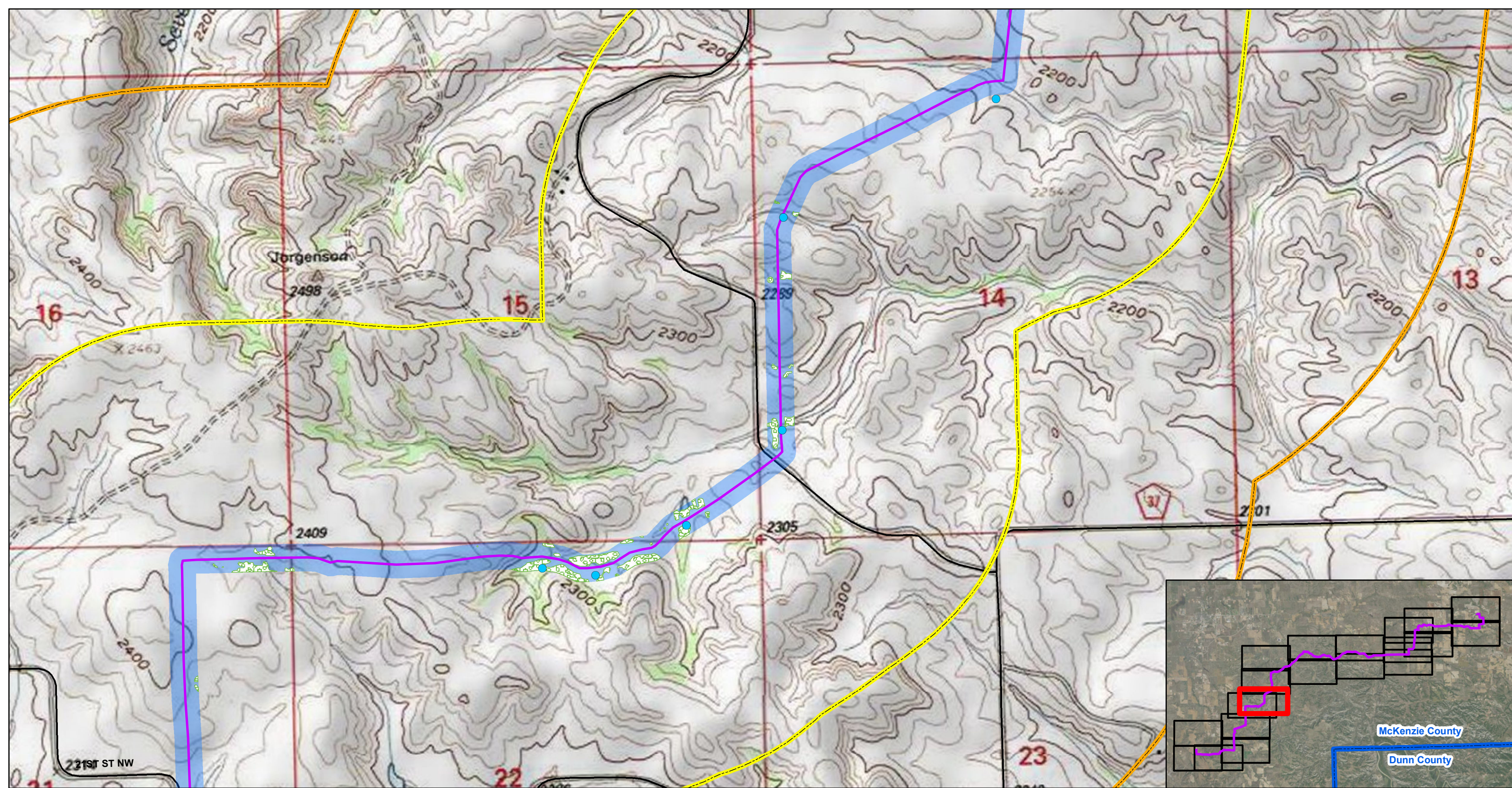


Figure 1.B
T. 149N, R. 98W
McKenzie County, North Dakota

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0 260 520 Meters

0 1,000 2,000 Feet

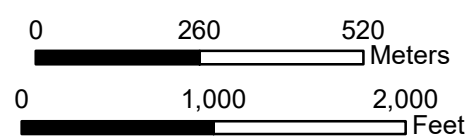


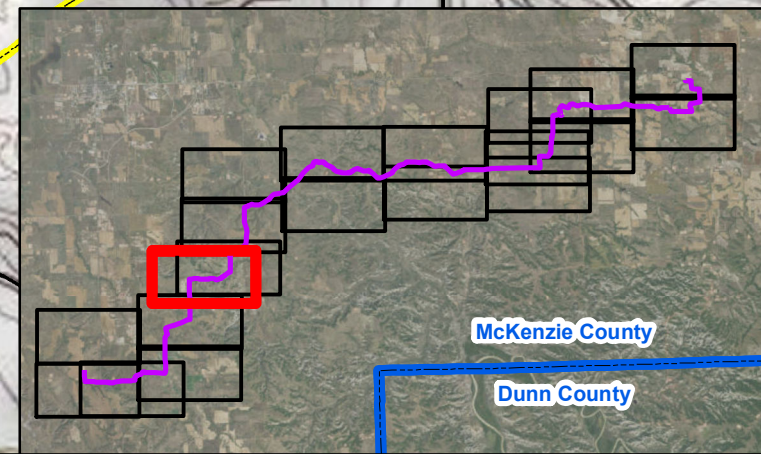
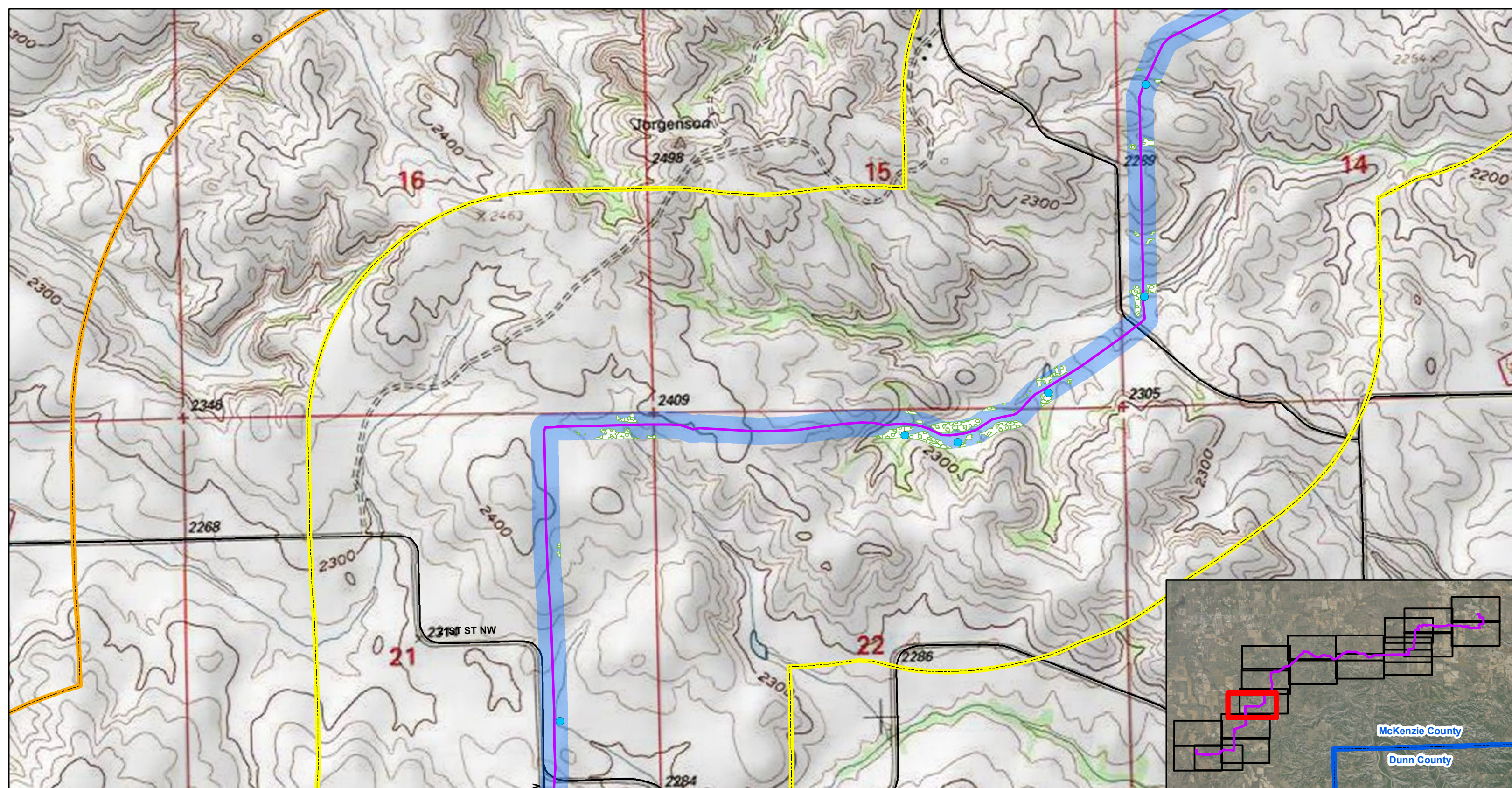
Johnson's Corner to Wilson Station

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| ★ Facility | ● Noxious Weeds | — Named Streams | ■ 300ft Pipeline Corridor | ■ Woody Vegetation |
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| ● Wetlands | — Proposed Alignment | — Roads | ■ 1mile Study Area | |



Figure 1.B
T. 149N, R. 98W
McKenzie County, North Dakota



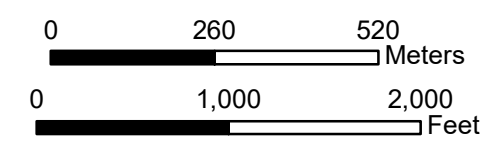


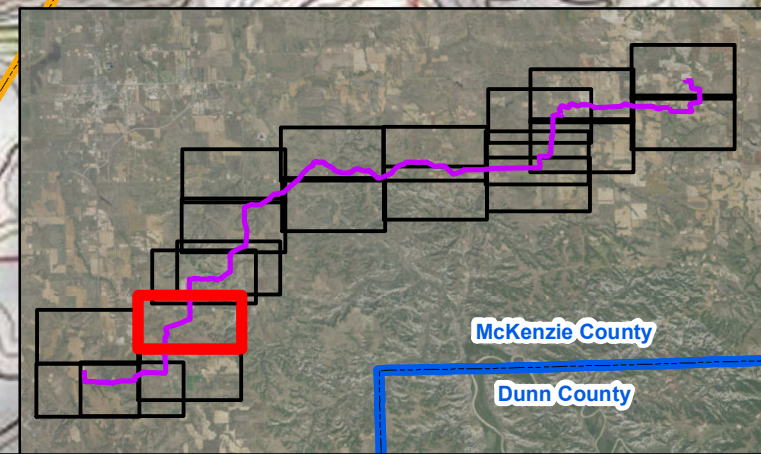
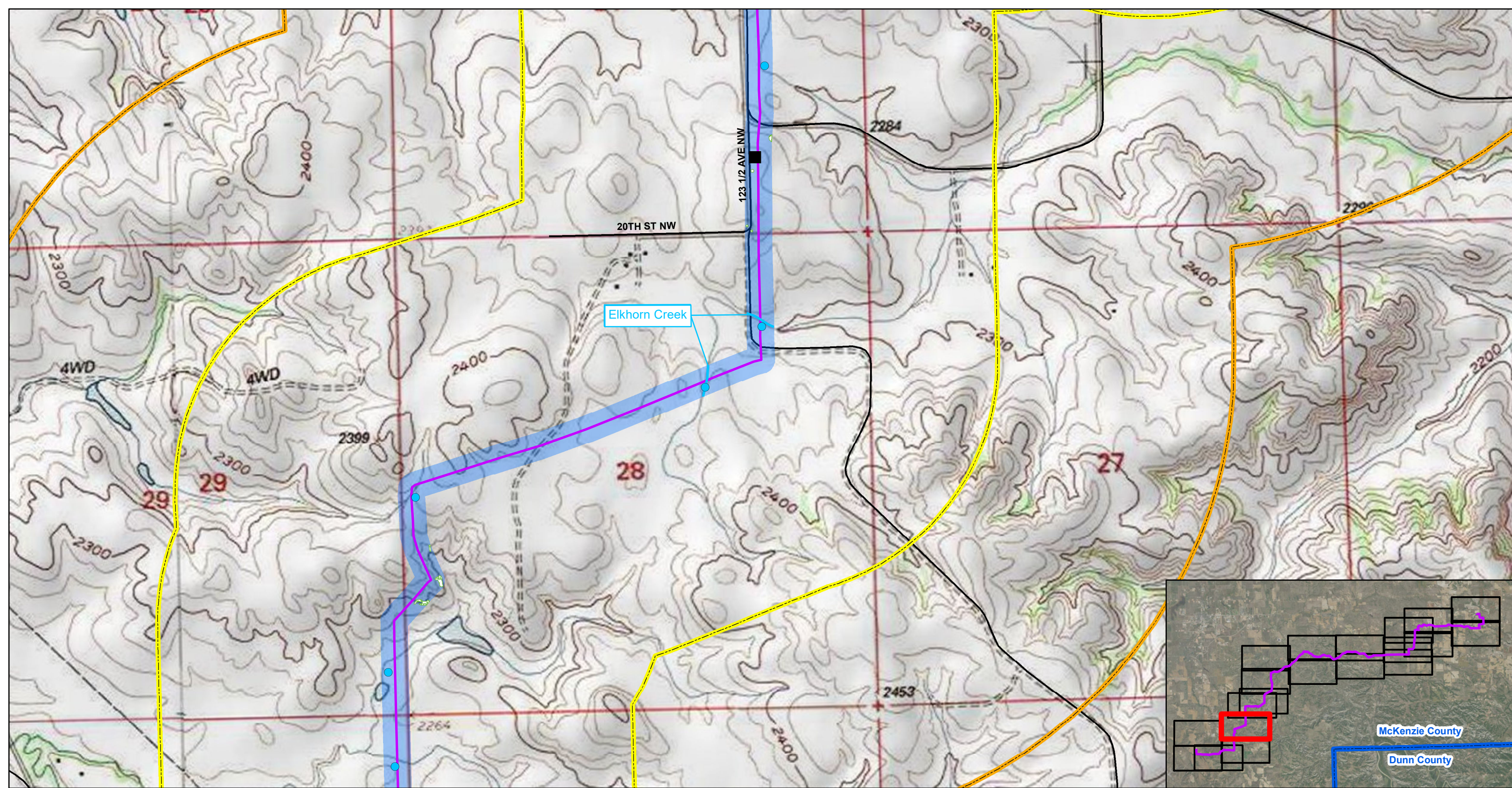
Johnson's Corner to Wilson Station

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|---------------|------------------------|-----------------|---------------------------|---------------------------|
| ★ Facility | ● Noxious Weeds | — Named Streams | ■ 300ft Pipeline Corridor | ▨ Woody Vegetation |
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Figure 1.B
T. 149N, R. 98W
McKenzie County, North Dakota





Johnson's Corner to Wilson Station

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|---------------|------------------------|-----------------|---------------------------|---------------------------|
| ★ Facility | ● Noxious Weeds | — Named Streams | ■ 300ft Pipeline Corridor | ▨ Woody Vegetation |
| ■ Block Valve | ⊗ Landslide Prone Area | — Highway | ▨ Raptor Survey Area | ▨ Township/Range Boundary |
| ● Wetlands | — Proposed Alignment | — Roads | ▨ 1mile Study Area | |

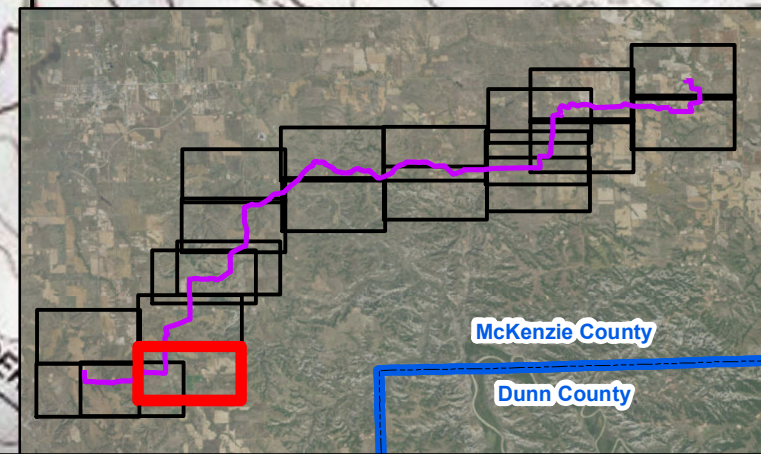
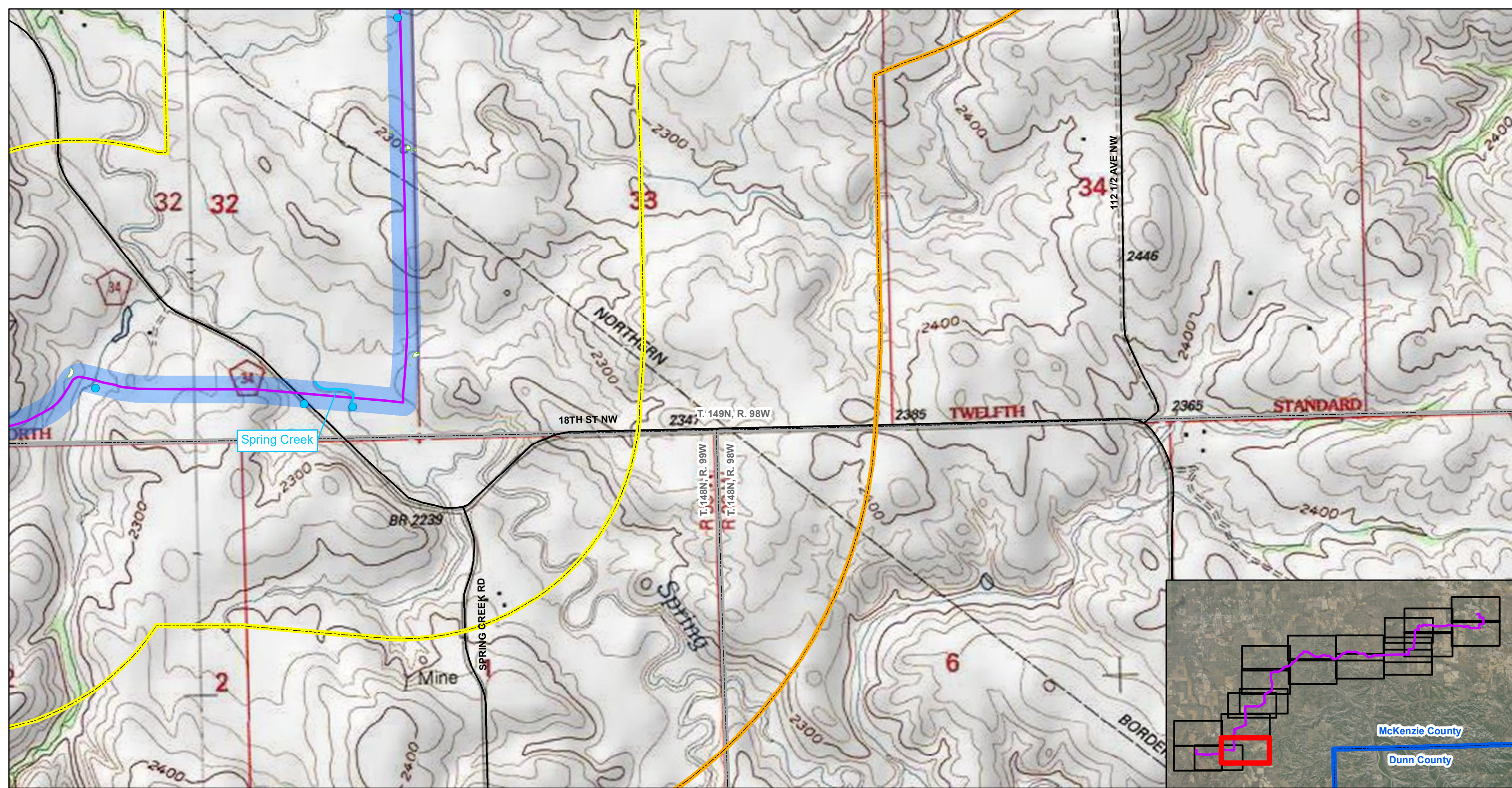


Figure 1.B
T. 149N, R. 98W
McKenzie County, North Dakota

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0 260 520 Meters

0 1,000 2,000 Feet



Johnson's Corner to Wilson Station

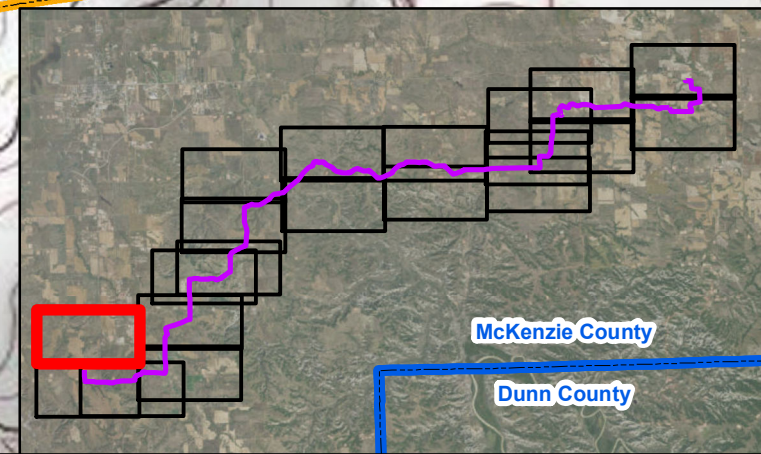
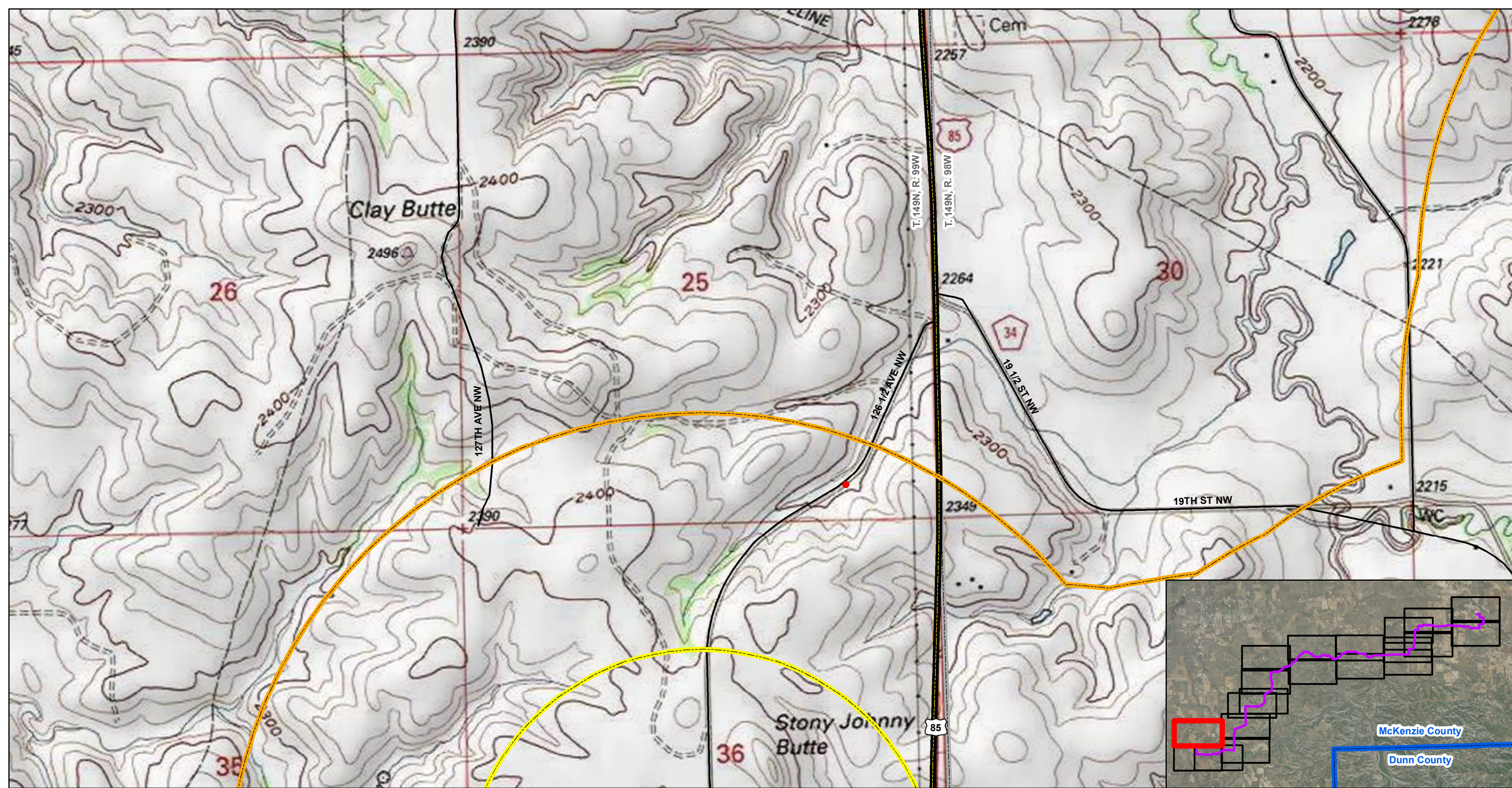
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| ★ Facility | ● Noxious Weeds | — Named Streams | ■ 300ft Pipeline Corridor | ■ Woody Vegetation |
| ■ Block Valve | ⊗ Landslide Prone Area | — Highway | ■ Raptor Survey Area | ■ Township/Range Boundary |
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Figure 1.B
 T. 149N, R. 98W, T. 148N, R. 98W,
 and T. 148N, R. 99W
 McKenzie County, North Dakota
 Page 17 of 20

0 260 520 Meters

0 1,000 2,000 Feet



Johnson's Corner to Wilson Station

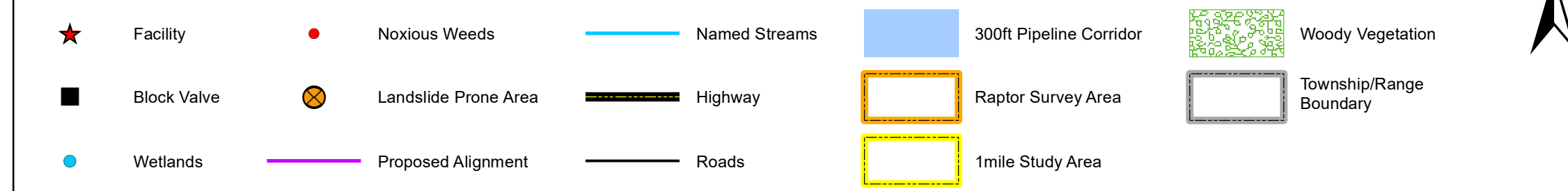
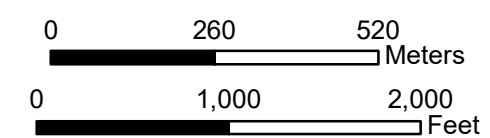
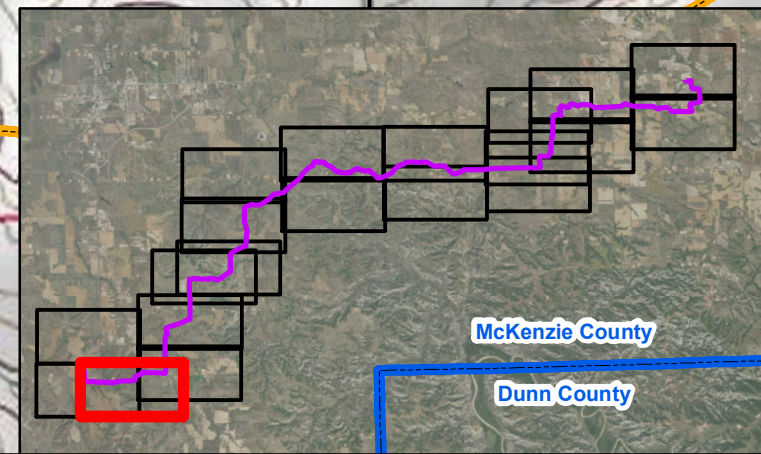
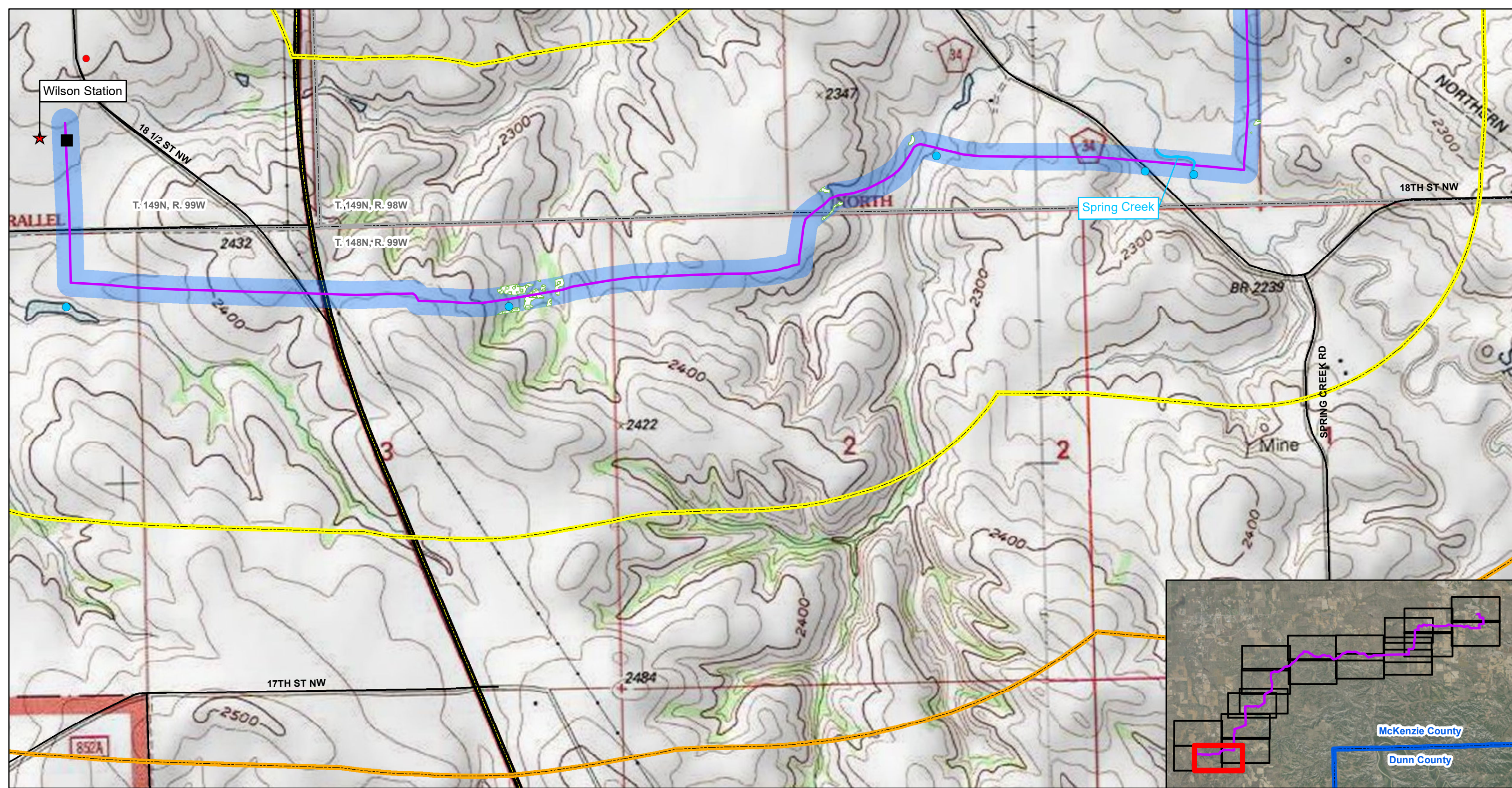


Figure 1.B
T. 149N, R. 98W and T. 149N, R. 99W
McKenzie County, North Dakota





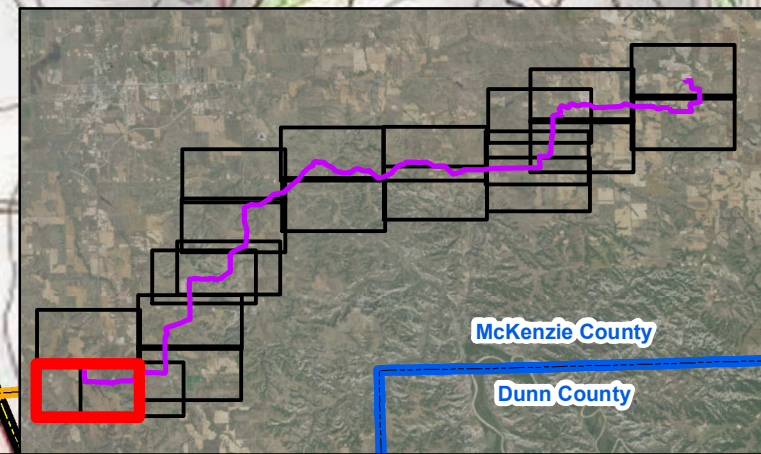
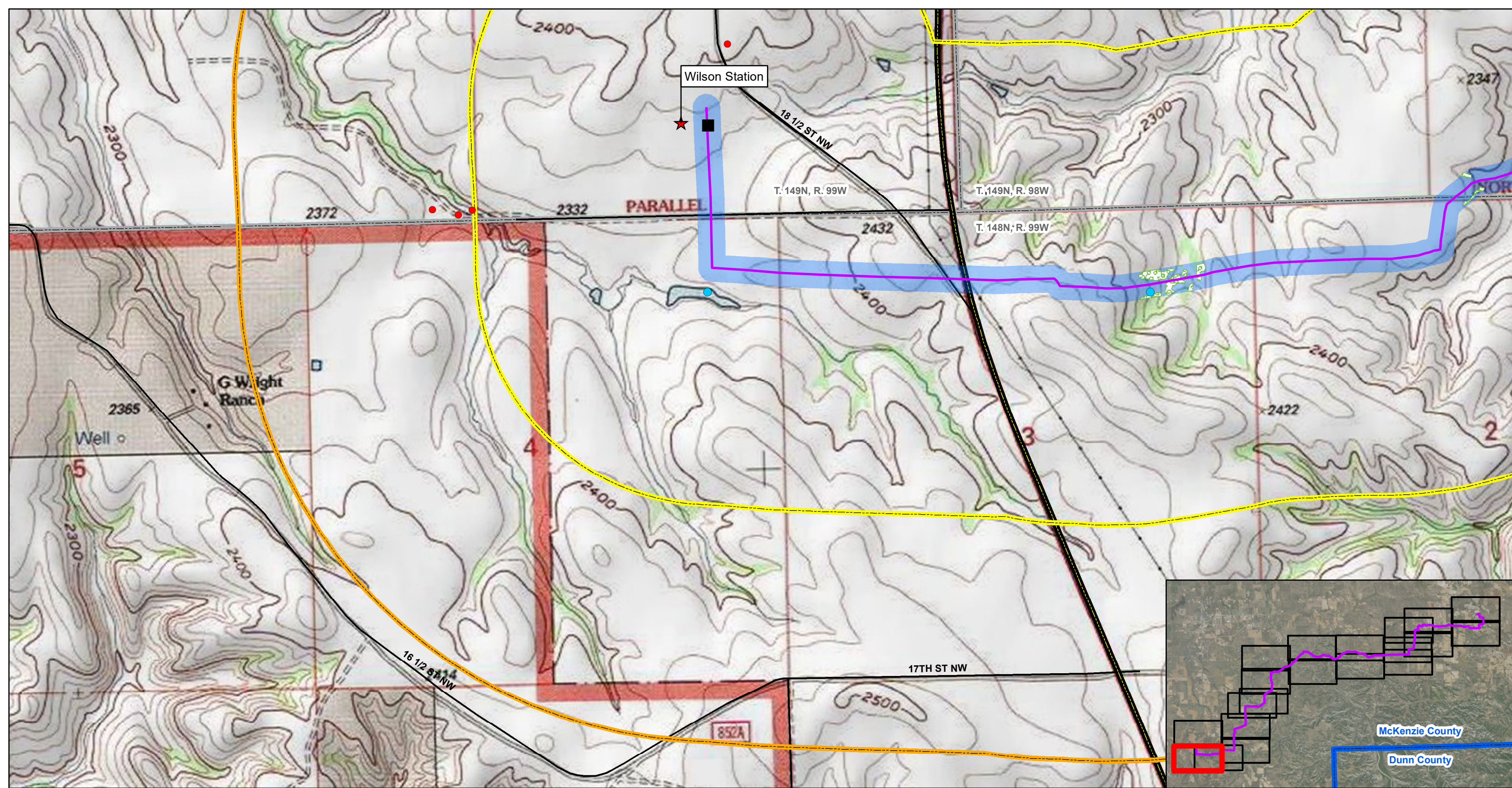
Johnson's Corner to Wilson Station

- | | | | | | |
|---------------|------------------------|-----------------|---------------------------|---------------------------|---------------|
| ★ Facility | ● Noxious Weeds | — Named Streams | ■ 300ft Pipeline Corridor | ▨ Woody Vegetation | ▲ North Arrow |
| ■ Block Valve | ⊗ Landslide Prone Area | — Highway | ▨ Raptor Survey Area | ▭ Township/Range Boundary | |
| ● Wetlands | — Proposed Alignment | — Roads | ▨ 1mile Study Area | | |

Figure 1.B
 T. 149N, R. 98W, T. 149N, R. 99W,
 and T. 148N, R. 99W
 McKenzie County, North Dakota
 Page 19 of 20

0 260 520 Meters

0 1,000 2,000 Feet



Johnson's Corner to Wilson Station

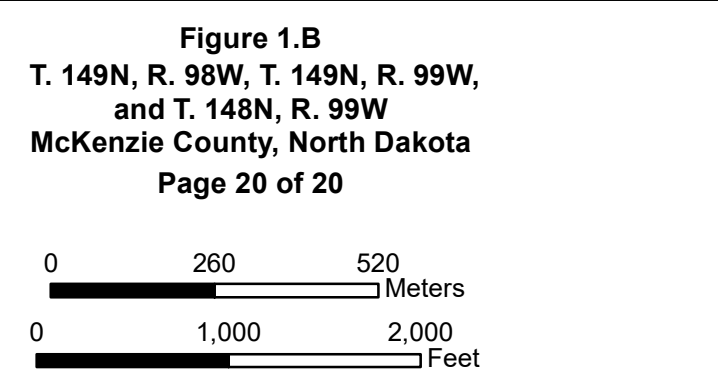
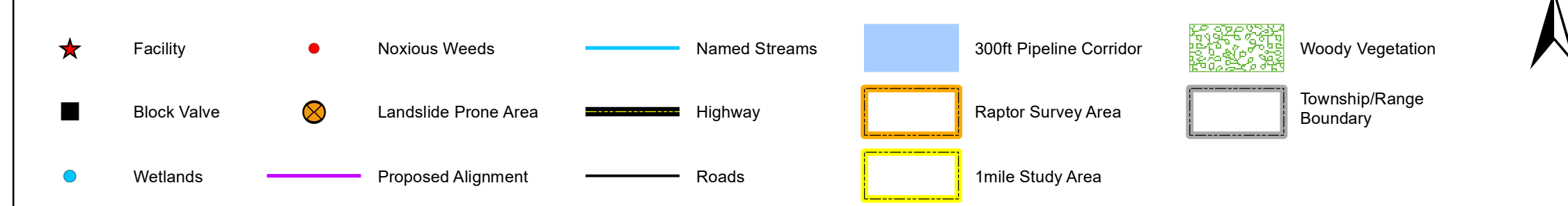


Exhibit B
Cultural Resource Report
Beaver Creek Archaeology, Inc.

**A Class III Cultural Resource Inventory of the Johnsons Corner
to Wilson Station Pipeline in McKenzie County, North Dakota**

By:
Brittany Brooks

Prepared for:
Keitu Engineers and Consultants, Inc.

On behalf of:
Bridger Pipeline, LLC

Prepared by:
Beaver Creek Archaeology, Inc.
1632 Capitol Way
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www.bcarch.org

Alex Atkinson, Principal Investigator
Wade Burns, Project Director

State Lands Permit: ROW #8118
BCA Project No.: 2020-1315
September 2020

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Beaver Creek
ARCHAEOLOGY

WHERE PROGRESS MEETS PRESERVATION

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MANUSCRIPT DATA RECORD FORM

1. Manuscript Number:
2. SHPO Reference #:
3. Author: **Brittany Brooks**
4. Title: **A Class III Cultural Resource Inventory of the Johnsons Corner to Wilson Station Pipeline in McKenzie County, North Dakota**
5. Report Date: **September 2020**
6. Number of Pages: **101**
7. Type – I, T, E, O: **I**
 I=Inventory; T=Formal Testing; E=Excavation; O=Other
8. List formally tested or excavated sites (not probes): **None**
9. Acres: **611**
10. List the legal description* and study unit. For study unit assignment, use the township tables in the *State Plan*, http://history.nd.gov/hp.stateplan_arch.html
 Study Units: LM, CB, KN, NE, SM, GA, JA, GR, NR, SR, SO, SH, YE

**For inventory, formal testing, and excavations projects, list the Class III legal locations only.*

| <u>County</u> | <u>Township</u> | <u>Range</u> | <u>Section</u> | <u>Study Unit</u> |
|-----------------|-----------------|--------------|---|-------------------|
| McKenzie | 150N | 95W | 19, 30 | LM |
| McKenzie | 150N | 96W | 21, 22, 23, 24, 25, 26, 27, 28, 31, 32, 33 | LM |
| McKenzie | 150N | 97W | 31, 32, 33, 34, 35, 36 | LM |
| McKenzie | 149N | 97W | 4, 6 | LM |
| McKenzie | 149N | 98W | 1, 2, 11, 14, 15, 16, 21, 22, 28, 29, 32, 33 | GA |
| McKenzie | 149N | 99W | 36 | LM |
| McKenzie | 148N | 99W | 2, 3, 4 | LM |

Abstract

Keitu Engineers and Consultants, Inc., on behalf of Bridger Pipeline, LLC (the Proponent), has contracted Beaver Creek Archaeology, Inc. (BCA) to complete a Class III cultural resource survey of the planned Johnsons Corner to Wilson Station Pipeline Project (Project) in McKenzie County, North Dakota. The planned Project is under the jurisdiction of the Public Service Commission (PSC). The Proponent is seeking a Certificate of Corridor Compatibility and Route Permit from the North Dakota PSC per the Energy Conversion and Transmission Facility Siting Act as set forth in the North Dakota Century Code (NDCC) Ch. 49-22.1 as well as the North Dakota Administrative Code (NDAC) Ch. 69-06-08, the Energy Conversion and Transmission Facility Siting Criteria. The NDCC §49-22.1–09 and NDAC Ch. 69-06-08 aid the Commission in considering what effect the undertaking will have on Historic Properties within the Area of Potential Effect (APE). The APE is defined as the combined area of all project components, including the conversion of 26.6 miles of pipeline and 2.4 miles of new pipeline construction, which is encompassed by the survey area, including a buffer.

The survey area is comprised of a 300' wide corridor mapped along the route of the planned pipeline. The survey corridor is 29-miles long (1,044 acres), of which 437 acres were previously surveyed for different projects. As a result, a total of 611 acres were inventoried during the current undertaking. The planned Project is located primarily on private property, with approximately 99 acres located on State Trust Land.

The planned Project is located on pastureland and agricultural fields within the Little Missouri River Study Unit (LMRSU) and the Garrison Study Unit (GSU) as defined by the North Dakota State Historic Preservation Office (SHPO). The planned Project location was identified using topographic and aerial maps, as well as global positioning system (GPS) hardware. Survey methods included an intensive pedestrian survey. On July 14-17, 2020, Alex Atkinson (Principal Investigator), Reilly Lembo (Field Director), and Silas Chapman (Staff Archaeologist) conducted the Class III cultural resource inventory. Talon Krebs (GIS Technician) created the project map and Wade Burns served as the Project Director.

The Class I file search revealed 81 sites, seven site leads, and 75 isolated finds within a one-mile radius of the survey area. Twelve of the previously recorded cultural resources were located within the survey area and were revisited and updated during the current undertaking. These cultural resources include one historical/architectural site, four historical sites, one prehistoric stone feature site, and six prehistoric isolated finds (see Table 1). The 11 historical/architectural, historical, and prehistoric isolated finds are recommended to remain listed as ineligible for the National Register of Historic Places (NRHP). As such, no avoidance measures are deemed necessary. The prehistoric stone feature site, 32MZ3129, is recommended to remain listed as unevaluated for the NRHP and site avoidance is deemed necessary. As the site is located within 100' of the permanent easement, the distance between the site boundary and any potential future maintenance is sufficient avoidance and no additional avoidance measures are deemed necessary.

During the pedestrian survey, three new cultural resources were encountered and recorded, including one historical site, one prehistoric stone feature site, and one prehistoric isolated find (see Table 1). The historical site (32MZ3409) and isolated find (32MZx1777) have been recommended as not eligible for the NRHP and no avoidance measures are deemed necessary. Site 32MZ3410, the prehistoric stone feature site, has been recommended as unevaluated for the NRHP and site avoidance is recommended. As the site is located within 71' of the permanent easement, the distance between the site boundary and any potential future maintenance is sufficient avoidance and no additional avoidance measures are deemed necessary.

Consequently, as long as sites 32MZ3129 and 32MZ3410 are avoided by the aforementioned avoidance measures (and listed in Table 1), BCA recommends a finding of *No Historic Properties Affected* for this project as currently planned.

Table 1. Cultural Resources Located Within the Survey Corridor.

| SITS # | Description | NRHP Status | Avoidance Measures |
|-----------|----------------------------------|--------------|--|
| 32MZ1561 | WAPA Transmission Line | Not Eligible | No avoidance necessary |
| 32MZ2074 | Depression, Trash Dump | Not Eligible | No avoidance necessary |
| 32MZ2533 | Depressions, CM Scatter | Not Eligible | No avoidance necessary |
| 32MZ2876 | Depressions | Not Eligible | No avoidance necessary |
| 32MZ3069 | Corduroy Road Segments | Not Eligible | No avoidance necessary |
| 32MZ3129 | Stone Alignment | Unevaluated | Distance from the site is sufficient avoidance |
| 32MZ3409 | Collapsed Structures, Trash Dump | Not Eligible | No avoidance necessary |
| 32MZ3410 | Cairn, Stone Circle, Arc, Other | Unevaluated | Distance from the site is sufficient avoidance |
| 32MZx1335 | Isolated Find: Chipped Stone | Not Eligible | No avoidance necessary |
| 32MZx1498 | Isolated Find: Chipped Stone | Not Eligible | No avoidance necessary |
| 32MZx1616 | Isolated Find: Chipped Stone | Not Eligible | No avoidance necessary |
| 32MZx1617 | Isolated Find: Chipped Stone | Not Eligible | No avoidance necessary |
| 32MZx1618 | Isolated Find: Chipped Stone | Not Eligible | No avoidance necessary |
| 32MZx1660 | Isolated Find: Chipped Stone | Not Eligible | No avoidance necessary |
| 32MZx1777 | Isolated Find: Chipped Stone | Not Eligible | No avoidance necessary |

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Acronyms and Abbreviations

AMSL: Above Mean Sea Level
APE: Area of Potential Effect
BCA: Beaver Creek Archaeology, Inc.
CCC: Civilian Conservation Corps
CFR: Code of Federal Regulations
CM: Cultural Material
cmbs: centimeters below surface
CSFD: Chipped Stone Flaking Debris
EPA: Environmental Protection Agency
FCP: Field-Clearing Pile
FCR: Fire-Cracked Rock
FWP: Federal Writers Project
GIS: Geographic Information Systems
GPS: Global Positioning System
GSU: Garrison Study Unit
GSV: Ground Surface Visibility
KRF: Knife River flint
LMRSU: Little Missouri River Study Unit
MHA: Mandan, Hidatsa, and Arikara
MS#: Manuscript Number
NAGPRA: Native American Grave Protection and Repatriation Act
NDAC: North Dakota Administrative Code
NDCC: North Dakota Century Code
NHPA: National Historic Preservation Act
NRCS: Natural Resource Conservation Service
NRHP: National Register of Historic Places
PP: Projectile Point
Proponent: Bridger Pipeline, LLC
PSC: Public Utilities Commission
Quad: Quadrangle
R: Range
S: Section
SHPO: State Historic Preservation Office
SHSND: State Historical Society of North Dakota
SITS: Smithsonian Institute Trinomial System
SRC: Swan River Chert
STP: Shovel Test Probe
T/Twp: Township
TCP: Traditional Cultural Property
TRSS: Tongue River silicified sediment
UPD: Unanticipated Discoveries Plan
USC: United States Code
USGS: United States Geological Survey
UTM: Universal Transverse Mercator
WPA: Works Progress Administration

Introduction

Bridger Pipeline, LLC (the Proponent), has proposed the conversion of the Johnsons Corner to Wilson Station Pipeline in McKenzie County, North Dakota, that will be under the jurisdiction of the North Dakota Public Service Commission (PSC). Beaver Creek Archaeology, Inc. (BCA) was hired by Keitu Engineers and Consultants, Inc. (consultant to the Proponent) to complete a cultural resource investigation, including a Class I file search, Class III intensive cultural resource inventory, and cultural resource survey report for submittal to the North Dakota State Historic Preservation Office (SHPO) in support of the Proponent’s PSC filing.

From July 14-17, 2020, Alex Atkinson (Principal Investigator), Reilly Lembo (Field Director), and Silas Chapman (Staff Archaeologist) conducted the Class III cultural resource inventory. Wade Burns served as the Project Director. This inventory covers the 611 acres of the survey area that were not covered by previous surveys conducted in the last 10 years (see Table 2 for location details). This report will detail the results of the file search and pedestrian inventory, as well as the environmental and cultural background of the project area.

Table 2. Planned Project Location.

| Township | Range | Sections | USGS Quad. Map |
|----------|-------|--|---------------------------------------|
| 150N | 95W | 19, 30 | Johnsons Corner |
| | 96W | 21, 22, 23, 24, 25, 26, 27, 28, 32, 33, 34 | Johnsons Corner & Schafer SE |
| | 97W | 31, 32, 33, 34, 35, 36 | Schafer SE & Schafer |
| 149N | 97W | 4, 6 | Schafer SE & Schafer |
| | 98W | 1, 2, 11, 14, 15, 21, 22, 28, 28, 32, 33 | Schafer, Lone Butte NW & Tepee Buttes |
| | 99W | 36 | Tepee Buttes |
| 148N | 99W | 2, 3, 4 | Tepee Buttes |

Objective

The Proponent is seeking a Certificate of Corridor Compatibility and Route Permit from the North Dakota PSC per the North Dakota Energy Conversion and Transmission Facility Siting Act, as set forth in the North Dakota Century Code (NDCC) Ch. 49-22.1 as well as the North Dakota Administrative Code (NDAC) Ch. 69-06-08, the Energy Conversion and Transmission Facility Siting Criteria. The NDCC §49-22.1–09 and NDAC Ch. 69-06-08 aid the Commission in considering what effect the undertaking will have on Historic Properties.

Project Description

The planned Project will originate approximately 2.25 miles east of Johnsons Corner and terminate approximately 8.25 miles south of Watford City at the Wilson Station (location details listed in Table 2). The planned Project is located primarily on private property with approximately 99 acres on State Trust land. The Area of Potential Effect (APE) is defined as the combined area of all project components, which consist of the conversion of 26.6 miles of an existing 8-inch gathering line to a public utility line (which is the same size and use) and the new construction of a 2.4-mile connection line that extends from the original gathering line to Johnsons Corner. The proposed construction corridor for this project is 100’ wide with a 50’ permanent easement. Anticipated disturbances are to be limited to the planned Project disturbance footprint (shown on the maps in Appendix A).

The planned pipeline conversion and new construction is currently estimated to be approximately 29 miles in length. At the request of Keitu Engineers and Consultants, Inc., a 300’ wide survey corridor was mapped along the centerline of any and all current possible variations for the routing of the pipeline, for a total survey area of 1,044 acres. The 300’ wide survey corridor encompasses

the entire potential pipeline construction area, including a buffer (see maps in Appendix A). Of the 1,044-acre survey area, 437 acres had been previously inventoried by different projects conducted within the past 10 years. As such, a total of 611 acres were covered by the current undertaking.

Project Environmental Setting

North Dakota is divided into 13 Archaeological Study Units based on areas with similar environmental, historical, and archaeological factors, and equate with different orders of hydrologic units (or drainage basins). These study units provide a broad archaeological overview, which can be utilized to understand and help predict the type and density of archaeological sites in the area (State Historical Society of North Dakota [SHSND] 2016:B.4).

The survey area of the planned Project is located on rolling plains in Little Missouri River and Garrison Study Units (LMRSU and GSU). The project area is located within the Little Missouri River and Missouri River drainage systems, with the area draining into Cherry Creek, Northfork Creek, Dry Creek, and Spring Creek and ultimately into the Little Missouri River, which is approximately 5.8 miles south of the project area.

Little Missouri River Study Unit Environment

The majority of the project area lies within the LMRSU, which is located in the North Dakota Badlands in southwestern North Dakota. The Little Missouri Badlands are characterized by buttes and eroded long finger ridges extending away from upland rolling grasslands and towards the Little Missouri River. Named streams include Cherry Creek, Beaver Creek, Whitetail Creek, Blacktail Creek, Sand Creek, Deep Creek, Wannagan Creek, and Ash Coulee. The only river in the LMRSU is the Little Missouri River. The dramatic buttes of the Badlands are the predominant landform in this area. Named buttes include Grassy Butte, Sentinel Butte, White Butte, Black Butte, Morman Butte, and the Killdeer Mountains (SHSND 2016:1.1-1.6).

The climate in the LMRSU is semiarid with long, cold, often dry winters and hot and dry summers. Precipitation averages around 14.4 inches annually, most of which falls as rain during the spring and summer months. Drought conditions can occur because of successive years of insufficient moisture (SHSND 2016:1.6).

This area of North Dakota is “characterized by greater floral and faunal diversity than the surrounding plains” (SHSND 2016:1.7). The western wheatgrass-sagebrush ecosystem is found in the Badlands, with vegetation including numerous perennial grasses in prairie uplands, prickly pear cactus and sagebrush on buttes and creek bottoms, and cottonwood forests located in some bottomlands (SHSND 2016:1.7). The Badlands are also home to many large and small mammals, birds, reptiles, and fish. Common animals include the bison, elk, antelope, white-tailed deer, mule deer, coyote, wolf, jackrabbit, prairie dog, and a variety of fish (SHSND 2016:1.7). This biotic diversity, along with the availability of water, lithic, and timber resources, makes this setting favorable for human settlement, both during prehistoric and historic time-periods.

Stones capable of conchoidal fracturing were ideal for stone tool production and available locally as stream gravels and near-surface lag deposits. Such materials included Knife River flint (KRF), chalcedonies, porcellanite, Miocene flint, Antelope Creek chert, and Tongue River Silicified sediment (TRSS). Other natural resources that may have been utilized by Native groups in the past included local clay for ceramics and juniper wood for the construction of timbered lodges (SHSND 2016:1.7).

Garrison Study Unit Environment

The project lies within the GSU, which is located in the Missouri valley in northwestern North Dakota. The environmental setting of the GSU provided favorable conditions and ample natural resources for human habitation throughout the Holocene.

The study unit is situated within the Glaciated Missouri Plateau Subsection of the Great Plains Physiographic Province, with portions in the Missouri Trench District, but primarily in Missouri Coteau and Coteau Slope terrain. Knob-and-kettle glaciated terrain and other glacial features are typical on the Coteau du Missouri, while the topography is gentler in the Coteau Slope, where rolling hills abound. Landforms in the GSU include glaciated uplands, breaks terrain, valley wall side slopes, foot slopes, draws, alluvial terraces, and floodplains. The Coteau Slope is filled with tributaries of the Missouri River, including a small part of the Big Muddy Creek basin. Named streams include the Big Muddy Creek, Painted Woods Creek, Douglas Creek, Shell Creek, and Deepwater Creek. Named rivers include Little Muddy River, Little Knife River, and White Earth River. Water sources in the Missouri Coteau are predominantly sloughs and potholes, with designated water bodies including White Lake and Powers Lake (SHSND 2016:6.1-6.6).

The GSU has a northern continental climate; temperatures vary immensely by season with warm summers and cold winters. Precipitation averages around 16 inches annually, most of which falls as rain during the spring and summer months. Prevailing winds throughout the year average around 16 mph from the west-northwest (SHSND 2016:6.6).

The GSU has a Northern Temperate Grasslands type biome consisting of mixed-grass prairie dominated by western wheatgrass, blue grama, and needle-and-thread. This grassland provided suitable habitat for large game animals, such as bison and antelope. Gallery forests grew along the Missouri River and other tributaries, which provided an appropriate environment for white-tailed deer and small mammals such as muskrat and porcupine. Hardwood draws of bur oak, green ash, and juniper are part of transition zones between the grasslands and floodplain forests. Food plants in the area include chokecherry, buffaloberry, and gooseberry. As a result of the variety of flora providing a range of habitats, the GSU is characterized by some of the greatest faunal diversity in the state. Animals native to the area that were utilized by hunters in the past include “bison, elk, pronghorns, white-tailed deer, mule deer, grizzly bears, mountain lions, bighorn sheep, wolves, coyotes, foxes, bobcats, otters, badgers, porcupines, prairie dogs, weasels, mink, cottontail rabbits, jackrabbits, ground squirrels, golden eagles, bald eagles, hawks, owls, pelicans, magpies, prairie chickens, grouse, and a variety of waterfowl, fish, turtles, and mussels” (SHSND 2016:6.8). This biotic diversity, along with the availability of water, makes this setting favorable for human settlement, both during prehistoric and historic time periods.

Mineral resources were also utilized in the past, with stone collected from glacial till and alluvial gravels. Stones capable of conchoidal fracturing used for stone tool production included KRF, quartzite, jaspers, cherts, agatized wood, Yellowstone agate, and porcellanite. Basalt and granite could be utilized for ground stone tools and some colorful bedrock stones were used for pigments (SHSND 2016:6.8).

Today, the area contains an agricultural-based economy with wheat, corn, and sunflowers being the most common crops. Ranching is also prevalent in the region, and grasslands are often used for grazing. Tree cover is limited to windbreaks surrounding farmsteads, floodplain forests, and hardwood draws.

Ecoregions

North Dakota is divided into 4 Level III ecoregions and 25 Level IV ecoregions (United States Environmental Protection Agency [EPA] 2019). Ecoregions serve as delineations of areas with

similar ecosystems, geology, and environmental resources (Woods et al. 2005). In the United States, these regions are separated into four levels of classification ranging from more general to more detailed, with 12 Level I ecoregions, 25 Level II ecoregions, 105 Level III ecoregions, and 967 Level IV ecoregions (EPA 2019).

The current project is located within the Northwestern Great Plains Level III ecoregion, which covers portions of North Dakota, South Dakota, Wyoming, and Montana. The Northwestern Great Plains ecoregion is “a largely unglaciated, semiarid, and rolling plain that is underlain by shale, siltstone, and sandstone” (Woods et al. 2002). In contrast to the Northwestern Glaciated Plains, this ecoregion has a lower precipitation rate and more irregular landforms. Prominent landforms of this ecoregion include buttes, badlands, intermittent streams, and a few perennial rivers. The native grasslands are commonly used as rangeland, although some farmers grow spring wheat and alfalfa. Agriculture is dependent upon the erratic precipitation patterns of the ecoregion and limited irrigation (Woods et al. 2002).

Portions of the project are located in the Missouri Plateau, River Breaks, and Little Missouri Badlands Level IV ecoregions. The Missouri Plateau ecoregion is predominantly comprised of treeless, rolling hills, and benches underlain by the Tertiary Ludlow, Cannonball, Slope, Bullion Creek, and Sentinel Butte Formation (Bryce et al. 1996). The soils are not naturally fertile, and natural vegetation often consists of wheatgrass-needlegrass (Woods et al. 2002). Land use is mixed between rangeland and farmland.

The River Breaks landscape consists of “very highly dissected terraces and uplands that descend to the Missouri and Yellowstone river systems” (Woods et al. 2002). These landforms are comprised of Tertiary sandstone and shale from the Fort Union Formation (Bryce et al. 1996). Natural vegetation includes wheatgrass, threadleaf sedge, needle-and-thread, junipers, and deciduous trees. Rangeland is more prevalent in this ecoregion, and the rugged terrain provides wildlife a refuge.

The Little Missouri Badlands consists of highly erosional silts and clays on conical hillslopes made of the Paleocene Sentinel Butte and Bullion Creek Formations (Bryce et al. 1996). Sparse natural vegetation includes mountain juniper, cottonwood, green ash, western wheatgrass, blue grama, little bluestem, and prairie sandreed. Land use is predominantly cattle ranching, wildlife habitat, and recreation.

Geology

The project is located in the Sentinel Butte Formation (Clayton 1980). The Sentinel Butte Formation was deposited at the end of the Paleocene (approximately 59-55 million years ago) in a subtropical swampy lowland environment, which at times was covered in established forests (Hoganson 2006). This formation consists of interbedded brownish gray and gray silt, clay sand, and lignite; some bentonitic clay and petrified wood zones (Carlson 1985). Fossils are common in the Sentinel Butte Formation and include abundant petrified wood – some sites with in situ stumps as well as leaves (fern, cycad, fig, bald cypress, *Ginko*, and many others). Invertebrates represented in this formation include freshwater mollusks (bivalves and snails) and insects, while the abundant vertebrate fossils consist of *Champsosaurus* (a crocodile-like animal), turtle, crocodile, *Piceoerpeton* (giant salamander), bony fish, and several species of mammals (Hoganson et al. 2011). The mammals include the largest to inhabit North Dakota during this time period: *Titanoides* (bear-like herbivore), as well as *Neoplagiaulax* (squirrel-like mammal), *Palaeoryctes* (shrew-like mammal), and many trace fossils (Hoganson and Campbell 2002). The Sentinel Butte Formation has a Potential Fossil Yield Classification number of 4 (high potential), indicating that the occurrence of fossils is likely within this formation (Liggett 2015).

Soils

Horizon A (i.e., topsoil) soils in the project area are generally shallow, varying in depth from 5-23 cm (2-9”). The dominant soil type is loam followed by silt loam and fine-sandy loam, which are found primarily on hillslopes, ridges, and hills. The Web Soil Survey soils map for the project area (Natural Resources Conservation Service [NRCS] 2020) indicates that the project area is located in the following soil types:

Table 3. Soils in the Project Area.

| Symbol | Soil Name | Slope | Landform | Parent Material |
|--------|---|-------|--------------------------|---|
| E0447B | Daglum-Belfield complex | 0-6% | Alluvial fans | Clayey alluvium |
| E0515B | Rhoades-Daglum complex | 0-6% | Hillslopes | Alluvium derived from shale and siltstone |
| E0559B | Dogtooth-Janesburg complex | 0-6% | Hillslopes | Residuum weathered from shale and siltstone |
| E0617B | Belfield-Savage-Daglum complex | 2-6% | Hillslopes | Slope alluvium derived from shale and siltstone |
| E0651B | Regent-Janesburg complex | 3-6% | Hillslopes | Residuum weathered from shale and siltstone |
| E0701F | Dogtooth-Janesburg-Cabba complex | 6-35% | Hillslopes | Residuum weathered from shale and siltstone |
| E0835A | Savage-Grail silty clay loams | 0-2% | Hillslopes | Slope alluvium derived from shale and siltstone |
| E0837B | Savage silty clay loam | 2-6% | Hillslopes | Slope alluvium derived from shale and siltstone |
| E0837C | Savage silty clay loam | 6-9% | Hillslopes | Slope alluvium derived from shale and siltstone |
| E0907D | Moreau-Cabba complex | 9-15% | Ridges | Clayey residuum weathered from calcareous shale |
| E0921C | Regent-Cabba complex | 6-9% | Hills, ridges | Clayey residuum weathered from shale |
| E1009B | Moreau-Barkof, silty clays | 3-6% | Pediments | Clayey residuum weathered from calcareous shale |
| E1025B | Regent-Savage silty clay loams | 3-6% | Hillslopes | Residuum weathered from shale and siltstone |
| E1333C | Vebar-Cohagen fine sandy loams | 6-9% | Hillslopes | Residuum weathered from sandstone |
| E1355D | Vebar-Flasher-Tally complex | 9-15% | Hillslopes | Residuum weathered from sandstone |
| E1403D | Beisigl-Flasher-Telfer loamy fine sands | 6-15% | Ridges, hills | Sandy residuum weathered from sandstone |
| E1423F | Flasher-Vebar-Parshall complex | 9-35% | Hillslopes | Residuum weathered from sandstone |
| E1475F | Flasher-Rock outcrop-Vebar complex | 9-70% | Ridges, hills | Sandy residuum weathered from sandstone |
| E2107A | Arnegard loam | 0-2% | Swales | Alluvium derived from mudstone |
| E2120A | Farnuf loam | 0-2% | Alluvial flats, terraces | Fine-loamy alluvium derived from sedimentary rock |
| E2120B | Farnuf loam | 2-6% | Terraces, alluvial fans | Fine-loamy alluvium derived from sedimentary rock |
| E2120C | Farnuf loam | 6-9% | Alluvial fans, ridges | Fine-loamy alluvium derived from sedimentary rock |
| E2213B | Golva silt loam | 2-6% | Alluvial fans | Fine-silty alluvium derived from siltstone |
| E2213C | Golva silt loam | 6-9% | Hills, ridges | Fine-silty alluvium derived from siltstone |
| E2601C | Amor-Cabba loams | 6-9% | Hillslopes | Residuum weathered from sedimentary rock |
| E2601D | Amor-Cabba loams | 9-15% | Hillslopes | Residuum weathered from sedimentary rock |
| E2617F | Cabba-Chama-Shambo loams | 9-50% | Hillslopes | Residuum weathered from sedimentary rock |
| E2725F | Arikara-Shambo-Cabba | 9-70% | Ridges | Loamy colluvium derived from mudstone |

| Symbol | Soil Name | Slope | Landform | Parent Material |
|--------|--|---------------------------|-------------------------------|--|
| E2737C | Chama-Cabba-Sen silt loams | 6-9% | Hills, ridges | Fine-silty residuum weathered from siltstone |
| E2741D | Cabba-Chama-Sen silt loams | 9-15% | Ridges | Fine-silty residuum weathered from sedimentary rock |
| E2803B | Amor-Shambo loams | 3-6% | Hillslopes | Residuum weathered from mudstone |
| E2819B | Reeder-Farnuf loams | 3-6% | Pediments | Fine-loamy residuum weathered from mudstone |
| E2913B | Chama-Sen-Cabba silt loams | 3-6% | Pediments | Fine-silty residuum weathered from siltstone |
| E3013D | Brandenburg-Searing-Dogtooth complex | 6-15% | Knobs, ridges | Loamy residuum weathered from porcellanite |
| E3013F | Brandenburg-Cabba-Dogtooth complex | 15-70% | Knobs, ridges | Loamy residuum weathered from porcellanite |
| E3043B | Searing-Ringling loams | 3-6% | Alluvial fans, alluvial flats | Fine-loamy residuum weathered from porcellanite |
| E3107F | Cabba-Badland complex | 6-70% | Ridges | Fine-loamy residuum weathered from sedimentary rock |
| E3161F | Cherry-Cabba silt loams | 9-45% | Ridges | Fine-silty residuum weathered from sedimentary rock |
| E3203C | Cherry silt loam | 6-9% | Alluvial fans | Fine-silty alluvium |
| E3527A | William-Bowbells loams | 0-3% | Rises | Fine-loamy till |
| E3541B | Williams-Zahl loams | 3-6% | Rises | Fine-loamy till |
| E3541C | Williams-Zahl loams | 6-9% | Knolls | Fine-loamy till |
| E3555D | Zahl-Williams loams | 9-15% | Hills, ridges | Fine-loamy till |
| E3609F | Zahl-Cabba-Maschetah complex | 6-70% | Ridges | Fine-loamy till |
| E3637D | Zahl-Beisigl-Tally complex | 9-15% | Hills, ridges | Fine-loamy till |
| E3639C | Zahl-Williams-Cabba complex | 6-9% | Knolls | Fine-loamy till |
| E3641D | Zahl-Cabba-Williams complex | 9-15% | Hills, ridges | Fine-loamy till |
| E3703C | Dooley-Zahl complex | 6-9% | Knolls, ridges | Fine-loamy alluvium |
| E4005A | Harriet loam | 0-2% occasionally flooded | Drainageways, alluvial flats | Clayey alluvium derived from sedimentary rock |
| E4121A | Havrelon loam | 0-2% occasionally flooded | Floodplain steps | Fine-loamy alluvium derived from sedimentary rock |
| E4139A | Korchea-Fluvaquents complex, channeled | 0-2% frequently flooded | Floodplains | Stratified fine-loamy alluvium derived from sedimentary rock |
| E4190F | Cabba-Chama-Havrelon, occasionally flooded complex | 2-70% | Ridges | Fine-silty residuum weathered from sedimentary rock |
| E4561F | Manning-Schaller-Wabek complex | 6-35% | Escarments on stream terraces | Coarse-loamy alluvium derived from sedimentary rock |
| L1355D | Rhame-Chinook fine sandy loams | 9-15% | Hillslopes | Residuum weathered from sandstone |
| L1424F | Rhame-Fleak complex | 9-50% | Hillslopes | Residuum weathered from sandstone |
| L2311E | Scairt-Maltese-Boxwell complex | 2-25% | Ridges, hills | Silty and clayey residuum weathered from shale and siltstone |
| L2335D | Rhame-Kremlin-Archin complex | 6-15% | Hills, ridges | Coarse-loamy residuum weathered from sandstone |
| L2633F | Boxwell-Cabbart-Arikara complex | 9-70% | Hillslopes | Residuum weathered from mudstone |
| L2807D | Boxwell-Kremlin loams | 9-15% | Hillslopes | Residuum weathered from mudstone |
| L3013F | Kirby-Scairt complex | 9-70% | Ridges, knobs | Channery residuum weathered from porcellanite |
| L3241B | Paten loam | 0-6% occasionally flooded | Alluvial fans | Fine-loamy alluvium |
| L3247C | Patent, occasionally flooded-Vanda-Gerda, barren complex | 0-9% | Alluvial fans | Fine-loamy alluvium |

Historic Context

The LMRSU and GSU have their own historic contexts, which describe the different types of prehistoric and historic districts, sites, buildings, structures, and objects that are known from various times in the past in different parts of the state. This information provides the comparative base needed for the management of cultural resources.

Native American Cultural Background

The most common archaeological sites found within the LMRSU and GSU are comprised of cultural material scatters, followed by stone circles and cairn sites. Sites within this area are most often found in upland settings, such as on ridges, hills, buttes, and terraces. The LMRSU has a particularly dense concentration of archaeological sites owing to the proximity to primary KRF quarries and heavy use of the area by Plains Village groups (SHSND 2016:1.8-1.10). The archaeological horizons encountered in North Dakota are as follows:

Paleo-Indian Period (9500–5500 BC)

LMRSU: The Paleo-Indian Period focuses on the first human occupation of the land that is now North Dakota. Due to ongoing research and exploration, the date of the earliest human occupation of North America is in a constant state of flux. Nonetheless, there is a general consensus that the first hunter-gatherers arrived on the Great Plains approximately 13,500 years ago (Frison 1991). Paleo-Indian subsistence elsewhere on the Northern Plains included hunting megafauna and large game and became increasingly focused on bison as the environment changed (Hofman and Graham 1998:116-122).

This portion of the state remained unglaciated, and the lithic resources and hunting potential in the area would have made the LMRSU a focal point during the Paleo-Indian Period; however, few intact Paleo-Indian deposits have been recorded in the study unit. There is reduced potential to find intact early Holocene contexts in the highly-eroded Badlands. However, some may remain intact in deeply buried settlements on ridgetops or in Little Missouri River terraces. The potential to find buried surfaces and cultural remains dating to the Paleo-Indian Period is much greater south of the Badlands. Still, the number of documented sites is low (SHSND 2016:1.21-1.24).

Paleo-Indian sites have been recorded in the Badlands. No Clovis or Goshen materials have been located in the LMRSU. However, the nearby Mill Iron site in Montana (24CT30) suggests that early Paleo finds can be anticipated in the southern Little Missouri River basin. Paleo-Indian sites in the LMRSU included Folsom, Plano, and Frederick/Lusk finds: Site 32BI122 yielded a Plano point, and the Pretty Butte site (32SL100) yielded lanceolate points resembling Frederick and Lusk types made from local raw materials. Most chipped stone artifacts found in the area utilized local materials. The raw materials present at the Beach Clovis Cache site (32GVX48) suggested that a group traveled from eastern Wyoming to Sentinel Butte to gather Miocene flint. The cache represented a campsite where bifaces were stored so that the group could return and restock tools. Although KRF was the most common material represented in Paleo assemblages in other portions of western North Dakota, local materials are predominant in the LMRSU. A more extensive range of point types, including Folsom, Agate Basin, Hell Gap, Cody, and Parallel-Oblique Flaked materials have been found in the rolling upland grasslands of the McKenzie Ranger District of the Little Missouri National Grasslands, partly located within the LMRSU and extending to the north and west (SHSND 2016:1.24-1.26).

GSU: The Paleo-Indian period focuses on the first human occupation of the land that is now North Dakota. Due to ongoing research and exploration, the date of the earliest human occupation of North America is in a constant state of flux. Nonetheless, there is a consensus that the first hunter-gatherers arrived on the Great Plains approximately 13,500 years ago (Frison 1991). Evidence of Paleo-Indian subsistence elsewhere on the Northern Plains included hunting based on megafauna

and large game and became increasingly focused on bison as the environment changed (Hofman and Graham 1998:116-122).

Due to the massive changes undergone by the landscape over the last 12,000 years, including erosion, deposition, and flooding, it is challenging to locate intact Paleo components in the GSU. While some Paleo-Indian projectile points have been documented in the eroding banks of Lake Sakakawea, even larger numbers of finds are rumored to have been illegally collected, further hampering studies of the period (SHSND 2016:6.39). Only two significant Paleo-Indian sites are known in the GSU. The Beacon Island site (32MN243A) is an Agate Basin bison kill and processing site that contains intact and datable remains of *Bison antiquus*, as well as Agate Basin, Clovis and Folsom points (SHSND 2016:6.34-35). The Moe site (32MN101) contains Folsom and later Paleo artifacts, but test excavations did not reveal intact Paleo-Indian cultural deposits (SHSND 2016:6.11, 6.39). The most significant number of Paleo-Indian sites in the state have been found in the KRF principal source area and in or near the Missouri River valley. The presence of unfinished pieces and failures in the Moe site assemblage suggests that the GSU may have been an essential part of the travel routes to and from the KRF quarries in this region (SHSND 2016:6.37-6.39).

Lithic technologies represented in the GSU include Clovis, Folsom, Plainview (or Goshen), Agate Basin, Parallel-Oblique Flakes, and Scottsbluff points.

Plains Archaic Period (5500–400 BC)

LMRSU: Middle and Late Archaic sites are relatively common on ridgetops in the LMRSU, with Middle Plains sites being the most extensively studied. Intact Middle and Late Archaic components are often found in exposed paleosols, eroding from the edge of ridges in the Badlands. Early Archaic finds are rare, although testing on the Cinnamon Creek ridge where there is a dense concentration of Archaic sites has revealed Paleosols of probable Early Archaic antiquity (SHSND 2016:1.27-1.28).

While there is not enough Early Archaic evidence, the distribution of Middle and Late Plains Archaic sites in the LMRSU suggests changing settlement patterns. Middle Plains Archaic settlements likely consisted of long-term base camps and associated smaller field camps, primarily on ridgetops in the region. Pelican Lake sites are located in ridgetop and terrace settings; settlement patterns may have ranged more widely and utilized a greater variety of environmental settings, although the difference may be attributable to differential site preservation. Plains Archaic subsistence practices consisted of hunting and gathering strategies, with faunal remains including bison, elk, antelope, and deer as well as evidence of hearths and roasting pits that suggest plant foods were also likely being gathered and processed. There is some evidence that subsistence strategies transitioned from a broad resource base in the Middle Archaic to a specialized hunting strategy focusing on bison procurement and relying less on a diet of small game and plant foods in the Late Plains Archaic period; however, this hypothesis has not been thoroughly tested (SHSND 2016:1.28-1.29).

Finds of Simonsen and Oxbow points, discovered at sites such as the Tysver-Olsen site (32DU605) and Olsen Ranch site (32MZ487), indicate an Early Plains Archaic component in the LMRSU. Middle Plains Archaic components are represented both by projectile point styles and radiocarbon dates: McKean Lanceolate, Mallory, Hanna, and Duncan points have been found at sites such as the Sunday Sage site (32BI22), the Ice Box Canyon Ridge site (32MZ38), and the Big Gulch-Chase site (32DU273). In contrast, radiocarbon dates have been secured for Paleosols on Cinnamon Creek Ridge and hearths features in the Ice Box Canyon Ridge site and Bottleneck site (32MZ394). Late Archaic Pelican Lake components are represented by basal stemmed and corner-notched projectile points and radiocarbon dated deposits at the multi-component Sunday Sage and Ice Box Canyon Ridge sites. Fewer Pelican Lake sites have been located in the Badlands than Middle Archaic sites.

Some local materials were used in the production of lithics through the Archaic Period; however, non-local KRF and high-quality chalcedony were most commonly utilized for Pelican Lake points and an obsidian flake has been associated with a McKean component in the LMRSU, demonstrating the prevalence of regional interaction during the Period (SHSND 2016:1.25-1.29).

GSU: The Plains Archaic period was a time of constant human adjustment to changing ecological conditions. The Atlantic Climatic episode, sometimes referred to as the Altithermal or Hypsithermal, was a defining event of the Early Plains Archaic period. The severe climatic shift resulted in a drought period, which is theorized to have been two short but severe droughts that may have dramatically limited human settlement in the Great Plains, making Early Plains Archaic discoveries difficult. In the GSU, post-Altithermal Middle and Late Plains Archaic materials are well represented in the archaeological record.

Middle and Late Plains Archaic deposits are found in quickly deposited sedimentary contexts, which correlate with erosion in the uplands from drought. Plains Archaic remnants have frequently been discovered in upland settings as well as in terrace and riverbank locations. While a higher number of Archaic sites have been documented in the uplands, there are likely more undocumented sites in the lowlands that are more deeply buried (SHSND 2016:6.39-6.40).

The Boots site (32MZ732) is one of the only sites in the region to provide any significant evidence from the Early Archaic period. The artifacts discovered established human occupation of the area from the Early Plains Archaic through the Historic period with over 8,500 prehistoric artifacts, including pottery, stone tools, hammerstones, and mano as well as a copper awl dating to the prehistoric period (Floodman et al. 1997). The presence of copper makes the site unique, as it is the only one in the region to suggest copper trade and utilization during the Archaic period. The Mondrian Tree site (32MZ58), on the banks of the Missouri River, includes deeply stratified Archaic, Woodland, and Euro-American components. Testing of the site has provided abundant evidence for Plains Archaic lifeways. Faunal remains included a range of large and small game including bison, antelope, elk, deer, and beaver, as well as canids (probably dogs). Testing also resulted in evidence of summertime collection and processing of plants consisting of charred seeds of various plants, a fragmentary grinding slab made of sandstone, and a quartzite mano (SHSND 2016:6.39-6.41).

Traditionally, Early Plains Archaic components are indicated by finds of Simonsen points; Middle Plains Archaic components are represented by Oxbow, McKean, Duncan, and Hanna points; and Late Plains Archaic components are indicated by finds of Yonkee and Sandy Creek points. In the GSU, however, there is considerable variation in lithic projectile point styles that have been utilized as diagnostic, and additional study focusing on contexts with radiocarbon dates is needed to understand better the relative chronology (SHSND 2016:6.67-6.68).

Plains Woodland Period (400 BC-AD 1200)

LMRSU: While mortuary ceremonialism and limited horticulture are hallmarks of the Plains Woodland period elsewhere in North Dakota, the main distinguishing characteristic of Plains Woodland sites in the LMRSU is the appearance of ceramic vessels for cooking and storage. Middle Plains Besant/Sonota are relatively common and although no mortuary sites have been located in the study unit, there may be cemetery locations in the region.

Although no Early Woodland sites have been identified, some Pelican Lake Archaic components have been dated to Early Woodland times. The small corner-notched dart points dated to the Late Plains and Early Plains Woodland outside of the region have been found within the LMRSU. Middle Woodland Besant/Sonota components are relatively common in the LMRSU and consist of stone circle sites, large base camps, and hunting camps, often near a water source. The Doaks Butte site (32BO222) resembled an Archaic site but with the addition of Woodland ceramics. Few

Avonlea Late Plains Woodland materials have been located in the LMRSU. Based on studies of Besant/Sonota camps, Woodland Period subsistence strategies in the LMRSU appear to have focused on bison, with faunal assemblages, including bison and antelope bones. No botanical remains have been recovered and organic residues have not been studied, so it is unclear if and/or to what extent plant resources were utilized during the Woodland Period in the region (SHSND 2016:1.29-1.32).

Although a Late Woodland vessel was located in a field camp in the region, most of the ceramics studied in the Badlands were Besant/Sonota type. While the number of sherd samples was limited, they bore some similarities to pottery found in the region but no affinity to contemporaneous Midwestern Woodland ceramics. For chipped stone tool production, some local cherts and chalcedonies were utilized, but KRF was the most commonly used raw material. Non-local resources such as shell, obsidian, and exotic cherts illustrate the direct or indirect regional and long-distance trade going on at this time (SHSND 2016:1.31-1.34).

GSU: The Plains Woodland period, though it displays several similarities to the preceding Plains Archaic period, is set apart by two, and arguably three, distinguishing traits: the appearance of ceramic vessels for cooking and storage, the rise of mortuary ceremonialism (which included the construction of burial mounds), and the adoption of limited horticulture. The gardening that did take place in this period remained secondary to hunting and gathering as a subsistence pursuit, but the rise of agriculture, even in this subordinate fashion, is noteworthy.

Early Plains Woodland (700-100 BC) sites, much like Early Archaic sites, are rare in the Garrison Study Unit. Middle Woodlands Besant/Sonota components are relatively common in the GSU. Mortuary sites, such as the Boeckel-Renner site (32ME799), along with a large number of Besant/Sonota sites in the area, indicate that Middle Plains Woodland groups with Besant/Sonota material culture established residential bases within the GSU. Site 32ME947 is a stratified, multi-component bison kill and processing site with Middle and Late Plains Woodland components associated with the Old Women's complex. Other Late Plains Woodland cultures in the GSU are represented by Avonlea and Mortlach components, including the Evans site (32MN301), where digging tools but no remains of garden crops were found (SHSND 2016:6.43-6.44).

Relative chronologies during the Plains Woodland Period are based on ceramic and lithic typologies. Ceramic technologies in the area emerged during the Middle Plains Woodland period at sites such as the Nightwalker's Butte (32ML39), the Evans site, and the Mondrian Tree site (32MZ58). Mortlach ceramics display substantial variability in decoration and vessel form. Lithic technologies also show stylistic variation in the Late Plains Woodland period with Prairie Side-Notched points, Avonlea points, and other variations of side- and corner-notched points (SHSND 2016:6.71-6.73).

Plains Village Period (AD 1200–1780)

LMRSU: Plains Village sites of the Initial Middle Missouri, Extended Middle Missouri, Initial Coalescent, and Extended Coalescent are found mainly on ridgetops in the LMRSU. It has been hypothesized that most of the Plains Village sites in the area are special-purpose sites, such as hunting camps, wild plant material collecting locations, eagle trapping sites, or sacred and religious sites; however, there is evidence of at least a trio of Hidatsa village sites known as Nightwalker's Buttes (SHSND 2016:1.36).

Some of the Plains Village sites in the LMRSU include the Connell Ranch site (32BI439), site 32MZ380D, the Bear Den site (32DU175), site 32BI503, the Davis Dam site (32SLA4), and the Black Widow site (32BI751). Many of these sites appear to be field camps used as a base for hunting or gathering lithic raw materials. In addition, there are ethnographic and ethnohistoric accounts of Villagers traveling to the Badlands and constructing conical timber lodges for eagle

trapping. Three Hidatsa village sites are known in the region: Nightwalker's Buttes. The villages include earthlodge depressions and cultural material on buttes north of the Little Missouri River. The sites have been looted extensively, and despite oral historical accounts and local interviews, it is unclear why they were abandoned (SHSND 2016:1.35-1.38).

Several ceramic temporal trends occurred during the Plains Village period via vessel forms and types of decoration. Ceramic trends include but are not limited to Anderson Low Rim, Knife River Plain, Knife River Fine, Fort Yates S-Rim, and Talking Crow wares (SHSND 2016:1.36-1.37).

GSU: The Plains Village period begins with a gradual shift in subsistence and settlement patterns, adopting a semi-sedentary way of life-based on horticulture as a core subsistence pursuit. The semi-permanent villages occupied by people of both the Middle Missouri and Coalescent traditions were, for the most part, confined to the Knife and Heart River regions. For most of the Plains Village period, the GSU was mainly an area utilized for hunting camps and temporary settlements, with the area becoming permanently occupied after Plains Villagers took refuge in the region, moving up the Missouri River from their earlier core territories in the Knife-Heart and perhaps Cannonball regions (SHSND 2016:6.46-47).

Sites with Plains Village Period components in the GSU are primarily field camps and specific purpose sites. At the Mondrian Tree site (32MZ58), Plains Village field camps were identified in a sheltered stream valley. Further study of the local landscape resulted in the identification of the Edna Mae site (32MZ369) in a neighboring upland setting, where specialized activities took place. Plains Village utilization of the area may have brought groups into conflict with Woodland peoples already in the GSU. The White Earth Creek site (32MN101) had fortification ditches and palisade walls with bastions, but no earthlodge depressions or evidence of permanent settlement (SHSND 2016:6.73-6.75).

Besides hunting, the Plains Villagers grew corn, melons, pumpkins, and beans. Several ceramic temporal trends occurred during the Plains Village period via vessel forms and types of decoration. These are associated with the Knife River phase and the Scattered Village complex. Exotic non-local shells, such as dentalium and abalone shells, and other trade goods have been found at the Mondrian Tree site (SHSND 2016:6.75-6.76).

Equestrian/Fur Trade Period (AD 1780–1880)

LMRSU: The advent of the Fur Trade and increased European-American contact in the 19th century brought about many changes in the traditional culture of groups such as the Hidatsa, Crow, and Dakota. Metal tools and implements obtained via trade replaced traditional items of stone, bone, wood, shell, and clay. The gun ascended to a place alongside the bow and arrow in basic weaponry. The horse and dog played vital roles in transportation as beasts of burden. Hunting parties set up temporary tipi camps during different seasons of the year, and these settlements functioned as the field camps of pedestrian hunter-gatherers. Many of these locations, unless repeatedly reoccupied or marked by stone circles, probably contain little identifiable material traces in the archaeological record. Subsistence living of the horse-mounted hunting and gathering peoples was dependent upon bison. Wild plant foods, other wild animal foods, and garden produce received in an exchange with settled Village gardeners also were significant components of the diet (SHSND 2016:1.38-1.40).

Written accounts of equestrian Indian groups using this area included descriptions of the Crow traveling between their Big Horn Territory and villages on the Missouri River and the Hidatsa, leaving their villages to hunt in the Badlands. Since their split in the 1500s, territorial continuity and cultural connections between the Crow and the Hidatsa may have persisted until smallpox wreaked havoc on the Villagers. In the late 1700s, nomadic tribes ascended to prominence, with the Teton Dakota controlling the area until the late 19th century when the US military campaigns

against native peoples and European-American efforts to decimate bison herds undermined traditional ways of life (SHSND 2016:1.38-1.41).

GSU: The advent of the Fur Trade and increased Euro-American contact brought about many changes in the traditional culture of groups on the Northern Plains. Metal tools and implements obtained via trade replaced traditional items of stone, bone, wood, shell, and clay. The gun ascended to a place alongside the bow and arrow in basic weaponry. The appearance of horses in the middle of the 18th century influenced the lifeways of nomadic tribes like the Lakota, Dakota, and Assiniboine.

Plains Village tradition sites in the GSU are more common during this period than the preceding period as the Mandan, Hidatsa, and Arikara were forced out of their long-established villages by disease brought by Euro-Americans and attacks from other tribes. Sites dating to this period are attributed to the Knife River phase. Equestrian tradition sites are relatively uncommon, since temporary tipi camps unless repeatedly reoccupied or marked by stone circles, contain little identifiable material traces in the archaeological record. In the GSU, Equestrian tradition sites are best represented in proximity to the Fort Union trading post (SHSND 2016:6.47).

During the Equestrian/Fur Trade period, intertribal interactions, as well as trade between tribes and Euro-American settlers intensified. Intertribal trade during this period is rooted in prehistoric connections. The first Euro-American trader in the region was James Kipp, who started a trading post in 1826 in western Mountrail County to trade with the Assiniboine. The Fort Union trading post in western Williams County became an essential locus for trade later in the 1800s. As a result of trade and Euro-American expansion, historical and ethnographic accounts of the groups using this area complement the archaeological record (SHSND 2016:6.49-51).

Reservation Era (AD 1880-Present)

Between 1850 and 1870, the United States government created reservations to separate Native Americans and the influx of settlers. The Fort Berthold Reservation was established in 1870 for the Mandan, Hidatsa, and Arikara (MHA) to protect them from hostile Equestrian Nomads (SHSND 2016:6.76). In 1887, the United States Congress passed the General Allotment Act, known more commonly as the Dawes Act. This brutal piece of legislation provided the federal government with the ability to divide communal tribal land into individual allotments. Some lawmakers, including Henry Dawes (for whom the act is named), believed that forcing Native Americans to adopt agriculture while simultaneously removing the communal element of tribal village life would help assimilate them into mainstream, or “civilized” society. They did not view the act of removing cultural traditions and general lifeways as destructive, but as a way of saving Native Americans from disappearing altogether; a misguided notion that many people believed. At the same time, other lawmakers saw the commercial potential in selling allotments to non-Indians, something that indeed came to fruition when certain allotments were not sold and therefore deemed “surplus.” Today, the Dawes Act is considered the most destructive policy dealing with Native peoples (MHA Nation 2012a, 2012b; SHSND 2008b).

As an additional means of forced integration, Christian missionaries were sent to reservations and children were taken from their family and placed in boarding schools (Indian schools). Schools such as the Fort Stevenson Indian School, Bismarck Indian School, and the Carlisle Indian School in Pennsylvania prohibited students from using their language, practices, and culture and were subjected to a curriculum that emphasized European-American culture (MHA Nation 2012a, 2012b; SHSND 2008b).

In 1934, to rectify some of the damage done, the Indian Reorganization Act, which secured certain rights to Native Americans, was established. This included the reversal of the Dawes Act and a return to local self-government on a tribal basis. However, in the late 1940s and early 1950s, the

Indian Reorganization Act was disassembled. The plan was to establish a policy that would eliminate tribal status altogether. In 1975, the Indian Self-Determination and Education Assistance Act was enabled. This policy meant to allow tribal autonomy while still benefitting from government treaty obligations. The American Indian Religious Freedom Act of 1978 was created to protect and preserve the traditional religious rights and cultural practices of Native Americans. In addition to Self-Determination, other laws were passed, such as the Indian Civil Rights Act, the Indian Financing Act, and the Indian Child Welfare Act (SHSND 2008b).

Today, reservations have tribal governments, which administer many governmental, economic, health, welfare, and educational programs. There are still problems on Indian reservations, such as poverty, crime, and alcoholism; however, there is also economic growth because of small independent business, farming, and gaming (MHA Nation 2012c).

European-American Cultural Background

The majority of historic sites within North Dakota are farmsteads/homesteads from the late 19th century and early 20th century.

Dakota Territory (1858-1889)

The Dakota Territory consisted of the northernmost part of the land acquired from France in the 1803 Louisiana Purchase, and in 1818, the United States acquired the northeastern portion of the Dakota Territory in a treaty with Great Britain. The Dakota Territory included North Dakota, South Dakota, and much of present-day Montana and Wyoming. After becoming an incorporated territory in 1861, the population was slow to increase due to Indian attacks. Eventually, the population increased during the “Dakota Boom,” from 1870 to 1880, because of the railroad growth and the Homestead Act of 1862. Many of the settlers came from Germany and the Scandinavian countries of Norway and Sweden. The economic base was organized around agriculture, mining, and cattle ranching (Federal Writers Project [FWP] 1938).

Fur Trade – The earliest Europeans and Euro-Americans to venture into the region were looking for trade routes or establishing fur trading posts. Before and after the Lewis and Clark 1804-1806 expedition, notable explorers included Sieur de la Vérendrye, David Thompson, Charles Chaboillez, Alexander Henry, and Manuel Lisa. Some Europeans and European-Americans settled in the area, including “Spaniards from St. Louis, Frenchmen from Quebec, Scots and Britons from Hudson’s Bay and Montreal, and Americans working either as ‘free traders’ or *engagés* for a dozen fur companies” (FWP 1938; Lamar 1996:27).

Forts – The majority of the forts in the region were constructed in the 19th century. Their purpose included trading outposts, primarily fur trade and military posts, to protect supply routes, trails, trade, and settlers. These forts, before the introduction of the railroad, were along rivers such as the Missouri, Yellowstone, Heart, and Red rivers. Some of the more notable forts include Fort Mandan, Fort Lisa, Fort Henry, Fort Clark, Fort Union, Fort Abercrombie, Fort Berthold, Fort Buford, Fort Rice, Fort Totten, and Fort Abraham Lincoln (FWP 1938; SHSND 2008).

Trails – Two significant trails, the River Trail and the Ridge Trail, branches of the network of Red River Trails in the Red River Valley, originally were Native American trails that were later used by Euro-American fur traders. The Red River Trails connected fur trading posts, where they hauled furs and goods by ox cart. Later, the trails also connected military posts, where military supplies and men were sent. These military posts (e.g., Fort Abercrombie, Fort Totten, and Fort Ransom) also protected the trails as well as the people traveling up and down the trails. Eventually, the trails and ox carts were replaced by the railroad (Gilman et al. 1979).

A notable trail in the western part of the region is the Bismarck-Deadwood Stage Trail (1877-1880). This trail was a stagecoach and supply line that ran between Bismarck, the western terminus of the

Northern Pacific Railroad, and the Black Hills gold town of Deadwood in the Dakota Territory. There were transportation and economic booms associated with this trail and these booms ended when the railroad reached Pierre and an alternate line opened (SHSND 2008).

Riverboats – The Missouri and Red rivers were essential to the settlement and expansion of the Dakota Territory and were used the most for river transportation. Riverboats such as rafts, sailboats, rowboats, Mackinaws, keelboats, and steamboats brought explorers and fur traders into the Dakota Territory; however, the keelboat and steamboat were probably used more often due to their carrying capacity. “Keelboats were used primarily from 1800 to 1840, when they were replaced by steamboats” (Miller 2012). This type of boat floated high in the water, allowing it to travel on shallow rivers and was able to carry 15 to 30 tons of cargo. River transportation became increasingly important for transporting goods to outposts and returning furs downstream.

Steamboats eventually replaced the keelboats and were used for cargo and passenger transportation. The riverboat industry became an accessible mode of transportation, as it was much easier to deliver goods to remote areas by boat than overland routes. In addition, “settlers and visitors could also travel much more safely by taking steamboats” (Burns 2004:14). The demise of riverboat transportation occurred for several reasons: (1) less shipping of passengers and cargo, (2) scarcity of wood yards, (3) inconvenient climate, (4) labor unrest, and (5) the railroad. Shipping on the Red River continued until 1912 and until the 1930s on the Missouri River (Burns 2004).

Railroad - Major development of the railroad in the Dakota Territory occurred in the 1870s and 1880s with the Northern Pacific Railroad and the Great Northern Railroad facilitating population growth during this time. Federal land grants were given to the Northern Pacific Railroad, who, in turn, sold the land, while the Great Northern Railroad bought its lands from the federal government and promoted settlement along its lines (FWP 1938).

Agriculture – The Federal Homestead Act of 1862 offered free land to anyone over 21 years old who would cultivate and improve his 160 acres of land and live on it for five years. An additional 160 acres could be obtained for a tree claim and a third tract of land could be acquired before or after the land was surveyed. Crops planted and harvested included spring wheat, durum, flaxseed, barley, oats, sugar beets, corn, hay, red clover, alfalfa, sweet clover, and seed potato. Ranching of cattle and sheep, poultry raising, and beekeeping was also done on farms (FWP 1938).

In eastern North Dakota, large tracts of land were often sold to just one family or one individual. These “Bonanza farms” were often large operations, commonly owned by companies in the east and run like factories with hundreds of men using the most advanced farming technologies of the time. Bonanza farming fluoresced in the Red River Valley during the last two decades of the 19th century, and the railroad companies appreciated the endeavor since it served as a great promotional tool for the land. However, land in the western part of North Dakota was more arid and posed more problems for farmers, especially those from other countries. Populations remained relatively small and early homesteading was often unsuccessful. The difficulty of farming the land, the isolation required to live on their claims while improving them, and the harsh and cold North Dakota landscape just proved to be too much for many of these first settlers (FWP 1938; Sherman 1986:12).

North Dakota (1889-Present)

North Dakota became the 39th state to enter the Union on November 2, 1889. After statehood, industrial development increased. The railroad industry expanded and peaked in 1905 through competition between the Great Northern Railway and the Soo Line. Large lignite mines opened and local brickworks and flourmills flourished in the state. Entrepreneurs built stores, shops, and offices along Main Street and town squares. While rural areas still relied on small local general stores, city consumers had more choices with locally owned department retail stores. In 1919, the Bank of North Dakota at Bismarck opened and has become a large and powerful economic force.

“The State Mill and Elevator at Grand Forks, completed in 1922, provided a market for grain and a source of feed and seed [and] the state hail insurance program benefitted many farmers until its elimination in the 1960s” (SHSND 2012).

Farm homes in the eastern part of the state were typically small, located close together, and made up of well-painted modernized buildings surrounded by neat lawns and tree groves. They had modern conveniences like electricity, telephones, radios, and cars. In the central part of the state, farms were not as modernized as eastern North Dakota but were well-kept. In western North Dakota, farm homes were often little more than shacks erected to establish residence under the Federal Homestead Act. Many such buildings were still in use in the early twentieth century (FWP 1938).

The collapse of wartime prices for grain in the 1920s instigated an economic depression in North Dakota that lasted through the 1930s, concurrent with the Great Depression era. In 1921, more banks closed than in any other year, resulting in a wave of farm foreclosures. The Great Depression of the 1930s spurred change throughout the state. Rural populations decreased while city populations grew. Because of the price decline of farm produce, cooperatives enjoyed a renewed popularity as farmers banded together to market their products and reduce the cost of farming. Farmers Unions built local elevators and organized oil cooperatives that served the needs of the rural community. Despite economic problems, crop failures, dust storms, and extreme weather, North Dakota visibly modernized during the 1930s, shifting to mechanized farming operations and motorized transportation. Federal relief programs improved highways, state parks, and city services throughout the state. State departments undertook public health and safety problems, and a movement for consolidated law enforcement was started with the formation of a State Highway Patrol in 1935. “Rural schools consolidated at an increasing rate. Public utilities extended their reach through development o[f] rural electric cooperatives; the first, Baker Electric of Cando, energized its lines in 1938” (SHSND 2012).

Immediately after Franklin Roosevelt took the oath of office, he began passing a series of laws aimed at putting people back to work, restoring faith in the banking system, and shoring up the economy (SHSND 2012). Among these efforts were the Works Progress Administration (WPA) and the Civilian Conservation Corps (CCC). In North Dakota between 1935 and 1942, the WPA built 20,373 miles of highways and streets, 821 new bridges and viaducts, 166 miles of sidewalks, 15,012 culverts, 503 new public buildings, 61 building additions, 680 outdoor recreation facilities, 809 water wells, two irrigation projects, 39 sewage treatment plants, and nine water treatment plants, as well as other reconstructions and repairs (Robinson 1966:408). In June of 1933, some 235,000 men were enrolled in the CCC to work on federal and state public improvement projects. They built national forest trails, campsites, and visitor centers in state and national parks as well as roads and dams (SHSND 2012).

From the 1940s to the 1960s, North Dakota continued to develop modern agriculture, industry, and infrastructure. Starting in the 1940s, favorable weather and improved crop yields coincided with higher prices stimulated by America’s entry into World War II. By the end of the war, farm debt had dropped noticeably. After the war, the industrial economy continued to prosper. The rapid agricultural and industrial developments led to the construction of the Garrison Dam in 1946. Industrial developments included the beginning of the energy industry; in 1951, oil was discovered within the Bakken near Tioga. North Dakota also played a role in the military sector and two large Air Force Bases, one in Minot and the other in Grand Forks, had been built by the 1960s. Infrastructure developments included communication and interstate transportation systems, which were improved and expanded in the 1950s. As private auto transportation increased, the use of passenger rail service declined, and railroads increasingly became a means of hauling freight (SHSND 2012).

Large-scale energy development took off in the 1960s owing to high demand. Initially, coal strip mines and coal-fired power plants were the dominant forms of energy in the state. An oil boom occurred in 1978 as international crude oil prices skyrocketed; oilfield towns such as Dickinson, Williston, and Watford City exploded along with the industry. This oil boom and subsequent population increase were short-lived, as worldwide oil prices declined in 1981 and oil workers moved away (SHSND 2012). Another oil boom started in 2008, resulting in enough oil and gas jobs to give North Dakota the lowest unemployment rate in the United States. In addition, the oil boom has supplied economic growth in other areas, such as the service industry (Rocco 2013).

Class I Literature Search

The file search was requested by Brittany Brooks of BCA and provided by Tim Reed from the North Dakota SHPO in Bismarck, North Dakota, on April 14, 2020. The literature search indicates the types, distribution, and density of cultural resources near the project area. This is done by checking individual files at the North Dakota SHPO.

North Dakota SHPO Files

The literature search indicated that 109 projects had been conducted within the sections where the survey area for the planned Project is located. Ninety-two projects were conducted within the last 10 years, of which 44 crossed into the survey area. Additionally, 172 acres were surveyed by BCA in 2019. Previously surveyed areas were not surveyed during the current undertaking. The manuscripts within the one-mile radius of the project are included in tabular form in Appendix C.

The file search also revealed that the site distribution is dense within a one-mile radius of the survey area and included 81 sites, seven site leads, and 75 isolated finds at the time of the file search. These results are included in tabular form in Appendix C. Twelve previously recorded cultural resources were located within the survey area and were revisited during the current inventory. The results are described in the following section.

Class III Pedestrian Survey

The survey area for the current inventory was mapped over the planned Project. The file search results, including previously recorded cultural resources and previous surveys completed within the last 10 years, were then added to this map. This Class III pedestrian survey covered the project area not previously surveyed. When combined with the previous Class III surveys, this inventory covers the entire disturbance area footprint for the proposed pipeline conversion and construction area, plus a buffer. The purpose of the inspection was to identify, via a pedestrian survey, any cultural resources within the survey area.

Inventory Methodology

Prior to the inventory, the survey area, previous surveys, and known cultural resources are mapped and loaded onto a Trimble Juno global positioning system (GPS). United States Geological Survey (USGS) topographic maps and the Trimble Juno GPS are used by BCA staff to navigate and orient within the survey area.

The pedestrian inventory of the survey corridor is performed by lining field crewmembers no more than 15 m apart in parallel transects. In areas of higher vegetation coverage and a higher probability for cultural resources, transects are reduced. When a cultural resource is identified, the location is marked with pin-flags and the surrounding area is intensely surveyed for additional artifacts or features to determine the size and nature of the resource. When the nature of the resource is determined, the appropriate site forms are filled out, and site boundaries and features are plotted with a GPS unit. These GPS points are then brought into the Geographic Information System (GIS)

software, where site maps and sketch maps are created. Since there is no collection, no curation facility is arranged for cultural material.

Site Definitions and Delineation

According to the North Dakota SHPO, “a cultural resource site is defined as a location of past human activity that took place over 50 years ago and which left physical traces of activity in the form of (1) an intact cultural feature, (2) six or more artifacts found within about 60 meters of one another, and/or (3) an intact subsurface cultural deposit regardless of the number of artifacts” (SHSND 2020:19). Archaeological (i.e., prehistoric) sites in the area typically consist of stone features and/or cultural material scatters. Stone features can include cairns, stone circles, arcs, alignments, and effigies. Cultural material can include ceramics, faunal remains, fire-cracked rock (FCR), projectile points, or other stone tools, chipped stone, and/or ground stone. Historic archaeological (i.e., historical) sites typically consist of foundations, depressions, dumps, earthworks, quarries/mines, collapsed structures, rock piles, and cultural material scatters. Cultural material can include ceramics, faunal remains, glass, masonry, metal, plastic, rubber, wood, and glass. Architectural sites consist of buildings and structures such as dwellings, barns, granaries, grain bins, windmills, corrals, and bridges. A deed search is required for historical and/or architectural sites where there is a potential that a person could have inhabited the location. As such, trash scatters, grain bins, and some cultural material scatters would not require a deed search. The delineation of site boundaries can be determined by features, surface cultural materials, landforms (i.e., topography), and/or subsurface testing.

An isolated find is defined as “a location of five or fewer artifacts and identified by the archaeologist(s) as representing an area of very limited past activity” (SHSND 2020:19). A GPS point is typically used to mark the location of an isolated find, as the isolate “site” boundary is generally recorded as 1 m² unless the artifacts are slightly dispersed.

Site leads are identified and defined by three separate situations:

- (1) Until a qualified archaeologist or architectural historic can determine whether a cultural resource exists, “a location reported by a landowner or other non-professional as containing cultural resources” is considered a site lead (SHSND 2020:19).
- (2) “A location with five or fewer surface visible artifacts that may, in the professional judgment of the archaeologist(s), be only a limited surface expression of a former occupation area where most of the artifacts are not visible (i.e., still buried)” is considered a site lead (SHSND 2020:19).
- (3) Architectural sites “that are [located] outside the project area and [are] not fully recorded or when access is denied so the form cannot be fully completed” is considered a site lead (SHSND 2020:19-20).

Because of the uncertainty of the site lead location, site lead boundaries typically cover large sections of land, such as a quarter section or an entire section.

Non-sites and property types defined by the North Dakota SHPO do not require formal documentation but must be mentioned in the report. Non-sites included utility lines, pipelines, railroads, field-clearing piles, recent trash, farm or ranch fences and enclosures, two-track roads, borrow pits, and isolated machinery, vehicles, and appliances (SHSND 2020).

Site Evaluation Criteria

To be eligible for inclusion on the National Register of Historic Places (NRHP), a site must usually be more than 50 years old, retain its integrity of location, design, setting, materials, workmanship, feeling, and association and it must meet one of the following criteria:

- (a) Be associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) Be associated with the lives of persons significant in our past; or
- (c) Embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinctions; or
- (d) Have yielded, or may be likely to yield, information important in prehistory or history.

In addition, cultural resources that hold traditional, cultural, or religious significance may be eligible for the NRHP as Traditional Cultural Property (TCP).

Historic Properties consist of any historic or prehistoric district, site, building, structure, or object (usually) over 50 years of age. Cultural resources include archaeological, historic, and architectural sites, as well as properties of traditional, cultural, or religious importance.

Shovel Test Probe Methodology

Should the ground surface visibility (GSV) fall below 30%, intervals are surveyed closer together and, if necessary, shovel test probes (STPs) are instituted every 40 m (within the low visibility areas) to aid field staff with decreased visibility. If a positive STP is encountered, then additional STPs take place 10 m apart in the four cardinal directions from the center of the cultural material. If a negative STP is encountered in each of the four cardinal directions, then the cultural resource is declared an isolated find or site lead. Should an STP yield a positive finding, further probes are necessary. At this point, the distance between STPs is reduced to 5 m intervals in all four cardinal directions until two consecutive negative STPs are encountered in each of the four cardinal directions, then an STP is placed 10 m away in all four cardinal directions. Assuming the last STP yields a negative result, then that defines the extent of the site boundary. However, should the last probe yield a positive result, then the process, as mentioned above, starts all over again.

The soils are dry-screened through a ¼-inch mesh. Excavations stop at a depth determined to be culturally sterile based on the surface geology. Cultural material is not collected and is reburied in the STP where it is found after field analysis and documentation.

Wall soil profiles are photographed and drawn. Simple archaeological soil analysis is conducted using Munsell color charts and simple soil texture analysis.

Field Notes

Throughout the survey, field notes and overview pictures of the survey area are taken. Field observations are recorded as field notes in a bound notebook, portions of which are transcribed into sections of this report. Digital photographs are taken, are on file at BCA, and are included in this report. Copies of maps, field notes, and photographs are located at the BCA main office in Bismarck, North Dakota. This report is printed on acid-free paper.

Project Personnel

On July 14-17, 2020, the survey area was inventoried by Alex Atkinson (Principal Investigator), Reilly Lembo (Field Director), and Silas Chapman (Staff Archaeologist). Talon Krebs (GIS Technician) created the project map and Wade Burns served as the Project Director.

Survey Conditions

The survey area was located on the rolling plains, with an elevation varying from 1,945-2,518' above mean sea level (AMSL). Weather at the time of the Class III inventory was clear to partly cloudy, and the temperature ranged from 57-84°F. The survey area was located within agricultural fields and rangeland. Vegetation observed during the inventory included wheat, flax, and alfalfa as

well as native and non-native grasses, plants, forbs, trees, and shrubs, including buffalograss, blue grama, little bluestem, buffaloberry, dwarf juniper, prairie turnip, prickly pear, purple coneflower, breadroot, silver sage, sagewort, snowberries, western wheatgrass, yucca, brome, crested wheatgrass, dogwood, yellow sweet clover, cattails, reeds, cottonwood, and box elder. Surface visibility was aided by spaced vegetation, bioturbation, cattle grazing, and erosion. The GSV at the time of the inventory was approximately 90-100% within plowed fields, 30-45% within the wheat fields, 65% within the flax fields, 30-40% within the hayfields, 35% within rangeland, 65% within recently seeded pipeline scars. As a result, no STPs were implemented due to low GSV. Areas of higher visibility, such as erosion features, areas of sparse vegetation, and rodent burrows, were also closely examined for cultural material. Photos of the survey area are included in Appendix B.

Survey Results and Recommendations

While conducting the pedestrian survey, it was noted that the survey area is presently used for agricultural production, livestock grazing, wildlife habitat, and oil and gas production. Previous disturbances include paved roads, gravel roads, two-tracks, cattleguards, active well pads, pipeline scars, overhead electric/transmission lines, fence lines, stock tanks, field-clearing piles, plow scars, shelterbelts, and erosion.

During the inventory, 12 previously recorded cultural resources were revisited and updated, including six sites and six isolated finds. Additionally, two new sites and one new isolated find were discovered and recorded. A summary of these cultural resources is included in Table 4 below. Additional details regarding the updated and newly recorded sites are provided in Appendix D, as this allows for easy removal of sensitive information if the report is requested for public usage.

Table 4. Cultural Resources and Their Distances to the Construction Corridor and Permanent Easement.

| SITS # | Description | Recording Status | NRHP Rec. | Avoidance | Distance to Permanent Easement |
|-----------|----------------------------------|------------------|--------------|-----------|--------------------------------|
| 32MZ1561 | WAPA Transmission Line | Update | Not Eligible | No | Within |
| 32MZ2074 | Depression, Trash Dump | Update | Not Eligible | No | 14' |
| 32MZ2533 | Depressions, CM Scatter | Update | Not Eligible | No | Within |
| 32MZ2876 | Depressions | Update | Not Eligible | No | 119' |
| 32MZ3069 | Corduroy Road Segments | Update | Not Eligible | No | 97' |
| 32MZ3129 | Stone Alignment | Update | Unevaluated | Yes | 100' |
| 32MZ3409 | Collapsed Structures, Trash Dump | Newly Recorded | Not Eligible | No | 37' |
| 32MZ3410 | Cairn, Stone Circle, Arc, Other | Newly Recorded | Unevaluated | Yes | 71' |
| 32MZx1335 | Isolated Find: Chipped Stone | Update | Not Eligible | No | 79' |
| 32MZx1498 | Isolated Find: Chipped Stone | Update | Not Eligible | No | 0' |
| 32MZx1616 | Isolated Find: Chipped Stone | Update | Not Eligible | No | Within |
| 32MZx1617 | Isolated Find: Chipped Stone | Update | Not Eligible | No | 17' |
| 32MZx1618 | Isolated Find: Chipped Stone | Update | Not Eligible | No | 34' |
| 32MZx1660 | Isolated Find: Chipped Stone | Update | Not Eligible | No | Within |
| 32MZx1777 | Isolated Find: Chipped Stone | Newly Recorded | Not Eligible | No | 27' |

Of the six revisited sites, one is a prehistoric stone feature site. Site 32MZ3129, a stone alignment, was located during the current undertaking. Stone features like alignments, arcs, and effigies were used in both day-to-day and ceremonial activities. As the specific purpose of the alignment is unknown, the site is recommended to remain unevaluated for nomination to the NRHP, pending further investigation, including tribal consultation. Consequently, avoidance is required.

One of the revisited sites is a historical/architectural site, while the remaining four within the survey corridor are historical. A portion of site 32MZ1561, the Western Area Power Administration (WAPA) electrical energy transmission line, crosses over the project area and requires not

avoidance, as it has been recommended to remain listed as ineligible for nomination to the NRHP. Sites 32MZ2074 (a depression and trash dump), 32MZ2533 (depressions and CM scatter), 32MZ2876 (depressions), and 32MZ3069 (corduroy road segments) have been recommended to remain listed as ineligible for nomination to the NRHP and do not require avoidance as they do not meet any of the eligibility criteria.

All six previously recorded isolated finds located within the survey corridor were originally discovered on the surface. During the current undertaking, no cultural material or evidence thereof was found while revisiting the locations of the isolated finds. Furthermore, each location was extensively disturbed due to grazing, pipeline installation, road construction, and/or erosion, indicating little to no potential for intact subsurface deposits. Consequently, the six previously recorded isolated finds (32MZx1335, 32MZx1498, 32MZx1616, 32MZx1617, 32MZx1618, and 32MZx1660) have all been recommended to remain listed as ineligible for nomination to the NRHP with no avoidance required.

Management Summary

The Proponent has proposed the conversion of the Johnsons Corner to Wilson Station pipeline in McKenzie County, North Dakota. To accomplish this, Keitu Engineers and Consultants, Inc. (consultant to the Proponent) hired BCA to conduct a Class I file search, a Class III cultural resource survey, and complete a Class III cultural resource survey report for submittal to the North Dakota PSC and the North Dakota SHPO.

The planned approximately 29-mile long, 8" pipeline conversion (26.6 miles) and new construction (2.4 miles) will originate approximately 2.25 miles east of Johnsons Corner and terminate at the Wilson Station, approximately 8.25 miles south of Watford City (see maps in Appendix A). This project is subject to the jurisdiction of the North Dakota PSC.

On July 14-17, 2020, BCA inventoried a 300' wide survey corridor for the planned pipeline. The planned Project consists of approximately 1,044 acres, of which 437 acres were previously surveyed. As a result, 611 acres were inventoried during the current undertaking.

The Class I file search revealed 81 sites, seven site leads, and 75 isolated finds within a one-mile radius of the survey area. Twelve of the previously recorded cultural resources were located within the survey area and were revisited and updated during the current undertaking. These cultural resources include one historical/architectural site, four historical sites, one prehistoric stone feature site, and six prehistoric isolated finds (see Table 5). The 11 historical/architectural, historical, and prehistoric isolated finds are recommended to remain listed as ineligible for the National Register of Historic Places (NRHP). As such, no avoidance measures are deemed necessary. The prehistoric stone feature site, 32MZ3129, is recommended to remain listed as unevaluated for the NRHP and site avoidance is deemed necessary. As the site is located within 100' of the permanent easement, the distance between the site boundary and any potential future maintenance is sufficient avoidance and no additional avoidance measures are deemed necessary.

During the pedestrian survey, three new cultural resources were encountered and recorded, including one historical site, one prehistoric stone feature site, and one prehistoric isolated find (see Table 5). The historical site (32MZ3409) and isolated find (32MZx1777) have been recommended as not eligible for the NRHP and no avoidance measures are deemed necessary. Site 32MZ3410, the prehistoric stone feature site, has been recommended as unevaluated for the NRHP and site avoidance is recommended. As the site is located within 71' of the permanent easement, the distance between the site boundary and any potential future maintenance is sufficient avoidance and no additional avoidance measures are deemed necessary.

Consequently, as long as sites 32MZ3129 and 32MZ3410 are avoided by the aforementioned avoidance measures (and listed in Table 5), BCA recommends a finding of *No Historic Properties Affected* for this project as currently planned.

Table 5. Summary of Cultural Resources Located Within the Survey Corridor.

| SITS # | Description | NRHP Status | Avoidance Recommendation |
|-----------|----------------------------------|--------------|--|
| 32MZ1561 | WAPA Transmission Line | Not Eligible | No avoidance necessary |
| 32MZ2074 | Depression, Trash Dump | Not Eligible | No avoidance necessary |
| 32MZ2533 | Depressions, CM Scatter | Not Eligible | No avoidance necessary |
| 32MZ2876 | Depressions | Not Eligible | No avoidance necessary |
| 32MZ3069 | Corduroy Road Segments | Not Eligible | No avoidance necessary |
| 32MZ3129 | Stone Alignment | Unevaluated | Distance from the site is sufficient avoidance |
| 32MZ3409 | Collapsed Structures, Trash Dump | Not Eligible | No avoidance necessary |
| 32MZ3410 | Cairn, Stone Circle, Arc, Other | Unevaluated | Distance from the site is sufficient avoidance |
| 32MZx1335 | Isolated Find: Chipped Stone | Not Eligible | No avoidance necessary |
| 32MZx1498 | Isolated Find: Chipped Stone | Not Eligible | No avoidance necessary |
| 32MZx1616 | Isolated Find: Chipped Stone | Not Eligible | No avoidance necessary |
| 32MZx1617 | Isolated Find: Chipped Stone | Not Eligible | No avoidance necessary |
| 32MZx1618 | Isolated Find: Chipped Stone | Not Eligible | No avoidance necessary |
| 32MZx1660 | Isolated Find: Chipped Stone | Not Eligible | No avoidance necessary |
| 32MZx1777 | Isolated Find: Chipped Stone | Not Eligible | No avoidance necessary |

Unanticipated Discovery Plan

The following protocol defines the appropriate procedures to deal with any potential discovery of cultural resources in accordance with the regulatory requirements of the following federal statutes: Section 106 of the National Historic Preservation Act (NHPA; 16 United States Code [USC] 470) and 36 Code of Federal Regulations (CFR) 800); Section 3(d) (USC Part 3002) of the Native American Graves Protection and Repatriation Act (NAGPRA; 25 USC Part 3001-3013) and the NDCC 23-06-27 and accompanying administrative rules (NDAC 40-02-03).

A cultural resource could consist of:

- Prehistoric features (e.g., stone features, hearths, charcoal stains)
- Prehistoric artifacts (e.g., lithic debitage, projectile points, ceramics)
- Historic features (e.g., wells, trails, foundations)
- Historic artifacts (e.g., military artifacts, farm implements, glass)
- Burials and funerary items including, but not limited to, skeletal remains, headstones, coffin wood fragments, burial goods (e.g., pipes, pottery, ornaments)

Bridger Pipeline, LLC, is responsible for ensuring that all construction staff present during groundbreaking activities monitor construction for potential archaeological remains. If unanticipated cultural resources are discovered during construction, the following procedures should be followed, which are described below according to the type of cultural material discovered.

Human Remains/Burial Goods

In the event that human remains or burial goods are uncovered during any construction activities, whoever identified the cultural resource will immediately notify the Construction Manager of the location and type of discovery. The Construction Manager will ensure that all construction activities cease at once in the immediate vicinity of the find. "Immediate vicinity" is defined as a 100' radius around the discovery or a boundary determined at the discretion of the BCA archaeologist. After visiting the discovery and determining the site boundary, the BCA archaeologist will recommend a distance at which to place protective fencing. If there is inclement weather during the discovery or subsequently, weatherproof material will be utilized immediately to protect the remains.

Once construction activities have ceased, the Construction Manager will notify local law enforcement (the McKenzie County Sheriff's Office) and BCA, who will, in turn, contact the North Dakota SHPO.

Construction shall not resume work at the discovery site until notice to proceed is given by the Sheriff and the North Dakota SHPO. Under no circumstances should human remains be removed from the site until all necessary parties have agreed upon an avoidance/mitigation plan. "Necessary parties" may include, but are not limited to, a medical examiner, local law enforcement, the North Dakota SHPO, Native American representatives, BCA, and other federal and state agencies/entities as appropriate. Further work at the discovery site will be suspended until the avoidance/mitigation plan agreed upon by necessary parties has been put into place.

General Archaeological Sites (not including human remains or burial goods)

In the event that finds of archaeological sites, such as artifact caches or hearths, are uncovered during any construction activities, whoever identified the cultural resource will notify the Construction Manager of the location and type of discovery. The Construction Manager will ensure that all construction activities cease at once in the immediate vicinity of the find. The Construction Manager will contact the BCA archaeologist to conduct a preliminary evaluation of the discovery

to make work stoppage recommendations to the Construction Manager. Should a work stoppage authority be deemed necessary, BCA will notify the North Dakota SHPO. Further work at the discovery site will be suspended until the avoidance/mitigation plan agreed upon by necessary parties has been put into place. "Necessary parties" may include, but are not limited to, North Dakota SHPO, BCA, Native American representatives, and other federal and state agencies/entities as appropriate.

The contact information for the project includes:

| Company/Agency | Name | Telephone Number |
|---------------------------------------|------------------|-------------------------|
| Construction Manager | | |
| Project Manager | | |
| North Dakota SHPO | Andrew Clark | (701) 328-3574 |
| McKenzie County Sheriff | Matthew Johansen | (701) 444-3654 |
| McKenzie County Coroner | Calvin Parrish | (701) 770-4522 |
| Beaver Creek Archaeology, Inc. | Main Office | (701) 663-5521 |
| | Wade Burns | (701) 367-8993 |

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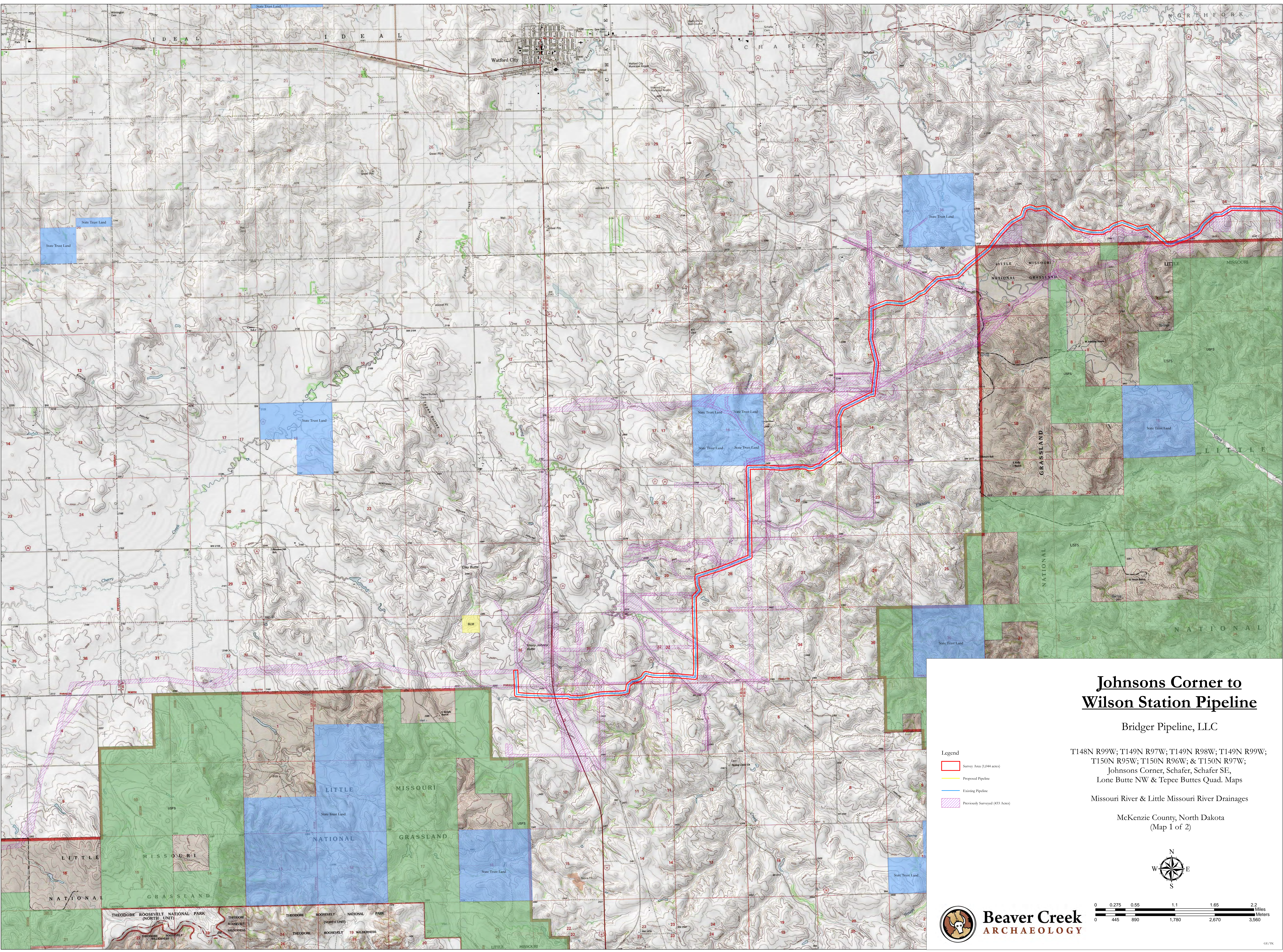
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Appendix A: Maps



Johnsons Corner to Wilson Station Pipeline

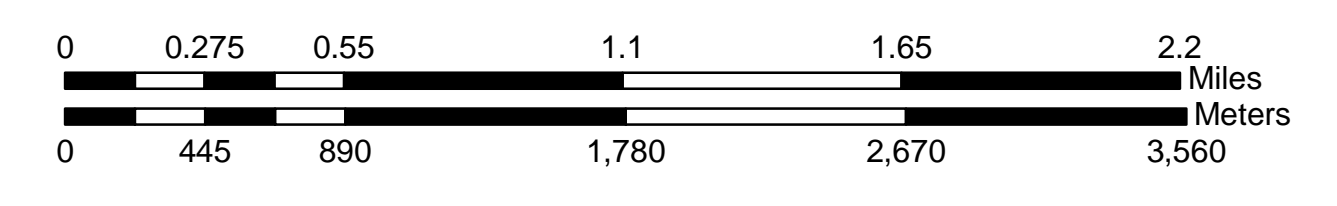
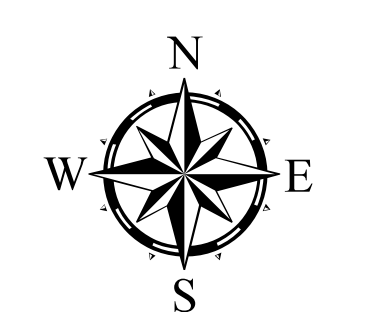
Bridger Pipeline, LLC

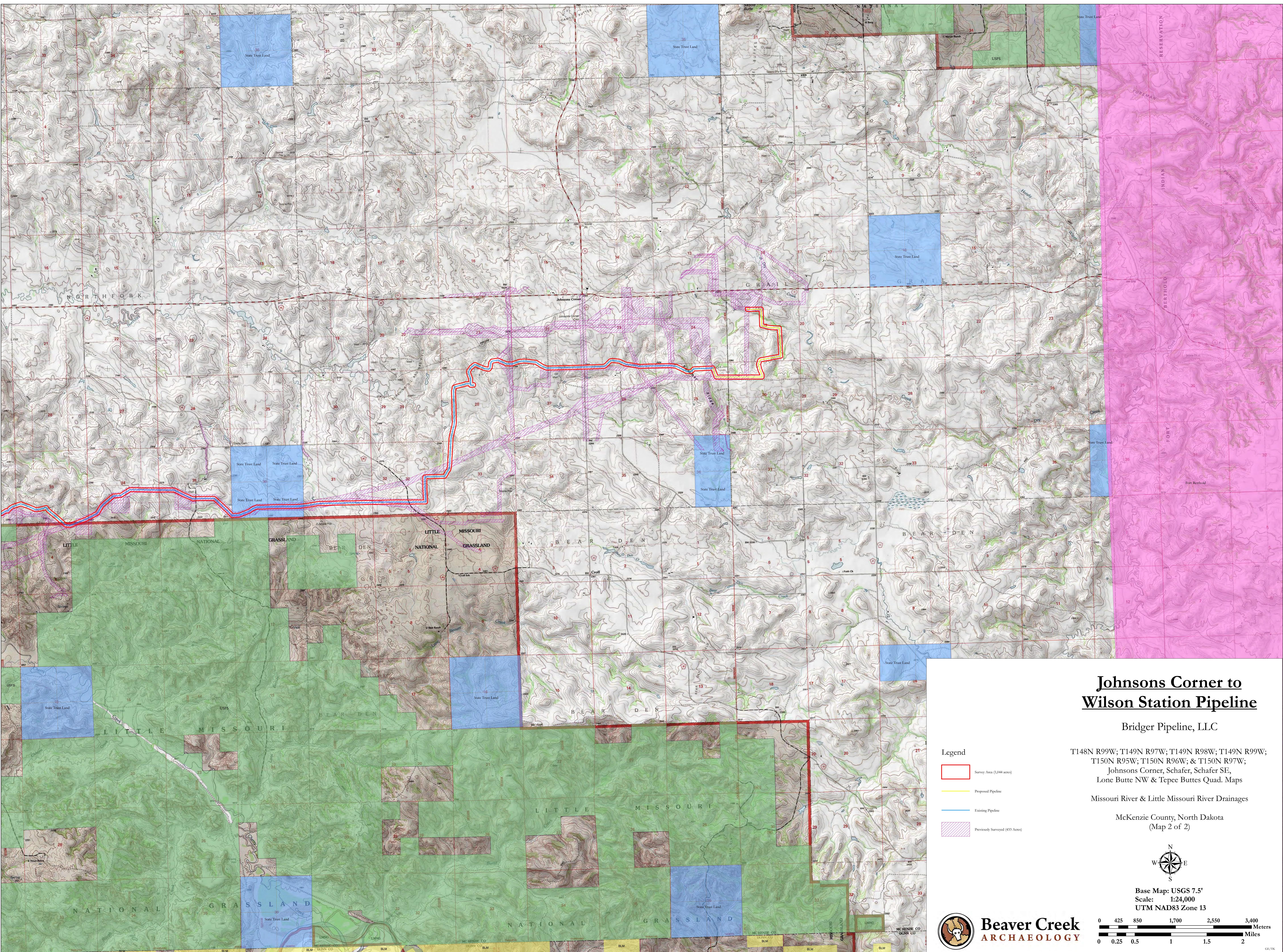
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T150N R95W; T150N R96W; & T150N R97W;
Johnsons Corner, Schafer, Schafer SE,
Lone Butte NW & Tepee Buttes Quad. Maps

Missouri River & Little Missouri River Drainages

McKenzie County, North Dakota
(Map 1 of 2)

- Legend**
- Survey Area (1,044 acres)
 - Proposed Pipeline
 - Existing Pipeline
 - Previously Surveyed (433 Acres)





Johnsons Corner to Wilson Station Pipeline





Bridger Pipeline, LLC

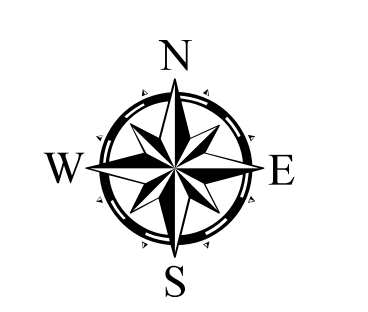
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T150N R95W; T150N R96W; & T150N R97W;
Johnsons Corner, Schafer, Schafer SE,
Lone Butte NW & Tepee Buttes Quad. Maps

Missouri River & Little Missouri River Drainages

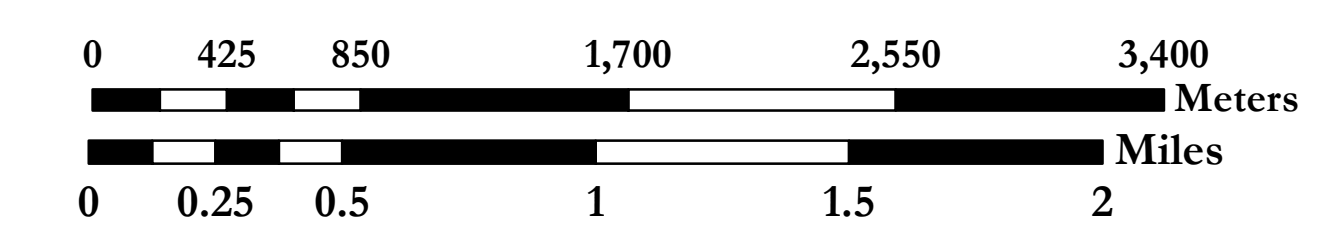
McKenzie County, North Dakota
(Map 2 of 2)

Legend

-  Survey Area (1,044 acres)
-  Proposed Pipeline
-  Existing Pipeline
-  Previously Surveyed (453 Acres)



Base Map: USGS 7.5'
Scale: 1:24,000
UTM NAD83 Zone 13



Appendix B: Survey Area Photos



Figure 3. Overview photo of the Wilson Station. View is to the west.
(Photo was taken on July 14, 2020, by Alex Atkinson. The image has not been altered.)



Figure 4. Overview photo of the survey area. View is to the south.
(Photo was taken on July 14, 2020, by Alex Atkinson. The image has not been altered.)



Figure 5. Overview photo of the survey area. View is to the north.
(Photo was taken on July 14, 2020, by Alex Atkinson. The image has not been altered.)



Figure 6. Overview photo of the survey area. View is to the north.
(Photo was taken on July 14, 2020, by Alex Atkinson. The image has not been altered.)



Figure 7. Overview photo of the survey area. View is to the south-southwest.
(Photo was taken on July 14, 2020, by Alex Atkinson. The image has not been altered.)



Figure 8. Overview photo of the survey area. View is to the southwest.
(Photo was taken on July 15, 2020, by Reilly Lembo. The image has not been altered.)



Figure 9. Overview photo of the survey area. View is to the northwest.
(Photo was taken on July 15, 2020, by Reilly Lembo. The image has not been altered.)



Figure 10. Overview photo of the survey area. View is to the west.
(Photo was taken on July 15, 2020, by Reilly Lembo. The image has not been altered.)



Figure 11. Overview photo of the survey area. View is to the south.
(Photo was taken on July 16, 2020, by Alex Atkinson. The image has not been altered.)



Figure 12. Overview photo of the survey area. View is to the northwest.
(Photo was taken on July 16, 2020, by Reilly Lembo. The image has not been altered.)



Figure 13. Overview photo of the survey area. View is to the east.
(Photo was taken on July 16, 2020, by Reilly Lembo. The image has not been altered.)



Figure 14. Overview photo of the survey area. View is to the southeast.
(Photo was taken on July 16, 2020, by Reilly Lembo. The image has not been altered.)



Figure 15. A GSV photo of rangeland.
(Photo was taken on July 14, 2020, by Reilly Lembo. The image has not been altered.)



Figure 16. A GSV photo of a plowed field.
(Photo was taken on July 14, 2020, by Reilly Lembo. The image has not been altered.)



Figure 17. A GSV photo of rangeland.
(Photo was taken on July 15, 2020, by Reilly Lembo. The image has not been altered.)



Figure 18. A GSV photo in a pipeline scar.
(Photo was taken on July 15, 2020, by Reilly Lembo. The image has not been altered.)



Figure 19. A GSV photo in a wheat field.
(Photo was taken on July 16, 2020, by Reilly Lembo. The image has not been altered.)



Figure 20. A GSV photo in a flax field.
(Photo was taken on July 16, 2020, by Reilly Lembo. The image has not been altered.)

Appendix C: File Search Results

April 14, 2020

REDACTED

Appendix D: Detailed Cultural Resource Results Descriptions

REDACTED

Exhibit C
Agency Correspondence

Exhibit C.1
NDIC Pipeline Authority

April 14, 2020

Justin Kringstad
North Dakota Industrial Commission
Pipeline Authority
600 E. Boulevard Ave. Dept. 405
Bismarck, ND 58505-0840

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

Keitu Engineers and Consultants, Inc. (“Keitu”) expects to submit the Application in August 2020. The Commission requires applicants to contact relevant agencies for comment on the Project.

Enclosed is a map of the pipeline route for your review. We respectfully request that any concerns known in the area is brought to our attention to ensure we focus on resolving your issues of concern.

As always, Keitu appreciates the opportunity to assist our client and the regulatory agencies with compliance. I will serve as the primary Keitu contact and can be reached at (701) 667-1800 or via email at jantognazzi@keitu.com.



Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

Exhibit C.2
ND State Water Commission

April 14, 2020

Dawn Martin
Planning Division
North Dakota State Water Commission
900 East Boulevard Avenue, Dept 770
Bismarck, ND 58505-0850

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

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As always, Keitu appreciates the opportunity to assist our client and the regulatory agencies with compliance. I will serve as the primary Keitu contact and can be reached at (701) 667-1800 or via email at jantognazzi@keitu.com.



Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

May 13, 2020

Jaimee Antognazzi
Keitu Engineers & Consultants, Inc.
PO Box 98
Mandan, ND 58554-0098

Dear Ms. Antognazzi:

This is in response to your request for a review of the environmental impacts associated with the Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline project.

The proposed project has been reviewed by State Water Commission staff, and the following comments are provided:

- There may be floodplains identified and/or mapped where this proposed project is to take place. North Dakota has no formal 'permitting' authority as a state entity in NFIP identified floodplain areas. The permitting is always done by the local entity, which has jurisdiction in the area in question. Please work closely with the local Floodplain Administrator.
- Initial review indicates the project does not require a conditional or temporary permit for water appropriation. However, if surface water or groundwater will be diverted for construction of the project, a water permit will be required per North Dakota Century Code § 61-04-02. Please consult with the Water Appropriations Division of the Office of the State Engineer if you have any questions at (701) 328-2754 or waterpermits@nd.gov.
- The State Water Commission maintains a network of observation wells across the state for monitoring the water levels and quality in glacial and bedrock aquifers. These wells are often installed in road and highway rights-of-way to limit inconvenience to the adjacent landowners. State Water Commission observation wells have a yellow protective casing extending between 1 and 3 feet above ground surface, and their locations are marked with a stake. If an observation well is encountered during project activities and must be removed, please contact the Water Appropriations Division. The State Water Commission hopes to keep all observation wells, but otherwise will ensure the well is properly abandoned.

Thank you for the opportunity to provide review comments. Should you have further questions, please contact me at 701-328-4970 or stevebest@nd.gov.

Sincerely,



Steven Best
Planner III

SB:dm/1570

Exhibit C.3
ND Department of Environmental Quality

April 14, 2020

Dave Glatt
North Dakota DEQ
Environmental Health Section
918 East Divide Avenue
Bismarck, ND 58501-1947

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

Keitu Engineers and Consultants, Inc. (“Keitu”) expects to submit the Application in August 2020. The Commission requires applicants to contact relevant agencies for comment on the Project.

Enclosed is a map of the pipeline route for your review. We respectfully request that any concerns known in the area is brought to our attention to ensure we focus on resolving your issues of concern.

As always, Keitu appreciates the opportunity to assist our client and the regulatory agencies with compliance. I will serve as the primary Keitu contact and can be reached at (701) 667-1800 or via email at jantognazzi@keitu.com.



Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

May 12, 2020

Jaimee Antognazzi
Operations Manager
Keitu Engineers & Consultants
PO Box 98
Mandan, ND 58554-0098

Re: Bridger Pipeline Johnson's Corner and Wilson Station 8" Pipeline in McKenzie County

Dear Ms. Antognazzi:

The North Dakota Department of Environmental Quality has reviewed the information concerning the above-referenced project received at the department on April 16, 2020 with respect to possible environmental impacts.

This department believes that environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. With respect to construction, we have the following comments:

1. Aggregate to be used for road construction should not contain any erionite. Aggregate sources should be tested for erionite following guidelines found at <https://deq.nd.gov/erionite>. For questions regarding erionite testing, please call Sandi Washek at 701-328-5166.
2. Care is to be taken during construction activity near any water of the state to minimize adverse effects on a water body. This includes minimal disturbance of stream beds and banks to prevent excess siltation, and the replacement and revegetation of any disturbed area as soon as possible after work has been completed. Caution must also be taken to prevent spills of oil and grease that may reach the receiving water from equipment maintenance, and/or the handling of fuels on the site. Guidelines for minimizing degradation to waterways during construction are attached.
3. Oil and gas projects disturbing one or more acres are required to obtain a permit to discharge storm water if runoff from the project will carry eroded material to a water of the state. A permit is not required for oil and gas projects if runoff from the project will not carry eroded material to a water of the state. Further information on the stormwater permit may be obtained from the department's website or by calling the Division of Water Quality (701-328-5210). In addition, cities or counties may impose additional requirements and/or specific best management practices for construction affecting their storm drainage system. Check with the local officials to be sure any local storm water management considerations are addressed.

918 East Divide Avenue | Bismarck ND 58501-1947 | Fax 701-328-5200 | deq.nd.gov

Director's Office
701-328-5150

Division of
Air Quality
701-328-5188

Division of
Municipal Facilities
701-328-5211

Division of
Waste Management
701-328-5166

Division of
Water Quality
701-328-5210

Division of Chemistry
701-328-6140
2635 East Main Ave
Bismarck ND 58501

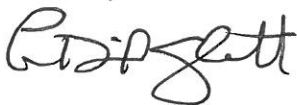
4. The proposed construction project overlies the Cherry Creek glacial drift aquifer, which is a sensitive groundwater area. Several domestic and stock water supply wells are located in close proximity to the project's intended route. Care should be taken to avoid spills of any materials that may have an adverse effect on groundwater quality. All spills must be immediately reported to this department and appropriate remedial actions performed.
5. All solid waste materials must be managed and transported in accordance with the state's solid and hazardous waste rules. Appropriate efforts to reduce, reuse and/or recycle waste materials are strongly encouraged. As appropriate, segregation of inert waste from non-inert waste can generally reduce the cost of waste management. Further information on waste management and recycling is available from the department's Division of Waste Management at (701) 328-5166.
6. Projects that involve construction of pipelines should select locations that minimize the potential for impacts to human health and the environment during and after construction by avoiding, when possible, source water protection areas and sensitive surface and groundwater environments. Additionally, when possible, pipeline routes should select areas with natural barriers to both surface and ground waters. Human health and the environment should be further protected by developing a spill response plan that emphasizes rapid deployment of prepositioned assets necessary to contain spills and subsequent cleanup. Proper surveillance and monitoring for early detection of leaks should be required.

These comments are based on the information provided about the project in the above-referenced submittal. The U.S. Army Corps of Engineers may require a water quality certification from this department for the project if the project is subject to their Section 404 permitting process. Any additional information which may be required by the U.S. Army Corps of Engineers under the process will be considered by this department in our determination regarding the issuance of such a certification.

The department owns no land in or adjacent to the proposed improvements, nor does it have any projects scheduled in the area. In addition, we believe the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota.

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,



L. David Glatt, P.E., Director
North Dakota Department of Environmental Quality

LDG:dlp
Attach.

Construction and Environmental Disturbance Requirements

The following are the minimum requirements of the North Dakota Department of Environmental Quality for projects that involve construction or environmental disturbance in or near waters of the State of North Dakota. They ensure that minimal environmental degradation occurs as a result of construction or related work which has the potential to affect waters of the state. All projects must be constructed to minimize the loss of soil, vegetative cover, and pollutants (chemical or biological) from a site.

Soils

Prevent the erosion of soil and sediment loss using erosion and sediment controls. Fragile and sensitive areas such as wetlands, riparian zones, delicate flora, and land resources must be protected against compaction, vegetation loss, and unnecessary damage.

Surface Waters

All construction must be managed to minimize impacts to aquatic systems. Follow safe storage and handling procedures to prevent the contamination of water from fuel spills, lubricants, and chemicals. Stream bank and stream bed disturbances must be controlled to minimize silt movement, nutrient upsurges, plant dislocations, and any physical, chemical, or biological disruption. The use of pesticides or herbicides in or near surface waters is allowed under the department's pesticide application permit with notification to the department.

Fill Material

Any fill material placed below the ordinary high-water mark must be free of topsoil, decomposable materials, and persistent synthetic organic compounds; including, but not limited to, asphalt, tires, treated lumber, and construction debris. The department may require testing of fill materials. All temporary fill must be removed. Debris and solid wastes must be properly disposed or recycled. Impacted areas must be restored to near original condition.

Exhibit C.4
ND DOT – Williston District

April 14, 2020

Williston District Office
North Dakota Department of Transportation
605 Dakota Parkway West
Williston, ND 58802-0698

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

Keitu Engineers and Consultants, Inc. (“Keitu”) expects to submit the Application in August 2020. The Commission requires applicants to contact relevant agencies for comment on the Project.

Enclosed is a map of the pipeline route for your review. We respectfully request that any concerns known in the area is brought to our attention to ensure we focus on resolving your issues of concern.

As always, Keitu appreciates the opportunity to assist our client and the regulatory agencies with compliance. I will serve as the primary Keitu contact and can be reached at (701) 667-1800 or via email at jantognazzi@keitu.com.



Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

Exhibit C.5
ND Department of Trust Lands

April 14, 2020

Mike Humann, Director
Surface Management Division
ND Department of Trust Lands
1707 N 9th Street, PO Box 5523
Bismarck, ND 58506-5523

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

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Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

Exhibit C.6
McKenzie County Planning Department

April 14, 2020

Jim Talbert
McKenzie County Planning Department
201 5th Street NW Ste. 699
Watford City, ND 58854

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

Keitu Engineers and Consultants, Inc. (“Keitu”) expects to submit the Application in August 2020. The Commission requires applicants to contact relevant agencies for comment on the Project.

Enclosed is a map of the pipeline route for your review. We respectfully request that any concerns known in the area is brought to our attention to ensure we focus on resolving your issues of concern.

As always, Keitu appreciates the opportunity to assist our client and the regulatory agencies with compliance. I will serve as the primary Keitu contact and can be reached at (701) 667-1800 or via email at jantognazzi@keitu.com.



Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

Exhibit C.7
US Army Corps of Engineers

April 14, 2020

Patricia McQueary
Regulatory Program Manager
US Army Corps of Engineers
3319 University Dr.
Bismarck, North Dakota 58504

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

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Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

Exhibit C.8
ND Parks and Rec

April 14, 2020

Kathy Duttenhefner, Coordinator
Natural Resources Division
North Dakota Parks and Recreation
P.O. Box 5594
Bismarck, ND 58506-6694

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

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Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

Exhibit C.9
ND Game and Fish

April 14, 2020

Terry Steinwand, Director
100 N. Bismarck Expressway
Bismarck, ND 58501-5095

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

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Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

From: [Schumacher, John D.](#)
To: jantognazzi@keitu.com
Subject: Bridger LLC - Johnson's Corner to Wilson Station Pipeline
Date: Thursday, May 14, 2020 6:29:08 PM
Attachments: [image001.png](#)

Jaimee Antognazzi
Operations Manager
Keitu Engineers & Consultants, Inc.

RE: Johnson's Corner to Wilson Station 8" Pipeline Project

Bridger Pipeline, LLC is proposing the conversion of a 27-mile crude oil gathering line, and construction of a new 2.4-mile extension, to a crude transmission line. The project originates from an existing terminal near Johnson's Corner and terminates at the Wilson Station south of Watford City in McKenzie County, North Dakota.

A primary concern with pipeline projects is the possible disturbance of native prairie and wooded draws associated with construction of the pipeline and access roads. Avoidance of native prairie areas reduces impacts to several grassland species including many of the species of conservation priority. We ask that work within these areas be avoided to the extent possible, every effort be made to prevent destruction of woody vegetation, and disturbed areas be reclaimed to pre-project conditions.

Aerial surveys should be conducted for raptor nests before construction begins. We recommend that a ½-mile construction buffer be implemented around active eagle nest sites (known occupied within the past 5 years). Ms. Sandra Johnson, Conservation Biologist, may be contacted at 701-328-6327 for additional information on golden eagle nest sites in the state.

We do not believe this project will have significant adverse effects on wildlife or wildlife habitat provided these recommendations are implemented where appropriate during project construction.

J.D. Schumacher

Resource Biologist

701.328.6321 • jdschumacher@nd.gov • gf.nd.gov



Exhibit C.10
Lake Ilo National Wildlife Refuge

May 28, 2020

Lake Ilo National Wildlife Refuge
Audubon NWR
Attention- Kathy Baer
3275 11th Street NW
Coleharbor, ND 58531

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

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Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

From: [Baer, Kathy](#)
To: [Jaimee Antognazzi](#)
Subject: Re: [EXTERNAL] FW: Returned mail
Date: Tuesday, June 2, 2020 11:09:46 AM
Attachments: [image001.jpg](#)

Jaimee,
There are no easements or fee title lands adjacent to the pipeline as provided.
Thank you for your assistance!
KB

Kathy Baer
Wetland District Manager
Audubon Wetland Management District

*"And onto the prairie I must go,
To lose my mind and find my soul."
Adapted from John Muir*

From: Jaimee Antognazzi <jantognazzi@keitu.com>
Sent: Monday, June 1, 2020 10:00 AM
To: Baer, Kathy <kathy_baer@fws.gov>
Subject: RE: [EXTERNAL] FW: Returned mail

Hi Kathy-

Attached is the shapefile for Bridger Pipeline, LLC's Johnson's Corner to Wilson Station 8" Pipeline.
Please let me know if you need anything else.

Thanks,

Jaimee Antognazzi
Keitu Engineers & Consultants, Inc.
PO Box 98
Mandan, ND 58554-0098
701-667-1808 Ext. 105

From: Baer, Kathy [mailto:kathy_baer@fws.gov]
Sent: Monday, June 1, 2020 8:59 AM
To: jantognazzi@keitu.com
Subject: Fw: [EXTERNAL] FW: Returned mail

Jaimee,
I will be serving as the POC for projects in SW North Dakota. Can you please send me a copy of the map (preferably a shapefile), so that I can review and look for FWS interests that may be impacted.

Thank you,
Kathy

Kathy Baer
Wetland District Manager
Audubon Wetland Management District

*"And onto the prairie I must go,
To lose my mind and find my soul."
Adapted from John Muir*

From: Gallion, Todd <Todd_Gallion@fws.gov>
Sent: Thursday, May 28, 2020 3:10 PM
To: Baer, Kathy <kathy_baer@fws.gov>
Subject: Fw: [EXTERNAL] FW: Returned mail

From: Amy Heilman <aheilman@keitu.com>
Sent: Thursday, May 28, 2020 2:16 PM
To: Gallion, Todd <Todd_Gallion@fws.gov>
Subject: [EXTERNAL] FW: Returned mail

Todd,

Please see attached letter that we have attempted to mail. Please let me know if you have any questions.

Thanks,
Amy Heilman

From: Amy Heilman <aheilman@keitu.com>
Sent: Thursday, April 30, 2020 8:38 AM
To: 'Todd_Gallion@fws.gov' <Todd_Gallion@fws.gov>
Subject: Returned mail

Good morning Todd,

Would you please verify the address for Lake Ilo National Wildlife Refuge? We sent a PSC notification letter to 489 102 Ave SW Dunn Center and it was returned.

Thanks so much!

Amy Heilman
Field Service Specialist

Keitu Engineers & Consultants, Inc.

1403 27th St NW

Mandan ND 58554

701.667-1800 ext. 102

06 KECI Logo Color



Exhibit C.11
U.S. Fish and Wildlife Service

April 14, 2020

Drew Becker, Acting ND Ecological Services Office Supervisor
North Dakota Field Office
U.S. Fish and Wildlife Service
3425 Miriam Avenue
Bismarck, ND 58501-7926

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

Keitu Engineers and Consultants, Inc. (“Keitu”) expects to submit the Application in August 2020. The Commission requires applicants to contact relevant agencies for comment on the Project.

Enclosed is a map of the pipeline route for your review. We respectfully request that any concerns known in the area is brought to our attention to ensure we focus on resolving your issues of concern.

As always, Keitu appreciates the opportunity to assist our client and the regulatory agencies with compliance. I will serve as the primary Keitu contact and can be reached at (701) 667-1800 or via email at jantognazzi@keitu.com.



Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

Exhibit C.12
U.S. Air Force

From: [Amy Heilman](#)
To: ["cy.munos@us.af.mil"](mailto:cy.munos@us.af.mil)
Subject: Bridger 8" Pipeline
Date: Tuesday, April 14, 2020 2:30:07 PM
Attachments: [Air_Force.zip](#)

Mr. Cy Munos,

Bridger Pipeline, LLC ("Bridger") plans to submit a Consolidated Corridor and Route Permit Application, requesting permission from the North Dakota Public Service Commission ("Commission") for the construction of an approximately 27-mile gathering line and a new 2.4 mile extension to a crude transmission pipeline ("Project"). It originates from an existing terminal near Johnson's Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota.

The purpose of this contact is to afford Cable Affairs the opportunity to assess the Project area for the presence of Intercontinental Ballistic Missile ("ICBM") related systems that could potentially be impacted, and to provide comments. We respectfully request that any specific concerns known in the area are brought to our attention to ensure we focus on those items. Attached are the GIS Shapefiles of the entire length of the proposed Project intended for the Minot Air Force Base Cable Affairs Office to review.

As always, Keitu appreciates the opportunity to assist our client and the regulatory agencies with compliance.

Amy Heilman on behalf of:
Jaimee Antognazzi, CSP
Operations Manager
Keitu Engineers & Consultants
1403 27th Street NW
Mandan, ND 58554
(701) 667-1808 Ext# 105

From: [MUNOS, CY I GS-11 USAF AFGSC 91 MMXS/MMXSFK](#)
To: [Amy Heilman](#)
Subject: RE: [Non-DoD Source] Bridger 8" Pipeline
Date: Wednesday, April 15, 2020 10:29:47 AM

Amy,

Thanks for resending the shape files. The Minot AFB has no assets in the project area.

Cy Munos
Cable Affairs Officer
91 MMXS/MMXSFK
Minot AFB ND
701-723-6053
701-720-8274

-----Original Message-----

From: Amy Heilman <aheilman@keitu.com>
Sent: Wednesday, April 15, 2020 9:43 AM
To: MUNOS, CY I GS-11 USAF AFGSC 91 MMXS/MMXSFK <cy.munos@us.af.mil>
Subject: RE: [Non-DoD Source] Bridger 8" Pipeline

Cy,

Sorry about that!

Amy

From: MUNOS, CY I GS-11 USAF AFGSC 91 MMXS/MMXSFK <cy.munos@us.af.mil>
Sent: Wednesday, April 15, 2020 8:10 AM
To: Amy Heilman <aheilman@keitu.com>
Subject: RE: [Non-DoD Source] Bridger 8" Pipeline

Amy,

The shape files you sent was blocked by our network. Is there any way that you could re send them unzipped? Thanks.

Cy Munos

Cable Affairs Officer

91 MMXS/MMXSFK

Minot AFB ND

701-723-6053

701-720-8274

From: Amy Heilman <aheilman@keitu.com <<mailto:aheilman@keitu.com>> >
Sent: Tuesday, April 14, 2020 2:30 PM
To: MUNOS, CY I GS-11 USAF AFGSC 91 MMXS/MMXSFK <cy.munos@us.af.mil <<mailto:cy.munos@us.af.mil>> >
Subject: [Non-DoD Source] Bridger 8" Pipeline

Mr. Cy Munos,

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Amy Heilman on behalf of:

Jaimee Antognazzi, CSP

Operations Manager

Keitu Engineers & Consultants

1403 27th Street NW

Mandan, ND 58554

(701) 667-1808 Ext# 105

Exhibit C.13
ND Soil Conservation Committee

April 14, 2020

Scott Hochhalter, State Soil Specialist
NDSU Extension Service
2718 Gateway Ave., Suite 104
Bismarck, ND 58503

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

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Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

Exhibit C.14
McKenzie County Commission

April 14, 2020

McKenzie County Commission
201 5th St NW, Ste. 543
Watford City, ND 58854

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

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Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

Exhibit C.15
U.S. McKenzie Ranger District

April 14, 2020

McKenzie Ranger District
1905 S. Main Street
Watford City, ND 58554

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

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Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

Exhibit C.16
McKenzie County Weed Board

April 14, 2020

Amber Higgins
Weed Board
512 14th St. SW
PO Box 930
Watford City, ND 58854

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

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Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

From: mcweed@restel.net
To: jantognazzi@keitu.com
Subject: Bridger Pipeline LLC
Date: Monday, April 20, 2020 3:02:30 PM
Attachments: [Weed Management Plan - Copy.doc](#)

Jaimee-

Good afternoon, I received your letter regarding Bridger Pipelines project from Johnsons corner to Wilson station. I appreciate the letter, if you could just fill out the attached Weed Management Plan and submit it to me I can review and approve if it meets our requirements. If you have any questions while filling this out please feel free to contact me.

Amber Higgins

McKenzie County Weed Officer

Phone- 701-842-4131

Fax -701-8424731

Exhibit C.17
ND Geological Survey

April 14, 2020

Fred Anderson
ND Geological Survey
600 E. Boulevard Ave, Dept 405
Bismarck, ND 58505-0840

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

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Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

Exhibit C.18
ND Department of Agriculture

April 14, 2020

ND Department of Agriculture
600 E Boulevard Ave, Dept. 602
Bismarck, ND 58505-0020

RE: Bridger Pipeline, LLC – Johnson’s Corner to Wilson Station 8” Pipeline

Our client, Bridger Pipeline, LLC (“Bridger”), plans to submit a Consolidated Corridor and Route Permit Application to the North Dakota Public Service Commission (“Commission”) for a project involving the conversion of a 27-mile crude oil gathering line and a new 2.4 mile extension to a crude transmission pipeline (“Project”). It originates from an existing terminal near Johnson’s Corner, North Dakota and terminates at the Wilson Station located south of Watford City, North Dakota. The Project is located entirely within McKenzie County and will be known as the Johnson’s Corner to Wilson Station Pipeline.

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Jaimee Antognazzi
Operations Manager

Enclosure: Proposed Pipeline Route

Exhibit D

Shapefiles